Express-HL2

COM Express® Basic Size Type 2 Module with Intel® Core™ and Celeron® Processor

Features

- Intel® i7/i5/i3 and Celeron® 200XE series Processor with Mobile Intel® QM87 Express Chipset
- Up to 16GB Dual Channel DDR3L at 1600MHz
- Dual Channel LVDS and VGA supporting 2 independent displays
- Six PCIe x1, one PCIe x16 and 32-bit PCI-bus
- GbE, four SATA 6 Gb/s, one PATA,IDE, eight 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

Intel® Core™ i7 Processors (Mobile) - 22nm

i7-4860EQ 2.4 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 i7-4650U, 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: Lanes 0/1/2/3/4/5

32-bit PCI bus rev 2.3

LPC bus, SMBus (system) , I^2C (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
2 independent and simultaneous display combinations of VGA and LVDS monitors

Encode/transcode HD content

LVDS

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

VGA

Analog VGA support with 300 MHz DAC

Analog monitor support up to QXGA (2048 x 1536)

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

I/O Interfaces

USB: 8x USB 2.0 (USB 0,1,2,3,4,5,6,7)

SATA: Four ports SATA 6Gb/s (SATA0, SATA1, SATA2, SATA3)

PATA: One PATA IDE single device only

GPIO: 4 GPO and 4 GPI with interrupt

Super I/O

On carrier if needed (standard support for W83627DHG-P)

TPM

Chipset: Atmel AT97SC3204

Type: TPM 1.2

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.

Specifications

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

Operating Systems

Standard Support

Windows 7/8 32/64-bit, Linux 32/64-bit

Extended Support (BSP)

WES7/8, Linux, VxWorks, QNX

Mechanical

Form Factor: PICMG COM.0: Rev 2.1 Type 2

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

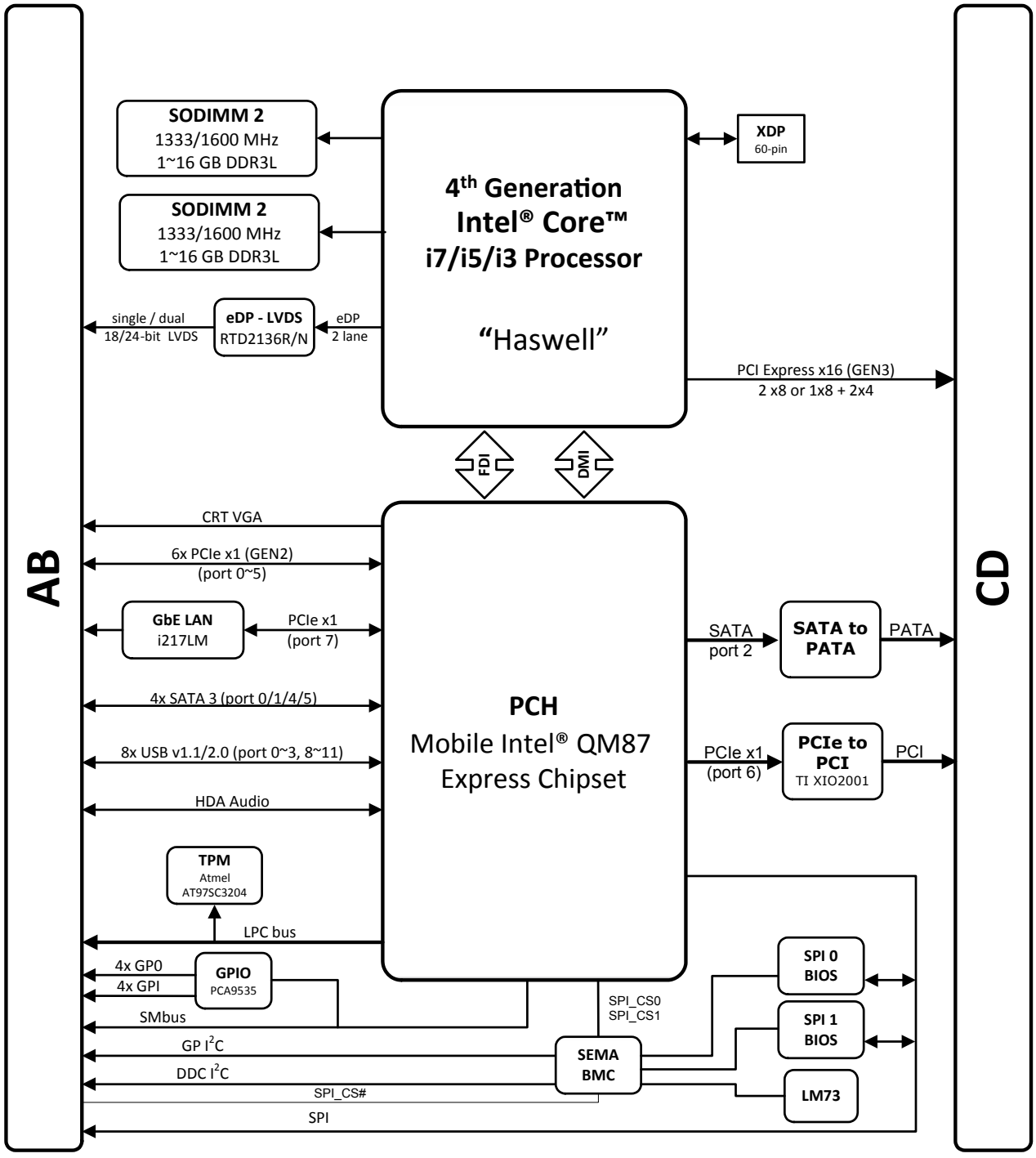
MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

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. Be aware that part numbers for SKUs with "build options" will need to be created and may cause production lead times.

Functional Diagram



Ordering Information

- **Express-HL2-i3-4100E**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i3-4100E at 2.4 GHz with GT2 level graphics
- **Express-HL2-i3-4102E**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i3-4102E at 1.6 GHz with GT2 level graphics
- **Express-HL2-i5-4400E**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i5-4400E at 2.7 GHz with GT2 level graphics
- **Express-HL2-i5-4402E**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i5-4402E at 1.6 GHz with GT2 level graphics
- **Express-HL2-i7-4700EQ**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-4700EQ at 2.4/1.7 GHz with GT2 level graphics
- **Express-HL2-i7-4860EQ**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-4860EQ at 2.18GHz with GT3 level graphics
- **Express-HL2-Celeron 2000E**
  COM Express® Basic Size Type 2 Module with Intel® Celeron® 2000E 2.2 GHz (no Turbo) 35W (2C/GT1)
- **Express-HL2-Celeron 2002E**
  COM Express® Basic Size Type 2 Module with Intel® Celeron® 2002E 1.5 GHz (no Turbo) 25W (2C/GT1)

Accessories

Heat Spreaders

- **HTS-HL-B**
  Heatspreader for Express-HL2 with threaded standoffs for bottom mounting
- **HTS-HL-BT**
  Heatspreader for Express-HL2 with through hole standoffs for top mounting

Passive Heatsinks

- **THS-HL-BL**
  Low profile heatsink for Express-HL2 with threaded standoffs for bottom mounting
- **THSH-HL-BL**
  Low profile heatsink for Express-HL2 with through hole standoffs for top mounting
- **THSF-HL-BL**
  High profile heatsink for Express-HL2 with threaded standoffs for bottom mounting

Active Heatsink

- **THSF-HL-BL-WT**
  High profile heatsink with Fan for Express-HL2 with threaded standoffs for bottom mounting

*Quad Core CPU at 47W cannot use above heatsinks

Starter Kit

- **COM Express Type 2 Starter Kit**
  Starter kit for Express-HL2 COM Express formfactor starter kit with Express-BASE board, power supply, and accessory kit