



### Features

- 4th Generation Low Power Intel® Core™ i7/i5/i3 Processor SoC
- Up to 16 GB DDR3L SDRAM at 1600MHz
- Two DDI channels, one LVDS supporting 3 independent displays
- Four PCIe x1 or 1 PCIe x4, Gigabit Ethernet
- Four SATA 6 Gb/s, two USB 3.0, six USB 2.0
- Supports Smart Embedded Management Agent (SEMA) functions
- Extreme Rugged™ operating temperature: -40°C to +85°C (optional)

### Specifications

#### Core System

CPU	4th Generation Intel® Core™ Processors (Mobile) - 22nm (also know as "Haswell-ULT") Core™ i7-4650U 1.7 GHz (3.3 GHz Turbo), 15W (2C/GT3) Core™ i5-4300U 1.9 GHz (2.9 GHz Turbo), 15W (2C/GT2) Core™ i3-4010U 1.7 GHz (no Turbo) 3MB, 15W (2C/GT2) Celeron® 2980U 1.6 GHz (no Turbo) 15W (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.
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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	4MB for i7-4650U, 3MB for i5-4300U and i3-4010U; 2MB for 2980U
Expansion Busses	4 PCI Express x1: lanes 0/1/2/3 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
LVDS	Single/dual channel 18/24-bit LVDS from eDP (two lanes)
Digital Display Interface	DDI1 supporting DisplayPort / HDMI / DVI DDI2 supporting DisplayPort / HDMI / DVI

#### Audio

Chipset	Intel® HD Audio integrated in SOC
Audio Codec	Located on carrier Express-BASE6 (ALC886 standard supported)

#### Ethernet

Intel® MAC/PHY Interface	i218LM (Enterprise SKU) with AMT 9.0 support 10/100/1000 GbE connection
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#### I/O Interfaces

USB	2x USB 3.0 (USB 0,1) and 6x USB 2.0 (USB2,3,4,5,6,7)
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

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

#### TPM (optional)

Chipset	Atmel AT97SC3204
Type	TPM 1.2

#### Power

Standard Input	ATX = 12V±5% / 5Vsb ±5% or AT = 12V±5%
Wide Input	ATX = 5-20 V / 5Vsb ±5% or AT = 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	Compact size: 95 mm x 95 mm
Operating Temperature	Standard: 0°C to +60°C Extreme Rugged™: -40°C to +85°C (optional)
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 7/8 32/64-bit, Linux 32/64-bit
Extended Support (BSP)	WES7/8, Linux, VxWorks

## Functional Diagram



## Ordering Information

### Modules

Model Number	Description/Configuration
<b>cExpress-HL-i7-4650U</b>	COM Express® Compact Size Type 6 Module with Intel® Core™ i7-4650U at 1.7 GHz with GT3 level graphics
<b>cExpress-HL-i5-4300U</b>	COM Express® Compact Size Type 6 Module with Intel® Core™ i5-4300U at 1.9 GHz with GT2 level graphics
<b>cExpress-HL-i3-4010U</b>	COM Express® Compact Size Type 6 Module with Intel® Core™ i3-4010U at 1.7 GHz with GT2 level graphics
<b>cExpress-HL-2980U</b>	COM Express® Compact Size Type 6 Module with Intel® Celeron® 2980u with 1.6GHz ULV 15W 2+1F and HD graphics

### Accessories

Model Number	Description/Configuration
<b>Heat Spreaders</b>	
HTS-cHL-B	Heatspreader for cExpress-HL with threaded standoffs for bottom mounting
HTS-cHL-BT	Heatspreader for cExpress-HL with through hole standoffs for top mounting
<b>Passive Heatsinks</b>	
THS-cHL-B	Low profile heatsink for cExpress-HL with threaded standoffs for bottom mounting
THS-cHL-BT	Low profile heatsink for cExpress-HL with through hole standoffs for top mounting
THSH-cHL-B	High profile heatsink for cExpress-HL with threaded standoffs for bottom mounting
<b>Active Heatsink</b>	
THSF-cHL-B	High profile heatsink with Fan for cExpress-HL with threaded standoffs for bottom mounting

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