Express-CF/CFE

COM Express® Basic Size Type 6 Module with Hexacore Mobile 8th Gen Intel® Xeon® and Core™ Processors

Features

- PICMG COM.0 R3.0 Type 6 module with hexacore Intel® processor
- Up to 48GB Dual Channel DDR4 at 2133/2400MHz
- Three DDI channels, one LVDS (or 4 lanes eDP), supports up to 3 independent displays
- One PCIe x16 Gen3, eight PCIe x1 Gen3 (NVMe SSD & Intel® Optane™ Memory Technology support)
- GbE, four SATA 6 Gb/s, four USB 3.1 and four USB 2.0
- Supports Smart Embedded Management Agent (SEMA) functions

Specifications

Core System

CPU
Mobile 8th Generation Intel Xeon® and Core™ Processors - 14nm process
- Xeon® E-2176M, 2.7 (4.4)GHz, 12MB, 45W (35W cTDP), 6C/GT2
- Core™ i7-8850H, 2.6 (4.3)GHz, 9MB, 45W (35W cTDP), 6C/GT2
- Core™ i5-8400H, 2.5 (4.2)GHz, 8MB, 45W (35W cTDP), 4C/GT2


Note: Availability of the features may vary between processor SKUs.

Memory
2133/2400 MHz DDR4 memory up to 48GB in three SODIMM sockets (Xeon® paired with CM246 supports both ECC and non-ECC memory) (48GB is build support)

Embedded BIOS
AMI EFI with CMOS backup in 32MB SPI BIOS with Intel® AMT 12.0 support

Cache
12MB for Xeon®, 9MB for Core™ i7, 8MB for Core™ i5

PCH
- CM246 (supports ECC memory and Intel® AMT)
- QM370 (supports Intel® AMT)
- HM370 (no support for Intel® AMT)

Expansion Busses
- PCIe x16, 2 PCIe x8, or 1 PCIe x8 with 2 PCIe x4 (Gen3)
- 6 PCI Express x1 (Gen3); AB connector, Lanes 0/1/2/3/4/5
- 2 PCI Express x1 (Gen3); CD connector, Lane 6/7
- LPC bus, SMBus (system), I²C (user)

SEMA Board Controller
Supports: voltage/current monitoring, power sequence debug support, AT/ATAx mode control, logistics and forensic information, flat panel control, general purpose I²C, fallsafe BIOS (dual BIOS), watchdog timer and fan control

Debug Headers
- 40-pin multipurpose flat cable connector for use 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
Intel® Generation 9 LP Graphics Core Architecture, supporting 3 independent and simultaneous display combinations of DisplayPort/HDMI (or VGA), LVDS or eDP outputs
- Hardware encode/transcode HD content (including HEVC 10-bit)
- DirectX 12, DirectX 11.2, DirectX 11.1, DirectX 11, DirectX 10.1, DirectX 10,DirectX 9 support
- OpenGL 5.0, 4.4/4.3 and ES 2.0 support
- OpenCL 2.1, 2.0/1.2 support

Digital Display Interface
DDI1/2/3 supporting DisplayPort 1.2, HDMI 1.4, DVI

Notes:
DP1.2: max. resolution is 4096x2304 @ 60Hz, 24bpp
HDMI1.4: max. resolution is 4096x2160 @ 24Hz, 24bpp

VGA

VGA support, in place of DDI3 channel (build option, max. resolution 1920x1200@60Hz)

LVDS
Single/dual channel 18/24-bit LVDS from eDP-to-LVDS IC (max. resolution 1920x1200@60Hz in dual mode)

eDP
4 lane support optional, in place of LVDS (build option, max. resolution 4096x2304@60Hz, 24bpp)

Audio

Chipset: Intel® HD Audio integrated in chipset
Audio Codec located on carrier Express-BASE6 (ALC886 standard supported)

Ethernet

Intel® I219LM/V with AMT 12.0 support (only LM version support AMT)
Interface: 10/100/1000 GbE connection

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

● Multi I/O and Storage
  USB: 4x USB 3.1 (USB 0, 1, 2, 3) and 4x USB 2.0 (USB 4, 5, 6, 7)
  SATA: Four ports SATA 6Gb/s (SATA0,1,2,3)
  Serial: 2 UART ports with console redirection
  GPIO/SD: 4 GPO and 4 GPI (GPI with interrupt TBD)
  SD/GPIO muxed design, switched by BIOS setting
  SD functions as storage device only
  Note: USB 3.1 Gen2 support dependent on carrier design

● Super I/O
  Supported on carrier if needed (standard support for W83627DHG-P)

● TPM
  Chipset: Infineon
  Type: TPM 2.0

● 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 5.0 compliant, Smart Battery support
  Power States: C1-C6, S0, S1, S3, S4, S5, S5 ECO mode (Wake-on-USB S3/S4, WOL S3/S4/S5)
  ECO mode: Supports deep S5 mode for power saving

Notes:
* All specifications are subject to change without further notice.
* For CPU and chipset combinations not listed, please contact your ADLINK representative for availability.

● Operating Systems
  Standard Support
  Windows® 10 64-bit, Linux 64-bit
  Windows® 10 64-bit (TBD)
  Extended Support (BSP)
  Linux 64-bit
  VxWorks 64-bit (TBD)

● Mechanical and Environmental
  Form Factor: PICMG COM.0, Rev 3.0 Type 6
  Dimension: Basic size: 125 mm x 95 mm
  Operating Temperature
  Standard: 0°C to 60°C
  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
Functional Diagram

Mobile 8th Gen Intel® Xeon® Processor

- SODIMM 1: 2133/2400 MHz, 4-16 GB DDR4
- SODIMM 2: 2133/2400 MHz, 4-16 GB DDR4
- SODIMM 3: 2133/2400 MHz, 4-16 GB DDR4

Mobile Intel® QM370/HM370/CM246 Chipset

- LAN (I219 LMiV)
- No GbE_SDPI
- HD Audio
- UART0/1
- LPC to UART
- TPM 2.0

- 4x SATA 6Gb/s (port 0/1/2/3)
- 8x USB 2.0 (USB0_HOST_PRSNT)
- 4x PCIe x1 (Gen3) (port 6/7)
- 2x PCIe x16 (Gen3)

Support Intel OPTANE memory & RST on PCIe port 0-7

- SDIO (for SD card)

- SDMM (for SD card)

- New SEMA BMC

- SPI 0 BIOS
- SPI 1 BIOS

- Thermal Sensor

- SPI
- SPI_CS#
- DDI 2
- DP/HDMI/DVI
- DDI 1
- DP/HDMI/DVI
- DDI 3
- DP/HDMI/DVI
- PCIe x16 (Gen3) 1x16, 2x8 or 1x8 + 2x4
- 4x USB 3.1 (port 0/1/2/3)

- 4x US 3.1 (port 0/1/2/3)

- 6x PCIex1 (Gen3) (port 0-5)

- 60/60

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- 4x USB 3.1 (port 0/1/2/3)
Ordering Information

- **Express-CFE-E-2176M**
  Basic COM Express Type 6 module with Intel® Xeon® E-2176M (6C/GT2), CM246 chipset, supports ECC/non-ECC
- **Express-CF-i7-8850H**
  Basic COM Express Type 6 module with Intel® Core™ i7-8850H (6C/GT2), QM370 chipset
- **Express-CF-i5-8400H**
  Basic COM Express Type 6 module with Intel® Core™ i5-8400H (4C/GT2), TBD chipset

Accessories

**Heat Spreaders**

- **HTS-CF-B**
  Heatspreader for Express-CF/CFE with threaded standoff for bottom mounting
- **HTS-CF-BT**
  Heatspreader for Express-CF/CFE with through hole standoff for top mounting

**Passive Heatsinks**

- **THS-CF-BL**
  Low profile heatsink for Express-CF/CFE with threaded standoff for bottom mounting
- **THS-CF-BT**
  Low profile heatsink for Express-CF/CFE with through hole standoff for top mounting
- **THSH-CF-BL**
  High profile heatsink for Express-CF/CFE with threaded standoff for top mounting

**Active Heatsink**

- **THSF-CF-BL**
  High profile heatsink with Fan for Express-CF/CFE with threaded standoff for bottom mounting

**Starter Kit**

- **COM Express Type 6 Starter Kit Plus**
  Starter kit for COM Express Type 6