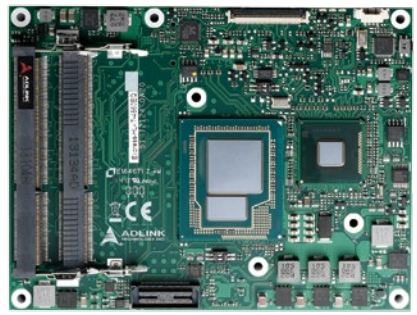
Express-HL

COM Express® Basic Size Type 6 Module with 4th Generation Intel® Core™ and Celeron® Processors

Features

- 4th Generation Intel® Core™ and Celeron® Processors with Intel® QM87 and Intel® HM86 Express Chipset
- Up to 16GB Dual Channel DDR3L at 1600MHz
- Three DDI ports support 3 independent displays
- Seven PCIe x1, one PCIe x16
- GbE, four SATA 6 Gb/s, four USB 3.0 and four USB 2.0
- Supports Smart Embedded Management Agent (SEMA®) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option)



Specifications

Core System

CPU

4th Generation Intel® Core™ Processors (Mobile) - 22nm

i7-4860EQ 1.8 GHz (3.2 GHz Turbo), 47W (4C/GT3)
i7-4700EQ 2.4 GHz (3.4 GHz Turbo), 47W (4C/GT2)
i5-4400E 2.7 GHz (3.3 GHz Turbo), 37W (2C/GT2)
i5-4402E 1.6 GHz (2.7 GHz Turbo), 25W (2C/GT2)
i3-4100E 2.4 GHz (no Turbo) 3MB, 37W (2C/GT2)
i3-4102E 1.6 GHz (no Turbo) 3MB, 25W (2C/GT2)
Celeron® 2000E 2.2 GHz (no Turbo) 35W (2C/GT1)
Celeron® 2002E 1.5 GHz (no Turbo) 25W (2C/GT1)

Supports: Intel® VT, Intel® TXT, Intel® SSE4.2, Intel® HT Technology, Intel® 64 Architecture, Execute Disable Bit, Intel® Turbo Boost Technology 2.0, Intel® AVX2, Intel® AES-NI, PCLMULQDQ Instruction, Intel® Secure Key and Intel® TSX.

Note: Availability of the features may vary between processor SKUs.

Memory

Dual channel non-ECC 1600/1333 MHz DDR3L memory up to 16GB in dual SODIMM socket

Embedded BIOS

AMI EFI with CMOS backup in 8MB SPI BIOS with Intel® AMT 9.0 support

L3 Cache

6MB for i7-4700EQ, 3MB for i5-4400E, i5-4402E, i3-4100E and i3-4102E

Expansion Busses

PCI Express x16 (Gen3) or PCI Express (2 x8 or 1 x8 with 2 x4)
6 PCI Express x1 (AB): Lanes 0/1/2/3/4/5
1 PCI Express x1 (CD): Lane 6
LPC bus, SMBus (system) , I²C (user)

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
Use in combination with DB-40 debug module
Providing BIOS POST code LED, BMC access, SPI BIOS flashing, Power Testpoints, Debug LEDs
60-pin XDP header for ICE debug of CPU/Chipset

Video

GPU Feature Support

Generation 7.5 graphics core architecture, supporting
3 independent and simultaneous display combinations of DisplayPort /HDMI / LVDS monitors
Encode/transcode HD content
Playback of high definition content including Blu-ray Disc

Digital Display Interface

DDI1 supporting DisplayPort / HDMI / DVI
DDI2 supporting DisplayPort / HDMI / DVI
DDI3 supporting DisplayPort / HDMI / DVI

VGA

Analog VGA support with 300 MHz DAC
Analog monitor support up to QXGA (2048 x 1536)

LVDS

Single/dual channel 18/24-bit LVDS from eDP (two lanes)

Audio

Chipset

Intel® HD Audio integrated in SOC

Audio Codec

Located on carrier Express-BASE6 (ALC886 standard supported)

Ethernet

Intel® MAC/PHY: I217LM (Enterprise SKU) with AMT 9.0 support
Interface: 10/100/1000 GbE connection

Note: "build option" indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product. Be aware that these "build option" part numbers will need to be newly created and this will result in production lead times.

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Specifications

I/O Interfaces

USB: 4x USB 3.0 (USB 0,1,2,3)
4x USB 2.0 (USB 4,5,6,7)
SATA: Four ports SATA 6Gb/s (SATA0, SATA1, SATA2, SATA3)
Serial: 2 UART ports COM1/2 with console redirection
GPIO: 4 GPO and 4 GPI with interrupt

Super I/O

Supported on carrier if needed (standard support for W83627DHG-P)

TPM

Chipset: Atmel AT97SC3204
Type: TPM 1.2

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 4.0 compliant, Smart Battery support
Power States: C1-C6, S0, S1, S4, S3, S5 , S5 ECO mode (Wake on USB S3/S4, WOL S3/S4/S5)
ECO mode: Supports deep S5 mode for power saving

Mechanical and Environmental

Form Factor: PICMG COM.0: Rev 2.1 Type 6
Dimension: Basic size: 125 mm x 95 mm

Operating Temperature

Standard: 0°C to +60°C
Extreme Rugged™: -40°C to +85°C (build option)

Humidity

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

Shock and Vibration

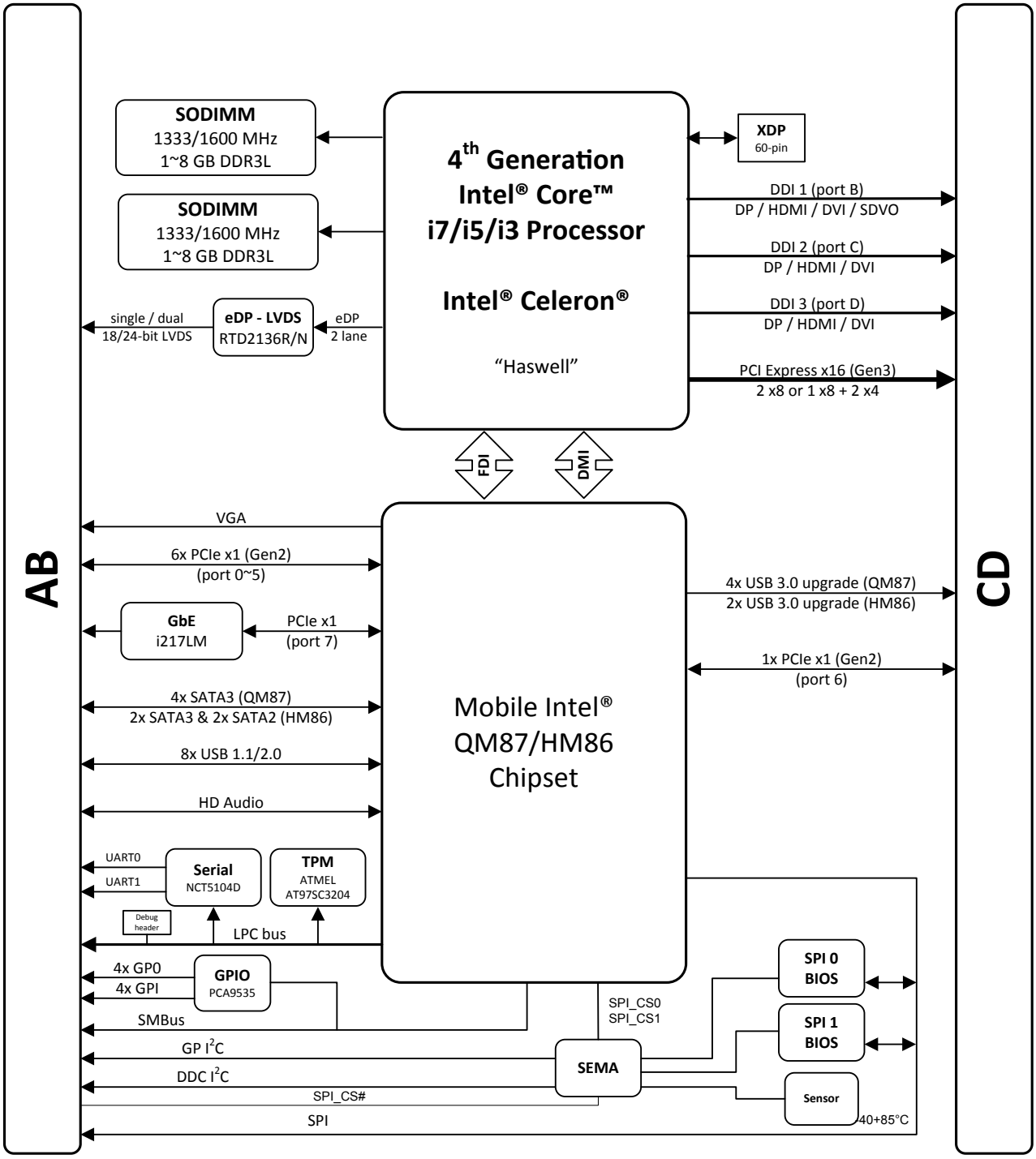
IEC 60068-2-64 and IEC-60068-2-27
MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

HALT tested

Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

Note: "build option" indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product.
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Functional Diagram



Ordering Information

- **Express-HL-i7-4860EQ**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i7-4860EQ at 1.8 GHz with GT3 level graphics
- **Express-HL-i7-4700EQ**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i7-4700EQ at 2.4/1.7 GHz with GT2 level graphics
- **Express-HL-i5-4400E**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i5-4400E at 2.7 GHz with GT2 level graphics
- **Express-HL-i3-4100E**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i3-4100E at 2.4 GHz with GT2 level graphics
- **Express-HL-i5-4402E**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i5-4402E at 1.6 GHz with GT2 level graphics
- **Express-HL-i3-4102E**
  COM Express® Basic Size Type 6 Module with Intel® Core™ i3-4102E at 1.6 GHz with GT2 level graphics
- **Express-HL-2000E**
  COM Express® Basic Size Type 6 Module with Celeron® 2000E 2.2 GHz (no Turbo) 35W (2C/GT1)
- **Express-HL-2002E**
  COM Express® Basic Size Type 6 Module with Celeron® 2002E 1.5 GHz (no Turbo) 25W (2C/GT1)

Note: Express-BL and Express-HL share the same thermal solution design

Accessories

Heat Spreaders

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

Passive Heatsinks

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

Active Heatsink

- **THSF-HL-BL**
  High profile heatsink with Fan for Express-HL with threaded standoffs for bottom mounting

Starter Kit

- **COM Express Type 6 Starter Kit Plus**
  COM Express formfactor starter kit with Express-BASE6 board, power supply, and accessory kit

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