INTEL® PRODUCT QUICK REFERENCE MATRIX

Intel® Product Quick Reference Matrix

Q3 2019

TABLE OF CONTENTS

INTEL® TECHNOLOGY PROVIDER

INTEL® VPRO™ TECHNOLOGY SOLUTION

INTEL® IOT PLATFORM

INTEL UNITE®

THUNDERBOLT™ 3

INTEL® GRAPHICS

INTEL MEMORY AND STORAGE

DESKTOP PRODUCTS

- Intel® Desktop Processors
- Intel® Ethernet Desktop Adapters
- Intel® Boxed Thermal Solutions
- Intel® NUC
- Intel® Compute Stick
- Intel® Compute Card

INTEL® WIRELESS PRODUCTS

INTEL® REALSENSE™ TECHNOLOGY

MOVIDIUS™ NEURAL COMPUTE STICK

SERVER PRODUCTS

- Intel® Server/Workstation Processors
- Intel® Server Boards
- Intel® Server Systems
- Intel® Data Center Blocks
- Intel® Server Chassis
- Intel® RAID
- Intel® Ethernet Server Adapters
- Intel® Server Management
- Intel® Accelerators
- Intel® Omni-Path Architecture

Intel® Product Quick Reference Matrix

Q3 2019

YOUR SOLUTIONS.
OUR TECHNOLOGY.
SMARTER
TOGETHER.

INTEL® TECHNOLOGY PROVIDER

Intel® Product Quick Reference Matrix
Q3 2019

INTEL® TECHNOLOGY PROVIDER

Intel® Technology Provider provides support to keep your business running smoothly, knowledge and expertise to provide an edge and rewards to grow your business.

ONLINE RESOURCES

Access a number of online resources designed to help provide the right solutions for your customers and grow your business.

ONLINE TRAINING

Access a wide range of online courses that include in-depth technical, business and technology specific training. Earn credits as you learn more.

INTEL® TECHNOLOGY PROVIDER

Your Solutions. Our Technology. Smarter Together.

Whether selling to businesses or consumers, Intel® Technology Providers get the competitive advantage. Access your many benefits as you progress through the program, receiving the support, expertise, and recognition you need to succeed in a fast-moving global marketplace.

SUPPORT	EXPERTISE	RECOGNITION
Grow your bottom line with sales and marketing tools dedicated to Intel Technology Providers.	Become a trusted advisor to your customers with training, events, newsletters, and online guides.	Be recognized for the business you do with Intel. Earn points on purchases to spend on rewards and access promotions and membership materials.

Helping You Succeed, with These Partner Benefits:

ACCOUNT MANAGEMENT	POINTS	TRAINING	EVENTS	SALES & MARKETING TOOLS	PRIORITY TECHNICAL SUPPORT
Platinum tier members may be eligible to work with an account manager to help you drive sales and solutions, stay ahead of industry trends and alert you to the latest opportunities.	Greater performance brings greater rewards. All partners can earn points while Gold and Platinum partners can spend points on Intel® technology, events and more.	Access to the latest online and face-to-face training courses.	Invitations for Platinum and Gold tier members to annual partner-only events offering the latest product information and the opportunity to network with other top ecosystem partners as well as Intel executives.	Targeted sales and marketing solutions to boost sales and grow your business.	Priority support for Platinum partners via chat, email, or phone, and advanced warranty service. NEW - Intel Support App. Submit support tickets from your mobile device.

For more information, visit **www.intel.com/technologyprovider**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

CLOUD DATA CENTER SPECIALTY BENEFITS

Earn specialty benefits and gain exclusive, partner-only resources to help you plan, build, and deploy your cloud data center solutions.

The Cloud Data Center Specialty aims to reward Partners who have the deepest expertise in designing and deploying cloud solutions. Intel has exclusive resources available to you, through Cloud Data Center Specialty Benefits, to help you plan, implement and deliver your data center solution, opening the door to another level of engagement with Intel on cloud.

ADDITIONAL POINTS FOR SPECIALISTS

We will offer our Cloud Specialists the opportunity to participate in offers and earn additional points for purchases of Intel Data Center Portfolio products through authorized distributors that are available only to Specialty Partners.

CUSTOMER MATCHMAKING

As a Cloud Specialist, you'll have priority access to Intel sales teams as they help match-make between your cloud expertise and our customer base. Intel also hosts special invitation-only matchmaking events at industry conferences.

POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by Cloud Specialists and accepted by Intel. Contact ITP-Cloud@intel.com for limitations and guidelines.

ACCESS TO INTEL CLOUD RESOURCES

Trainings, white papers, success stories and other collateral are just a few examples of the available resources that will help you stay up to date with cloud technologies and stay ahead of the competition. Our research and world-class resources will assist you in planning and architecting cloud solutions.

ACCELERATOR INITIATIVES

Exclusive accelerator efforts designed to support and drive transitions to the latest Intel® technologies and enable your company to have a competitive edge on the latest industry products.

PRIORITY INVITATION TO INDUSTRY EVENTS AND TECHNICAL TRAINING

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As a Cloud Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.

ACCESS TO CLOUD EXPERTS FOR PRESALES TECHNICAL SUPPORT

As a Cloud Specialist, you'll receive priority access to our Cloud Experts, who can help you confidently offer end-to-end solutions to grow your business and cement your role as a trusted advisor. Reach out to us at ITP-Cloud@intel.com, and we will get you in touch with the right person to help you achieve your business goals.

CLOUD SPECIALIST PROMOTION & SPECIALIST DESIGNATION

Intel will promote Cloud Specialists as the experts to the market. Our "Partner with an Intel Cloud Data Center Specialist" web page will give you invaluable exposure, making it easier for potential customers to find and connect with you. Display your specialty badge to show your official affiliation with Intel and your specific expertise.

OPPORTUNITY TO EARN STRATEGIC OEM (SOEM) STATUS

As part of the Data Center Specialty you may have the opportunity to be eligible for Strategic OEM status based on annual revenue level. As an SOEM you would be eligible for matching annual Market Development Funds and if qualified year on year bonus based on total Intel revenue growth. This initiative is invite-based and intended to accelerate technology solutions, encourage innovation, and improve long term strategic planning with our key OEM's.

For more information, visit **www.intel.com/technologyprovider/cloud**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

HIGH-PERFORMANCE COMPUTING (HPC) DATA CENTER SPECIALTY BENEFITS

Earn specialty benefits and gain exclusive, partner-only resources to help you plan, implement, and deliver your data center solutions.

Intel has preferred resources available to you through HPC Data Center Specialty Benefits to help you plan, implement and deliver your data center solution. This includes access to special members-only training and events. These resources will open the door to another level of engagement with Intel on HPC.

ACCELERATOR INITIATIVES

Exclusive accelerator efforts designed to support and drive transitions to the latest Intel® technologies and enable your company to have a competitive edge on the latest industry products.

CUSTOMER MATCHMAKING

As an HPC Specialist, you'll have priority access to Intel sales teams as they help match-make between your HPC expertise and our customer base. Intel also hosts special invitation-only matchmaking events at industry conferences.

POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by HPC Specialists and accepted by Intel. Contact ITPHPC@intel.com for limitations and guidelines.

ADDITIONAL POINTS OFFERS FOR HPC SPECIALISTS

Participate in offers and earn additional points available only to Specialty partners. Use points to build your business and attract more data center customers.

SPECIAL OMNI-PATH PRICING

HPC Specialists receive special pricing on purchase of Omni-path products.

PRIORITY INVITATION TO INDUSTRY EVENTS AND TECHNICAL TRAININGS

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As an HPC Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.

ACCESS TO HPC EXPERTS FOR PRESALES TECHNICAL SUPPORT

Closing deals can be a complicated process that requires all the help you can get. With access to our experts, we can help you confidently offer end-to-end solutions to grow your business and cement your role as a trasted advisor. Reach out to us at ITPHPC@intel.com, and we will get you in touch with the right person to help you achieve your business goals.

HPC DATA CENTER SPECIALIST PROMOTIONS AND SPECIALTY DESIGNATION

Intel will promote the HPC Specialists as experts to the market. Our "Partner with an Intel HPC Data Center Specialist" web page will give you exposure, making it easier for potential customers to find and connect with you as an expert in HPC design and deployment. Display your specialty badge to show your official affiliation with Intel and your specific expertise in providing Intel® technology and solutions to end customers.

OPPORTUNITY TO EARN STRATEGIC OEM (SOEM) STATUS

As part of the Data Center Specialty you may have the opportunity to be eligible for Strategic OEM status based on annual revenue level. As an SOEM you would be eligible for matching annual Market Development Funds and if qualified year on year bonus based on total Intel revenue growth. This initiative is invite-based and intended to accelerate technology solutions, encourage innovation, and improve long term strategic planning with our key OEM's.

For more information, visit **www.intel.com/technologyprovider/hpc**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

ARTIFICIAL INTELLIGENCE (AI) SPECIALTY BENEFITS

Earn specialty benefits and gain exclusive, partner-only resources to help you plan, implement, and deliver your AI solutions.

Intel has preferred resources available to you through AI Specialty Benefits to help you plan, implement and deliver your data center solution. This includes access to special members-only training and events. These resources will open the door to another level of engagement with Intel and AI.

PROMOTION OF YOUR COMPANY BY INTEL

Intel will promote AI Specialists as the experts to the market. Our "Partner with an Intel AI Specialist" web page will give you invaluable exposure, making it easier for potential customers to find and connect with you as an AI service provider they can trust.

PUBLIC RELATIONS SUPPORT

Intel will provide quotes and other supporting comments from our recognized AI experts to support your technical, sales and marketing collateral .

POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by AI Specialists and accepted by Intel. Contact ITP-AI@intel.com for limitations and guidelines.

ADDITIONAL POINTS OFFERS FOR AI SPECIALISTS

Participate in offers and earn additional points available only to Specialty partners. Use points to build your business and attract more data center customers.

PRIORITY INVITATION TO INDUSTRY EVENTS & TECHNICAL TRAININGS

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As an AI Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.

ACCESS TO AI EXPERTS FOR PRESALES TECHNICAL SUPPORT

Closing deals can be a complicated process that requires all the help you can get. With access to our experts, we can help you confidently offer end-to-end solutions to grow your business and cement your role as a trusted advisor. Reach out to us at ITP-AI@intel.com, and we will get you in touch with the right person to help you achieve your business goals.

AI SPECIALIST PROMOTIONS AND SPECIALTY DESIGNATION

Intel will promote the AI Specialists as experts to the market. Our "Partner with an Intel AI Specialist" web page will give you exposure, making it easier for potential customers to find and connect with you as an expert in AI design and deployment. Display your specialty badge to show your official affiliation with Intel and your specific expertise in providing Intel® technology and solutions to end customers.

ACCESS TO ONLINE TRAINING AND COLLATERAL

Product trainings, white papers, success stories and other collateral are just a few examples of the available resources that will help you stay up to date with AI technologies and stay ahead of the competition. Our research and world class resources will assist you in planning and architecting AI solutions.

For more information, visit **www.intel.com/technologyprovider/AI**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

ENTHUSIAST PC SPECIALTY BENEFITS FOR SELLER/LOEM

Get Assets, Promotion and Unique Benefits to Help You Differentiate and Succeed

Enthusiast PC specialty benefits give you exclusive, partner-only resources to help you excel, differentiate and accelerate in the enthusiast market segment. Get access to valuable benefits designed and tailored for channel partners selling and promoting finished systems based on Intel® Core™ X, K, H series.

MARKET INTELLIGENCE REPORTS

Access quarterly Intel curated enthusiast market segment intelligence reports, containing market data, insights, and forecasting at the macro and country level.

GET WORLD CLASS GAMING, SOFTWARE PACKS

Receive entertainment packs free-of-cost with Intel® Core™ processor-based systems. Latest titles are sourced from top gaming and software partners.

GET PROMOTED

Be included in promotional listings of qualified Enthusiast Specialists on select Intel partner directories.

GET PASSES TO LOCAL E-SPORTS EVENTS

Receive at least 10 passes to your local E-Sports League or Intel® Extreme Masters (IEM) events, to be used as giveaways or promotions.

EARN ADDITIONAL POINTS

Earn additional points when you participate in offers only for Enthusiast PC Specialists. Use your points for partner events, marketing resources and more.

ACCESS ONLINE TECHNICAL WEBINARS

Join exclusive technical sessions led by Intel experts on topical and technical enthusiast and gaming topics in your geography.

MERCHANDISE AND GIVEAWAYS

Receive select merchandise and giveaways to help in your marketing and promotion, starting with an Intel® Technology Provider-branded E-sports shirts.

For more information, visit **www.intel.com/enthusiastpc**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

ENTHUSIAST PC SPECIALTY BENEFITS FOR DEVELOPER/PUBLISHER

Get Assets, Promotion and Unique Benefits to Help You Differentiate and Succeed

Enthusiast PC specialty benefits give you exclusive, partner-only resources to help you excel, differentiate and accelerate in the enthusiast market segment. Get access to valuable benefits designed and tailored for channel partners selling and promoting finished systems based on Intel® Core™ X, K, H series.

MATCHMAKING CONCIERGE

Get connected to gaming hardware providers, for an opportunity to collaborate on go-to-market and innovative business opportunities.

SPONSORSHIP PASS TO INTEL® PARTNER CONNECT

Get additional exposure through your local Intel® Partner Connect event. Receive a one-time offer of "Developer" Tier Sponsorship Pass to the next event. (Value of USD $10K).

MARKET INTELLIGENCE REPORTS

Access quarterly Intel curated enthusiast market segment intelligence reports.

GET PROMOTED

Be included in promotional listings of qualified Enthusiast Specialists on select Intel partner directories.

GET PASSES TO LOCAL E-SPORTS EVENTS

Receive at least 10 passes to your local E-Sports League OR Intel® Extreme Masters (IEM) events, to be used as giveaways or promotions.

ACCESS ONLINE TECHNICAL WEBINARS

Join exclusive technical sessions led by Intel experts on topical and technical enthusiast and gaming topics in your geography. Coming soon.

MERCHANDISE AND GIVEAWAYS

Receive select merchandise and giveaways to help in your marketing and promotion, starting with Intel® Technology Provider-branded E-sports shirts.

For more information, visit **www.intel.com/enthusiastpc**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

INTEL® SUPPORT APP

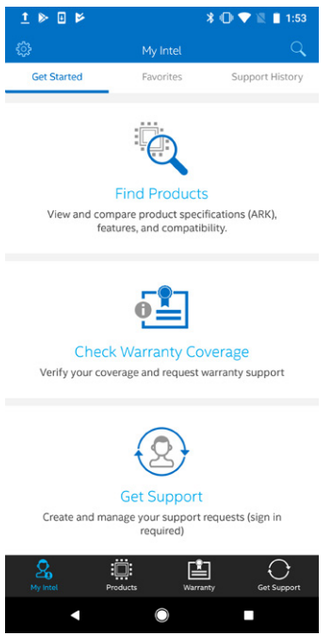
Intel® Support App

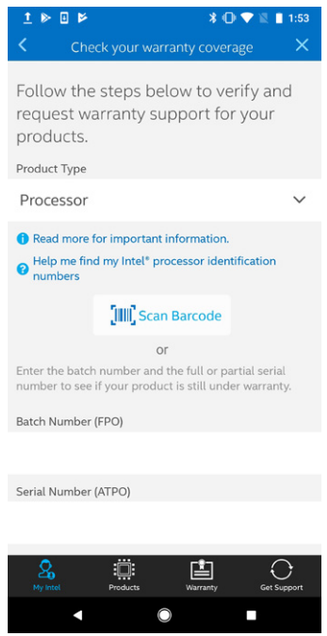
The Intel® Support App is an easy and simple smartphone application that allows you to connect with Intel for all your support needs.

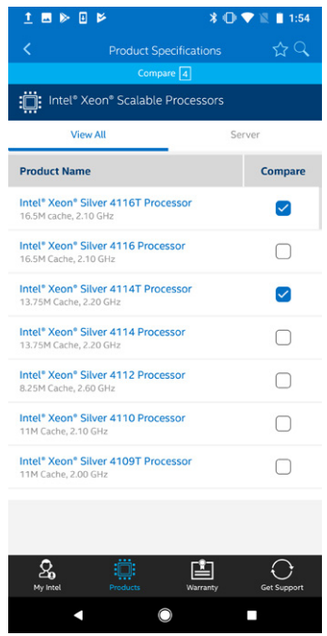
Key features of the app include:

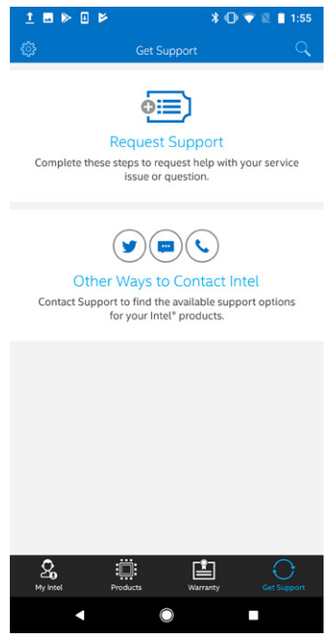
- **Barcode Scanning** feature to quickly check the warranty coverage and eligibility of boxed processors. Future enhancements will allow for the scanning of additional Intel products beyond just processors.
- Submit new support requests, check the status of active requests, submit warranty claims, or view your support history.
- Use the Product Specification tool to get the specs on a variety of Intel products, from processors to SSDs to NUCs.
- Gives you a more personalized experience, and provides more control over where, when, and how you engage with Intel Customer Support.
- Available on iPhone®, iPad®, and Android® mobile devices.

AVAILABLE FOR DOWNLOAD ON THE APPLE APP STORE & GOOGLE PLAY









All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.
* Other names and brands may be claimed as the property of others.

INTEL® VPRO™ TECHNOLOGY SOLUTION

Intel® Product Quick Reference Matrix
Q3 2019

THE FOUNDATION FOR BUSINESS COMPUTING

THE INTEL® VPRO™ PLATFORM

The Intel® vPro™ platform[1] meets the needs of the user and the business by combining a premium computing experience with hardware-enhanced security, flexible management, and improved stability—all made possible by 8th Generation Intel® Core™ vPro™ processors.

[1] Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com.

THE ADVANTAGES OF INTEL® VPRO PLATFORMS FOR BUSINESS OF ALL SIZES

Refresh your desktop fleet with the latest 8th Gen Intel® vPro™ processors to unlock performance and productivity, enhanced security and improved capabilities. The new 8th Gen Intel® vPro™ processors with up to 6 Cores provide exceptional performance and responsiveness leveraging Intel® Optane™ Memory technology. This is the first 6-core Intel® vPro™ processor for Mainstream computing with enhanced hardware security and advanced remote manageability. The new 8th Gen Intel® vPro™ platform is Intel's Best-In-Class business platform.

31%

Up to 31% Better Productivity Performance vs 7th Gen [1,2,4]

Premium performance enables things like - robust content creation, analyze data using Microsoft* Office products up to 31% faster than a 7th Gen PC

41%

Up to 41% Faster Multi-Tasking vs 7th Gen [2,5,6,7,8,9]

Collaborate with teammates while also working on multiple Microsoft Office applications faster than a 7th Gen PC

10HRS

Up to 10 Hours Battery Life [3]

Enjoy up to 10 hours battery life to analyze data and create content while conducting research on the web

Sales Opportunities

Nearly half (46%) of small businesses are in a managed environment, and drive 62% of small business IT spending.**	Devices powered by Intel® Core™ vPro™ processors deliver proven value with reduced repair times and improved system availability.	Intel vPro technology is supported by a broad set of ISV management consoles and a wide variety of devices.

Processor

Intel® Core™ i7 and
Intel® Core™ i5 vPro™ Processors

+

Desktop Chipset OR **Mobile Chipset**

Intel® Q Series Chipset

Intel® QM Series Chipset

+

Network

Intel® LAN Controller

** Source: AMI-Partners (http://www.ami-partners.com) 2013. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

8th Generation Intel® Core™ vPro™ Processors

BUSINESS-CLASS PERFORMANCE YOU CAN COUNT ON

Streamline productivity with performance for serious business compute, multitasking for maximum efficiency, and unprecedented battery life that lasts up to 10 hours.

Lighten your heaviest workloads

When finance crunches complex calculations, developers compile precise code, and designers manipulate sophisticated graphics, the premium performance of new 8th Intel® Core™ vPro™ processors give uptime a whole new meaning.

From Excel macros to CAD animations, Intel® Hyper-Threading Technology handles demanding applications by running multiple threads on each core to deliver cutting-edge responsiveness for serious business compute.

Take the task out of multitasking

Trying to do more than one thing at a time on old technology is a productivity drain, not a driver.

Keep business running smoothly with new 8th Generation Intel® Core™ vPro™ processor-based devices that have Intel® Speedshift™ Technology for steady load balancing across highly demanding workloads.

Performance automatically adjusts to focus frequencies where they're needed most, while applications running in the background reserve power.

Unleash real mobile productivity

From improving interactions with patients to delighting customers on the sales floor, modern business is all about mobility and long battery life is central to this transformation.

Make your workforce more productive from anywhere, anytime with the endurance of new 8th Generation Intel® Core™ vPro™ processor-based devices, which provide up to 10 hours of untethered power to last the entire work day.

For more information, visit **www.intel.com/go/vpro**

Refresh Configurations

Intel® Core™ i5-8350U (Intel Reference Platform), 15W, 4C8T, Turbo up to 3.6GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows* 10

Intel® Core™ i5-3427U, 15W, 2C4T, Turbo up to 2.8GHz, Memory: 2x4GB DDR3-1600, Storage: 80GB SSD, Graphics: Intel(R) HD Graphics 4000, OS: Windows* 10

Gen-on-Gen Configurations

Intel® Core™ i7-8650U (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows* 10

Intel® Core™ i7-7600U (Intel Reference Platform), 15W, 2C4T, Turbo up to 3.9GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows* 10

Battery Life Configuration

Intel® Core™ i7-8650U Processor (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2133, Storage: Intel 540s m.2 SSD, Graphics: Intel UHD Graphics 620, OS: Windows* 10, Battery Size: 42WHr, Screen: 25x14 12.5", Windows 10 Power Slider – Better Performance

Workloads

1 SYSmark* 2014 SE: SYSmark* 2014 SE is a benchmark from the BAPCo* consortium that measures the performance of Windows* platforms. SYSmark 2014 SE tests four usage scenarios: Office Productivity, Media Creation, Data/Financial Analysis, and Responsiveness. SYSmark contains real applications from Independent Software Vendors such as Microsoft* and Adobe*.

2 Office Productivity and Multitasking Workload: Slack is open in the background while a 2.28 MB, Microsoft PowerPoint .ppt presentation is exported as a 1920x1080 H.264 .mp4 video presentation. While the video presentation is being created 1) a 6.49 MB, 844 page, Microsoft Word .docx document is converted to a 7.98 MB, PDF file and 2) a 70.4 MB, .Microsoft Excel .xlsm macro-enabled worksheet that is recalculated.

3 EMBC Browsing Bench Component Average Power (projected on Intel Reference Platform using a 42WHr battery and 25x14 Panel): Disconnect all USB devices, connect to a local WiFi access point and set the screen brightness to 200 nits (disable DPST, set brightness to 200 nits on a white background and enable DPST). Wait for 10 mins for the OS to completely idle and then launch EEMBC Browsing Bench using Microsoft® Edge Browser. Set the web pages to idle for 20s in between page loads. Measure power for the duration of all page loads and report 3 run median.

4 Large numerical calculation workload: uses the Black-Scholes model to execute approximately 300,000 iterations of the Monte Carlo simulation in Microsoft* Excel* 2016. It also uses Excel lookup functions to compare the Black-Scholes model's put price with the historical market price for 50,000 rows to understand the convergence, creating a spreadsheet file larger than 70 MB.

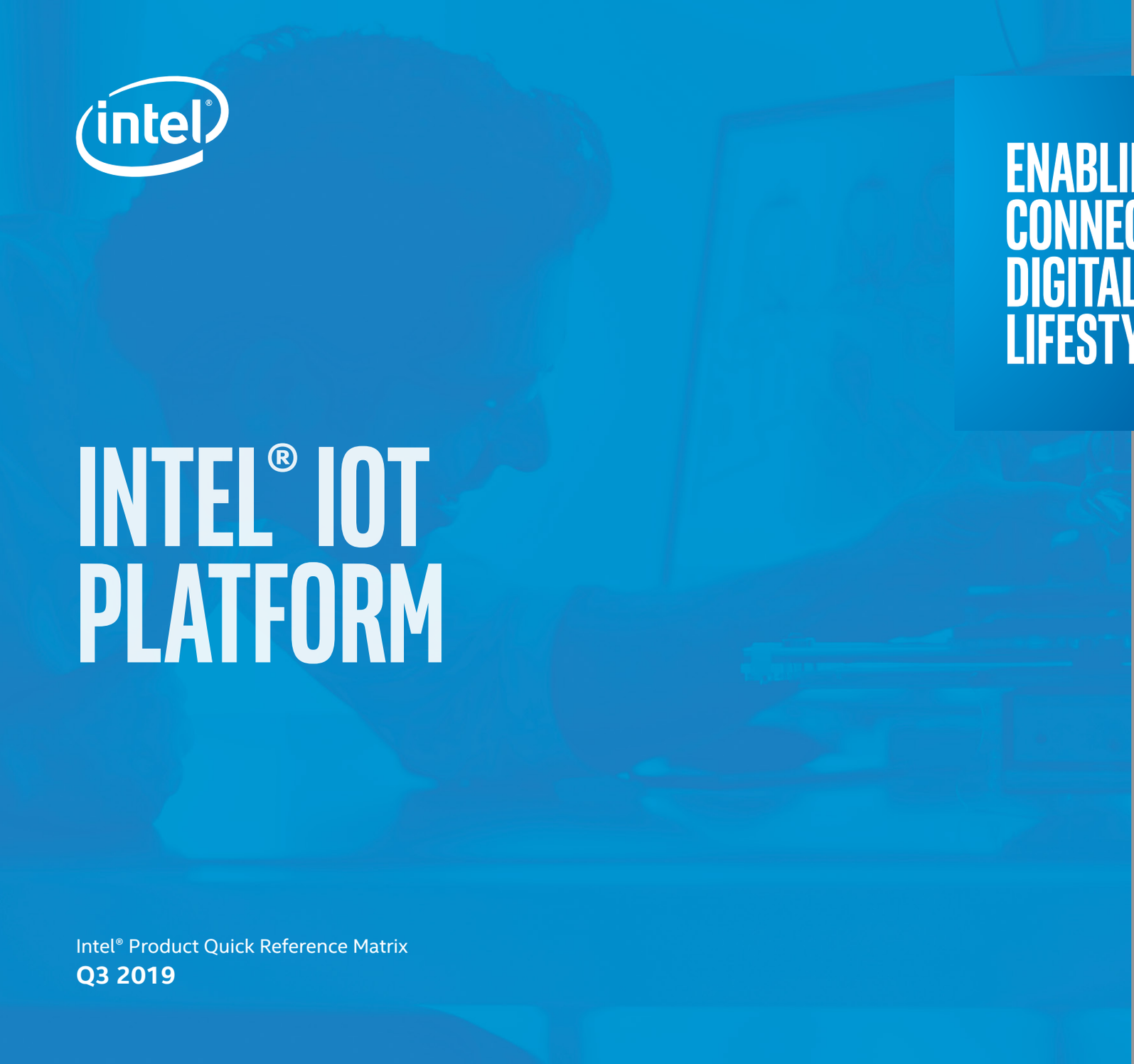
5,6 WebXPRT* 2015 ([5] Stock Option Pricing Subscore, [6] DNA Sequencing Subscore: benchmark from Principled Technologies* that measures the performance of web applications using six usage scenarios: Photo Enhancements, Organize Album, Local Notes, Stock Option Pricing, Sales Graphs, and Explore DNA Sequencing. WebXPRT tests modern browser technologies such as HTML5 Canvas 2D, HTML5 Table, HTML5 Local Storage, as well as JavaScript*. Reported metrics: elapsed time in seconds (lower is better) for each scenario, plus an overall score (higher is better). Scaling efficiencies: CPU dominant (newer browsers are GPU accelerated), sensitive to frequency. WebXPRT is very sensitive to browser type and version. OS support: Any OS that supports an HTML5 browser.

7 Microsoft* PowerBI Data Source Change Workload: Measures the time to load, query, calculate statistics, and draw 6 charts from a different local data source containing 2.2 million sales records

8 Dataset JOIN query workload: Measures the time to perform a multi-table SQL JOIN query in Microsoft* Access 2016 on a sample dataset containing 2.2 million sales records to create a quarterly sales summary.

9 File Compression (Zipping) workload: Measures the time to compress 50 files totaling 118MB using WinZip* v22.

* Other names and brands may be claimed as the property of others.



ENABLING A CONNECTED DIGITAL LIFESTYLE

INTEL® IOT PLATFORM

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® IOT PLATFORM

The Intel® IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.

INTEL® IOT PLATFORM

Enabling a connected digital lifestyle through devices that are able to connect to the internet securely.

The Intel® IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.

INTEL® IOT PLATFORM INFOGRAPHIC

The Internet of Things (IoT) is at the heart of a powerful technology revolution. The act of connecting devices and systems to each other so that they can share data is the seed of new products, services, and experiences. Today, there are many IoT solutions based on Intel® technology in operation worldwide and the impact has been significant for businesses and consumers.

IOT PRODUCT PORTFOLIO

Intel technology is the backbone of proven IoT solutions in smart home, industrial, and mobile applications, as well as for vertical markets, including transportation, healthcare, and retail. It is helping billions of devices talk to each other and share valuable information, protecting sensitive data, and providing critical analytics and API offerings.

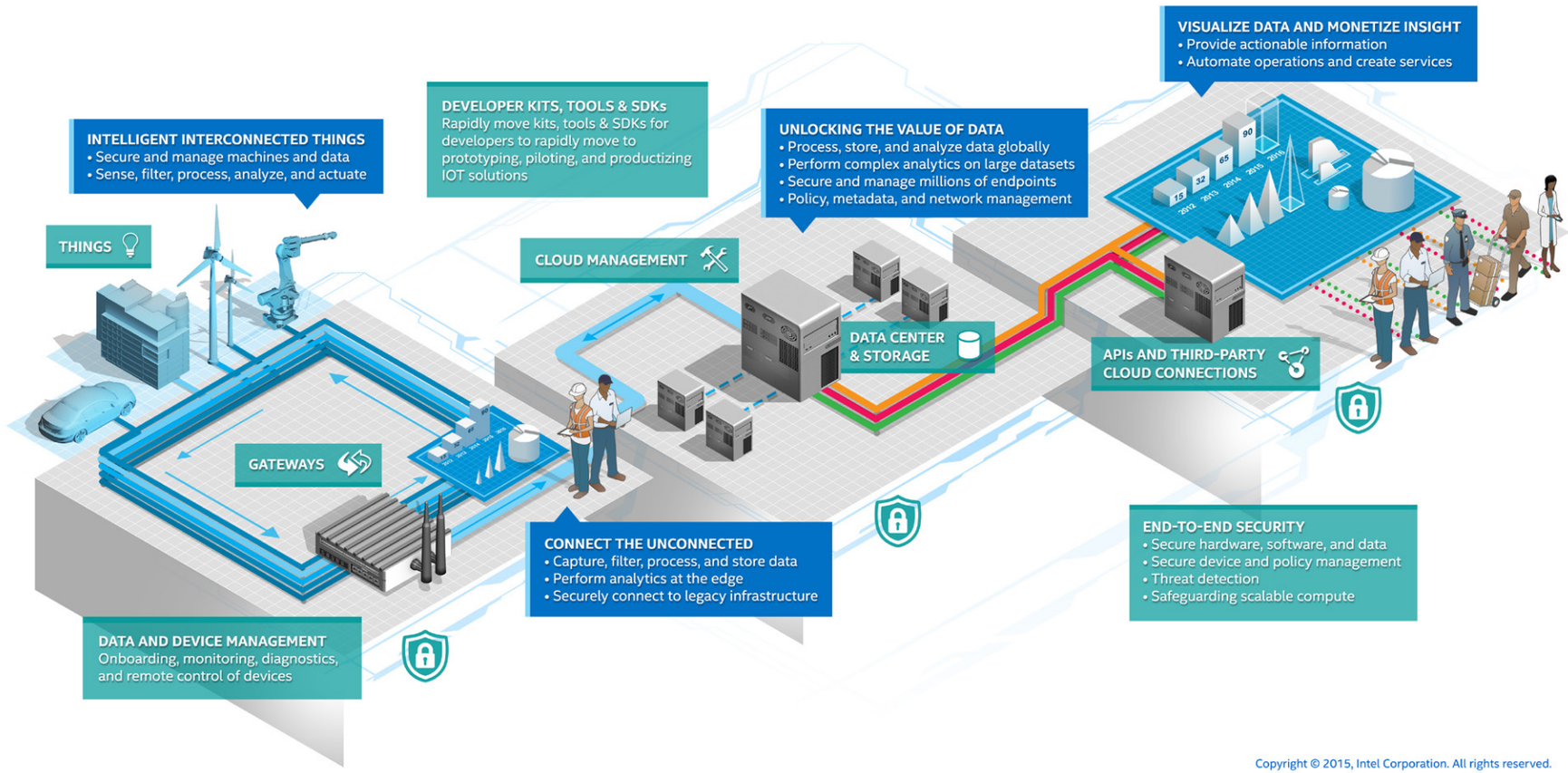
IOT SECURITY PORTFOLIO

Intel supports tightly integrated hardware and software security from the edge to the cloud, along with data protection and policy management, delivering trusted data resulting in valuable insights.

INTEL® IOT PLATFORM

Secure. Scalable. Interoperable.

The Intel® IoT Platform is an end-to-end reference architecture and family of products from Intel, that works with third-party solutions, to provide a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.



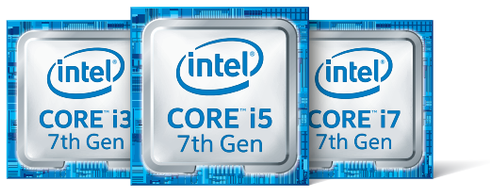
Copyright © 2015, Intel Corporation. All rights reserved.

For more information, visit **www.intel.com/content/www/us/en/internet-of-things/overview.html**

INTEL® PROCESSORS FOR IOT

Hyperreal Visuals Drive Greater IOT Possibilities

Build your most innovative solutions with 7th Gen Intel® Core™ processors, featuring enhanced graphics, performance, and responsiveness.



- 14nm silicon technology
- Reduced electrical and power consumption
- Latest hardware- and software-enhanced security
- Long-term availability (up to seven years)

BETTER PERFORMANCE

- Up to 17%[1] better CPU performance
- Power-optimized for mobility
- Intel® Optane™ memory ensures media responsiveness
- Intel® Speed Shift Technology optimizes task performance

STRONGER GRAPHICS

- Up to 4K Ultra HD
- New HEVC 10-bit and VP9 decode
- Integrated HDCP 2.2
- Support for additional formats, such as AVC/H.264, MPEG-2, and VC-1

Intel® Processors for IoT

INTEL® QUARK™ PROCESSORS

Intel® Quark™ processors are microcontrollers for intelligent things. They provide flexible, low-power computing for a variety of small form factor applications to offer low-cost connectivity, integration, and compatibility for the IoT.

INTEL® ATOM™ PROCESSORS

Intel® Atom™ processors pack an entire system-on-a-chip for the ultimate in power and portability. Get performance/watt leadership, security and manageability, rich graphics, and I/O integration, with stunning graphics performance for edge devices.

7TH GENERATION INTEL® CORE™ PROCESSORS

The 7th generation Intel® Core™ processors offer unprecedented power and responsiveness of Intel® Turbo Boost Technology.[2] Work with superior CPU and graphics performance, powerful security, and a range of power options to boost edge-to-cloud IoT designs.

INTEL® XEON® PROCESSORS

The Intel® Xeon® processors power any workload and lift date center productivity. They combine multi-core performance and compute density with hardware-based manageability, security, virtualization, and power management for scalability and reliability at the edge.

Learn more at **intel.com/iot**

[1] Measured by Intel on a system with 7th Gen Intel® Core™ processor i7-7700 versus a system with 6th Gen Intel® Core™ processor i7-6700 using SPECfp2006 (8 copy).

[2] Requires a system with Intel® Turbo Boost Technology. Intel® Turbo Boost Technology and Intel® Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit intel.com/turboboost.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. For more complete information about performance and benchmark results, visit intel.com/benchmarks.

Copyright © 2019, Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Atom, Intel Core, Xeon and Quark are trademarks of Intel Corporation in the U.S. and/or other countries. *Other names and brands may be claimed as the property of others.

INTEL® UNITE

SMARTER ROOMS. SMARTER COLLABORATION.

INTEL® UNITE

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.

Intel® Product Quick Reference Matrix

Q3 2019

SMARTER ROOMS. SMARTER COLLABORATION.

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.

intel UNITE®

ENTERPRISE INSTALLATION

This easily scalable solution is ideal for enhancing collaboration in *managed* IT environments with more than a few rooms, including medium to large businesses and schools. It features a centralized administrative web portal, broad OS support, and the ability to integrate optional plugin extensions.

SMALL BUSINESS INSTALLATION – NEW!*

For unmanaged small business environments with only a few rooms, this easy-to-install option requires no IT expertise or server components, and enables basic collaboration capabilities for users with PCs and Macs. Connection reliability is now on par with the enterprise installation, and multiple subnets are now supported.

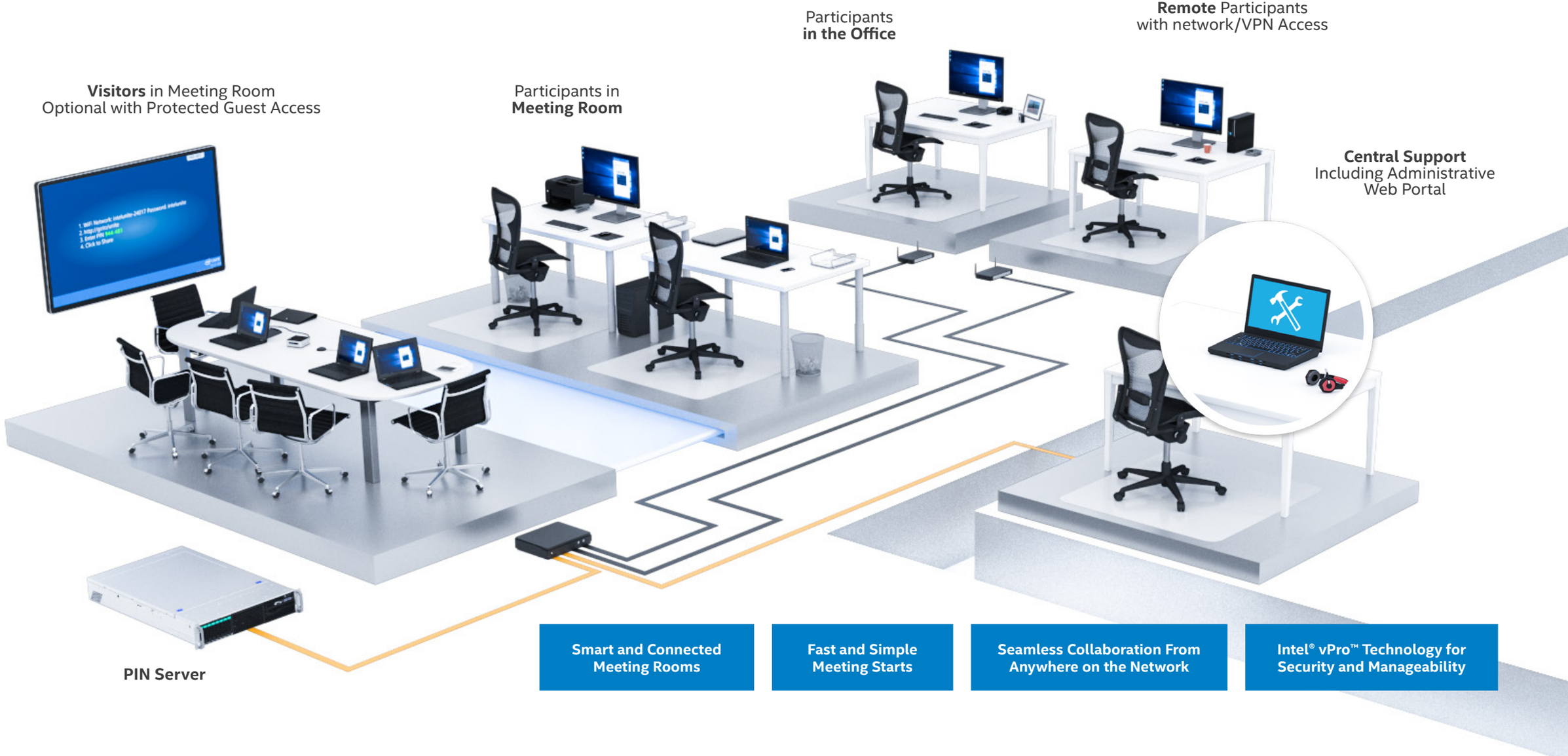
* Now available with Intel Unite® software version 3.2

INTEL UNITE® SOFTWARE

COLLABORATION MADE EASY

Just launch the app on your device, enter the short PIN shown on the room's display, and begin wirelessly sharing or viewing content with a click.

INTEL UNITE® - ENTERPRISE SOFTWARE INSTALLATION FOR MANAGED ENVIRONMENTS



Smart and Connected Meeting Rooms

Fast and Simple Meeting Starts

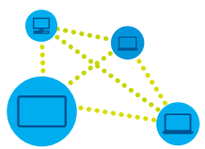
Seamless Collaboration From Anywhere on the Network

Intel® vPro™ Technology for Security and Manageability

THE INTEL UNITE® SOLUTION

Simplify IT Management

With Intel® vPro™ technology on every room-based PC running Windows and Intel Unite® software, you can easily integrate these PCs into your existing IT infrastructure and leverage the management tools, systems and policies you already have in place. And by simplifying the infrastructure technologies needed in your conference rooms, you can help reduce costs and improve manageability.



Ditch the Dongle

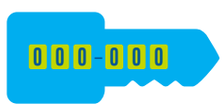
Technology connects attendees to new or existing displays, projectors, and interactive whiteboards. There's no need to waste time searching for the right adapter or dongle.

Collaborate in Real Time

Attendees from any location can view, annotate, and share documents—in real time, every time. Share files easily using the built-in file transfer feature.

Host From Your PC

No room monitor? An Intel® Core™ vPro™ processor-based client device with the Intel Unite® app installed can host a session, allowing workers to share screens wirelessly between their devices.[1]

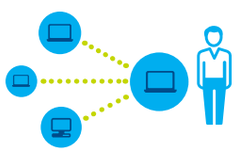


Safer Meetings

To improve security, attendees must enter the appropriate rotating PIN code to join the meeting. Guests outside of your network can temporarily join and participate in configured rooms using the optional software plugin[3] for protected guest access.

Protected Data

Enterprise-grade security ensures that data is 256-bit Secure Sockets Layer (SSL) encrypted and stays within your corporate network. Data always stays within the virtual walls of your business and isn't dependent on any additional vendor solutions.[1]



Remote Manageability

With the remote management tools of Intel® vPro™ technology, you can manage all conference room PCs from any location to complete basic tasks, apply patching, or make repairs. Use the Administrative Web Portal[3] to track analytics and centrally manage or configure your deployed Intel Unite® solutions.

RESELLER OPPORTUNITIES

Reseller Conferencing Dilemma

Conferencing solutions in SMB are quickly becoming the new battle ground.
Resellers have numerous solutions from several vendors to offer their customers.

Resellers will gravitate towards solutions that:

- Have the features their customer demand
- Are easy to deploy and manage
- Offer them incremental opportunities for margin
- Keep the lines of communications open with their customer
- Offer the best support from the OEM for the entire solution

Reseller Opportunities with Conferencing

Resell

- NUCs and branded systems
- Network infrastructure
- Third Party Peripherals

Plan

- Communication workshops
- Network assessments
- System integration

Enhance

- Customization
- Vertical LOB integration
- Vertical applications

Advantages of adopting Intel Unite® software for the Reseller

Added margin opportunities

Resell

- Intel® Core™ vPro™ PC with Intel Unite® software
- Third Party Peripherals

Plan

- Conference Consulting Services
- Network Assessment Services

Enhance

- Customization Services
- Service Level Agreements
- Configure room hubs with modular plug-ins for added functionality or integrated control of other enabled solutions (enterprise installation only)

DEPLOY & CONFIGURE

Deploy & Configure the Intel Unite® solution with Confidence

Follow these tips to help your customers jumpstart a more collaborative experience in every meeting, whether for a single shared space or throughout their organizations.

Unmanaged Small Business Installation

For basic screen sharing in small, unmanaged business environments, a small business installation – formerly 'standalone' – is now available. In addition to adequate memory and storage, hubs will need Intel® vPro™ technology and Windows* 10 with Microsoft* .NET Framework 4 or newer. Clients require Windows* 7 or newer or Mac OS* X 10.9 or newer, plus the Intel Unite® app. For a cost-effective approach, configure the mini PC to work as both a collaboration solution and a personal or shared PC work station.

Enterprise Installation

Add a new server or use a compatible existing server to manage connections for enterprise deployment. The server should have Microsoft* IIS and Microsoft SQL Server* 2008 or newer. Chromebook, Linux client, iPad and Android tablet support are also now available for enterprise installations via their respective app stores.

Customize for Manageability

IT can configure rooms in enterprise installations differently with plugins and, add the organization's theme with hub customizations. Use the server's Administrative Web Portal to create and manage rooms, generate solution telemetry data reports, and control optional moderator account permissions.

For an exclusive ITP opportunity to download the Intel Unite® software today and to learn more, visit:
https://www-ssl.intel.com/content/www/us/en/secure/technology-provider/products/software/unite-enables-real-time-collaboration.html

[1] Intel technologies may require enabled hardware, specific software, or services activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.
Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Core, the Intel Experience What's Inside logo, Intel Experience What's Inside, Intel Unite, and Intel vPro are trademarks of Intel Corporation in the U.S. and/or other countries.

[2] Skype* for Business sold separately.

[3] Available with enterprise installation only.

* Other names and brands may be claimed as the property of others.

THUNDERBOLT™ 3

THE USB-C THAT DOES IT ALL

WHAT IS THUNDERBOLT™ 3?

At 40 Gb/s, it's the fastest port available on a computer today.

- 8x faster than USB 3.0 and 4x more video bandwidth than HDMI 1.4
- Transfer a 4K movie in less than 30 seconds
- Back up a year's worth of continuous MP3s in five minutes
- Plus, connect to any display, Thunderbolt, or USB device

Intel® Product Quick Reference Matrix

Q3 2019

THUNDERBOLT™ 3

Thunderbolt™ 3 brings Thunderbolt to USB-C at speeds up to 40 Gigabits per second (Gbps), creating one compact port that does it all – delivering the fastest*, most versatile connection to any dock, display, or data device.

THE SPEED YOU NEED

Thunderbolt™ 3 technology is 8x faster than USB 3.0 and provides 4x more video bandwidth than HDMI 1.4, helping users work and play more efficiently. Incredible data transfer rates for high-powered external graphics cards - deliver exciting potential for multi-streaming HD and 4K UHD video and also allow you to enjoy the latest games as they were intended. Orchestrate desktop-level performance from a lightweight laptop, experience higher frame rates and improve visual quality with an unprecedented speed of 40Gbps.

ALL-IN-ONE SIMPLICITY

Expand your capabilities while reducing cables with the simplicity of a single Thunderbolt™ 3 port paired with the latest 8th Generation Intel® Core™ processor. Now, just one compact port can enable lightning-fast data transfer, support two 4K UHD 60 Hz displays, and even charge a laptop. It's the most advanced, efficient, and versatile single-docking solution available.

* As compared to other PC I/O connection technologies including eSATA, USB, and IEEE 1394 Firewire. Performance will vary depending on the specific hardware and software used. Must use a Thunderbolt-enabled device.

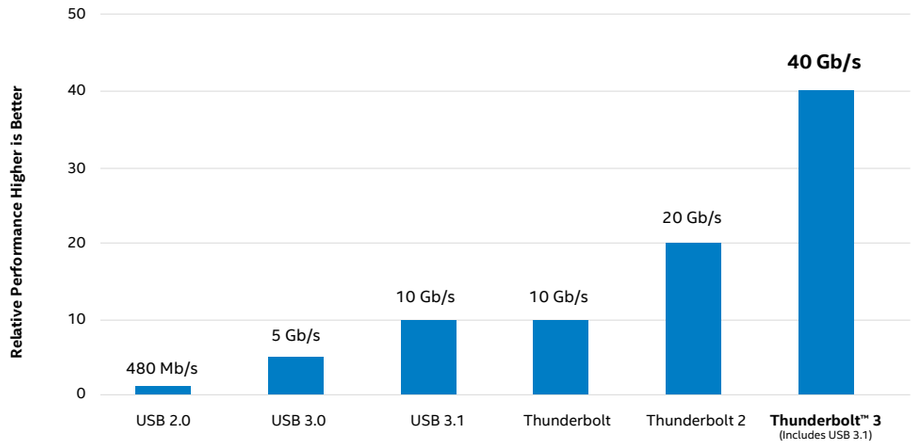
THUNDERBOLT™ 3

Thunderbolt™ 3 Brings Thunderbolt to USB-C

THE USB-C THAT DOES IT ALL

Thunderbolt™ 3 technology offers a fast and simple level of connection and consistency for work or home, bringing the speed and versatility of Thunderbolt™ to USB-C. Increase productivity by linking multiple devices through a single, compact port or add a little more power to your gaming with lightning-fast transfers.

- 40Gb/s Thunderbolt™ 3
- Bi-directional, PCI Express and DisplayPort
- Four lanes of PCI Express Gen 3
- Eight lanes of DisplayPort 1.2
- Native USB 3.1 (10Gb/s)
- Native DisplayPort 1.2



More Protocols

Simplify with one port to connect Thunderbolt devices, every display, and billions of USB devices.

More Speed

Speed your creation of multi-stream HD or 4K video and archive it with superfast storage.

More Power

Data, video, and power on the same cable. Up to 100W notebook charging, 15W to bus-powered devices.

More Pixels

Access the fastest storage, two 4K displays and simultaneously charge with a single cable.

For more information, visit **thunderbolttechnology.net** or **www.intel.com/thunderbolt**

ADAPTER/EXPANSION

thunderbolttechnology.net/products

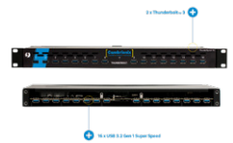
THUNDERBOLT™

BRAND	**Ableconn Technologies**	**Ableconn Technologies**	**Akitio**	**Akitio**	**Akitio**	**Akitio**
PRODUCT	Ableconn TBT3-DPX2 Thunderbolt 3 to Dual DisplayPort Adapter	Ableconn TBT3-HDX2 Thunderbolt 3 to Dual HDMI Adapter	AKiTiO Node Duo	AKiTiO Node Lite	AKiTiO Node Pro	AKiTiO T3-2DP
BRAND	**Akitio**	**Akitio**	**Akitio**	**ALOGIC**	**ALOGIC**	**Apple**
PRODUCT	AKiTiO T3T	AKiTiO Thunder3 10G Network Adapter	AKiTiO Thunder3 PCIe Box	Alogic Thunderbolt 3 (USB-C) to Dual DisplayPort Adapter - 4K 60 Hz	ALOGIC Thunderbolt 3 (USB-C) to Dual HDMI Adapter - 4K 60 Hz	Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
BRAND	**Areca Technology**	**Areca Technology**	**Atech Flash Technology, Inc**	**Atech Flash Technology, Inc**	**ATTO Technology**	**ATTO Technology**
PRODUCT	ARC-4108T3	ARC-4607T3	Blackjet TX-1S Media Reader for Sony SxS Cards	Blackjet UX-1 Cinema Dock	ATTO ThunderLink SH 3128	ATTO ThunderLink® FC 3162 (SFP+)

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**ATTO Technology**	**ATTO Technology**	**ATTO Technology**	**ATTO Technology**	**ATTO Technology**	**Cable Matters**
PRODUCT	ATTO ThunderLink® FC 3322 (SFP+)	ATTO ThunderLink® NQ 3401 (QSFP+)	ATTO ThunderLink® NQ 3402 (QSFP+)	ThunderLink® NS 3101 (SFP+)	ThunderLink® NS 3102 (SFP+)	Cable Matters Dual DisplayPort Thunderbolt 3 Mini Dock
						
BRAND	**Cable Matters**	**Cable Matters**	**Cable Matters**	**Cable Matters**	**Cambrionix**	**CE-LINK**
PRODUCT	Cable Matters Thunderbolt 3 Dual HDMI 2.0 Mini Dock for Mac & Windows	Thunderbolt 3 to Dual 4K HDMI Adapter for Mac & Windows	Thunderbolt 3 to Dual 4K or Single5K DPAdapter for Mac&SelectedWindows	Thunderbolt 3 to Thunderbolt Adapter for Windows & Mac	ThunderSync3-16	Thunderbolt™ 3 to Dual DisplayPort Adapter
BRAND	**Delock**	**Delock**	**Fullink Technology Co., Ltd.**	**HighPoint Technologies, Inc**	**IOGEAR**	**IOGEAR**
PRODUCT	Delock 62709 Adapter Thunderbolt™ 3 > Thunderbolt™	Delock Adapter 62708 Thunderbolt™ 3 > 2 x Displayport 4K 60 Hz	Thunderbolt™ 3 to Dual DisplayPort Adapter	RocketStor 6661A Thunderbolt™ 3 to PCIe 3.0 x16 Expansion Chassis	Thunderbolt 3 6-Slot SD Card Reader	Thunderbolt 3 to Dual 4K DisplayPort Adapter

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**IOGEAR**	**IOGEAR**	**IOGEAR**	**Linkup Technology Inc.**	**Linkup Technology Inc.**	**Lintes Technology**
PRODUCT	Thunderbolt 3 to Dual 4K HDMI Adapter	Thunderbolt 3 to eSATA and USB Adapter	Thunderbolt 3 Travel Dock	Linkup Thunderbolt 3 Dual 4K / 5K 60Hz DisplayPort Adapter	Linkup Thunderbolt 3 Dual 4K 60Hz HDMI Adapter	LINTES Thunderbolt 3 Baby Adapter

BRAND	**Lintes Technology**	**Lintes Technology**	**Lintes Technology**	**Micro Solution, Inc.**	**Micro Solution, Inc.**	**Monoprice**
PRODUCT	LINTES Thunderbolt 3 eSATA+USB3.1 Dongle	LINTES Thunderbolt 3 Legacy Adapter	LINTES Thunderbolt 3 Travel Dock	Thunderbolt™ 3 DP Dual Display Adapter TB3DDA02-MSJ	Thunderbolt™ 3 HDMI 2.0 Dual Display Adapter TB3DHA02-MSJ	Monoprice Thunderbolt 3 6-Slot SD Card Reader

BRAND	**Monoprice**	**Monoprice**	**Monoprice**	**Monoprice**	**Monoprice**	**Monoprice**
PRODUCT	Monoprice Thunderbolt 3 Dual Display-Port Mini Dock Mac & Windows	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Dual DP Output Micro Adapter, 4K@60Hz	Monoprice Thunderbolt 3 Mobile Travel Dock,DualVideo HDMI & DP,4K@60Hz	Thunderbolt 3 Dual DisplayPort Output Adapter, 4K @ 60Hz	Thunderbolt 3 Dual HDMI 2.0 Output Adapter, 4K@60Hz

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**National Instruments**	**Nekteck, Inc.**	**Nekteck, Inc.**	**Netstor**	**Netstor**	**One Stop Systems**
PRODUCT	PXIe-8301	Nekteck Thunderbolt 3 to Dual 4K DP Adapter Converter-Mac&Windows Syst	Nekteck Thunderbolt 3 to Dual 4K HDMI Adapter Cnvtr for Mac & Win Syst	Netstor HL23T	Netstor NA211TB3	ExpressBox 3T-V3
BRAND	**OWC**	**OWC**	**OWC**	**Panasonic**	**Plugable Technologies**	**Plugable Technologies**
PRODUCT	OWC Mercury Helios 3	OWC Thunderbolt 3 Dual DisplayPort Adapter	OWC Thunderbolt 3 Dual HDMI Adapter	Memory Card Drive "expressP2 drive" AU-XPD3	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X-83
BRAND	**Plugable Technologies**	**Promise**	**Promise**	**Promise**	**QNAP**	**QNAP**
PRODUCT	Plugable Thunderbolt 3 Dual HDMI Adapter - TBT3-HDMI2X-83	SANLink3 F2	SANLink3 N1	SANLink3 T1	QNA-T310G1S	QNA-T310G1T

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**QSAN**	**Raidon**	**Raidon**	**RaidSonic**	**RaidSonic**	**RaidSonic**
PRODUCT	XN-TB302	AR0080-TB3	STARDOM SA2TB3	IB-SPL1025-TB3	IB-SPL1026-TB3	ICY BOX IB-DK405-TB3
BRAND	**RaidSonic**	**Sabrent**	**Sabrent**	**Sabrent**	**Sabrent**	**Sapphire Technology Limited**
PRODUCT	ICY BOX IB-DK406-TB3	DS-TH3C	Sabrent TH-3HD2	TH-3DP2	TH-W3H2	SAPPHIRE GearBox Thunderbolt™ 3 eGFX Solution
BRAND	**Sapphire Technology Limited**	**Sapphire Technology Limited**	**Shenzhen DAK Technology Co., Ltd.**	**Shenzhen DAK Technology Co., Ltd.**	**Shenzhen MMUI Co., Ltd. (IOCREST)**	**SIIG, Inc.**
PRODUCT	SAPPHIRE Thunderbolt™ 3 to Dual DisplayPort Dongle	SAPPHIRE Thunderbolt™ 3 to Dual HDMI Dongle	CHOETECH Dual DP Adptr for Mac & Windows Thunderbolt 3 Computers	CHOETECH Thunderbolt 3 to Dual HDMI 2.0 Output Adapter	IOCREST Thunderbolt 3 to 10 Gigabit Network Adapter	Thunderbolt 3 (USB-C) to Dual DisplayPort Adapter - DP, 1.2 4K@60Hz

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**SIIG, Inc.**	**SIIG, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**
PRODUCT	Thunderbolt 3 to Dual HDMI Video Hub LAN Dock	USB-C Thunderbolt V3 (USB Type C, male) to Dual HDMI Adapter - HDMI 2.0	Echo™ Express III-D – Thunderbolt 3 Edition	Echo™ Express III-R – Thunderbolt 3 Edition	Sonnet Echo Express SE I - Thunderbolt 3 Edition	Sonnet Echo Express SEL - Thunderbolt 3 Edition
BRAND	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**
PRODUCT	Sonnet Echo™ 11 Thunderbolt 3 Dock	Sonnet Echo™ Express SE III	Sonnet eGFX Breakaway Box 550	Sonnet eGFX Breakaway Box 650	Sonnet eGFX Breakaway™ Box	Sonnet SF3™ Series — CFast™ 2.0 Pro Card Reader
BRAND	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**
PRODUCT	Sonnet SF3™ Series - SxS™ Pro Card Reader	Sonnet Solo10G SFP+ Thunderbolt 3 Edition	Sonnet Solo10G™ Thunderbolt 3 Edition	Sonnet Thunderbolt™ 3 to Dual Display-Port™ Adapter	Sonnet Thunderbolt™ 3 to Dual HDMI 2.0 Adapter	Sonnet Twin 10G™ SFP+ Thunderbolt 3 Edition

ADAPTER/EXPANSION

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Sonnet Technologies, Inc.**	**StarTech.com**	**StarTech.com**	**StarTech.com**	**StarTech.com**	**StarTech.com**
PRODUCT	Sonnet Twin 10G™ Thunderbolt 3 Edition	Mini Thunderbolt 3 Dock for Laptops-Mac Windows-Dual DisplayPort-4K 60Hz	StarTech.com Thunderbolt 3 to Dual DisplayPort Adapter - 4K 60 Hz	StarTech.com Thunderbolt 3 to Dual HDMI Adapter - 4K 30Hz	Thunderbolt 3 PCIe Expansion Chassis with DisplayPort - PCIe x16	Thunderbolt 3 to eSATA Adapter + USB 3.1 (10Gbps) Port - Mac / Windows

BRAND	**StarTech.com**	**StarTech.com**	**Vantec**	**Vantec**	**Winstars Technology Ltd.**	**Winstars Technology Ltd.**
PRODUCT	Thunderbolt 3 to USB 3.1 Controller Adapter - 1x USB-C, 3x USB-A	Thunderbolt™ 3 to Thunderbolt Adapter - Windows Only	Thunderbolt™ 3 to Dual DisplayPort 4K (60Hz) Adapter (CB-TB3DP122)	Thunderbolt™ 3 To Dual HDMI 2.0 4K (60Hz) Adapter (CB-TB3HD142)	Thunderbolt™ 3 Dual DisplayPort 8K Adapter	Thunderbolt™ 3 USB-C to dual 4K DisplayPort Adapter

BRAND	**Winstars Technology Ltd.**	**Winstars Technology Ltd.**	**Xcellon (A Gradus Group Brand)**	**ZOTAC**	**ZOTAC**
PRODUCT	Thunderbolt™ 3 USB-C to dual 4K HDMI Adapter	Thunderbolt™ 3 USB-C to NVMe SSD Adapter	Xcellon Little Brother	AMP BOX	AMP BOX MINI

ADD-IN-CARDS

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	ASRock	ASUS	GIGABYTE	MSI	Sonnet Technologies, Inc.
PRODUCT	ASRock Thunderbolt 3 AIC	ASUS ThunderboltEX 3	GIGABYTE GC-ALPINE RIDGE	MSI THUNDERBOLT M3	Sonnet Thunderbolt 3 Upgrade Cards

AUDIO/VIDEO

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**AJA Video Systems**	**AJA Video Systems**	**AVID Technology**	**AVID Technology**	**AVID Technology**	**BlackMagic Design**
PRODUCT	AJA Io IP	IO-4K Plus	AVID ARTIST DNXID	Avid Artist DNxIP	Avid Artist DNxIV	Blackmagic UltraStudio 4K Extreme 3

BRAND	**BlackMagic Design**	**IOGEAR**	**Monoprice**	**Monoprice**	**Monoprice**	**Monoprice**
PRODUCT	UltraStudio HD Mini	Thunderbolt 3 to Dual 4K HDMI Adapter	Monoprice Thunderbolt 3 Dual Display-Port Mini Dock Mac & Windows	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Dual DP Output Micro Adapter, 4K@60Hz	Monoprice Thunderbolt 3 Mobile Travel Dock, Dual Video HDMI & DP, 4K@60Hz

BRAND	**Plugable Technologies**	**Plugable Technologies**	**Plugable Technologies**	**Sabrent**	**Sabrent**	**Sabrent**
PRODUCT	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X-83	Plugable Thunderbolt 3 Dual HDMI Adapter - TBT3-HDMI2X-83	DS-TH3C	Sabrent TH-3HD2	TH-3DP2

AUDIO/VIDEO

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Sonnet Technologies, Inc.**	**StarTech.com**	**StarTech.com**	**Vantec**	**Winstars Technology Ltd.**	**Winstars Technology Ltd.**
PRODUCT	Sonnet Echo™ 11 Thunderbolt 3 Dock	StarTech.com Thunderbolt 3 to Dual DisplayPort Adapter - 4K 60 Hz	StarTech.com Thunderbolt 3 to Dual HDMI Adapter - 4K 30Hz	Thunderbolt™ 3 to Dual DisplayPort 4K (60Hz) Adapter (CB-TB3DP122)	Thunderbolt™ 3 USB-C to dual 4K DisplayPort Adapter	Thunderbolt™ 3 USB-C to dual 4K HDMI Adapter

CABLE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Accusys**	**Akitio**	**Akitio**	**Akitio**	**Apple**	**Apple**
PRODUCT	Accusys Thunderbolt 3 Cable 2M 40Gb/s	AKiTiO 40Gbps Thunderbolt 3 Cable (2m)	AKiTiO 40Gbps Thunderbolt™ 3 Cable (0.5m)	AKiTiO T3T	Apple Thunderbolt 3 (USB-C) Cable (0.8m)	Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
BRAND	**Atech Flash Technology, Inc**	**Belkin**	**Cable Matters**	**Cable Matters**	**Cable Matters**	**Cable Matters**
PRODUCT	Blackjet 40Gbps Thunderbolt™ 3 Cable (0.5m)	Thunderbolt 3 Cable (40Gbps) (0.5m)	Cable Matters 20 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m	Cable Matters 20 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 1.6 Feet / 0.5m	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m
BRAND	**Cable Matters**	**Cable Matters**	**CalDigit**	**CalDigit**	**CalDigit**	**CalDigit**
PRODUCT	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Thunderbolt 3 to Thunderbolt Adapter for Windows & Mac	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 0.5m	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 0.7m/2.3 Feet	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 3.3 Feet / 1m	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 6.6 Feet / 2m

CABLE

thunderbolttechnology.net/products

BRAND	**Delock**	**Delock**	**Delock**	**HighPoint Technologies, Inc**	**HighPoint Technologies, Inc**	**HighPoint Technologies, Inc**
PRODUCT	Delock 62709 Adapter Thunderbolt™ 3 > Thunderbolt™	Delock Thunderbolt™ 3 (20 Gb/s) cable 1.0M 1.5M 2.0M	Delock Thunderbolt™ 3 (40 Gb/s) cable 0.5M	TB3-040G-505	TB3-040G-510	TB3-040G-520
BRAND	**IOGEAR**	**IOGEAR**	**IOGEAR**	**KaiJet Technology International Limited**	**KaiJet Technology International Limited**	**KaiJet Technology International Limited**
PRODUCT	Thunderbolt 3 USB-C 0.5m 40Gbps Cable	Thunderbolt 3 USB-C 1m 20Gbps Cable	Thunderbolt 3 USB-C 2m 20Gbps Cable	j5create 20Gbps Thunderbolt™ 3 Cable (1m)	j5create 40Gbps Thunderbolt™ 3 Cable (0.5m)	j5create 40Gbps Thunderbolt™ 3 Cable (1m)
BRAND	**Lintes Technology**	**Lintes Technology**	**Lintes Technology**	**Lintes Technology**	**Lintes Technology**	**Monoprice**
PRODUCT	LINTES Thunderbolt 3 0.7M 40Gbps Passive Cable	LINTES Thunderbolt 3 2M 40Gbps Active Cable	LINTES Thunderbolt 3 Baby Adapter	LINTES Thunderbolt 3 Legacy Adapter	Lintes Thunderbolt™ 3 40Gbps Cable - 0.5-meter	Thunderbolt 3 (40 Gbps) USB-C Cable, 100W

CABLE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Nekteck, Inc.**	**Nekteck, Inc.**	**Nekteck, Inc.**	**Nekteck, Inc.**	**OWC**	**OWC**
PRODUCT	Nekteck 20 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m	Nekteck 20 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Nekteck 40 Gbps Thunderbolt™ 3 Cable in Black 1.6 Feet / 0.5m	Nekteck Thunderbolt 3 40Gbps Active Cable - 2M	OWC Thunderbolt 3 Cable 20Gb/s - Black - 1.0M, 2.0M	OWC Thunderbolt 3 Cables 40Gb/s - Black - .5M, 1.0M, 2.0M
BRAND	**Plugable Technologies**	**Plugable Technologies**	**Plugable Technologies**	**Shenzhen DAK Technology Co., Ltd.**	**Shenzhen DAK Technology Co., Ltd.**	**Shenzhen DAK Technology Co., Ltd.**
PRODUCT	Plugable 20Gbps Thunderbolt 3 1m Cable	Plugable 20Gbps Thunderbolt 3 2m Cable	Plugable 40Gbps Thunderbolt 3 0.5m Cable	CHOETECH Thunderbolt 3 Cable (0.5M/1.6FT)– 40Gbps/ 100W	CHOETECH Thunderbolt 3 Cable (2M/6.5FT) - 40Gbps/ 100W	CHOETECH Thunderbolt 3 Cable (2M/6.5FT)–20Gbps/ 60W
BRAND	**Sonnet Technologies, Inc.**	**Sonnet Technologies, Inc.**	**StarTech.com**	**StarTech.com**	**StarTech.com**	**StarTech.com**
PRODUCT	Sonnet 0.5m Thunderbolt 3 (40Gbps) Cable	Sonnet 1m Thunderbolt 3 (40Gbps) Cable	StarTech.com 0.5m Thunderbolt 3 Cable	StarTech.com 1m Thunderbolt 3 20Gbps Cable	StarTech.com 2m Thunderbolt 3 20Gbps Cable	Thunderbolt™ 3 to Thunderbolt Adapter - Windows Only

CABLE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	Sumitomo Electric Industies, Ltd.	TEKQ (Mega Grand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)
PRODUCT	Passive 0.8 meter Thunderbolt™3 40Gbps from Sumitomo	TEKQ Thunderbolt 3 Cable (0.5 m)	Xcellon Thunderbolt 3 Active Cable (40Gbps/100W) (2M)	Xcellon Thunderbolt 3 Cable (20Gb-ps/100W) (1M)	Xcellon Thunderbolt 3 Cable (20Gb-ps/100W) (2M)	Xcellon Thunderbolt 3 Cable (40Gb-ps/100W) (0.5M)

BRAND	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Zikko Inc.
PRODUCT	Xcellon Thunderbolt 3 Cable (40Gb-ps/100W) (0.7M)	Xcellon Thunderbolt 3 Cable (40Gb-ps/100W) (1M)	Zikko Thunderbolt™ 3 Cable 0.5M 40Gbps

DISPLAY

thunderbolttechnology.net/products

THUNDERBOLT™

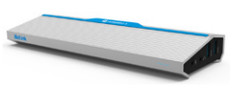
BRAND	**ASUS**	**ASUS**	**Lenovo**	**Lenovo**	**LG Electronics**	**Samsung Electronics**
PRODUCT	ASUS ProArt PA27AC Professional Monitor	ASUS ProArt PA32UC Professional Monitor	Lenovo ThinkVision P32u-10	ThinkVision X1 (2nd Gen)	LG UltraFine 5K Display	C34J791

DOCK

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	Action Star Technology	Akitio	ALOGIC	Atech Flash Technology, Inc	ATEN/IOGEAR	Belkin
PRODUCT	Thunderbolt 3 Travel Dock	AKiTiO Thunder3 Dock Pro	ALOGIC Thunderbolt 3 Docking Station with Dual 4K Display & Power Delivery	Blackjet UX-1 Cinema Dock	UH7230 Thunderbolt™ 3 Multiport Dock with Power Charging	Thunderbolt 3 Express Dock HD



BRAND	BizLink	Cable Matters	Cable Matters	CalDigit	CalDigit	CalDigit
PRODUCT	Bizlink Thunderbolt 3 Docking Station (Alpine Ridge)	Cable Matters Thunderbolt 3 Docking Station for Windows & Mac Computers	Thunderbolt 3 Dock w/Dual 4K Video,SD Memory Card Slot & 60W Pwr Delivery	CalDigit Thunderbolt 3 mini Dock - Dual DisplayPort	CalDigit Thunderbolt 3 mini Dock - Dual HDMI	CalDigit Thunderbolt™ Station 3

BRAND	CalDigit	CalDigit	CalDigit	Diamond Multimedia	Elgato	HP
PRODUCT	CalDigit Thunderbolt™ Station 3 Lite	CalDigit Thunderbolt™ Station 3 Plus	CalDigit Thunderbolt™ Station 3 Plus - Space Gray	TB3000DS	Elgato Thunderbolt™ 3 Dock	HP ZBook Dock with Thunderbolt 3

DOCK

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**IOGEAR**	**IOGEAR**	**IOGEAR**	**Kensington Computer Products Group**	**Kensington Computer Products Group**	**Kensington Computer Products Group**
PRODUCT	Quantum Thunderbolt 3 Docking Station	Quantum Thunderbolt 3 Docking Station Pro 85	Thunderbolt 3 Travel Dock	Kensington SD5000T Thunderbolt 3 Docking Station	Kensington SD5200T Thunderbolt 3 Docking Station	LD5400T Multi-User Thunderbolt 3 Dock with K-Fob™ Smart Lock
BRAND	**Kensington Computer Products Group**	**Lenovo**	**Linkup Technology Inc.**	**Mantiz Innovation Ltd.**	**Micro Solution, Inc.**	**Monoprice**
PRODUCT	Single-User Thunderbolt 3 Universal Dual 4KDock w/K-Fob Smart Lock	ThinkPad Thunderbolt 3 Dock	Linkup Thunderbolt 3 Docking Station	Mantiz Titan	Thunderbolt™ 3 PD Docking Station TB3DS1230-MSJ	Monoprice Thunderbolt 3 Dual Display-Port Mini Dock Mac & Windows
BRAND	**Monoprice**	**Monoprice**	**Monoprice**	**Nekteck, Inc.**	**OWC**	**OWC**
PRODUCT	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Travel Dock, Dual Video HDMI & DP, 4K@60Hz	Thunderbolt 3 Docking Station, PD UpTo 60W, Dual Display UpTo 4K 60Hz	Thunderbolt 3 PD Docking Station-4K HD Display, 60W PD, 4K HDMI2.0@60Hz	OWC Thunderbolt 3 Dock	OWC Thunderbolt 3 Dock

DOCK

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**OWC**	**Plugable Technologies**	**Plugable Technologies**	**Promise**	**RaidSonic**	**RaidSonic**
PRODUCT	Thunderbolt 3 Dock	Thunderbolt 3 Docking Station w/Host Charging (Supports Single HDMI or DP)	Thunderbolt 3 Docking Station-No Host Charging, Single HDMI or DP Monitor	Dock TD-300	IB-DK2501-TB3	ICY BOX IB-DK2801-TB3
BRAND	**Shenzhen DAK Technology Co., Ltd.**	**SIIG, Inc.**	**SIIG, Inc.**	**Sonnet Technologies, Inc.**	**StarTech.com**	**StarTech.com**
PRODUCT	CHOETECH Thunderbolt 3 Travel Dock-Model:HUB-M12	Thunderbolt 3 Dual 4K Video Docking Station with Power Delivery	Thunderbolt 3 to Dual HDMI Video Hub LAN Dock	Sonnet Echo™ 11 Thunderbolt 3 Dock	Dual 4K Monitor Mini Thunderbolt 3 Dock with HDMI	Mini Thunderbolt 3 Dock for Laptops - Mac and Windows - Dual DP - 4K 60Hz
BRAND	**StarTech.com**	**StarTech.com**	**StarTech.com**	**StarTech.com**	**Targus**	**Toshiba**
PRODUCT	Thunderbolt 3 Dock with SD Card Reader - Dual-4K - 85W USB Power Delivery	Thunderbolt 3 Dual-4K Docking Station for Laptops - Mac and Windows	Thunderbolt 3 Dual-4K Docking Station for Laptops - Mac and Windows - PD	Thunderbolt™ 3 Dual-4K Docking Station for Laptops - 5K Support - Windows Only	Thunderbolt™ 3 DV4K Docking Station with Power	Toshiba Thunderbolt 3 Dock

DOCK

thunderbolttechnology.net/products

BRAND	TUL Corporation	Winstars Technology Ltd.
PRODUCT	TUL TDX-120B	Thunderbolt 3 USB-C 4K Display Docking Station

EXTERNAL GRAPHICS (EGFX)

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Akitio**	**ASUS**	**ASUS**	**BlackMagic Design**	**Galaxy Microsystems Ltd.**	**GIGABYTE**
PRODUCT	AKiTiO Node	ASUS ROG XG Station 2	XG-STATION-PRO	Blackmagic eGPU	GALAX SNPR External Graphics Enclosure	AORUS GTX 1070 Gaming Box

BRAND	**GIGABYTE**	**GIGABYTE**	**HP**	**Mantiz Innovation Ltd.**	**Netstor**	**OWC**
PRODUCT	AORUS GTX 1080 Gaming Box	RX 580 Gaming Box	OMEN by HP Accelerator	Mantiz Venus (MZ-02)	Netstor HL23T-PRO	Mercury Helios FX 650

BRAND	**OWC**	**Razer**	**Razer**	**Razer**	**Sapphire Technology Limited**	**Sonnet Technologies, Inc.**
PRODUCT	OWC Mercury Helios FX	Razer Core	Razer Core V2	Razer Core X	SAPPHIRE GearBox Thunderbolt™ 3 eGFX Solution	Sonnet eGFX Breakaway Box 550

EXTERNAL GRAPHICS (EGFX)

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	TUL Corporation	TUL Corporation
PRODUCT	Sonnet eGFX Breakaway Box 650	Sonnet eGFX Breakaway™ Box	Sonnet eGFX Breakaway™ Puck Radeon™ RX 560	Sonnet eGFX Breakaway™ Puck Radeon™ RX 570	PowerColor Devil Box	POWERCOLOR GAMING STATION

BRAND	TUL Corporation	Visiontek	ZOTAC	ZOTAC
PRODUCT	TBX-550CA	Visiontek VT-TB3-eGPU100	AMP BOX	AMP BOX MINI

MOTHERBOARDS

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	ASRock	ASUS	ASUS	ASUS	GIGABYTE	GIGABYTE
PRODUCT	ASRock X299 Designer+	ASUS MAXIMUS-VIII-EXTREME	ASUS X99-DELUXE II	ASUS Z170-PREMIUM	GA-H170-DESIGNARE	GA-X170-WS ECC

BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	GA-X99-Designare EX	GA-Z170X-Designare	GA-Z170X-Gaming 7-EU	GA-Z170X-UD3 Ultra	GA-Z270X-Gaming 7	GA-Z270X-Gaming 8

BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	GA-Z270X-Gaming 9	GA-Z270X-UD5	GIGABYTE GA-X170-EXTREME ECC	GIGABYTE GA-X99P-SLI	GIGABYTE GA-Z170X-Gaming 7	GIGABYTE GA-Z170X-Gaming G1

MOTHERBOARDS

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**GIGABYTE**	**GIGABYTE**	**GIGABYTE**	**GIGABYTE**
PRODUCT	GIGABYTE GA-Z170X-Gaming GT	GIGABYTE GA-Z170X-UD5 TH	GIGABYTE GA-Z170X-Ultra Gaming	X299 UD4 EX + GC-ALPINE RIDGE AIC

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Acer**	**Acer**	**Acer**	**Acer**	**Acer**	**Acer**
PRODUCT	Acer Aspire R 13	Acer Aspire Switch 12 S	Acer Aspire V 15 Nitro	Acer Aspire V 17 Nitro	Acer Predator 15	Acer Predator 17

BRAND	**Acer**	**Apple**	**Apple**	**Apple**	**Apple**	**ASUS**
PRODUCT	Acer Predator 17 X	Apple 13-inch MacBook Pro	Apple 13-inch MacBook Pro with Touch Bar	Apple 15-inch MacBook Pro with Touch Bar	Apple iMac Pro	ASUS ROG G501VW

BRAND	**ASUS**	**ASUS**	**ASUS**	**ASUS**	**ASUS**	**ASUS**
PRODUCT	ASUS ROG G701VO	ASUS ROG G752VL	ASUS ROG G752VT	ASUS ROG G752VY	ASUS ROG GL702VT	ASUS ROG GX700VO

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**ASUS**	**ASUS**	**ASUS**	**Clevo**	**Clevo**	**Clevo**
PRODUCT	ASUS Transformer 3 Pro	ASUS ZenBook 3 Deluxe UX490UA	ASUS ZenBook Pro UX501VW	Clevo P750DM	Clevo P770DM	Clevo P870DM

BRAND	**Clevo**	**Clevo**	**Clevo**	**Clevo**	**Clevo**	**Clevo**
PRODUCT	N130WU	N130ZU	N140WU	N141ZU	N150ZU	N350TV

BRAND	**Clevo**	**Clevo**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	N350TW	P870TM1	Alienware 13	Alienware 15	Dell 15 inch Precision 5530 2 in 1	Dell Alienware 13

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	Dell Alienware 15	Dell Alienware 17	Dell Latitude 12 5290 2-in-1	Dell Latitude 12 7285 2-in-1	Dell Latitude 5480	Dell Latitude 5580

BRAND	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	Dell Latitude 7275	Dell Latitude 7280	Dell Latitude 7290	Dell Latitude 7370	Dell Latitude 7380	Dell Latitude 7390

BRAND	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	Dell Latitude 7390 2-in-1	Dell Latitude 7480	Dell Latitude 7490	Dell Latitude 7520	Dell Latitude 7720	Dell Latitude E5570

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	Dell Precision 15 3000 Series (3510)	Dell Precision 15 5000 Series (5510)	Dell Precision 15 7000 Series (7510)	Dell Precision 17 7000 Series (7710)	Dell Precision 3520	DELL XPS 12
BRAND	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**	**DELL**
PRODUCT	DELL XPS 13	Dell XPS 13 2-in-1	Dell XPS 13 9370	DELL XPS 15	Dell XPS 15 9575 2-in-1	Precision 5520
BRAND	**EVGA**	**EVGA**	**Fujitsu**	**GIGABYTE**	**GIGABYTE**	**GIGABYTE**
PRODUCT	EVGA SC15 Geforce GTX 1060 Gaming Laptop	EVGA SC17 Geforce GTX 1080 Gaming Laptop	FUJITSU Workstation CELSIUS H760	AORUS X5v7	AORUS X7 DT v7	AORUS X7v7

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	AORUS X9	GB-BKi5HT2-7200	GB-BKi5T2-7200	GB-BKi7HT2-7500	GB-BKi7T2-7500	GB-GZ1DTi7

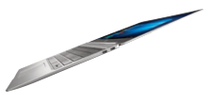
BRAND	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
PRODUCT	GIGABYTE AERO14K	GIGABYTE AERO15	GIGABYTE GB-BSi5HT-6200	GIGABYTE GB-BSi5T-6200	GIGABYTE GB-BSi7HT-6500	GIGABYTE GB-BSi7T-6500

BRAND	GIGABYTE	HP	HP	HP	HP	HP
PRODUCT	GIGABYTE P56XT	EliteBook x360 1030 G2	HP Elite x2 1012 G1	HP Elite x2 1012 G2	HP Elite x2 1013 G3 Tablet	HP EliteBook 1040 G4(KBL-H)

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

						
BRAND	**HP**	**HP**	**HP**	**HP**	**HP**	**HP**
PRODUCT	HP EliteBook Folio G1	HP EliteBook x360 1020 G2	HP EliteBook x360 1030 G3	HP EliteBook x360 G2	HP EliteDesk 800 G4 SFF/TWR	HP EliteOne 1000 G2 AiO

BRAND	**HP**	**HP**	**HP**	**HP**	**HP**	**HP**
PRODUCT	HP Envy 27 All-in-One PC	HP ENVY Curved 34 All-in-One PC	HP Spectre 13 Laptop PC	HP Spectre Notebook PC (13")	HP Spectre x360 Convertible PC 13	HP Spectre x360 Convertible PC 13 (2017 new model)

BRAND	**HP**	**HP**	**HP**	**HP**	**HP**	**HP**
PRODUCT	HP Spectre x360 Convertible PC 15	HP Z2 Mini G4 Workstation	HP Z4 G4 Workstation	HP Z6 G4 Workstation	HP Z8 G4 Workstation	HP ZBook 15 G4 Mobile Workstation

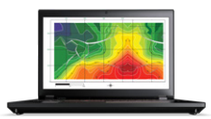
NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**HP**	**HP**	**HP**	**HP**	**HP**	**Huawei**
PRODUCT	HP ZBook 17 G4 Mobile Workstation	HP ZBook Studio G4 Mobile Workstation	HP ZBook Studio x360 G5	Omen 15 Laptop	OMEN X Laptop 17	HUAWEI MateBook X Pro

BRAND	**Intel**	**Intel**	**Intel**	**Intel**	**Intel**	**Intel**
PRODUCT	Intel NUC Kit NUC7i5BNH	Intel NUC Kit NUC7i5BNK	Intel NUC Kit NUC7i7BNH	Intel NUC kit NUC8i7HVK	Intel NUC: NUC8i3BEH	Intel® NUC Kit NUC8i7BEH

						
BRAND	**Intel**	**Lenovo**	**Lenovo**	**Lenovo**	**Lenovo**	**Lenovo**
PRODUCT	Intel® NUC: NUC6i7KY	Lenovo Legion Y720 Laptop	Lenovo Miix 720	Lenovo ThinkPad P50	Lenovo ThinkPad P70	ThinkPad P51

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Lenovo**	**Lenovo**	**Lenovo**	**Lenovo**	**Lenovo**	**Lenovo**
PRODUCT	ThinkPad P51s	ThinkPad P71	ThinkPad T470	ThinkPad T470s	ThinkPad T570	ThinkPad X1 Carbon

BRAND	**Lenovo**	**Lenovo**	**MSI**	**MSI**	**MSI**	**MSI**
PRODUCT	ThinkPad X1 Yoga	ThinkPad Yoga 370	MSI GS40 Gaming Notebook	MSI GS60 Gaming Notebook	MSI GS63 Gaming Notebook	MSI GT72 Gaming Notebook

BRAND	**MSI**	**MSI**	**MSI**	**MSI**	**Panasonic**	**Panasonic**
PRODUCT	MSI GT80 Gaming Notebook	MSI Vortex G65 Gaming PC	MSI WS60 Workstation Notebook	MSI WT72 Workstation Notebook	Let's note CF-LV7	Let's note CF-SV7

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Panasonic**	**Razer**	**Razer**	**Razer**	**Razer**	**Razer**
PRODUCT	Let's note CF-SV8	Razer Blade	Razer Blade Pro	Razer Blade Stealth	Razer Blade Stealth - 13"	Razer Blade Stealth (late 2017)
BRAND	**Samsung Electronics**	**Samsung Electronics**	**Samsung Electronics**	**Smartron India Pvt Ltd**	**Toshiba**	**Toshiba**
PRODUCT	Notebook Pen S	NoteBook9 Always 2018	NoteBook9 Pro	t.book Flex	PORTEGE X20W-E	Portege® X20W Convertible Notebook Series
BRAND	**Toshiba**	**Toshiba**	**Toshiba**	**Toshiba**	**VAIO Corporation**	**ZOTAC**
PRODUCT	Portege® X30 Laptop Series	Portege® X30-E Laptop Series	Tecra® X40 Laptop Series	Tecra® X40-E Laptop Series	VAIO S11	ZBOX-CI549NANO

NOTEBOOK/COMPUTER

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	ZOTAC	ZOTAC	ZOTAC	ZOTAC
PRODUCT	ZBOX-MI549NANO	ZBOX-MI552	ZBOX-MI553	ZBOX-MI572

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Accusys**	**Accusys**	**Action Star Technology**	**Akitio**	**Akitio**	**Akitio**
PRODUCT	Accusys A12T3-Share	Accusys Gamma	Thunderbolt 3 6-Slot SD Card Reader	AKiTiO Node Lite with Intel Optane 905P SSD	AKiTiO Thunder3 Duo Pro	AKiTiO Thunder3 PCIe SSD

BRAND	**Akitio**	**Akitio**	**Akitio**	**Akitio**	**Archgon International Ltd.**	**Areca Technology**
PRODUCT	AKiTiO Thunder3 Quad	AKiTiO Thunder3 Quad mini	AKiTiO Thunder3 Quad X	AKiTiO Thunder3 RAID STATION	X70 Portable SSD - Thunderbolt 3	ARC-8050T3 SAN

BRAND	**Areca Technology**	**Areca Technology**	**Areca Technology**	**Areca Technology**	**Areca Technology**	**Areca Technology**
PRODUCT	ARC-8050T3-12	ARC-8050T3-12R	ARC-8050T3-24R	ARC-8050T3-4	ARC-8050T3-6	ARC-8050T3-6M

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Areca Technology**	**Atech Flash Technology, Inc**	**ATTO Technology**	**BIOS**	**BIOS**	**BIOSAP Inc**
PRODUCT	ARC-8050T3-8	Blackjet UX-1 Cinema Dock	ATTO ThunderLink SH 3128	EP106TB3	EP112TB3	DVT12T3
BRAND	**Cable Matters**	**CalDigit**	**CalDigit**	**DELL**	**DELL**	**Delock**
PRODUCT	480GB Bus-Powered Ext Thunderbolt 3 SSD Up to 2400 MB/s Read	CalDigit T4 Thunderbolt™ 3 RAID	CalDigit Tuff X	Dell Portable Thunderbolt 3 SSD, 1TB	Dell Portable Thunderbolt 3 SSD, 500GB	Delock 54000 Thunderbolt™ 3 External Portable SSD (240GB)
BRAND	**Delock**	**Drobo**	**G-Technology**	**G-Technology**	**G-Technology**	**G-Technology**
PRODUCT	Delock 54007 Thunderbolt™ 3 External Portable SSD (480GB)	Drobo 5D3	G-DRIVE with Thunderbolt 3 / USB 3.1	G-RAID w/Thunderbolt 3, USB 3.1, HDMI - Removable Dual Drive Storage System	G-SPEED Shuttle SSD	G-SPEED Shuttle with ev Series Bay Adapters

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**G-Technology**	**G-Technology**	**G-Technology**	**G-Technology**	**HighPoint Technologies, Inc**	**HighPoint Technologies, Inc**
PRODUCT	G-SPEED Shuttle with Thunderbolt 3	G-SPEED Shuttle XL Thunderbolt 3 (with ev Series Bay Adapters)	G-SPEED Shuttle XL with ev Series Bay Adapters (with Thunderbolt 3)	G-SPEED Shuttle XL with Thunderbolt 3	HighPoint RocketStor 6618A	RocketStor 6618T
BRAND	**HighPoint Technologies, Inc**	**HighPoint Technologies, Inc**	**HighPoint Technologies, Inc**	**LaCie**	**LaCie**	**LaCie**
PRODUCT	RocketStor 6628A	RocketStor 6628T	RocketStor 6674T	2big Dock	LaCie 12big Thunderbolt3	Lacie 6big Thunderbolt3
BRAND	**LaCie**	**LaCie**	**MagStor**	**Monoprice**	**MyDigitalDiscount.com**	**Nekteck, Inc.**
PRODUCT	LaCie Bolt3	LaCie d2 Thunderbolt3	TRB3-HL8 Desktop LTO8 12TB LTFS Tape Drive with Thunderbolt™ 3 Interface	Monoprice Thunderbolt 3 6-Slot SD Card Reader	MyDigitalSSD Pocket Vault eXpress port PCIe Gen 3 Thunderbolt 3 USB-C Ext SSD	Nekteck 480GB Thunderbolt 3 SSD NVME SSD Hard Drive

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Netstor**	**Netstor**	**Netstor**	**Netstor**	**Netstor**	**Netstor**
PRODUCT	Netstor NA333TB3	Netstor NA338TB3	Netstor NA341TB3	Netstor NA381TB3	Netstor NA611TB3	Netstor NA762TB3

BRAND	**Netstor**	**Noon Technology Co., Ltd.**	**Noon Technology Co., Ltd.**	**Noon Technology Co., Ltd.**	**Other World Computing, Inc.**	**OWC**
PRODUCT	Netstor NS370TB3	TerraMaster D4 Thunderbolt 3	TerraMaster D5 Thunderbolt 3	TerraMaster D8 Thunderbolt3	OWC Envoy Pro EX	OWC Envoy Pro EX (VE) Thunderbolt 3

BRAND	**OWC**	**OWC**	**OWC**	**Panasonic**	**Phison Electronics Corp.**	**Phison Electronics Corp.**
PRODUCT	OWC ThunderBay 4 - Thunderbolt 3	OWC ThunderBay 6	OWC ThunderBlade	Memory Card Drive "expressP2 drive" AU-XPD3	PHISON E12 Thunderbolt 3 Portable SSD	PHISON E8 Thunderbolt 3 Portable SSD

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	Plugable Technologies	Promise	QNAP	QNAP	QNAP	QNAP
PRODUCT	Plugable TBT3-NVME480 Thunderbolt 3 480GB NVMe SSD	Pegasus3 RAID (R4/R6/R8)	TS-453BT3	TVS-1282T3	TVS-1582TU	TVS-882BRT3

BRAND	QNAP	QSAN	Raidon	Raidon	Raidon	Raidon
PRODUCT	TVS-882ST3	XN-TB302	GR3660-TB3	GR4670-TB3	GR8480-TB3	GR8670-TB3

BRAND	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
PRODUCT	GR8680-TB3	GT4670-TB3	GT8670-TB3	STARDOM DR2-TB3	STARDOM DR3-TB3	STARDOM DR8M-TB3

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
PRODUCT	STARDOM DR8-TB3	STARDOM PD01-TB3	STARDOM SR4-TB3	STARDOM SR8-TB3	STARDOM ST2-TB3	STARDOM ST4-TB3

BRAND	Raidon	Raidon	Rocstor	Rocstor	Rocstor	Sabrent
PRODUCT	STARDOM ST4-TL3+	STARDOM ST8-TB3	Rocpro RT38 Thunderbolt 3 RAID & JBOD 8-Bay2U Rackmount Hot-Swap DT DAS	Rocpro T34 Thunderbolt 3 RAID & JBOD 4-Bay Desktop DAS Hot-Swap Storage	Rocpro T38 Thunderbolt 3 RAID & JBOD 8-Bay Hot-Swap Desktop DAS Storage	TH-P1TB

BRAND	Sabrent	Sabrent	Sabrent	Samsung Electronics	Sonnet Technologies, Inc.	TEKQ (Mega Grand)
PRODUCT	TH-P256	TH-P2TB	TH-P512	Samsung Portable SSD X5	Sonnet Fusion Thunderbolt 3 PCIe Flash Drive	TEKQ Rapide Thunderbolt 3 SSD

STORAGE

thunderbolttechnology.net/products

THUNDERBOLT™

BRAND	**Visiontek**	**Visiontek**	**Winstars Technology Ltd.**
PRODUCT	VisionTek Portable 1TB Thunderbolt 3 SSD	VisionTek Portable 512GB Thunderbolt 3 SSD	Thunderbolt™ 3 USB-C to NVMe SSD Adapter

OTHER

thunderbolttechnology.net/products

BRAND	National Instruments	Panasonic
PRODUCT	PXIe-8301	Memory Card Drive "expressP2 drive" AU-XPD3

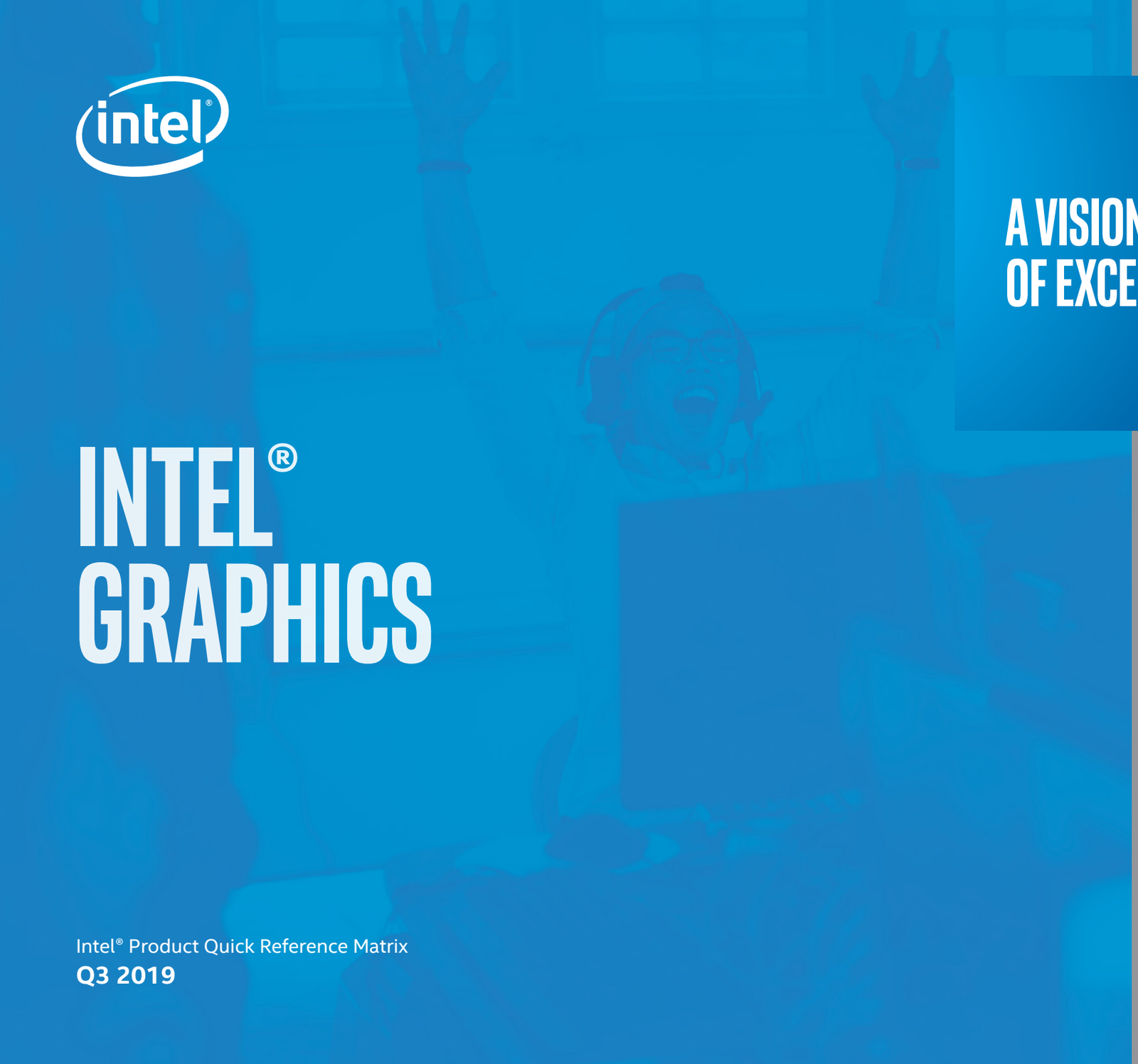
Visit **ThunderboltTechnology.net** for more information.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The products and services described may contain defects or errors which may cause deviations from published specifications. Current characterized errata are available on request.

© 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Thunderbolt, and the Thunderbolt logo are trademarks of Intel Corporation in the U.S. and other countries.

* Other names and brands may be claimed as the property of others.



INTEL® GRAPHICS

Intel® Product Quick Reference Matrix

Q3 2019

A VISION OF EXCELLENCE

INTEL® GRAPHICS TECHNOLOGY

Work and play in high resolution with Intel® UHD Graphics and Iris® Plus Graphics. Watch captivating 4K Ultra HD (UHD) video on up to three screens, edit photos and videos like a pro, and immerse yourself in vividly rendered, seamless 3D gameplay - all with the added power boost of an Intel® Core™ processor. Intel® Graphics Technology brings stunning visuals to thinner and lighter portable devices, like laptops, 2 in 1s, and desktop computers.

INTEL® GRAPHICS

Immerse yourself in rich, vivid visuals enabled by integrated Intel® UHD Graphics and Iris™ Plus Graphics, delivering built-in 4K Ultra HD for new home theater, gaming, and conferencing experiences.

INTEL® GRAPHICS

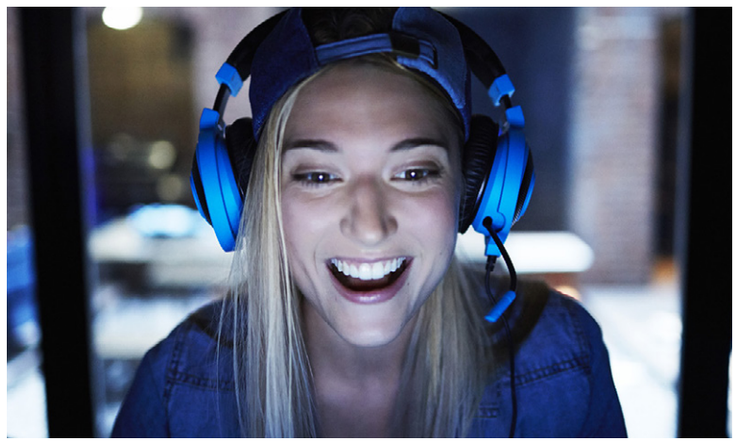
Experience visual perfection with Intel® UHD graphics and Iris™ Plus graphics. Watch captivating 4k video on up to three screens, edit photos and videos like a professional, and desktop computers. Immerse yourself in vividly rendered, seamless 3D gameplay. Intel UHD graphics, and Iris™ Plus graphics are built right in to the processor, bringing stunning visuals to thinner and lighter portable devices, like Notebook 2 in 1s, and portable All-in-Ones.

8TH AND 9TH GEN INTEL® CORE™ PROCESSOR GRAPHICS DELIVER EXCITING EXPERIENCES

Watch

View stunning 4K UHD video and immerse yourself completely in up to three angles of the same experience with multi-screen capability.

- 4K/UHD Premium Content Playback with Netflix* HDR
- 360 degree playback
- Multiple video streams



Game

Enjoy the latest games delivered to you in high definition, complete with complex shading, and fast frame rates.

- HD Gaming on Intel® UHD Graphics
- Up to 1080p Gaming on Intel® Iris® Plus Graphics
- Accelerated game streaming

Visit Gameplay.intel.com – to discover in-game settings optimized for your Intel® Graphics Technology.

Create

Uninhibited expression through enhanced media conversion and rendering, delivering picture perfect performance, every time. Uses fixed function hardware for fast, low-power video encode and transcode.

- 4K photo and video editing
- 360 degree stitching/VR content creation[1]

[1] May not be available on all SKUs

[2] Requires 7th Generation Intel® Core™ i5 Processors with Intel® UHD 620 Graphics or higher

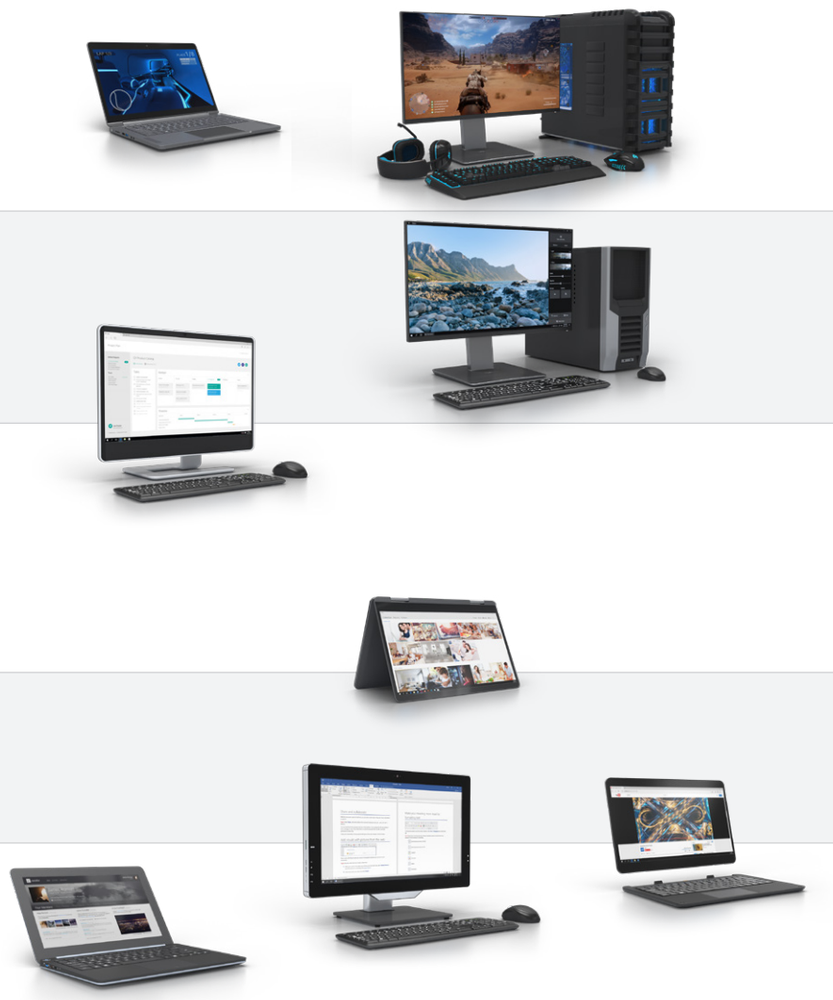
OPTIMIZE YOUR GAMING EXPERIENCE – VISIT GAMEPLAY.INTEL.COM

- **Auto-detect / Enter Intel processor details and explore supported games**
- **Click on chosen games and discover optimal in-game settings per your hardware**
- **Optimized settings available for hundreds of games over multiple genres**

Visit gameplay.intel.com

Settings only available for 4th Generation Intel® Core™ processor or higher.

8TH AND 9TH GEN INTEL® CORE™ PROCESSOR GRAPHICS ADVOCACY



Intel® Core™ Processor H-Series, X-Series, S-Series 'K', and G-Series High-End Discrete Graphics	• >1080p gaming & premium VR experiences with H-series processors optimized for discrete graphics
Intel® Core™ Processor S-Series Intel® UHD Graphics Mid-Range Discrete Graphics	• Up to Intel® UHD Graphics for HD gaming • 5K support • UHD resolution support
Intel® Core™ Processor U-Series Intel® Iris® Plus Graphics Intel® UHD Graphics	• Up to Intel® Iris® Plus Graphics for 1080p gaming • UHD resolution support
Intel® Core™ Processor Y-Series Intel® UHD Graphics	• Up to Intel® UHD Graphics for HD gaming • UHD resolution support
Intel® Core™ Processor N-Series Intel® UHD Graphics	• Up to Intel® UHD Graphics • UHD resolution support

9TH GENERATION INTEL® PROCESSOR GRAPHICS

9th Generation Intel® Processor Graphics

Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, minipcs and all-in-ones.

	INTEL® UHD GRAPHICS 630
Processor Family	Intel® Core™
Max Dynamic Frequency	1.2 GHz
Processor Number	i9-9900K
	i7-9700K
	i5-9600K

8th Generation Intel® Core™ Processor with Radeon™ RX Vega M Graphics

NEXT LEVEL PERFORMANCE IN SLEEK, THIN & LIGHT COMPUTERS

The new 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics is Intel's first processor and discrete graphics bundled in a single package. This unprecedented design unlocks performance levels previously unseen in thin and light form factors with Intel processors due to its ultra-small footprint and unique power sharing capability. This new processor is for the high performing, small form factor computers like 2-in-1's, thin and light notebooks and mini-PC's.

	INTEL® CORE™ i7-8809G PROCESSOR	INTEL® CORE™ i7-8709G PROCESSOR	INTEL® CORE™ i7-8706G PROCESSOR	INTEL® CORE™ i7-8705G PROCESSOR	INTEL® CORE™ i5-8305G PROCESSOR
Discrete Graphics	Radeon™ RX Vega M GH	Radeon™ RX Vega M GH	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL
Intel HD Graphics	630	630	630	630	630
Graphics Dynamic Frequency (MHz)	Up to 1100	Up to 1100	Up to 1100	Up to 1100	Up to 1100
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes
Discrete GPU & HBM Overclocking	Yes	No	No	No	No

8th Generation Intel® Processor Graphics

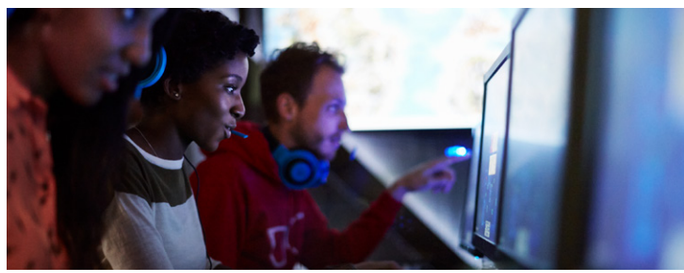
Starting with 8th Gen Intel® Core™ processors, Intel's integrated graphics offerings will be branded Intel® UHD Graphics. Intel® UHD graphics brand aligns the brand to the 4K platform capabilities of 8th Generation Intel® Core™ processors, including content playback, content creation, output, and display. Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.

	INTEL IRIS PLUS GRAPHICS 655	INTEL UHD GRAPHICS P630	INTEL® UHD GRAPHICS 630	INTEL® UHD GRAPHICS 620	INTEL® UHD GRAPHICS 615	INTEL UHD GRAPHICS 610	INTEL UHD GRAPHICS 605	INTEL UHD GRAPHICS 600
Processor Family	Intel® Core™	Intel® Xeon™	Intel® Core™ / Intel® Pentium®	Intel® Core™	Intel® Core™	Intel® Pentium® / Intel® Celeron®	Intel® Pentium®	Intel® Celeron®
Max Dynamic Frequency	1.2 GHz	1.2 GHz	1.2 GHz	1.15 GHz	1.10 GHz	1.05 GHz	800 MHz	750 MHz
eDRAM	128 Mb	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Processor Number	i7-8559U	E-2186G	i9-8950HK	i7-8650U	i7-8500Y	Pentium® Gold G5400	Pentium® Silver N5000	N4100
	i5-8269U	E-2176G	i7-8850H	i7-8565U	i5-8200Y	Pentium® Gold G5400T	Pentium® Silver J5005	N4000
	i5-8259U	E-2174G	i7-8750H	i5-8550U	m3-8100Y	Celeron® G4920		J4105
	i3-8109U	E-2146G	i7-8700K	i5-8350U		Celeron® G4900		J4005
		E-2144G	i7-8700	i5-8265U		Celeron® G4900T		
		E-2126G	i7-8700T	i5-8250U				
		E-2124G	i5-8600K	i3-8145U				
		E-2104G	i5-8600	i3-8130U				
		E-2186M	i5-8600T					
		E-2176M	i5-8500					
			i5-8500T					
			i5-8400					
			i5-8400H					
			i5-8400T					
			i3-8350K					
			i3-8300					
			i3-8300H					
			i3-8300T					
			i3-8100					
			i3-8100T					
			Pentium® Gold G5600					
			Pentium® Gold G5500					
			Pentium® Gold G5500T					

7TH GENERATION INTEL® PROCESSOR GRAPHICS

Advanced Performance for Captivating Visuals

Intel® 7th Generation Processor Graphics delivers advanced performance for captivating visuals. With 7th Gen Intel® Core™ processors, you can watch, create, share, and game like never before. Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.



		INTEL® HD GRAPHICS 620[2]	INTEL® HD GRAPHICS 650[4]
Productivity	SYSmark* 2014	1.0	1.11x
Video Editing	TouchXPRT* 2016	1.0	1.40x
Gaming	3DMark* 11	1.0	1.65x

7th Generation Intel® Processor Graphics

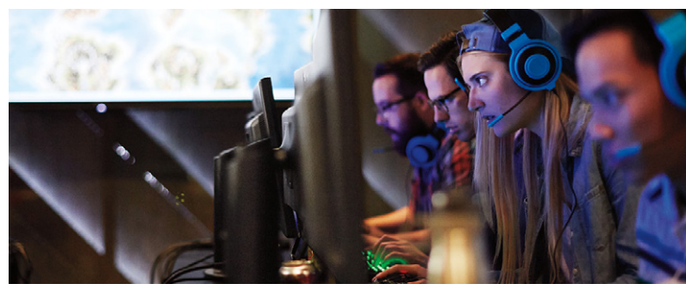
	INTEL® IRIS™ PLUS GRAPHICS 650	INTEL® IRIS™ PLUS GRAPHICS 640	INTEL® HD GRAPHICS 630	INTEL® HD GRAPHICS 620	INTEL® HD GRAPHICS 610	INTEL® HD GRAPHICS 615
Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Family
Processor Line	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
Platform	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-7567U	i7-7660U	i7-7920HQ	i7-7600U	4415U	m-7Y75
	i5-7287U	i7-7560U	i7-7820HQ	i7-7500U	3965U	m-7Y57
	i5-7267U	i5-7360U	i7-7820HK	i5-7300U	3865U	m-7Y54
	i3-7167U	i5-7260U	i7-7700HQ	i5-7200U		m-7Y30
			i5-7440HQ	i3-7100U		
			i5-7300HQ			
			i3-7100H			

6TH GENERATION INTEL® PROCESSOR GRAPHICS

Intel® Iris™ Graphics

Intel® Iris™ Graphics delivers advanced performance for captivating 4K visuals. Edit photos and videos like a pro with fast processor graphics. Expand entertainment to multiple screens for home entertainment and gaming. Challenge your skills with agile, texture-rich graphics for gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.

		INTEL® HD GRAPHICS 520[2]	INTEL® IRIS™ GRAPHICS 540[3]	INTEL® HD GRAPHICS 550[4]
Productivity	SYSmark* 2014 Overall	1.0	1.06x	1.12x
Video Editing	CyberLink* MediaEspresso 7 Ultra HD Media Transcode	1.0	1.40x	1.40x
Gaming	3DMark* 11 Graphics Score (relative)	1.0	1.30x	1.80x



6th Generation Intel® Processor Graphics

	INTEL® IRIS™ GRAPHICS 580	INTEL® IRIS™ GRAPHICS 550	INTEL® IRIS™ GRAPHICS 540	INTEL® HD GRAPHICS 530	INTEL® HD GRAPHICS 520	INTEL® HD GRAPHICS 510	INTEL® HD GRAPHICS 515
Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Family
Processor Line	H-Series	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
Platform	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-6970HQ	i7-6567U	i7-6650U	i7-6920HQ	i7-6600U	4405U	m-6Y75
	i7-6870HQ	i5-6287U	i7-6560U	i7-6820HQ	i7-6500U	3995U	m-6Y57
	i7-6770HQ	i5-6267U	i5-6360U	i7-6820HK	i5-6300U	3855U	m-6Y54
	i5-6350HQ	i3-6167U	i5-6260U	i7-6700HQ	i5-6200U		m-6Y30
				i5-6440HQ	i3-6100U		
				i5-6300HQ			
				i3-6100H			

5TH GENERATION INTEL® PROCESSOR GRAPHICS

Intel® Iris™ Graphics

Intel® Graphics Technology gives you discrete-level graphics power and performance without the additional add-in card, integrated right into your favorite Intel processor. The results are clear: home theater, gaming, conferencing and video and photo editing are smooth, vivid and faster than ever before. It's an immersive experience for premium notebooks, Ultrabook™, mini-pcs, and all-in-ones.

		INTEL® HD GRAPHICS 5500[5]	INTEL® IRIS™ GRAPHICS 6100[6]	INTEL® IRIS™ PRO GRAPHICS 6200[7]
Productivity	CPU Performance SYSmark* 2014 Overall	1x	1.10x	1.70x
Video Editing	Quick Sync Video Accelerated Conversion Performance HDXPRT* Video Conversion	1x	1.20x	1.95x
Gaming	3DMark* 11-P Graphics Subscore, 3DMark* Firestrike Graphics Subscore, 3DMark* Vantage-P Graphics Subscore	1x	1.50x	2x

5th Generation Intel® Processor Graphics

	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ Graphics 6100	INTEL® IRIS™ Graphics 6000	INTEL® HD Graphics 5600	INTEL® IRIS™ Graphics 5500	INTEL® HD Graphics 5300	INTEL® HD Graphics
Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Pentium® / Intel® Celeron®
Processor Line	S-Series	H-Series	U-Series	U-Series	H-Series	U-Series	Y-Series	U-Series
Platform	Desktop	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-5775R	i7-5950HQ	i7-5557U	i7-5650U	i7-5700HQ	i7-5600U	M-5Y70	3805U
	i7-5775C	i7-5850HQ	i7-5287U	i7-5550U		i7-5500U	M-5Y71	3755U
	i5-5675R	i7-5750HQ	i7-5257U	i5-5350U		i5-5300U	M-5Y31	3205U
	i5-5675C	i5-5350H	i7-5157U	i5-5250U		i5-5200U	M-5Y10	3825U
	i5-5575R					i5-5010U	M-5Y10a	3765U
						i5-5005U	M-5Y10c	3215U

Intel® Core™ i7-7567U Processor (e*) up to 4 GHz, 4T/2C, 4MB w/ Iris Plus Graphics 650 vs. Intel® Core™ i7-7500U Processor (e*) up to 3.5GHz, 4T/2C, 4MB w/ HD Graphics 620

Estimates and measurements based on (1) Productivity - SYSmark* 2014 Overall Score, (2) Media Editing – TouchXPRT* 2016 –Convert Videos for sharing Sub-score, (3) 3DMark* Sky Diver* - Graphics Score

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance

1 Data based on SKUs below

2 Core i7-6500U 15W w/HD Graphics 520

3 Core i7-6560U 15W w/Iris Graphics 540

4 Core i7-6567U 28w w/Iris Graphics 550

5 System configuration for 5th Generation Intel Core Processor w/ HD Graphics 5500: Intel CRB, Intel® Core™ i7-5600U Processor, 2C4T, Turbo up to 3.2GHz, Memory: 2x2GB LPDDR3-1600, Storage: Intel SSD, Display Resolution:1920x1080.

6 System configuration for 5th Generation Intel Core Processor w/ Iris Graphics 6100: Intel CRB, Intel® Core™ i7-5557U 15W/28W, 2C4T, Turbo up to 3.2GHz/3.4 GHz, Memory: 2x2GB LPDDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. (Estimates based on measurements done with DDR3L)

7 System configuration for 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel® Core™ i7-5950HQ PL1=47W TDP, 4C8T, Turbo up to 3.8 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080.

System configuration for Desktop LGA 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel® Core™ i7-5775C PL1=65W TDP, 4C8T, Turbo up to 3.7 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. System configuration for Previous Gen Desktop LGA 4th Generation Intel Core Processor: Intel CRB, Intel® Core™ i7-4790S 65W, 4C8T, Turbo up to 4.0 GHz, Memory: 2x4GB DDR3L-1600, Storage: Intel SSD, Display Resolution:1920x1080.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

* Other names and brands may be claimed as the property of others.

FLEXIBILITY. STABILITY. EFFICIENCY.

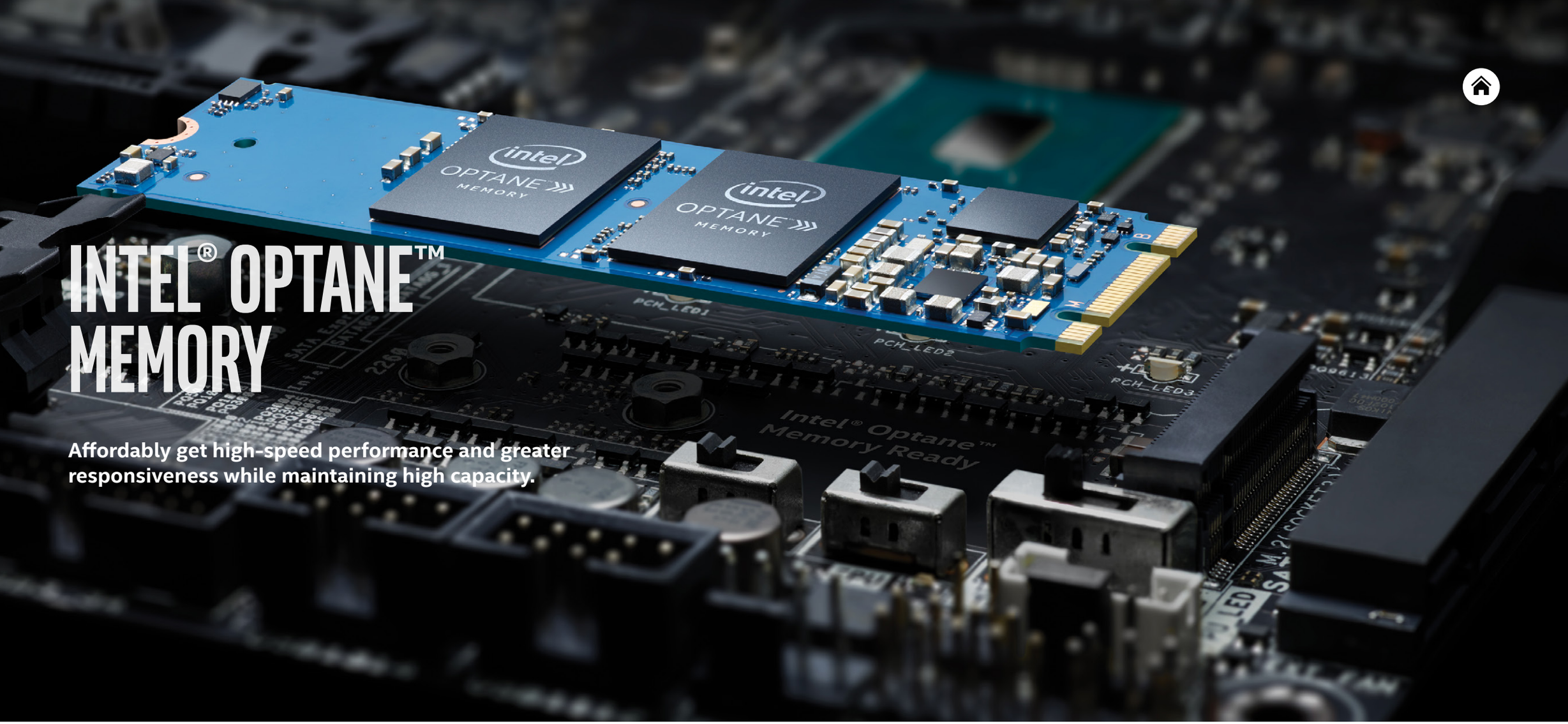
INTEL® MEMORY AND STORAGE

Intel® Product Quick Reference Matrix

Q3 2019

MEMORY AND STORAGE

Intel provides technically-advanced products that support every level of computing—from data center workloads to enthusiast usage. Intel® Optane™ memory creates an accelerated bridge between memory and storage. Intel® Solid State Drives (Intel® SSDs) provide storage flexibility, stability, and efficiency.



INTEL® OPTANE™ MEMORY

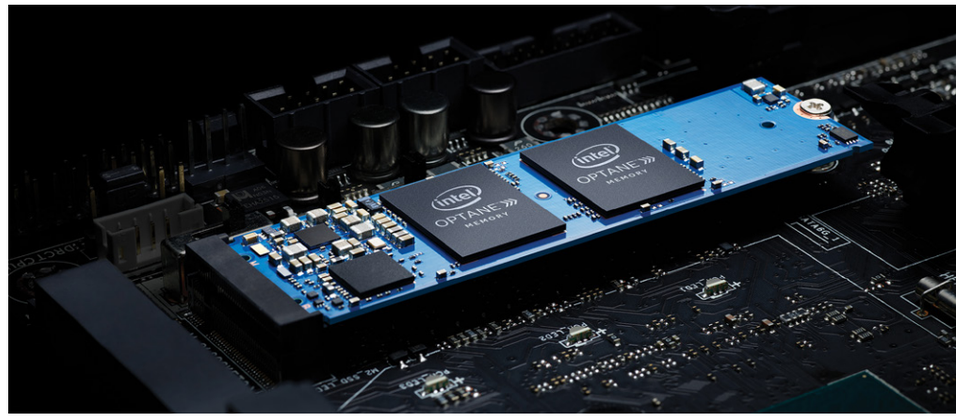
Affordably get high-speed performance and greater responsiveness while maintaining high capacity.

BREAKTHROUGH SPEED. UNCOMPROMISED CAPACITY.

Increase PC responsiveness with Intel® Optane™ memory, smart and adaptable system accelerator that pairs with a 7th Gen or greater Intel® Core™ processor based PC to deliver high-performance responsiveness for almost everything—from checking email and web surfing to gaming and business.

INTEL® OPTANE™ MEMORY OFFERS BETTER END USER VALUE

USES	• System Acceleration with 7th/8th Gen Core based systems and a SATA HDD • Intel® Optane™ Memory Ready Motherboards
TARGET SEGMENTS	• Desktops, Workstations (Refer to Intel® Optane™ Memory POR document CDI 568777 for full list of supported platforms)
FEATURES	• High Speed & 2x Responsiveness • Revolutionary Intel® Optane™ Technology • Intelligent System Acceleration • High performance at low queue depth • Intel Q&R backed by 5Yr Warranty • Software Encryption with Bitlocker and McAfee • New Sell-Up Opportunity • Platform Confidence & Intel Branded Solution



	16 GB INTEL® OPTANE™ MEMORY	32 GB INTEL® OPTANE™ MEMORY
MARKET SEGMENT	• Mainstream / DIY Builder • SMB / Mainstream Corporate Users	• Mainstream Enthusiast / DIY Builder • Enthusiast / Corporate Users
IDEAL FOR USERS THAT	• Need high capacity storage and affordable performance • Task switch across online applications • Often have multiple browser tabs open • Utilize a smaller-footprint workload • Run multiple applications throughout the day	• Need high capacity storage and affordable performance • Work in applications with large data sets • Run a variety of data intensive applications • Play Mainstream games • Work in content creation applications • Regularly multi-task

PERFORMANCE BENEFITS FROM INTEL® OPTANE™ MEMORY

INTEL® OPTANE™ MEMORY DELIVERS BETTER END USER VALUE

INTEL® OPTANE™ MEMORY DELIVERS BETTER OVERALL SYSTEM RESPONSIVENESS ACROSS EVERYDAY TASKS THAN ADDING ADDITIONAL RAM

MAINSTREAM

ENTHUSIAST

BUSINESS

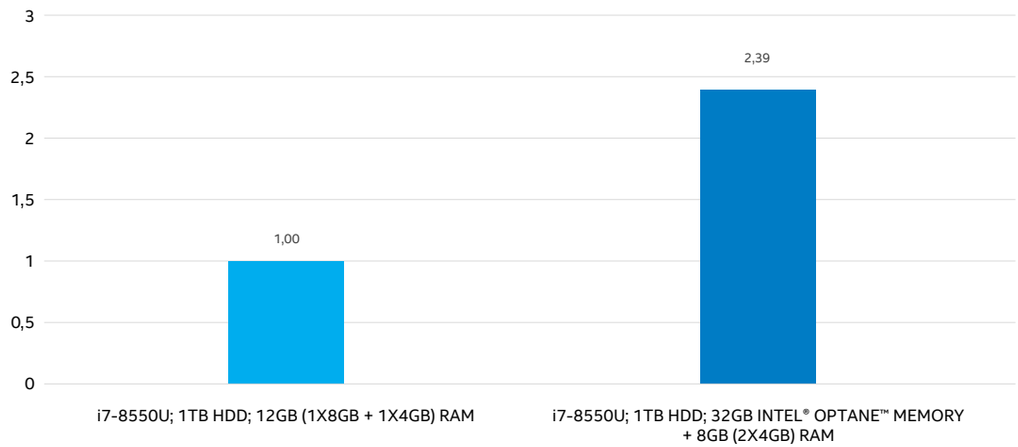
16GB Intel® Optane™ Memory vs system with an HDD alone

Tested on an 8th Gen Intel® Core™ i7 mobile platform

For Overall Responsiveness & Productivity	
Everyday Tasks[1]	Up to 2.3x more responsive
Launch Presentations[2]	Up to 2.7x faster
Load Emails[3]	Up to 2.6x faster
Load Documents[4]	Up to 2.1x faster
Launch Web Browsers[5]	Up to 79% faster
For Gamers	
Launch Games[6]	Up to 62% faster
Load Levels[7]	Up to 3.1x faster
For Content Creation	
Load Digital Libraries[8]	Up to 3x faster
Load, Edit, and Render[9]	Up to 76% faster

8th Gen Intel® Core™ i7-8550U Processor Featuring Intel® Optane™ Memory SYSmark* 2014 SE Responsiveness SubScore[10]

Relative Performance (higher is better). Normalized to 12GB (1x8GB + 1x4GB) RAM.



1-9 Performance results are based on testing as of August 17, 2018 (Launch Presentations, Load Emails, Load Documents, Launch Web Browsers, Adobe Photoshop Workloads), August 21, 2018 (Launch Games, Load Levels) and August 30, 2018 (Everyday Tasks) and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure. See appendix I for configurations and details.

11 See Appendix II for configurations and details.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit http://www.intel.com/benchmarks

The benchmark results reported above may need to be revised as additional testing is conducted. The results depend on the specific platform configurations and workloads utilized in the testing, and may not be applicable to any particular user's components, computer system or workloads. The results are not necessarily representative of other benchmarks and other benchmark results may show greater or lesser impact from mitigations.

Some applications and most games may require 8GB of DRAM memory for loading with or without Intel® Optane™ memory.

Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/OptaneMemory for configuration requirements.

*Other names and brands may be claimed as the property of others

Appendix I

TESTING DETAILS:

Performance results are based on testing as of August 17, 2018 (Launch Presentations, Load Emails, Load Documents, Launch Web Browsers, Adobe Photoshop Workloads), August 21, 2018 (Launch Games, Load Levels) and August 30, 2018 (Everyday Tasks) and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit http://www.intel.com/benchmarks

INTEL® OPTANE™ MEMORY FOR OVERALL RESPONSIVENESS & PRODUCTIVITY

1. As measured by SYSmark* 2014 SE Responsiveness Subscore comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
2. As measured by Presentation Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
3. As measured by e-mail Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
4. As measured by Document Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
5. As measured by Web Browser Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)

INTEL® OPTANE™ MEMORY FOR GAMING

6. As measured by Game Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
7. As measured by Game Launch Workload comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)

INTEL® OPTANE™ MEMORY FOR CONTENT CREATION

8. As measured by Adobe Photoshop Workload (aka Star Trails) comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)
9. As measured by Adobe Photoshop Workload (aka Star Trails) comparing 8th Gen Intel® Core™ i7-8550U (HDD) vs. 8th Gen Intel® Core™ i7-8550U (16GB Intel® Optane™ memory module + HDD)

PLATFORM CONFIGURATIONS:

Testing by Intel as of August 17th 2018 (Presentation Launch, Email launch, Document Launch, Web Browser Launch, and Adobe Photoshop Workloads), August 21st 2018 (Game Launch and Level Load Workloads) and August 30th 2018 (SYSmark* 2014 SE).

8th Generation Intel® Core™ i7-8550U Mobile Platform Configurations

Intel® Core™ i7 8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz on Intel Reference Platform, Graphics: Intel® UHD Graphics 620, Memory: 2x4GB DDR4, 16GB Intel® Optane™ memory, Storage: 1TB HDD, OS: Windows* 10 RS4 Version 1803, OS Build 10.0.17134.48 , MCU 0x84
Intel® Core™ i7 8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz on Intel Reference Platform, Graphics: Intel® UHD Graphics 620, Memory: 2x4GB DDR4, 32GB Intel® Optane™ memory, Storage: 1TB HDD, OS: Windows* 10 RS4 Version 1803, OS Build 10.0.17134.48 , MCU 0x84
Intel® Core™ i7 8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz on Intel Reference Platform, Graphics: Intel® UHD Graphics 620, Memory: 2x4GB DDR4, 64GB Intel® Optane™ memory, Storage: 1TB HDD, OS: Windows* 10 RS4 Version 1803, OS Build 10.0.17134.48 , MCU 0x84
Intel® Core™ i7 8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz on Intel Reference Platform, Graphics: Intel® UHD Graphics 620, Memory: 2x4GB DDR4, Storage: 1TB HDD, OS: Windows* 10 RS4 Version 1803, OS version 10.0.17134.48, MCU 0x84

WORKLOAD DETAILS:

Game Launch Workload - Workload developed by Intel® measuring the time elapsed to launch Total War: WARHAMMER* II 7450.1400824, V1.4.1 and reach the Main Menu with intro videos disabled (Launch)
Game Level Load Workload - Workload developed by Intel® measuring the time elapsed from the Main Menu to completion of level loading on Total War: WARHAMMER* II 7450.1400824, V1.4.2
Game Launch Workload - Workload developed by Intel® measuring the time elapsed to launch PUBG*, V4.7.8.10 and reach the Main Menu with intro videos disabled (Launch)
Adobe Photoshop* Workload - This workload consists of 142, 16MP .JPG photos shot on a Sony NEX-5R ranging from 3.81 MB – 4.25 MB in size. The smart object and stacking features of Photoshop* are used to create a photo with a “star trails” effect.
Presentation Launch Workload - Workload developed by Intel measuring the time elapsed to launch the Microsoft* PowerPoint 2016 application with a 3.5MB presentation file
Email Launch Workload - Workload developed by intel measuring the time elapsed to launch Microsoft* Outlook 2016 and load with a 250mb local data file
Document Launch Workload - Workload developed by Intel measuring the time elapsed to launch the Microsoft* Word 2016 application with a 3.5MB document file
Web Browser Launch – Workload developed by Intel measuring the time elapsed to launch Google* Chrome

BENCHMARK DETAILS:

SYSmark* 2014 SE (Second Edition) is a benchmark from the BAPCo* consortium that measures the performance of Windows* platforms. SYSmark tests the usage scenarios: Office Productivity, Media Creation, Responsiveness and Data/Financial Analysis. SYSmark contains real applications from Independent Software Vendors such as Microsoft* and Adobe*. Reported metrics: SYSmark 2014 SE Rating and a rating for each scenario result (higher is better for all). Scaling efficiencies: CPU dominant, sensitive to frequency, core count and memory. QSV enabled.

Appendix II

The benchmark results reported may need to be revised as additional testing is conducted. The results depend on the specific platform configurations and workloads utilized in the testing, and may not be applicable to any particular user's components, computer system or workloads. The results are not necessarily representative of other benchmarks and other benchmark results may show greater or lesser impact from mitigations.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors.

Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit http://www.intel.com/benchmarks

Some applications and most games may require 8GB of DRAM memory for loading with or without Intel® Optane™ memory

Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/OptaneMemory for configuration requirements

SYSTEM CONFIGURATIONS:

Intel® Core™ i7-8550U Processor, PL1=15W TDP, 4C8T, up to 4GHz, Graphics: Intel® UHD Graphics 620, Memory: 1x8GB + 1x4GB DDR4, Storage: Seagate ST1000LM048 2.5" 5400 RPM 1TB HDD, OS: Windows* 10 RS3
Intel® Core™ i7-8550U Processor, PL1=15W TDP, 4C8T, up to 4GHz, Graphics: Intel® UHD Graphics 620, Memory: 2x4GB DDR4, Storage: Seagate ST1000LM048 2.5" 5400 RPM 1TB HDD + 32GB Intel® Optane™ memory, OS: Windows* 10 RS3

TESTING DETAILS:

Testing on all Consumer Notebook 8th Gen Intel® Core™ (U-series & H-series) platforms was done internally

SYSmark* 2014 SE - benchmark from the BAPCo* consortium that measures the performance of Windows* platforms. SYSmark* tests four usage scenarios: Office Productivity, Media Creation, Data/Financial Analysis, and Responsiveness. SYSmark* contains real applications from Independent Software Vendors such as Microsoft* and Adobe*.

INTEL® SOLID STATE DRIVE OPTANE™ FAMILY

INTEL® SSD	INTEL® OPTANE™ SSD 905P	INTEL® OPTANE™ SSD 900P
USES	For the most demanding storage workloads and high performance desktop • Media Content creation, high performance gaming • CGI, Particle Simulation, Rendering, Game Development • High resolution image and video • Engineering design and workloads	Storage for high performance Desktop and Workstations • CGI, Particle Simulation, Rendering, Game Development • High Resolution Image and Video • Engineering design and high workload • Media creation
INTERFACE	PCI Express* 3.0 x4, NVM Express*	PCI Express* 3.0 x4, NVM Express*
FORM FACTOR	AIC, U.2 (15mm), M.2	AIC, U.2(15mm)
CAPACITIES	380GB / 480GB / 960GB / 1.5TB	280GB / 480GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 575k IOPS Writes: Up to 550k IOPS	Reads: Up to 550k IOPS Writes: Up to 500k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2700 MB/s Writes: Up to 2200 MB/s	Reads: Up to 2500 MB/s Writes: Up to 2000 MB/s
SECURITY	AES 256 bit encryption	AES 256 bit encryption
ENDURANCE	6.93 PBW	5.11 PBW
WARRANTY	5 year limited	5 year limited

Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive[4]
- Easy to use
- Free

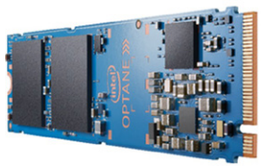
Download now at **www.intel.com/go/ssdinstallation**

*Other names and brands may be claimed as the property of others.

Intel® SSD Toolbox v3.5.11

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at **www.intel.com/go/ssdtoolbox**



INTEL® SSD	INTEL® OPTANE™ SSD 815P SERIES	INTEL® OPTANE™ SSD 800P SERIES
USES	Packs the performance of Intel® Optane™ technology in the slim M.2 form factor for storage in mobile and desktop systems, optimized for use as an exceptional OS drive, in mobile RAID configuration, or for high-performance specialty uses like application swap files or logging.	Packs the performance of Intel® Optane™ technology in the slim M.2 form factor for storage in mobile and desktop systems, optimized for use as an exceptional OS drive, in mobile RAID configuration, or for high-performance specialty uses like application swap files or logging.
INTERFACE	PCI Express* 3.0 x4, NVM Express*	PCI Express* 3.0 x2, NVM Express*
FORM FACTOR	M.2 80mm	M.2 80mm
CAPACITIES	118GB	58GB / 118GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 420k IOPS Writes: Up to 220k IOPS	Reads: Up to 250k IOPS Writes: Up to 140k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 1900 MB/s Writes: Up to 1000 MB/s	Reads: Up to 1450 MB/s Writes: Up to 640 MB/s
SECURITY	AES 256 bit encryption End-to-end data protection Enhanced power loss data protection	End-to-end data protection
ENDURANCE	365 TBW	365 TBW
WARRANTY	5 year limited	5 year limited

Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive[4]
- Easy to use
- Free

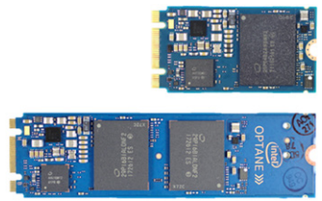
Download now at **www.intel.com/go/ssdinstallation**

*Other names and brands may be claimed as the property of others.

Intel® SSD Toolbox v3.5.11

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at **www.intel.com/go/ssdtoolbox**



INTEL® SSD	INTEL® OPTANE™ MEMORY SERIES	INTEL® OPTANE™ MEMORY M10 SERIES
USES	System Acceleration with 7th Gen or later Intel® Core™ processor-based systems Accelerate your mobile or desktop system and get amazing speed and responsiveness without compromising system storage	System Acceleration with 7th Gen & 8th Gen Intel® Core™ processor-based systems Accelerate your computer experience with short boot times, fast application launches, extraordinary gaming, and responsive browsing
INTERFACE	PCI Express* 3.0 x2, NVM Express*	PCI Express* 3.0 x2, NVM Express*
FORM FACTOR	M.2 80mm	M.2 80mm, M.2 42mm
CAPACITIES	16GB / 32 GB	80mm: 16GB / 32GB / 64GB 42mm: 16GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 240k IOPS Writes: Up to 65k IOPS	Reads: Up to 250k IOPS Writes: Up to 140k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 1350 MB/s Writes: Up to 290 MB/s	Reads: Up to 1450 MB/s Writes: Up to 640 MB/s
ENDURANCE	182.5 TBW	365 TBW
WARRANTY	5 year limited	5 year limited

Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive[4]
- Easy to use
- Free

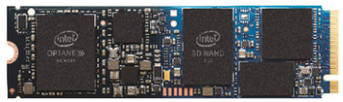
Download now at **www.intel.com/go/ssdinstallation**

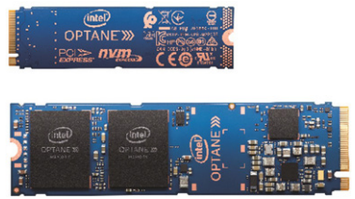
*Other names and brands may be claimed as the property of others.

Intel® SSD Toolbox v3.5.11

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at **www.intel.com/go/ssdtoolbox**





INTEL® SSD	INTEL® OPTANE™ MEMORY H10 SERIES	INTEL® OPTANE™ MEMORY M15 SERIES
USES	System Acceleration with 8th Gen Intel® Core™ processor-based systems	System Acceleration with 8th Gen Intel® Core™ processor-based systems Accelerate your computer experience with short boot times, fast application launches, extraordinary gaming, and responsive browsing
INTERFACE	PCI Express* 3.0 x4, NVM Express*	PCI Express* 3.0 x4, NVM express*
FORM FACTOR	M.2 80mm	M.2 80mm
CAPACITIES	16GB + 256GB / 32GB + 512GB / 32GB + 1TB	16GB / 32GB / 64GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 87k IOPS Writes: Up to 85k IOPS	Reads: Up to 450k IOPS Writes: Up to 220k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2400 MB/s Writes: Up to 1800 MB/s	Reads: Up to 2000 MB/s Writes: Up to 900 MB/s
ENDURANCE	Up to 300 TBW	Up to 365 TBW
WARRANTY	5 year limited	5 year limited

Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive[4]
- Easy to use
- Free

Download now at **www.intel.com/go/ssdinstallation**

*Other names and brands may be claimed as the property of others.

Intel® SSD Toolbox v3.5.11

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at **www.intel.com/go/ssdtoolbox**

INTEL® SOLID STATE DRIVES

Intel Corporation manufactures world-class solid state drives targeting data center, embedded, professional, and consumer market segments.

CONSUMER FAMILY

Impressive performance with NVMe*/PCIe* and SATA for enthusiasts and mainstream consumers.

PROFESSIONAL FAMILY

Enhanced security and remote manageability with Intel® vPro™ integration for the corporate client.

DATA CENTER FAMILY

Consistently amazing performance for NVMe*/PCIe* and SATA with broad industry compatibility, and robust enterprise RAS features.

INTEL® SOLID STATE DRIVE CONSUMER FAMILY

INTEL® SSD	INTEL® SSD 760p SERIES	INTEL® SSD 660p SERIES	INTEL® SSD 545s SERIES
USES	PCs – notebooks, desktops, NUCs Everyday Computing Gaming Mobile Computing	PCs – Desktop & Mobile computing, NUCs Everyday Computing HDD Replacement SATA SSD Replacement Gaming	PCs – notebooks, desktops, NUCs Everyday computing Gaming Mobile computing
INTERFACE	PCI Express* 3.1 x4, NVM Express*	PCI Express* 3.0 x4, NVM Express*	SATA 6Gb/s
FORM FACTOR	M.2 80mm	M.2 80mm	M.2 80mm, 2.5" (7mm)
CAPACITIES	128GB / 256GB/ 512GB/ 1.024TB / 2.048TB (Double Sided)	512GB / 1.024TB / 2.018TB	M.2: 128GB / 256GB / 512GB 2.5": 128GB / 256GB / 512GB / 1.024TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 340k IOPS Writes: 275k IOPS	Reads: Up to 250k IOPS Writes: Up to 250k IOPS	Reads: Up to 75k IOPS Writes: Up to 85k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3230 MB/s Writes: Up to 1625 MB/s	Read: Up to 1800MB/s Write: Up to 1800MB/s	Reads: Up to 550 MB/s Writes: Up to 500 MB/s
SECURITY	End-to-end data protection AES 256-bit encryption	End-to-end data protection AES 256-bit encryption	End-to-end data protection AES 256-bit encryption
ENDURANCE	Up to 576 TBW	Up to 400 TBW	Up to 576 TBW
WARRANTY	5 year limited	5 year limited	5 year limited

Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive[4]
- Easy to use
- Free

Download now at **www.intel.com/go/ssdinstallation**

*Other names and brands may be claimed as the property of others.

Intel® SSD Toolbox v3.5.11

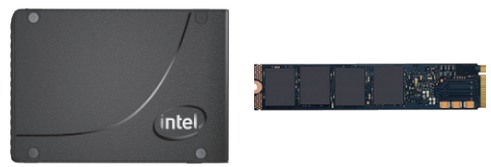
- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at **www.intel.com/go/ssdtoolbox**

INTEL® SOLID STATE DRIVE PROFESSIONAL FAMILY

INTEL® SSD	INTEL® SSD PRO 7600p SERIES	INTEL® SSD PRO 5450s SERIES
USES	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC
INTERFACE	PCI Express* 3.1 x4, NVM Express*	SATA 6Gb/s
FORM FACTOR	M.2 80mm	M.2 80mm, 2.5"(7 mm)
CAPACITIES	128GB / 256GB / 512GB / 1.024TB / 2.048TB	M.2 80mm: 128GB / 256GB / 512GB / 1.024TB 2.5": 128GB / 256GB / 512GB / 1.024TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 340k IOPS Writes: Up to 275k IOPS	Reads: Up to 75k IOPS Writes Up to 85k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3230 MB/s Writes: Up to 1625 MB/s	Reads: Up to 550 MB/s Writes: Up to 500 MB/s
SECURITY	AES 256-bit Encryption, OPAL 2.0 features, eDrive capable End-to-end data protection	AES 256-bit Encryption, OPAL 2.0 features, eDrive capable End-to-end data protection
ENDURANCE	Up to 576 TBW	Up to 576 TBW
WARRANTY	5 years limited	5 year limited

Intel® Solid State Drive Data Center Family for PCIe* - Intel® Optane™ SSDs



INTEL® SSD	INTEL® OPTANE™ SSD DC P4800X SERIES	INTEL® OPTANE™ SSD DC P4801X SERIES
USES	Eliminate data center storage bottlenecks and allows bigger, more affordable data sets. Accelerate applications, reduce transaction costs for latency-sensitive workloads, and improve overall data center TCO. • Fast storage or cache • Extended memory	Eliminate data center storage bottlenecks and allows bigger, more affordable data sets. Accelerate applications, reduce transaction costs for latency-sensitive workloads, and improve overall data center TCO. • Fast storage or cache • Extended memory
INTERFACE	PCI Express* 3.0 x4, NVM Express*	PCI Express* 3.0 x4, NVM Express*
FORM FACTOR	AIC, U.2(15mm)	U.2 15 mm, M.2 110mm
CAPACITIES (MB)	AIC: 375GB / 750GB / 1.5TB U.2: 375GB / 750GB	U.2: 100GB M.2: 100GB / 200GB / 375GB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 550k IOPS Writes: Up to 550k IOPS	Reads: Up to 550k IOPS Writes: Up to 550k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2500 MB/s Writes: Up to 2200 MB/s	Reads: Up to 2200 MB/s Writes: Up to 2200 MB/s
SECURITY	AES 256-bit encryption End-to-end data protection	AES 256-bit encryption Power loss data protection End-to-end data protection
ENDURANCE	375GB – Up to 41PBW (30 DWPD) 750GB – Up to 82PBW (30 DWPD) 1.5TB - 164PBW (60 DWPD)	100GB – 10.9PBW (100 DWPD) 200GB – 21.9PBW (60 DWPD) 375GB - 41PBW (60 DWPD)
WARRANTY	5 year limited	5 year limited

* Other names and brands may be claimed as the property of others.

Intel® Solid State Drive Data Center Family for PCIe* - Standard/Mid End.

INTEL® SSD	INTEL® SSD DC P4610	INTEL® SSD DC P4510	INTEL® SSD DC P4511 SERIES
USES	Cloud Storage FSI and Database Workload Virtualization	Cloud Storage Scale Out Storage Hard Drive Replacement	Low power applications for database and logging Data analytics and compute node storage solution Cloud storage
INTERFACE	PCI Express* 3.1 x4, NVM Express*	PCI Express* 3.1 x4, NVM Express*	PCIe* 3.1 x4, NVMe* 1.2
FORM FACTOR	U.2 15mm	U.2 15mm	M.2 22mm x 110mm
CAPACITIES (MB)	1.6TB / 3.2TB / 6.4TB / 7.68TB	1TB / 2TB / 4TB / 8TB	1TB / 2TB
MAXIMUM RANDOM PERFORMANCE	Read: Up to 654k IOPS Write: Up to 222k IOPS	Read: Up to 637k IOPS Write: Up to 134k IOPS	Read: Up to 295k IOPS Write: Up to 36k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3200 MB/s Writes: Up to 3200 MB/s	Reads: Up to 3200 MB/s Writes: Up to 3000 MB/s	Reads: Up to 2000 MB/s Writes: Up to 1430 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	Up to 44.25PBW	Up to 13.88 PBW	Up to 1.95PBW
WARRANTY	5 year limited	5 year limited	5 year limited

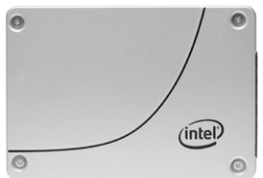
Intel® Solid State Drive Data Center Family for PCIe* - Value/Essential End.

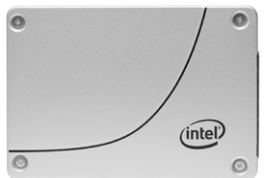
INTEL® SSD	INTEL® SSD D5-P4420	INTEL® SSD D5-P4320
USES	Cloud Storage Scale Out Storage HDD Replacement	Cloud Storage Scale Out Storage Hard Drive Replacement
INTERFACE	PCI Express* 3.1 x4, NVM Express*	PCI Express* 3.1 x4, NVM Express*
FORM FACTOR	U.2 15mm	U.2 15mm
CAPACITIES (MB)	7.68TB	7.68TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 427k IOPS Writes: Up to 46k IOPS	Reads: Up to 427k IOPS Writes: Up to 46k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 3300 MB/s Writes: Up to 1000 MB/s	Reads: Up to 3300 MB/s Writes: Up to 1000 MB/s
SECURITY	AES 256-bit encryption Power loss data protection End-to-end data protection	AES 256-bit encryption Power loss data protection End-to-end data protection
ENDURANCE	5.6 PBW (random), 24.6 PBW (sequential)	2.8 PBW (random), 12.3 PBW (sequential)
WARRANTY	5 years limited	5 years limited

Intel® Solid State Drive Data Center Family for PCIe* - Boot Drive

INTEL® SSD	INTEL® SSD DC P4101
USES	Boot Drive Storage Edge Cache Search Index Business Intelligent Segment Offline Analytics
INTERFACE	PCI Express* 3.1 x4, NVM Express*
FORM FACTOR	M.2 22x80mm
CAPACITIES (MB)	128GB / 256GB / 512GB / 1TB / 2TB
MAXIMUM RANDOM PERFORMANCE	Reads: Up to 275k IOPS Writes: Up to 16k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Reads: Up to 2600 MB/s Writes: Up to 840 MB/s
SECURITY	AES 256-bit encryption
ENDURANCE	0.29 DWPD
WARRANTY	5 years limited

Intel® Solid State Drive Data Center Family for SATA





INTEL® SSD	INTEL® SSD D3-S4610 SERIES	INTEL® SSD D3-S4510 SERIES
USES	Manufacturing Retail Virtualization Analytical & operational databases Machine generated data	Cloud Embedded Boot, Static Web Content Low data rate, Operational databases & Analytics Web server and SQL Logs OS Paging and Media Streaming
INTERFACE	SATA 6Gb/s	SATA 6Gb/s
FORM FACTOR	2.5” 7mm	2.5” 7mm
CAPACITIES (MB)	240GB, 480GB, 960GB, 1.92TB, 3.84TB	240GB, 480GB, 960GB, 1.92TB, 3.84TB
MAXIMUM RANDOM PERFORMANCE	Read: Up to 97K IOPS Write: Up to 51k IOPS	Read: Up to 97k IOPS Write: Up to 36k IOPS
MAXIMUM SEQUENTIAL PERFORMANCE	Read: Up to 560 MB/s Write: Up to 510 MB/s	Read: Up to 560 MB/s Write: Up to 510 MB/s
SECURITY	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
ENDURANCE	Up to 22PBW	Up to 13.1PBW
WARRANTY	5 year limited	5 year limited

Consumer Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® Optane™ SSD 905P Series	480GB	**SSDPE21D480GAX1**	(480GB, 2.5in PCIe* x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ Standard U.2 Cable	1
	480GB	**SSDPE21D480GAM3**	(480GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ M.2 Adapter Cable	1
	960GB	**SSDPE21D960GAX1**	(960GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ M.2 Adapter Cable	1
	960GB	**SSDPE21D960GAM3**	(960GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ Standard U.2 Cable	1
	1.5TB	**SSDPE21D015TAX1**	(1.5TB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ Standard U.2 Cable	1
	1.5TB	**SSDPE21D015TAM3**	(1.5TB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	w/ M.2 Adapter Cable	1
Intel® Optane™ SSD 900P Series	280GB	**SSDPED1D280GASX**	(280GB, ½ Height PCIe 3.0 X4, 20nm Intel® Optane™ Memory Media)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	**SSDPED1D280GAX1**	(280GB, ½ Height PCIe x4, Intel® Optane™ Memory Media)	Reseller Single Pack	SSD only	1
	280GB	**SSDPE21D280GAX1**	(280GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Reseller Single	SSD only	1
	280GB	**SSDPE21D280GASM**	(280GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	**SSDPE21D280GASX**	(280GB, 2.5in PCIe x4, Intel® Optane™ Memory Media)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	**SSDPED1D480GASX**	(480GB, ½ Height PCIe 3.0 X4, 20nm Intel® Optane™ Memory Media)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	**SSDPED1D480GAX1**	(480GB, ½ Height PCIe x4, Intel® Optane™ Memory Media)	Reseller box	SSD only	1
Intel® Optane™ SSD 815P Series	118GB	**SSDPEK1F118GA01**	(Solid State Drive 118GB PCIe M.2 80mm)	Generic Pack	SSD only	1
	118GB	**SSDPEK1F118GA**	(Solid State Drive 118GB PCIe M.2 80mm)	Generic Pack	SSD only	100
	118GB	**SSDPEK1F118GAX1**	(Solid State Drive 118GB PCIe M.2 80mm)	Retail Box	SSD only	1
	118GB	**SSDPEK1F118GAXT**	(Solid State Drive 118GB PCIe M.2 80mm)	Retail Box	SSD only	10
Intel® Optane™ SSD 800P Series	60GB	**SSDPEK1W060GAXT**	(60GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Retail Box	SSD only	10
	120GB	**SSDPEK1W120GAXT**	(120GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Retail Box	SSD only	10
	120GB	**SSDPEK1W120GAX1**	(120GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Retail Box	SSD only	1
	60GB	**SSDPEK1W060GA01**	(60GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Generic Pack	SSD only	1
	120GB	**SSDPEK1W120GA01**	(120GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Generic Pack	SSD only	1
	60GB	**SSDPEK1W060GA**	(60GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Generic Pack	SSD only	100
	120GB	**SSDPEK1W120GA**	(120GB, M.2 80mm PCIe x4, Intel® Optane™ Memory Media)	Generic Pack	SSD only	100

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD 760p Series	1.024TB	**SSDPEKKW010T8X1**	(1.024TB, M.2 80mm PCIe* 3.0 x4, 3D2, TLC)	Retail Box	SSD only	1
	512GB	**SSDPEKKW512G8XT**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	512GB	**SSDPEKKW512G801**	(512GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	256GB	**SSDPEKKW256G8XT**	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	256GB	**SSDPEKKW256G801**	(256GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	128GB	**SSDPEKKW128G8XT**	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	128GB	**SSDPEKKW128G801**	(128GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
Intel® SSD 660p Series	256GB	**SSDPEKNW256G801**	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	512GB	**SSDPEKNW512G801**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	512GB	**SSDPEKNW512G8X**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
	512GB	**SSDPEKNW512G810**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	10
	512GB	**SSDPEKNW512G8XT**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	10
	1.0TB	**SSDPEKNW010T801**	(1.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	1.0TB	**SSDPEKNW010T8X1**	(1.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
	2.0TB	**SSDPEKNW020T801**	(2.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	2.0TB	**SSDPEKNW020T8X1**	(2.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
Intel® SSD 545s Series	1.024TB	**SSDSC2KW010T8X1**	(1.024TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail box	SSD only	1
	512GB	**SSDSC2KW512G8**	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	512GB	**SSDSC2KW512G8XT**	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	512GB	**SSDSC2KW512G8X1**	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	512GB	**SSDSCKKW512G8X1**	(512GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	**SSDSC2KW256G8**	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	**SSDSC2KW256G8XT**	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	256GB	**SSDSC2KW256G8X1**	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	**SSDSCKKW256G8**	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	**SSDSCKKW256G8XT**	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	256GB	**SSDSCKKW256G8X1**	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	**SSDSC2KW128G8**	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	128GB	**SSDSC2KW128G8XT**	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	128GB	**SSDSC2KW128G8X1**	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	**SSDSCKKW128G8X1**	(128GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1

Consumer Family SSDs Intel® Optane™ Memory

PRODUCT NAME	DENSITY	MM#	PRODUCT DESCRIPTION	PRODUCT CODE
	16GB	**953340**	(16GB, M.2 80mm PCIe* 3.0, 20nm, Generic 1pk)	MEMPEK1W016GA01
	16GB	**957794**	(16GB, M.2 80mm PCIe 3.0, 20nm, Generic 100pk)	MEMPEK1W016GA
	16GB	**957790**	(16GB, M.2 80mm PCIe 3.0, 20nm, Retail 10pk)	MEMPEK1W016GAXT
	32GB	**953341**	(32GB, M.2 80mm PCIe 3.0, 20nm, Generic 1pk)	MEMPEK1W032GA01
	32GB	**957795**	(32GB, M.2 80mm PCIe 3.0, 20nm, Generic 100pk)	MEMPEK1W032GA
	35GB	**957793**	(32GB, M.2 80mm PCIe 3.0, 20nm, Retail 10pk)	MEMPEK1W032GAXT
Intel® Optane™ Memory M10	16GB	**960260**	(16 GB PCIe M.2 80mm Generic 1pk)	MEMPEK1J016GA01
	16GB	**962391**	(16 GB PCIe M.2 80mm Retail 10pk)	MEMPEK1J016GAXT
	32GB	**960261**	(32 GB PCIe M.2 80mm Generic 1pk)	MEMPEK1J032GA01
	32GB	**963292**	(32 GB PCIe M.2 80mm Retail 10pk)	MEMPEK1J032GAXT
	64GB	**960262**	(64 GB PCIe M.2 80mm Generic 1pk)	MEMPEK1J064GA01
Intel® Optane™ Memory H10	256GB	**984682**	(16GB + 256GB, M.2 80mm PCIe 3.0, Generic 1pk)	HBRPEKNX0101A01
	256GB	**999FD6**	(16GB + 256GB, M.2 80mm PCIe 3.0, QLC Generic 100pk)	HBRPEKNX0101A
	512GB	**984683**	(32GB + 512GB, M.2 80mm PCIe 3.0, QLC Generic 1pk)	HBRPEKNX0202A01
	512GB	**999FD8**	(32GB + 512GB, M.2 80mm PCIe 3.0, QLC Generic 100pk)	HBRPEKNX0202A
	1TB	**984684**	(32GB + 1TB, M.2 80mm PCIe 3.0, QLC Generic 1pk)	HBRPEKNX0203A01
	1TB	**999FD9**	(32GB + 1TB, M.2 80mm PCIe 3.0, QLC Generic 1oopk)	HBRPEKNX0203A
Intel® Optane™ Memory M15	16GB	**980261**	(PCIe M.2 80mm Intel® Optane™ Memory 16 GB Generic 1pk)	MEMPEK1F016GA01
	32GB	**980262**	(PCIe M.2 80mm Intel® Optane™ Memory 32 GB Generic 1pk)	MEMPEK1F032GA01
	64GB	**980263**	(PCIe M.2 80mm Intel® Optane™ Memory 64 GB Generic 1pk)	MEMPEK1F064GA01
	16GB	**980265**	(PCIe M.2 80mm Intel® Optane™ Memory 16 GB Generic 100pk)	MEMPEK1F016GA
	32GB	**980266**	(PCIe M.2 80mm Intel® Optane™ Memory 32 GB Generic 100pk)	MEMPEK1F032GA
	64GB	**980267**	(PCIe M.2 80mm Intel® Optane™ Memory 64 GB Generic 100pk)	MEMPEK1F064GA
	16GB	**984686**	(PCIe M.2 80mm Intel® Optane™ Memory 16 GB Retail 1pk)	MEMPEK1F016GAX1
	32GB	**984687**	(PCIe M.2 80mm Intel® Optane™ Memory 32 GB Retail 1pk)	MEMPEK1F032GAX1
	64GB	**984688**	(PCIe M.2 80mm Intel® Optane™ Memory 64 GB Retail 1pk)	MEMPEK1F064GAX1
	16GB	**984690**	(PCIe M.2 80mm Intel® Optane™ Memory 16 GB Retail 10pk)	MEMPEK1F016GAXT
	32GB	**984691**	(PCIe M.2 80mm Intel® Optane™ Memory 32 GB Retail 10pk)	MEMPEK1F032GAXT
	64GB	**984692**	(PCIe M.2 80mm Intel® Optane™ Memory 64 GB Retail 10pk)	MEMPEK1F064GAXT

Professional Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD Pro 7600p Series	2.048TB	**SSDPEKKF0202T8X1**	(2.048TB, M.2 80mm PCIe* 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	1.02TB	**SSDPEKKF010T8X1**	(1.024TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	512 GB	**SSDPEKKF512G8X1**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256 GB	**SSDPEKKF256G8X1**	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	128 GB	**SSDPEKKF128G8X1**	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
Intel® SSD Pro 5450s Series	512GB	**SSDSC2KF512G8X1**	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256GB	**SSDSC2KF256G8X1**	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256GB	**SSDSCKKF256G8ES**	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Single Pack	SSD only	1
	256GB	**SSDSCKKF256G8X1**	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1

Intel® Solid State Drives Data Center for PCIe*

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® Optane™ SSD DC P4800X Series	750GB	**SSDPED1K750GA01**	(750GB, 1/2 Height PCIe x4)	Generic Pack	SSD only	1
	750GB	**SSDPE21K750GA01**	(750GB, 2.5in PCIe x4)	Generic Pack	SSD only	1
	375GB	**SSDPED1K375GA01**	(375GB, 1/2 Height PCIe x4)	Generic Pack	SSD only	1
	375GB	**SSDPE21K375GA01**	(375GB, 2.5in PCIe x4)	Generic Pack	SSD only	1
Intel® Optane™ SSD DC P4801X Series	100GB	**SSDPE21K100GA01**	(100GB PCIe 2.5" Drive)	Generic Pack	SSD only	1
	100GB	**SSDPE21K100GA10**	(100GB PCIe 2.5" Drive)	Generic Pack	SSD only	10
	100GB	**SSDPEL1K100GA01**	(100GB PCIe M.2 Drive)	Generic Pack	SSD only	1
	200GB	**SSDPEL1K200GA01**	(200GB PCIe M.2 Drive)	Generic Pack	SSD only	1
	375GB	**SSDPEL1K375GA01**	(375GB PCIe M.2 Drive)	Generic Pack	SSD only	1
Intel® SSD DC P4510 Series	2TB	**SSDPE2KX020T810**	(2.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
	2TB	**SSDPE2KX020T801**	(2.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	1TB	**SSDPE2KX010T810**	(1.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
	1TB	**SSDPE2KX010T801**	(1.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4511 Series	1TB	**SSDPELKX010T801**	(1.0TB, M.2 110mm PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	2TB	**SSDPELKX020T801**	(2.0TB, M.2 110mm PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD DC P4600 Series	6.4TB	**SSDPE2KE064T701**	(6.4TB, 2.5in PCIe* 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	**SSDPEDKE040T701**	(4.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	3.2TB	**SSDPE2KE032T701**	(3.2TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	**SSDPEDKE020T701**	(2.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	**SSDPE2KE020T701**	(2.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1.6TB	**SSDPE2KE016T701**	(1.6TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4610 Series	1600GB	**SSDPE2KE016T8**	(1.6TB PCIe* 2.5" x 15mm Drive)	Generic Pack	SSD only	1
	3200GB	**SSDPE2KE032T8**	(3.2TB PCIe 2.5" x 15mm Drive)	Generic Pack	SSD only	1
	6400GB	**SSDPE2KE064T8**	(6.4TB PCIe 2.5" x 15mm Drive)	Generic Pack	SSD only	1
	7680GB	**SSDPE2KE076T8**	(7.68TB PCIe 2.5" x 15mm Drive)	Generic Pack	SSD only	1
Intel® SSD D5 P4420 Series	7.6TB	**SSDPE2NU076T80**	(7.6TB, 2.5in PCIe 3.1 x4, 3D2, QLC)	Generic Pack	SSD only	1
Intel® SSD D5 P4320 Series	7.68TB	**SSDPE2NV076T801**	(7.6TB, 2.5in PCIe 3.1 x4, 3D2, QLC)	Generic Pack	SSD only	1
Intel® SSD DC P4101	128GB	**SSDPEKKA128G801**	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Pack	SSD only	1
	256GB	**SSDPEKKA256G801**	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Pack	SSD only	1
	512GB	**SSDPEKKA512G801**	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Pack	SSD only	1
	1TB	**SSDPEKKA010T801**	(1.024TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Pack	SSD only	1
	2TB	**SSDPEKKA020T801**	(2.048TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Generic Pack	SSD only	1

Intel® SSD Data Center Family for SATA

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD D3-S4610 Series	240GB	**SSDSC2KG240G8**	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	240GB	**SSDSC2KG240G801**	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	480GB	**SSDSC2KG480G8**	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	480GB	**SSDSC2KG480G801**	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	960GB	**SSDSC2KG960G8**	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	960GB	**SSDSC2KG960G801**	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	1.92TB	**SSDSC2KG019T8**	(1.92TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	1.92TB	**SSDSC2KG019T801**	(1.92TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	3.84TB	**SSDSC2KG038T8**	(3.84TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	3.84TB	**SSDSC2KG038T801**	(3.84TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
Intel® SSD D3-S4510 Series	240GB	**SSDSC2KB240G8**	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	240GB	**SSDSC2KB240G801**	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	480GB	**SSDSC2KB480G8**	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	480GB	**SSDSC2KB480G801**	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	960GB	**SSDSC2KB960G8**	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	960GB	**SSDSC2KB960G801**	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	1.9TB	**SSDSC2KB019T8**	(1.9TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	1.9TB	**SSDSC2KB019T801**	(1.9TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	3.8TB	**SSDSC2KB038T8**	(3.8TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	3.8TB	**SSDSC2KB038T801**	(3.8TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1

For more information, visit **www.intel.com/ssd**

1 Performance varies by capacity. Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. System configurations:

1a Intel® Core™ i7-4770 CPU at 3.4 GHz, 8GB DDR3 at 1600 MHz, Intel® SSD DC P3608 Series 1.6TB

1b Intel Core i7-3770K CPU @ 3.50GHz, 8GB of system memory, Windows[1] Server 2012, IOMeter. Random performance is collected with 4 workers each with 32 QD. Average RMS Active write power measured at max bandwidth

1c Performance measured by Intel using Iometer 1.1.0 with queue depth 32. Measurements are performed on 8 GB of Logical Block Address (LBA) range on a full SSD. System configuration: Intel® Core i7-5960X processor, Intel® X99 chipset, PC2666 16GB DRAM.

2 Random 4 KB reads. Performance specifications apply to both compressible and non-compressible data.

3 Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com

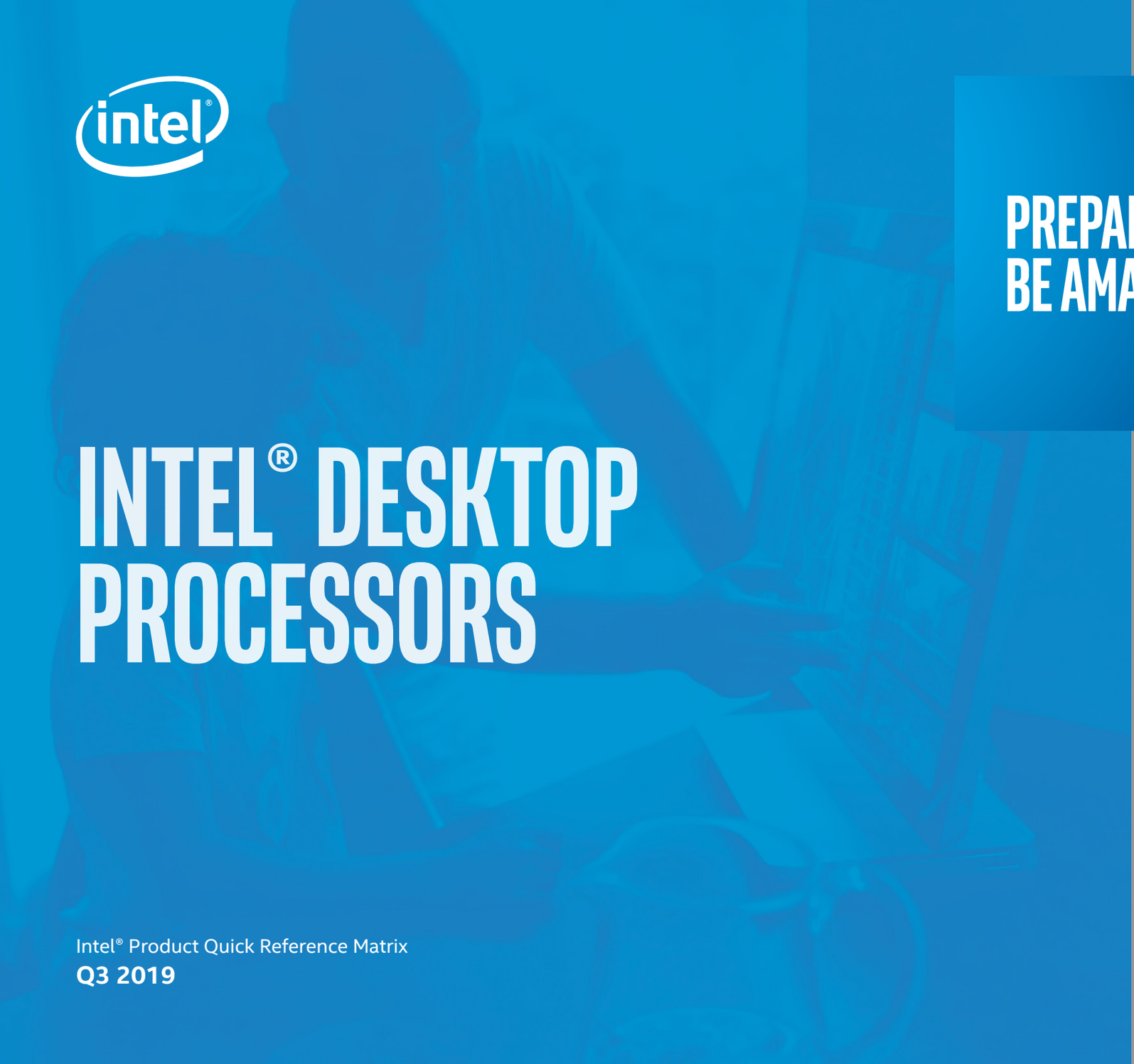
4 1 PB = 1000 TeraBytes

5 Desktop installation kit contents: SATA signal cables, screws, installation guide, and warranty documentation.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Copyright © Intel Corporation. All rights reserved. Intel, the Intel logo, and Ultrabook are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.



INTEL® DESKTOP PROCESSORS

PREPARE TO BE AMAZED

INTEL® DESKTOP PROCESSORS

This new generation of processors extends all the capabilities users have come to love in our desktop platforms with advanced innovations that deliver exciting new features to immerse you in incredible experiences on a variety of form factors.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® DESKTOP PROCESSORS

ACCELERATE PERFORMANCE WITH 9TH GEN INTEL® CORE™ PROCESSOR FAMILY.

**All-new performance. All-new experiences.
An all-new computer.**

PERFORMANCE TO EXCITE

A desktop computer based on a 9th Generation Intel® Core™ processor is always ready for real-life productivity, creativity and entertainment.

EXPERIENCE TO AMAZE

9th Generation Intel® Core™ processor-based desktop PCs are packed with new and enhanced features to deliver amazing experiences that a 5-year old PC can't handle. Uncompromised gaming, while you stream, chat and share with your community – stunning visuals of Ultra HD 4K premium content – or transport into a great VR experience.

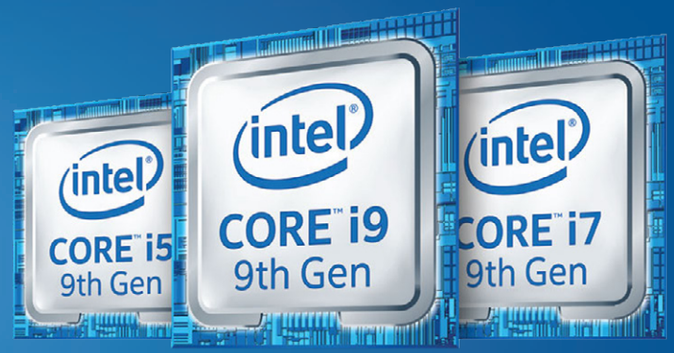
HARDWARE-BASED FEATURES MITIGATE THREATS

9th Generation Intel® Core™ processors offer hardware-level security features that strengthen the protection of your enabled security software. Hardware-based security to help you compute with greater peace of mind.

SCALABLE PORTFOLIO OF PROCESSORS

The 9th Generation Intel® Core™ processor family delivers significant value and is a great investment in your success. From the i9-9900K to the i3-9350KF, there is a processor to fit a wide range of budgets and needs, from the performance-hungry professionals to the first-time buyers.

9TH GENERATION INTEL® CORE™ DESKTOP PROCESSOR



The Most Powerful Generation of Intel® Core™ Processors

Introducing the NEW 9th Gen Intel® Core™ desktop processors - the most powerful generation of Intel® Core™ desktop processors. Whether you are a gamer looking for a fantastic in-game experience with the performance headroom for smooth live streaming and seamless highlights recording or you are a creator that is ready to do more creating and sharing, less time waiting, this new generation of processors is ready to take you to that new level.

Game on a Whole New Level

Game, Record, Stream without compromise on a system powered by a 9th Generation Intel® Core™ i9 processor. Utilize Intel® Quick Sync Video technology to live-stream, capture, and multitask without interruption. Power up and customize your gaming rig with up to 40 platform PCIe* lanes giving you the outstanding flexibility. Pair it with Intel® Optane™ memory technology to accelerate the loading and launching of the games you play the most.

Hardware Based Security[1]

9th Generation Intel® Core™ processors integrate hardware level technologies that help strengthen the protection of your enabled security[1] software. Hardware-based security helps you experience online and offline activities with added peace of mind, enabled by features that include: Intel® Software Guard Extensions (Intel® SGX)[1] to help applications protect your system and your data; Intel® BIOS Guard and Intel® Boot Guard to help protect your system during startup.

Create Without Limits

Unlock your creative potential with the power you need to create, edit, and share. Let your creativity flow as the 9th Generation Intel® Core™ processor renders and encodes in the background so you don't miss a beat. Minimize the wait time between inspiration and creation with Intel® Optane™ memory accelerating the loading of your most used applications.

Scalable Portfolio of Processors

A 9th Generation Intel® Core™ processor is a great investment in your desktop experiences — whether for gaming, creating, entertainment, or general purpose computing — wherever your life takes you. From the bar-raising performance of the 9th Generation Intel® Core™ i9-9900K processor with up to 5GHz and 16-way multitasking to great value entry-level performance options down the stack, our latest generation of desktop processors offers a range of options for your budgets and needs.

Ultra-High Definition Entertainment

Desktop computers based on the 9th Generation Intel® Core™ processors integrate advanced media technologies that bring premium, high-quality content to your desktop, including:

- HEVC 10-bit encode/decode, VP9 10-bit decode:
  - Delivering smooth streaming of premium 4K UHD entertainment to your PC from leading online providers.
  - Providing full-size, screen-immersive viewing experiences with 4K video and 360-degree viewing.
- High Dynamic Range (HDR) and Rec. 2020 (Wide Color Gamut) for life-like luminesces to provide enhanced image and video viewing experiences.

1 Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at https://www.intel.com.

* Other brands and names may be claimed as the property of others

9TH GEN INTEL® CORE™ DESKTOP PLATFORM

A New Level of Performance

The 9th Gen Intel® Core™ processor takes mainstream desktop PC performance to a while new level. At the top of the stack, our mainstream flagship, the new i9-9900K. The first Intel® Core™ i9 desktop processor for the mainstream users. Best in class, the i9-9900K with 16MB of cache[1] and Intel® Turbo Boost 2.0 technology cranks maximum turbo frequency up to blazing 5.0 GHz. Throw in high performing 16-way multitasking support powered by 8 cores with Intel® Hyper-Threading Technology to conquer the most demanding workloads. Want to reach for even greater levels of performance? — Overclock confidently with new and enhanced features like Solder Thermal Interface Material (STIM) and improved overclocking customizations to tweak the processor performance to its unleashed potential. [2]

The NEW 9th Generation Intel® Core™ processor family delivers:

- A range of processors including the first unlocked Intel® Core™ i9 mainstream desktop processor.
- Data acceleration when paired with Intel® Optane™ memory to retrieve that data you use the most for fast system responsivenes.[1]
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds.
- Intel Z390 chipset support which includes unprecedented connectivity to all of your devices with integrated USB 3.1 Gen 2, Intel® Wireless-AC and support for Gigabit Wi-Fi speed.
- Compatible with Intel® 300 series chipset.

1 Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com.

2 Warning: Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of systems and components for additional details.

* Other brands and names may be claimed as the property of others

9th Gen Intel® Core™ Processor SKUs (LGA)

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Intel®Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	Processor Graphics	PCIe Lanes	Memory Speed[2]	Memory Channels	Maximum Memory Capacity	Reliability, Availability & Serviceability	TDP (W)	Intel® SIPP[3]	Intel Technologies		
														Intel® vPro™[4]	ISM[4]	Intel® Optane™ Memory[5]
Socket 1151 95W																
i9-9900K	3.6	16M	8/16	5.0	✓	Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		95	✓	✓	✓	✓
i7-9700K	3.6	12M	8/8	4.9	✓	Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		95	✓	✓	✓	✓
i5-9600K	3.7	9M	6/6	4.6	✓	Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		95	✓	✓	✓	✓
i3-9350K	4	8M	4/4	4.6	✓	Intel® UHD Graphics 630	16	DDR4-2400	2	64GB		91			✓	✓
Socket 1151 Standard Power																
i9-9900	3.1	16M	8/16	5.0[6]		Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		65	✓	✓	✓	✓
i7-9700	3	12M	8/8	4.7		Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		65	✓	✓	✓	✓
i5-9600	3.1	9M	6/6	4.6		Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		65	✓	✓	✓	✓
i5-9500	3	9M	6/6	4.4		Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		65	✓	✓	✓	✓
i5-9400	2.9	9M	6/6	4.1		Intel® UHD Graphics 630	16	DDR4-2666	2	128GB		65			✓	✓
i3-9320	3.7	8M	4/4	4.4		Intel® UHD Graphics 630	16	DDR4-2400	2	64GB		62			✓	✓
i3-9300	3.7	8M	4/4	4.3		Intel® UHD Graphics 630	16	DDR4-2400	2	64GB		62			✓	✓
i3-9100	3.6	6M	4/4	4.2		Intel® UHD Graphics 630	16	DDR4-2400	2	64GB		65			✓	✓
Pentium Gold G5620	4	4M	2/4	N/A		Intel® UHD Graphics 630	16	DDR4-2400	2	64GB		54			✓	✓

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

1 Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html.

2 DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs. DDR4 2DPC UDIMM 2666 is capable when same UDIMM part number are populated with in each channel.

3 Eligible for Intel® SIPP starting with Coffee Lake-S Refresh Corporate Platform availability.

4 When paired with the eligible Intel® 300 Series chipset SKU. Intel® vPro™ includes Intel® TXT, Intel® AMT, Intel® Hardware Shield.

5 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/Optanememory for configuration requirements.

6 Includes the effect of the Intel® Thermal Velocity Boost feature which opportunistically and automatically increases clock frequency by up to 100 MHz if the processor is at a temperature of 70°C or lower and turbo power budget is available. The frequency gain and duration is dependent on the workload (best for bursty workloads), capabilities of the individual processor, and the processor cooling solution. Frequencies may reduce over time and longer workloads may start at the max frequency but drop as processor temperature increases.

* Intel® Standard Manageability

9th Gen Intel® Core™ Processor SKUs (LGA)

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Intel®Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	Processor Graphics	PCIe Lanes	Memory Speed[2]	Memory Channels	Maximum Memory Capacity	Reliability, Availability & Serviceability	TDP (W)	Intel® SIPP[3]	Intel Technologies		
														Intel® vPro™[4]	ISM[4]	Intel® Optane™ Memory[5]
Socket 1151 Standard Power																
Pentium Gold G5420	3.8	4M	2/4	N/A		Intel® UHD Graphics 610	16	DDR4-2400	2	64GB		54/58[6]			✓	✓
Celeron G4950	3.3	2M	2/2	N/A		Intel® UHD Graphics 610	16	DDR4-2400	2	64GB		54				✓
Celeron G4930	3.2	2M	2/2	N/A		Intel® UHD Graphics 610	16	DDR4-2400	2	64GB		54				✓

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

1 Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html.

2 DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs. DDR4 2DPC UDIMM 2666 is capable when same UDIMM part number are populated with in each channel.

3 Eligible for Intel® SIPP starting with Coffee Lake-S Refresh Corporate Platform availability.

4 When paired with the eligible Intel® 300 Series chipset SKU. Intel® vPro™ includes Intel® TXT, Intel® AMT, Intel® Hardware Shield.

5 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/Optanememory for configuration requirements.

6 From 4-core die (54W) and fused 6-core die (58W)

* Intel® Standard Manageability

9th Gen Intel® Core™ Processor SKUs (LGA) (Requires External Graphics)

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Intel®Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	Processor Graphics	PCIe Lanes	Memory Speed[2]	Memory Channels	Maximum Memory Capacity	Reliability, Availability & Serviceability	TDP (W)	Intel® SIPP[3]	Intel Technologies		
														Intel® vPro™[4]	ISM[4]	Intel® Optane™ Memory[5]
Socket 1151 95W																
i9-9900KF	3.6	16M	8/16	5.0	✓	N/A	16	DDR4-2666	2	128GB		95			✓	✓
i7-9700KF	3.6	12M	8/8	4.9	✓	N/A	16	DDR4-2666	2	128GB		95			✓	✓
i5-9600KF	3.7	9M	6/6	4.6	✓	N/A	16	DDR4-2666	2	128GB		95			✓	✓
i3-9350KF	4	8M	4/4	4.6	✓	N/A	16	DDR4-2400	2	64GB		91			✓	✓
Socket 1151 Standard Power																
i7-9700F	3	12M	8/8	4.7		N/A	16	DDR4-2666	2	128GB		65			✓	✓
i5-9500F	3	9M	6/6	4.4		N/A	16	DDR4-2666	2	128GB		65			✓	✓
i5-9400F	2.9	9M	6/6	4.1		N/A	16	DDR4-2666	2	128GB		65			✓	✓
i3-9100F	3.6	6M	4/4	4.2		N/A	16	DDR4-2400	2	64GB		65			✓	✓

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

1 Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html.

2 DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs. DDR4 2DPC UDIMM 2666 is capable when same UDIMM part number are populated with in each channel.

3 Eligible for Intel® SIPP starting with Coffee Lake-S Refresh Corporate Platform availability.

4 When paired with the eligible Intel® 300 Series chipset SKU. Intel® vPro™ includes Intel® TXT, Intel® AMT, Intel® Hardware Shield.

5 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/Optanememory for configuration requirements.

* Intel® Standard Manageability

8TH GEN INTEL® CORE™ DESKTOP PLATFORM

Exceptional Platform Performance

The 8th Generation Intel® Core™ processors redefine mainstream desktop PC performance with up to six cores for more processing power—that's two more cores than the previous generation Intel® Core™ processor family—Intel® Turbo Boost Technology 2.0 to increase the maximum turbo frequency up to 4.7 GHz, and up to 12 MB of cache memory.[1]

Intel® Hyper-Threading Technology (Intel® HT Technology)[1] delivers up to 12-way multitasking support in the latest generation of Intel® Core™ processors.

For the enthusiast, the unlocked 8th Generation Intel® Core™ i7-8700K processor provides you the opportunity to tweak the platform performance to its fullest potential and enjoy great gaming and VR experiences.

The new 8th Generation Intel® Core™ processor family delivers:

- An impressive portfolio of standard and unlocked systems for a broad range of usages and performance levels
- New system acceleration when paired with Intel® Optane™ memory to deliver amazing system responsiveness[1]
- Intel® Turbo Boost Technology 2.0 to give you that extra burst of performance when you need it
- Intel® Hyper-Threading Technology (Intel® HT Technology), which allows each processor core to work on two tasks at the same time, improving multitasking, speeding up workflows, and accomplishing more in less time
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds
- The ability to set an overclocked ratio per core with unlocked processors,[1] when paired with select chipset SKUs, to provide you more control and more granularity for overclocking[2] your platform

1 Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com.

2 Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html.

* Other brands and names may be claimed as the property of others

8th Generation Intel® Core™ Processor SKUs

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Memory Speed Support (DDR4)[2]	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel® SIPP[3]	Intel Technologies				
												Intel® vPro™ Technology[4]	ISM*[4]	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready[5]
Core i7-8700K	3.7	12M	6/12	2666	4.7	✓	Intel® UHD Graphics 630	1200	2 ch	95	✓	✓	✓	✓	✓	✓
Core i5-8600K	3.6	9M	6/6	2666	4.3	✓	Intel® UHD Graphics 630	1150	2 ch	95	✓	✓	✓	✓	✓	✓
Core i3-8350K	4	8M	4/4	2400	N/A	✓	Intel® UHD Graphics 630	1150	2 ch	91			✓		✓	✓
Core i7-8700	3.2	12M	6/12	2666	4.6		Intel® UHD Graphics 630	1200	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8600	3.1	9M	6/6	2666	4.3		Intel® UHD Graphics 630	1150	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8500	3	9M	6/6	2666	4.1		Intel® UHD Graphics 630	1100	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8400	2.8	9M	6/6	2666	4		Intel® UHD Graphics 630	1050	2 ch	65			✓		✓	✓
Core i3-8300	3.7	8M	4/4	2400	N/A		Intel® UHD Graphics 630	1150	2 ch	62			✓		✓	✓
Core i3-8100	3.6	6M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	65			✓		✓	✓
Pentium Gold G5600	3.9	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	54			✓		✓	
Pentium Gold G5500	3.8	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	54			✓		✓	
Pentium Gold G5400	3.7	4M	2/4	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54/58[6]			✓		✓	
Celeron G4920	3.2	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54					✓	
Celeron G4900	3.1	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54					✓	
Core i7-8700T	2.4	12M	6/12	2666	4		Intel® UHD Graphics 630	1200	2 ch	35	✓	✓	✓	✓	✓	✓
Core i5-8600T	2.3	9M	6/6	2666	3.7		Intel® UHD Graphics 630	1150	2 ch	35	✓	✓	✓	✓	✓	✓

Continued on next page...

... continued from previous page

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Memory Speed Support (DDR4) [2]	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel® SIPP[3]	Intel Technologies				
												Intel® vPro™ Technology[4]	ISM*[4]	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready[5]
Core i5-8500T	2.1	9M	6/6	2666	3.5		Intel® UHD Graphics 630	1100	2 ch	35	✓	✓	✓	✓	✓	✓
Core i5-8400T	1.7	9M	6/6	2666	3.3		Intel® UHD Graphics 630	1050	2 ch	35			✓		✓	✓
Core i3-8300T	3.2	8M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			✓		✓	✓
Core i3-8100T	3.1	6M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			✓		✓	✓
Pentium Gold G5500T	3.2	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1050	2 ch	35			✓		✓	
Pentium Gold G5400T	3.1	4M	2/4	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	35			✓		✓	
Celeron G4900T	2.9	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1000	2 ch	35					✓	

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.
All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)
All processors support Intel® Virtualization Technology (Intel® VT-x)

1 See overclocking disclaimer above
2 DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs
3 Eligible for Intel® SIPP starting with Coffee Lake-S Corporate Platform availability
4 When paired with the eligible Intel® 300 Series chipset SKU, availability targeted Q1 2018.
5 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/Optanememory for configuration requirements
6 From 4-core die (54W) and fused 60-core die (58w)

INTEL® CORE™ X-SERIES PROCESSOR FAMILY

Intel® Core™ X-Series Processors and Intel® X299 Chipset

The new Intel® Core™ X-series processors deliver the power and flexibility to turn creative vision into reality. Designed for intense multi-threaded workloads, these processors are built for handling creator's most demanding tools and applications.

- Unprecedented scalability from 8 cores to 18 cores
- Fully unlocked for performance tuning[1]
- Featuring Solder Thermal Interface Material (STIM)
- Improved Intel® Turbo Boost Max Technology 3.0
- Intel® Turbo Boost Technology 2.0
- Rebalanced Intel® Smart Cache hierarchy
- Up to 44 PCI Express* 3.0 lanes on all SKUs
- Support for Optane™ Memory and Intel® Optane™ SSDs

Intel® Core™ X-Series Processor Family (Basin Falls Refresh) SKUs (LGA) — Socket 2066

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/ Threads	Memory Type	Memory Speed	Intel® Turbo Boost Max Technology 3.0 (GHz)	Intel®Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked[1]	PCIe Lanes	Integrated Memory Controller	TDP (W)	PCG	Intel® SIPP	Intel® Technologies			
														Intel® vPro™	ISM[3]	Intel® TXT	Intel® Optane™ Memory Ready[2]
i9-9980XE	3.0	24.75M	18/36	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓
i9-9960X	3.1	22M	16/32	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓
i9-9940X	3.3	19.25M	14/28	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓
i9-9920X	3.5	19.25M	12/24	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓
i9-9900X	3.5	19.25M	10/20	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓
i9-9820X	3.3	16.5M	10/20	DDR4	2666	4.2	4.1	✓	44	4 Ch	165	2017X					✓
i7-9800X	3.8	16.5M	8/16	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X					✓

Intel® processor numbers are not a measure of performance.Processor numbers differentiate features within each processor family, not across different processor families.
All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November2007 proposed IPC/JEDEC J-STD-709 standards)
All processors support Intel® Virtualization Technology (Intel® VT-x)

1 Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.
2 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/Optanememoryfor configuration requirements
3 Intel® Standard Manageability

INTEL® 300 SERIES CHIPSETS

Intel® 300 Series Chipsets

- Supports 9th and 8th Gen Intel® Core™ (Coffee Lake-S) processors
- Support for integrated Intel® Wireless-AC[3]
  - Wi-Fi 802.11ac (160MHz) & Bluetooth* 5
- Integrated USB 3.1 Gen 2 (10 Gb/s)[3]
- Support for next generation Intel® Optane™ Memory
- Support for Intel® Smart Sound Technology with quad-core audio DSP[3]
- Intel® Platform Trust Technology
- Intel® Boot Guard
- Integrated Gigabit Ethernet MAC
  - Supports Intel® Ethernet Connection I219 (Jacksonville LAN PHY)

KEY FEATURE DIFFERENTIATION	Q370	Z390	Z370	H370	B365	B360	H310	H310C
Intel® ME Firmware SKU	ME 12 Corporate	ME 12 Consumer	ME 11 Consumer	ME 12 Consumer/ Corporate	ME11 Consumer	ME12 Consumer/ Corporate	ME 12 Consumer	ME 11 Consumer
Processor PCI Express* 3.0 Configuration Support	1x16 or 2x8or 1x8+2x4	1x16 or 2x8or 1x8+2x4	1x16 or 2x8or 1x8+2x4	1x16	1x16	1x16	1x16	1x16
Independent Display Ports / Pipes Support	3/3	3/3	3/3	3/3	3/3	3/3	3/2	3/2
Memory Channels / DIMMs per Channel	2/2	2/2	2/2	2/2	2/2	2/2	2/1	2/1
Processor Overclocking[5]	No	Yes	Yes	No	No	No	No	No
Integrated Intel® Wireless-AC Support	Yes	Yes	No	Yes	No	Yes	Yes	No
Intel® Smart Sound Technology[3]	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Intel® SIPP Eligible[4]	Yes	No	No	No	No	No	No	No
Intel® vPro™ Technology Eligible[4]	Yes	No	No	No	No	No	No	No
Intel® Active Management Technology[4]	Yes	No	No	No	No	No	No	No
Intel® Standard Manageability	Yes	No	No	No	No	No	No	No
Intel® Optane™ Memory Support	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Integrated SDXC (SDA 3.0) Support	Yes	Yes	No	Yes	No	Yes	Yes	No
Maximum High Speed I/O Lanes	30	30	30	30	30	24	14	14
Total USB Ports (Maximum USB 3.1)[2]	14 (10)	14 (10)	14 (10)	14 (8)	14 (8)	12 (6)	10 (4)	10 (4)
Maximum USB 3.1 Ports: Gen 2 (10 Gb/s) / Gen 1 (5 Gb/s)[2]	6 / 10	6 / 10	0 / 10	4 / 8	0 / 8	4 / 6	0 / 4	0 / 4
Maximum SATA 3.0 Ports (6 Gb/s)[2]	6	6	6	6	6	6	4	4
Maximum PCI Express* 3.0 lanes[2]	24	24	24	20	20	12	6 (Gen 2.0 only)	6 (Gen 2.0 only)
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Intel® RST for PCIe Storage Ports (x2 M.2 or x4 M.2)[2]	3	3	3	2	2	1	0	0
Intel® RST PCIe RAID 0, 1, 5[1]	Yes	Yes	Yes	Yes	Yes	No	No	No
Intel® RST SATA RAID 0, 1, 5, 10[1]	Yes	Yes	Yes	Yes	Yes	No	No	No
Intel® Rapid Storage Technology for CPU-attached Intel PCIe Storage[1]	Yes	Yes	Yes	No	No	No	No	No

1 Some features and capabilities require SSDs and/or multiple HDDs.

2 Maximum lanes/port counts available may vary depending on platform implementation.

3 Certain features may not be present in all system configurations.

4 Intel SIPP, Intel vPro™, & Intel AMT support requires select Coffee Lake-S processors and select Intel® 300 series chipsets.

5 Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

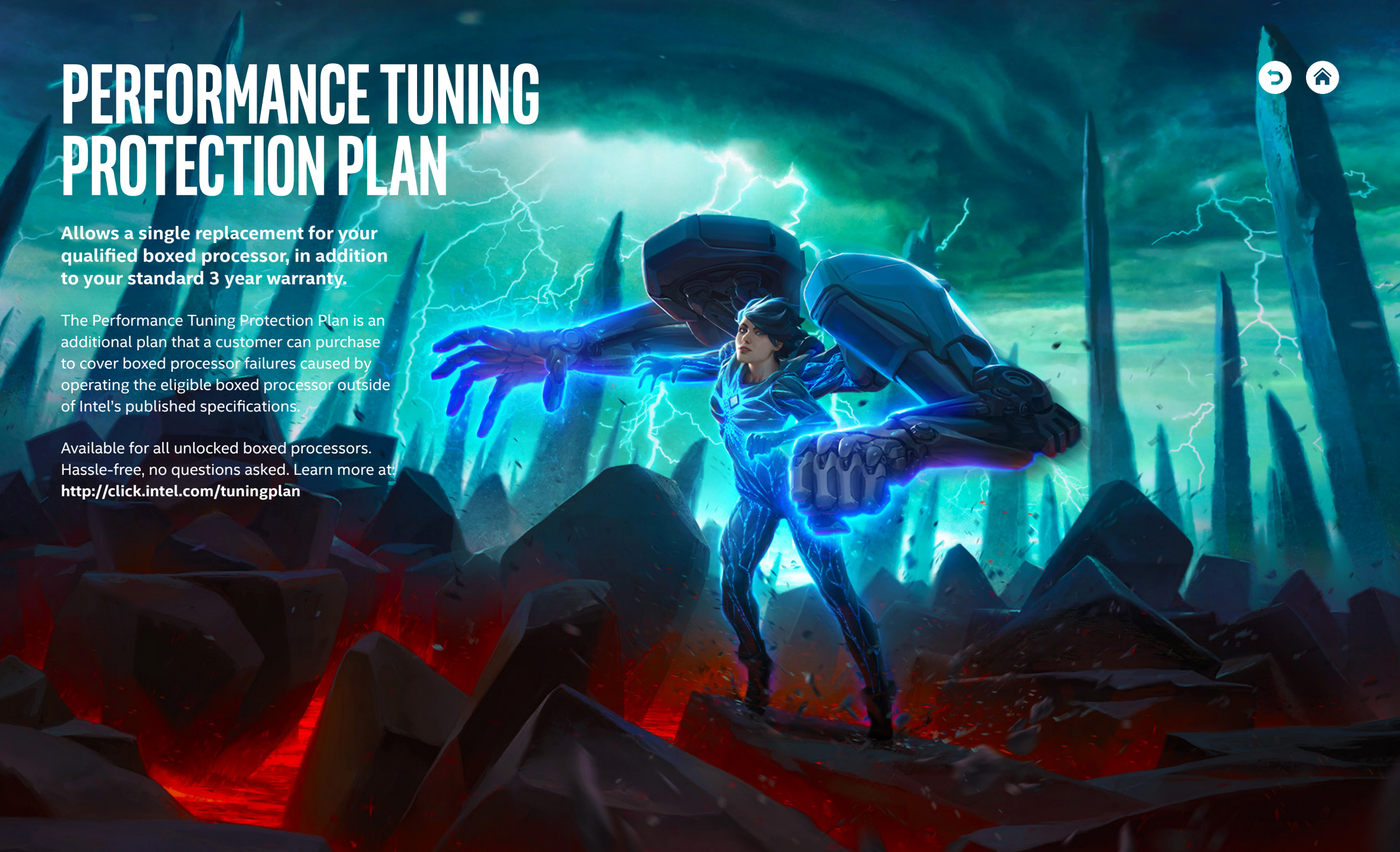
* Other brands and names may be claimed as the property of others.

PERFORMANCE TUNING PROTECTION PLAN

Allows a single replacement for your qualified boxed processor, in addition to your standard 3 year warranty.

The Performance Tuning Protection Plan is an additional plan that a customer can purchase to cover boxed processor failures caused by operating the eligible boxed processor outside of Intel's published specifications.

Available for all unlocked boxed processors. Hassle-free, no questions asked. Learn more at: **http://click.intel.com/tuningplan**



INTEL® ETHERNET DESKTOP ADAPTERS

Intel® Product Quick Reference Matrix

Q3 2019

1GB INTEL® ETHERNET FOR DESKTOP

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT[1]	ORDER CODES
Intel® Gigabit CT Desktop Adapter	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	82574	PCI Express* v2.1 2.5 GT/s, x1 Lane	Single Port	Low Profile and Full Height	N/A	N/A	N/A	iSCSI, NFS, SMB	N/A	EXPI9301CT EXPI9301CTBLK

Make the Connection with Intel® Ethernet Adapters at **intel.com/ethernet**

[1] Intel Ethernet Power Management includes Energy Efficient Ethernet (EEE) and DMA Coalescing.

Intel and the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© Intel Corporation

INTEL® BOXED THERMAL SOLUTIONS

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® BOXED THERMAL SOLUTIONS

INTEL® THERMAL SOLUTION TS15A

The Intel® Thermal Solution TS15A (air cooling) is an efficient thermal solution for 6th Generation Intel® Core™ processors. It is designed to support a wide range of processor sockets for performance desktops.

Features
- Supports up to 130 W processors
- Lower cost
- Shock and vibe compliant and keep out safe
- Supports the LGA 1151/1156/1150
- 3 year limited warranty

MM# 944216
Product code: BXTS15A

INTEL® THERMAL SOLUTION TS13A

The Intel® Thermal Solution TS13A (air cooling) is designed for budget-focused cooling requirements. Targeted uses include business, government, and entry-level workstations.

Features
- Supports up to 140 W processors
- Low cost
- Shock and vibe compliant and keep out safe
- Supports the LGA2011 and LGA2011-v3 socket only
- 3 year limited warranty

MM# 937425
Product code: BXTS13A

INTEL® THERMAL SOLUTION HTS1155LP

The Intel® Thermal Solution HTS1155LP is a compact cooling solution for Thin Mini-ITX based All-in-One PCs, and compatible Mini PCs.

Features
- Low-profile All-In-One / Small Form Factor thermal solution
- Supports up to 65 W processors in the LGA1155 socket
- Compatible with Thin Mini-ITX desktop boards
- Multiple options for fan placement
- Available now from authorized Intel® distributors
- 3 year limited warranty

MM# 917752
Product code: BXHTS1155LP

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at http://www.intel.com/support/processors/sb/CS-034910.htm or http://www.intel.com/support/processors/sb/CS-034340.htm

Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Intel Core are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

INTEL® NUC

SMALL PACKAGE. BIG POTENTIAL.

INTEL® NUC

The Intel® NUC is a powerful 4x4-inch mini PC with entertainment, gaming, and productivity features, including a customizable board that is ready to accept the memory, storage, and operating systems that you want.

INTEL® NUC MINI PCS

Fully configured Intel® NUC with Windows 10 pre-installed.

INTEL® NUC KITS

Customizable kit, configurable features - choose memory, storage, and operating system.

INTEL® NUC BOARDS

4x4-inch form factor with soldered-on processor.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® NUC MINI PCS

NEW! 8th generation Intel® NUCs, now with Optane!

The Intel® NUC Mini PC has gotten faster, smaller and smarter! The latest products with 8th generation Intel® Core™ processors are available, including 3 skus with Intel® Optane memory pre-installed for an incredibly responsive PC experience. Combining an incredibly small form factor, cutting-edge technologies and the performance of Intel's latest processors, Intel® NUCs deliver an incredible user experience.

INTEL® NUC MINI PCS

Fully configured Intel® NUC with Windows 10 pre-installed.

INTEL® NUC KITS

The Intel® NUC kits are available from various retailers and include a highly customizable four-by-four-inch board that is ready to accept the memory, hard drive, and operating system you choose to install.

INTEL® NUC BOARDS

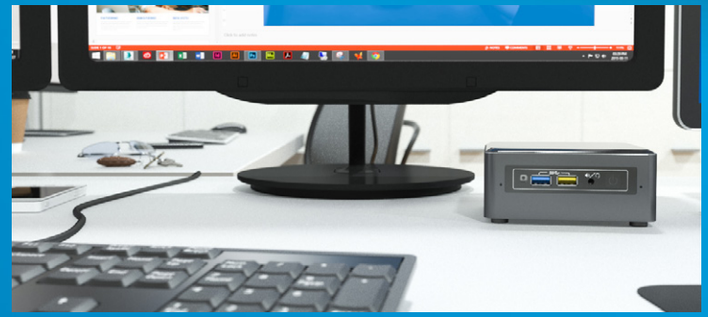
The four-by-four-inch Intel® NUC board comes complete with a soldered-on processor. The board can be purchased independently of the kit, giving you the flexibility to choose the chassis that best suits your needs.

SMALL PACKAGE, BIG POTENTIAL

The Intel® NUC is an energy-efficient, fully functioning and versatile PC.

IMMERSIVE GAMING

With a form factor as small as a game controller, but as powerful as a dragon slayer, the Intel® NUC delivers an immersive gaming experience.



BUSINESS PRODUCTIVITY

The Intel® NUC delivers a fully functioning PC at a fraction of the size, as well as support for VESA* mount brackets and much more.

HOME ENTERTAINMENT

Compact and capable, Intel® NUC gives you the performance you need to be organized, connected and enjoy a visually stunning experience.

INTEL® NUC MINI PCS

	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC8i3CYSM	NUC8i3CYSN
DESCRIPTION	**Intel® NUC 8 Home, a mini PC with Windows® 10**	**Intel® NUC 8 Home, a mini PC with Windows® 10**
CPU & GFX	**8th Generation Intel® Core™ i3-8121U** 2.2 GHz - 3.2 GHz Turbo, Dual Core, 4MB Cache, 15W AMD Radeon™* 540 discrete graphics, 2GB GDDR5 graphics memory	
RAM	8GB Dual-channel LPDDR4-2666	4GB Dual-channel LPDDR4-2666
HDD	1TB SATA3 HDD pre-installed	
INTEL® OPTANE™ MEMORY	Yes	
OS LOAD	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded	
DIMENSIONS	117 x 112 x 52 mm	
CONNECTIVITY	2x front USB 3.1 (one charging), 2x rear USB 3.1, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	2x HDMI 2.0b ports	
SDXC	SDXC slot with UHS-I support	
NETWORKING	Intel® i219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI signals	
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	$19V_{DC}$ input range, $19V_{DC}$ 90W power supply with geo-specific AC cords	
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0 internal headers	
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC8i7HVKVA	NUC8i7HNKQC
DESCRIPTION	**Intel® NUC 8 Enthusiast, a Mini PC with Windows 10**	**Intel® NUC 8 Business, a Mini PC with Windows 10**
CPU & GFX	**8th Generation Intel® Core™ i7-8809G, 3.1 GHz - 4.2 GHz Turbo, Quad Core, 8MB Cache, 100W** Radeon™ RX Vega M GH graphics, 1063 MHz – 1190 MHz, Unlocked and VR-capable	**8th Generation Intel® Core™ i7-8705G, 3.1 GHz - 4.1 GHz Turbo, Quad Core, 8MB Cache, 65W** Radeon™ RX Vega M GL graphics, 931 MHz – 1011 MHz
RAM	16GB DDR4-2400 pre-installed, 1.2V; Dual-channel, 32GB maximum	16GB DDR4-2400 pre-installed, 1.2V; Dual-channel, 32GB maximum
SSD	1TB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3; one additional slot free	512GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3; one additional slot free
OS LOAD	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded	Windows 10 Professional x64, Intel® Driver & Support Assistant pre-loaded
DIMENSIONS	221 x 142 x 39 mm (1.2 L)	
CONNECTIVITY	Front USB 3.1 Gen2 via USB-C™ and front USB type-A connectors Front charging USB 3.0, 4x rear USB 3.0, 2x internal USB 3.0 and 2x USB 2.0 via headers Front Consumer Infrared port	
VIDEO OUTPUTS	2x Mini DisplayPort 1.2 ports 2x Thunderbolt™ 3 ports Front and rear HDMI 2.0b connectors	
SDXC	SDXC slot with UHS-I support	
NETWORKING	2x Intel® 10/100/1000 Mbps (i219-LM and i210-AT) Ethernet ports Intel® Wireless-AC 8265 M.2 22x30 card, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack, 3.5mm rear speaker / TOSLINK combo jack Beam-forming, far-field, quad-mic array	
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	$19V_{DC}$ 230W power supply with geo-specific AC cords	
INTERNAL HEADERS	Front Consumer Infrared port Common I/O header with Front Panel, CEC, 2x USB 3.0, 2x USB2.0 signals	
OTHER FEATURES	Replaceable lid with customizable RGB LED illumination and front panel status RGB LEDs Microsoft Windows* 10 logo'd, compatible with Windows Server 2016 VESA mounting plate included Individual retail packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC8i7BEHGA	NUC8i5BEHFA	NUC8i3BEHFA
DESCRIPTION	**Intel® NUC 8 Enthusiast, a Mini PC with Windows 10**	**Intel® NUC 8 Home, a Mini PC with Windows 10**	**Intel® NUC 8 Home, a Mini PC with Windows 10**
CPU & GFX	**8th Generation Intel® Core™ i7+ 8559U** 2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz	**8th Generation Intel® Core™ i5+ 8259U** 2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	**8th Generation Intel® Core™ i3-8109U** 3.0 GHz - 3.6 GHz, Dual Core, 4MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz
RAM	8GB DDR4-2400 SODIMM pre-installed, 1.2V; Dual-channel, 32GB maximum	4GB DDR4-2400 SODIMM pre-installed, 1.2V; Dual-channel, 32GB maximum	
HDD	2TB SATA3 HDD pre-installed	1TB SATA3 HDD pre-installed	
INTEL® OPTANE™ MEMORY	Intel® Optane™ Memory 32GB pre-installed	Intel® Optane™ Memory 16GB pre-installed	
OS LOAD	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded		
DIMENSIONS	117 x 112 x 51 mm		
CONNECTIVITY	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port		
VIDEO OUTPUTS	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port		
NETWORKING	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas		
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals		
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security		
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 90W power supply with geo-specific AC cords		
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0 headers		
OTHER FEATURES	Front panel status RGB LED Microsoft Windows* 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty		

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC8i7BEKQA	NUC8i5BEKPA
DESCRIPTION	**Intel® NUC 8 Enthusiast, a Mini PC with Windows 10**	**Intel® NUC 8 Home, a Mini PC with Windows 10**
CPU & GFX	8th Generation Intel® Core™ i7-8559U 2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz	8th Generation Intel® Core™ i5-8259U 2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz
RAM	16GB (2x 8GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32GB maximum	8GB (2x 4GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32GB maximum
SSD	512GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3	256GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3
INTEL® OPTANE™ MEMORY		
OS LOAD	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded	
DIMENSIONS	117 x 112 x 36 mm	
CONNECTIVITY	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port	
NETWORKING	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals	
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 90W power supply with geo-specific AC cord	
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0 headers	
OTHER FEATURES	Front panel status RGB LED Microsoft Windows* 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC7i5DNKPC	NUC7i3DNKTC	NUC7i3DNHNC
DESCRIPTION	**Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro**	**Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro**	**Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro**
CPU & GFX	**7th Generation Intel® Core™ i5-7300U** 2.6 GHz to 3.5 GHz Turbo, Dual Core, 3MB Cache, 15W Intel® HD Graphics 620, 300 MHz - 1.0 GHz Intel® vPro™ Technology, Intel® AMT v11.6	**7th Generation Intel® Core™ i3-7100U** 2.4 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 620, 300 MHz - 1.0 GHz	
RAM	8GB (2x 4GB) DDR4-2133 SODIMMs pre-installed (1.2V, dual-channel, 32GB maximum)	4GB DDR4-2133 SODIMM pre-installed (1.2V, dual-channel, 32GB maximum)	
HDD	256GB Intel® SSD E 6100p pre-installed, M.2 NVMe	128GB Intel® SSD E 5100s pre-installed, M.2 SATA3	1TB HDD pre-installed, 2.5" SATA3
INTEL® OPTANE™ MEMORY			M.2 22x80 slot available for SSD or Intel® Optane™ Memory
OS LOAD	Windows 10 Pro* x64 with platform drivers pre-installed		
DIMENSIONS	115 x 111 x 36 mm		115 x 111 x 52 mm
CONNECTIVITY	2x front USB 3.0, 2x rear USB 3.0, 1x internal USB 3.0 header (host & device modes) 2x internal USB 2.0 headers (all USB ports w/ individual power control)		
VIDEO OUTPUTS	Dual HDMI 2.0a (4K 60Hz, HDR), w/HDCP2.2 and basic CEC built-in for 1 port		
NETWORKING	Intel Wireless-AC 8265 vPro™ M.2 22x30 card 802.11ac 2x2 + BT 4.2, internal antennas Intel® i219-LM 10/100/1000 Mbps RJ45 Ethernet	Intel Wireless-AC 8265 M.2 22x30 card 802.11ac 2x2 + BT 4.2, internal antennas Intel® i219-LM 10/100/1000 Mbps RJ45 Ethernet	
AUDIO	Up to 7.1 multichannel (or dual 8-channel) digital audio via HDMI		
ENCLOSURE	Aluminum and plastic chassis, replaceable lid, Kensington lock with base security		
POWER ADAPTER	12 – 24V_{DC} input range, 19V_{DC} 65W power supply with geo-specific AC cords		
INTERNAL HEADERS	1x internal USB 3.0 header (host & device modes)		Speaker and microphone 3.5mm audio jacks Additional USB 3.0 port
OTHER FEATURES	Microsoft Windows* 10 (logo'd), Windows 10 IOT Enterprise, Windows Server 2016 Supports Ubuntu 16.04 LTS, compatible with various Linux distros Qualified for 24x7 operation VESA mounting plate included Individual brown-box packaging Three-year Warranty		

For more information, visit **www.intel.com/NUC**

FULL SYSTEM

FULL SYSTEM

PRODUCT FAMILY	NUC7i7BNKQ	NUC7i5BNKP
CPU & GFX	**7th Generation Intel® Core™ i7-7567U** 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	**7th Generation Intel® Core™ i5-7260U** 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz
RAM	16 GB (2x 8 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum	8 GB (2x 4 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum
SSD	512 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe	256 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant	
DIMENSIONS	115 x 111 x 35 mm	
CONNECTIVITY	Thunderbolt™ 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2 via USB-C™ connector 2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt™ 3 (USB-C™) port Both ports support HDCP 2.2	
SDXC	MicroSDXC slot with UHS-I support	
NETWORKING	Intel® I219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	
ENCLOSURE	Aluminum and plastic with replaceable lid, Kensington lock with base security	
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 65W wall-wart power supply with replaceable plugs	
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0	
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel RGB LED ring Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty	

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC7i7BNHXG	NUC7i5BNHXF	NUC7i3BNHXF
DESCRIPTION	**Intel® NUC 7 Enthusiast, a Mini PC with Windows 10**	**Intel® NUC 7 Home, a Mini PC with Windows 10**	**Intel® NUC 7 Home, a Mini PC with Windows 10**
CPU & GFX	**7th Generation Intel® Core™ i7-7567U** 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	**7th Generation Intel® Core™ i5-7260U** 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz	**7th Generation Intel® Core™ i3-7100U** 2.4 GHz, Dual Core, 3 MB cache, 15W Intel® HD Graphics 620, 300 MHz – 1 GHz
RAM	8 GB DDR4-2400 SODIMM pre-installed, 1.2V Dual-channel capable, 32 GB maximum	4 GB DDR4-2400 SODIMM pre-installed Dual-channel capable, 32 GB maximum	
INTEL® OPTANE™ MEMORY	32 GB M.2 22x80 module pre-installed	16 GB M.2 22x80 module pre-installed	
HDD	2 TB SATA3 pre-installed	1 TB SATA3 pre-installed	
USB-C™ PORT	Thunderbolt™ 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2		USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard		
DIMENSIONS	115 x 111 x 51 mm		
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port		
VIDEO OUTPUTS	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port; Both ports support HDCP 2.2		
SDXC	MicroSDXC slot with UHS-I support		
NETWORKING	Intel® I219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas		
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals; 3.5mm front headset jack		
ENCLOSURE	Aluminum and plastic with replaceable lid, Kensington lock with base security		
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 65W wall-wart power supply with replaceable plugs		
INTERNAL HEADERS	Front Panel, CEC, 2x USB2.0		
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel RGB LED ring Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty		

For more information, visit **www.intel.com/NUC**

	FULL SYSTEM	FULL SYSTEM
PRODUCT FAMILY	NUC7CJYSAL	NUC6CAYS
DESCRIPTION	**Intel® NUC 7 Enthusiast, a Mini PC with Windows 10**	**Intel® NUC Mini PC**
CPU & GFX	**Intel® Celeron® J4005** Intel® HD Graphics 600, 700 MHz	**Intel® Celeron® J3455** Intel® HD graphics 500
RAM	4 GB DDR4-2400 SODIMM pre-installed, 1.2V Dual-channel capable, 8 GB maximum	2Gb DDR3L-1600 module preinstalled, 1.3V Dual-channel DDR3L-1866 SODIMMs, 8GB maximum
OS LOAD	Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant	
FLASH STORAGE	32 GB eMMC v5.1	
2.5" SATA3	9.5mm bay and port	Supported
DIMENSIONS	115 x 111 x 49 mm	
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port	Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header
VIDEO OUTPUTS	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2	HDMI; VGA
SDXC	SDXC slot with UHS-I support	SDXC slot with UHS-I support on the side
NETWORKING	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas	Intel® Wireless-AC 3168 10/100/1000 Mbps Ethernet
AUDIO	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	Replaceable lid
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 65W power supply with replaceable AC cords	Multi-country plugs (IEC types A/C/G/I)
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0	
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty	Consumer Infrared sensor on front panel Windows 10 Home pre-installed with latest Intel®drivers 3-year Advanced Warranty Replacement

For more information, visit **www.intel.com/NUC**

INTEL® NUC MINI PC SUMMARY

INTEL® NUC	PROCESSOR[5]	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC8i3CYSM	Intel® Core™ i3-8121U	LPDDR4	2	Yes	2x HDMI 2.0b	1 M.2	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	AMD Radeon™* 540 discrete graphics
NUC8i3CYSN	Intel® Core™ i3-8121U	LPDDR4	1	Yes	2x HDMI 2.0b	1 M.2	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	AMD Radeon™* 540 discrete graphics
NUC8i7HKVA	Intel® Core™ i7-8809G	DDR4	2	Yes	2x HDMI 2.0b 2x Mini DisplayPort 1.2	1 M.2	7.1 digital (HDMI or DP)	5 + 2	0 + 2	GbE + WiFi*	No	Thunderbolt™ 3
NUC8i7HNKQC	Intel® Core™ i7-8705G	DDR4	2	Yes	2x HDMI 2.0b 2x Mini DisplayPort 1.2	1 M.2	7.1 digital (HDMI or DP)	5 + 2	0 + 2	GbE + WiFi*	No	Thunderbolt™ 3
NUC8i7BEHGA	Intel® Core™ i7+ 8559U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i5BEHFA	Intel® Core™ i5+ 8259U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i3BEHFA	Intel® Core™ i3-8109U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i7BEKQA	Intel® Core™ i7-8559U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Thunderbolt™ 3
NUC8i5BEKPA	Intel® Core™ i5-8259U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Thunderbolt™ 3
NUC7i5DNKPC	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics; Intel® vPro™ Technology
NUC7i3DNKTC	Intel® Core™ i3-7100U	DDR4	1	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i3DNHNC	Intel® Core™ i3-7100U	DDR4	1	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	5 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i7BNKQ	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNKP	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i7BNHXG	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNHXF	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i3BNHXF	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYSAL	Intel® Celeron® J4005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC6CAYS	Intel® Celeron™ J3455	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics

INTEL® NUC KITS[1]

PRODUCT FAMILY	NUC7i7BNH	NUC7i5BNH	NUC7i5BNK
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	N/A	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A	N/A
PROCESSOR	**Intel® Core™ i7-7567U**	**Intel® Core™ i5-7260U**	**Intel® Core™ i5-7260U**
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® Iris™ Plus graphics 640
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT[4]	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB[4] maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 2 GB[4] maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB[4] maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	M.2 Support	M.2 Support	M.2 Support
AUDIO[3]	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	N/A	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support

PRODUCT FAMILY	NUC7i7DNKE	NUC7i7DNHE
DESCRIPTION	**Intel® NUC 7 Business Mini PC Kit**	**Intel® NUC 7 Business Mini PC Kit**
CPU & GFX	8th Generation Intel® Core™ i7-8650U 1.90 GHz to 4.20 GHz Turbo, Quad Core, 8MB Cache, 15W TDP Intel® UHD Graphics 620, 300 MHz – 1.15 GHz Intel® vPro™ Technology, Intel® AMT v11.6	
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum	
HDD	SATA3 data and power connectors	SATA3 data, power, 9.5mm bay
INTEL® OPTANE™ MEMORY	Intel® Optane™ Memory ready	
OS LOAD	Microsoft Windows* 10 Pro (logo'd), supports Windows 10 IOT Enterprise, Windows Server 2016	
DIMENSIONS	115 x 111 x 36 mm	115 x 111 x 52 mm
CONNECTIVITY	2x front USB 3.0, 2x rear USB 3.0, 1x internal USB 3.0 header (host & device modes)	
VIDEO OUTPUTS	Dual HDMI 2.0a with basic CEC built-in for 1 port	
NETWORKING	Intel® i219-LM 10/100/1000 Mbps Ethernet	
AUDIO	Up to 7.1 multichannel (or dual 8-channel) digital audio via HDMI	
ENCLOSURE	Aluminum and plastic chassis, replaceable lid, Kensington lock with base security; Back panel opening w/DB9 bracket (DNHE)	
POWER ADAPTER	12 – 24V_{DC} rear jack, internal 2x2 connector; 19V_{DC} 65W power supply with geo-specific AC cords	
INTERNAL HEADERS	2x internal USB 2.0 headers (all USB ports with individual USB power control) Internal 4-lane eDP 1.4 connector	
OTHER FEATURES	Aluminum and plastic, replaceable lid, Kensington lock with base security Certified with Ubuntu* 16.04 LTS; compatible with various Linux distros Qualified for 24x7 operation VESA mounting plate included Individual brown-box packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

PRODUCT FAMILY	NUC8i7HVK	NUC8i7HNK
CPU & GFX	**8th Generation Intel® Core™ i7-8809G** 3.1 GHz - 4.2 GHz Turbo, Quad Core, 8MB Cache, 100W Radeon™ RX Vega M GH graphics, 1063 MHz – 1190 MHz Unlocked and VR-capable	**8th Generation Intel® Core™ i7-8705G** 3.1 GHz - 4.1 GHz Turbo, Quad Core, 8MB Cache, 65W Radeon™ RX Vega M GL graphics, 931 MHz – 1011 MHz
RAM	Dual channel DDR4-2400+ SODIMMs, 1.2V, 32GB maximum	
SSD	2x M.2 22x42/80 key M slots for PCIe x4 Gen3 NVMe / AHCI or SATA3 SSD, RAID-0 and RAID-1 capable	
DIMENSIONS	221 x 142 x 39 mm (1.2 L)	
CONNECTIVITY	Front USB 3.1 Gen2 via USB-C™ and front USB type-A connectors Front charging USB 3.0, 4x rear USB 3.0, 2x internal USB 3.0 and 2x USB 2.0 via headers Front Consumer Infrared port	
VIDEO OUTPUTS	Front and rear HDMI 2.0b connectors 2x Mini DisplayPort 1.2 ports 2x Thunderbolt™ 3 ports	
SDXC	SDXC slot with UHS-I support	
NETWORKING	2x Intel® 10/100/1000 Mbps (i219-LM and i210-AT) Ethernet ports Intel® Wireless-AC 8265 M.2 22x30 card, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack, 3.5mm rear speaker / TOSLINK combo jack Beam-forming, far-field, quad-mic array	
ENCLOSURE	Replaceable lid with customizable RGB LED illumination and front panel status RGB LEDs Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	19V_{DC} 230W power supply with geo-specific AC cords	
INTERNAL HEADERS	Common I/O header with Front Panel, CEC, 2x USB 3.0, 2x USB2.0 signals	
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with Windows Server 2016 VESA mounting plate included Individual retail packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

PRODUCT FAMILY	NUC8i7BEH	NUC8i5BEH	NUC8i5BEK
CPU & GFX	**8th Generation Intel® Core™ i7-8559U** 2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz	**8th Generation Intel® Core™ i5-8259U** 2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum		
INTEL® OPTANE™ MEMORY	Intel® Optane™ Memory supported		-
HDD	2.5” 9.5mm SATA3 bay and port		SATA3 port only
USB-C™ PORT	Yes		
DIMENSIONS	117 x 112 x 51 mm		117 x 112 x 36 mm
CONNECTIVITY	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port		
VIDEO OUTPUTS	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port Thunderbolt™ 3 port		
SDXC	MicroSDXC slot with UHS-I support		
NETWORKING	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas		
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack Beam-forming, far-field, dual-mic array		
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security		
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 90W power supply with geo-specific AC cords		
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0 headers; Front panel status RGB LED		
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty		

For more information, visit **www.intel.com/NUC**

PRODUCT FAMILY	NUC8i3BEH	NUC8i3BEK
CPU & GFX	**8th Generation Intel® Core™ i3-8109U** 3.0 GHz - 3.6 GHz, Dual Core, 4MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum	
INTEL® OPTANE™ MEMORY	Intel® Optane™ Memory supported	-
HDD	2.5” 9.5mm SATA3 bay and port	SATA3 port only
USB-C™ PORT	Yes	
DIMENSIONS	117 x 112 x 51 mm	117 x 112 x 36 mm
CONNECTIVITY	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port Thunderbolt™ 3 port	
SDXC	MicroSDXC slot with UHS-I support	
NETWORKING	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack Beam-forming, far-field, dual-mic array	
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 90W power supply with geo-specific AC cords	
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0 headers; Front panel status RGB LED	
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	

For more information, visit **www.intel.com/NUC**

PRODUCT FAMILY	NUC7i3BNH	NUC7i3BNK
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	**Intel® Core i3-7100U**	**Intel® Core i3-7100U**
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT[4]	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	M.2 Support	M.2 Support
AUDIO[3]	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support

PRODUCT FAMILY	NUC7PJYH	NUC7CJYH
DESCRIPTION	-	-
CPU & GFX	**Intel® Pentium® J5005** Intel® HD Graphics 605, 800 MHz	**Intel® Celeron® J4005** Intel® HD Graphics 600, 700 MHz
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 8 GB maximum	Dual channel DDR4-2400 SODIMMs, 1.2V, 8 GB maximum
OS LOAD	-	-
FLASH STORAGE	-	-
2.5" SATA3	9.5mm bay and port	9.5mm bay and port
DIMENSIONS	115 x 111 x 49 mm	115 x 111 x 49 mm
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port
VIDEO OUTPUTS	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2
SDXC	SDXC slot with UHS-I support	SDXC slot with UHS-I support
NETWORKING	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas
AUDIO	Up to 7.1 multichannel digital audio via HDMI; 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Up to 7.1 multichannel digital audio via HDMI; 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	Plastic with metal inner frame, replaceable lid, Kensington lock with base security
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 65W power supply with replaceable AC cords	12 – 19V_{DC} input range, 19V_{DC} 65W power supply with replaceable AC cords
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0	Front Panel, CEC, RGB LED, 2x USB2.0
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty

PRODUCT FAMILY	NUC7i5DNHE	NUC7i5DNKE
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	BLKNUC7i5DNHE	BLKNUC7i5DNKE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	**Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology**	**Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology**
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
MEMORY SUPPORT[4]	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO[3]	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265
POWER DELIVERY	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	Yes (TPM v2.0); Worldwide and China-specific options	Yes (TPM v2.0); Worldwide and China-specific options
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included

PRODUCT FAMILY	NUC7i3DNHE	NUC7i3DNKE
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	BLKNUC7i3DNHE	BLKNUC7i3DNKE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	**Intel® Core™ i3-7100U**	**Intel® Core™ i3-7100U**
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
MEMORY SUPPORT[4]	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO[3]	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265
POWER DELIVERY	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included

PRODUCT FAMILY	NUC6CAYH	NUC5CPYH
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	**Intel® Celeron® J3455**	**Intel® Celeron® J3060**
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® HD graphics 500	Intel® HD Graphics
DISPLAY OUTPUTS	HDMI VGA	HDMI VGA
MEMORY SUPPORT[4]	Dual-channel DDR3L-1866 SODIMMs 1.35V, 8GB maximum	Single Channel DDR3L SODIMM 1.35V, 1333/1600 MHz, 8GB[4] maximum
2.5" HDD SUPPORT	Yes	Yes
EXPANSION CONNECTORS	SDXC slot with UHS-I support on the side	M.2 support; SDXC slot with UHS-I support on the side
AUDIO[3]	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Eight-Channel (7.1) digital audio via Mini HDMI 1.4a output, two-channel via headphone jack
USB PORTS	Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header	Four USB 3.0 ports (two front panel with one being charging capable, two back panel) and two USB 2.0 ports (via internal header)
ONBOARD LAN	Intel® Wireless-AC 3168 10/100/1000 Mbps Ethernet	Intel® 10/100/1000 Network Connection Intel® Wireless-AC 3165
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOS BIOS Vault Technology Fast Boot
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel	Replaceable lid Consumer Infrared sensor on front panel

PRODUCT FAMILY	NUC5i3RYHS	NUC5i3RYHSN
CPU & GFX	**5th Generation Intel® Core™ i3-5005U** 2.0 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 5500, 300 MHz – 850 MHz	**5th Generation Intel® Core™ i3-5005U** 2.0 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 5500, 300 MHz – 850 MHz
RAM	DDR3L-1600 SODIMMs, 1.35V; Dual-channel, 16GB maximum	4GB (2x 2GB) DDR3L-1600 SODIMMs pre-installed, 1.35V; Dual-channel, 16GB maximum
2.5" HDD SUPPORT	2.5” 9.5mm SATA3 bay and port	1TB SATA3 HDD pre-installed
STORAGE	M.2 22x42/60/80 key M slot for PCIe x4 Gen2 NVMe / AHCI SSD	
DIMENSIONS	115 x 111 x 49 mm	
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header Front Consumer Infrared port	
VIDEO OUTPUTS	Mini HDMI 1.4a and Mini DisplayPort 1.2	
NETWORKING	Intel® i218-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 7265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack	
ENCLOSURE	Aluminum chassis, replaceable lid, Kensington lock	
POWER ADAPTER	12 – 19V_{DC} input range, 19V_{DC} 65W wall-wart power supply with replaceable plugs	
INTERNAL HEADERS	AUX_PWR, 2x USB2.0 headers	
OTHER FEATURES	Microsoft Windows* 10, 8.1, 7 logo’d, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	

INTEL® NUC KITS[1], WITH INTEL OPTANE MEMORY

PRODUCT FAMILY	NUC7i7BNHX	NUC7i5BNHX	NUC7i3BNHX
KIT / BOARD	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**	**Intel® NUC Kit[1]**
5-PACK OUTERCASE	N/A	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A	N/A
PROCESSOR	**Intel® Core™ i7-7567U**	**Intel® Core™ i5-7260U**	**Intel® Core™ i3-7100U**
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® HD graphics 620
DISPLAY OUTPUTS	HDMI; DisplayPort	HDMI; DisplayPort	HDMI; DisplayPort
MEMORY SUPPORT[4]	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB[4] maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB[4] maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB[4] maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module
AUDIO[3]	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	N/A	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support	Intel® Visual BIOs Intel® Express BIOS update support
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support

Intel® NUC Kit[1] Summary

INTEL® NUC	PROCESSOR[5]	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC7i7BNH	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i5BNH	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i5BNK	Intel® Core™ i5-7260U	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i7DNKE	Intel® Core™ i7-8650U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	Intel® UHD Graphics 620; Intel® vPro™ Technology
NUC7i7DNHE	Intel® Core™ i7-8650U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	Intel® UHD Graphics 620; Intel® vPro™ Technology
NUC8i7HVK	Intel® Core™ i7-8809G	DDR4	2	Yes	HDMI 2.0b + DP1.2	2 M.2	7.1 digital (HDMI or DP)	4 + 2	0 + 2	GbE + WiFi*	No	Radeon™ RX Vega M GH graphics
NUC8i7HNK	Intel® Core™ i7-8705G	DDR4	2	Yes	HDMI 2.0b + DP1.2	2 M.2	7.1 digital (HDMI or DP)	4 + 2	0 + 2	GbE + WiFi*	No	Radeon™ RX Vega M GL graphics
NUC8i7BEH	Intel® Core™ i7-8559U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i5BEH	Intel® Core™ i5-8259U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i5BEK	Intel® Core™ i5-8259U	DDR4	2	No	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics 655
NUC8i3BEH	Intel® Core™ i3-8109U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i3BEK	Intel® Core™ i3-8109U	DDR4	2	No	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics 655
NUC7i3BNH	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i3BNK	Intel® Core™ i3-7100U	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7PJYH	Intel® Pentium® J5005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYH	Intel® Celeron® J4005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7i5DNHE	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial, Int Exp.
NUC7i5DNKE	Intel® Core™ i5-7300U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial
NUC7i3DNHE	Intel® Core™ i3-7100U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial, Int Exp.
NUC7i3DNKE	Intel® Core™ i3-7100U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial
NUC6CAYH	Intel® Celeron® J3455	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC5CPYH	Intel® Celeron® N3050	DDR3L	1	Yes	mHDMI* + VGA	1 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE + WiFi*	No	CIR
NUC5i3RYHS	Intel® Core™ i3-5005U	DDR3L	2	Yes	Mini HDMI 1.4a + Mini DP 1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD Graphics 5500; CIR
NUC5i3RYHSN	Intel® Core™ i3-5005U	DDR3L	2	Yes	Mini HDMI 1.4a + Mini DP 1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD Graphics 5500; CIR
NUC7i7BNHXG	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNHXF	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i3BNHXF	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR

INTEL® NUC BOARDS

PRODUCT FAMILY	NUC7i5DNBE	NUC7i3DNBE	DE3815TYBE
KIT / BOARD	**Intel® NUC Board**	**Intel® NUC Board**	**Intel® NUC Board**
5-PACK OUTERCASE	BLKNUC7i5DNKE	BLKNUC7i5DNKE	N/A
10-PACK PRODUCT CODE	N/A	N/A	BLKDE3815TYBE
PROCESSOR	**Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology**	**Intel® Core™ i3-7100U Processor**	**Intel® Atom™ E3815**
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® HD graphics 620	Intel® HD graphics 620	Intel® HD graphics
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector	HDMI*; VGA; eDP*
MEMORY SUPPORT[4]	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB[4] maximum	Single-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 8 GB[4] maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header	One half-size PCI Express* Mini Card
AUDIO[3]	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports	Eight-Channel (7.1) digital audio via HDMI 1.4a output, two-channel via headphone jack
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers	One USB 3.0 port (front panel), five USB 2.0 ports (two external ports and three additional ports via internal headers)
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® PRO 10/100/1000 Network Connection
POWER CORD OPTION	19V 65W AC power adapter	19V 65W AC power adapter	N/A
TRUSTED PLATFORM MODULE	Yes (TPM v2.0); Worldwide and China-specific options	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS	Intel® Visual BIOS; BIOS Vault Technology; Fast Boot
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header	4 GB eMMC storage device soldered down, Custom Solutions header, watchdog timer, fanless design

PRODUCT FAMILY	NUC7i7DNBE
KIT / BOARD	**Intel® NUC Board**
5-PACK OUTERCASE	BLKNUC7i5DNKE
10-PACK PRODUCT CODE	N/A
PROCESSOR	**Intel® Core™ i7-8650U Processor with Intel® vPro™ Technology**
CHIPSET	N/A
INTEGRATED GRAPHICS CORE[2]	Intel® UHD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector
MEMORY SUPPORT[4]	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum
2.5" HDD SUPPORT	Yes
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header
AUDIO[3]	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265
POWER CORD OPTION	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	Yes (TPM v2.0); Worldwide and China-specific options
LEAD-FREE	Yes
BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty
OTHER	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header

INTEL® NUC BOARD SUMMARY

INTEL® NUC	PROCESSOR[5]	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCIe*	AUDIO	USB 3 EXT+INT	USB 2 EXT+INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC7i5DNBE	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0
NUC7i3DNBE	Intel® Core™ i3-7100U	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	
DE3815TYBE	Intel® Atom™ processor E3815	DDR3L	1	Yes	HDMI + VGA + eDP*	1	Dual HDMI	1 + 0	2 + 3	GbE	Yes	Fanless + 4 GB on-board memory
NUC7i7DNBE	Intel® Core™ i7-8650U	DDR4	2	Yes	Dual HDMI	2 M.2	Dual HDMI	4 + 1	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0

For more information, visit **www.intel.com/NUC**

For more information, visit **www.intel.com/NUC**

1 Intel® NUC Kit: Each kit contains motherboard, chassis, and power supply.

2 Requires a processor with Intel® HD graphics.

3 Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com/design/chipsets/hdaudio.htm

4 System resources and hardware (such as PCI and PCI Express*) require physical memory address locations that can reduce available addressable system memory. This could result in a reduction of as much as 1 GB or more of physical addressable memory being available to the operating system and applications, depending on the system configuration and operating system.

5 Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor_number/

Intel® NUC Mini PCs, Kits and Boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available on request. All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, Intel Atom, and Celeron are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

BUILT FOR PERFORMANCE. SIZED FOR CONVENIENCE.

INTEL® COMPUTE STICK

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® COMPUTE STICK

Intel® Compute Stick is a device the size of a pack of gum that turns any HDMI display into a fully functional computer: same operating system, same high quality graphics, and same wireless connectivity.

All this in a PC on a stick that measures 4.5 inches from end to end, and is ready to compute right out of the box.

INTEL® COMPUTE STICK

Connect. Compute.
It's that simple.

QUAD-CORE INTEL® ATOM™ PROCESSOR

This innovative processor delivers great performance while consuming low energy—making the Intel® Compute Stick both space and energy efficient.

INTEL® HD GRAPHICS

Exceptional clarity makes for an exceptional visual experience. The Intel® Compute Stick delivers HD wow, whether you're viewing videos, games, or photos.

INTEL® HD AUDIO

Get a high quality, multichannel sound experience, without an audio card. It's truly an immersive media experience that will have your ears seeing stars.

THE INTEL® COMPUTE STICK

Connect. Compute.
It's that simple.

INTERACTIVE DISPLAY

Transform a display into a fully functional interactive display solution.

CONFERENCE PRESENTATION

Connect to your presentation device and stream videos or display visual content with ease.

ENTERTAINMENT

Turn your HDMI* television or monitor into a home entertainment computer.

INTEL® COMPUTE STICK "CEDAR CITY"

Product Code	**STK2m3W64CC**	**STK2mv64CC**
Processor	6th generation Intel® Core™ Y-Series m3, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC)	6th generation Intel® Core™ Y-Series m5, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC), Intel® vPro™ Technology
Memory	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)
Graphics	Intel® HD graphics; 1x HDMI 1.4b male plug	Intel® HD graphics; 1x HDMI 1.4b male plug
Audio	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
Peripheral Connectivity	1x USB 3.0 Type-A host port on side	1x USB 3.0 Type-A host port on side
Storage	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)
Networking	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas
Enclosure	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)
Power Delivery	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs
Additional Featured	Pre-installed OS: Windows* 10, 64-bit HDMI* Extender Cable Power LED, Power Button Three Year Warranty	HDMI* Extender Cable Power LED, Power Button Three Year Warranty

For more information, visit **www.intel.com/computestick**

Actual Intel® Compute Stick may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computestick

* Other names and brands may be claimed as the property of others.

INTEL® COMPUTE STICK "STERLING CITY"

Product Code	**STK1AW32SC**	**STK1A32SC**
Processor	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA
Memory	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB
Graphics	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug
Audio	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
Peripheral Connectivity	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side
Storage	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)
Networking	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0
Enclosure	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm
Power Delivery	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets
Additional Featured	Pre-installed OS: Windows* 10, 32-bit (64-bit capable) Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty	Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty

For more information, visit **www.intel.com/computestick**

Actual Intel® Compute Stick may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computestick

* Other names and brands may be claimed as the property of others.

For more information, visit **www.intel.com/computestick**

Intel products are not intended for use in medical, life-saving, or life-sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Actual Intel® Compute Stick may differ from the image shown.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computestick

All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Intel Atom are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

INTEL® COMPUTE CARD

THE FUTURE IS SMART

Intel® Product Quick Reference Matrix
Q3 2019

INTEL® COMPUTE CARD — SMALL IN SIZE, NOT IN CAPABILITIES

Intel® Compute Card is just slightly longer than a credit card, but it's ready to power anything from entry-level to full featured devices.

The modularity and flexibility of this computer on a card allows compute integration via card slot into devices like digital signage, kiosks, Smart TVs, appliances and more.

THE FUTURE IS SMART

The Intel® Compute Card is pushing the boundaries of where and how technology enriches life.

DRIVING INNOVATION

Now any device with a Compute Card slot is a smart device, unlocking potential everywhere compute is possible.

DELIVERING VALUE

Revolutionary in size, form, and function, the Intel® Compute Card brings tremendous value to designers, OEMs, manufacturers, distributors, channel partners, and ultimately, their customers.

DELIVERED COMPLETE

With Intel® brand processors and everything your customers need—including RAM, storage, and wireless connectivity—already built-in.

COMPUTE ANYWHERE

IN THE HOME

Smart appliances and devices for a more connected home.

IN BUSINESS

Digital signage, point of sale, intelligent vending, and smart security solutions to bring business into the future.

IN THE FACTORY

Automation, inventory management, fleet tracking and mobile workstations to reinvent the factory floor.

INTEL® COMPUTE CARD - MARBLE CREEK

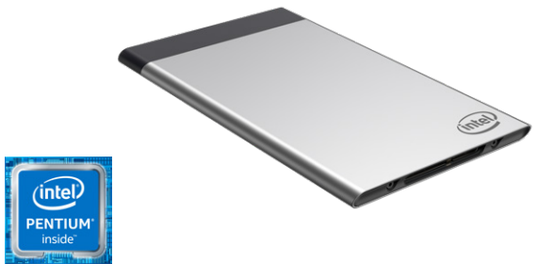
Product Code	**CD1i5128MK**	**CD1M3128MK**
Processor	7th Generation Intel® Core™ i5-7Y57 Processor	7th Generation Intel® Core™ m3-7Y30 Processor
Memory	8GB dual channel LPDDR3-1866	4GB dual channel LPDDR3-1866
Graphics	Intel® HD Graphics 630, 300 MHz up to 950 MHz	Intel® HD Graphics 615, 300 MHz up to 900 MHz
Storage	128GB PCIe x2 SSD	128GB PCIe x2 SSD
Networking	Intel® Wireless-AC 8265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 8265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas
Enclosure	Metal with a plastic cap	Metal with a plastic cap
Additional Featured	No moving components Three year warranty	No moving components Three year warranty

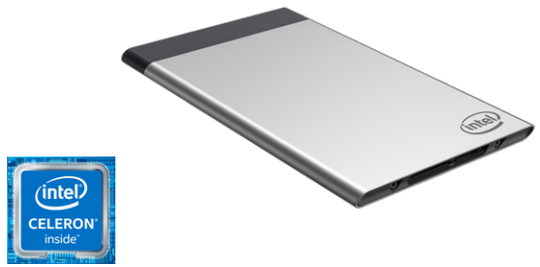
For more information, visit **www.intel.com/computecard**

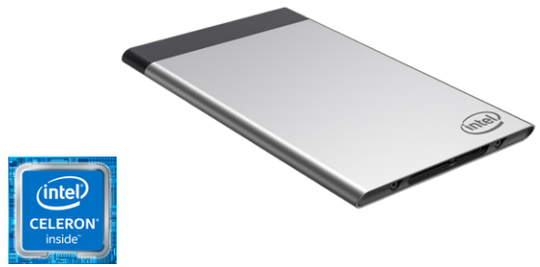
Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computecard

* Other names and brands may be claimed as the property of others.

INTEL® COMPUTE CARD - GRANITE CREEK







Product Code	**CD1P64GK**	**CD1C64GK**	**CD1C32GK**
Processor	Intel® Pentium® Processor N4200	Intel® Celeron® N3450 Processor	Intel® Celeron® N3350 Processor
Memory	4GB dual channel LPDDR3-1866	4GB dual channel LPDDR3-1866	2GB dual channel LPDDR3-1866
Graphics	Intel® HD Graphics 505, 200 MHz up to 750 MHz	Intel® HD Graphics 500, 200 MHz up to 700 MHz	Intel® HD Graphics 500, 200 MHz – 700MHz
Storage	64GB eMMC 5.0, HS400	64GB eMMC 5.0, HS400	32GB eMMC 5.0, HS400
Networking	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas
Enclosure	Metal with a plastic cap	Metal with a plastic cap	Metal with a plastic cap
Additional Featured	No moving components Three year warranty	No moving components Three year warranty	No moving components Three year warranty

For more information, visit **www.intel.com/computecard**

Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computecard

* Other names and brands may be claimed as the property of others.

INTEL® COMPUTE CARD DOCK - PORT JEFFERSON

Product Code	**DK132EPJ**
Supported Cards	CD1IV128MK Intel® Core™ i5 vPro* CD1M3128MK Intel® Core™ m3 CD1P64GK Intel® Pentium® CD1C64GK Intel® Celeron®
Security	Mechanical security latch, Compute Card ejection lock, Kensington lock
Networking	Intel® Ethernet Controller I211-AT, IEEE 802.3/u/ab, RJ45 with dual LEDs, 10/00/1000 Mbps
Enclosure	Metal with plastic
Additional Featured	Electronic ejection Active cooling One year warranty

For more information, visit **www.intel.com/computecard**

Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computecard

* Other names and brands may be claimed as the property of others.

For more information, visit **www.intel.com/computecard**

Intel products are not intended for use in medical, life-saving, or life-sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Actual Intel® Compute Card may differ from the image shown.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/computecard

All rights reserved. Intel, the Intel logo, Intel Inside, Experience What's Inside logo, Intel vPro, Intel Core, Pentium, Celeron and the Intel Inside logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

INTEL® WIRELESS PRODUCTS

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® WIRELESS-AC WI-FI FOR YOUR CONNECTED LIFE

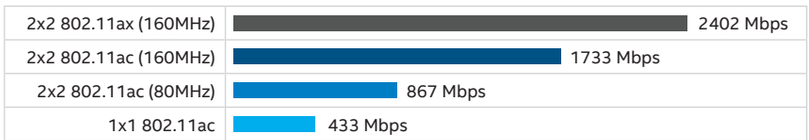
GIGABIT WI-FI POWERED BY INTEL

With the right solution from Intel, your Wi-Fi performs just as remarkably as you do—easily keeping pace with your entertainment, business, and super-connected lifestyle.

INTEL® WIRELESS PRODUCTS

Intel® Wi-Fi delivers Gigabit speeds

Less time waiting, more time enjoying with Intel Gigabit-class Wi-Fi.



Wi-Fi 6 is a Game Changer in 2019

Wi-Fi 6 brings better performance in dense environments like your home, improves network efficiency, delivers up to 75% reduction in latency[6] and is 3X faster than baseline 802.11ac 2x2 80MHz (867Mbps)[7].

Module Form Factors

M.2 2230 Socketed

M.2 1216 Soldered Down

Progression of Wi-Fi Standards & Technologies

YEAR	WI-FI TYPE	SHORT NAME	MAX SPEED	STREAMS	CHANNEL WIDTH	CHANNEL DENSITY
2019	2x2 802.11ax	Wi-Fi 6	2402Mbps	2	160MHz	Heavy
2016	2x2 802.11ac	2x2AC	1733Mbps	2	160MHz	Heavy
2013	2x2 802.11ac	2x2AC	867Mbps	2	80MHz	Heavy
2013	1x1 802.11ac	1x1AC	433Mbps	1	80MHz	Heavy

Note: Wider channels, heavier channel densities, and higher number of streams each contribute to higher maximum speeds

- PC (client) and AP/Router must support same technology to get highest speeds.
- Intel has important additional unique features:
  - Wireless Intel® Active Management Technology (Intel® vPro™ Technology)[1]
  - Worldwide Regulatory Support with Intel® Dynamic Regulatory Solution[2]

INTEL® WIRELESS-AC PRODUCTS

Wireless Products (802.11ac Wi-Fi and Bluetooth®)

Wi-Fi is not just for laptops. Experience the flexibility and performance offered by Intel® Wireless-AC in the desktop.

PRODUCT	INTEL® WI-FI 6 AX200	INTEL® WIRELESS-AC 9560	INTEL® WIRELESS-AC 9260	INTEL® WIRELESS-AC 9461/9462	INTEL® DUAL BAND WIRELESS-AC 8265	INTEL® DUAL BAND WIRELESS-AC 8260	INTEL® DUAL BAND WIRELESS-AC 7265	INTEL® DUAL BAND WIRELESS-AC 3168
FORM FACTOR	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230
SPEED SPATIAL STREAMS (TX AND RX)	Gig+ - 2402 Mb/s (2x2)	Gigabit - 1733Mb/s (2x2)	Gigabit - 1733Mb/s (2x2)	433Mb/s (1x1) Single Antenna-9461; Diversity Antenna-9462	867Mb/s (2x2)	867 Mb/s (2x2)	867 Mb/s (2x2)	433 Mb/s (1x1)
ENTERPRISE / SMB FEATURES	OFDMA, MU-MIMO Rx, 1024QAM, WPA3 Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROSet/Wireless Software, MU-MIMO, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution
BANDS	Dual Band – 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz
INTEL® vPRO™ TECHNOLOGY[1]	✓	✓	✓		✓	✓	✓	
BLUETOOTH®	Bluetooth® 5	Bluetooth® 5	Bluetooth® 5	Bluetooth® 5	Bluetooth® 4.2	Bluetooth® 4.2	Bluetooth® 4.2	Bluetooth® 4.2
Wi-Fi* CERTIFICATION (802.11)	WiFi certified 802.11 ax/ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n
OPTIMIZED FOR	9th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel Celeron® processors	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors with platforms designed to support connectivity integration	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors with platforms designed to support connectivity integration	7th generation Intel® Core™ processors	6th generation Intel® Core™ processors	5th & 6th generation Intel® Core™ processors	6th & 7th generation Intel® Core™ processors

DESKTOP WIRELESS M.2 KIT

Intel® Dual Band Wireless-AC 8265 Desktop Kit

Intel® wireless networking solutions for desktop platforms enable network connectivity without wires. This solution requires a motherboard with an M.2 key E connector for wireless and includes 2 antennas, 2 RF cables with connectors and 2 mounting brackets (long/short). Integrate wireless in the desktop vs. an external USB dongle for uncompromising performance, enhanced security, and scalability for fast, flexible connectivity at work and home.

SEGMENT	BUSINESS, EDUCATION, PERFORMANCE CONSUMER
PRODUCT	INTEL® DUAL BAND WIRELESS-AC 8265 DESKTOP KIT
FORM FACTOR	M.2 (key E)
ANTENNA	Included
SPEED SPATIAL STREAMS (TX AND RX)	867 Mb/s (2x2)[4]
BANDS	Dual Band – 2.4 GHz and 5 GHz
ENTERPRISE / SMB FEATURES	Intel® PROSet / Wireless Software, MU-MIMO
BLUETOOTH® 4	Bluetooth® 4.2
WI-FI* CERTIFICATION (802.11)	802.11ac, 802.11n
AVAILABILITY	Shipping

INTEL® CHANNEL WIRELESS PRODUCTS

Intel offers a full portfolio of advanced technologies to optimise every wireless experience

PRODUCT CODE	MM#	DESCRIPTION	PACKING	PRODUCT CONSIDERATIONS
CYCLONE PEAK - AX200				
AX200.NGWG	985857	Discrete, Wi-Fi 6, Gig+, 2x2, + Bluetooth 5 – M.2	100 pack	Recommended wireless solution for 9th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors. Supports Intel® vPro™ technology on 9th generation Intel® Core™ processors.
JEFFERSON PEAK 1 & 2 - 9461, 9462 & 9560				
9560.NGWG	957714	CNVi, Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth® 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors with platforms designed for connectivity integration. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
9461.NGWG.NV	958885	CNVi, Single Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors with platforms designed for connectivity integration.
9462.NGWG.NV	958856	CNVi, Diversity Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 M.2	100 pack	
THUNDER PEAK 2 - 9260				
9260.NGWG	957712	Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentinum® Silver and Intel® Celeron® Processors. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
WINDSTORM PEAK - 8265				
8265.NGWMG	946658	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth® 4.2 - m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 7th generation Intel® Core™ processors.
8265.NGWMG.DTX1	958156	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 – m.2 desktop kit	1 Retail Box	
SNOWFIELD PEAK - 8260				
8260.NGWMG	942165	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 6th generation Intel® Core™ processors.
SANDY PEAK - 3168				
3168.NGWG	944884	1x1 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. [5]
STONE PEAK 1 & 2 – 3165 & 7265				
7265.NGWG.W	939155	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 5th generation Intel® Core™ processor-based systems. Supports Intel® vPro™ Technology on 5th generation Intel® Core™ processors. [1]
7265.NGWWB.W	945063	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2, 10pk	10 Packs	Lower quantity pack to support smaller product orders.
3165.NGWG	940106	1x1 802.11ac/a/b/g/n + Bluetooth 4.1 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. [5]

For more information, visit **www.intel.com/wireless**

For more information, visit **www.intel.com/wireless**

1 Intel® vPro™ technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software, and IT environment. To learn more visit: www.intel.com/content/www/us/en/architecture- and-technology/vpro/intel-vpro-technology-developer.html

2 For a list of country approvals, please contact your local Intel representative.

3 Based on actual product benchmark performance. Theoretical maximum bandwidth enabled by 2x2 802.11ac (80MHz) and 2x2 802.11ac (160MHz) implementations are 867 Mbps and 1733Mbps PHY rates respectively.

4 Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit http://www.intel.com/performance.

5 "Nearly 3x/6x/12x faster" Intel® Wireless-AC claims are based on the comparison of maximum theoretical data rates for single (433 Mbps), dual (867 Mbps) spatial stream 802.11ac (80MHz) and dual (1733Mbps) spatial stream 802.11ac (160MHz) vs. single spatial stream (150 Mbps) 802.11n Wi-Fi solutions as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ac wireless network routers or better.

6 "Up to 4X lower latency" is based on Intel simulation data of 802.11ax with and without OFDMA using 9 clients. Average latency without OFDM is 36ms, with OFDMA average latency is reduced to 7.6ms. Latency improvement requires that the AP and all clients support OFDMA

7 802.11ax 2x2 160MHz enables 2402Mbps maximum theoretical data rate, ~3X faster than standard 802.11ac 2x2 80MHz (867Mbps) and nearly 6x faster than baseline 1x1ac (433Mbps) Wi-Fi as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Intel Corporation is under license

Intel, the Intel logo, Celeron, Pentium, and vPro are trademarks of Intel Corporation in the U.S. and/or other countries.

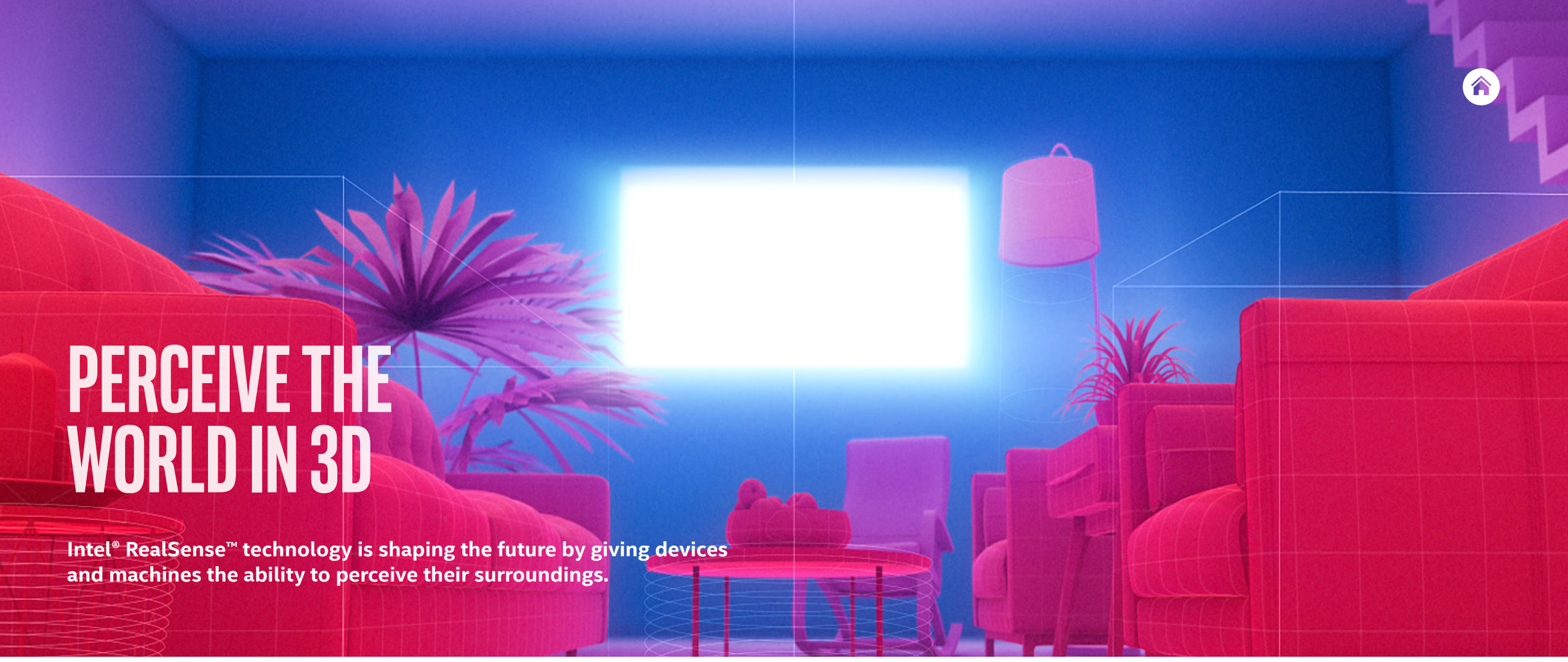
Copyright © Intel Corporation. All rights reserved.

* Other names, brands, and logos may be claimed as the property of others.

INTEL® REALSENSE™ TECHNOLOGY

Intel® Product Quick Reference Matrix

Q3 2019



PERCEIVE THE WORLD IN 3D

Intel® RealSense™ technology is shaping the future by giving devices and machines the ability to perceive their surroundings.

INTEL® REALSENSE™ TRACKING CAMERA T265

With its small form factor and low power consumption, the Intel® RealSense™ Tracking Camera T265 has been designed to give you the tracking performance you want straight off-the-shelf. Cross-platform, developer friendly simultaneous localization and mapping for all your robotics, drone and augmented reality rapid prototyping needs.

INTEL® REALSENSE™ DEPTH CAMERAS

Designed for easy setup and portability, Intel® RealSense™ depth cameras feature long-range capabilities and high depth resolution and include active infrared (IR) stereo with standard or wide field of view. For value-conscious applications, choose rolling shutter. Fast-moving and outdoor applications benefit from global shutter.

INTEL® REALSENSE™ TRACKING CAMERA T265 — AVAILABLE FOR PRE-ORDER

Tracking Redefined

Introducing a new class of stand-alone simultaneous localization and mapping device, the Intel® RealSense™ Tracking Camera T265 for use in robotics, drones and more. With its small form factor and low power consumption, the Intel® RealSense™ Tracking Camera T265 has been designed to give you the tracking performance you want straight off-the-shelf. Cross-platform, developer friendly simultaneous localization and mapping for all your robotics, drone and augmented reality rapid prototyping needs.

LOW POWER

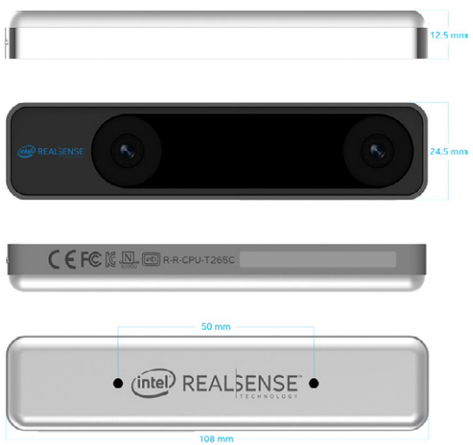
Featuring highly optimized proprietary V-SLAM algorithms running directly on the device, it operates at an incredible 1.5W.

PRECISION TRACKING

Extensively tested and validated for performance, providing under 1%[1] closed loop drift under intended use conditions.

SMALL AND LIGHT

At 108 x 25 x 13 mm in size and weighing only 55 g, this device won't weigh your prototype down.



Technical Specifications

V-SLAM, PART OF INTEL® REALSENSE™ TECHNOLOGY

High precision Visual Inertial Odometry Simultaneous Localization and Mapping algorithms.

INTEL® MOVIDIUS™ MYRIAD™ 2.0 VPU

Visual Processing Unit optimized to run V-SLAM at low power.

TWO FISHEYE LENSES WITH COMBINED 163±5° FOV

The camera includes two OV9282 imagers with fisheye lenses for a combined, close to hemispherical 163±5° field of view for robust tracking even with fast motion.

BMI055 IMU

The Inertial Measurement Unit, allows for accurate measurement of rotation and acceleration of the device, to feed into the V-SLAM algorithms.

USB 3.1 GEN 1 MICRO B

USB 2.0 and USB 3.1 supported for either pure pose data or a combination of pose and images.

2 X M3 0.5MM PITCH MOUNTING SOCKETS

Securely attach the camera to your device with these standard mounting points on the rear of the camera.

1. Under 1% drift observed in repeated testing in multiple use cases and environments. AR/VR use cases were tested with the T265 mounted on the head in indoor living and office areas with typical indoor lighting including sunlight entering the room. Wheeled robot use cases tested with wheel odometer data integrated, again in indoor office and home environments.

INTEL® REALSENSE™ DEPTH CAMERAS

Make Perception Your Advantage

Stereo image sensing technologies use two cameras to calculate depth and enable devices to see, understand, interact with, and learn from their environment — powering intuitive, natural interaction and immersion. Stereo depth works both indoors and outdoors in a wide variety of lighting conditions and can also be used in multiple camera configurations without the need for custom calibration. The onboard Intel® RealSense™ Vision Processor D4 performs all the depth calculations on the camera, allowing for low power, platform agnostic devices. Start developing immediately with the Intel® RealSense™ SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.

	INTEL® REALSENSE™ DEPTH CAMERA D435i	INTEL® REALSENSE™ DEPTH CAMERA D435	INTEL® REALSENSE™ DEPTH CAMERA D415
Connectors	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*
Depth FOV (Horizontal x Vertical for HD 16:9)	85.2° x 58°	85.2° x 58°	63.4° x 40.4°
Depth Frame Rate	Up to 90 fps	Up to 90 fps	Up to 90 fps
Depth Resolution	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720
Depth Technology	Active IR Stereo	Active IR Stereo	Active IR Stereo
Dimensions (Length x Depth x Height)	90 mm x 25 mm x 25 mm	90 mm x 25 mm x 25 mm	99 mm x 20 mm x 23 mm
Image Sensor Technology	Global Shutter, 3µm x 3µm pixel size	Global Shutter, 3µm x 3µm pixel size	Rolling Shutter, 1.4µm x 1.4µm pixel size
Inertial Measurement Unit	Yes	No	No
Main components	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D415
Minimum Depth Distance (Min-Z):	0.11 m	0.11 m	0.16 m
Mounting Mechanism	One 1/4-20 UNC thread mounting point Two M3 thread mounting points	One 1/4-20 UNC thread mounting point Two M3 thread mounting points	One 1/4-20 UNC thread mounting point Two M3 thread mounting points
RGB Frame Rate and Resolution	1920 x 1080 at 30 fps	1920 x 1080 at 30 fps	1920 x 1080 at 30 fps
RGB Sensor FOV (Horizontal x Vertical)	69.4° x 42.5° (+/- 3°)	69.4° x 42.5° (+/- 3°)	69.4° x 42.5° (+/- 3°)
Use environment	Indoor / Outdoor	Indoor / Outdoor	Indoor / Outdoor

For more information, visit **intelrealsense.com/stereo-depth/**

INTEL® REALSENSE™ SOFTWARE DEVELOPER KIT 2.0

Open Source, Cross Platform

Featuring:

- Tools: Intel® RealSense™ Viewer
- Utilities for Debug
- Code Samples
- RealSense™ SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.

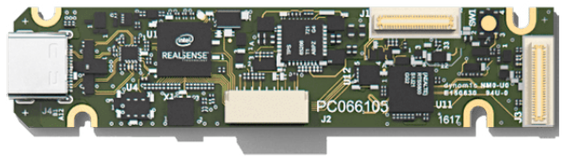
Depth Modules

MORE CONTROL, TIGHTER INTEGRATION

For customers who are looking for closer integration and a more flexible form factor, as well as lower cost, we offer our custom camera modules. With the addition of the Intel® RealSense™ Vision Processor D4 and ASIC card, modules allow greater design flexibility, without the need to spend engineering resources on camera placement and calibration.

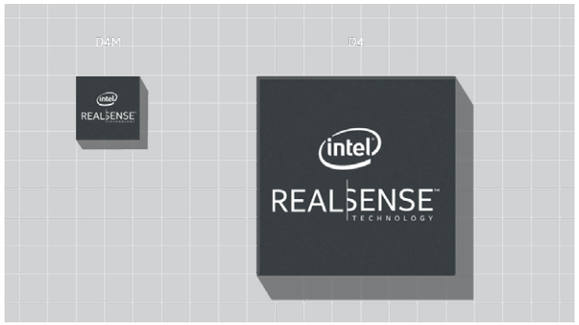
If you are planning to integrate Intel RealSense technology into higher volume products, our depth modules can offer the best compromise between price and flexibility. We offer multiple different configurations to better suit your needs, fully calibrated and validated for ease of integration.

Designed for easy system integration, our complete line of modules feature a calibrated imaging sub-system with stereo sensors. When paired with an Intel® RealSense™ Vision Processor, depth data can be output via USB to any platform.



	D410	D415	D420	D430
Depth Technology	Active IR Stereo	Active IR Stereo	Passive IR Stereo	Active IR Stereo
Image Sensor Technology	Rolling Shutter	Rolling Shutter	Global Shutter	Global Shutter
Depth FOV (Horizontal x Vertical for HD 16:9)	63.4° x 40.4°	63.4° x 40.4°	85.2° x 58°	85.2° x 58°
RGB Frame Rate and Resolution	-	1920 x 1080 at 30 fps	-	-
Depth Resolution	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720
Depth Frame Rate	Up to 90 fps	Up to 90 fps	Up to 90 fps	Up to 90 fps
Range	.16-10m+	.16-10m+	.11-10m+	.11-10m+

Depth Processors



ACCELERATE REAL-TIME PROCESSING

We offer our standalone Intel® RealSense™ Vision Processor D4 which gives you the ability to create quality stereo depth devices with your choice of sensors in any physical configuration.

Achieve superior stereo depth and computer vision with the Intel® RealSense™ Vision Processor D4. This application specific integrated circuit provides dedicated real-time processing up to 36.6* million pixels per second in a small footprint, while offering support for flexible camera customization. Contact your Intel RealSense sales representative for more information.

Depth Processor: Stereo	Depth Max Throughput: up to 36.6* MP/sec (848 x 480 @ 90fps)	IR Projector Controls: Yes
Form Factor and Package: ASIC BGA	Depth Stream Output Resolution: Up to 1280 x 720	Host Interface: USB 3.0
Process Technology: 28nm	Depth Stream Output Frame Rate: Up to 90bps	Multi-Camera Support: Yes, up to 5
Package Size: 6.4 mm x 6.4 mm x 1 mm	RGB Sensor Max Resolution & Max Frame Rate: 1920 x 1080, Up to 60 fps	I/O: 5x MIPI CSI-2, 5x I2C, 1xSPI, GPIO, Timer

Visit **www.intelrealsense.com** for more information.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

Intel, Intel Inside and Intel RealSense are trademarks of Intel Corporation in the U.S. and other countries.

Other names and brands may be claimed as the property of others.

Copyright © 2019, Intel Corporation. All rights reserved.

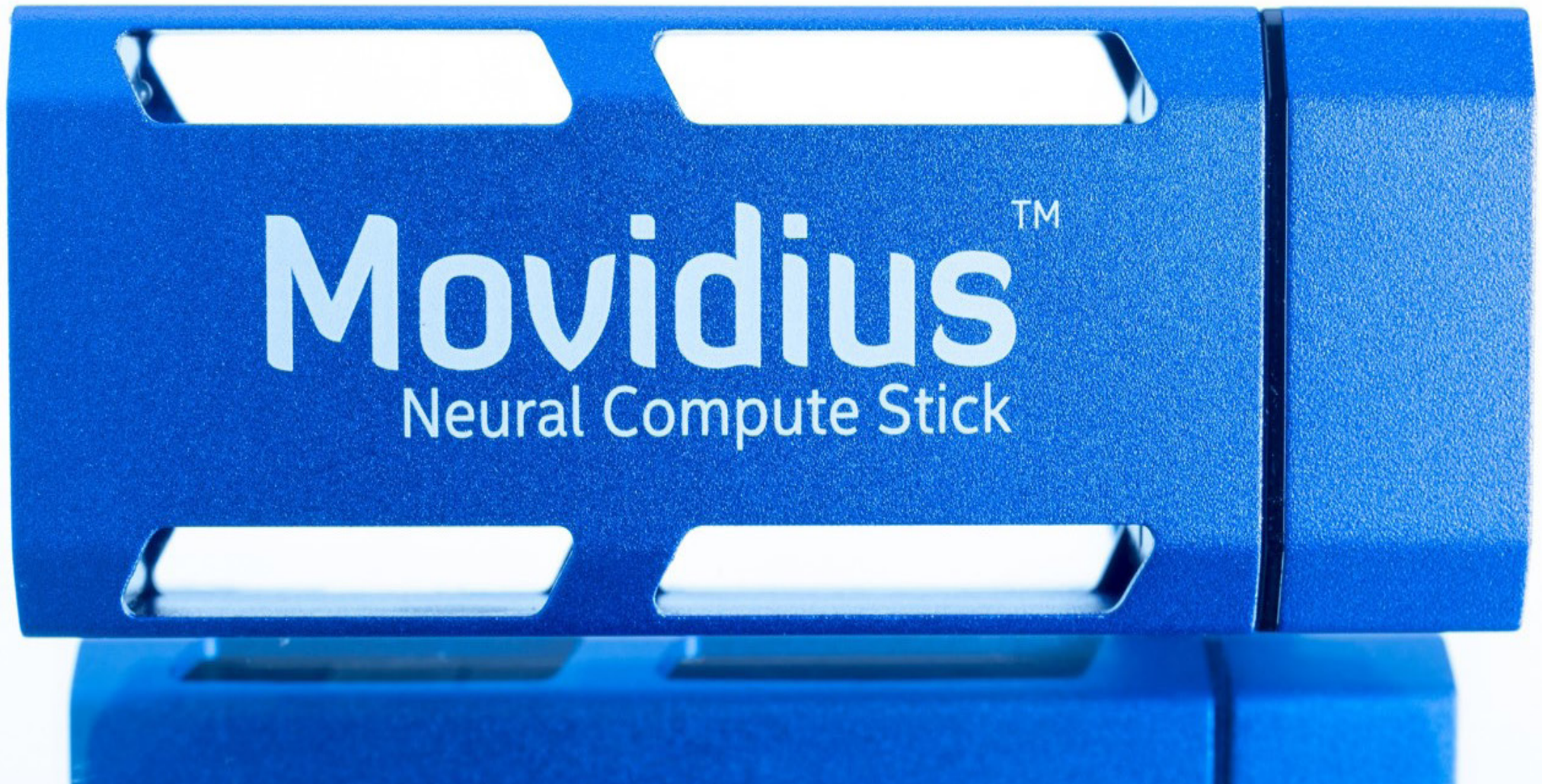
Movidius
an Intel company

MOVIDIUS™ NEURAL COMPUTE STICK

Intel® Product Quick Reference Matrix
Q3 2019

ACCELERATE DEEP LEARNING DEVELOPMENT AT THE EDGE

The Movidius™ Neural Compute Stick is a miniature deep learning hardware development platform that you can use to prototype and tune, validate, and your AI programs, specifically Deep Neural Networks. It features the same Movidius vision processing unit (VPU) used to bring machine intelligence to drones, surveillance cameras, and VR or AR headsets. Now, in a USB stick form factor.



MOVIDIUS™ NEURAL COMPUTE STICK

Product Insights

Powered by the Movidius™ Vision Processing Unit, capable of running high performance Floating-point CNNs at ultra-low power, packaged in a convenient USB stick form factor for real time deep learning inferences with best in class power efficiency.

Movidius
an Intel company
NEURAL COMPUTE STICK

**Deep neural networks
- on a stick -
no Cloud required**

Deep Learning Insights

Profile, Validate, and Run your Deep Neural Network (DNN) to get real-world embedded results for deep learning research and development insights into performance and power.

Immediate Productivity

Supports the popular Caffe DNN framework to get up and running easily. Out-of-the-box examples for x86 and Raspberry Pi* platforms help you easily integrate DNN inferences into any application.

Prototyping Versatility

USB stick form factor enables deep learning R&D and prototyping on a Linux laptop, x86 based host device, Raspberry Pi* and others to come.

Run multiple devices on the same platform to scale performance.

* Other names and brands may be claimed as the property of others.

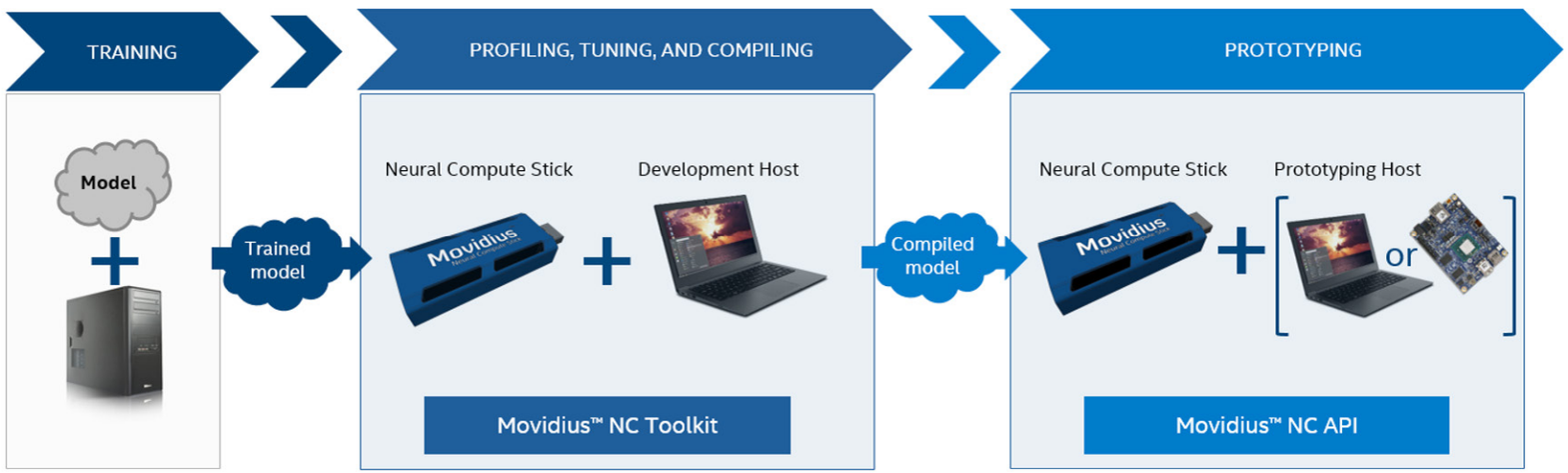
Compile, Tune and Accelerate

A Software Development Kit (SDK) containing a Toolkit and API allows deep learning developers to profile, tune, compile and deploy deep neural network (DNN) applications on the Movidius™ Neural Compute Stick.

Compile the Deep Neural Network: Automatically convert a trained Caffe-based convolutional neural network (CNN) into an embedded neural network optimized to run on the onboard Movidius Myriad 2 vision processing unit (VPU).

Tune the Network: Layer-by-layer performance metrics for both industry standard examples provided and custom-designed neural networks enable effective tuning for optimal real-world performance at ultra-low power. Validation scripts allow developers to compare the accuracy of the optimized model on the device to the original PC-based model.

Accelerate the Network on the Neural Compute Stick: Unique to Movidius Neural Compute Stick, the device can behave as a discrete neural network accelerator by adding dedicated deep learning inference capabilities to existing computing platforms for improved performance and power efficiency.



For more information, visit **developer.movidius.com**

Visit **developer.movidius.com** for more information.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information. The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: http://www.intel.com/design/literature.htm

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products, computer systems, dates and figures specified are preliminary based on current expectations, and are subject to change without notice.

All products, platforms, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice. All dates specified are target dates, are provided for planning purposes only and are subject to change.

This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel, Intel Inside and Movidius are trademarks of Intel Corporation in the U.S. and other countries.

Other names and brands may be claimed as the property of others.

Copyright © 2019, Intel Corporation. All rights reserved.

INTEL® SERVER / WORKSTATION PROCESSORS

Intel® Product Quick Reference Matrix

Q3 2019

INNOVATION YOU WANT. VERSATILITY YOU NEED.

ENABLING BETTER DESIGNS AND FASTER TIME TO MARKET

The demand for faster time to market, design optimization, and cost reduction is driving the rapid adoption of workstation products in many industries. Not long ago, workstations were relegated to high-end design tasks such as complex mechanical assemblies, buildings, and aerospace design. Today, workstations are used in every major industry for tasks ranging from financial modeling, to designing complex buildings and vehicles. Workstations have become standard equipment for engineers, content creators, analysts, and others who need the highest levels of performance, visualization, and data integrity.

INTEL® SERVER / WORKSTATION PROCESSORS

Innovation You Want. Versatility You Need.

Intel® Xeon PHI™ Product Family

2nd Generation Intel® Xeon® Scalable Processors

Intel® Xeon® Scalable Processors

Intel® Xeon® Processor E7-8800/4800 v4 Family

Intel® Xeon® Processor E7-8800/4800 v3 Family

Intel® Xeon® Processor E7-8800/4800/2800 v2 Family

Intel® Xeon® Processor E5-4600 v4 Family

Intel® Xeon® Processor E5-4600 v3 Family

Intel® Xeon® Processor E5-2600/1600 v4 Family

Intel® Xeon® Processor E5-2600/1600 v3 Family

Intel® Xeon® Processor E5-4600/2600/2400/1600 v2 Family

Intel® Xeon® W Processors

Intel® Xeon® Processor E3-1500 v5 Family

Intel® Xeon® Processor E3-1200 v6 Family

Intel® Xeon® Processor E3-1200 v5 Family

Intel® Xeon® Processor E3-1200 v4 Family

Intel® Xeon® Processor E3-1200 v3 Family

Intel® Xeon® Processor D-1500 Product Family

INTEL® XEON® PHI™ PRODUCT FAMILY

The Intel® Xeon Phi™ Processor – Your Path to Deeper Insight

Eliminate node bottlenecks, simplify your code modernization, and build on a power-efficient architecture with the Intel® Xeon Phi™ processor, a foundational element of Intel® Scalable System Framework. The bootable host processor offers an integrated architecture for powerful, highly parallel performance that will pave your path to deeper insight, innovation, and impact for today's most-demanding High Performance Computing applications, including Machine Learning. Supported by a comprehensive technology roadmap and robust ecosystem, the Intel® Xeon Phi™ processor is a future-ready solution that maximizes your return on investment by using open standards code that are flexible, portable, and reusable.

Product Specifications

PROCESSOR NAME	# OF CORES/ # OF THREADS	CLOCK SPEED	MAX TDP/POWER	MEMORY TYPES	FABRIC	L2 CACHE
Intel® Xeon™ Phi Processor 7250 (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	215 W	DDR4-2400	No	34 MB
Intel® Xeon™ Phi Processor 7230 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2400	No	32 MB
Intel® Xeon™ Phi Processor 7210 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2133	No	32 MB
Intel® Xeon™ Phi Processor 7290 (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	245 W	DDR4-2400	No	36 MB
Intel® Xeon™ Phi Processor 7290F (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	260 W	DDR4-2400	Yes	36 MB
Intel® Xeon™ Phi Processor 7250F (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	230 W	DDR4-2400	Yes	34 MB
Intel® Xeon™ Phi Processor 7230F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2400	Yes	32 MB
Intel® Xeon™ Phi Processor 7210F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2133	Yes	32 MB

Intel® Xeon Phi™ Coprocessors

Power breakthrough innovations with the highly parallel processing of the Intel® Xeon Phi™ coprocessor. Languages, tools, and applications run smoothly across the full spectrum of Intel® Xeon® processor family-based platforms. Intel Xeon Phi coprocessors provides 68 cores, 272 threads, and 2.828 double-precision teraFLOPS of performance,[4,5,6] and they come in a variety of configurations to address diverse hardware, software, workload, performance, and efficiency requirements.

Intel® Xeon Phi™ Coprocessor Product Family for Server Systems

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	CACHE	NO. OF CORES	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	THERMAL	UPC CODE
Intel® Xeon Phi™ Coprocessor 7240P	SC7240P	1.3 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33734 2
Intel® Xeon Phi™ Coprocessor 7220A	SC7220A	1.2 GHz	34 MB	68	✓	205W	Active Thermal	7 35858 33731 1
Intel® Xeon Phi™ Coprocessor 7220P	SC7220P	1.2 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33732 8
Intel® Xeon Phi™ Coprocessor 7220AEB (HS)	SC7220AEB	1.2 GHz	34 MB	68	✓	205W	Active Thermal	7 35858 33730 4

NEW 2nd Generation Intel® Xeon® Scalable Processors

The 2nd Generation Intel® Xeon® Scalable processors are the new foundation for secure, agile, multi-cloud data centers. With uncompromising security and exceptional processing performance for trusted data service delivery, these processors deliver monumental leaps in I/O, memory, storage and network technology to harness actionable insights from our increasingly data-fueled smart and connected world.

2nd Generation Intel® Xeon® Scalable Processors for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® UPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Platinum Processor 8280	CD8069504228001 (tray)	2.7	10.40GT/sec	38.5M	DDR4-2933	28/56	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8276	CD8069504195501 (tray)	2.2	10.40GT/sec	38.5M	DDR4-2933	28/56	✓	2	165W	N/A
Intel® Xeon® Platinum Processor 8270	CD8069504195201 (tray)	2.7	10.40GT/sec	35.75M	DDR4-2933	26/52	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8268	CD8069504195101 (tray)	2.9	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8260	CD8069504201101 (tray)	2.4	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	165W	N/A
Intel® Xeon® Platinum Processor 8256	CD8069504194701 (tray) BX806958256 (box)	3.8	10.40GT/sec	16.5M	DDR4-2933	4/8	✓	2	105W	N/A
Intel® Xeon® Platinum Processor 8253	CD8069504194601 (tray)	2.2	10.40GT/sec	22M	DDR4-2933	16/32	✓	2	125W	N/A
Intel® Xeon® Gold Processor 6254	CD8069504194501 (tray)	3.1	10.40GT/sec	24.75M	DDR4-2933	18/36	✓	2	200W	N/A
Intel® Xeon® Gold Processor 6252	CD8069504194401 (tray) BX806956252 (box)	2.1	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6248	CD8069504194301 (tray) BX806956248 (box)	2.5	10.40GT/sec	27.5M	DDR4-2933	20/40	✓	2	150W	tbd
Intel® Xeon® Gold Processor 6244	CD8069504194202 (tray)	3.6	10.40GT/sec	24.75M	DDR4-2933	8/16	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6242	CD8069504194101 (tray) BX806956242 (box)	2.8	10.40GT/sec	22M	DDR4-2933	16/32	✓	2	150W	N/A

Continued on next page

Continued from previous page

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® UPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Gold Processor 6240	CD8069504194001 (tray) BX806956240 (box)	2.6	10.40GT/sec	24.75M	DDR4-2933	18/36	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6230	CD8069504193701 (tray) BX806956230 (box)	2.1	10.40GT/sec	27.5M	DDR4-2933	20/40	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5222	CD8069504193501 (tray)	3.8	10.40GT/sec	16.5M	DDR4-2666	4/8	✓	2	105W	N/A
Intel® Xeon® Gold Processor 5220	CD8069504214601 (tray) BX806955220 (box)	2.2	10.40GT/sec	24.75M	DDR4-2666	18/36	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5218	CD8069504193301 (tray) BX806955218 (box)	2.3	10.40GT/sec	22M	DDR4-2666	16/32	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5217	CD8069504214302 (tray)	3	10.40GT/sec	11M	DDR4-2666	8/16	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5215	CD8069504214002 (tray)	2.5	10.40GT/sec	13.75M	DDR4-2666	10/20	✓	2	85W	N/A
Intel® Xeon® Silver Processor 4216	CD8069504213901 (tray) BX806954216 (box)	2.1	10.40GT/sec	22M	DDR4-2400	16/32	✓	2	100W	N/A
Intel® Xeon® Silver Processor 4215	CD8069504212701 (tray)	2.5	10.40GT/sec	11M	DDR4-2400	8/16	✓	2	85W	N/A
Intel® Xeon® Silver Processor 4214	CD8069504212601 (tray) BX806954214 (box)	2.2	10.40GT/sec	16.5M	DDR4-2400	12/24	✓	2	85W	N/A

Intel® Xeon® Scalable Processors

The Intel® Xeon® Scalable processors are the new foundation for secure, agile, multi-cloud data centers. With uncompromising security and exceptional processing performance for trusted data service delivery, these processors deliver monumental leaps in I/O, memory, storage and network technology to harness actionable insights from our increasingly data-fueled smart and connected world.

Intel® Xeon® Scalable Processors for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® UPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Platinum Processor 8180	CD8067303314400 (tray) WX806738180 (box)	2.50 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	205W	TBD
Intel® Xeon® Platinum Processor 8176	CD8067303314700 (tray) WX806738176 (box)	2.10 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	165W	TBD
Intel® Xeon® Platinum Processor 8170	CD8067303327601 (tray) WX806738170 (box)	2.10 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	✓	2.0	165W	N/A
Intel® Xeon® Platinum Processor 8164	CD8067303408800 (tray) WX806738164 (box)	2.00 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	✓	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8168	CD8067303327701 (tray)	2.70 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	✓	2.0	205W	N/A
Intel® Xeon® Platinum Processor 8160	CD8067303405600 (tray) WX806738160 (box)	2.10 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	✓	2.0	150W	TBD
Intel® Xeon® Platinum Processor 8158	CD8067303406500 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	✓	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8156	CD8067303368800 (tray)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2666 MHz	4/8	✓	2.0	105W	N/A
Intel® Xeon® Platinum Processor 8153	CD8067303408900 (tray)	2.00 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	125W	N/A
Intel® Xeon® Gold Processor 6154	CD8067303592700 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	200W	N/A
Intel® Xeon® Gold Processor 6152	CD8067303406000 (tray) WX806736152 (box)	2.10 GHz	10.4 GT/s	30.25M	DDR4-2666 MHz	22/44	✓	2.0	140W	TBD
Intel® Xeon® Gold Processor 6150	CD8067303328000 (tray)	2.70 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	165W	TBD

Continued on next page

Continued from previous page

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® UPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Gold Processor 6148	CD8067303406200 (tray) WX806736148 (box)	2.40 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6142	CD8067303405400 (tray) WX806736142 (box)	2.60 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6140	CD8067303405200 (tray) WX806736140 (box)	2.30 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	140W	TBD
Intel® Xeon® Gold Processor 6138	CD8067303406100 (tray) WX806736138 (box)	2.00 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	✓	2.0	125W	TBD
Intel® Xeon® Gold Processor 6132	CD8067303592500 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	14/28	✓	2.0	133W	N/A
Intel® Xeon® Gold Processor 6136	CD8067303405800 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	✓	2.0	148W	N/A
Intel® Xeon® Gold Processor 6134	CD8067303330302 (tray) WX806736134 (box)	3.20 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	8/16	✓	2.0	130W	N/A
Intel® Xeon® Gold Processor 6130	CD8067303409000 (tray) WX806736130 (box)	2.10 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	125W	TBD
Intel® Xeon® Gold Processor 6128	CD8067303592600 (tray) WX806736128 (box)	3.40 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	6/12	✓	2.0	115W	N/A
Intel® Xeon® Gold Processor 6126	CD8067303405900 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	12/24	✓	2.0	125W	N/A
Intel® Xeon® Gold Processor 5122	CD8067303330702 (tray) WX806735122 (box)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	4/8	✓	2.0	105W	N/A
Intel® Xeon® Gold Processor 5120	CD8067303535900 (tray) WX806735120 (box)	2.20 GHz	10.4 GT/s	19.25M	DDR4-2400 MHz	14/28	✓	2.0	105W	TBD
Intel® Xeon® Gold Processor 5118	CD8067303536100 (tray)	2.30 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	12/24	✓	2.0	105W	N/A
Intel® Xeon® Gold Processor 5115	CD8067303535601 (tray)	2.40 GHz	10.4 GT/s	13.75M	DDR4-2400 MHz	10/20	✓	2.0	85W	N/A
Intel® Xeon® Sliver Processor 4116	CD8067303567200 (tray) WX806734116 (box)	2.10 GHz	9.6 GT/s	16.5M	DDR4-2400 MHz	12/24	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4114	CD8067303561800 (tray) WX806734114 (box)	2.20 GHz	9.6 GT/s	13.75M	DDR4-2400 MHz	10/20	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4112	CD8067303562100 (tray) WX806734112 (box)	2.60 GHz	9.6 GT/s	8.25M	DDR4-2400 MHz	4/8	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4110	CD8067303561400 (tray) WX806734110 (box)	2.10 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4108	CD8067303561500 (tray) WX806734108 (box)	1.80 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Bronze Processor 3106	CD8067303561900 (tray) WX806733106 (box)	1.70 GHz	9.6 GT/s	11M	DDR4-2133 MHz	8/16	No	No	85W	TBD
Intel® Xeon® Bronze Processor 3104	CD8067303562000 (tray) WX806733104 (box)	1.70 GHz	9.6 GT/s	8.25M	DDR4-2133 MHz	6/12	No	No	85W	TBD

INTEL® XEON® PROCESSOR E7-8800 / 4800 V4 FAMILY

Introducing the New Intel Xeon Processor E7-8800/ 4800 v4 Product Family

Unleash exceptional performance for your most demanding data workloads. Fast track your business for real-time analytics and in-memory computing with the secure, reliable, performance workhorse that is the Intel® Xeon® processor E7-8800/4800 v4 product families. Designed for the most mission-critical workloads and the always-on enterprise, the processor combines large memory capacities with leading performance, reliability, and virtualization capabilities to keep your data center supplying business advantage without interruption.

Intel® Xeon® Processor E7-8800 v4 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E7-8893 v4	CM8066902065502	3.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v4	CM8066902027903	2.80 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8867 v4	CM8066902028403	2.40 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	165 W
Intel® Xeon® processor E7-8890 v4	CM8066902885200	2.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	24/48	✓	✓	165 W
Intel® Xeon® processor E7-8880 v4	CM8066902325500	2.20 GHz	9.6 GT/s	55M	1866 MHz (DDR4) 1600 MHz (DDR3)	22/44	✓	✓	150 W
Intel® Xeon® processor E7-8870 v4	CM8066902025802	2.10 GHz	9.6 GT/s	50M	1866 MHz (DDR4) 1600 MHz (DDR3)	20/40	✓	✓	140 W
Intel® Xeon® processor E7-8860 v4	CM8066902325800	2.20 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	140 W

Intel® Xeon® Processor E7-4800 v4 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E7-4850 v4	CM8066902026904	2.10 GHz	8.0 GT/s	40M	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	115 W
Intel® Xeon® processor E7-4830 v4	CM8066902027102	2.00 GHz	8.0 GT/s	35M	1866 MHz (DDR4) 1600 MHz (DDR3)	14/28	✓	✓	115 W
Intel® Xeon® processor E7-4820 v4	CM8066902027500	2.00 GHz	6.4 GT/s	25M	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	✓		115 W
Intel® Xeon® processor E7-4809 v4	CM8066902027604	2.10 GHz	6.4 GT/s	20M	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	✓		115 W

INTEL® XEON® PROCESSOR E7-8800 / 4800 V3 FAMILY

Introducing the New Intel Xeon Processor E7-8800/ 4800 v3 Product Family

In Q2 2015, Intel will launch the next-generation processor family in the Mission Critical and Expandable Segment for server platforms with 2, 4, and 8+ sockets. The Intel® Xeon® Processor E7-8800/4800 v3 family will offer top-of-the-line performance, scalability, and reliability for enterprise and mission critical workloads, including advanced analytics, databases, virtualization, and scale-up HPC. Based on Haswell[1] microarchitecture on the 22nm process technology, the Intel Xeon Processor E7-8800/4800 v3 family will introduce performance improvements, new RAS capabilities, and new power and thermal management capabilities, as well as support for DDR4 memory.

Intel® Xeon® Processor E7-8800 v3 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E7-8893 v3	CM8064501753602	3.20 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v3	CM8064501552202	2.80 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8890 v3	CM8064501549928	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	165 W
Intel® Xeon® processor E7-8880 v3	CM8064501550002	2.30 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	150 W
Intel® Xeon® processor E7-8880L v3	CM8064501552522	2.00 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	115 W
Intel® Xeon® processor E7-8870 v3	CM8064501550107	2.10 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	140 W
Intel® Xeon® processor E7-8867 v3	CM8064502025001	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	165 W
Intel® Xeon® processor E7-8860 v3	CM8064502017900	2.20 GHz	9.60 GT/s	40 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	140 W

Intel® Xeon® Processor E7-4800 v3 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E7-4850 v3	CM8064501551702	2.20 GHz	8 GT/s	35 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/28	✓	✓	115 W
Intel® Xeon® processor E7-4830 v3	CM8064502020101	2.10 GHz	8 GT/s	30 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	12/24	✓	✓	115 W
Intel® Xeon® processor E7-4820 v3	CM8064502020200	1.90 GHz	6.40 GT/s	25 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	✓		115 W
Intel® Xeon® processor E7-4809 v3	CM8064501551526	2.00 GHz	6.40 GT/s	20 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	✓		115 W

Intel® Xeon® Processor E7-8800 / 4800 / 2800 v2 Product Families

Rapidly process and analyze large amounts of data in near real time with the Intel® Xeon® processor E7-8800 / 4800 / 2800 v2 product families.

Keep data local with up to 1.5 TB of memory per socket to manage data-demanding, transaction-intensive workloads. Intel® Run Sure Technology[2] helps increase system uptime and data integrity for business-critical solutions. Hardware-embedded security features help better protect data and provide a safer environment.

Intel® Xeon® Processor E7-8800 v2 Product Family for Server / Workstation Systems Featuring Eight LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E7-8893 v2	CM8063601454907	3.40 GHz	8 GT/s	37.5 MB	1600 MHz	6/12	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8891 v2	CM8063601377422	3.20 GHz	8 GT/s	37.5 MB	1600 MHz	10/20	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8890 v2	CM8063601213513	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8880 v2	CM8063601271810	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-8880L v2	CM8063601275812	2.20 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	105 W	N/A
Intel® Xeon® processor E7-8870 v2	CM8063601272006	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-8857 v2	CM8063601275912	3.00 GHz	8 GT/s	30 MB	1600 MHz	12/12		✓	130 W	N/A
Intel® Xeon® processor E7-8850 v2	CM8063601272306	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A

Intel® Xeon® Processor E7-4800 v2 Product Family for Server / Workstation Systems Featuring Four LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E7-4890 v2	CM8063601272412	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-4880 v2	CM8063601272512	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4870 v2	CM8063601272606	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4860 v2	CM8063601453406	2.60 GHz	8 GT/s	30 MB	1600 MHz	12/24	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4850 v2	CM8063601272906	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4830 v2	CM8063601374506	2.20 GHz	7.20 GT/s	20 MB	1333 MHz	10/20	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4820 v2	CM8063601521707	2.00 GHz	7.20 GT/s	16 MB	1333 MHz	8/16	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4809 v2	CM8063601537106	1.90 GHz	6.40 GT/s	12 MB	1066 MHz	6/12	✓		105 W	N/A

Intel® Xeon® Processor E7-2800 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011-1 Sockets

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E7-2890 v2	CM8063601375306	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-2880 v2	CM8063601273306	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-2870 v2	CM8063601273406	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-2850 v2	CM8063601275706	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A

INTEL® XEON® PROCESSOR E5-4600 V4 FAMILY

Introducing the New Intel® Xeon® Processor E5-4600 v4 Product Family

Four-socket servers based on the Intel® Xeon® processor E5-4600 v4 product family provide high-density, cost-optimized, energy-efficient compute resources to support larger workloads and high virtual machine densities for the data center or cloud.

Intel® Xeon® Processor E5-4600 v4 Product Family for Server / Workstation Systems

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E5-4660 v4	CM8066002062605	2.20 GHz	9.6 GT/s	40 MB	DDR4-2400 MHz	16/32	✓	✓	120 W
Intel® Xeon® processor E5-4650 v4	CM8066002028621	2.20 GHz	9.6 GT/s	35 MB	DDR4-2400 MHz	14/28	✓	✓	105 W
Intel® Xeon® processor E5-4640 v4	CM8066002061701	2.10 GHz	8.0 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4620 v4	CM8066002883900	2.10 GHz	8.0 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W
Intel® Xeon® processor E5-4610 v4	CM8066002062800	1.80 GHz	6.4 GT/s	25 MB	DDR4-1866 MHz	10/20	✓		105 W
Intel® Xeon® processor E5-4669 v4	CM8066002064800	2.20 GHz	9.6 GT/s	55 MB	DDR4-2400 MHz	22/44	✓	✓	135 W
Intel® Xeon® processor E5-4667 v4	CM8066002064600	2.20 GHz	9.6 GT/s	45 MB	DDR4-2400 MHz	18 /36	✓	✓	135 W
Intel® Xeon® processor E5-4655 v4	CM8066002065000	2.50 GHz	9.6 GT/s	30 MB	DDR4-2400 MHz	8/16	✓	✓	135 W
Intel® Xeon® processor E5-4627 v4	CM8066002330800	2.60 GHz	9.6 GT/s	25 MB	DDR4-2400 MHz	10/10		✓	135 W

INTEL® XEON® PROCESSOR E5-4600 V3 FAMILY

Introducing the New Intel® Xeon® Processor E5-4600 v3 Product Family

Available Q2 2015, the Intel® Xeon® processor E5-4600 v3 product family is a 4-socket server platform that supports DDR4 memory technology. Target applications and usage models include large memory databases that need a highly scalable number of cores and memory bandwidth per server, and large-scale online transaction processing workloads where high-speed and large capacity memory configurations are required.

Intel® Xeon® Processor E5-4600 v3 Product Family for Server / Workstation Systems

PROCESSOR NAME[1]	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER
Intel® Xeon® processor E5-4660 v3	CM8064402018700	2.10 GHz	9.60 GT/s	35 MB	2133 MHz	14/28	✓	✓	120 W
Intel® Xeon® processor E5-4650 v3	CM8064401441008	2.10 GHz	9.60 GT/s	30 MB	2133 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4640 v3	CM8064401442601	1.90 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4620 v3	CM8064401442401	2.00 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	105 W
Intel® Xeon® processor E5-4610 v3	CM8064402018800	1.70 GHz	6.40 GT/s	25 MB	1600 MHz	10/20	✓		105 W
Intel® Xeon® processor E5-4669 v3	CM8064401864100	2.10 GHz	9.60 GT/s	45 MB	2133 MHz	18/36	✓	✓	135 W
Intel® Xeon® processor E5-4667 v3	CM8064401864200	2.00 GHz	9.60 GT/s	40 MB	2133 MHz	16/32	✓	✓	135 W
Intel® Xeon® processor E5-4655 v3	CM8064402018600	2.90 GHz	9.60 GT/s	30 MB	2133 MHz	6/12	✓	✓	135 W
Intel® Xeon® processor E5-4627 v3	CM8064401544203	2.60 GHz	8 GT/s	25 MB	2133 MHz	10/10		✓	135 W

Intel® Xeon® Processor E5-2600 v4 Product Family

The powerful new Intel® Xeon® processor E5-2600 v4 product family offers versatility across diverse workloads. These processors are designed for architecting next-generation data centers running on, software defined infrastructure supercharged for efficiency, performance, and agile services delivery across cloud-native and traditional applications. They support workloads for cloud, high-performance computing, networking, and storage.

Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-2699 v4	CM8066002022506 (tray)	2.20 GHz	9.6 GT/s	55M	DDR4-2400 MHz	22/44	✓	2.0	145	N/A
Intel® Xeon® Processor E5-2698 v4	CM8066002024000 (tray)	2.20 GHz	9.6 GT/s	50M	DDR4-2400 MHz	20/40	✓	2.0	135	N/A
Intel® Xeon® Processor E5-2697 v4	CM8066002023907 (tray) BX80660E52697V4 (box)	2.30 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	✓	2.0	145	735858310574
Intel® Xeon® Processor E5-2697A v4	CM8066002645900 (tray)	2.60 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	✓	2.0	145	N/A
Intel® Xeon® Processor E5-2695 v4	CM8066002023801 (tray) BX80660E52695V4 (box)	2.10 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	✓	2.0	120W	735858310628
Intel® Xeon® Processor E5-2690 v4	CM8066002030908 (tray) BX80660E52690V4 (box)	2.60 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	135W	735858310857
Intel® Xeon® Processor E5-2683 v4	CM8066002023604 (tray) BX80660E52683V4 (box)	2.10 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	✓	2.0	120W	735858310529
Intel® Xeon® Processor E5-2680 v4	CM8066002031501 (tray) BX80660E52680V4 (box)	2.40 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	120W	735858310802
Intel® Xeon® Processor E5-2660 v4	CM8066002030908 (tray) BX80660E52660V4 (box)	2.00 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	105W	735858310758
Intel® Xeon® Processor E5-2650 v4	CM8066002031103 (tray) BX80660E52650V4 (box)	2.20 GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	✓	2.0	105W	735858310703

Continued on next page

Continued from previous page

Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-2640 v4	CM8066002032701 (tray) BX80660E52640V4 (box)	2.40 GHz	9.6 GT/s	25M	DDR4-2133 MHz	10/20	✓	2.0	90W	735858314220
Intel® Xeon® Processor E5-2630v4	CM8066002032301 (tray) BX80660E52630V4 (box)	2.20 GHz	8 GT/s	25M	DDR4-2133 MHz	10/20	✓	2.0	85W	735858314121
Intel® Xeon® Processor E5-2620v4	CM8066002032201 (tray) BX80660E52620V4 (box)	2.10 GHz	8 GT/s	20M	DDR4-2133 MHz	8/16	✓	2.0	85W	735858314077
Intel® Xeon® Processor E5-2609v4	CM8066002032901 (tray) BX80660E52609V4 (box)	1.70 GHz	8 GT/s	20M	DDR4-1866 MHz	8/8	✓	2.0	85W	735858314022
Intel® Xeon® Processor E5-2603v4	CM8066002032805 (tray) BX80660E52603V4 (box)	1.70 GHz	6.4 GT/s	15M	DDR4-1866 MHz	6	✓	2.0	85W	735858313971
Intel® Xeon® Processor E5-2650L v4	CM8066002033006 (tray)	1.70 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	65W	N/A
Intel® Xeon® Processor E5-2630L v4	CM8066002033202 (tray)	1.80 GHz	8 GT/s	20M	DDR4-2133 MHz	10/20	✓	2.0	55W	N/A
Intel® Xeon® Processor E5-2667 v4	CM8066002041900 (tray)	3.20 GHz	9.6 GT/s	25M	DDR4-2400 MHz	8/16	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2643 v4	CM8066002041500 (tray)	3.40 GHz	9.6 GT/s	20M	DDR4-2400 MHz	6/12	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2637 v4	CM8066002041100 (tray)	3.50 GHz	9.6 GT/s	15M	DDR4-2400 MHz	4/8	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2623 v4	CM8066002402400 (tray)	2.60 GHz	8 GT/s	10M	DDR4-2133 MHz	4/8	✓	2.0	85W	N/A
WORKSTATION SKU										
Intel® Xeon® Processor E5-2687W v4	CM8066002042802 (tray) BX80660E52687V4 (box)	3.0GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	✓	2.0	160W	735858310901

Intel® Xeon® Processor E5-1600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
SERVER SKUS										
Intel® Xeon® Processor E5-1680 v4	CM8066002044401 (tray)	3.40 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1660 v4	CM8066002646401 (tray)	3.20 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1650 v4	CM8066002044306 (tray) BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	✓	2.0	140W	735858318952
Intel® Xeon® Processor E5-1630 v4	CM8066002395300 (tray)	3.70 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1620 v4	CM8066002044103 (tray) BX80660E51620V4 (box)	3.50 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	✓	2.0	140W	735858314176
WORKSTATION SKU										
Intel® Xeon® Processor E5-1650 v4	BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	✓	2.0	140W	

Intel® Xeon® Processor E5-2600 / 1600 v3 Product Family

Intel® Xeon® processor E5-2600 / 1600 v3 product families are at the heart of an agile, efficient data center and help meet your needs for compute, storage, and network. These energy-efficient marvels are designed to help deliver a combination of performance, built-in capabilities, and cost-effectiveness. Whether addressing technical computing challenges, enabling cloud deployments, delivering intelligent storage, or powering design automation and data analytics, enjoy better-than-ever performance. Help better safeguard your data and infrastructure with technology foundational for greater security. Break challenging data management performance bottlenecks with 40 gigabit Intel® Ethernet, DDR4 support, and innovative storage features. Built-in capabilities that measure and monitor make Intel-powered platforms the smart choice for a software-defined world. With the flexibility and versatility of the Intel Xeon processor E5-2600 / 1600 v3 families, you only have to remember one thing: It's what's inside that counts.

Intel® Xeon® Processor E5-2600 v3 Product Family for Server and Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
ADVANCED SKUS										
Intel® Xeon® processor E5-2690 v3	BX80644E52690V3 (box) CM8064401439416 (tray)	2.60 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	135 W	7 35858 28363 2
Intel® Xeon® processor E5-2680 v3	BX80644E52680V3 (box) CM8064401439612 (tray)	2.50 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	120 W	7 35858 28358 8
Intel® Xeon® processor E5-2670 v3	BX80644E52670V3 (box) CM8064401544801 (tray)	2.30 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	120 W	7 35858 28368 7
Intel® Xeon® processor E5-2660 v3	BX80644E52660V3 (box) CM8064401446117 (tray)	2.60 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28353 3
Intel® Xeon® processor E5-2650 v3	BX80644E52650V3 (box) CM8064401723701 (tray)	2.30 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28378 6
STANDARD SKUS										
Intel® Xeon® processor E5-2640 v3	BX80644E52640V3 (box) CM8064401830901 (tray)	2.60 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	90 W	7 35858 28522 3
Intel® Xeon® processor E5-2630 v3	BX80644E52630V3 (box) CM8064401831000 (tray)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	7 35858 28533 9
Intel® Xeon® processor E5-2620 v3	BX80644E52620V3 (box) CM8064401831400 (tray)	2.40 GHz	8 GT/s	15 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	7 35858 28538 4
BASIC SKUS										
Intel® Xeon® processor E5-2609 v3	BX80644E52609V3 (box) CM8064401850800 (tray)	1.90 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28373 1
Intel® Xeon® processor E5-2603 v3	BX80644E52603V3 (box) CM8064401844200 (tray)	1.60 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28517 9

Continued on next page

Continued from previous page

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
SEGMENT-OPTIMIZED SKUS										
Intel® Xeon® processor E5-2699 v3	CM8064401739300 (tray only)	2.30 GHz	9.60 GT/s	45 MB	DDR4-2133 MHz	18 / 36	✓	✓	145 W	N/A
Intel® Xeon® processor E5-2698 v3	CM8064401609800 (tray only)	2.30 GHz	9.60 GT/s	40 MB	DDR4-2133 MHz	16 / 26	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2697 v3	BX80644E52697V3 (box) CM8064401807100 (tray)	2.60 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	145 W	7 35858 28264 2
Intel® Xeon® processor E5-2695 v3	BX80644E52695V3 (box) CM8064401438110 (tray)	2.30 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	120 W	7 35858 28269 7
Intel® Xeon® processor E5-2683 v3	CM8064401609728 (tray only)	2 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	120 W	N/A
WORKSTATION SKUS										
Intel® Xeon® processor E5-2687W v3	BX80644E52687V3 (box) CM8064401613502 (tray)	3.10 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	160 W	7 35858 28348 9
FREQUENCY-OPTIMISED SKUS										
Intel® Xeon® processor E5-2667 v3	CM8064401724301 (tray only)	3.20 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	8/16	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2643 v3	CM8064401724501 (tray only)	3.40 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	6/12	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2637 v3	CM8064401724101 (tray only)	3.50 GHz	9.60 GT/s	15 MB	DDR4-2133 MHz	4/8	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2623 v3	CM8064401832000 (tray only)	3 GHz	8 GT/s	10 MB	DDR4-1866 MHz	4/8	✓	✓	105 W	N/A
LOW-POWER SKUS										
Intel® Xeon® processor E5-2650L v3	CM8064401575702 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	65 W	N/A
Intel® Xeon® processor E5-2630L v3	CM8064401832100 (tray only)	1.80 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	55 W	N/A
EMBEDDED SKUS										
Intel® Xeon® processor E5-2658 v3	CM8064401545904 (tray only)	2.20 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	105 W	N/A
Intel® Xeon® processor E5-2648L v3	CM8064401546007 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2628L v3	CM8064401547200 (tray only)	2 GHz	8 GT/s	25 MB	DDR4-1866 MHz	10/20	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2622 v3	CM8064401576904 (tray only)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	N/A
Intel® Xeon® processor E5-2618L v3	CM8064401610301 (tray only)	2.30 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2608L v3	CM8064401909500 (tray only)	2 GHz	6.40 GT/s	15 MB	DDR4-1866 MHz	6/12	✓		52 W	N/A

Intel® Xeon® Processor E5-1600 v3 Product Family for Workstation Systems Featuring One LGA2011 Socket

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
ADVANCED SKUS									
Intel® Xeon® processor E5-1680 v3	CM8064401547809 (tray only)	3.20 GHz	20 MB	DDR4-2133 MHz	8/16	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1660 v3	CM8064401909200 (tray only)	3 GHz	20 MB	DDR4-2133 MHz	8/16	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1650 v3	CM8064401548111 (tray only)	3.50 GHz	15 MB	DDR4-2133 MHz	6/12	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1630 v3	CM8064401614501 (tray only)	3.70 GHz	10 MB	DDR4-2133 MHz	4/8	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1620 v3	CM8064401973600 (tray only)	3.50 GHz	10 MB	DDR4-2133 MHz	4/8	✓	✓	140 W	N/A

Intel® Xeon® Processor E5-4600 / 2600 / 2400 / 1600 v2 Product Families

The Intel® Xeon® processor E5-2600 / 1600 v2, E5-2400 v2, and E5-4600 v2 product families are at the heart of an agile, efficient data center. Deploy a more trusted private cloud with the technology foundational for greater security. Put the "instantaneous" into data analysis with the performance to quickly process big data. These new Intel Xeon processor families enable greater energy efficiency and power management for a range of enterprise applications.

Intel® Xeon® Processor E5-4600 v2 Product Family for Server Systems Featuring Four LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E5-4657L v2	CM8063501285605 (tray only)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	115 W	N/A
Intel® Xeon® processor E5-4650 v2	CM8063501541700 (tray only)	2.40 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4640 v2	CM8063501285713 (tray only)	2.20 GHz	8 GT/s	20 MB	1866 MHz	10/20	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4627 v2	CM8063501454002 (tray only)	3.30 GHz	7.20 GT/s	16 MB	1866 MHz	8/8		✓	130 W	N/A
Intel® Xeon® processor E5-4624L v2	CM8063501293407 (tray only)	1.90 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	70 W	N/A
Intel® Xeon® processor E5-4620 v2	CM8063501393202 (tray only)	2.60 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4610 v2	CM8063501521600 (tray only)	2.30 GHz	7.20 GT/s	16 MB	1600 MHz	8/16	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4607 v2	CM8063501377604 (tray only)	2.60 GHz	6.40 GT/s	12 MB	1333 MHz	6/12	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4603 v2	CM8063501453800 (tray only)	2.20 GHz	6.40 GT/s	10 MB	1333 MHz	4/8	✓	✓	95 W	N/A

Intel® Xeon® Processor E5-2600 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E5-2697 v2	BX80635E52697V2 (box) CM8063501288843 (tray)	2.70 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	130 W	7 35858 26666 6
Intel® Xeon® processor E5-2695 v2	BX80635E52695V2 (box) CM8063501288706 (tray)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	115 W	7 35858 26671 0
Intel® Xeon® processor E5-2690 v2	BX80635E52690V2 (box) CM8063501374802 (tray)	3 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	130 W	7 35858 26832 5
Intel® Xeon® processor E5-2687W v2	BX80635E52687V2 (box) CM8063501287203 (tray)	3.10 GHz	8 GT/s	20 MB	1866 MHz	8/16	✓	✓	150 W	7 35858 26922 3
Intel® Xeon® processor E5-2680 v2	BX80635E52680V2 (box) CM8063501374901 (tray)	2.80 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	130 W	7 35858 26837 0
Intel® Xeon® processor E5-2670 v2	BX80635E52670V2 (box) CM8063501375000 (tray)	2.50 GHz	8 GT/s	20 MB	1866 MHz	10/20	✓	✓	115 W	7 35858 26842 4
Intel® Xeon® processor E5-2667 v2	CM8063501287304 (tray only)	3.30 GHz	8 GT/s	25 MB	1866 MHz	8/16	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2660 v2	BX80635E52660V2 (box) CM8063501452503 (tray)	2.20 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	95 W	7 35858 26847 9
Intel® Xeon® processor E5-2650 v2	BX80635E52650V2 (box) CM8063501375101 (tray)	2.60 GHz	8 GT/s	20 MB	1866 MHz	8/16	✓	✓	95 W	7 35858 26852 3
Intel® Xeon® processor E5-2650L v2	CM8063501287602 (tray only)	1.70 GHz	7.20 GT/s	25 MB	1600 MHz	10/20	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2643 v2	CM8063501287403 (tray only)	3.50 GHz	8 GT/s	25 MB	1866 MHz	6/12	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2640 v2	BX80635E52640V2 (box) CM8063501288202 (tray)	2 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 26857 8
Intel® Xeon® processor E5-2637 v2	CM8063501520800 (tray only)	3.50 GHz	8 GT/s	15 MB	1866 MHz	4/8	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2630 v2	BX80635E52630V2 (box) CM8063501288100 (tray)	2.60 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 26884 4
Intel® Xeon® processor E5-2630L v2	CM8063501376200 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	N/A
Intel® Xeon® processor E5-2620 v2	BX80635E52620V2 (box) CM8063501288301 (tray)	2.10 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	735858 26889 9
Intel® Xeon® processor E5-2609 v2	BX80635E52609V2 (box) CM8063501375800 (tray)	2.50 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26894 3
Intel® Xeon® processor E5-2603 v2	BX80635E52603V2 (box) CM8063501375902 (tray)	1.80 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26899 8

Intel® Xeon® Processor E5-2400 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	INTEL® QPI[3] SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E5-2470 v2	BX80634E52470V2 (box) CM8063401286102 (tray)	2.40 GHz	8 GT/s	25 MB	1600 MHz	10/20	✓	✓	95 W	7 35858 27206 3
Intel® Xeon® processor E5-2450 v2	BX80634E52450V2 (box) CM8063401376400 (tray)	2.50 GHz	8 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 27211 7
Intel® Xeon® processor E5-2450L v2	CM8063401287001 (tray only)	1.70 GHz	8 GT/s	20 MB	1600 MHz	8/16	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2440 v2	BX80634E52440V2 (box) CM8062000862604 (tray)	1.90 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 27201 8
Intel® Xeon® processor E5-2430 v2	BX80634E52430V2 (box) CM8063401286400 (tray)	2.50 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 27196 7
Intel® Xeon® processor E5-2430L v2	CM8063401376704 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	60 W	N/A
Intel® Xeon® processor E5-2420 v2	BX80634E52420V2 (box) CM8063401286503 (tray)	2.20 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 27191 2
Intel® Xeon® processor E5-2407 v2	BX80634E52407V2 (box) CM8063401286600 (tray)	2.40 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27186 8
Intel® Xeon® processor E5-2403 v2	BX80634E52403V2 (box) CM8063401286702 (tray)	1.80 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27181 3

Intel® Xeon® Processor E5-1600 v2 Product Family for Workstation Systems Featuring One LGA2011 Socket

(Thermal Solution Sold Separately)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E5-1660 v2	BX80635E51660V2 (box) CM8063501291808 (tray)	3.70 GHz	15 MB	1866 MHz	6/12	✓	✓	130 W	7 35858 26927 8
Intel® Xeon® processor E5-1650 v2	CM8063501292204 (tray only)	3.50 GHz	12 MB	1600 MHz	6/12	✓	✓	130 W	N/A
Intel® Xeon® processor E5-1620 v2	CM8063501292405 (tray only)	3.70 GHz	10 MB	1600 MHz	4/8	✓	✓	130 W	N/A

Intel® Xeon® W Processors for Workstation Systems

Intel® Xeon® W processors deliver optimized performance for the needs of mainstream workstation professionals. Hardware-enhanced workload performance, security, and reliability for the increasing demands of professional workstations and ready for professional quality VR design.

PROCESSOR NAME[1]	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® W-2123 Processor	CD8067303533002	BX80673W2123	3.60 GHz	8.25 MB	2400 MHz	4/8	✓	✓	120W	735858351737
Intel® Xeon® W-2125 Processor	CD8067303533303	N/A	4.00 GHz	8.25 MB	2400 MHz	4/8	✓	✓	120W	N/A
Intel® Xeon® W-2133 Processor	CD8067303533204	N/A	3.60 GHz	8.25 MB	2400 MHz	6/12	✓	✓	140W	N/A
Intel® Xeon® W-2135 Processor	CD8067303533403	BX80673W2135	3.70 GHz	8.25 MB	2400 MHz	6/12	✓	✓	140W	735858355131
Intel® Xeon® W-2145 Processor	CD8067303533601	N/A	3.70 GHz	11 MB	2400 MHz	8/16	✓	✓	140W	N/A
Intel® Xeon® W-2155 Processor	CD8067303533703	N/A	3.30 GHz	13.75 MB	2400 MHz	10/20	✓	✓	140W	N/A
Intel® Xeon® W-2195 Processor	CD8067303805901	N/A	2.30 GHz	24.75 MB	2400 MHz	18/36	✓	✓	140W	N/A

INTEL® XEON® PROCESSOR E3-1500 V5 FAMILY

Introducing the Intel® Xeon® Processor E3-1500 v5 product family—the data center graphics powerhouse

Create visually stunning user experiences at low total cost of ownership with the new Intel® Xeon® processor E3-1500 v5 product family featuring Intel® Iris™ Pro graphics P580.

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Processor E3-1585 v5	JQ8066201935710	3.50 GHz	8 MB	2133 MHz	4/8	✓	✓	65W	N/A
Intel® Xeon® Processor E3-1585L v5	JQ8066201935627	3.00 GHz	8 MB	2133 MHz	4/8	✓	✓	45W	N/A
Intel® Xeon® Processor E3-1565L v5	JQ8066201935626	2.50 GHz	8 MB	2133 MHz	4/8	✓	✓	35W	N/A

Intel® Xeon® Processor E3-1200 v6 Product Family for Server and Workstation Systems

The latest Intel® Xeon® processor E3-1200 v6 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, Intel Xeon processor E3-1200 v6 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.

PROCESSOR NAME[1]	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v6	CM8067702870647	N/A	3.9 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	N/A
Intel® Xeon® Processor E3-1275 v6	CM8067702870931	BX80677E31275v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	✓	73 W	00735858328364
Intel® Xeon® Processor E3-1270 v6	CM8067702870648	BX80677E31270v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328487
Intel® Xeon® Processor E3-1245 v6	CM8067702870932	BX80677E31245v6	3.7 GHz	8 MB	2400 MHz	4/8	✓	✓	73 W	00735858328128
Intel® Xeon® Processor E3-1240 v6	CM8067702870649	BX80677E31240v6	3.7 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328180
Intel® Xeon® Processor E3-1230 v6	CM8067702870650	BX80677E31230v6	3.5 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328425
Intel® Xeon® Processor E3-1225 v6	CM8067702871024	BX80677E31225v6	3.3 GHz	8 MB	2400 MHz	4/4	✓	✓	73 W	00735858328241
Intel® Xeon® Processor E3-1220 v6	CM8067702870812	BX80677E31220v6	3.0 GHz	8 MB	2400 MHz	4/4		✓	72 W	00735858328302

INTEL® XEON® PROCESSOR E3-1200 V5 FAMILY

Intel® Xeon® Processor E3-1200 v5 Product Family for Server and Workstation Systems

The latest Intel® Xeon® processor E3-1200 v5 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, and graphics performance, Intel Xeon processor E3-1200 v5 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.

PROCESSOR NAME[1]	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v5	CM806620192160		3.7 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	N/A
Intel® Xeon® Processor E3-1270 v5	CM8066201921712	BX80662E31270V5	3.6 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301732
Intel® Xeon® Processor E3-1260L v5	CM8066201921903		2.9 GHz	8 MB	2133 MHz	4/8	✓	✓	45 W	N/A
Intel® Xeon® Processor E3-1240L v5	CM8066201935808		2.1 GHz	8 MB	2133 MHz	4/8	✓	✓	25 W	N/A
Intel® Xeon® Processor E3-1240 v5	CM8066201921715	BX80662E31240V5	3.5 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301855
Intel® Xeon® Processor E3-1230 v5	CM8066201921713	BX80662E31230V5	3.4 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301916
Intel® Xeon® Processor E3-1220 v5	CM8066201921804	BX80662E31220V5	3 GHz	8 MB	2133 MHz	4/4	✓	✓	80 W	735858302036
Intel® Xeon® Processor E3-1275 v5	CM8066201934909	BX80662E31275V5	3.6 GHz	8 MB	2133 MHz	4/8		✓	80 W	735858301671
Intel® Xeon® Processor E3-1245 v5	CM8066201934913	BX80662E31245V5	3.5 GHz	8 MB	2133 MHz	4/8		✓	80 W	735858301794
Intel® Xeon® Processor E3-1235L v5	CM8066201935807		2 GHz	8 MB	2133 MHz	4/4		✓	25 W	N/A
Intel® Xeon® Processor E3-1225 v5	CM8066201922605	BX80662E31225V5	3.3 GHz	8 MB	2133 MHz	4/4		✓	80 W	735858301978

Intel® Xeon® Processor E3-1200 v4 Product Family for Server and Workstation Systems

The Intel® Xeon® Processor E3-1200 v4 product family supports up to 1.8x the overall graphics performance of the previous-generation[2], and delivers high-quality visual experiences with up to 1.4x more video transcoding performance per node[4] and up to 4,300 simultaneous HD video streams per rack than the previous generation Intel® Xeon® processor E3-1200 v3 product family.[3]

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E3-1285 v4[5]	CM8065802482701	3.50 GHz	6 MB	1866 MHz	4/8	✓	✓	95 W	N/A
Intel® Xeon® processor E3-1285L v4[5]	CM8065802482901	3.40 GHz	6 MB	1866 MHz	4/8	✓	✓	65 W	N/A
Intel® Xeon® processor E3-1265L v4[5]	CM8066201937901	2.30 GHz	6 MB	1866 MHz	4/8	✓	✓	35 W	N/A
Intel® Xeon® processor E3-1278L v4[6]	FH8065802420303	2.0 GHz	6 MB	1600 MHz	4/8	✓	✓	47 W	N/A
Intel® Xeon® processor E3-1258L v4[6, 7]	FH8065802420602	1.8 GHz	6 MB	1600 MHz	4/8	✓	✓	47 W	N/A

For more information, visit **www.intel.com/xeone3**

1 Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor_number/

2 Up to 1.8x better performance on 3DMark* 11. Baseline configuration: Intel® Hermosa Beach 2 CRB platform with Intel® Xeon® processor E3-1286v3, 32GB memory (4x 8GB DDR3-1333 UDIMM), 64GB SATA SSD, Intel® Turbo Boost enabled, HT enabled, Red Hat Enterprise Linux* 6.3, Oracle* Java* Hotspot Java 1.7.0_17. 3DMark* Score 1524, Source: Internal Intel measurements as of April 2014.

Intel® Xeon® processor workstation platform (Intel® Server Board 51200RP) with one Intel® Xeon® processor E3-1285 v4 (quad- core, 3.5GHz, 6M cache) BIOS 51200RP.8

68.03.01.0002.041520151123, Intel® Hyper-Threading Technology best configuration, 32GB memory (4x8GB DDR3-1600 ECC UDIMM), Intel® Iris™ Pro graphics P6300 with driver 10.18.10.3980, Intel SSDSC2BB300G4, Microsoft Windows 8.1* 3DMark* Score 2881, Source: Intel internal testing as of June 2015.

3 Up to 4300 streams per rack, or 1.4x vs previous generation. Rack density based on the Supermicro* SuperServer 5038ML-H24TRF 3U chassis with 12 sleds. Each sled containing 2 Intel® Xeon® E3-1200 v3 or v4 processors for a total of 24 E3-1200 v3 or v4 processors per 3U chassis. Assuming 2U for top of rack switches, 13 3U chassis could fit in each rack, giving 24*13=312 sockets in a 42u rack. 312*10=3120 streams E3-1286L v3; 312*14=4368 streams on E3-1285L v4

4 Up to 1.4x transcoding performance with Intel® Xeon® E3-1285L v4 when compared with Intel® Xeon® E3-1286L v3 on Intel Media Server Studio 2015 R3 Essentials Edition. Number of real time threads transcoded simultaneously: 10 on E3-1286L v3, 14 on E3-1285L v4, using 1080p30 20Mbps streams. Baseline configuration: Intel Rainbow Pass SR1200V3RP platform with Intel(R) Xeon® E3-1285L v4 (65W, 4C, 3.4Ghz, Intel® Iris Pro Graphics P6300) or Intel® Xeon® Processor E3-1286L v3 (65W, 4C, 3.2Ghz, Intel® HD Graphics P4700), 32 GB (4x8GB DDR3-1600MHz UDIMM), 160GB 7200 SATA HOD, Turbo Boost Enabled, HT Enabled, Windows Server 2012 R2, Intel Media Server Studio 2015 R3 Essentials Edition, Multi Transcoding Sample Version 6.0.0.36, Intel graphics driver pGFX 10.18.14.4172, BIOS S1200RP.86B.03.01.002. Source: Intel internal measurements as of May 2015

5 Intel® Iris™ Pro Graphics P6300 requires the latest-version Intel® Graphics Driver, Intel C226 chipset, and Intel® Xeon® processor E3-1285 v4, Intel® Xeon® processor E3-1278L v4, or Intel® Xeon® processor E3-1265 v4 to enable data centre graphics application optimizations.
To learn more about Intel Xeon processors for data center graphics, visit intel.com/datacentregraphics.

6 BGA package

7 HD P5700 graphics

Intel® Xeon® Processor E3-1200 v3 Product Family

The Intel® Xeon® Processor E3-1200 v3 product family supports a range of business needs. Platforms based on the Intel Xeon processor E3-1200 v3 product family can be used as an entry server for small business applications or as an entry workstation for CAD and financial services. Low-power SKUs are uniquely suited to support scale-out workloads in Microserver platforms, and graphics-enabled SKUs support remote / virtual graphics capabilities and media transcode usages in the data center.

Intel® Xeon® Processor E3-1200 v3 Product Family for Server and Workstation Systems Featuring One LGA1150 Socket

(Thermal Solution Included with Box SKUs)

PROCESSOR NAME[1]	PRODUCT CODE	CLOCK SPEED	SINGLECORE TURBO MAX. SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® GRAPHICS ENGINE	INTEL® HYPER-THREADING TECHNOLOGY[2]	INTEL® TURBO BOOST TECHNOLOGY[2]	POWER	UPC CODE
Intel® Xeon® processor E3-1281 v3	CM8064601575329 (tray only)	3.70 GHz	4.10 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	N/A
Intel® Xeon® processor E3-1276 v3	BX80646E31276V3 (box) CM8064601575216 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 27876 8
Intel® Xeon® processor E3-1271 v3	BX80646E31271V3 (box) CM8064601575330 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27900 0
Intel® Xeon® processor E3-1246 v3	BX80646E31246V3 (box) CM8064601575205 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 27882 9
Intel® Xeon® processor E3-1245 v3	BX80646E31245V3 (box) CM8064601466509 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 25940 8
Intel® Xeon® processor E3-1241 v3	BX80646E31241V3 (box) CM8064601575331 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27906 2
Intel® Xeon® processor E3-1231 v3	BX80646E31231V3 (box) CM8064601575332 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27912 3
Intel® Xeon® processor E3-1230L v3	CM8064601467601 (tray only)	1.80 GHz	2.80 GHz	8 MB	1600 MHz	2/4		✓	✓	25 W	N/A
Intel® Xeon® processor E3-1226 v3	BX80646E31226V3 (box) CM8064601575206 (tray)	3.30 GHz	3.70 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		✓	84 W	7 35858 27894 2
Intel® Xeon® processor E3-1225 v3	BX80646E31225V3 (box) CM8064601466507 (tray)	3.20 GHz	3.60 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		✓	84 W	7 35858 25946 0
Intel® Xeon® processor E3-1220 v3	BX80646E31220V3 (box) CM8064601467204 (tray)	3.10 GHz	3.50 GHz	8 MB	1600 MHz	4/4			✓	80 W	7 35858 25976 7
Intel® Xeon® Processor E3-1220L v3	CM8064601481914 (tray only)	1.10 GHz	1.50 GHz	4 MB	1600 MHz	2/4		✓	✓	13 W	N/A

For more information, visit **www.intel.com/xeon**

For more information, visit **www.intel.com/xeon**

1 Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor_number/

2 Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com

3 Intel® QPI–Intel® QuickPath Interconnect; GT/s–Gigatransfers per second.

4 Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information, go to www.intel.com/performance

5 Claim based on calculated theoretical peak double precision performance capability for a single coprocessor. 16 DP FLOPS/clock/core * 61 cores * 1.238 GHz = 1.208 TeraFLOPS.

6 Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

7 Intel® Xeon® Processor E5-2600 v4 product family (22C, 55M Cache) compared to Intel® Xeon® Processor E5-2600 v3 product family (18C, 45M Cache).

8 E5 v4 up to 47% vs. previous-generation E5 v3 performance based on binomialcpu v3.0_AVX2 financial services workload results as of 16 March 2016) comparing 1-Node, 2 x Intel® Xeon® Processor E5-2699 v3 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux* 6.4 kernel 2.6.32-358, Options per second Score: 106025 vs. 2 x Intel® Xeon® Processor E5-2699 v4 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux* 6.4 kernel 2.6.32-358, Options per second Score: 156141 Higher is better. Data Source: Request Number: 1871 E5 v4 up to 27% vs. previous-generation E5 v3 average performance based on key industry-standard benchmarks calculations submitted by OEMs as of 16 March 2016) comparing 2-socket Intel® Xeon® processor E5 v3 to v4 family. Key industry benchmarks include: SPECint*_rate_base2006, SPECint*_base 2006 (Speed), SPECfp*_rate_base 2006, SPECfp*_base2006 (Speed), SPECmpiL*_base2007, SPECmpiM*_base2007, SPECompG*_base2012, SPECvirt_sc*2013, VMmark* 2.5 performance (matched pairs), TPC-E*, SPECjEnterprise*2010, Two-tier SAP SD* Windows*/Linux, 1-Node TPC-H* 1TB, TPCx-BB* and SPECjbb*2015 MultiJVM. See http://www.intel.com/performance/datacenter for full configuration details.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/xeon

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Xeon, and Xeon Phi are trademarks of Intel Corporation in the U.S. and / or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

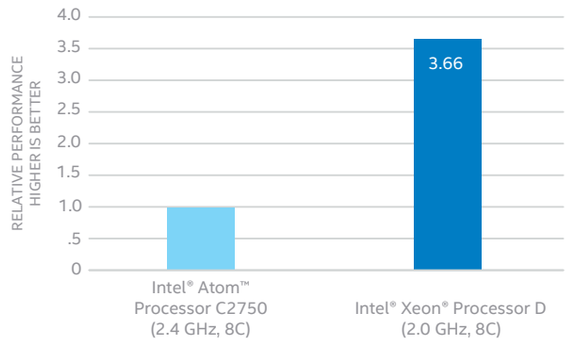
INTEL® XEON PROCESSOR D-1500 PRODUCT FAMILY

The Intel® Xeon® processor D family offers new options for infrastructure optimization, by bringing the performance and advanced intelligence of Intel® Xeon® processors into a dense, lower-power system-on-a-chip. The Intel Xeon processor D product family is Intel's 3rd generation 64-bit SoC and the first based on Intel Xeon processor technology. It can be deployed for a variety of workloads including dynamic web serving, dedicated web hosting, warm storage, network routing, and more.

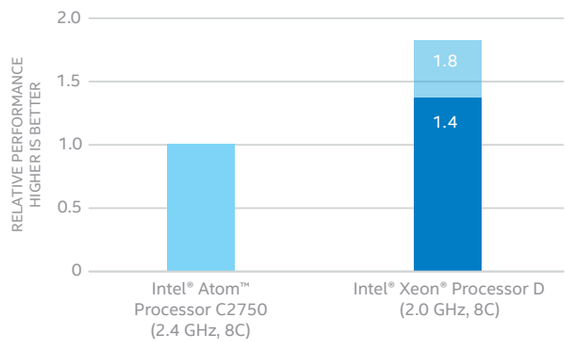
Intel® Xeon® Processor D-1500 Product Family

	INTEL® XEON® PROCESSOR D-1541	INTEL® XEON® PROCESSOR D-1521
Thermal Design Point	45W	45W
Frequency	2.1 GHz	2.4 GHz
Max Turbo Frequency	2.7 GHz	2.7 GHz
Cores	8	4
Threads	16	8
Memory Channels	2	2
DIMMS per Channel	2	2
DRAM Interface	ECC (DDR4), DDR3	ECC (DDR4), DDR3
Max. Memory Speed	2133 MT/s	2133 MT/s
Max. DRAM Capacity	128 GB	128 GB
Integrated I/O	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3
Network Interface	2 x 1/2.5/10 GbE Intel Ethernet	2 x 1/2.5/10 GbE Intel Ethernet
Built-In Intel® Virtualization Technology	VT-x, VT-d, and Cache QoS	VT-x, VT-d, and Cache QoS
Cache Hierarchy	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)

Performance
Dynamic Web Serving



Performance per Watt
Dynamic Web Serving



Intel® Xeon® Processor D-1500 Product Family

Intel® Xeon® Processor Intelligence in a Low-Power SoC	Up to 3.6x higher performance per node1,3 versus Intel® Atom™ processor C2750-based solutions. Includes up to 8 cores, two integrated ports of 10 Gigabit Intel® Ethernet, plus support for up to 128 GB of memory. Also includes Intel® 64-bit software support[4], L1 cache (32K data, 32K instructions per core), L2 cache (256K per core), LLC cache (1.5 MB per core), Intel® Turbo Boost Technology[4], and Intel® Hyper-Threading Technology.[4]
Industry-Leading 14 nm Process Technology	Enables dense, low power system designs with thermal design points of ~20W to 45W and system level performance per watt of up to 1.8x that of Intel Atom processor C2750-based solutions[2,3].
Server-Class Reliability, Availability, and Serviceability (RAS)	Provides high system reliability and data integrity with support for error correction code (ECC) memory, single device data correction (SDDC), memory demand and patrol scrubbing, and much more.
Built-In Intel® Virtualization Technology	Delivers near-native compute and I/O performance in virtualized data centers, network infrastructure, and cloud computing, with advanced monitoring of cache and memory bandwidth for better service level and infrastructure management.
Hardware-Enhanced Security and Compliance	Intel Advanced Encryption Standard New Instructions (Intel AES-NI) provide integrated support for fast, low-overhead encryption and Intel® Trusted Execution Technology (Intel® TXT) provides platform verification (through authenticated boot) to enable strong security with reduced performance impact[5].
Server-Class Manageability	Includes Intel® Node Manager Base for adaptive power management.
Intel® Platform Storage Extensions	Enables fast data movement and high availability through integrated support for non-transparent bridging (NTB), asynchronous DRAM self-refresh (ADR), and Intel® QuickData technology, which provides a direct memory access (DMA) engine within the SoC[6].

For more information, visit **www.intel.com/xeon**

1 Up to 3.6x better performance on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora* 20 (3.17.8-200.fc20.x86_64, Nginx* 1.4.4, Php-fpm* 15.4.14, memcached* 1.4.14, Simultaneous users=43844 Supermicro SuperServer* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu* 14.10(3.16.0-23 generic), Nginx* 1.4.4, Php-fpm* 15.4.14, memcached* 1.4.14, Simultaneous users=12896.

2 Up to 1.8x (estimated) better performance per watt on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora* 20 (3.17.8-200.fc20.x86_64, Nginx* 1.4.4, Php-fpm* 15.4.14, memcached* 1.4.14, Simultaneous users=43844, Estimated wall power based on microserver chassis, power=90W, Perf/W=487.15 users/W Supermicro SuperServer* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu* 14.10 (3.16.0-23 generic), Nginx* 1.4.4, Php-fpm* 15.4.14, memcached* 1.4.14, Simultaneous users=12896. Maximum wall power =46W, Perf/W=280.3 users/W

3 Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

4 Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked “reserved” or “undefined.” Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information. The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request. Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order. Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or by visiting Intel’s Web site at www.intel.com.

5 Intel technologies’ features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com

6 Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

For more information go to http://www.intel.com/performance

Intel, the Intel logo, Intel Xeon, and Intel Atom are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation.

INTEL® SERVER BOARDS

THE QUALITY YOU WANT. THE CONFIDENCE YOU NEED.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® SERVER BOARDS

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

INTEL® SERVER BOARDS

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

THE QUALITY YOU WANT WITH THE CONFIDENCE YOU NEED

Intel designs and builds to a high specification, delivering server products with maximum processing power, great flexibility, excellent manageability, and high reliability. Stringent design and manufacturing practices, rigorous validation and testing, and excellent warranty and technical support ensure you receive value that is difficult to find anywhere else.

Platform connected boards featuring Intel® Xeon® processor Scalable family

Intel® Server Board S2600WF family:
Power and performance at peak efficiency supporting a 1U and 2U rack mount server form factor.

Intel® Server Board S2600BP family:
Density optimized board enabling highest processing and memory performance.

Intel® Server Board S2600ST family:
Flexible general purpose boards in an SSI EEB form factor.

Single-socket board featuring bootable Intel® Xeon Phi™ processor family

Intel® Server Board S7200AP family:
A High Performing Compute Node Featuring a bootable Intel® Xeon Phi™ Processor. This board family is designed to support the demands of parallel processing while delivering performance, high availability, and serviceability.

Single-socket board featuring Intel® Xeon® processor E3 v6 family

Refreshed Intel® Server Board S1200SP family:
Reliable, cost effective, easy to manage board in a microATX form factor.

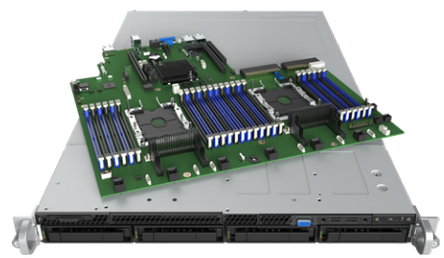
Delivering high performance and increased memory bandwidth

The Intel® Xeon® processor families deliver versatility across diverse workloads in the data center or cloud.

Intel® Server Board S2600WF Product Family Featuring 2nd Generation Intel® Xeon® Scalable Processors

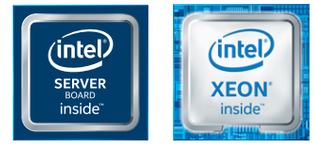
FEATURE RICH HYPER-CONVERGED INFRASTRUCTURE (HCI) SERVER WITH MAXIMUM FLEXIBILITY

The Intel® Server Board S2600WF product family delivers power and performance at peak efficiency designed for use in either in a 1U and 2U rack mount form factor server that features the energy-efficient dual 2nd Generation Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server board for business IT, appliance, data center, cloud and high performance computing applications.



DESCRIPTION	Full-featured Server Board family with maximum flexibility for expansion; available as a 1U or 2U rack-mount form factor featuring the energy efficient 2nd Generation Intel® Xeon® processor Scalable Family.		
TARGET MARKETS	Storage, Cloud, Networking		
ORDER CODE	S2600WF0R	S2600WFTR	S2600WFQR
INTEL® QUICKASSIST TECHNOLOGY	No	No	Yes
FORM FACTOR	Custom (16.7" x 17")		
INTEL® SERVER CHASSIS	Intel® Server Chassis R1000WF family; Intel® Server Chassis R2000WF family; Intel® Server System R1000WF family; Intel® Server System R2000WF family		
PROCESSOR SUPPORT[1]	2nd Generation Intel® Xeon® Scalable processor: up to 140W TDP (on all System SKUs), 165W TDP (Select System SKUs), 205W TDP (Board only)		
CHIPSET	Intel® C624 Chipset	Intel® C624 Chipset	Intel® C628 Chipset
TOTAL PCI SLOTS	Up to 8 PCIe slots via 3 Risers, One x8 PCIe Gen 3 SAS Mezz Module		
M.2	Up to 2-M.2 SATA/PCIe (x2, x4) storage device 80 mm		
DIRECT ATTACH PCIe* 2.5" SSD	4 OCuLink connectors	4 OCuLink connectors	2 OCuLink connectors
MEMORY CAPACITY	24 DDR4 RDIMM/LRDIMMs, 2 SPC, 12x channels/system		
ONBOARD PCIe* NVME	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)
SATA PORTS	8x via MiniSAS HD 2x 7pin Connector	8x via MiniSAS HD 2x 7pin Connector	2x 7pin Connector
SAS OPTIONS	6 Gb/s or 12 Gb/s SAS via optional SAS module		
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)		
MANAGEMENT SUPPORT	Integrated baseboard mangaement controller (IPMI 2.0 compliant), Support for Intel®Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)		
INTEL® RAID SUPPORT	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support		
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules		
INTEL® TRANSPARENT SUPPLY CHAIN	Intel® Trusted Platform Module 2.0 (Accessory Option)		
WARRANTY	3 year limited warranty, optional 2 year extended warranty available		

Intel® Server Board S2600BP Product Family featuring 2nd Generation Intel® Xeon® Scalable processors



DENSITY OPTIMIZED SYSTEM ENABLING HIGH PERFORMANCE

The Intel® Server Board S2600BP product family is a purpose built, density-optimized server board ideal for use in hyper-converged, data analytics, storage, cloud and high performance computing applications. Designed to support 16 DDR4 DIMM slots per server board at 2 DIMMs per channel, Intel® Optane™ DC Persistent Memory and the 2nd Generation Intel® Xeon® processor Scalable Family, the S2600BP family maximizes memory and processor bandwidth to meet demanding compute use requirements.

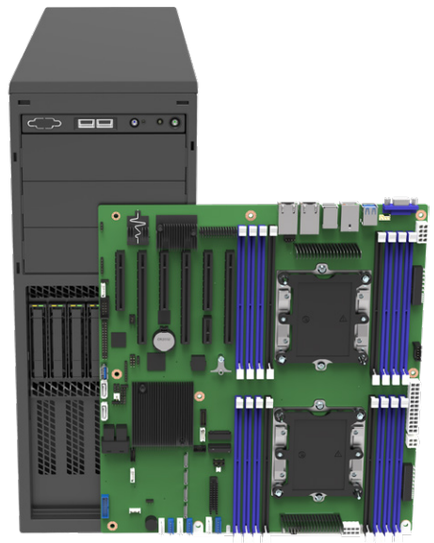
DESCRIPTION	This density-optimized board family enables high processing and memory performance, making this a compelling offering for compute-intensive workloads.		
TARGET MARKETS	Storage, Cloud, HPC		
ORDER CODE	S2600BPBR	S2600BPSR	S2600BPQR
INTEL® QUICKASSIST TECHNOLOGY	No	No	Yes
FORM FACTOR	6.8” x 19.1”		
INTEL® SERVER CHASSIS	Intel® Server Chassis H2000P Product Family		
PROCESSOR SUPPORT	2nd Generation Intel® Xeon® Scalable processor: up to 165W TDP (on Intel® Server Chassis H2204XXLRE or HNS2600BPBLC only), 140W TDP on all other SKUs		
CHIPSET	Intel® C621Chipset	Intel® C622 Chipset	Intel® C628 Chipset
PCIe* SLOT TYPES	Two x16 PCIe* lanes on two risers, and two x24 PCIe* lanes on two risers	Two x16 PCIe* lanes on two risers, and two x24 PCIe* lanes on two risers	One riser with x16 PCIe* lanes, and two x24 PCIe* lanes on two risers
M.2	One (1) 42mm M.2 SATA/PCIe* x4		
MEMORY CAPACITY	16 DIMM Slots (8 per CPU) – DDR4 RDIMM/LRDIMM, and up to 2TB of Intel® Optane™ DC Persistent Memory		
ONBOARD PCIe* NVME	None		
SATA PORTS	Four (4) SATA 6Gbps ports via Mini-SAS HD (SFF-8643) connector (from PCH)	Four (4) SATA 6Gbps ports via Mini-SAS HD (SFF-8643) connector (from PCH)	None
SAS OPTIONS	6 Gb/s or 12 Gb/s SAS via bridgeboard (specific SKUs only)		
NETWORKING	Dual 10GBase-T ports	Dual 10GbE SFP+ ports Support	Dual 10GBase-T ports
MANAGEMENT SUPPORT	Integrated baseboard mangaement controller (IPMI 2.0 compliant), Support for Intel® Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)		
INTEL® RAID SUPPORT	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support		
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules		
INTEL® TRANSPARENT SUPPLY CHAIN	Intel® Trusted Platform Module 2.0 (Accessory Option)		
WARRANTY	3 year limited warranty, 5 year extended warranty available		

Intel® Server Board S2600ST Product Family featuring 2nd Generation Intel® Xeon® Scalable processors

FLEXIBLE, GENERAL PURPOSE SERVER BOARD IN A STANDARD FORM FACTOR

The Intel® Server Board S2600ST product family delivers robust features and powerful performance in a standard 12" x 13" EEB form factor for flexibility and ease of adoption. Featuring 2nd Generation Intel® Xeon® Scalable processors, high PCIe* lane availability and SAS/SATA/NVMe* flexibility, it provides a cost-effective option for pedestal, rack mount, or custom systems. The S2600ST is ideal for use in small and medium business, storage, networking, web hosting, and security appliances where feature capacity and price-performance balance is key.

DESCRIPTION	A family of flexible general purpose server boards supporting two 2nd Generation Intel® Xeon® Scalable processors up to 205W and 16 DIMMs in a standard SSI EEB form factor board.	
TARGET MARKET	Small- and medium-sized businesses, Networking, Embedded deployments	
ORDER CODE	S2600STBR	S2600STQR
INTEL® QUICKASSIST TECHNOLOGY	No	Yes
FORM FACTOR	SSI EEB 12" W x 13" L	
INTEL® SERVER CHASSIS	Intel® Server Chassis P4000G Family	
PROCESSOR SUPPORT[1]	2nd Generation Intel® Xeon® Scalable processors: up to 205W TDP	
CHIPSET	Intel® C624 Chipset	Intel® C628 Chipset
TOTAL PCIe* SLOTS	CPU0: 1 x8 Gen3, 1 x16 Gen3 CPU1: 2 x8 Gen3, 2 x16 Gen3	
M.2	Dual M.2 SATA/PCIe (x2, x4) 80 mm connectors	
DIRECT ATTACH PCIe* 2.5" SSD	4 OCuLink connectors	Up to 2 OCuLink connectors
MEMORY CAPACITY	16 DDR4 RDIMMs or LRDIMMs, 2-1-1 Slot Config	
ONBOARD PCIe* NVME	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)
SATA PORTS	8x via MiniSAS HD 2x 7-pin Connector	2x 7pin Connector
SAS OPTIONS	Via PCIe adapters	
INTEGRATED LAN	Dual 10GBase-T down or Dual 10GbE SFP+ via custom AIC	
MANAGEMENT SUPPORT	Integrated baseboard mangaement controller (IPMI 2.0 compliant), Support for Intel® Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)	
INTEL® RAID SUPPORT	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support	
MODULE UPGRADES	Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules	
INTEL® TRANSPARENT SUPPLY CHAIN	Intel® Trusted Platform Module 2.0 (Accessory Option)	
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	



Intel® Server Boards Supporting the Intel® Xeon® Processor E5-2600 v4 Family

RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology with the Intel® Xeon® processor E5-2600 v4 family of server solutions. These products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future. To address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel® Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Intel® Server Products products ordered with the new Refresh order codes include the BIOS installed for the Intel® Xeon® Processor E5-2600 v4[1]. Previous genertation products will require an Intel® Xeon® processor E5-2600 v3 (Haswell) in order to update to an Intel® Xeon® processor E5-2600 v4 (Broadwell) production BIOS.

PRODUCT NAME	INTEL® SERVER BOARD S2600KP FAMILY	INTEL® SERVER BOARD S2600TP FAMILY
DESCRIPTION	A hot-pluggable, high-density compute module integrated with an Intel® Server Board S26000KP model (available with or without integrated FDR InfiniBand*), maximum memory bandwidth, and flexible configuration options for the Intel® Server Chassis H2000G family.	A hot-pluggable, high-density compute module integrated with an Intel® Server Board S2600TP model (available with or without integrated FDR InfiniBand*) for higher memory capability and flexible configuration options for the Intel® Server Chassis H2000G family.
TARGET MARKET	High performance computing (HPC) / big data	Hyper-converged infrastructure/ High performance computing (HPC) / big data / storage / cloud
ORDER CODE	HNS2600KPR: 1U node with S2600KPR HNS2600KPFR: 1U node with S2600KPFR, onboard FDR InfiniBand* (1 rear InfiniBand 56 Gb/s port) BBS2600KPR: Board BBS2600KPFR: Board with FDR InfiniBand (56 Gb/s) BBS2600KPTR: Board with TPM 1.2	HNS2600TPR: 1U node with S2600TPR HNS2600TPFR: 1U node with S2600TPFR, onboard FDR InfiniBand (1 rear InfiniBand 56 Gb/s port) HNS2600TP24R: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G BaseT HNS2600TP24SR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G (SFP+) HNS2600TP24STR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT with TPM2.0 BBS2600TPR: Board BBS2600TPFR: Board with FDR InfiniBand (56 Gb/s)
FORM FACTOR	Custom (6.4" x 17.7")	Custom (6.8" x 18.9")
INTEL® SERVER CHASSIS OR SYSTEM	Intel® Server Chassis H2000G family	Intel® Server Chassis H2000G family
PROCESSOR SUPPORT,[1] MAX TDP	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W
CHIPSET	Intel® C612 Chipset	Intel® C612 Chipset
TOTAL PCIe* SLOTS	3 Riser slots	4 Riser slots
PCIe* SLOT TYPES	1 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 2 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot	2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 3 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot
MEMORY CAPACITY	8 LR / R/ DIMMs 1333 /1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz[3] 1024 GB max per system	16 LR / R/ DIMMs 1333 / 1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz[3] 2048 GB max per system
SATA PORTS	10-port SATA (6 Gb/s)	HNS2600TP24R/HNS2600TP24SR: 6-port 6 Gb/s SATA; 10-port SATA (6 Gb/s)
SAS OPTIONS	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter HNS2600TP24R/HNS2600TP24SR: 12 GBb/s SAS via integrated 12 GB SAS bridge board
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0	Intel® Server Management Software Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance; Platform Certificate	Statement of Conformance
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	3 year limited warranty, optional 2 year extended warranty available

[1] Intel always recommends updating the BIOS/BM/FRUSDR prior to server deployment [2] Maximum memory speed supported depends on the processor used. [3] NVDIMM support refer to Intel® Server Configurator Tool (https://serverconfigurator.intel.com).

PRODUCT NAME	INTEL® SERVER BOARD S2600CW FAMILY	INTEL® SERVER BOARD S2600WT FAMILY
DESCRIPTION	A family of flexible general purpose server boards supporting two Intel® Xeon® processor E5-2600 v4 family up to 145 W and 16 DIMMs in a standard SSI EEB form factor. Board variations available for two 1 Gb or 10 Gb Ethernet ports, as well as options for an 8-port SAS controller.	A rack-optimized server board supporting two Intel® Xeon® processor E5-2600 v4 family up to 145 W, 24 DIMMs, and two 1 Gb or 10 Gb Ethernet port options available.
TARGET MARKET	Embedded / small- and medium-sized businesses / storage / cloud	Enterprise and medium business IT / big data / storage / cloud
ORDER CODE	DBS2600CW2R: Dual 1 Gb Ethernet ports DBS2600CWTR: Dual 10 Gb Ethernet ports DBS2600CW2SR: Dual 1 Gb Ethernet ports, 8-port LSI* 3008 SAS controller DBS2600CWTSR: Dual 10 Gb Ethernet ports, 8-port LSI 3008 SAS controller	S2600WT2R: 1 Gb Ethernet ports S2600WTTR: 10 Gb Ethernet ports S2600WTTS1R: 10 Gb Ethernet ports with TPM2.0
FORM FACTOR	SSI EEB (12" x 13")	Custom (16.7" x 17")
INTEL® SERVER CHASSIS OR SYSTEM	Intel® Server Chassis P4000G family	Intel® Server Chassis R1000WT family Intel® Server Chassis R2000WT family Intel® Server System R1000WT family Intel® Server System R2000WT family
PROCESSOR SUPPORT,[1] MAX TDP	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max
CHIPSET	Intel® C612 Chipset	Intel® C612 Chipset
TOTAL PCIe* SLOTS	6	3 Riser slots; 1 Intel® I/O Expansion Module Connector; 1 Intel® RAID Module Connector
PCIe* SLOT TYPES	1 PCI Express* 3.0 x8, 4 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 2 PCI Express 3.0 x8, 3 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 (models with LSI* 3008)	2 PCI Express* 3.0 x24 riser super socket (supporting x8, x16, and PCI-X riser card slot options) 1 PCI Express 3.0 mixed x8, x4 slot riser socket (supporting x4, and x8 riser card slot options) 1 PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 PCI Express 3.0 x8 Intel® RAID Module
MEMORY CAPACITY	16 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4[2] NVDIMMs 2133MHz[3] 1 TB max using 64 GB DIMMs 2 TB max using 128 GB DIMMs	24 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4[2] NVDIMMs 2133MHz[3] 1.50 TB max using 64 GB DIMMs
SATA PORTS	10-port SATA (6.0 Gb/s)	10-port SATA (6.0 Gb/s)
SAS OPTIONS	Models with LSI* 3008: 8 Integrated SAS ports, 12G SAS with battery-less hardware RAID	6 Gb/s or 12 Gb/s SAS via optional SAS module
INTEGRATED LAN	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
MANAGEMENT SUPPORT	Intel® Server Management Software; Integrated BMC with IPMI 2.0	Intel® Server Management Software; Integrated BMC with IPMI 2.0
INTEL® RAID SUPPORT	PCH SATA 6G with Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 optional RAID 5 supported through the ESRT2 RAID 5 upgrade key Integrated RAID levels 0, 1, 1E, and 10; optional RAID level 5 upgrade available	Intel® Rapid Storage Technology[2] 4.0 (SW RAID levels 0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (SW Raid levels 0, 1, and 10; optional RAID level 5 upgrade available)
MODULE UPGRADES	Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module	Intel® I/O Expansion Module Intel Integrated RAID Module (ROC or IOC) Intel Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	N/A	Statement of Conformance; Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	3 year limited warranty, optional 2 year extended warranty available

[2] Maximum memory speed supported depends on the processor used. [3] NVDIMM support refer to Intel® Server Configurator Tool (https://serverconfigurator.intel.com).

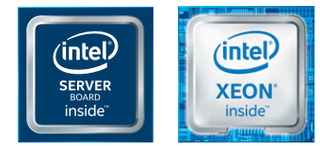
Intel® Server Board S7200AP family supporting the Intel® Xeon Phi™ Processor (Knights Landing and Knights Mill)

RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology with the Intel® Xeon® Phi™ processor family of server solutions for customers. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future.

PRODUCT NAME	INTEL® SERVER BOARD S7200AP FAMILY	
DESCRIPTION	A hot-pluggable, efficient, high-density compute module integrated with the Intel® Server Board S72000AP and optimized memory performance. Customizable as a 2U, four node system with serviceability and high availablility, hot-swappable compute modules, 2.5" or 3.5" drive bays and redundant power supplies.	
TARGET MARKET	High performance computing (HPC)	
ORDER CODE	**S7200APR** **HNS7200APR** **HNS7200APRL**	**S7200AP** **HNS7200AP** **HNS7200APL**
FORM FACTOR	Custom (6.8" x 14.2")	
INTEL® SERVER CHASSIS	Intel® Server Chassis H2204XXLRE	Intel® Server Chassis H2216XXLR2 Intel® Server Chassis H2312XXLR2
PROCESSOR SUPPORT,[1] MAX TDP	Intel® Xeon Phi™ Processor, up to 320W	Intel® Xeon Phi™ Processor, up to 230W
CHIPSET	Intel® C612 Chipset	
PCIe* SLOT TYPES	Riser 1: PCIe Gen3 x 16 Riser 2: PCIe Gen3 x 20 (x16 or x4)	
MEMORY CAPACITY	6 x DDR4 DIMMs, 1SPC, 6 x native channels/system	
SATA PORTS	Integrated 9-port SATA: 4 ports to bridge board, 1 port to mSATA, 4 ports to MiniSAS HD connector	
SAS OPTIONS	12 Gb/s SAS via optional PCIe* card	
ETHERNET	2x Intel® i210 (1GbE) Controllers	
MANAGEMENT SUPPORT	Pilot 3 BMC with optional advanced features via RMM4-lite module	
INTEL® RAID SUPPORT	Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10	
MODULE UPGRADES	Intel® Remote Management Module 4Lite Intel® Omni-Path Port Upgrade Kit (Two Port) Intel® Omni-Path low provide PCIe* adapter	
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate	
WARRANTY	3 year limited warranty, optional 2 year extended warranty available	

Intel® Server Boards Supporting the Intel® Xeon® Processor E3-1200 v6 Family



RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology in the sixth generation Intel® Xeon® processor E3-1200 v6 family of server solutions. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, reliability, security, and cost flexibility to meet customers' requirements and growth needs now and in the future.

DESCRIPTION	A flexible and feature-rich entry-level server board family in a uATX form factor is available as a rack-mount system or easily integrated into a general purpose Intel® Server Chassis or 3rd party chassis.		
TARGET MARKET	Entry level server for small and medium businesses (SMBs), embedded, and storage and security appliance applications		
ORDER CODE	**DBS1200SPLR**	**DBS1200SPSR**	**DBS1200SPOR**
FORM FACTOR	microATX (9.6" x 9.6")		
INTEL® SERVER CHASSIS	Intel® Server Chassis P40000SFDR, P4304XXSFCN, P4304XXSHCN Intel® Server System R1000SPO family		
PROCESSOR SUPPORT,[1] MAX TDP	Intel® Xeon® processor E3-1200 v5/v6 and Intel® Core® processor i3 series up to 80W TDP	Intel® Xeon® processor E3-1200 v5/v6 without HD Graphic up to 80W TDP	Intel® Xeon® processor E3-1200 v5/v6 without HD Graphic up to 80W TDP
CHIPSET	Intel® C236 Chipset	Intel® C232 Chipset	Intel® C236 Chipset
TOTAL PCI SLOTS	3 Riser Slots	1 Riser Slot	3 Riser Slots
PCIe* SLOT TYPES	1-PCIe 3.0 x8 elec, x16 mech 1-PCIe 3.0 x4 elec, x8 mech 1-PCIe 3.0 x8 elec, x8 mech	1-PCIe 3.0 x8 elec, x16 mech 1-PCIe 3.0 x4 elec, x8 mech 1-PCIe 3.0 x8 elec, x8 mech	1-PCIe 3.0 x8 elec, x16 mech with Riser Card suport
MEMORY CAPACITY	4 UDIMMs up to 2400 MHz ECC DDR4 64 GB max		
SATA PORTS	8-port 6Gb/s	6-port 6Gb/s	8-port 6Gb/s
SAS OPTIONS	With Intel® Integrated RAID module (optional)	No	With Intel® Integrated RAID module (optional)
INTEGRATED LAN	Dual port integrated Intel® Ethernet Controller i210 (1 GbE)		
MANAGEMENT SUPPORT	Intel® Server Management Software Integrated BMC with IPMI 2.0		
INTEL® RAID SUPPORT	Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Intel® Rapid Storage Technology2 4.0 (0, 1, 5, and 10)		
MODULE UPGRADES	Intel® Integrated RAID Module, 22x42mm M.2 module, Intel® Remote Management Module 4 Lite2, Trusted Platform Module 1.2	-	Intel® I/O Expansion Module, Intel® Integrated RAID module, 22x42mm M.2 Module, Intel® Remote Management Module 4 Lite2, Trusted Platform Module 1.2
WARRANTY	3 year limited warranty, optional 2 year extended warranty available		

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/go/serverboards** or **ark.intel.com**

[1] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.
Refer to http://support.intel.com/ support/motherboards/server for up-to-date details on processors supported by each server board.

[2] Requires a 4th generation Intel® Core™ processor, enabled chipset, and Intel® Rapid Storage Technology (Intel® RST) software.

[3] On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

[4] The Intel® Server Chassis H2204XXLRE is offered as part of the Intel® Data Center Blocks for HPC only. This product can not be ordered separately.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more information go to http://www.intel.com/performance.

Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation.

INTEL® SERVER SYSTEMS

PERFORMANCE.
RELIABILITY.
SECURITY.

Intel® Product Quick Reference Matrix
Q3 2019

INTEL® SERVER SYSTEMS

Based on Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

FEATURE-RICH INTEL® SERVER SYSTEMS FOR PERFORMANCE, RELIABILITY AND SECURITY

Customers want data center products designed for outstanding performance and reliability that will address their unique needs. With Intel® Server Systems featuring the latest Intel® Xeon® processor families you can count on trusted performance, quality and reliability to help solve the most complex business challenges.

Intel® Server System S9200WK Data Center Block for HPC

INTEL® SERVER SYSTEM S9200WK: NEXT GENERATION INTEL DATA CENTER BLOCK FOR HPC

The Intel® Server System S9200WK product family is a purpose built, performance-optimized data center block ideal for use in High Performance Computing and Artificial Intelligence applications. Designed for the Intel® Xeon® Platinum 9200 Processors with up to 24 DDR4 DIMM slots per compute module, the Intel® Server System S9200WK product family maximizes processor and memory bandwidth to provide leadership performance for the most demanding compute use.

DESCRIPTION	Designed for the Intel® Xeon® Platinum 9200 Processors with up to 24 DDR4 DIMM slots per compute module, the Intel® Server System S9200WK product family maximizes processor and memory bandwidth to provide leadership performance for the most demanding compute use requirements.
TARGET MARKET	High Performance Computing
KEY FEATURES	**Maximum Intel® Xeon® Platinum 9200 Processors Performance** • Leadership CPU performance per socket with Intel's highest core count, Intel® Xeon® Platinum 9200 Processors • Double the memory bandwidth for memory-intensive workloads with 12 memory channels per CPU, 24 memory channels per compute module • New Intel® DL Boost Instructions for data analytics greatly accelerates inference performance • Multi-Chip packaging optimized for density and performance **Density Optimized 2U Rack Server with Air-Cooled and Liquid-Cooled Options** • Up to four compute modules per 2U chassis which can support multiple compute module types in a single chassis • 2 CPU compute module design with advanced cooling technology for high flow rate air cooled or liquid cooling for CPUs, VRs, DIMMs, and memory VRs for high heat capture ratio • Up to 350W processor TDP for high performance workloads in a 2U air cooled chassis, up to 400W processor TDP with liquid-cooled versions • Up to 2 x16 PCIe slots in 1U compute modules, up to 4 x16 PCIe slots in 2U compute modules for network expansion options • Support for 2x M.2 SATA/NVMe storage devices per 1U compute module, up to 2x M.2 SATA/NVMe and 2x U.2 NVMe storage devices per 2U compute module • Hot-swappable compute modules, storage[1], fans, and power supplies
FORM FACTOR	2U rack enclosure; Up to 4 independent warm-swap compute modules
CPU	Intel® Xeon® Platinum 9200 Processors up to 56 cores
MEMORY	DDR4 2933 MT/s DIMMS, up to 96x DIMMs per DCB (24 DIMMs per compute module) @ 1DPC Supports 8GB to 128GB DIMM options, number and capacity configurable
STORAGE	Up to 8x M.2 SSDs per DCB (2x per compute module with 1U compute module Up to 4x M.2 SSDs & 4x hot-swap U.2 NVMe SSDs with 2U Compute Modules). M.2 and U.2 number and capacity configurable
POWER SUPPLY	3x hot-swap CRPS 2100W (Platinum) or 1600W (Titanium) PSUs
ETHERNET	Integrated 1Gbase-T RJ45 (two ports per compute module) Optional shared 1Gbase-T RJ45 management port chassis card

For the latest product SKUs and specifications, visit **ark.intel.com**

Continued on next page

Intel® Server System S9200WK Data Center Block for HPC

COOLING	Available with high flow rate air-cooling or integrated liquid-cooling options
I/O	2 x16 Gen3 PCIe slots per 1U compute module; 4 x16 Gen3 PCIe slots per 2U compute module for high-speed networking support
MANAGEABILITY	Dedicated, consolidated Management Module
SECURITY & SERVICEABILITY	TPM 2.0 (optional); Hot-swap/redundant fans, and PSUs; light path diagnostic LEDs

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at **www.intel.com/support**

Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

INTEL® SERVER SYSTEMS S2600BP BASED ON THE INTEL® SERVER BOARD S2600BP FAMILY — DENSITY OPTIMIZED SYSTEM ENABLING NEXT-GEN PERFORMANCE

The Intel® Server Board S2600BP product family is a purpose built, rack-optimized server board ideal for use in hyper-converged, data analytics, storage, cloud and high performance computing applications. Designed to support the 2nd generation Intel® Xeon® processor Scalable family and up to 16 DDR4 DIMM slots per server board (eight DIMMs per processor), the S2600BP family maximizes memory and processor bandwidth to meet demanding compute use requirements.

DESCRIPTION	Purpose Built for Outstanding Compute Density Purpose built for breakthrough performance, compute density, high-speed networking and I/O with stability and increased uptime
TARGET MARKET	High Performance Computing (HPC), Hyper Converged Infrastructure (HCI), Cloud, Storage
SERVER BOARD INCLUDED	S2600BPBR S2600BPSR S2600BPQR
PROCESSOR SUPPORT,[1] MAX TDP	Up to two 2nd Gen Intel® Xeon® processor Scalable family Support for 2nd generation Intel® Xeon® processor family with Intel® Omni-Path Architecture integrated fabric connectors—One 100 Gb/s port per processor 165 W – board 140 W/165 W‡ – chassis
PCI CONFIGURATION OPTIONS	Riser Slot 1 (CPU1): x16 PCIe* 3.0 lanes (Riser slot 1 not available on S2600BPQR) • HNS2600BPBR/HNS2600BPB24R: Default: Video adapter; Optional: One PCIe* Slot x16 elec/x16 mech low-profile cards only • HNS2600BPBLCR/HNS2600BPBLC24R: Not Available with AXXBPLCKIT installed (required accessory) • HNS2600BPSR/HNS2600BPS24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support • HNS2600BPQR/HNS2600BPQ24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support Riser Slot 2 (CPU1): x24 PCIe 3.0 lanes; One PCIe* slot x16 elec/x16 mech low-profile cards only Riser Slot 3 (CPU2) not available with Bridge Board installed; x24 PCIe 3.0 lanes Riser Slot 4 (CPU2) not available with Bridge Board installed; x16 PCIe 3.0 lanes
MEMORY CAPACITY	16 DIMM slots (eight per CPU) – DDR4 RDIMM/LRDIMM, Up to 29331 MT/s, 1.2V and Intel® Optane™ DC Persistent Memory
MODULE UPGRADES	Up to four
INTEL® TRANSPARENT SUPPLY CHAIN	Supported
WARRANTY	3-year limited warranty or optional 5-year extended warranty

‡ Note: 165 W TDP supported in enhanced air cooled Intel® Server Chassis H2204XXLRE only.

For the latest product SKUs and specifications, visit **ark.intel.com**

Continued on next page

Continued from previous page

Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

INTEL® COMPUTE MODULE HNS2600BP FAMILY

Dimensions	716 x 269 x 158 mm
System Cooling	HNS2600BPBLCR / HNS2600BPBLC24R: Liquid Cooling Compatible¥
Power Supply	Two x 2130 W AC common redundant power supply (CRPS); 80 PLUS* Platinum
Thermal Solution	HNS2600BPBLCR / HNS2600BPBLC24R: Liquid Cooling Compatible¥
PCI Riser Slots	Riser Slot 1 (CPU1): x16 PCIe* 3.0 lanes (Riser slot 1 not available on S2600BPQR) • HNS2600BPBR/HNS2600BPB24R: Default: Video adapter; Optional: One PCIe* Slot x16 elec/x16 mech low-profile cards only • HNS2600BPBLCR/HNS2600BPBLC24R: Not Available with AXXBPLCKIT installed (required accessory) • HNS2600BPSR/HNS2600BPS24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support • HNS2600BPQR/HNS2600BPQ24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support Riser Slot 2 (CPU1): x24 PCIe 3.0 lanes; One PCIe* slot x16 elec/x16 mech low-profile cards only Riser Slot 3 (CPU2) not available with Bridge Board installed; x24 PCIe 3.0 lanes Riser Slot 4 (CPU2) not available with Bridge Board installed; x16 PCIe 3.0 lanes
Additional Expansion	Bridge Board Slot Server Management: • Integrated Baseboard Management Controller, IPMI 2.0 compliant, Redfish support • One Dedicated RJ45 Management Port • One 2x4 pin header for optional Intel® Remote Management Module 4 Lite (Intel® RMM4 Lite 2) with support for Remote KVM and • Onboard LEDs: system status, system ID, POST code diagnostic, BMC error code Three 40x56 mm dual rotor system fans
Warranty	3-year limited warranty or optional 5-year extended warranty

SPECIFIC SKUs

HNS2600BPBR	Module integrated with an Intel® Server Board S2600BPBR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
HNS2600BPSR	Module integrated with an Intel® Server Board S2600BPSR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
HNS2600BPQR	Module integrated with an Intel® Server Board S2600BPQR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
HNS2600BPB24R	Module integrated with an Intel® Server Board S2600BPBR Compatible with Intel® Server Chassis H2224XXLR3

SPECIFIC SKUs

HNS2600BPQ24R	Module integrated with an Intel® Server Board S2600BPQR Compatible with Intel® Server Chassis H2224XXLR3
HNS2600BPBLCR	Module integrated with an Intel® Server Board S2600BPBR with Asetek D2C* liquid-cooling (AXXBPLCKIT accessory required¥) Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
HNS2600BPBLC24R	Module integrated with an Intel® Server Board S2600BPBR with Asetek D2C* liquid-cooling (AXXBPLCKIT accessory required¥) Compatible with Intel® Server Chassis H2224XXLR3

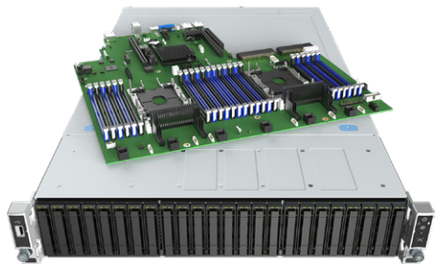
¥ Liquid-cooling compute modules require Asetek* DQC-05F connection with Asetek* PGW-236 Coolant for compatibility.

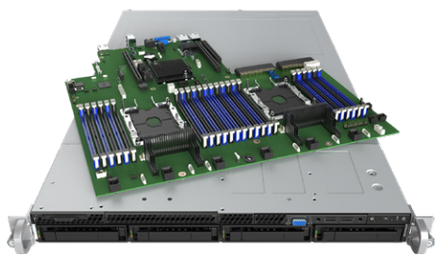
Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

INTEL® SERVER SYSTEMS R1000WF AND R2000WF BASED ON THE INTEL® SERVER BOARD S2600WF FAMILY — RELIABLE SOLUTIONS MADE EASY

Intel® Server S2600WF Product family delivers power and performance at peak efficiency in a 1U and 2U rack mount server form factor that features the energy-efficient dual 2nd Generation Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server for business IT, appliance, data center, cloud and high performance computing applications.

DESCRIPTION	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WF family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual 2nd Gen Intel® Xeon® processors Scalable Family.
TARGET MARKET	Enterprise and medium business IT / big data / storage / cloud
SERVER BOARD INCLUDED	S2600WFT: Onboard 10 GbE S2600WF0: No LOM S2600WFQ: Intel® QAT support
PROCESSOR SUPPORT,[1] MAX TDP	2 x 1st or 2nd Generation Intel Xeon processors Scalable Family NOTE: Max CPU TDP supported up to 205 W with configuration limitations, see Technical Product Specifications
TOTAL PCI SLOTS	3 Riser slots 1 Intel® RAID Module Connector
PCI SLOT TYPES	1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module 2U: 3 Riser Options: Total of up to 7 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 3 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module Riser 1 and 2 Options: 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Riser 1 and 2 Options: 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Riser 3: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser
MEMORY CAPACITY	24 ECC DDR4[2] LR/RDIMMs with speeds up to 2933 MT/s; NVDIMMs[3] 2666 MT/s Intel® Optane™ DC Persistent Memory Module support
MODULE UPGRADES	Intel® OCP Mezzanine Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available





For the latest product SKUs and specifications, visit **ark.intel.com**

Continued on next page

Continued from previous page

Intel® Server Systems R1000WF Based on the Intel® Server Board S2600WF Family

1U RACK SYSTEMS

Dimensions (H x W x D)	1.72” x 17.25” x 28”
System Cooling	Redundant cooling fans
Power Supply	1100 W AC Redundant PSU (Platinum Efficiency) Optional 1300 W AC Redundant PSU (Titanium Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module
Additional Expansion	1x OCP Mezzanine Expansion Module
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available

SPECIFIC SKUs

R1208WFTYS/R1208WFTYSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10 GbE ports Support for 8x 2.5” hot-swap drives 24 DDR4 DIMMs
R1208WFQYSR	Intel® Server Board S2600WFQR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Intel® QAT support Support for 8x 2.5” hot-swap drives 24 DDR4 DIMMs

SPECIFIC SKUs

R1304WF0YS/R1304WF0YSR	Intel® Server Board S2600WF0/S2600WF0R Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Support for 4x 3.5” hot-swap drives 24 DDR4 DIMMs No LOM
R1304WFTYS/R1304WFTYSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10 GbE ports Support for 4x 3.5” hot-swap drives 24 DDR4 DIMMs

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at **www.intel.com/support**

Continued on next page

Continued from previous page

Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

2U RACK SYSTEMS

Dimensions (H x W x D)	3.44” x 17.25” x 28”
System Cooling	Redundant and hot-swap cooling fans
Power Supply	1300 W AC redundant-capable PSU (Titanium Efficiency) Optional 1100 W AC redundant-capable PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8,1 x PCI Express 3.0 x8 Intel® Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser
Additional Expansion	1x Intel® OCP Mezzanine Expansion Module
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available

SPECIFIC SKUs

R2208WFTZS/R2208WFTZSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 205W TDP processors Integrated Dual 10GbE ports Single 1300W AC 80 PLUS Titanium PSU Support for 8x 2.5” SAS/SATA/NVMe hot-swap drives 24 DDR4 DIMMs
R2208WF0ZS/R2208WF0ZSR	Intel® Server Board S2600WF0/S2600WF0R Supports up to 205W TDP processors Single 1300W AC 80 PLUS Titanium PSU Support for 8x 2.5” SAS/SATA/NVMe hot-swap drives 24 DDR4 DIMMs No LOM
R2208WFQZS/R2208WFQZSR	Intel® Server Board S2600WFQ/S2600WFQR Supports up to 205W TDP processors Single 1300W AC 80 PLUS Platinum PSU Intel® QAT support Support for 8x 2.5” hot-swap SAS/SATA/NVMe drives 24 DDR4 DIMMs

SPECIFIC SKUs

R2224WFTZS/R2224WFTZSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 150W/165W TDP processors Single 1300W AC 80 PLUS Titanium PSU Support for 24 x 2.5” hot-swap SAS/SATA/NVMe drives Integrated Dual 10GbE ports
R2224WFQZS	Intel® Server Board S2600WFQ Supports up to 150W TDP processors Single 1300W AC 80 PLUS Platinum PSU Intel® QAT support Support for 24x 2.5” hot-swap SAS/SATA/NVMe drives 24 DDR4 DIMMs

Continued on next page

Continued from previous page

Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

2U RACK SYSTEMS

SPECIFIC SKUs	
R2308WFTZS/R2308WFTZSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10 GbE ports Support for 8x 3.5” hot-swap drives 24 DDR4 DIMMs
R2312WFTZS/R2312WFTZSR	Intel® Server Board S2600WFT/S2600WFTR Supports up to 140W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10 GbE ports Support for 12x 3.5” hot-swap drives 24 DDR4 DIMMs

SPECIFIC SKUs	
R2312WF0NP/R2312WF0NPR	Intel® Server Board S2600WF0/S2600WF0R Supports up to 140W TDP processors Support for 12x 3.5” hot-swap drives 24 DDR4 DIMMs No LOM No PSU
R2312WFQZS	Intel® Server Board S2600WFQ Supports up to 140W TDP processors Single 1300W AC 80 PLUS Titanium PSU Intel® QAT support Support for 12x 3.5” hot-swap drives 24 DDR4 DIMMs

Product does not include memory, processors, or hard drives.

For compatibility information please refer to the configuration guide at **www.intel.com/support**

For more information, visit **www.intel.com/go/serversystems**

In 2019, Intel released the 2nd Generation Intel® Xeon® processor Scalable family. To enable support for the new processor family, Intel created an updated system software stack which includes the System BIOS and other system firmware. In support of the 2nd Gen Intel® Xeon® processor Scalable family, Intel began pre-loading the supporting system software stack onto all server boards and systems that define the Intel® Server S2600WF product family. All server board and systems with a pre-loaded system software stack compatible with the 2nd Gen Intel® Xeon® processor Scalable family can be identified by a product order code ending in an 'R'. Existing server boards and systems that define the Intel® Server S2600WF product family with product codes that do NOT end in an 'R' can be made to support the 2nd Gen Intel® Xeon® processor Scalable family by updating the system software stack to one that supports this processor family. A System Update Package (SUP) with the latest system software stack can be downloaded from the following Intel website: https://downloadcenter.intel.com

[1] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

[2] Overall memory size depends on the processor used.

[3] NVDIMM support refer to Intel® Server Configurator Tool (https://serverconfigurator.intel.com).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/serversystems.

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

Intel® Server Systems Supporting the Intel® Xeon® Processor E5-2600 v4 Family

INTEL® SERVER SYSTEMS R1000WT AND R2000WT BASED ON THE INTEL® SERVER BOARD S2600WT FAMILY — RELIABLE SOLUTIONS MADE EASY

Supporting 1U and 2U rack systems for expansion flexibility and maximum compute, memory, and I/O capacity to address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel® Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Get the latest Intel® Server Products built on a foundation of high-quality technology in the next-generation Intel® Xeon® processor E5-2600 v4 family of server solutions. The latest Intel Server Products are designed to span multiple use-cases and customization requirements while offering performance, reliability, and security to meet customers' requirements and growth needs now and in the future.

DESCRIPTION	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WT family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual Intel® Xeon® processors E5-2600 v4.
TARGET MARKET	Enterprise and medium business IT / big data / storage / cloud
SERVER BOARD INCLUDED	S2600WT2R: 1 Gb Ethernet S2600WTTR: 10 GbE
PROCESSOR SUPPORT,[1] MAX TDP	2 x Intel Xeon processors E5-2600 v4 product family NOTE: Max CPU TDP supported 145 W with configuration limitations, see Technical Product Specifications
TOTAL PCI SLOTS	3 Riser slots 1 Intel® I/O Module Connector 1 Intel® RAID Module Connector
PCI SLOT TYPES	1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module 2U: 3 Riser Options: Total of up to 6 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Option 3) 2 PCI-X 133 MHz FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 2.0 x4 LP via 3rd riser
MEMORY CAPACITY	24 LR / R / DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4[1] NVDIMMs 2133MHz[2] 1.50 TB max using 64 GB DIMMS
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
INTEL® TRANSPARENT SUPPLY CHAIN	Statement of Conformance Platform Certificate
WARRANTY	3 year limited warranty, optional 2 year extended warranty available

For the latest product SKUs and specifications, visit **ark.intel.com**

[1] Maximum memory speed supported depends on the processor used.

[2] NVDIMM support refer to Intel® Server Configurator Tool (https://serverconfigurator.intel.com).

Continued on next page

Continued from previous page

Intel® Server Systems R1000WT Based on the Intel® Server Board S2600WT Family

1U RACK SYSTEMS

Dimensions (H x W x D)	1.72” x 17.25” x 28”
System Cooling	Redundant cooling fans
Power Supply	750 W AC Redundant PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available

SPECIFIC SKUs

R1208WT2GSR	Intel® Server Board S2600WT2R 8 x 2.5” hot-swap HDD, optional support for 1 x 2.5” fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE)
R1208WTTGSR	Intel® Server Board S2600WTTR 8 x 2.5” hot-swap HDD, optional support for 1 x 2.5” fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
R1304WT2GSR	Intel® Server Board S2600WT2R 4 x 3.5” hot-swap HDD, optional support for 1 x 2.5” fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE)

SPECIFIC SKUs

R1304WTTGSR	Intel® Server Board S2600WTTR 4 x 3.5” hot-swap HDD, optional support for 1 x 2.5” fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at **www.intel.com/support**

Continued on next page

Continued from previous page

Intel® Server Systems R2000WT Based on the Intel® Server Board S2600WT Family

2U RACK SYSTEMS

Dimensions (H x W x D)	3.44” x 17.25” x 28”
System Cooling	Redundant and hot-swap cooling fans
Power Supply	750 W AC redundant-capable PSU (Platinum Efficiency) 750 W DC -48V redundant-capable power supply (Gold Efficiency) 1100 W AC redundant-capable PSU (Platinum Efficiency) NOTE: Second power supply sold separately
Thermal Solution	Included
PCI Riser Slots	3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module,1 x PCI Express 3.0 x8 Intel® Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Option 3) 2 PCI-X 133 MHz FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 2.0 x4 LP via 3rd riser
Other Components	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
Warranty	3 year limited warranty, optional 2 year extended warranty available

SPECIFIC SKUs

R2208WT2YSR	Intel® Server Board S2600WT2R 8 x 2.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
R2208WTTYC1R	Intel® Server Board S2600WTTR 8 x 2.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 2 x 1100 W AC redundant-capable PSU Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x8, 1 PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP

SPECIFIC SKUs

R2208WTTYSR	Intel® Server Board S2600WTTR 8 x 2.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
R2224WTTYSR	Intel® Server Board S2600WTTR 24 x 2.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

Continued on next page

Continued from previous page

Intel® Server Systems R2000WT Based on the Intel® Server Board S2600WT Family

SPECIFIC SKUs

R2308WTTYSR	Intel® Server Board S2600WTTR 8 x 3.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL) 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
R2312WTTYSR	Intel® Server Board S2600WTTR 12 x 3.5” hot-swap HDD, optional 2 x 2.5” SATA rear hot-swap drives, 2 x 2.5” fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at **www.intel.com/support**

[1] Maximum memory speed supported depends on the processor used.

Intel® Server Boards S1200SP–Based Systems Supporting the Intel® Xeon® Processor E3-1200 v6 Family

RELIABLE, COST EFFECTIVE AND EASY TO MANAGE

Get Intel® Server Products built on a foundation of high-quality technology in the sixth generation Intel® Xeon® processor E3-1200 v6 family-based server system. The Intel® Server System R1000SP Family has the processing power to deliver reliability, durability and performance along with server management features and options for increased storage, functionality or faster networking speed. Intel® Server Products are backed by Intel's design excellence and manufacturing expertise to deliver processing power with high levels of flexibility, manageability and reliability.

DESCRIPTION	Robust and cost effective server s that can scale as customers grow. The Intel Server System R1000SP Famiily offers systems that scale via SATA and PCIe* expansion options, server management and storage flexibility at budget friendly prices.
TARGET MARKET	Small and medium businesses, embedded, storage or security appliances and web hosting rack installations
SERVER BOARD INCLUDED	S1200SPOR: Rack optimized to support Intel® I/O Expansion Module and storage modules
PROCESSOR SUPPORT[1]	1 x Intel® Xeon® processor E3-1200 v6 product family
TOTAL PCI SLOTS	1
PCI SLOT TYPES	1 PCIe* Gen3 x8 with x16 connection
MEMORY CAPACITY	4 x DDR4 UDIMMs up to 2400 MHz ECC 64 GB max
MODULE UPGRADES	Intel® I/O Expansion Module Intel® Integrated RAID Module Intel® Remote Management Module 4 LITE2 Trusted Platform Module 1.2

1U RACK SYSTEMS

Dimensions (H x W x D)	1.7" x 17.26" x 23.84"
System Cooling	Fixed cooling fans
Power Supply	450 W Redundant (Gold Efficiency)
Thermal Solution	Sold separately
Other Components	Optional optical disk drive
Warranty	3 year limited warranty

SPECIFIC SKUs

R1208SPOSHORR	8 x 2.5" hot-swap HDD Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU
R1304SPOSHBNR	4 x 3.5" hot-swap HDD Intel® Server Board S1200SPOR 1 x 350 W fixed PSU
R1304SPOSHORR	4 x 3.5" hot-swap HDD Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at **www.intel.com/support**

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/go/serversystems**

[1] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

[2] High efficiency power supply.

[3] On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

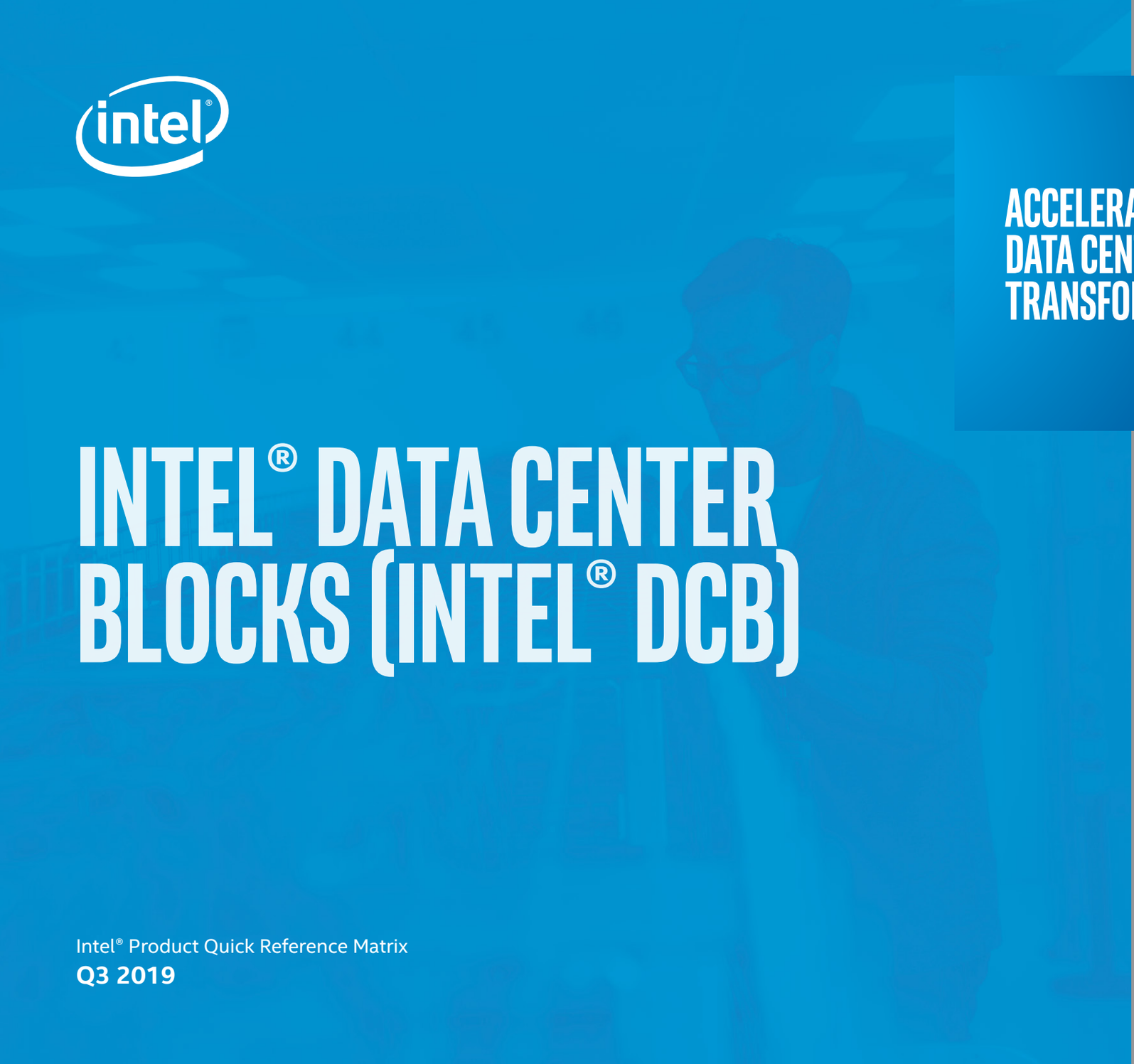
For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/serversystems.

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation



ACCELERATING DATA CENTER TRANSFORMATION

INTEL® DATA CENTER BLOCKS (INTEL® DCB)

Intel® Product Quick Reference Matrix

Q3 2019

REDUCE COMPLEXITY AND DRIVE INNOVATION

Customer data centers today require unique server solutions that run complex, business-critical workloads. Increasingly, it takes more of your resources to develop those solutions. Intel® Data Center Blocks make it easier for you to adopt, qualify, and sell the latest Intel® technology, helping you address the demands of today's data centers.

INTEL® DATA CENTER BLOCKS

Reduce complexity and speed time to market with unbranded, fully-validated data center blocks that feature Intel's latest technologies.

HIGHER INTEGRATION AND VALIDATION FOR FASTER TIME-TO-MARKET

The world of computing is getting more complex. In order to help partners keep up with the rapid pace of technological demands, Intel is making it easier to adopt, qualify and sell the latest Intel technology with purpose-built Data Center Blocks. These fully-validated server building blocks feature the required Intel technology to deliver customized solutions that meet complex customer needs. Because these Data Center Blocks come with a higher level of integration and validation, partners can reallocate R&D resources to higher value activities and accelerate time to market with innovative solutions.

Cloud and Software-Defined Infrastructure

Gain increased access to the private cloud and SDI market with fully-validated, server systems featuring the latest Intel® technologies and ISV software certifications.

High Performance Computing (HPC)

Accelerate your growth in the HPC market with unbranded, semi-integrated 1 and 2U rack system options built-to-order for intensive workloads.

Transform Business with Enterprise Performance

Grow and transform your business with pre-configured, fully validated server systems designed for the needs of business IT.

INTEL® DATA CENTER BLOCKS FOR HPC

Making the path to reliable HPC Solutions Easier

The process of configuring and validating the foundational components of an HPC solution that is tuned to meet specific customer requirements is a complex and resource intensive process. To help address these challenges, Intel provides high-quality, fully validated Intel Data Center Blocks for HPC that can reduce complexity for resellers. These Data Center Blocks for HPC incorporate Intel's latest data center technologies - already optimized to work better together - allowing partners to accelerate time to market with reliable HPC solutions.

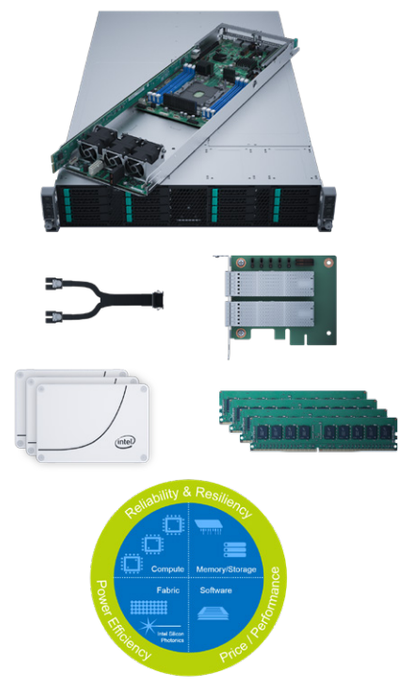
HPC Compute Blocks

CONFIGURE TO ORDER

Intel Data Center Blocks for HPC capture the innovations taking place in compute, fabric, storage and memory in a building block optimized for HPC environments. This means partners can order based on the specific needs of their customer. By taking advantage of Intel's latest technologies, as well as world-class engineering and validation expertise, partners can build innovative solutions faster and with a lower total cost of ownership.

MIX AND MATCH: BUILD YOUR OWN RACK

1U and 2U Rack form factors:
R1208WFTYS
R1304WF0YS, R1304WFTYS
R2208WFTZS, R2208WF0ZS, R2208WFQZS, R2224WFTZS, R2224WFQZS
R2308WFTZS, R2312WFTZS, R2312WF0NP, R2312WFQZS
HNS2600BPBR, HNS2600BPB24R, HNS2600BPSR, HNS2600BPS24R, HNS2600BPQR, HNS2600BPQ24R
HNS2600KPR, HNS2600KPFR
HNS2600TPR, HNS2600TP24R, HNS2600TP24SR, HNS2600TPFR
R1304WT2GSR, R1304WTTGSR
R1208WT2GSR, R1208WTTGSR
R2208WT2YSR, R2208WTTYC1R, R2208WTTYSR, R2224WTTYSR
R2308WTTYSR, R2312WTTYSR
HNS7200AP
2nd Generation Intel® Xeon® Scalable Processors Family
Intel® Xeon Phi™ processor family
Intel® Omni-Path Fabric
Intel Ethernet and RAID adapters
Intel® Server Products hardware and accessories from supported families

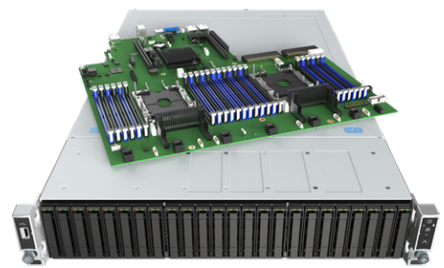


Intel® Data Center Blocks for Nutanix* Enterprise Cloud

Intel® Data Center Blocks (Intel® DCB) for Nutanix Enterprise Cloud are configure to order, non-branded server systems that are orderable with multiple options to allow your customer flexibility. When combined with Nutanix Enterprise Cloud* OS, Intel® DCB afford the agility and simplicity of the public cloud, with the security and control you need in a private cloud. Achieve operational agility with compute, storage and virtualization all in one box, while retaining your ability to choose your hardware configurations to meet your customers' requirements.

SUGGESTED CONFIGURATIONS

TYPE	INTEL® SERVER BOARD (NODE)	INTEL® XEON® SCALABLE PROCESSOR	INTEL® DC S4610 SSD 960GB	INTEL® DC S4610 SSD 1.92GB	INTEL® DC S4610 SSD 3.84TB	INTEL® DC P4610 SSD 3.2TB	SEAGATE 2TB HDD ST2000NX0433
VISUALIZED SERVERS WITHIN PRIVATE CLOUDS							
Good	S2600BP	2 x Silver 4116	2	-	-	-	4
Better	S2600BP	2 x Gold 5120	-	6	-	-	-
Best	S2600BP	2 x Gold 6152	-	-	4	2	-
BUSINESS-CRITICAL DATABASE & ANALYTICS							
Good	S2600WF	2 x Silver 4116	4	-	-	-	8
Better	S2600WF	2 x Gold 6130	-	16	-	-	-
Best	S2600WF	2 x Platinum 8164	-	-	20	2	-



NUTANIX™

Visit **www.intel.com/nutanix** for additional information on Intel® DCB for Nutanix Enterprise Cloud.

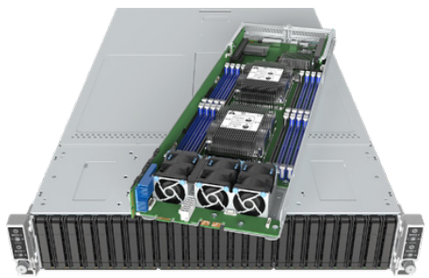
Utilize the CTO tool at **orderconfigurator.intel.com** to configure the right solution for your customer today.

Intel® Data Center Blocks for Cloud - Microsoft Windows Server*

Designing, testing and validating a Microsoft Windows Server solutions for private cloud or Software Defined Storage (SDS) and be complex and resource-intensive. Cloud blocks for Microsoft are fully-validated, preconfigured server systems build with certified Windows Server ingredients. Designed to address the challenges of modern IT, this offering help resellers reduce complexity and speed to market.

CLOUD BLOCKS FROM INTEL

PRODUCT	Intel® Data Center Blocks for Cloud – Microsoft Windows Server*
DESCRIPTION	Cloud Blocks for Microsoft Windows Server are fully-validated, pre-configured server systems featuring the latest Intel® technology, including Intel® Server Boards and Chassis, Intel® Xeon® processors and Intel® Solid State Drives (SSDs). Built with certified Windows Server ingredients and optimized for Microsoft Storage Spaces Direct (SDS), these blocks are available in multiple All-Flash (AF) or Hybrid (HY) configurations.
TARGET MARKET	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test and Development scenarios, and Enterprise Production Workloads.



ORDER CODES	INTEL® SERVER SYSTEM	FEATURES*
	ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)	
MCB2208WFAF10R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 32 TB raw storage capacity • Intel® Xeon® Gold 6230 processor • 512 GB memory
MCB2208WFAF9R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 24 TB raw storage capacity • Intel® Xeon® Gold 6230 processor • 768 GB memory
MCB2208WFAF8R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 16 TB raw storage capacity • Intel® Xeon® Gold 6230 processor • 512 GB memory
MCB2208WFAF7R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 12 TB raw storage capacity • Intel® Xeon® Gold 5218 processor • 384 GB memory
MCB2208WFAF6R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 16 TB raw storage capacity • Intel® Xeon® Gold 5218 processor • 384 GB memory
MCB2208WFAF5R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 30.7 TB raw storage capacity • Intel® Xeon® Gold 5218 processor • 384 GB memory
MCB2208WFAF4R[3]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 11.5 TB raw storage capacity • Intel® Xeon® Gold 5218 processor • 384 GB memory
MCB2208WFAF6[3]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• 24 TB raw storage capacity • Intel® Xeon® Gold 6152 processor • 768 GB memory
MCB2208WFAF5[3]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• 12 TB raw storage capacity • Intel® Xeon® Gold 5120 processor • 384 GB memory

Intel® Data Center Blocks for Cloud - Microsoft Windows Server* — Continued

ORDER CODES	INTEL® SERVER SYSTEM	FEATURES*
	ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)	
MCB2208WFAF4[3]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• 11.5 TB raw storage capacity • Intel® Xeon® Gold 5118 processor • 384 GB memory
MCB2224BPAF3R[3]	2U 4 node Intel® Server Chassis H2224XXLR3	• 11.5 TB raw storage capacity per node • Intel® Xeon® Gold 5218 processor • 256 GB memory
MCB2224BPAF3[3]	2U 4 node Intel® Server Chassis H2224XXLR3 and Intel® Server Board S2600BPS	• 7.7 TB raw storage capacity per node • Intel® Xeon® Gold 5118 processor • 256 GB memory
	HYBRID CONFIGURATIONS (Hard drives for capacity, SSDs for cache)	
MCB2208WFHY2R[2]	2U 1 node Intel® Server System and Intel® Server Board S2600WF0R	• 15.8 TB raw storage capacity • Intel® Xeon® Gold 5218 processor • 128 GB memory
MCB2208WFHY2[2]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• 12 TB raw storage capacity • Intel® Xeon® Gold 5118 processor • 128 GB memory
MCB2224BPHY1R[2]	2U 4 node Intel® Server Chassis	• 8 TB raw storage capacity per node • Intel® Xeon® Silver 4215 processor • 128 GB memory
MCB2224BPHY1[2]	2U 4 node Intel® Server Chassis H2224XXLR3 and Intel® Server Board S2600BPS	• 8 TB raw storage capacity per node • Intel® Xeon® Gold 5115 processor • 128 GB memory

Visit **ark.intel.com** to view product specific support status for Windows Server 2016 and Windows Server 2019 versions

[2] 3rd party SW stack and HDD NOT included
[3] 3rd party SW stack NOT included
* Other names and brands may be claimed as the property of others

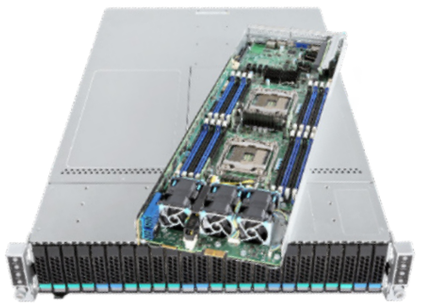
Intel® Data Center Blocks for Cloud – VMware* (vSAN ReadyNode*)

ACCELERATING THE PATH TO PRIVATE CLOUD WITH SOFTWARE DEFINED STORAGE (SDS) AND VMWARE* (VSAN READYNODE) FROM INTEL® DATA CENTER BLOCKS

The new 2nd generation Intel® Xeon® processor Scalable family, including Intel® Optane™ technology, empowers modern hybrid cloud deployments with the ability to place large data sets closer to the processors for reduced latency, high density, and non-volatility. As a result, today's enterprises gain the ability to move, store, and process data more quickly in demanding workflow scenarios, and extract greater value from data sets. Intel® Data Center Blocks for Cloud (Intel® DCB for Cloud) - VMWare* vSAN ReadyNode offer a validated and supported solution tailored for high performance computing, hyper-converged architecture, and storage scenarios requiring outstanding performance. Available in All-Flash and Hybrid configurations, these systems offer partners the flexibility to build innovative, cost-effective, software-defined storage solutions quickly and efficiently.

INTEL® DATA CENTER BLOCKS FOR CLOUD - VMWARE (VSAN READYNODE)

PRODUCT	Intel® Data Center Blocks for Clouds - VMware (vSAN ReadyNode)
DESCRIPTION	Intel Cloud Blocks for VMware are fully-validated, pre-configured server systems featuring the latest Intel technology, including Intel® Server Boards and Chassis, 2nd Generation Intel® Xeon® processors, and Intel® Solid State Drives (SSDs), as well as third-party memory and VMware VSAN certifications in configurations optimized for SDS solutions. These vSAN ReadyNodes from Intel are available in multiple All-Flash (AF) or Hybrid (HY) system configurations, each designed for specific workloads and use cases.
TARGET MARKET	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test and Development scenarios, and Enterprise Production Workloads.



ORDER CODES	VMWARE* VSAN PROFILE	INTEL® SERVER SYSTEM	FEATURES*
	ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)		
VRN2208WFAF83R	All Flash (AF-8)[3]	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 24 TB raw storage capacity per node • Intel® Xeon® Gold 6230 processor • 512 GB memory
VRN2208WFAF82R	All Flash (AF-8)[3]	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 12 TB raw storage capacity per node • Intel® Xeon® Gold 5218 processor • 384 GB memory
VRN2208WFAF81R	All Flash (AF-8)[3]	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 11.5 TB raw storage capacity per node • Intel® Xeon® Gold 5218 processor • 384 GB memory
VRN2208WFAF61R	All Flash (AF-6)[3]	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 7.68 TB raw storage capacity per node • Intel® Xeon® Gold 5218 processor • 256 GB memory
VRN1208WFAF41R	All Flash (AF-4)[3]	1U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 3.84 TB raw storage capacity per node • Intel® Xeon® Gold 5215 processor • 128 GB memory

Continued on next page

Intel® Data Center Blocks for Cloud – VMware* (VSAN Ready Node) — Continued

Continued from previous page

ORDER CODES	VMWARE* VSAN PROFILE	INTEL® SERVER SYSTEM	FEATURES*
		ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)	
VRN2208WFAF83	All Flash (AF-8)[3]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• Up to 120 VMs and 80K IOPs per node • 24 TB raw storage capacity per node • Intel® Xeon® Gold 6152 processor • 768GB memory
VRN2208WFAF82	All Flash (AF-8)[3]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	• Up to 120 VMs and 80K IOPs per node • 12 TB raw storage capacity per node • Intel® Xeon® Gold 5120 processor • 384 GB memory
VRN2208WFAF81	All Flash (AF-8)[3]	2U 1 node Intel® Server Chassis R2208WF0ZS and Intel® Server Board S2600WFO	• Up to 120 VMs and 80K IOPs per node • 11.5 TB raw storage capacity per node • Intel® Xeon® Gold 5118 processor • 384 GB memory
VRN2224BPAF6	All Flash (AF-6)[3]	2U 4 node Intel® Server Chassis H2224XXLR3 with Intel® Server Board S2600BPS	• Up to 60 VMs and 50K IOPs per node • 9.6 TB raw storage capacity per node • Intel® Xeon® Xeon Gold 5118 processor • 256 GB memory
		HYBRID CONFIGURATIONS (Hard for capacity, SSDs for cache)	
VRN2208WFHY6R	Hybrid (HY-6)[2]	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WF0R	• 12 TB raw storage capacity per node • Intel® Xeon® Gold 5215 processor • 256 GB memory
VRN2208WFHY6	Hybrid (HY-6)[2]	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	• Up to 50 VMs and 20K IOPs per node • 12 TB raw storage capacity per node • Intel® Xeon® Gold 5115 processor • 256 GB memory
VRN2224BPHY6R	Hybrid (HY-6)[2]	2U 1 node Intel® Server Chassis H2224XXLR3	• 8 TB raw storage capacity per node • Intel® Xeon® Gold 5215 processor • 256 GB memory
VRN2224BPHY6	Hybrid (HY-6)[2]	2U 4 node Intel® Server Chassis VRN2224BPHY6 and Intel® Server Board S2600BPS	• Up to 50 VMs and 20K IOPs per node • 8 TB raw storage capacity per node • Intel® Xeon® Gold 5115 processor • 256 GB memory
VRN2224BPHY4R	Hybrid (HY-4)[2]	2U 4 node Intel® Server Chassis H2224XXLR3	• 4 TB raw storage capacity per node • Intel® Xeon® Gold 5215 processor • 128 GB memory

[2] 3rd party SW stack and HDD NOT included

[3] 3rd party SW stack NOT included

* Other names and brands may be claimed as the property of others

Intel® Data Center Blocks for Networking – NFVI Server System

SIMPLIFYING AND ACCELERATING NETWORK FUNCTIONS VIRTUALIZATION INFRASTRUCTURE (NFVI) DEPLOYMENT

With the global network functions virtualization (NFV) market projected to grow at a compound annual growth rate (CAGR) of 42%, reaching $15.5 billion by 2020, a massive market opportunity exists. However, many system builders do not have deep experience in designing for the unique requirements of multi-function systems and are looking for a way to address the complexity they face in selecting and validating optimal configurations. The NFVI Server System designed and tested by Intel to deliver exceptional performance for NFVI workloads. Rather than procuring hardware as components and building the system from scratch, the NFVI Server System comes as a pre-configured system to help partners accelerate time to market with workload optimized solutions.

KEY BENEFITS

- Optimized for the unique needs of network functions virtualization infrastructure (NFVI) workloads to deliver exceptional performance
- Fully validated, pre-configured NFVI Server System saves time and money[1] freeing up resources to focus on value-add and competitive differentiation
- Single order code simplifies procurement and reduces complexity associated with system design and validation
- Intel quality and reliability with world-class integration, validation, certification, and support
- Standard Intel three-year warranty ensures customer satisfaction

NFVI ENABLEMENT OPTIONS FROM INTEL

NFVI Server Block	Intel® Select Solution for NFVI Reference Architecture	Intel® Select Fast Track Kit for NFVI
Pre-configured, fully-validated Intel Xeon® Scalable processor-based system with balanced Intel® QuickAssist Technology (Intel® QAT), Networking, and NVMe* Storage are designed to accelerate time to market. Ensures efficient data flows, with consistent, repeatable performance. Designed to meet the Intel® Select Solution for NFVI hardware specification.	Reference Architecture that includes a hardened configuration of hardware, firmware, and software optimized for essential NFV workloads. Delivered as a branded Intel® Select Solution systems through Intel partners. The NFVI Server System hardware is used for reference architecture validation.	Combines the NFVI Server System with pre-installed Intel® Select Solution for NFVI software (Ubuntu or RedHat). Provides faster access to a fully functional NFVI optimized development platform.

Continued on next page

Intel® Data Center Blocks for Networking – NFVI Server System (Continued)

Continued from previous page

PRODUCT SPECIFICATIONS

ORDER CODE	NB2208WFQNFVI
PROCESSOR	2x Intel® Xeon® Gold 6152 processor, 22 Cores, 2.1 GHz, Base non-AVX Core frequency, 30.25 LLC (MB), 140 W TDP
BOARD + CHASSIS	Intel® Server System R2208WFQZS (including Intel® Server Board S2600WFQ with symmetric Intel® QAT and 2U Intel® Server Chassis with 8 x 2.5” backplane
DIMENSIONS	16.93" x 27.95" x 3.44"
POWER SUPPLY	2x Redundant 1300 W CRPS - AC, Titanium
MEMORY	24x RDIMM 16 GB – DDR4 288-pin, 2666 MHz (384 GB total)
STORAGE-CAPACITY	4x Intel® SSD DC P4500 (1.0 TB)
BOOT DRIVES (R1)	2x Intel® SSD DC S4500 (240 GB)
NVME* SWITCH	1x 4 Port Switch adapter (CPU1 riser)
CABLES - STORAGE	4x OCuLink* Cables for 4 drives -- AXXCBL470CVCR (1), AXXCBL530CVCR (1), AXXCBL800CVCR (2)
CONNECTIVITY - NICS	4x Intel® Ethernet Network Adapter XXV710-DA2 (25 GbE, 2 adapters per riser)
MANAGEMENT NIC	1x Intel® Ethernet Network Connection OCP I357-T4
REAR HOT SWAP BACKPLANE (HSBP)	Rear Hot-swap Dual Drive Cage Upgrade Kit

[1] Cost reduction scenarios described are intended as examples of how a given Intel®-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

Intel® Data Center Block with Firmware Resilience

Making It Easier to Deliver Competitive and Secure[1] Servers for Critical Infrastructure, Government, and Financial Institutions.

As security threats continue to evolve and increase, security IT officers are driving for a holistic and expanded view to protect their critical infrastructure. This includes protecting the server all the way down to the firmware at the lowest layers of the platform, where threats are most difficult to detect. While technologies exist to protect the higher layers of the infrastructure stack, system IT users need assurance that the underlying platform launching these security technologies can be trusted.

As hackers seek new ways to infiltrate servers, the lower layers of the platform, where threats are most difficult to detect become a more common target. To address this, Intel has developed the Intel® Data Center Block with Firmware Resilience. Featuring Intel® Platform Firmware Resilience technology, this preconfigured, validated server system enables platform security starting in the factory through power-on, system boot, OS load, and beyond[1]. With this offering, customers can protect firmware from being intercepted, detect firmware corruption, and automatically restore a system if malware is detected. The ability to correct firmware corruptions is a new and innovative capability, and an ideal solution for security-sensitive industries including government, financial institutions, and critical infrastructure.

Intel is simplifying adoption of this technology through fully-validated, configure-to-order systems featuring security-optimized Intel® Xeon® processor, Intel® Server Boards, Intel® Server Chassis, and multiple upgrade options to provide a solution that customers can deploy quickly and with confidence.

Configure a system designed for your needs. Choose from three security-optimized processors and a variety of upgrade options.

Intel® Platform Firmware Resilience technology protects, detects critical firmware during boot and runtime attacks
9 pre-configured system SKUs with Order Codes: LFRB2208WFTF801, LFRB2208WFTF601, LFRB2208WFTF401, LFRB2312WFTF801, LFRB2312WFTF601, LFRB2312WFTF401, LFRB1208WFTF801, LFRB1208WFTF601, LFRB1208WFTF401
Intel® Server Board S2600WFTF
Intel® Server Chassis R2000WFTF and R1000WFTF families; 2U & 1U chassis with 1300WAC Power Supplies.
3x Security Optimized Processor Options (Intel® Xeon® Scalable processor, Platinum, Gold & Silver)
Includes two memory modules:16GB, RDIMM, DDR4, 2666 MT/s
RFID Antenna for Protect-In-Transit
Intel Fabric, Ethernet and RAID adapters (Optional)
Support for 8x2.5" or 12x3.5" (only 2U) drives
Intel® Server Products hardware and accessories from supported families

[1] Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer to learn more at intel.com.

Software Guard Extensions Server Block

CONTENT DELIVERY NETWORKS, CLOUD SERVICE PROVIDERS, COMMUNICATIONS NETWORKS, AND FINANCIAL INSTITUTIONS

The Software Guard Extensions Server Block is optimized for information security, featuring Intel's industry-leading cryptographic isolation technology - Intel® Software Guard Extensions (Intel® SGX). Intel® SGX provides CPU-hardened enclaves, or protected areas of execution in memory, that increase security for selected code and data on compromised platforms. The Software Guard Extensions Server Block is an unbranded server system designed to be a cost-effective cryptographic security solution that delivers enterprise-grade performance, reliability and security in an easy-to-manage system.

PRODUCT	Software Guard Extensions Server Block
DESCRIPTION	Pre-configured, fully validated 1U rack system, featuring Intel® Software Guard Extensions (Intel® SGX) for cryptographic security; includes the Intel® Server Board S1200SPOR, as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe* expansion options for increased storage functionality or faster networking speed.
ORDER CODE	LR1304SPCFSGX1
TARGET MARKET	Security optimized server for customers with high data protection needs
SERVER BOARD	Intel® Server Board S1200SPOR
FORM FACTOR	1U; microATX 9.6" x 9.6"
PROCESSOR SUPPORT	Single Intel® Xeon® processor E3-1270 v6, up to 72W TDP
CHIPSET	Intel® C236 chipset
MEMORY	64GB (4 x16GB), 2133MHZ, DDR4, UDIMM
SATA PORTS	One DH-10 Serial Port 'A' connector
INTEGRATED LAN	Dual 1GbE – Intel® i210
MANAGEMENT SUPPORT	Intel® Remote Management Module 4 Lite 2 (AXXRMM4LITE2)
CHASSIS	Intel 1U chassis with hot-swappable 4 x 3.5" (2.5" SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)
CHASSIS DIMENSIONS	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)
SECURITY	TPM 2.0 Module
FANS	Three managed 40mm single rotor system fans One fan for each installed power supply module
STORAGE	4 x 3.5" (2.5" SSD Ready) hot-swap drive bays 1 x optical drive bay
UPGRADE OPTIONS	Two Intel® SSD DC S3520 Series (1.2 TB, 2.5in. SATA 6Gb/s, 16nm, MLC) Intel® Integrated RAID Module options Intel® I/O Expansion Module options
WARRANTY	3 year limited warranty with options to expand to 5 years

Intel® Data Center Blocks for Business - Entry Server Block

ENTERPRISE PERFORMANCE FOR ENTRY NEEDS

In a highly competitive market, small enterprise and cloud service providers (CSPs) need a cost-effective server that delivers enterprise-grade performance, reliability and security in an easy-to-manage system. They also need solutions that are able to scale and be more agile, while also being competitively priced. To help address this demand, Intel is providing pre-configured, fully-validated Entry Server Blocks that will help accelerate time to market with server solutions optimized for the needs of small enterprises and CSPs. This 1U rack system includes Intel® components and 3rd party memory, in an unbranded offering that will help reduce the complexity and costs associated with designing, configuring and validating server solutions.

ENTRY SERVER BLOCK FROM INTEL

PRODUCT	Intel® Data Center Blocks for Business - Entry Server Block
DESCRIPTION	Pre-configured, fully validated 1U rack system, featuring the Intel® Server Board S1200SPOR as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe* expansion options for increased storage functionality or faster networking speed.
ORDER CODE	LR1304SPCFG1R
TARGET MARKET	Entry level server for small and medium businesses (SMBs), optimized for web hosting, enterprise applications and storage
SERVER BOARD	Intel® Server Board S1200SPOR
FORM FACTOR	1U; microATX 9.6” x 9.6”
PROCESSOR SUPPORT	Single Intel® Xeon® processor E3-1230 v6, up to 72W TDP
CHIPSET	Intel® C236 chipset
MEMORY	16GB (1 x16GB), 2133MHZ, DDR4, UDIMM
SATA PORTS	One DH-10 Serial Port ‘A’ connector
INTEGRATED LAN	Dual 1GbE – Intel® i210
MANAGEMENT SUPPORT	Intel® Remote Management Module 4 Lite 2 (AXXRMM4LITE2)
CHASSIS	Intel 1U chassis with hot-swappable 4 x 3.5” (2.5” SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)
CHASSIS DIMENSIONS	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)
FANS	Three managed 40mm single rotor system fans One fan for each installed power supply module
STORAGE	4 x 3.5” (2.5” SSD Ready) hot-swap drive bay, drives not included 1 x optical drive bay
UPGRADE OPTIONS	Up to 4x 2.5” SSD drives; Intel® Integrated RAID Module options; Intel® I/O Expansion Module options
WARRANTY	3 year limited warranty with options to expand to 5 years

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/dcb** or **ark.intel.com**

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

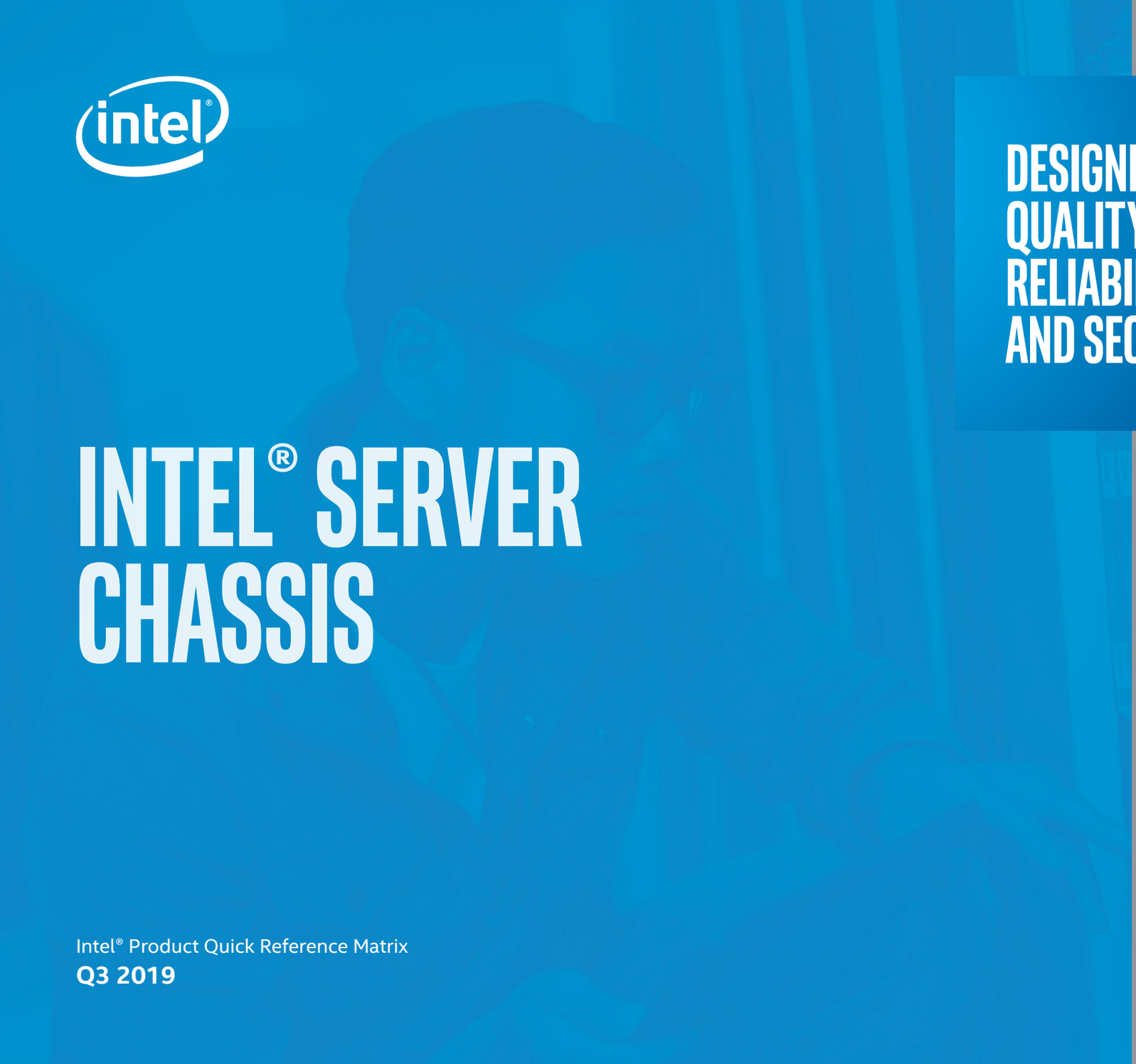
For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/products/server/chassis or ark.intel.com.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation



DESIGNED FOR QUALITY, RELIABILITY, AND SECURITY.

INTEL® SERVER CHASSIS

1U/2U RACK

New flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments support custom form factor server boards. Find high-density, 2U rackable chassis supporting up to 4 hot-pluggable Intel® Compute Modules up to 24 2.5 inch hot-swap drives or up to 12 3.5 inch hot-swap drives.

TOWER CHASSIS

Pedestal chassis ideal for small and medium business environments and purpose-built appliances.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR

INTEL® SERVER CHASSIS H2000G FAMILY[3]

CHASSIS	2U rack chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB24, HNS2600BPQ24 or HNS2600BPS24, 24 2.5″ hot-swap drives, and 2 2130 W AC Platinum efficiency common redundant power supplies	2U rack chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB, HNS2600BPQ, or HNS2600BPS, up to 4 2.5″ hot-swap drives and 2 2130 W AC Platinum efficiency common redundant power supplies	High-density, 2U rackable chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB, HNS2600BPQ, HNS2600BPS up to 12 3.5″ hot-swap drives and two 2130 W AC Platinum efficiency common redundant power supplies
TARGET MARKET	Hyper-converged infrastructure, Cloud, Datacenter		
MODEL	24 2.5″ hot-swap drives	4 2.5″ hot-swap drives	3.5″ Hot-swap drive model
COMPUTE MODULE SUPPORT[1]	HNS2600BP24	HNS2600BPB	
CHASSIS ORDER CODE[1]	**H2224XXLR3**	**H2204XXLRE:** Available only as part of the HPC Data Center Block offering	**H2312XXLR3**
SPARES KIT ORDER CODE[2]	**AHWBPBGB24:** 6-Port IT Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, 2 NVMe* drives (pass-through), no RAID **AHWBPBGB24R:** 6-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID, 2 NVMe drives (pass-through), RAID 0/1/10 **AHWBPBGB24P:** 6-Port Add-In-Card (AIC) pass-through Bridge Board; Must be used in combination with an add-in RAID card to be functional	**AHWBPBGB:** 4-Port SATA SW RAID Bridge Board, 6G SATA only, no RAID **AHWBP12GBGB:** 4-Port Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10 **AHWBP12GBGBR5:** 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10	**AHWBPBGB:** 4-Port SATA SW RAID Bridge Board, 6G SATA Only, no RAID **AHWBP12GBGB:** 4-Port Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10 **AHWBP12GBGBR5:** 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10
FORM FACTOR	2U Rack		
DRIVE BAYS	Supports up to 24 2.5″ hot-swap SAS / SATA drives	Supports up to four 2.5″ hot-swap SAS / SATA drives	Up to 12 2.5″ or 3.5″ hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Included		
NVMe*	Support up to 8 2.5″ PCIe* SFF devices	None	N/A
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module		
POWER SUPPLIES	2 Common redundant 2130 W AC (Platinum Efficiency)		
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap		
DIMENSIONS (H x W x D)	3.46″ x 17.24″ x 28.86″	3.46″ x 17.24″ x 30.35″	
BEZEL FEATURES	Black, independate front panel controls for each individual module		
FRONT CONNECTORS	N/A		
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis		

INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4

INTEL® SERVER CHASSIS H2000G FAMILY[3]

CHASSIS	2U rack chassis supporting up to four hot-pluggable Intel® Compute Module HNS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5″ hot-swap drives and two 1600W common redundant power supplies.	2U rack chassis supporting up to four hot-pluggable Intel® Compute Module NS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5″ hot-swap drives and two 2130 W common redundant power supplies.
TARGET MARKET	Hyper-converged infrastructure/Cloud/Datacenter	
MODEL	4 2.5″ hot-swap drives, including support for up to eight 2.5″ PCIe* small form factor (SFF) devices	
INTEL® SERVER BOARD SUPPORT[1]	HNS2600TP24R, HNS2600TP24SR	
CHASSIS ORDER CODE[1]	**H2224XXKR2**	**H2224XXLR2**
SPARES KIT ORDER CODE[2]	24 x 2.5″ Backplane: FHW24X25HS12G Power interposer board: FXXCRPSPIB Power docking board: FH2000NPB24 Bridge board: FHWKPTPBGB24	24 x 2.5″ Backplane: FHW24X25HS12G Bridge board: FHWKPTPBGB24 Front control panel kit: FH2000FPANEL2 Power distribution board: FXXCRPSPDB2 Power board: FH2000NPB24 Power in backplane bridge board module: FXXCRPSPIB
FORM FACTOR	2U Rack	
DRIVE BAYS	Supports up to twenty-four 2.5″ hot-swap SAS drives	
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Included	
NVMe*	Support up to eight 2.5″ PCIe* SFF devices	
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module	
POWER SUPPLIES	(2) Common Redundant 1600 W (Platinum Efficiency)	
I/O SLOTS	Up to 2	
BACKPLANE	Included combination backplane with PCIe* SFF device support	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.46″ x 17.24″ x 28.86″	
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4

INTEL® SERVER CHASSIS H2000G FAMILY[3]

CHASSIS	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
MODEL	3.5″ drive model	2.5″ drive model
INTEL® SERVER BOARD SUPPORT[1]	HNS2600KPR, HNS2600KPFR HNS2600TPR, HNS2600TPFR	
CHASSIS ORDER CODE[1]	**H2312XXKR2**	**H2216XXKR2**
SPARES KIT ORDER CODE[2]	12 x 3.5″ Backplane: FHW12X35HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2	16 x 2.5″ Backplane: FHW16X25HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2
FORM FACTOR	2U Rack	
DRIVE BAYS	Up to twelve 2.5″ or 3.5″ hot-swap SAS / SATA drives	Up to sixteen 2.5″ hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	FXX35HSCAR	FXX25HSCAR
NVMe*	N/A	
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module	
POWER SUPPLIES	(2) Common Redundant 1600 W (Platinum Efficiency)	
I/O SLOTS	Up to 2	
BACKPLANE	Included	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.42″ x 17.24″ x 30.35″ (87mm x 438mm x 771mm)	3.42″ x 17.24″ x 28.86″ (87mm x 438mm x 771mm)
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON PHI™ PROCESSOR

INTEL® SERVER CHASSIS H2000G FAMILY[3]

CHASSIS	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
MODEL	3.5″ drive model	2.5″ drive model
INTEL® SERVER BOARD SUPPORT[1]	HNS7200AP; HNS7200APL; HNS2600KPR, HNS2600KPFR; HNS2600TPR, HNS2600TPFR	
CHASSIS ORDER CODE[1]	**H2312XXLR2**	**H2216XXLR2**
SPARES KIT ORDER CODE[2]	12 x 3.5″ Backplane: FHW12X35HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U4APRISER Bridge Board Spare: FHWAPBGB	16 x 2.5″ Backplane: FHW16X25HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U4APRISER Bridge Board Spare: FHWAPBGB
FORM FACTOR	2U Rack	
DRIVE BAYS	Up to twelve 2.5″ or 3.5″ hot-swap SAS / SATA drives	Up to sixteen 2.5″ hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	FXX35HSCAR	FXX25HSCAR
NVMe*	N/A	
SYSTEM COOLING	3 x 40mm x 56mm dual rotor fans per module	
POWER SUPPLIES	(2) Common Redundant 2130 W (Platinum Efficiency)	
I/O SLOTS	Up to 2	
BACKPLANE	Included	
TOOL-LESS FEATURES	PSU, Compute module, HDD bays are all hot-swap	
DIMENSIONS (H x W x D)	3.42″ x 17.24″ x 30.35″ (87mm x 438mm x 771mm)	3.42″ x 17.24″ x 28.86″ (87mm x 438mm x 771mm)
BEZEL FEATURES	Black, independate front panel controls for each individual module	
FRONT CONNECTORS	N/A	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	

INTEL® SERVER CHASSIS R1000WF AND INTEL® SERVER CHASSIS R1000WT FAMILIES

The Intel® Server Chassis R1000WF and Intel® Server Chassis R1000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.

	INTEL® SERVER CHASSIS R1000WF FAMILY	INTEL® SERVER CHASSIS R1000WT FAMILY
CHASSIS	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.	
MODEL	Hot-swap drive models	
INTEL® SERVER BOARD SUPPORT[1]	S2600WFT, S2600WF0, S2600WFQ†	S2600WT2R, S2600WTTR
CHASSIS ORDER CODE[1]	**R1304WFXXX**	**R1208WTXXX** **R1304WTXXX**
SPARES KIT ORDER CODE[2]	1U riser for PCI Express* 3.0 x16 FHHL: F1UL16RISER3 SAS cables depend on usage model, reference Configuration Guide	
FORM FACTOR	1U Rack	
DRIVE BAYS	**R1304WTXXX:** Up to four 2.5″ or 3.5″ hot-swap SAS / SATA drives **Optional:** Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)	**R1208WTXXX:** Up to eight 2.5″ hot-swap SAS / SATA drives, up to 4 PCI Express SSD with optional accessory (A1U44X25NVMEDK) **R1304WTXXX:** Up to four 2.5″ or 3.5″ hot-swap SAS / SATA drives **Optional:** Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Included	
SYSTEM COOLING	6 x 40mm internal redundant chassis fans	
POWER SUPPLIES	(2) Common Redundant 1100 W AC (Platinum Efficiency) (2) Common Redundant 750 W DC -48V (Gold Efficiency) NOTE: Power supply sold separately	
I/O SLOTS	Up to 2 PCI Express 3.0 x8 (HLFH) with purchase of risers F1UL16RISER2, Intel® I/O Expansion module, SAS module	
BACKPLANE	Included	
TOOL-LESS FEATURES	Front bezel, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	
DIMENSIONS (H x W x D)	Rack: 17.25″ x 1.72″ x 28″ (438mm x 44mm x 711mm)	
BEZEL FEATURES	Black, control panel, two USB ports	
FRONT CONNECTORS	2 x USB	
SYSTEM SECURITY	Locking bezel and chassis intrusion	

† Q SKU launches Q4'17

For more information, visit **www.intel.com/products/server/chassis** or **ark.intel.com**

INTEL® SERVER CHASSIS R2000WF AND INTEL® SERVER CHASSIS R2000WT FAMILIES

The Intel® Server Chassis R2000WF and Intel® Server Chassis R2000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.

	INTEL® SERVER CHASSIS R2000WF FAMILY	INTEL® SERVER CHASSIS R2000WT FAMILY
CHASSIS	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.	
MODEL	Hot-swap drive models	
INTEL® SERVER BOARD SUPPORT[1]	S2600WFT, S2600WF0	S2600WT2R, S2600WTTR
CHASSIS ORDER CODE[1]	**R2000WFXXX**	**R2000WTXXX; R2312WTXXX**
SPARES KIT ORDER CODE[2]		Accessory 2U Hot-swap Drive Cage Upgrade Kit with 4x NVMe SSD support: A2U44X25NVMEDK
	2U 3 slot riser for PCI Express* 3.0 x8: A2UL8RISER2 2U short riser PCI Express 3.0 x8, PCI Express x4: A2UX8X4RISER Accessory 2U 2 slot riser for PCI Express 3.0 x16: A2UL16RISER2 Rear 2-drive cage accessory: A2UREARHSDK SAS cables depend on usage model, reference Configuration Guide, See Configuration Guide for detailed list of Spares and Accessories	
FORM FACTOR	2U Rack	
DRIVE BAYS	**R2000FTXXX:** Requires accessory bays to support hot-swap drives, support for 2.5″ SSDs, optional 2 x 2.5″ rear hot-swap drives available with accessory (A2UREARHSDK)	**R2312WTXXX:** Up to 12 x 3.5″ hot-swap SAS / SATA drives, support for 2.5″ SSDs, optional 2 x 2.5″ rear hot-swap drives available with accessory (A2UREARHSDK) **R2000WTXXX:** Requires accessory bays to support hot-swap drives, support for 2.5″ SSDs, optional 2 x 2.5″ rear hot-swap drives available with accessory (A2UREARHSDK)
	Optional: 4 x 2.5″ NVM Express* (PCI Express SSDs) available with accessory (A2U44X25NVMEDK)	
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	A2U8X35S3PHSDK1: 8 x 2.5″ drives (Single port) A2U8X35S3PHSDK1(x3), Storage rack handle A2UHANDLKIT2 for 24 x 2.5″ drives (Single port) A2U8X25S3DPDK2: Dual port drive cage kit supports dual port SAS drives up to 24 drives	A2U8X25S3HSDK: 8 x 2.5″ drives (Single port) A2U8X25S3HSDK (x3), Storage rack handle A2UHANDLKIT for 24 x 2.5″ drives (Single port) A2U8X35S3HSDK: 8 x 3.5″ drives A2U44X25NVMEDK: Upgrade kit supporting up to 4 x 2.5″ NVMe* drives, optional 8 x 2.5″ HDD backplane A2U8X25S3DPDK: Dual port drive cage kit supports dual port SAS drives up to 24 drives
	See Configuration Guide for detailed list of cables needed	
SYSTEM COOLING	6 x 80mm internal redundant and hot-swap chassis fans	
POWER SUPPLIES	(2) Common Redundant 1300 W AC (Titanium Efficiency)	(2) Common Redundant 750 W AC (Platinum Efficiency)
	(2) Common Redundant 750 W DC -48V (Gold Efficiency); (2) Common Redundant 1100 W AC (Platinum Efficiency); NOTE: Power supply sold separately	
I/O SLOTS	Up to 8 x PCI Express 3.0 with purchase of risers: 2 x A2UL8RISER2 and 1 x A2UX8X4RISER	
BACKPLANE	R2000WFXXX: See ‘Drive Bays’	R2312WTXXX: Included; R2000WTXXX: See ‘Drive Bays’
TOOL-LESS FEATURES	Front bezel, top cover, PCI card retainer, fans, hot-swap drive carriers, hot-swap drive bays, peripheral bays, and PSU installation	
DIMENSIONS (H x W x D)	Rack: 17.25″ x 3.44″ x 28″ (438mm x 87mm x 711mm)	
BEZEL FEATURES	Black, control panel, security lock, two USB ports	
FRONT CONNECTORS	2 x USB	
SYSTEM SECURITY	Locking bezel and chassis intrusion	

INTEL® SERVER CHASSIS P4000M FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR AND INTEL® XEON® PROCESSOR E5-V4

Intel® Server Chassis P4000 series requires the separate purchase of a thermal solution kit and air duct specific to the Intel® Server Board selected. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers. Other boxed Intel® Thermal Solutions are mechanically compatible with the processor socket but are not thermally validated in Intel Server Chassis.

	INTEL® SERVER CHASSIS P4000 FAMILY
CHASSIS	A sleek and flexible mid-length tower chassis targeted at small- to medium-sized businesses supporting custom form factor server boards.
MODEL	Fixed drive models (upgradeable to hot-swap drive support)
INTEL® SERVER BOARD SUPPORT[1]	S2600STB, S2600STS, S2600CW2R, S2600CWTR, S2600CW2SR, S2600CWTSR
CHASSIS ORDER CODE[1]	**P4304XXMFEN2, P4304XXMUXX**
SPARES KIT ORDER CODE[2]	120mm Fixed Fan PCI area: FUPMNHFANPCI 120mm Fixed Fan for CPU area: FUPNHFANCPU 1600 W Common Redundant Power Supply: FXX1600PCRPS Accessory kit enables support for 2.5" FF PCI Express* 3.0 SSDs (NVMe): FUP8X25S3NVDK Bezel Spare for P4000 Chassis Supporting Fixed HDD: FUPCRPSCAGE Bracket and Extension Kit for P4000M Chassis Family: AUPMCOPROBR Front bezel with door: FUPBEZELHSD2 High Current P4000 Family Chassis Power Distribution Board Spare: FUPPDBHC2 hot-swap Drive Cage: FXX25SHCAR Redundant Power Supply Cage for Intel® Server Chassis P4000 Family: FUPCRPSCAGE SRC-B tower passive heat sink 92mm x 100mm: AUPCWPBTP Spare 3.5" Fixed HDD Carriers: FUP4X35NHDK Spare hot-swap Fan Kit for Intel® Server Chassis P4000M: FUPMLHSFAN
FORM FACTOR	4U Tower (rackable)
DRIVE BAYS	Up to 4 x 3.5" fixed drives, optional 4 or 8 x 3.5" or 8 or 16 x 2.5" hot-swap drive bay (2.5" configurations also support up to 4x PCIe 3.0 SSD's)
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Upgrade: Convert up to 8 SAS / SATA hot-swap drive bays using the upgrade kit: (FUP8X25HSDK) Upgrade: Convert up to 8 hot-swap PCI Express* drive cages to support 2.5" FF PCIe SSDs (NVMe*): FUP8X25S3NVDK
SYSTEM COOLING	P4304XXMFEN2: 2 x 120mm Internal fixed chassis fans; P4304XXMUXX : 5 x 80mm Redundant hot-swap internal chassis fans
POWER SUPPLIES	P4308XXMFEN2: (1) Fixed Non-redundant 550 W (Silver Efficiency); P4304XXMUXX: (2) Common Redundant 750 W (Platinum Efficiency) or (2) Common Redundant 1600 W (Platinum Efficiency) sold separately
I/O SLOTS	Up to 6
BACKPLANE	None included
TOOL-LESS FEATURES	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers
DIMENSIONS (H x W x D)	Tower: 17.24" x 6.81" x 24.9" (438mm x 173mm x 632mm)
BEZEL FEATURES	Black, control panel, two USB ports
FRONT CONNECTORS	2 x USB
SYSTEM SECURITY	Locking bezel and chassis intrusion

INTEL® SERVER CHASSIS P4000S FAMILY

CHASSIS	A general purpose 4U tower chassis supporting the Intel® Server Board S1200SP family with up to four 3.5″ fixed drives, two 460W common redundant power supplies optimized for thermal and acoustic performance.	A general purpose tower chassis optimized for thermal and acoustic performance.	
MODEL	4 x 3.5″ Fixed drives	Fixed drive models	Hot-swap drive models
INTEL® SERVER BOARD SUPPORT[1]	S1200SPLR, S1200SPSR		
CHASSIS ORDER CODE[1]	**P4000XXSFDR**	**P4304XXSFCN**	**P4304XXSHCN**
SPARES KIT ORDER CODE[2]	Front Panel board: FXXFPANELR Power Distribution Board: AP4000E3V5PDB 4 x 3.5″ 6Gb/s hard drive hot-swap backplane: FUP4X35HSBP 8 x 3.5″ 6Gb/s hard drive hot-swap backplane: FUP8X35HSBP 4 x 3.5″ 12Gb/s hard drive hot-swap backplane: FUP4X35S3HSBP 460W Cold redundant power supply: FXX460GCRPS	Mechanical Spares Kit: FUPSMSK Electrical Spares Kit: FUPSESK Air ducts sold separately based on board purchased	
FORM FACTOR	4U Tower		
DRIVE BAYS	Up to four 3.5″ fixed drives	Up to four 3.5″ fixed SAS / SATA drives	Up to four 3.5″ hot-swap SAS / SATA drives
HOT-SWAP DISK DRIVE BAY (ORDER CODE)	Hot-swap 6Gbps SATA drives: FUP4X35HSDK Hot-swap 6Gbps SATA drives: FUP8X35HSDK Hot-swap 12Gbps SAS drives: FUP4X35S3HSDK Hot-swap 12Gbps SAS drives: 2x FUP4X35S3HSDK	Upgrade: convert to four slot hot-swap drive bays using the following Drive Bay upgrade kit: (FUP4X35HSDK), supports four SAS / SATA hot-swap drives	Share the same hot-swap drive bay kit (FUP4X35HSDK), use as a spare
SYSTEM COOLING	(2) 92mm fixed fans (one PCIe* zone and one rear system fan)	2 x 92mm internal chassis fan (single fan in P4304XXSFCN)	2 x 92mm internal chassis fan (single fan in P4304XXSHCN)
POWER SUPPLIES	(2) Common Redundant 460 W (Gold Efficiency)	P4304XXSFCN: (1) Fixed 365 W (Silver Efficiency)	P4304XXSHCN: (1) Fixed 365 W (Silver Efficiency) P4304XXSHDR: (2) Common Redundant 460 W (Gold Efficiency)
I/O SLOTS	Up to 3	Up to 6	
BACKPLANE	None included		
TOOL-LESS FEATURES	Front bezel, EMI cover, PCI card retainer, peripheral bays, power supply unit installation, and fixed drive carriers	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	Front bezel, side cover, PCI card retainer, hot-swap drive carriers, hot-swap drive bay, peripheral bays, and PSU installation
DIMENSIONS (H x W x D)	Tower: 17.24″ x 6.81″ x 22.05″ (438mm x 173mm x 560mm)	Tower: 17.24″ x 6.81″ x 21.5″ (438mm x 173mm x 546mm)	
BEZEL FEATURES	Black, control panel, three 5.25″ peripheral drive bays, four internal drive bays	Black, control panel, three 5.25″ peripheral drive bays, four internal drive bays, two USB ports	Black, control panel, three 5.25" peripheral drive bays, four hot-swap drive bays and carriers (behind door), security lock, two USB ports
FRONT CONNECTORS	Two USB 3.0 ports	2 x USB	
SYSTEM SECURITY	Protection for chassis drives with a lock to the chassis	Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole	Front door: Security lock (available on hot-swap drive SKUs only) Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/products/server/chassis** or **ark.intel.com**

[1] Refer to http://support.intel.com/support/motherboards/server for up-to-date details on server boards supported by each chassis.

[2] For complete spare and accessory list, please download the latest configuration guide from Spare Parts list and Configuration Guide at http://support.intel.com/support/motherboards/server

[3] Intel® Server Chassis H2000 series requires the separate purchase of Intel® Compute Modules. See the Accessories and Spare Parts section of the chosen Intel® Server Board configuration guide for recommended part numbers.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/products/server/chassis or ark.intel.com.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

INTEL® RAID

EXCEPTIONAL DATA PROTECTION. FASTER PERFORMANCE. EASE OF USE.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® TRI-MODE GENERATION RAID PRODUCTS

The Intel® Tri-Mode RAID controllers, featuring LSI* SAS3500/SAS3400 series RAID-on-Chip (ROC) processors, offer significant performance enhancements for solutions architected with SAS, SATA, and PCIe* 3.0 NVMe* drives.

INTEL® RAID EXPANDER BOARDS

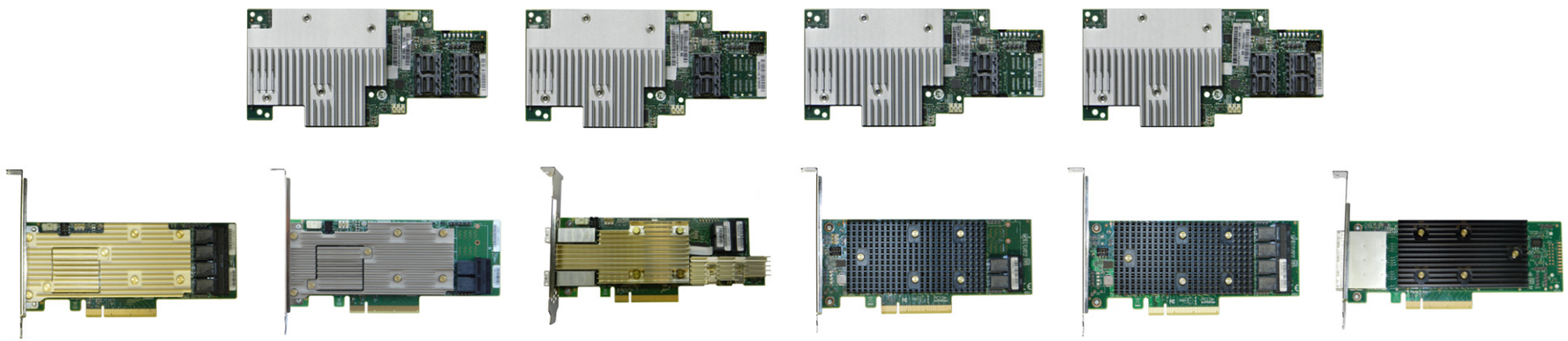
For high drive count solutions, Intel offers 12Gb/s SAS expander boards (available in midplane and add-in card form factors) and PCIe 3.0 switches and retimers.

INTEL® RAID PREMIUM FEATURES

Get more performance and data protection with Premium Features for Intel® RAID solutions. When combined with Intel® RAID controllers, you can further enhance storage applications and deliver higher ROI for your server boards and systems.

Tailor a Solution to Match Your Storage Needs

Intel offers multiple categories of RAID products to protect data, increase performance, scale storage, and enhance server availability. A brief description of each category is listed below.



Controller Cards and Modules

- Intel® RAID Modules are designed for select 2U Intel® Xeon® Processor-based server solutions, affording up to 16 ports of PCIe*/SAS/SATA connectivity without taking up a standard add-in card PCIe* slot, for a highly integrated configuration.
- Intel® RAID Adapters come in a low-profile MD2 standard PCIe* form-factor, and are PCIe* compliant for flexibility of configuration and use in any system by any vendor.

RAID Cache Backup

- Maintenance Free Backup Units (MFBUs) are available for Full-Featured RAID products with embedded cache. The backup options are listed in the “Backup Option” row of the product tables.

Expander Boards

- Intel® RAID Expander Cards are intended for any system with more than 8 drives. As an example of use, 8 RAID ports can be expanded to 24 ports.

Premium Feature Keys

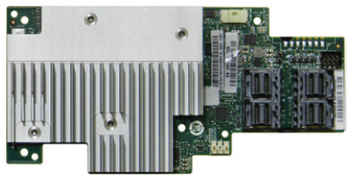
- Several upgrade features can be added to enhance the performance and data protection of Intel’s intelligent RAID cards and modules.

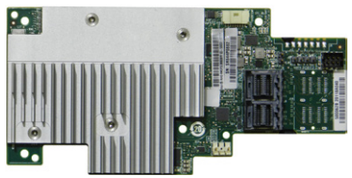
Cable Kits and Converter Boards

- Newer-generation RAID products do not ship with cables, as multiple options exist depending on the system in which the RAID products are installed. Therefore, Intel offers a variety of cables. A converter board that allows for two internal 8087 connectors to be converted to two external 8088 connectors is also available.

For the latest product SKUs and specifications, visit **http://ark.intel.com**

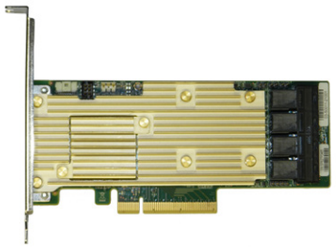
Intel® Integrated RAID Modules (Tri-Mode)

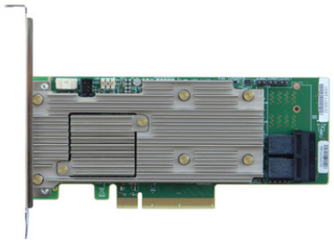


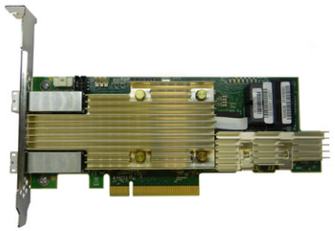


CONTROLLER	INTEL® INTEGRATED RAID MODULE RMSP3AD160F	INTEL® INTEGRATED RAID MODULE RMSP3CD080F	INTEL® INTEGRATED RAID MODULE RMSP3HD080E	INTEL® INTEGRATED RAID MODULE RMSP3JD160J
DESCRIPTION	Tri-Mode SAS/SATA/PCIe* full-featured RAID mezzanine module with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe full-featured RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe JBOD mezzanine module with 16 internal ports using four Mini-SAS-HD connectors
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID	JBOD
ORDER CODE	**RMSP3AD160F**	**RMSP3CD080F**	**RMSP3HD080E**	**RMSP3JD160J**
PROCESSOR	**LSI 3516**	**LSI 3508**	**LSI 3408**	**LSI 3416**
ONBOARD CACHE MEMORY	4GB DDR4	4GB DDR4	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	16 Internal ports	8 Internal ports	8 Internal ports	16 Internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	JBOD mode only
CACHE BACKUP OPTIONS	AXXRMFBU7	AXXRMFBU7	N/A	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
AVAILABILITY	Q2 2017	Q2 2017	Q2 2017	Q2 2017
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

Intel® RAID Controllers (Tri-Mode) - Full-Featured

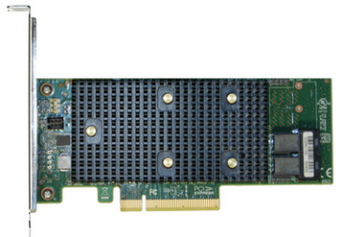


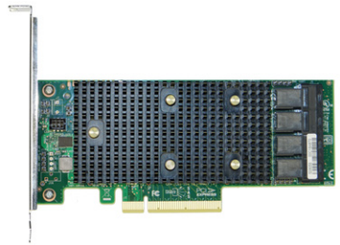




CONTROLLER	INTEL® INTEGRATED RAID MODULE RMSP3AD160F	INTEL® INTEGRATED RAID MODULE RMSP3CD080F	INTEL® INTEGRATED RAID MODULE RMSP3HD080E
DESCRIPTION	Tri-Mode SAS/SATA/PCIe* full-featured RAID mezzanine module with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe full-featured RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID
ORDER CODE	**RMSP3AD160F**	**RMSP3CD080F**	**RMSP3HD080E**
PROCESSOR	**LSI 3516**	**LSI 3508**	**LSI 3408**
ONBOARD CACHE MEMORY	4GB DDR4	4GB DDR4	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	16 Internal ports	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode
CACHE BACKUP OPTIONS	AXXRMFBU7	AXXRMFBU7	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
AVAILABILITY	Q2 2017	Q2 2017	Q2 2017
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

Intel® RAID Controllers (Tri-Mode) - Entry-Level and JBOD



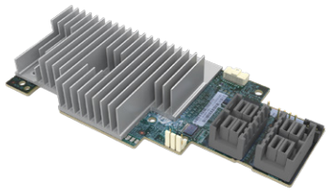


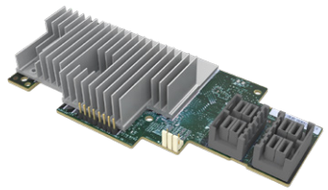
CONTROLLER	INTEL® RAID CONTROLLER RSP3WD080E	INTEL® INTEGRATED RAID MODULE RSP3QD160J	INTEL® INTEGRATED RAID MODULE RSP3GD016J
DESCRIPTION	Tri-Mode SAS/SATA/PCIe* entry-level RAID adapter with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 external ports using four external Mini-SAS-HD connectors
MARKET SEGMENT	Entry-level RAID	JBOD	JBOD
ORDER CODE	**RSP3WD080E**	**RSP3QD160J**	**RSP3GD016J**
PROCESSOR	**LSI* 3408**	**LSI 3416**	**LSI 3416**
ONBOARD CACHE MEMORY	N/A	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	16 Internal ports	8 External ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50 and JBOD mode	JBOD only mode	JBOD only mode
CACHE BACKUP OPTIONS	N/A	N/A	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Intel® Server boards + third party boards	Intel® Server boards + third party boards	Intel® Server boards + third party boards
AVAILABILITY	Q2 2017	Q2 2017	Q2 2017
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

Intel® Integrated RAID Modules (12Gb/s SAS 3.0)

CONTROLLER	INTEL® INTEGRATED RAID MODULE RMS3CC080	INTEL® INTEGRATED RAID MODULE RMS3CC040	INTEL® INTEGRATED RAID MODULE RMS3HC080	INTEL® INTEGRATED RAID MODULE RMS3JC080
DESCRIPTION	12 Gb/s SAS/SATA full-featured RAID mezzanine module with eight internal connectors and a storage I/O connector	12 Gb/s SAS/SATA full-featured RAID mezzanine module with four internal connectors and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Entry-level RAID	Entry-level RAID
ORDER CODE	**RMS3CC080**	**RMS3CC040**	**RMS3HC080**	**RMS3JC080**
PROCESSOR	**LSI* 3108 ROC**	**LSI* 3108 ROC**	**LSI* 3008 IOC**	**LSI* 3008 IOC**
ONBOARD CACHE MEMORY	1 GB DDR3	1 GB DDR3	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8
PORTS	8 Internal ports	4 Internal ports	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
CACHE BACKUP OPTIONS	AXXRMFBU5	AXXRMFBU5	N/A	N/A
CABLES	Purchased separately	Purchased separately	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

Intel® Integrated RAID Modules (12Gb/s SAS 3.0) - High Port Count





CONTROLLER	INTEL® INTEGRATED RAID MODULE RMS3AC160	INTEL® INTEGRATED RAID MODULE RMS3VC160
DESCRIPTION	A 12 Gb/s SAS/SATA full-featured RAID mezzanine module with 16 internal ports and dual core RAID-On-Chip (ROC)	A 12 Gb/s SAS/SATA JBOD mezzanine module with sixteen internal ports and dual core RAID-On-Chip (ROC)
MARKET SEGMENT	Full-featured RAID	Full-featured RAID
ORDER CODE	**RMS3AC160**	**RMS3VC160**
PROCESSOR	**LSI* 3316 ROC**	**LSI* 3216 ROC**
ONBOARD CACHE MEMORY	2 GB DDR3	NA
PCI E* INTERFACE	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	16 internal ports	16 internal ports
CHASSIS COMPATIBILITY	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	N/A (JBOD mode only)
CACHE BACKUP OPTIONS	AXXRMFBU6	NA
CABLES	Purchased separately	Purchased separately
INTEL® SERVER BOARD SUPPORT	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
WARRANTY	3 year limited warranty	3 year limited warranty

Intel® RAID Controllers (12Gb/s SAS 3.0) - Full-Featured

CONTROLLER	INTEL® RAID CONTROLLER RS3DC080	INTEL® RAID CONTROLLER RS3DC040	INTEL® RAID CONTROLLER RS3SC008
DESCRIPTION	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 8 internal ports	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 4 internal ports	A12 Gb/s SAS/SATA full-featured RAID adapter (PCIe AIC) with 8 external ports
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Full-featured RAID
ORDER CODE	**RS3DC080**	**RS3DC040**	**RS3SC008**
PROCESSOR	**LSI* SAS3108 ROC**	**LSI* SAS3108 ROC**	**LSI* SAS3108 ROC**
ONBOARD CACHE MEMORY	1GB DDR3	1GB DDR3	1GB DDR3
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	4 Internal ports	8 External ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60
CACHE BACKUP OPTIONS	AXXRMFBU4	AXXRMFBU4	AXXRMFBU4
CABLES	Purchased separately	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

Intel® RAID Controllers (12Gb/s SAS 3.0) – Entry Level

CONTROLLER	INTEL® RAID CONTROLLER RS3WC080	INTEL® RAID CONTROLLER RS3UC080
DESCRIPTION	A 12 Gb/s SAS/SATA entry-level RAID adapter (PCIe AIC) with 8 internal ports	A 12 Gb/s SAS/SATA entry-level RAID Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	Entry-level	Entry-level
ORDER CODE	**RS3WC080**	**RS3UC080**
PROCESSOR	**LSI* SAS3008 IOC**	**LSI* SAS3008 IOC**
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

Intel® Storage Controllers (12Gb/s SAS 3.0) - JBOD Only

CONTROLLER	INTEL® RAID CONTROLLER RS3GC008	INTEL® RAID CONTROLLER RS3UC080J
DESCRIPTION	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 external ports	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	JBOD	JBOD
ORDER CODE	**RS3GC008**	**RS3UC080J**
PROCESSOR	**LSI* SAS3008**	**LSI* SAS3008**
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 External ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	JBOD mode (SAS Connectivity)	JBOD mode (SAS Connectivity)
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

Intel® VROC – Virtual RAID on CPU

Intel® VROC is available on Intel® Server Board S2600WF, S2600BP, and S2600ST family boards. It enables RAID levels 0, 1, 10 (Standard) and 5 (Premium) with no RAID write hole. Intel® VROC boasts high IOPS and low latency.

ACTIVATION KEY	PRODUCT NAME	SKU STORAGE FUNCTIONALITY
VROCSTANMOD	Intel® Virtual RAID on CPU (Standard)	Activation key to support 3rd party NVMe SSDs and enable RAID (0, 1, 10) functionality
VROCPREMMOD	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure
VROCISSDMOD	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure (for use with Intel® SSD's only)

Intel® RAID Expanders (12 Gb/s SAS 3.0)

EXPANDER BOARD	INTEL® RAID EXPANDER RES3FV288	INTEL® RAID EXPANDER RES3TV360
DESCRIPTION	12 Gb/s SAS/SATA expander adapter (PCIe AIC) with 28 internal ports and 8 external ports	12 Gb/s SAS/SATA Expander Midplane Board with 36-ports
ORDER CODE	**RES3FV288**	**RES3TV360**
PCI E* INTERFACE	PCIe x4 (for Power Only)	N/A
PORTS	28 Internal ports / 8 External ports	36 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe* x4 or chassis mount	2U (or greater) system; requires chassis mount
POWER OPTIONS FOR EXPANDERS	PCIe x4 or 4-pin Molex	4-pin Molex
MANAGEMENT	SGPIO	SGPIO
FAULT LED HEADERS	Includes 2 pin headers to support each SAS port	Includes 2 pin headers to support each SAS port
WARRANTY	3 year limited warranty	3 year limited warranty

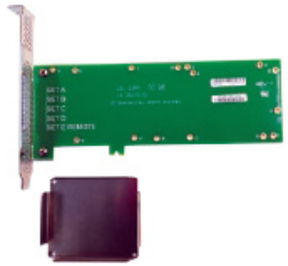
Intel® RAID Premium Features

These features are available as an upgrade for all LSI* SAS2208 and SAS3108 processor-based Intel® RAID products. To identify products with these processors, please refer to the Processor row of the preceding feature tables. The Premium Feature Keys are described below.

PREMIUM FEATURE	SSD CACHE 2 – 12G SAS only	DRIVE ENCRYPTION MANAGEMENT – 12G SAS and Tri-Mode
Key Benefits	SSD Cache allows Solid State Drives (SSD) to be utilized as additional cache for the RAID controller. Frequently accessed information is stored in the cache, allowing rapid access.	Drive encryption management enables authentication key management, auto-lock, and instant erase of self-encrypting drives (SED).
	SSD Cache capacity of up to 2 TB possible for SAS3108-based products.	All drives eventually leave the data center and the use of SEDs helps reduce risk of data breaches.
	SSD partitioning so that a portion of the drive is available to the operating system and the remainder for cache.	Instant-erase significantly reduces the cost and time of repurposing or retiring drives.
Order Code	AXXRPFKSSD2	AXXRPFKDE2

Mounting Brackets

MOUNTING BRACKET	ORDER CODE	DESCRIPTION	INTERNAL CONNECTORS	EXTERNAL CONNECTORS
Intel® RAID Battery Remote Mounting Bracket	AXXBBUBRKTP	A mounting bracket that fits in a low-profile PCI Express* slot and holds two RAID batteries or Maintenance Free Backup Units.	None	None



Cable Kits and Converter Boards

The following cables are available for connecting Intel® RAID cards and modules to storage devices and drive bays. Intel® cables are designed to a high-quality specification and include the ability to bend at a very small radii. These cables allow low-profile Intel RAID products with vertical 8087 connectors to be used in 2U rack chassis while installed in a standard PCI Express* slot. Intel offers many other cable kits that help optimize the integration of RAID products into specific Intel® Server Systems. For a list of these cables, refer to the Server Board and System Configuration Guide available on the support web site for each given Intel Server System.

CABLE KIT ORDER CODE	NUMBER OF CABLES INCLUDED IN KIT	INITIATOR CONNECTOR	TARGET CONNECTOR	LENGTH
AXXCBL650HDMS	2	HD mini-SAS straight[1]	8087 mini-SAS straight[1]	650mm
AXXCBL730HDMS	2	HD mini-SAS straight[1]	8087 mini-SAS straight[1]	730mm
AXXCBL750MS7P	2	8087 mini-SAS straight[1]	Four x 7-pin SATA style	750mm
AXXCBL650MSMS	2	8087 mini-SAS straight[1]	8087 mini-SAS straight[1]	650mm

[1] Cable is reversible so that either connector can be on the target or initiator side. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

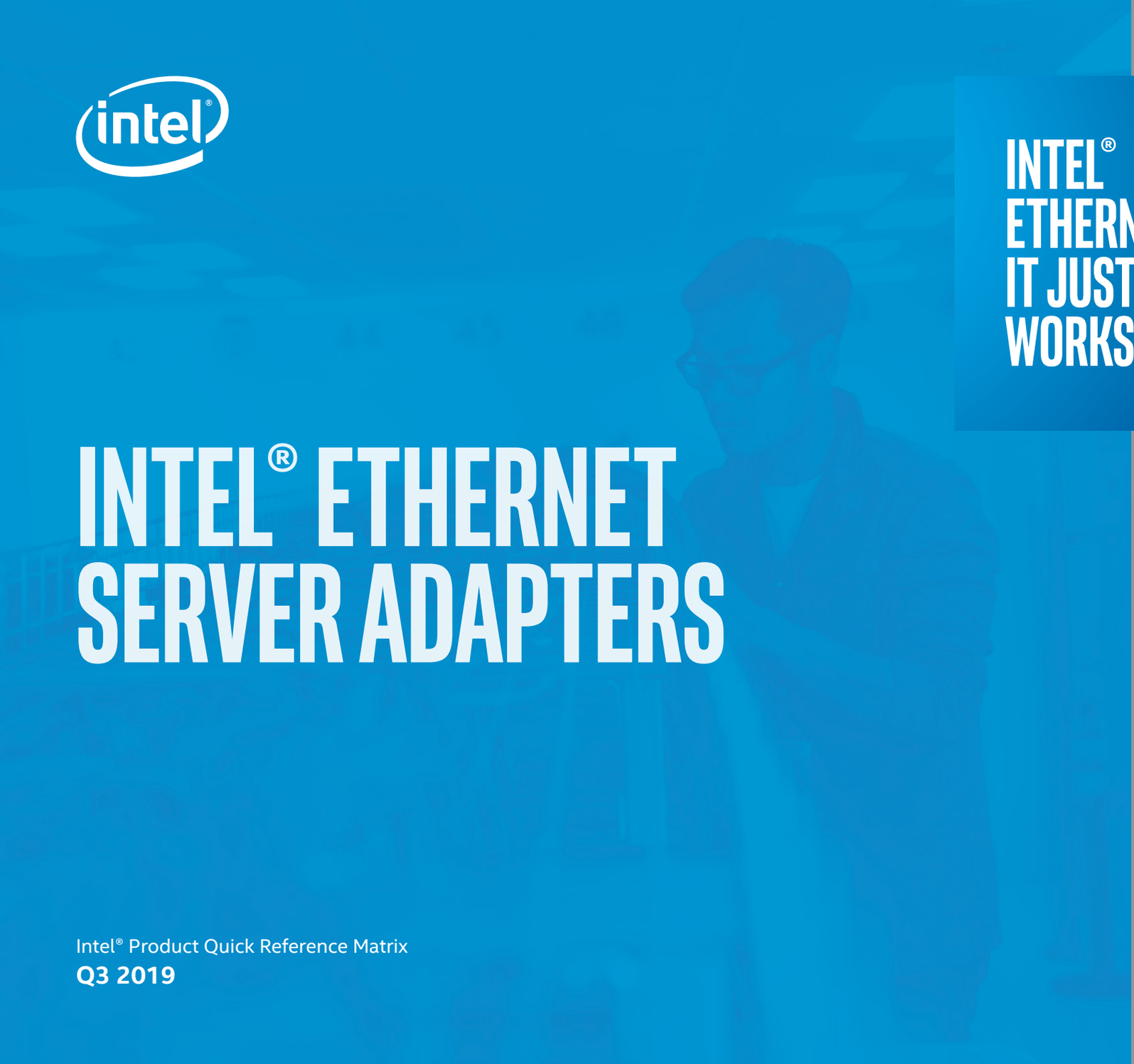
For the latest product SKUs and specifications, visit **http://ark.intel.com**

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation.



INTEL® ETHERNET. IT JUST WORKS.

INTEL® ETHERNET SERVER ADAPTERS

Intel® Product Quick Reference Matrix

Q3 2019

WHY INTEL® ETHERNET?

Driving continuous innovation for more than 35 years, Intel® Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

INTEL® ETHERNET SERVER ADAPTERS

Intel® Ethernet. It Just Works.

WHY INTEL® ETHERNET?

Driving continuous innovation for more than 35 years, Intel® Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

High Compatibility and Broad Interoperability

- Fully tested network adapters and accessories (optics and cables)
- Hardware and software is thoroughly validated across server and networking ecosystem
- Supports a broad selection of operating systems

Ease of Use

- Works out of the box
- Automatic and highly optimized configuration setups
- Delivers the right traffic to the right VM with 128 perfect match filters

Performance Assurance

- Optimized for Intel® architecture and broad OSV ecosystem
- Scales with CPU technology, leverages intelligent hardware offloads, network virtualization, and fast packet processing via Data Plane Development Kit (DPDK)

Worldwide product support

- World-class pre- and post-sales support provide convenient accessibility to customers
- Adheres to global regulatory, environmental, and market requirements
- Long product lifecycle support

Broad Product Selection and Accessories

- Supports all speeds (1/10/25/40GbE) and media types (BASE-T, Fiber, SFP+, QSFP+, SFP28, QSFP28, KR, XAUI, CAUI)
- Available in many different form factors: discrete controller, Intel® SoCs, and add-in cards (PCIe*, OCP, and custom form factors)

INTEL® ETHERNET 700 SERIES NETWORK ADAPTERS

Accelerate the delivery of new services and capabilities by increasing the speed and efficiency of your network infrastructure. The Intel® Ethernet 700 Series is the foundation for server connectivity, providing broad interoperability, critical performance optimizations, and increased agility for Telecommunications, Cloud, and the Data Center.

- **Interoperability** - Multiple speeds and media types for broad compatibility backed by extensive testing and validation.
- **Optimization** - Intelligent offloads and accelerators to unlock network performance in servers with Intel® Xeon® processors.
- **Agility** - Both kernel and Data Plane Development Kit (DPDK) drivers for scalable packet processing.

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	ADVANCED FEATURES	STORAGE OVER ETHERNET	ORDER CODES
XXV710-DA1 XXV710-DA2	SFP28 Direct Attach Copper Twinaxial SFP28 LC Fiber Optic Module	Direct Attach Passive Twinaxial 25GbE: up to 5m with RS-FEC, up to 3m with no FEC Direct Attach Passive Twinaxial 10 GbE: up to 15m Multimode Fiber: up to 70m (OM3), up to 100m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE / 25 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, NFS, SMB	XXV710DA1, XXV710DA1BLK, XXV710DA2, XXV710DA2BLK
X710-DA2 X710-DA4FHBLK	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m Multimode Fiber: up to 300m (OM3), up to 400m (OM4) Single-mode Fiber: up to 10km	X710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual and Quad Port	Low Profile (DA2 only) and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, NFS, SMB	X710DA2, X710DA2BLK, X710DA4FH, X710DA4FHBLK
XL710-QDA1 XL710-QDA2	QSFP+ Direct Attach Copper Twinaxial QSFP+ Fiber Optic Module	Direct Attach Passive Twinaxial: up to 7m Multimode Fiber: up to 100m (OM3), up to 150m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	10 GbE / 40 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, NFS, SMB	XL710QDA1, XL710QDA1BLK, XL710QDA2, XL710QDA2BLK
X710-T4	RJ45 Copper Twisted-pair	Category 6: up to 55m Category 6A or better: up to 100m	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Quad Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, NFS, SMB	X710T4, X710T4BLK
X722-DA2 X722-DA4	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m Multimode Fiber: up to 300m (OM3), up to 400m (OM4) Single-mode Fiber: up to 10km	X710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual and Quad Port	Low Profile (DA2 only) and Full Height	iWARP/RDMA Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, NFS, SMB	X722DA2, X722DA4FH

[1] Learn more about DPDK at intel.com/dpdk
All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable.

INTEL® ETHERNET 500 SERIES NETWORK ADAPTERS

The best choice for 10GBASE-T, the Intel® Ethernet 500 Series is a backward compatible with existing 1000BASE-T networks, simplifying the transition to 10GbE when more bandwidth is needed.

- Supports 100Mb, and 1/2.5/5/10GBASE-T
- Low cost, low power
- Optimized for network virtualization overlays

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	NETWORK VIRTUALIZATION ACCELERATION	STORAGE OVER ETHERNET	ORDER CODES
X550-T1 X550-T2	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE / 2.5 GbE / 5 GbE)	X550	PCI Express* v3.0 8.0 GT/s, x4 Lanes Operable in x8 and x16 slots	100 Mb / 1 GbE / 2.5 GbE / 5 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support[1]	iSCSI, FCoE,[2] NFS, SMB	X550T1, X550T1BLK; X550T2, X550T2BLK
X540-T1 X540-T2	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE)	X540	PCI Express* v2.1 5.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support[1]	iSCSI, FCoE,[2] NFS, SMB	X540T1, X540T1BLK; X540T2, X540T2BLK
X520-DA2	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m; Multimode Fiber: up to 300m (OM3), up to 400m (OM4); Single-mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support[1]	iSCSI, FCoE,[2] NFS, SMB	E10G42BTDA, E10G42BTDABLK
X520-SR1 X520-SR2	LC Fiber Optic *Customer may remove optics as needed.*	Multimode Fiber: up to 300m (OM3), up to 400m (OM4)	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support[1]	iSCSI, FCoE,[2] NFS, SMB	E10G41BFSR, E10G41BFSRBLK; E10G42BFSR, E10G42BFSRBLK
X520-LR1	LC Fiber Optic *Customer may remove optics as needed.*	Single-mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support[1]	iSCSI, FCoE,[2] NFS, SMB	E10G41BFLR, E10G41BFLRBLK

[1] Learn more about DPDK at intel.com/dpdk

[2] Support for new operating systems will not be added to FCoE. The last operating system versions supporting FCoE are: Microsoft Windows Server* 2012 R2, Red Hat Enterprise Linux* 7.2 & 6.7, SUSE Linux Enterprise Server 11 SP4, 12 SP1; VMware ESX* 6.0

All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable.

INTEL® ETHERNET OPTICS AND CABLES FOR INTEL® ETHERNET 700 SERIES AND 500 SERIES NETWORK ADAPTERS

Combine these accessories with Intel Ethernet 700 Series and 500 Series Network Adapters, for dependable interoperability and consistent performance across the network.

INTEL® ETHERNET SFP+ OPTICS	INTEL® ETHERNET SFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ OPTICS	INTEL® ETHERNET QSFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ TWINAXIAL BREAKOUT CABLES
E10GSFPSR = SFP+ SR Optic E10GSFPSRX = SFP+ SR Optic (Extended Temp) E10GSFPLR = SFP+ LR Optic E10GSFPLRX = SFP+ LR Optic (Extended Temp)	SFP+ to SPF+ copper direct attach cable XDACBL1M = 1 Meter XDACBL3M = 3 Meter XDACBL5M = 5 Meter	E40GQSFPSR = QSFP+ SR Optic E40GQSFPLR = QSFP+ LR Optic	QSFP+ to QSFP+ copper direct attach cable XLDACBL1M = 1 Meter XLDACBL3M = 3 Meter XLDACBL5M = 5 Meter	QSFP+ to (4) SFP+ copper direct attach breakout cable X4DACBL1 = 1 Meter X4DACBL3 = 3 Meter X4DACBL5 = 5 Meter

INTEL® ETHERNET SFP28 OPTICS	INTEL® ETHERNET SFP28 TWINAXIAL CABLES	INTEL® ETHERNET QSFP28 TO SFP28 TWINAXIAL BREAKOUT CABLES	INTEL® ETHERNET ACTIVE OPTICAL CABLE SFP28	INTEL® ETHERNET ACTIVE OPTICAL CABLE QSFP28 TO SFP28 BREAKOUT
E25GSFP28SR = SFP28 SR Optic E25GSFP28SRX = SFP28 SR Optic (extended temp)	SFP28 to SFP28 copper direct attach cable XXVDACBL1M = 1 Meter XXVDACBL2M = 2 Meter XXVDACBL3M = 3 Meter	QSFP28 to (4) SFP+ copper direct attach breakout cable XXV4DACBL1M = 1 Meter XXV4DACBL2M = 2 Meter XXV4DACBL3M = 3 Meter	XXVAOC5M = 5 Meter XXVAOC10M = 10 Meter XXVAOC15M = 15 Meter XXVAOC20M = 20 Meter	XXV4AOC5M = 5 Meter XXV4AOC10M = 10 Meter XXV4AOC15M = 15 Meter XXV4AOC20M = 20 Meter

1GB INTEL® ETHERNET NETWORK ADAPTERS

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT[1]	ORDER CODES
I210-T1	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I210	PCI Express* v2.1 2.5 GT/s, x1 Lane	Single Port	Low Profile and Full Height	Yes	Yes	Includes Audio-Video Bridging (AVB) support 802.1Qav)	iSCSI, NFS, SMB	Yes	I210T1 I210T1BLK
I350-T4	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T4V2
I350-T2	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T2V2
I350-F2	LC Fiber Optic	Multimode Fiber OM1 (62.5 µm): up to 275m Multimode Fiber OM2 or better (50 µm): up to 550m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350F2 I350F2BLK
I350-F4	LC Fiber Optic	Multimode Fiber OM1 (62.5 µm): up to 275m Multimode Fiber OM2 or better (50 µm): up to 550m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350F4 I350F4BLK
I340-F4	LC Fiber Optic	Multimode Fiber OM1 (62.5 µm): up to 275m Multimode Fiber OM2 or better (50 µm): up to 550m	82580	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq)	iSCSI, NFS, SMB	N/A	E1G44HF

[1] Learn more about DPDK at intel.com/dpdk
All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable.

www.intel.com/ethernet

Intel and the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries. *Other names and brands may be claimed as the property of others. © Intel Corporation

INTEL® SERVER MANAGEMENT

Intel® Product Quick Reference Matrix

Q3 2019

BUILD.
DEPLOY.
MANAGE.

SOFTWARE TO BUILD, DEPLOY AND MANAGE SERVERS WITH EASE

Intel® Server Products come with a set of software utilities that help you manage hardware and firmware across your data center network.

REMOTE SERVER MANAGEMENT – MADE EASY

While Agent based utilities help you configure the system settings (BIOS & BMC) and update the firmware (BIOS/BMC/ME/SDR), Agent-less utilities are added recently into the suite that help you do the same from a remote management console.

INTEGRATED BASEBOARD MANAGEMENT CONTROLLER

Embedded systems management enables monitoring, debug, configuration and update via a variety of out-of-band protocols (Redfish, IPMI) as well as via the embedded web console.

INTEL® SERVER MANAGEMENT

Software to build, deploy and manage servers with ease.

GET YOUR SERVERS UP AND RUNNING FAST— AND KEEP THEM RUNNING

Intel® Server Management Software is a set of software utilities that help you manage the entire lifecycle of building, deployment and further debug & maintenance of the servers with Intel® Server boards in the data centers.

For more information, visit **www.intel.com/go/servermanagement**

SERVER MANAGEMENT - MADE EASY

Intel® Server Utilities can be broadly classified into two categories - Agent-based and Agent-less utilities. Agent-based utilities are run on the server which needs configuration and manageability. They are either run on the Server OS or EFI Shell to make the necessary system configuration changes and/or update the firmware. Agent-less utilities are run on a management console which can connect remotely through a secure network to rest of the servers in the data center and the system configuration and/or firmware upgrades can be executed remotely from the management console.

The Integrated Baseboard Management Controller enables secure access to the server via a variety of protocols to assist with the debug, monitoring, configuration and provisioning of the server.

Intel® Server Management Software

Intel® Server Management Software comes in two different modes of operation. Agent-based and Agent-less applications

AGENT-BASED APPLICATIONS

Agent-based applications are run on the server which needs to be configured and/or updated to a new firmware released by Intel. These are essentially single server utilities which are comprised of:

- **SYSCFG –** Helps to configure BIOS & BMC Settings and supported on Linux*/Windows*/UEFI mode. These are command line based and scriptable.
- **SYSINFO –** Retrieves the system info on system inventory, FRU, BIOS, BMC and other platform firmware. Supported on Linux*/Windows*/UEFI mode.
- **SELViewer –** Displays System Event Logs (SEL) recorded by BMC in a human readable format. Clear the SEL in BMC or Save it locally. Supported on Linux*/Windows*/UEFI mode.
- **Flash Utilities –** Helps to reprogram flash memory with new versions of BIOS. BIOS/BMC/SDR/ME can be updated with this utility which can be scriptable and available on Linux*/Windows*/UEFI.
- **Intel® Multi-Server Manager (Intel® MSM) –** While all the above are single server utilities, Intel® MSM is a multi-server utility which can be connected to other servers in the same in-band network. It helps to remotely manage a number of servers and the features include monitoring health and performance, system info retrieval, BMC configuration and System FW Update for a single or a group of servers that are within the group.

AGENT-LESS APPLICATIONS

Agent-less applications take advantage of the Out-of-Band (OOB) network and connect remotely to one or a group of servers which can be reached through the Management NIC. The connections are completely secure and independent of the host network. These include:

- **VMCLI –** This tool is a command line interface for virtual media. It can be used to boot virtual media on any remote server ad perform a firmware update for example.
- **Intel® MSM -** Has the same set of features as the Agent-based version except that the management server connects to the remote servers (managed nodes) through the OOB network and can perform the same operations such as monitor health & performance, system info retrieval, BMC configuration and system FW update a single or a group of servers that are within the group. The FW update can be scheduled for a particular date and time.
- **Intel® Server Debug & Provisioning Tool (Intel® SDPTool) –** This is an OOB utility for agent-less debugging and support. The tool helps to connect to a remote server(managed node) through the OOB network on the fly without any provisioning and do a bunch of system configuration settings. The features supported are platform firmware update (BIOS/BMC/ME/SDR) or a custom firmware update of any other component on the board, change the system settings supported by the SYSCFG utility (above), change the network settings, download debug logs and display the system info like CPU, Memory, FRU. The greatest advantage of this tool is it is so lightweight and can be scripted to be scaled to any number of servers without any provisioning overhead.
- **Intel® Data Center Manager (Intel® DCM) –** This is a real time power and thermal monitoring software which can be deployed across heterogeneous systems in the data center. Helps with Health Monitoring and Rack Density Optimization as well. Firmware for Intel Server Boards can be updated through the GUI of Intel® Data Center Manager (New!!!!) too but please be aware that it is distributed through a license.

Intel® System Management Software

Intel® System Management Software is a set of management applications that let you view, debug, configure and provision servers across your network.

FEATURES	INTEL® SDPTOOL	INTEL® MSM	AGENT-BASED UTILITIES
Install Requirements	Application: Requires install on top of operating system on the management server but no installation required on remote managed servers	Application: Requires install on top of operating system on the management server but can operate in both agent-based and agent-less modes on the managed nodes	Application: Requires agent install on top of operating system
User Interface	Command Line Interface Tool - Scriptable	Command Line Interface Tool - Scriptable	Command Line Interface Tools - Scriptable
Multiple Remote server management	Single server only but can be scripted to add many servers without provisioning	Yes	No
Operating System Support	Host - Linux*. Managed nodes can be any OS	Host - Linux*. Managed nodes can be any OS	Windows*/Linux*/UEFI
Network Configuration	OOB Network	OOB Network	Uses existing operating system network
View System Info (Platform, Memory, CPU, FRU)	Yes	Yes	Yes – Use SYSINFO
Hardware Predictive Failure Analysis	Yes	Yes	Yes
Sensor Readings	Yes	Yes	Yes
Remote Firmware Update	Yes	Yes	No – (Local FW update only)
Configure Network Settings	Yes	No	No
Health Monitoring	Yes	Yes	No
BMC Configuration	Yes	Yes – many BMCs at the same time	Yes – Use SYSCFG
Power Management	Yes	Yes	No
Remote debug with Event Logs	Yes	Yes	No
Remote Power On/Off/Reboot	Yes	Yes	No
Serial Over LAN (Console Redirection)	No	Yes	No
Download Debug Logs	Yes	No	Yes

Integrated Baseboard Management Controller (BMC)

Embedded Intel System Management Software is available in two varieties—an Integrated BMC, which has Redfish and IPMI 2.0 stack available for comprehensive remote (out-of-band) or local (in-band) management, or an Integrated BMC web console available without the requirements for any agents and is always accessible, regardless of the state of the operating system.

FEATURES	INTEL® SERVER BOARD S1200SP FAMILY	INTEL® SERVER SYSTEMS SUPPORTING INTEL® XEON® PROCESSORS E5-2600 V3 & V4 PRODUCT FAMILY AND INTEL® SERVER SYSTEMS SUPPORTING INTEL® XEON PHI™ PRODUCT FAMILY	INTEL® SERVER SYSTEMS SUPPORTING THE INTEL® XEON® PROCESSOR SCALABLE FAMILY
IPMI 2.0	Yes	Yes	Yes
Power Control	Yes	Yes	Yes
VLAN	Yes	Yes	Yes
Redfish & RSD Support			Yes
Java based Virtual Media and KVM	Yes	Yes	Yes
HTML5 Virtual Media and KVM			Yes
Remote Debug	Autonomous Debug Log	Autonomous Debug Log	Autonomous Debug Log & Remote Debug over PECI
Remote BMC/BIOS Update			Yes
Remote BIOS Configuration			Yes
SSH	SMASH CLP	SMASH CLP	SOL Only
Remote SMBIOS Retrieval	Yes	Yes	Yes
NVMEe Management			Yes
Open LDAP	Yes	Yes	Yes
Security Logs			Yes
POST Code Retrieval			Yes
Node Manager	Yes	Yes	Yes
Alerting	SNMP Traps & SMTP	SNMP Traps & SMTP	SNMP Traps & SMTP

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/go/servermanagement**

1 For the latest Intel® Server Board support, visit http://support.intel.com/support/motherboards/server

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Features and functions of the Intel® Management Packs are dependent on the features and functions available on the server and client hardware and the loaded software and operating systems.

Not all features and functions are available on all products and may require Intel® AMT or IPMI technologies for additional functionality.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com/go/servermanagement

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

INTEL® ACCELERATORS

Intel® Product Quick Reference Matrix

Q3 2019

OPTIMIZE VIDEO DELIVERY

SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS.

The Intel® Visual Compute Accelerator is designed to optimize video delivery (transcoding and encoding). This new product is the ideal media and graphics solution bringing together the power of Intel® Xeon® Processor E5 with the graphics performance of Intel® Xeon® Processor E3 within one system along with flexible software architecture enabling software vendors to write applications quicker for many different graphics workloads.

Intel® Visual Compute Accelerator 2

SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS

The Intel® Visual Compute Accelerator 2 is the second generation PCI Express* card containing three Intel® Xeon® Processors E3 v5 designed to deliver cutting edge rendering performance per watt for graphics intensive workloads.[1] For OTT content providers and telecommunications service providers, Intel® VCA 2 takes the next step in transcode density, adding HEVC encode into the Quick Sync Video portfolio of accelerated codecs.

In the enterprise domain, security concerns and worker mobility are driving the need for cloud-based remote workstations, while at same time, applications such as AutoCad* are consuming ever more graphics processing cycles.

The accelerator card provides customers:

- Best-in-class media transcode channel density for Intel® Xeon® processor E5-based systems in communications service provider deployments
- High performance remote graphics for Intel® Xeon® processor E5-based systems in purpose-built clouds and IT datacenters

PRODUCT NAME	INTEL® VISUAL COMPUTE ACCELERATOR
ORDER CODE	VCA1585LMV
TARGET MARKET	Comms SPs, Video Cloud Builders (Private Cloud), Enterprise Datacenter
PROCESSORS	Three Intel® Xeon® Processor E3-1585L v5 • 4 Cores at 3.0 GHz • 45W TDP • Intel® Iris™ Pro graphics P580 (GT4e), 128MB eDRAM
FORM FACTOR	Full-length, full-height, double-width PCIe* card
PCI	PCIe* 3.0, x16, 8 lanes per processor
POWER	235W
MEMORY	DDR4 2133MHz (1.2V), ECC SODIMMs, 2 channels per processor, up to 64GB per processor
SSD's	Not included
OPERATING SYSTEM ON CARD	CentOS* 7.2, Windows* 10 and Windows Server* 2016 Xen* and KVM hypervisors

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.
Visit **servermarketinglibrary.intel.com**

For more information, visit **www.intel.com/xeon** and **ark.intel.com**

[1] Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Xeon, and Iris are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

INTEL® OMNI-PATH ARCHITECTURE

THE HIGH PERFORMANCE, LOW COST FABRIC FOR HPC

INTEL® OMNI-PATH ARCHITECTURE

Intel® Omni-Path Architecture (Intel® OPA), an element of Intel® Scalable System Framework, delivers the performance for tomorrow's high performance computing (HPC) workloads and the ability to scale to tens of thousands of nodes—and eventually more—at a price competitive with today's fabrics.

Intel® Product Quick Reference Matrix

Q3 2019

INTEL® OMNI-PATH ARCHITECTURE

Intel® Omni-Path Architecture

THE HIGH PERFORMANCE, LOW COST FABRIC FOR HPC. INTEL® OMNI-PATH ARCHITECTURE.

Imagine you could achieve supercomputing-class performance for your HPC fabric, while reducing your infrastructure requirements by as much as 50 percent.[1]

You could use the money you saved to expand your cluster, potentially delivering up to 24 percent more compute power to your scientists and engineers.[2]

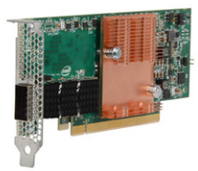
That's the transformative power of Intel® Omni-Path Architecture, a foundational component of the Intel® Scalable System Framework. This end-to-end fabric solution provides 100 Gbps port bandwidth with low latency that stays low even at extreme scale.

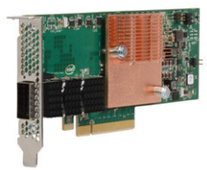
With cost-effective scaling from desk-side clusters to exascale supercomputers, Intel Omni-Path Architecture offers world-class fabric solutions for every level of HPC.

For more information, visit **www.intel.com/omnipath**

100GB Host Interfaces

Designed specifically for HPC, the Intel® Omni-Path Host Fabric Interface (Intel® OP HFI) uses an advanced connectionless design that delivers performance that scales with high node and core counts, making it the ideal choice for the most demanding application environments. Intel OP HFI supports 100 Gbps per port, which means each Intel OP HFI port can deliver up to 25 GBps per port of bidirectional bandwidth. The same ASIC utilized in the Intel OP HFI will also be integrated into future Intel® Xeon® processors and used in third-party products.





100GB HOST INTERFACES

INTEL PART #	**100HFA018LS** **100HFA018FS**	**100HFA016LS** **100HFA016FS**
DESCRIPTION	Single-port PCIe x8 Adapter, Low Profile and Std Height	Single-port PCIe x16 Adapter, Low Profile and Std Height
SPEED	58 Gbps	100 Gbps
PORTS, MEDIA	Single port, QSFP28	Single port, QSFP28
FORM FACTOR	Low profile PCIe Std Height PCIe	Low profile PCIe Std Height PCIe
FEATURES	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers
SANDY BRIDGE	None	None
IVY BRIDGE	None	None
INTEL® XEON® PROCESSOR E5-2600 V3 (HASWELL-EP)	✓	✓
INTEL® XEON® PROCESSOR E5-2600 V4 (BROADWELL-EP)	✓	✓

Edge Switches

The next generation of high performance computing (HPC) fabrics use Intel® Omni-Path Architecture to create fabrics that meet the needs of the most demanding set of applications.

The Intel® Omni-Path Edge Switch consists of two models supporting 100 Gb/s for all ports, an entry-level 24-port switch for small clusters and a 48-port switch. The larger switch, in addition to enabling a 48-port fabric in 1U, can be combined with other edge switches and directors to build much larger multitier fabrics.

These Intel Omni-Path Edge Switches are members of the Intel® Omni-Path Fabric 100 series of switches, host adapters, and software delivering an exceptional set of high-speed networking features and functions.

100GB Host Interfaces

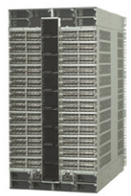
INTEL PART #	**100SWE48UF2 / R2 (2 Power Supplies)** **100SWE48QF2 / R2 (2 Power Supplies)** **100SWE48UF1 / R1 (1 Power Supply)** **100SWE48QF1 / R1 (1 Power Supply)**	**100SWE24UF2 / R2(2 Power Supplies)** **100SWE24QF2 / R2 (2 Power Supplies)** **100SWE24UF1 / R1 (1 Power Supply)** **100SWE24QF1 / R1 (1 Power Supply)**	**100SWE48QFH** **100SWE48UFH**
DESCRIPTION	48 Port Edge Switch (“Q” = mgmt card)	24 Port Edge Switch (“Q” = mgmt card)	Hot Swap Power Supply/Fans 48 Port Edge Switch (“Q” = mgmt card)
SPEED	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	48	24	48
MEDIA	QSFP28	QSFP28	QSFP28
FORM FACTOR	1U	1U	1U
FEATURES	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward airflow and mgmt card options, up to 2 PSU

Hot Swap Modules

INTEL PART #	**100SWEHSFTF**	**100SWEHSPSF**
DESCRIPTION	Hot Swap Fan Module	Hot Swap Power Supply Module

Director Switches

The Intel® Omni-Path Director Class Switch (Intel® OP Director Class Switch), based on Intel's next generation 48-radix switch silicon, has many innovative features that provide optimum performance for both small and large fabrics. Both switch models are dense form factor designs capable of supporting up to 768 100 Gb/s ports in a low 20U footprint. Designed to be modular alongside edge switches, host adapters, and software, the Intel OP Director Class Switch 100 series enables customers to tailor their system configuration to meet present and future needs.



DIRECTOR SWITCHES

INTEL PART #	100SWD24B1N 100SWD24B1D 100SWD24B1A	100SWD06B1N 100SWD06B1D 100SWD06B1A	100SWDLF32Q	100SWDSPINE	100SWDMGTSH
DESCRIPTION	24-slot Director Class Switch, Base Config	6-slot Director Class Switch, Base Config	Director Class Switch Leaf Module	Director Class Switch Spine Module	Director Class Switch Management Module
SPEED	100 Gbps	100 Gbps	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	768	192	32	N/A	N/A
MEDIA	10/100/1000 Base-T USB Gen2	10/100/1000 Base-T USB Gen2	QSFP28	Internal high speed connections	10/100/1000 Base-T USB Gen2
FORM FACTOR	20U	7U	Half-width module 2 modules per leaf	Full width module, 2 boards/module	Half-width module
FEATURES	Up to 2 mgmt modules, up to 12 PSUs, AC and DC options	Up to 2 mgmt modules, up to 6 PSUs, AC and DC options	Hot swappable	96 internal mid-plane connections,hot swappable	N+1 redundancy,hot swappable

Intel® Omni-Path Cables

Intel® Omni-Path Fabric solutions support a broad array of 3rd party cable types and lengths from the industry's leading providers. These cables, together with the Intel® OPA Packet Integrity Protection feature, provide highly reliable communication links with superior bit error rate (BER) performance.

PASSIVE COPPER CABLES

CABLE LENGTH	INTEL® ONMI-PATH PASSIVE COPPER CABLES
0.5M	100CQQF3005; 100CQQH3005 (30 AWG)
1.0M	100CQQF3010; 100CQQH3010 (30 AWG)
1.5M	100CQQH2615 (26 AWG); 100CQQF3015 (30 AWG)
2.0M	100CQQH2620 (26AWG); 100CQQF3202 (30 AWG)
3.0M	100CQQH2630 (26AWG); 100CQQF3030 (30 AWG); 100CQQF2630 (26 AWG)
3.5M*	100CQQH3035 (30 AWG)
4.0M*	100CQQH2640 (26 AWG); 100CQQF3040 (30 AWG); 100CQQF2640 (26 AWG)
5.0M*	100CQQH2650 (26 AWG); 100CQQF2650 (26 AWG)
5.5M*	100CQQH2655 (26 AWG)
6.0M*	100CQQF2660 (26 AWG)

* Please consult Intel for configuration details. 100CQQx x=Vendor

ACTIVE OPTICAL CABLES

CABLE LENGTH	INTEL® OMNI-PATH ACTIVE FIBRE CABLES
3.0M	100FRRF0030; 100FRRL0030; 100FRRA0030
5.0M	100FRRF0050; 100FRRL0050; 100FRRA0050
10M	100FRRF0100; 100FRRA0050; 100FRRA0100
15M	100FRRF0150; 100FRRL0150; 100FRRA0150
20M	100FRRF0200; 100FRRL0200; 100FRRA0200
30M	100FRRF0300; 100FRRL0300; 100FRRA0300
40M	100FRRF0300; 100FRRL0300; 100FRRA0300
50M	100FRRF0500; 100FRRL0500; 100FRRA0500
60M	100FRRF0600; 100FRRL0600; 100FRRA0600
100M	100FRRF1000; 100FRRL1000; 100FRRA1000

* 100FFRx x=Vendor

For more information, visit **www.intel.com/omnipath**

FOOTNOTES

1 Reduction of infrastructure requirements claim based on a 1024-node full bisectional bandwidth (FBB) Fat-Tree configuration, using a 48-port switch for Intel Omni-Path cluster and 36-port switch ASIC for either Mellanox or Intel® True Scale clusters.

2 Configuration assumes a 750-node cluster, and number of switch chips required is based on a full bisectional bandwidth (FBB) Fat-Tree configuration. Intel® OPA uses one fully-populated 768-port director switch, and Mellanox EDR solution uses a combination of 648-port director switches and 36-port edge switches. Intel and Mellanox component pricing from www.kernelsoftware.com, with prices as of October 20, 2016. Assumes $6,200 for a 2-socket Intel® Xeon® processor based compute node.

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark* and MobileMark,* are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can provide absolute security.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

© 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, and Intel Xeon are trademarks of Intel Corporation in the U.S. and other countries.

* Other names and brands may be claimed as the property of others.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Intel:
SSDPEK1W120GAX1