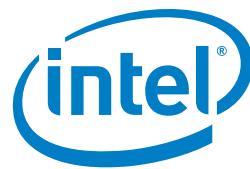


SOLUTION BRIEF

Intel® Atom™ Processor E3800 Product Family

Intel® Celeron® Processor

Retail, Industrial, Print Imaging, Automotive and
Digital Security Surveillance



Reliable, Low Power and Secure Intelligent Systems

The Intel® Atom™ processor E3800 product family offers advancements in reliability, media/graphics performance, CPU, and security, setting a new standard for entry-level devices.



Challenges

- **The Internet of Things is driving systems to be more interconnected and interdependent**, making exceptional reliability a must.
- **Industries from retail to healthcare demand improved visual quality and video playback**, requiring more processing power for high-end media and graphics.
- **Today's technology solutions and applications are increasingly compute-intensive**, driving a need for higher performance at lower power consumption.
- **Systems and data of all types need to be protected against adept cybercriminals**, necessitating improved system protection and the widespread use of data encryption.

Intel's first
system-on-chip (SoC)
designed for
intelligent systems

Solutions

- **Error-correcting code (ECC), fanless designs, and industrial temperature range support** provide added protection against soft errors and extreme environmental conditions.
- **Gen 7 Intel® Graphics Technology with dramatically improved graphics and media performance** has five times the 3D graphics power and 80 percent higher decode performance than previous generations.¹
- **Quad-core processing, out-of-order instruction execution, and other microarchitecture enhancements** significantly increase performance: up to double per core and four times per CPU compared to prior generations.²
- **Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)³ and Secure Boot** use hardware-assisted capabilities to encrypt/decrypt data and allow only trusted software to run on the device.



RAISING THE BAR FOR ENTRY-LEVEL DEVICES:

- Enhanced reliability with ECC
- Greatly enhanced full HD video acceleration
- Up to 15 simultaneous 1080p30 streams decode
- Secure, measured booting
- Software scalability up to Intel® Xeon® processors



REDUCED POWER AND FORM FACTOR

SoC family with 5-10W thermal design power (TDP)⁴ and smaller package sizes



EXTENDED LIFE CYCLE

Product support for up to 7+ years



CRUCIAL SECURITY FOR SENSITIVE DATA

Acceleration of data encryption and decryption



The Intel® Atom™ processor E3800 product family helps advance the Internet of Things

The next generation of intelligent systems is driving new opportunities for original equipment manufacturers (OEMs) and developers in markets as diverse as retail, industrial, automotive, print imaging, and surveillance.

Powered by the Intel® Atom™ processor E3800 product family manufactured on Intel's industry-leading 22nm process technology, this is the first system-on-chip (SoC) designed for entry-level intelligent systems, delivering impressive compute, graphical, and media performance while operating in an extended temperature range.

Two Intel® Celeron® processors, based on the same microarchitecture, are offered alongside the Intel Atom processor E3800 product family on Intel's embedded roadmap. While they do not offer an industrial temperature range or ECC, they provide many of the same features and performance-per-watt benefits, making them ideal for PC-like designs, such as thin clients, retail transactional clients, and digital signage.

System-on-chip (SoC)

This highly-integrated, one-chip solution helps save on bill of materials (BOM) cost and allows for smaller form factor solutions over previous-generation, two-chip offerings.

Solution Scalability

The product family features multiple SKUs with quad-, dual-, and single- core offerings that are pin-compatible and software compatible with Intel® Core™ and Intel® Xeon® processors.

Graphics Turbo Capability

Advancements in visual processing capabilities enable faster media conversions, stereoscopic 3D, immersive web browsing, and enhanced HD video transcoding.

Integrated I/O Interfaces

The SoC integrates a wide range of I/O, including:

- **Memory** (DDR3L with optional ECC)
- **Display** (embedded DisplayPort*, DisplayPort, HDMI, and VGA)
- **Storage** (SATA Gen2, eMMC, SD card)
- **Legacy I/O** (SDIO, SIO)
- **Audio** (low power and high definition versions)
- **High-speed I/O** (PCI Express* Gen 2.0 and USB 2.0/3.0)

Hardware-based Virtualization

Intel® Virtualization Technology⁵ (Intel® VT-x) provides near-native performance of virtualized workloads for greater reliability, security, investment protection, and flexible resource management.

Business Segments

Retail

Driving enhanced user experiences and intelligent retail

- **Captivating visuals** are vital for attracting retail customers. The built-in visual technologies in the Intel Celeron processor and Intel Atom™ processor E3800 product families support exceptional entry-level video playback and improved graphics for rich, interactive 2D/3D graphics and compelling interactive digital experiences.
- **Secure, fast transactions** at point-of-sales devices are a must-have during peak selling times. The Intel Celeron processor and Intel Atom™ processor E3800 product families deliver security enhancements when compared with the previous generation processor, such as Intel Advanced Encryption Standard New Instructions (Intel AES-NI), which provides faster data encryption/decryption for securing personal data without compromising performance.
- **Operation in harsh conditions** is a necessity for outdoor systems, like ATMs and gas station pumps. The Intel Atom processor E3800 product family supports the industrial temperature range of -40° to 110° C (-40° to 230° F), making it capable of operating reliably across retail environments.

Industrial

Leading the way for the next industrial revolution

- **Combining control and human machine interface (HMI)** on a single device requires a variety of technologies. Providing the necessary ingredients, the Intel Atom processor E3800 product family has up to four cores, an integrated graphics engine, and hardware-assisted virtualization technology.
- **Factory workspace is a premium.** The single-chip footprint of the Intel Atom processor E3800 product family supports the industrial temperature range and ECC, and provides higher performance at significantly less power than the previous generation. The CPU enables smaller form factors, helping industrial managers save space, and increase intelligence and connectedness on the factory floor.
- **Factory operations must remain secure.** The Intel Atom processor E3800 product family offers security enhancements not available on previous Intel Atom processors, including: faster data encryption with McAfee* Endpoint Encryption*, which uses Intel AES-NI; secure boot with McAfee Deep Defender*, which uses Intel VT-x; and McAfee Embedded Control*, which uses whitelisting to protect systems against malware.

Business Segments (continued)

Digital Security Surveillance

Providing exceptional video and security functionality for entry-level security surveillance (DSS) systems

- **Video management, storage, and streaming** are demanding and can take advantage of multi-core and integrated media processing acceleration. Capable of decoding up to 11 simultaneous 1080p60 streams and supporting two SATA Gen 2 interfaces, the Intel Atom processor E3800 product family is the foundation for an exceptional entry-level DSS device.
- **Smoother playback** on DSS devices improves the user experience, and the Intel Atom processor E3800 product family serves it up, with smoother, full-HD, 1080p video playback on a wide variety of display types.
- **Video data integrity must be protected on DSS devices.** The Intel Atom processor E3800 product family brings security enhancements, such as faster data encryption for securing video data through transmission channels. Intel's platform security technologies are also designed to complement comprehensive software security solutions from McAfee* to protect systems against attacks, viruses, and malware, including providing security protection below the operating system.

Automotive

Unleashing the next generation of in-vehicle experiences

- **Connecting the car, consumer devices, and the cloud** requires a robust computing foundation to deliver in-vehicle experiences that align with the ones people enjoy outside the car. The Intel Atom processor E3800 product family delivers an ideal mix of computing power, accelerated security, and image processing. Plus, built-in Gen 7 Intel® Graphics Technology enable the delivery of high-quality visual playback and 3D performance for interactive content.
- **Security is of utmost importance** as cars become more connected. The Intel Atom processor E3800 product family with Intel AES-NI delivers fast encryption/decryption without sacrificing performance, and better protecting media, data, and assets from loss.
- **Operation across a wide range of temperatures** is a must for vehicles driven in all types of weather conditions. Supporting the industrial temperature range of -40° to 110° C (-40° to 230° F), the Intel Atom processor E3800 product family is an ideal platform for in-vehicle infotainment systems in consumer and commercial vehicles.

Print Imaging

Increasing the security and performance of multi-function, multi-user systems.

- **Multifunction printers** require enough computing performance to service dozens of users in an office environment. With quad-core processing, high-speed I/O, the Intel Atom processor E3800 product family has ample computing power for the task.
- **Asset protection** is essential when users stream confidential files for printing. An effective safeguard is to encrypt the files, which the Intel Atom processor E3800 product family is able to quickly decrypt before printing using Intel AES-NI, all the while maintaining high printing throughput.
- **BOM optimization and simplified system design** is essential in this highly competitive market segment. As a single-chip solution with a high degree of I/O integration and various acceleration functionalities, the Intel Atom processor E3800 product family reduces the number of components, size, and design effort needed to develop small form factor printers.

SOLUTION PROVIDED BY:



To learn more about the Intel Atom processor E3800 product family, visit <http://www.intel.com/content/www/us/en/intelligent-systems/bay-trail/atom-processor-e3800-family-overview.html>.

¹Transition from PowerVR® SGX* to Gen 7 Intel® Graphics Technology.

²Based on transition from the Intel® Atom™ processor N2000/D2000 product family and benchmark testing : CINT2006 Rate and CFP2006 Rate and (integer and floating point).

³Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) requires a computer system with an Intel AES-NI-enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. Intel AES-NI is available on select Intel® processors. For availability, consult your reseller or system manufacturer. For more information, see <http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/>.

⁴The TDP specification should be used to design the processor thermal solution. TDP is not the maximum theoretical power the processor can generate.

⁵Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit <http://www.intel.com/go/virtualization>.

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