cExpress-HL

COM Express® Compact Size Type 6 Module with Intel® Core™ i7/i5/i3 Processor

Features

- 4th Generation 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
- GbE, 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 (build option)



Specifications

Core System

CPU

4th Generation Intel® Core™ Processors (Mobile) - 22nm (formerly codename "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.

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: i218LM (Enterprise SKU) with AMT 9.0 support

Interface: 10/100/1000 GbE connection

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

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.

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Specifications

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

Operating Systems

Standard Support

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

Extended Support (BSP)

WES7/8, Linux , VxWorks

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 (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

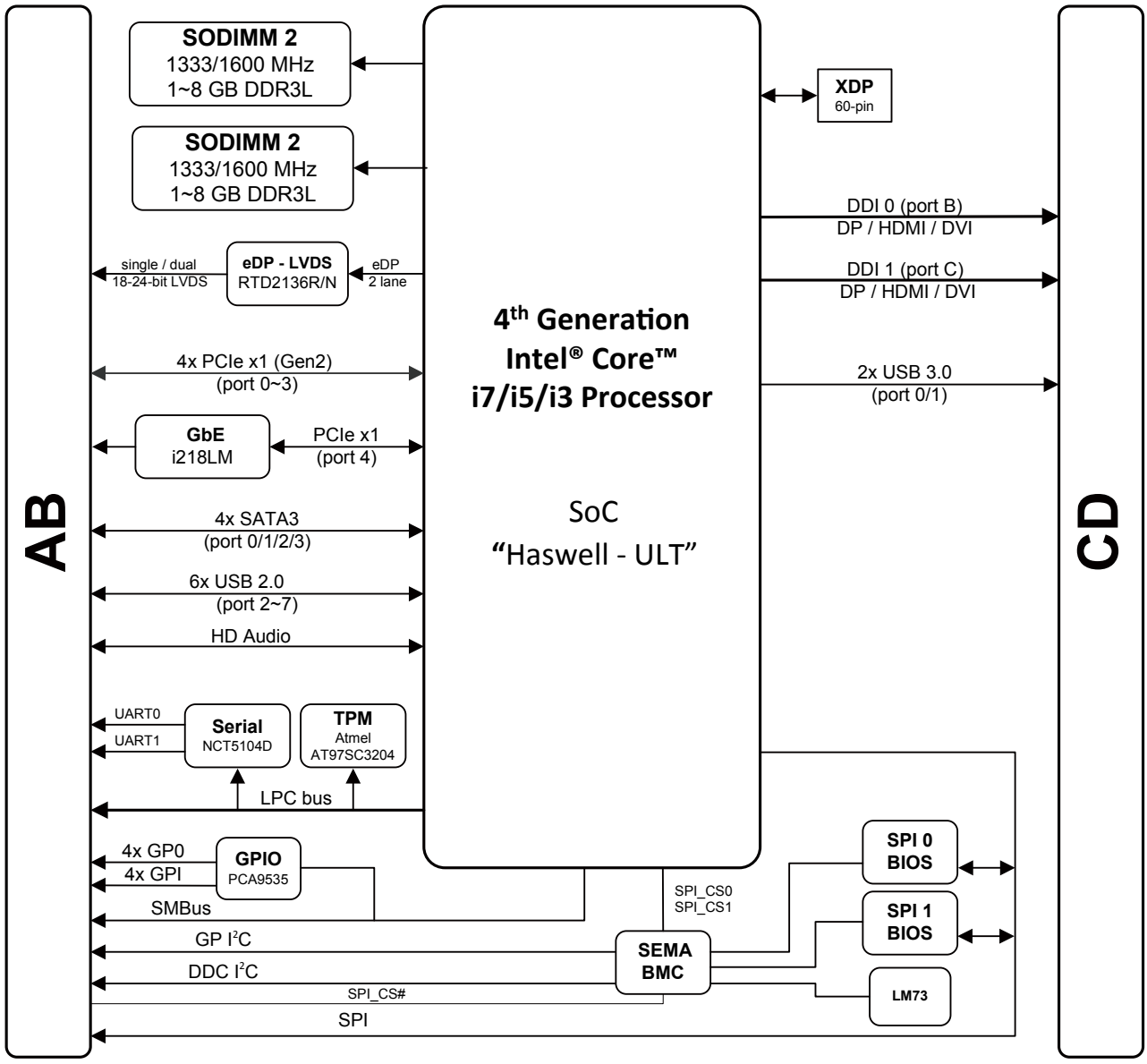
MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

HALT

Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

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Functional Diagram



Ordering Information

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

Starter Kit

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

Accessories

Heat Spreaders

- **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

Passive Heatsinks

- **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

Active Heatsink

- **THSF-cHL-B**
  High profile heatsink with Fan for cExpress-HL with threaded standoffs for bottom mounting

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