Express-KL/KLE

COM Express Basic Size Type 6 Module with 7th Gen Intel® Core™, Intel® Xeon® Processor

Features

- 7th Gen Intel® Core™, Intel® Xeon® Processor
- Up to 32 GB Dual Channel DDR4 at 1867/2133 MHz (supports both ECC and non-ECC memory)
- 3x DDI channels, 1x LVDS (or 4 lanes eDP) supports up to 3 independent displays
- 8x PCIe x1 (Gen3) and 1x PCIe x16 (Gen3)
- GbE, 4x SATA 6 Gb/s, 4x USB 3.0 and 4x 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

Mobile Intel® Xeon®, Core™ Processors - 14nm
Xeon® E3-1505M v6 3.0/4.0GHz (Turbo), 45W (4C/GT2)
Xeon® E3-1505L v6 2.2/3.0GHz (Turbo), 25W (4C/GT2)
Core™ i7-7820EQ 3.0/3.7GHz (Turbo), 45W (4C/GT2)
Core™ i5-7440EQ 2.9/3.6GHz (Turbo), 45W (4C/GT2)
Core™ i5-7442EQ 2.1/2.9GHz (Turbo), 25W (4C/GT2)
Core™ i3-7100E 2.9GHz (no Turbo), 35W (2C/GT2)
Core™i3-7102E 2.1GHz (no Turbo), 25W (2C/GT2)
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 1867/2133 MHz DDR4 memory up to 32GB in dual SODIMM sockets (ECC/non-ECC support dependent on selected CPU/PCH)

Embedded BIOS

AMI EFI with CMOS backup in 16MB SPI BIOS with Intel® AMT 11.6 support

Cache

8MB for Xeon® and Core™ i7, 6MB for Core™ i5, 3MB for Core™ i3

PCH

CM238 (supports ECC memory, Intel AMT)
QM175 (supports non-ECC, Intel AMT)
HM175 (supports non-ECC, no Intel AMT support)

Expansion Busses

PCIe x16 or 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 x2 (Gen3): CD connector, Lanes 6/7
LPC bus, SMBus (system) , I²C (user)

Debug Headers

40-pin 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/LVDS or eDP outputs

Hardware encode/transcode

HD content (including HEVC) DirectX 12, DirectX 11.2, DirectX 11.1, DirectX 11, DirectX 10.1, DirectX 10, DirectX 9 support OpenGL 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/HDMI/DVI

LVDS

Single/dual channel 18/24-bit LVDS from eDP-to-LVDS IC

eDP

4 lane support optional, in place of LVDS

Audio

Chipset

Intel® HD Audio integrated in chipset

Audio Codec

located on carrier Express-BASE6 (ALC886 standard supported)

Ethernet

Intel® MAC/PHY: i219LM/V (LM with AMT 11.0 support)
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

I/O Interfaces

USB: 4x USB v. 3.0 (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: 4 GPO and 4 GPI

Super I/O

Supported on carrier if needed (standard support for W83627DHG-P)

TPM (option)

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 (Standard temp. only)
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

Operating Systems

Standard Support

Windows 10 64-bit, Linux 64-bit, VxWorks

Extended Support (BSP)

Linux 64-bit, VxWorks

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 Ruggeed: -40°C to +85°C (build option for 25W TDP SKUs)

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

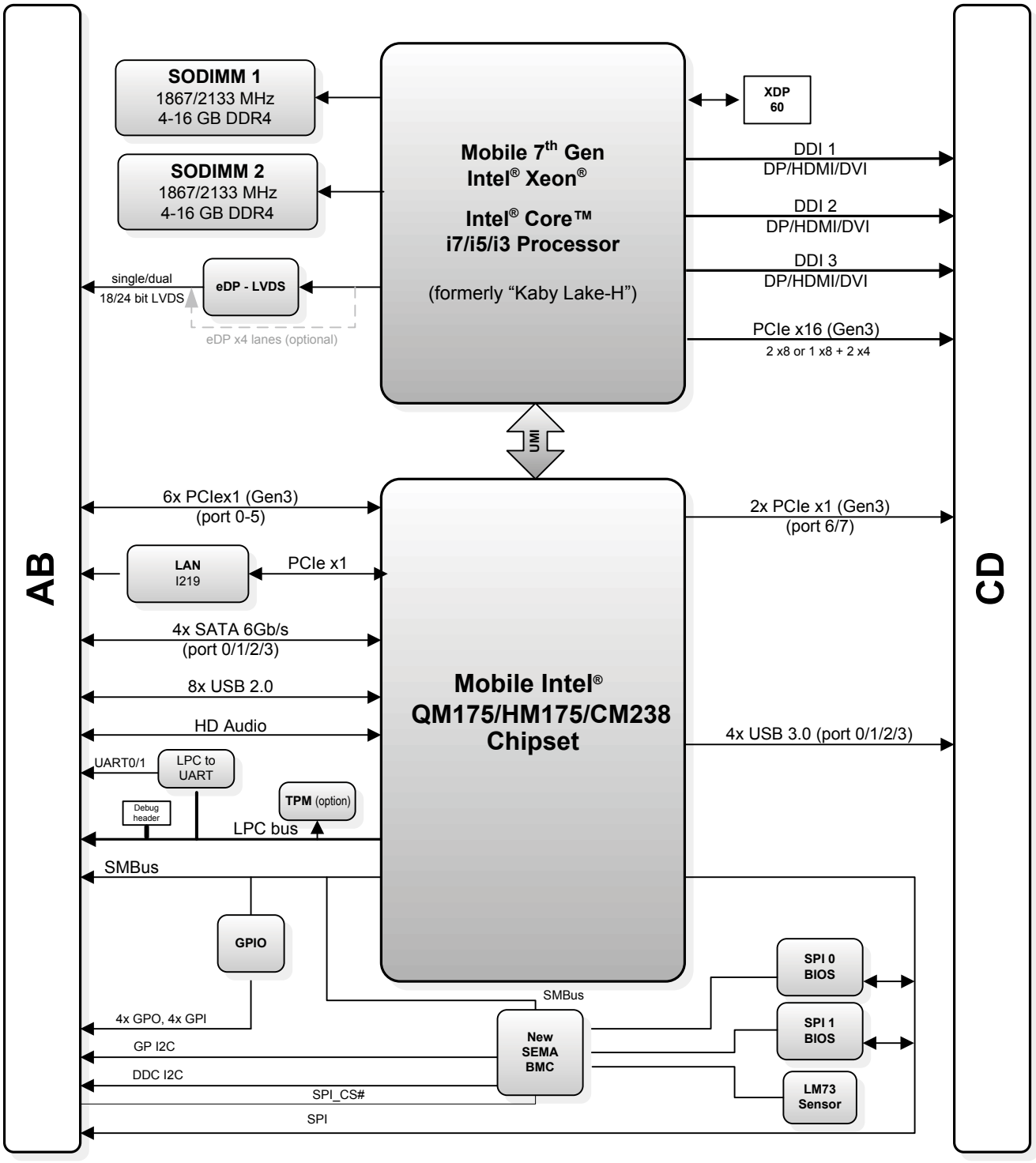
Intelligent Middleware

SEMA®

Local management, control of embedded computer systems
Extended EAPI for monitoring, controlling and analytics applications
Multiple OS support and across platforms (x86, ARM)

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Functional Diagram



Ordering Information

- **Express-KLE-E3-1505M v6**
  Basic Size COM Express® Type 6 module with Intel® Xeon® E3-1505M v6 and GT2 level graphics, CM238 chipset
- **Express-KLE-E3-1505L v6**
  Basic Size COM Express® Type 6 module with Intel® Xeon® E3-1505M v6 and GT2 level graphics, CM238 chipset
- **Express-KL-i7-7820EQ**
  Basic Size COM Express® Type 6 module with Intel® Core™ i7-7820EQ and GT2 level graphics, QM175 chipset
- **Express-KL-i5-7440EQ**
  Basic Size COM Express® Type 6 module with Intel® Core™ i5-7440EQ and GT2 level graphics, QM175 chipset
- **Express-KL-i5-7442EQ**
  Basic Size COM Express® Type 6 module with Intel® Core™ i5-7442EQ and GT2 level graphics, QM175 chipset
- **Express-KL-i3-7100E**
  Basic Size COM Express® Type 6 module with Intel® Core™ i3-7100E and GT2 level graphics, HM175 chipset
- **Express-KL-i3-7102E**
  Basic Size COM Express® Type 6 module with Intel® Core™ i3-7102E and GT2 level graphics, HM175 chipset

Accessories

Heat Spreaders

- **HTS-SL-B**
  Heatspreader for Express-SL with threaded standoffs for bottom mounting
- **HTS-SL-BT**
  Heatspreader for Express-SL with through hole standoffs for top mounting

Passive Heatsinks

- **THS-SL-BL**
  Low profile heatsink for Express-SL with threaded standoffs for bottom mounting
- **THS-SL-BT**
  Low profile heatsink for Express-SL with through hole standoffs for top mounting
- **THSH-SL-BL**
  High profile heatsink for Express-SL with threaded standoffs for top mounting

Active Heatsink

- **THSF-SL-BL**
  High profile heatsink with Fan for Express-KL with threaded standoffs for bottom mounting

Starter Kit

- **Starterkit-COM Express 6 PLUS**
  COM Express formfactor starter kit with Express-BASE6 board, power supply, and accessory kit

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