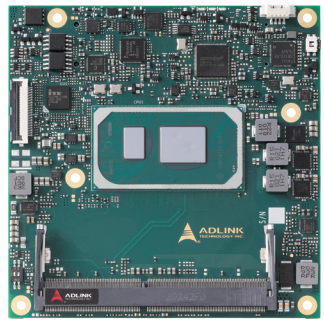
cExpress-TL

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

Features

- 11th Gen Intel® Core™ and Celeron® Processor SoC, Gen12 GFX integration
- AI inference (VNNI + Iris Xe graphics)
- PCIe Gen4 and PCIe Gen3 lanes
- 2.5GbE Ethernet, with optional TSN
- In-band ECC error correction



Specifications

Core System

CPU

11th Gen Intel® Core™ and Celeron® Processors - Mobile 10nm++ process (formerly "Tiger Lake UP3")

Intel® Core™ i7-1185G7E,	2.8(4.4)GHz,	12MB,	15-28W (4C/Iris Xe)
Intel® Core™ i5-1145G7E,	2.6 (4.1)GHz,	8MB,	15-28W (4C/Iris Xe)
Intel® Core™ i3-1115G4E,	3.0(3.9)GHz	6MB,	15-28W (2C/UHD)
Intel® Celeron® 6305E,	1.8 GHz,	4MB,	15W (2C/UHD)
Intel® Core™ i7-1185GRE,	2.8 (4.4) GHz,	12MB,	15-28W (4C/Iris Xe)
Intel® Core™ i5-1145GRE,	2.6 (4.1) GHz,	8MB,	15-28W (4C/Iris Xe)
Intel® Core™ i3-1115GRE,	3.0 (3.9) GHz,	6MB,	15-28W (2C/UHD)

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 of the SKUs listed above are supported by project basis only. Please contact your ADLINK representative for availability.

Memory

Dual channel DDR4 memory up to 3200 MT/s IBECC/non-ECC (BIOS selectable), max. 64GB (2x 32GB) in two SODIMM sockets
One SO-DIMM on top side, one SO-DIMM on bottom side
Intel In-Band ECC (IBECC), provides ECC protection without additional ECC device (i7-1185GRE, i5-1145GRE, i3-1115GRE support IBECC)

Embedded BIOS

AMI UEFI with CMOS backup in 32 or 16MB (TBC) SPI BIOS with Intel® AMT 12.x support (dual BIOS by build option)

Cache

12MB for Core™ i7, 8MB for Core™ i5, 6MB for Core™ i3, 4MB for Celeron®

Expansion Busses

5 PCIe x1 Gen3 (AB): Lanes 0/1/2/3 (configurable to 4 x1, 2 x2, 1 x4, 2 x1 + 1 x2, 1 x2 + 2 x1) and Lane 4 (x1 only)
Note: PCIe switch build option available by project basis to offer more x1 lanes (Lanes 5, 6, 7)
1 PCIe x4 Gen4 (CD): Lanes 16-19 (only 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 Header

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® Gen12 Graphics Core Architecture, supporting 4 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

VGA

Support by build option via DP-to-VGA IC (in place of DDI3), max. resolution 1920x1200@60Hz

LVDS

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

eDP

Optional 4 lane support, in place of LVDS, max. resolution 4K@60Hz

Specifications

Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

On Express-BASE6 carrier (ALC886 standard support)

Ethernet

Intel® MAC/PHY

LAN Controller, Intel® i225 series (V/LM/IT versions)
TSN supported by IT versions only on Linux, by project basis

Interface

2.5Gbe, 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: 2x SATA 6Gb/s (SATA 0, 1)
Serial: 2x UART ports with console redirection
GPIO: 4x GPO and 4x GPI from EC (GPI with interrupt)
Note: USB 3.2 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, build option)

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: support deep S5 mode for power saving

Mechanical and Environmental

Form Factor: PICMG COM.0 Rev 3.0 Type 6
Dimension: Compact size: 95 mm x 95 mm

Operating Temperature

Standard: 0°C to 60°C (Storage: -20°C to 80°C)
Extreme Rugged: -45°C to 85°C (optional, selected SKUs; Storage: -45°C to 85°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

Operating Systems

Standard Support

Windows 10 IOT Enterprise 64-bit, Yocto Linux 64-bit, VxWorks 64-bit (TBC)
Ubuntu (TBC)

Functional Diagram