Express-TL

COM Express Basic Size Type 6 Module with 11th Gen Intel® Core™, Intel® Xeon® and Intel® Celeron® Processors

Features

- Intel® Tiger Lake-H Processors (up to 8 cores) integrated with Intel® UHD Graphics (Xe architecture)
- AI inference (AVX512 VNNI + Intel® UHD GFX)
- Up to 128GB DDR4 SO-DIMM, non-ECC, ECC
- 3x DDI channels, 1x LVDS (opt. 4 lane eDP), opt. VGA, up to 4 independent displays
- PCIe x16 Gen4, 2.5GbE (TSN, build option)
- Extreme Rugged operating temperature: -40°C to +85°C (build option, selected SKUs, up to 2933MT/s memory frequency)



Specifications

Core System

CPU

Intel® Xeon®, 11th Gen Intel® Core™, Intel® Celeron® Processors (Tiger Lake-H)

- Intel® Xeon® W-11865MRE, 2.6(4.7) GHz, 24MB, 45W(35W cTDP), 8C/16T
- Intel® Xeon® W-11865MLE, 1.5(4.5) GHz, 24MB, 25W, 8C/16T
- Intel® Core™ i7-11850HE, 2.6(4.7) GHz, 24MB, 45W(35W cTDP), 8C/16T
- Intel® Xeon® W-11555MRE, 2.6(4.5) GHz, 12MB, 45W(35W cTDP), 6C/12T
- Intel® Xeon® W-11555MLE, 1.9(4.4) GHz, 12MB, 25W, 6C/12T
- Intel® Core™ i5-11500HE, 2.6(4.5) GHz, 12MB, 45W(35W cTDP), 6C/12T
- Intel® Xeon® W-11155MRE, 2.4(4.4) GHz, 8MB, 45W(35W cTDP), 4C/8T
- Intel® Xeon® W-11155MLE, 1.8(3.1) GHz, 8MB, 25W, 4C/8T
- Intel® Core™ i3-11100HE, 2.4(4.4) GHz, 8MB, 45W(35W cTDP), 4C/8T
- Intel® Celeron® 6600HE, 2.6GHz, 8MB, 35W, 2C/2T

Supports: Intel® VT, Intel® VT-d, Intel® TXT, Intel® SSE4.2, Intel® HT Technology, Intel® 64 Architecture, Execute Disable Bit, Intel® Turbo Boost Technology 2.0, Intel® AVX-512, Intel® AVX2, Intel® AES-NI, PCLMULQDQ Instruction, Intel® Secure Key and Intel® TSX-NI.

Notes:
Availability of features may vary between processor SKUs.
Some SKUs listed above are supported by project basis only. Please contact your ADLINK representative for availability.

Memory

Dual channel up to 3200 MT/s DDR4 memory up to 128GB in four SODIMM sockets

Two SO-DIMM on top side, two SO-DIMM on bottom side (3 or 4 socket build option dependent on carrier design)

ECC support by Xeon CPU paired with RM590E PCH

Embedded BIOS

AMI UEFI with CMOS backup in 32MB SPI BIOS (dual BIOS by build option)

Cache

Xeon® W-11865MRE / Core™ i7-11850HE: 24MB
Xeon® W-11555MRE / Core™ i5-11500HE: 12MB
Xeon® W-11155MRE / Core™ i3-11100HE / Celeron® 6600HE: 8MB

Chipset

Intel® RM590E (support ECC, with Xeon® CPU)
Intel® QM580E
Intel® HM570E

Expansion Busses

PCIe x16 Gen4: Lanes 15-31 (configurable to one x16, two x8, one x8 + two x4)
8 PCIe x1 Gen3: Lanes 0/1/2/3 (configurable to x1, x2, x4) and Lanes 4/5/**6/7** (**configurable to x1, x2, x4**)
LPC bus (through an ESPI to LPC bridge IC), 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, watchdog timer, fan control and failsafe BIOS (dual BIOS by build option)

Debug Headers

30-pin multipurpose flat cable connector for use with DB-30 x86 debug module providing BIOS POST code LED, EC access, SPI BIOS flashing, power testpoints, debug LEDs

Video

GPU Feature Support

Intel® Gen 12 Graphics Core Architecture, supporting multiple independent and simultaneous display combinations of DisplayPort/HDMI/LVDS, eDP or VGA outputs (4x 4K60)

Hardware encode/transcode of HD content (including HEVC)

DirectX 12 support

OpenGL 4.5, 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

USB4

Maximum 2x USB4 by using DDI 1 and DDI2

Notes: USB4 is a build option (HW and BIOS) supported by project basis in place of DDI channels. USB4 support also requires re-timer and PD on carrier.

VGA

Supported by build option through DP-to-VGA IC (in place of DDI3), 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

Build option: 4 lane support, in place of LVDS

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

Audio

Chipset

Intel® HD Audio integrated on CPU

Audio Codec

On carrier Express-BASE6 (ALC886 standard support)

Ethernet

Intel® MAC/PHY

LAN controller i225 series (i225-IT feature TSN by build option)

Interface

2.5GbE and 1000/100/10 Mbit/s Ethernet connection

GbE0_SDP available if TSN support enabled

I/O Interfaces

USB: 4x USB 3.2/2.0/1.1 (USB 0,1,2,3) and 4x USB 2.0/1.1 (USB 4,5,6,7)

SATA: 4x SATA 6Gb/s (SATA 0,1,2,3)

On-board Storage: Soldered type PCIe based SSD (build option)

Serial: 2x UART ports with console redirection

GPIO/SD: 4x GPO and 4x GPI from EC (GPI with interrupt)

Note: USB 3.1 Gen2 support dependent on carrier design

Super I/O

Supported on carrier if needed (standard support for W83627DHG-P, other Super I/O supported by project basis)

TPM

Chipset: Infineon

Type: TPM 2.0 (SPI based)

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

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 (storage: -20°C to 80°C)

Extreme Rugged: -40°C to 85°C (storage: -40°C to 85°C, build option, selected SKUs, up to 2933MT/s memory frequency)

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 10 64-bit, Windows 10 Enterprise 64-bit, Ubuntu 20.04.3 LTS, Ubuntu Desktop 20.10/20.04 LTS

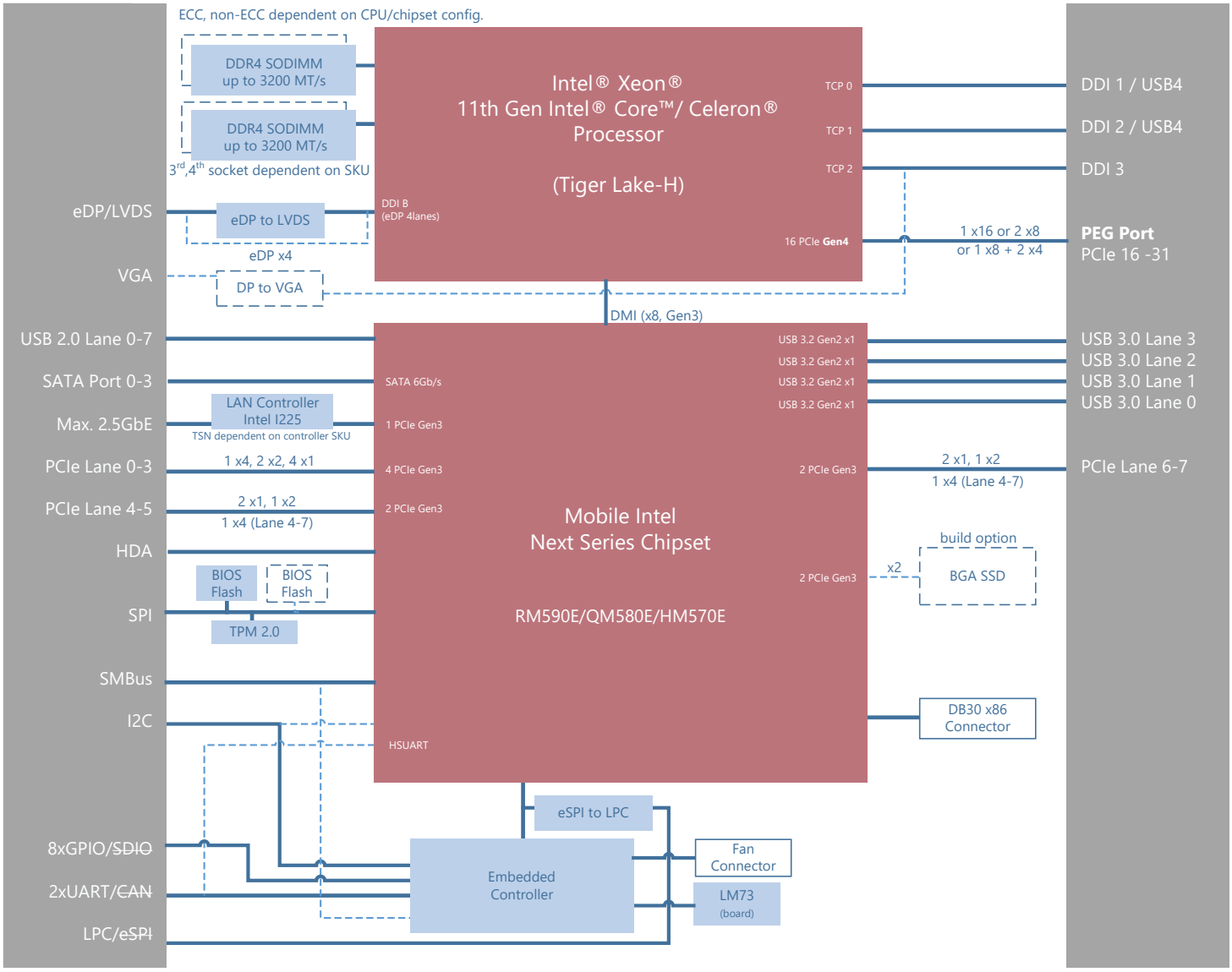
Extended Support (BSP)

Yocto project based Linux 64-bit

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Functional Diagram



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Ordering Information

- **Express-TL-i7-11850HE**
  Basic size type 6 COM Express module with 11th Gen Intel® Core™ i7-11850HE octa core processor with QM580E chipset, 3 SO-DIMM
- **Express-TL-i5-11500HE**
  Basic size type 6 COM Express module with 11th Gen Intel® Core™ i5-11500HE hexa core processor with QM580E chipset, 2 SO-DIMM
- **Express-TL-i3-11100HE**
  Basic size type 6 COM Express module with 11th Gen Intel® Core™ Core i3-11100HE quad core processor with HM570E chipset, 2 SO-DIMM
- **Express-TL-W-11865MRE**
  Basic size type 6 COM Express module with Intel® Xeon® W-11865MRE octa core processor with RM590E chipset, 3 SO-DIMM
- **Express-TL-W-11865MLE**
  Basic size type 6 COM Express module with Intel® Xeon® W-11865MLE octa core processor with RM590E chipset, 3 SO-DIMM
- **t1Express-TL-W-11865MRE**
  Basic size type 6 COM Express module with 11th Intel Xeon W-11865MRE octa core processor with RM590E chipset, 3 SO-DIMM, -40° to 85°
- **t1Express-TL-W-11555MRE**
  Basic size type 6 COM Express module with 11th Intel Xeon W-11555MRE hexa core processor with RM590E chipset, 2 SO-DIMM, -40° to 85°
- **t2Express-TL-W-11555MRE**
  Basic size type 6 COM Express module with 11th Intel Xeon W-11555MRE hexa core processor with RM590E chipset, 2 SO-DIMM, -40° to 85°, ETT
- **t2Express-TL-W-11865MRE**
  Basic size type 6 COM Express module with 11th Intel Xeon W-11865MRE octa core processor with RM590E chipset, 3 SO-DIMM, -40° to 85°, ETT

*For processor SKUs not listed, please contact your ADLINK representative for availability.

Starter Kit

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

  Starter kit for COM Express Type 6

  For PCIe Gen4 specific version, please contact your local ADLINK representative.

Accessories

Heat Spreaders

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

Passive Heatsinks

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

Active Heatsinks

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

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