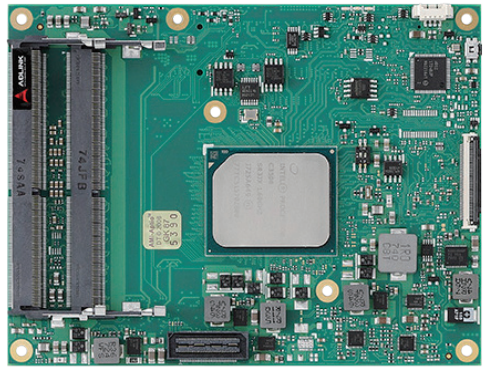
Express-DN7

COM Express Basic Size Type 7 Module with Intel Atom® C3000 SoC

Features

- Intel Atom® Processor C3000 SoC (up to 16 cores), supports full virtualization (VT-d/VT-x)
- Up to 48GB ECC DDR4 memory at max. 2400MHz (and non-ECC supported)
- Up to 2x PCIe x8 Gen3 for flexible expansion
- Up to 4x 10GBASE-KR ports
- IEEE 1588 Precision Time Protocol (PTP) support for real-time applications
- Extreme Rugged operating temperature range: -40°C to +85°C (build option for eTEMP SKUs)
- Supports Smart Embedded Management Agent (SEMA) functions



Specifications

Core System

CPU

Intel Atom® Processor C3000 SoC, 14nm (formerly codename: "Denverton-NS")

Atom® C3808 2.0GHz 12MB, 25W (12C/2133MHz, eTEMP)
Atom® C3708 1.7GHz 16MB, 17W (8C/2133MHz, eTEMP)
Atom® C3508 1.6GHz 8MB, 12W (4C/1866MHz, eTEMP)
Atom® C3308 1.6/2.1GHz 4MB, 10W (2C/1866MHz, eTEMP)
Atom® C3958 2.0GHz 16MB, 31W (16C/2400MHz, by request)
Atom® C3858 2.0GHz 12MB, 25W (12C/2400MHz, by request)
Atom® C3758 2.2GHz 16MB, 25W (8C/2400MHz, by request)
Atom® C3558 2.2GHz 8MB, 16W (4C/2133MHz, by request)
Atom® C3538 2.1GHz 8MB, 15W (4C/2133MHz, by request)
Atom® C3338 1.5/2.2GHz 4MB, 9W (2C/1866MHz, by request)

Supports: Intel® Quick Assist Technology (Crypto and Compression accelerator), Intel® VT (including VT-x, VT-d, VT-x with Extended Page Tables), Intel® Turbo Boost Technology 2.0, Intel® SSE4.2, Intel® 64 Architecture, Intel® ISA compatibility, Intel® Execute Disable Bit, Intel® OS Guard, Intel® Secure Key, Intel® AES-NI, Intel® Security Hash Algorithm Extensions (SHA-1, SHA-256)

Note: Availability of features may vary between SoC SKUs

Memory

Up to dual channel 2400/2133/1866 MHz DDR4 ECC (or non-ECC), up to 48GB in three SODIMM sockets
Notes: Memory frequency & capacity depends on SKUs; 3rd SO-DIMM supported by build option.

Embedded BIOS

AMI EFI with CMOS backup in 16MB SPI BIOS

Cache

16MB for C3708/C3958/C3758, 12MB for C3808/C3858, 8MB for C3508/C3558/C3538, 4MB for C3308/C3338

Expansion Busses

Up to 1 PCI Express x8 Gen3; CD connector (lanes 16-23 x8, x4, x2 (or x1), four controllers)

Up to 1 PCI Express x8 Gen3; AB & CD connector, lanes 0-7 (x8, x4, x2 (or x1), four controllers, dependent on GbE support)

LPC bus, SMBus (system) , I²C (user)

Note: PCI Express ports dependent on SoC SKU

SEMA Board Controller

Supports voltage/current monitoring, power sequence debug support, AT/ATX mode control, logistics and forensic information, flat panel control, general purpose I²C, failsafe BIOS (dual BIOS), watchdog timer and fan control

Debug Headers

40-pin multipurpose flat cable connector for use with DB-40 debug module providing BIOS POST code LED, BMC access, SPI BIOS flashing, power testpoints, debug LEDs

MIPI60 header for debug of CPU (build option)

10G Ethernet

Intel® MAC/PHY

Intel® 10G Ethernet Controller integrated in SoC (two controllers)

10G Interface

Up to 4x 10GBASE-KR (bandwidth dependent on SoC SKU)

Ethernet

Intel® MAC/PHY

Intel® i210

Interface

10/100/1000 GbE connection

NC-SI

NC-SI supported on AB connector, connected to GbE controller

Note: * All specifications are subject to change without further notice.

Express-DN7

Specifications

Multi I/O and Storage

USB
Up to 2x USB 3.0/2.0 (USB 0,1), 2x USB 2.0 (USB 2,3)
Note: USB ports dependent on SoC SKU

SATA
Up to 2x SATA 6Gb/s (SATA 0,1)
Note: SATA ports dependent on SoC SKU

Serial
2 UART ports with console redirection

GPIO/SD
4 GPO and 4 GPI (GPI with interrupt)

eMMC
eMMC 5.0 (build option)
8GB/16GB/32GB/64GB
As storage device

Super I/O
Supported on carrier if needed (standard support for W83627DHG-P)

TPM (build option)
Chipset: Infineon
Type: TPM 2.0

Power
Standard Input: ATX = 12V±5% / 5Vsb ±5% or AT = 12V±5%
Wide Input: ATX = 8.5-20 V / 5Vsb ±5% or AT = 8.5-20V
Management: ACPI 5.0 compliant, Smart Battery support
Power States: C1-C6, S0, S1, S4, S5 , S5 ECO mode (Wake-on-USB S4, WOL S4/S5)
ECO mode: Supports deep S5 mode for power saving

Mechanical and Environmental
Form Factor: PICMG COM.0, Rev 3.0 Type 7
Dimension: Basic size: 125 mm x 95 mm

Operating Temperature
Standard: 0°C to 60°C
Extreme Rugged: -45°C to +85°C (optional by project basis, only for eTEMP SKUs)

Humidity
5-90% RH operating, non-condensing
5-95% RH storage (and operating with conformal coating)

Shock and Vibration
IEC 60068-2-64 and IEC-60068-2-27
MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

HALT
Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

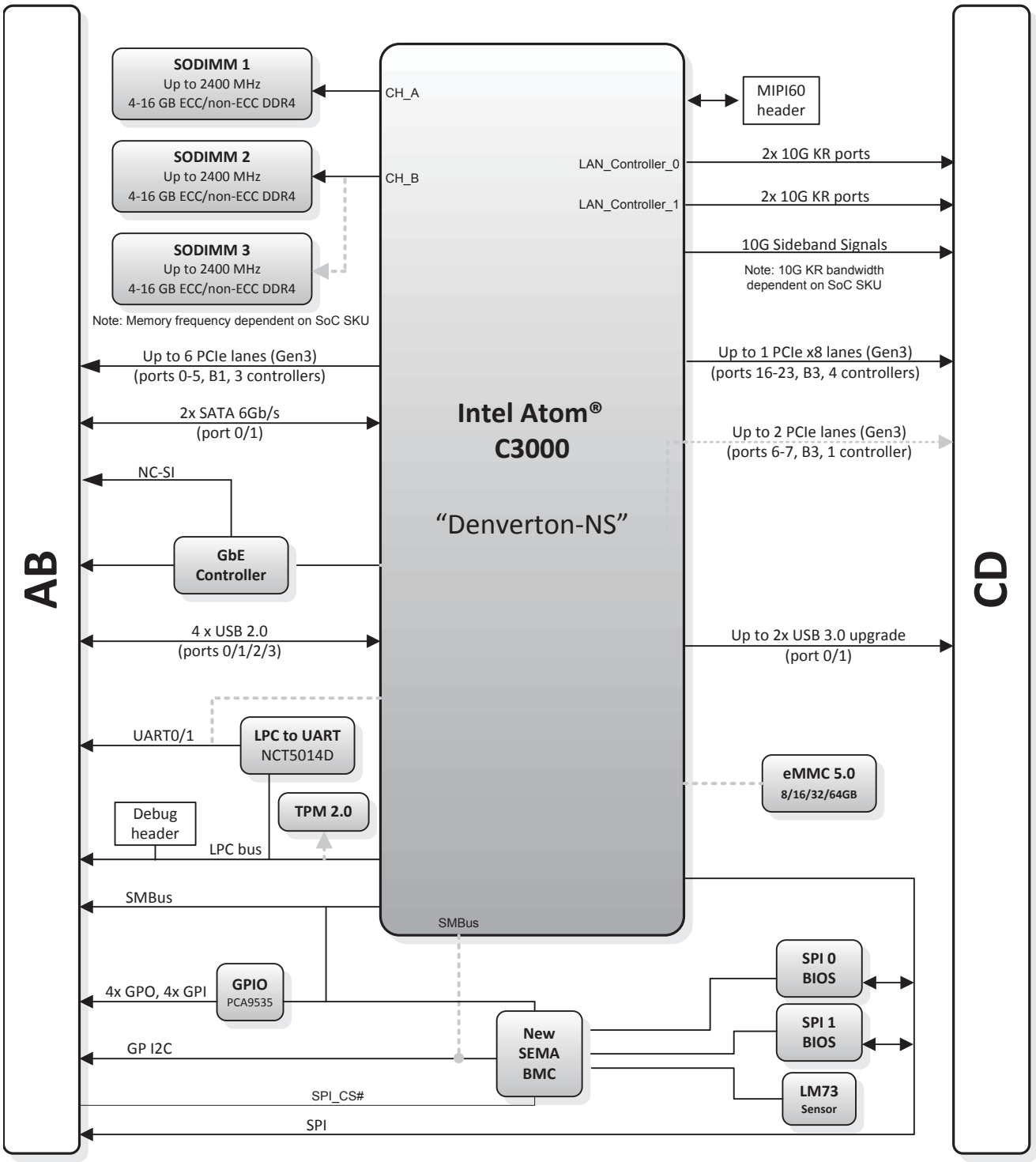
Operating Systems

Standard Support
Windows Server 2012/2016 64-bit, Yocto Linux 64-bit)

Extended Support (BSP)
Yocto Linux 64-bit

Note: * All specifications are subject to change without further notice.

Functional Diagram



Express-DN7

Ordering Information

- **Express-DN7-C3808**
  Basic size COM Express Type 7 module with Intel Atom® C3808, 12C (eTEMP)
- **Express-DN7-C3708**
  Basic size COM Express Type 7 module with Intel Atom® C3708, 8C (eTEMP)
- **Express-DN7-C3508**
  Basic size COM Express Type 7 module with Intel Atom® C3508, 4C (eTEMP)
- **Express-DN7-C3308**
  Basic size COM Express Type 7 module with Intel Atom® C3308, 2C (eTEMP)
- **Express-DN7-C3958**
  Basic size COM Express Type 7 module with Intel Atom® C3958, 16C
- **Express-DN7-C3858**
  Basic size COM Express Type 7 module with Intel Atom® C3858, 12C
- **Express-DN7-C3758**
  Basic size COM Express Type 7 module with Intel Atom® C3758, 8C
- **Express-DN7-C3558**
  Basic size COM Express Type 7 module with Intel Atom® C3558, 4C
- **Express-DN7-C3538**
  Basic size COM Express Type 7 module with Intel Atom® C3538, 4C
- **Express-DN7-C3338**
  Basic size COM Express Type 7 module with Intel Atom® C3338, 2C

Note: C3958, C3858, C3758, C3558, C3538, C3338 support by project basis

Accessories

Heat Spreaders

- **HTS-DN7-B**
  Heatspreader for Express-DN7 with threaded standoffs for bottom mounting
- **HTS-DN7-BT**
  Heatspreader for Express-DN7 with through hole standoffs for top mounting

Passive Heatsinks

- **THS-DN7-BL**
  Low profile heatsink for Express-DN7 with threaded standoffs for bottom mounting
- **THS-DN7-BTL**
  Low profile heatsink for Express-DN7 with through hole standoffs for top mounting
- **THSH-DN7-BL**
  High profile heatsink for Express-DN7 with threaded standoffs for bottom mounting

Active Heatsink

- **THSF-DN7-BL**
  High profile heatsink with fan for Express-DN7 with threaded standoffs for bottom mounting

Starter Kit

- **Starterkit**
  COM Express Type 7 Starter Kit Plus-Full Fiber
  COM Express Type 7 Starter Kit Plus-Full Copper

Note: Two starter kits are available: one supporting SPF+ and one supporting 10GBASE-T

10G BASE-KR Support

	C3808	C3708	C3508	C3308
LAN Controller 0 (Gb/s)	10 2.5 1		2.5 1	
LAN Controller 1 (Gb/s)	10 2.5 1		2.5 1	

	C3958	C3858	C3758	C3558	C3538	C3338
LAN Controller 0 (Gb/s)	10 2.5 1					2.5 1
LAN Controller 1 (Gb/s)	10 2.5 1			2.5 1		

Combined throughput on all four ports is 20Gb/s

10GBASE-KR ports 0,1 are from LAN Controller 0
10GBASE-KR ports 2,4 are from LAN Controller 1

Notes:

* All specifications are subject to change without further notice.
* "Build option" indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product. Please contact our sales representatives.
* All modules above support to connect to optical PHY as default. connect to copper PHY is by project basis

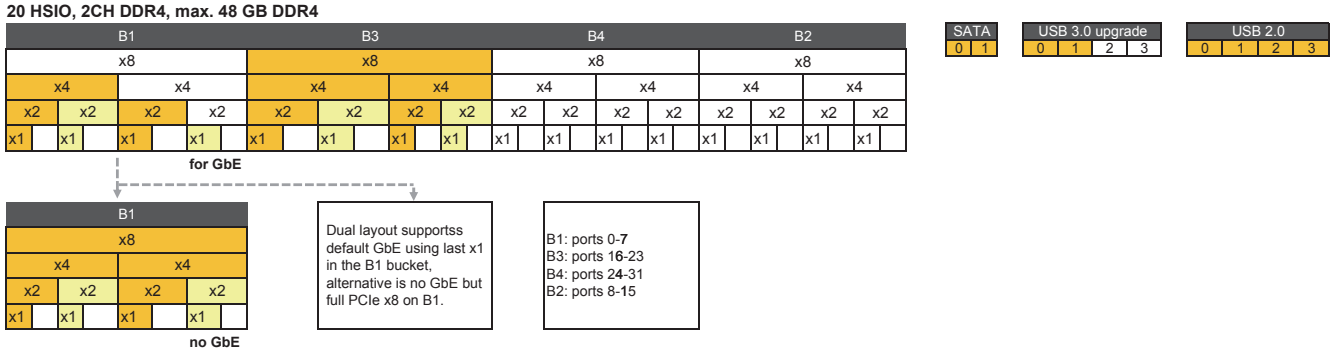
Express-DN7

I/O support on different SOCs

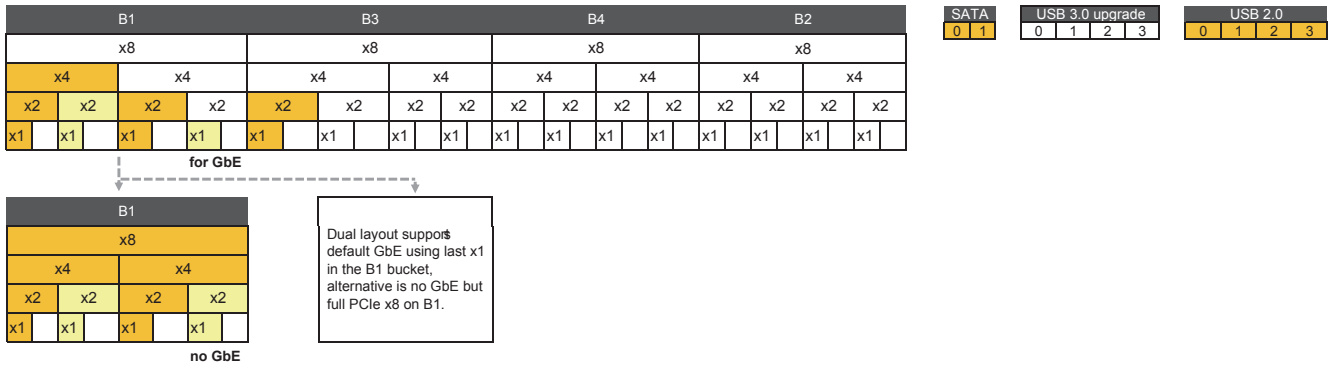
compliant with PICMG definition

"Type7 module may supports more x1 root hubs in bucket one (B1).
It's expected that future generation products may limit the number of available root hubs on bucket one (B1) to 2.

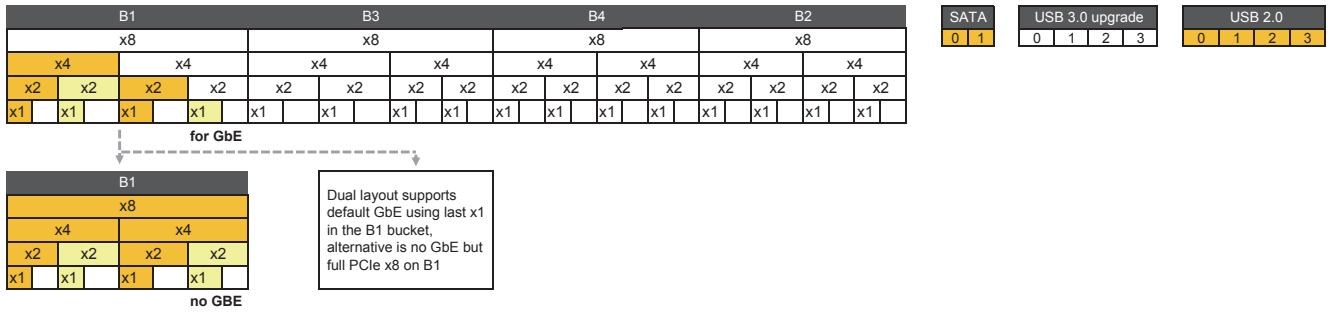
C3808, C3708, C3958, C3858, C3758
20 HSIO, 2CH DDR4, max. 48 GB DDR4



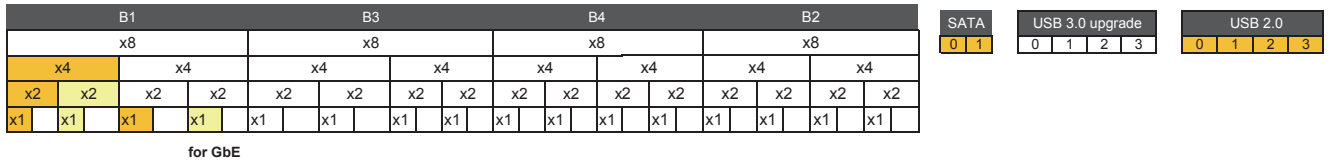
C3558, C3538
12 HSIO, 2CH DDR4, max. 48 GB DDR4



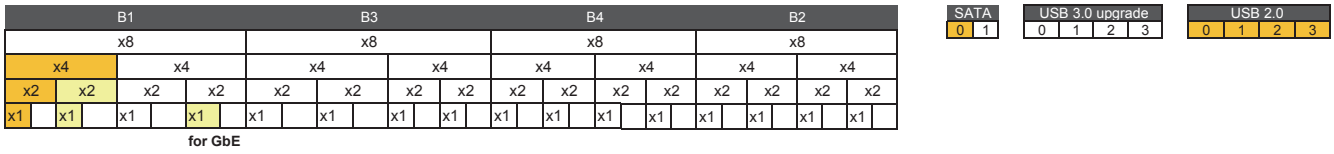
C3338
10 HSIO, 1CH DDR4, max. 16 GB DDR4



C3508
8 HSIO2CH DDR4max. 48 GB DDR4



C3308
6 HSIO, 1CH DDR4, max. 16 GB DDR4



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HTS-DN7-B