cExpress-BL

COM Express® Compact Size Type 6 Module with
5th Generation Intel® Core™ i7/i5/i3 and Celeron® SoC

Features

- 5th Generation Intel® Core™ i7/i5/i3 and Celeron® SoC
- Up to 32GB DDR3L at 1600MHz
- Two DDI channels, one LVDS supporting 3 independent displays
- Dual channel 18/24-bit LVDS (or build option eDP)
- GbE, four PCIe x1 or 1 PCIe x4
- 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
5th Generation Intel® Core™ and Celeron® Processor (Mobile) - 14nm (formerly "Broadwell U-Series")
Core™ i7-5650U 2.2 GHz (3.2 GHz Turbo), 4MB, 15W (2C/GT3)
Core™ i5-5350U 1.8 GHz (2.9 GHz Turbo), 3MB, 15W (2C/GT3)
Core™ i3-5010U 2.1 GHz (no Turbo), 3MB, 15W (2C/GT2)
Celeron® TBC
Note: Availability of features may vary between processor SKUs.

Memory
Dual channel non-ECC 1600/1333 MHz DDR3L memory up to 32GB in dual SODIMM socket

Embedded BIOS
AMI EFI with CMOS backup in BMB SPI BIOS with Intel AMT 10 support

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

Audio
Chipset
Intel® HD Audio integrated in U-Series SoC

Audio Codec
located on carrier Express-BASE6 (ALC886 standard supported)

Video

GPU Feature Support
Generation 8 Intel graphics core architecture, supporting 3 independent and simultaneous displays
Combinations of DisplayPort/HDMI/LVDS or eDP outputs
Encode/transcode HD content
Playback of high definition content including Blu-ray Disc
Superior image quality with sharper, more colorful images
Playback of Blu-ray disc S3D content using HDMI (1.4a spec compliant with 3D)
DirectX Video Acceleration (DXVA) support for accelerating video processing
Full AVC/VC1/MPEG2 HW Decode
Advanced Scheduler 2.0, 1.0, XPDM support
Windows 8, Windows 7, OSX, Linux OS support
DirectX 11.1, DirectX 11.1+, DirectX 10.1, DirectX 10, DirectX 9 support
OpenGL 4.2/4.0 support

LVDS/eDP
Single/dual channel 18/24-bit LVDS (default)
eDP support (optional)

Digital Display Interface
DDI1 supporting DisplayPort / HDMI
DDI2 supporting DisplayPort / HDMI

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

- **Ethernet**
  Intel® MAC/PHY: i218LM (Enterprise SKU) with AMT 10 support
  Interface: 1G/10G/1000 GbE connection

- **I/O Interfaces**
  USB: 2x USB 1.1/2.0/3.0 (USB 0,1) and 6x USB 1.1/2.0 (USB 2,3,4,5,6,7)
  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

- **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 = 5~20 V / 5Vsb ±5% or AT = 5~20V
  Management: ACPI 4.0 compliant, Smart Battery support
  Power States: C1-C6, S0, S4, S5, SS ECO mode
  (Wake on USB S3/S4, WOL S3/S4/SS)
  ECO mode: Supports deep SS mode for power saving

- **Operating Systems**
  Standard Support
  Windows 7/8.1U 32/64-bit, Linux 32/64-bit

  Extended Support (BSP)
  WES7, WEBS, Linux, VxWorks (all support 32/64-bit)

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.

- **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 + 85°C (build option)

  Humidity
  5-90% RH operating, non-condensing
  5-95% RH storage (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

- **Intelligent Middleware**
  SEMA®
  Local management, control of embedded computer systems
  Extended EAPI for monitoring, controlling and analytics applications
  Multiple OS support and across platforms (x86, ARM)
Functional Diagram

5th Generation Intel® Core™
Dual Core
Intel® Celeron™
(formerly “Broadwell-U”)

SODIMM1
1333/1600MHz
1~8 GB DDR3L,
non-ECC

SODIMM2
1333/1600MHz
1~8 GB DDR3L,
non-ECC

GbE
i218LM

PCIe x1 Gen2
(port 0~3)

4 PCIe x1 Gen2
(port 0~3)

4x SATA 6Gb/s
(port 0~3)

8x USB 1.1/2.0
(port 0~7)

HD Audio

UART 0
UART 1

Serial
NCT1683D

TPM
Atmel
AT97SC3204

UART 0
UART 1

4x GPIO
4x GPI

SMBus

GP I2C
DDC I2C

SEMA
BMC

SPI 0 BIOS
SPI 1 BIOS

UM73

DDI 0
DP/HDMI/DVI

DDI 1
DP/HDMI/DVI

2x USB 3.0 upgrade
(port 0~1)

XDP
60 pin

4-lane eDP

4x GPIO

SMBus

SPI

SPI_0

SPI_CS#
Ordering Information

- **cExpress-BL-i7-5650U**
  Compact COM Express® Type 6 module with Intel® Core™ i7-5650U at 2.2/3.2 GHz with GT3 level graphics

- **cExpress-BL-i5-5350U**
  Compact COM Express® Type 6 module with Intel® Core™ i5-5350U at 1.8/2.9 GHz with GT3 level graphics

- **cExpress-BL-i3-5010U**
  Compact COM Express® Type 6 module with Intel® Core™ i3-5010U at 2.1 GHz with GT2 level graphics

- **cExpress-BL-Celeron®**
  Compact COM Express Type 6 module with Intel® Celeron®

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-cBL-B**
  Heatspreader for cExpress-BL with threaded standoffs for bottom mounting

- **HTS-cBL-BT**
  Heatspreader for cExpress-BL with through hole standoffs for top mounting

Passive Heatsinks

- **THS-cBL-B**
  Low profile heatsink for cExpress-BL with threaded standoffs for bottom mounting

- **THS-cBL-BT**
  Low profile heatsink for cExpress-BL with through hole standoffs for top mounting

Active Heatsink

- **THSF-cBL-B**
  High profile heatsink with Fan for cExpress-BL with threaded standoffs for bottom mounting

- **THSH-cBL-B**
  High profile heatsink for cExpress-BL with through hole standoffs for bottom mounting