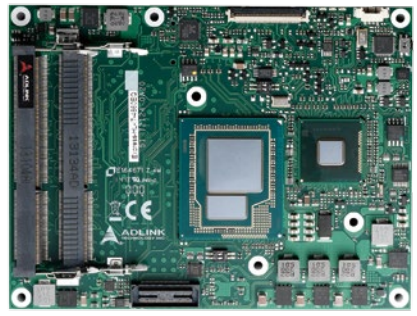
Express-HL

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

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)

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.

Specifications

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

Operating Systems

Standard Support	Windows 7/8 32/64-bit, Linux 32/64-bit
Extended Support (BSP)	WES7/8, Linux , VxWorks, QNX

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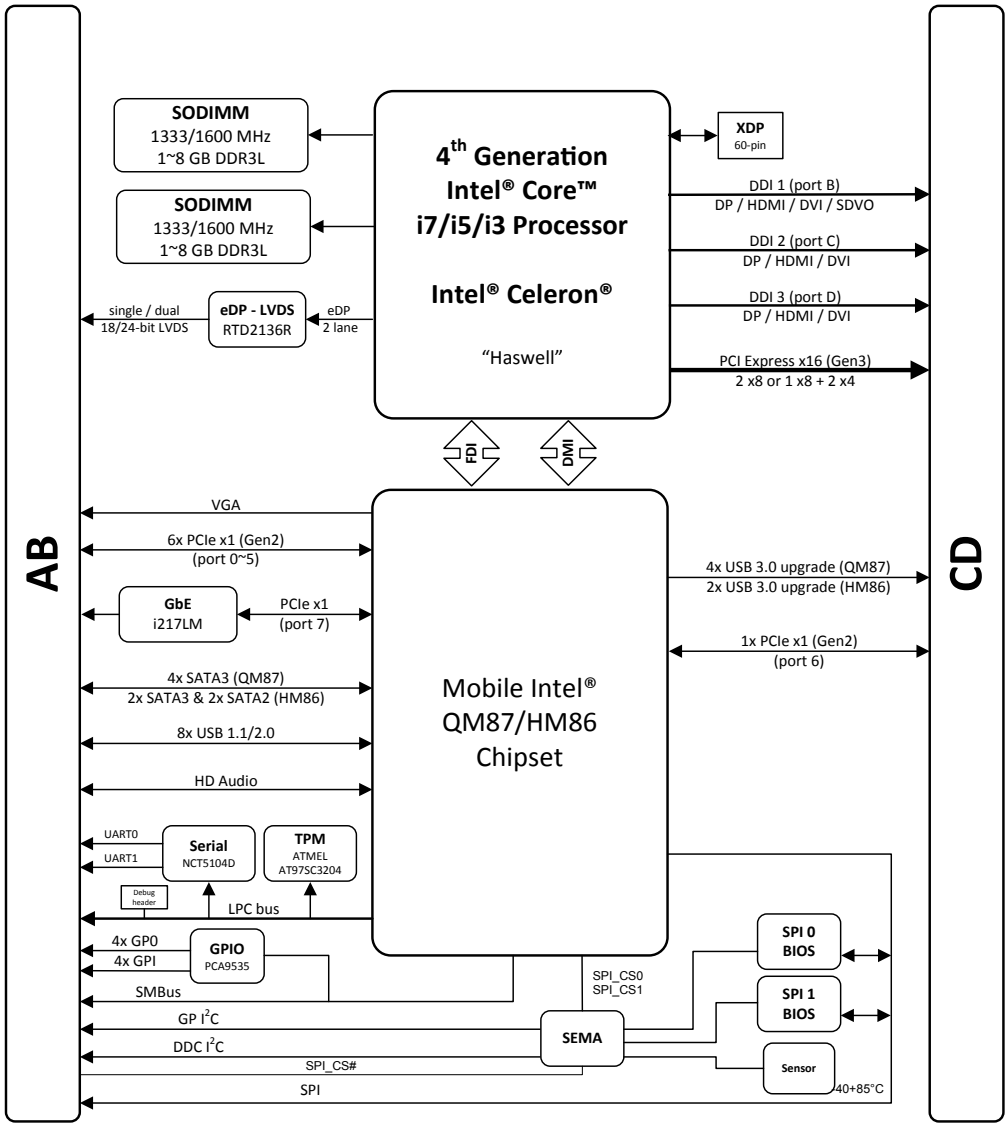
Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
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)

Starter Kit

Model Number	Description/Configuration
COM Express Type 6 Starter Kit Plus	COM Express formfactor starter kit with Express-BASE6 board, power supply, and accessory kit

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

Accessories

Model Number	Description/Configuration
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 stand-offs 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