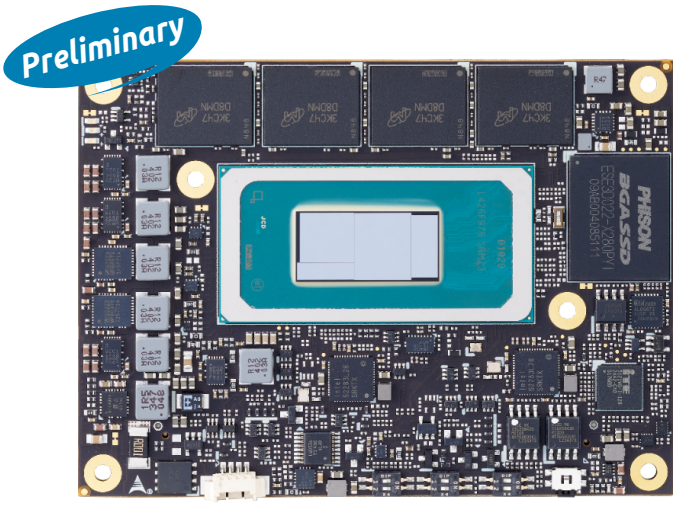
ADLINK
LEADING EDGE COMPUTING

COM-HPC-mMTL

COM-HPC Mini Module Based on Intel® Meteor Lake Platform



Features

- Smallest COM module with Intel Core Ultra processors and rich I/O
- Up to 16 CPU cores, 8 Xe GPU, and 8.2 TOPS VPU
- Up to 64GB LPDDR5x memory at max. 7467MT/s
- Up to 16 PCIe lanes, 2x 2.5GbE LAN
- Multiple DDI/USB4, USB3.x/2.0, and SATA (optional)
- 2x MIPI-CSI and onboard SSD (optional)
- Extreme Rugged operating temperature option: -40°C to 85°C (optional, selected SKUs)

Specifications

Core System	SoC	Intel Core Ultra 7/5 at 28W/15W For more detailed information, please refer to the SKU section. Supports: Intel® VT (including VT-x, VT-d, VT-x with Extended Page Tables), Intel® HT Technology, Intel® SSE4.2, Intel® 64 Architecture, Intel® Turbo Boost Technology 3.0, Intel® AVX512-VNNI, Intel® TXT, Execute Disable Bit, Intel® Data Protection Technology with Intel® Secure Key, Intel® AES-NI Note: Availability of features may vary between processor SKUs.
	NPU	Integrated, up to 8.2 TOPS
	Memory	Up to 64GB (4x 16GB) LPDDR5x soldered-down memory at max. 7467MT/s
	Embedded BIOS	AMI UEFI with CMOS backup in 32MB SPI BIOS (dual BIOS opt.)
	Cache	Ultra 7 165H/155H 24MB Ultra 5 135H/125H 18MB Ultra 7 165U/155U 12MB Ultra 5 135U/125U 12MB

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

Core System	Expansion Busses	Max. 16 PCIe Gen4 lanes • 4 PCIe at lanes 8-11: x4 configuration • 4 PCIe at lanes 12-15: x4 configuration • 4 PCIe at lanes 0-3: x1, x2, x4 configurable • Up to 4 PCIe at lanes 4-7: x1, x2, x4 configurable Note: PCIe lane 6 muxed with SATA port 1; PCIe lane 7 muxed with SATA port 0 and NBASE-T port 1; defaults are PCIe lane 6 and NBASE-T port 1. • SMBus (system), 2x I2C (user), 1x GP_SPI (TBC), 1x Boot_SPI and eSPI
	SEMA Board Controller	Voltage/current monitoring, power sequence debug support, AT mode control, logistics and forensic information, general purpose I2C, UART, GPIO, watchdog timer, and fan control
	Debug Headers	40-pin multipurpose flat cable connector for use with DB40-HPC debug module providing BIOS POST code LED, MMC/EC access, SPI BIOS flashing, power testpoints, debug LEDs
Video	GPU Feature Support	Intel® Xe Low-power Graphic Architecture, max. 8 Xe-cores, supporting 4 concurrent display combinations of DisplayPort/HDMI/eDP and Display Alternative mode through USB4/Thunderbolt4, outputting 4x 4K60. Hardware encode/decode DirectX 12, Open GL 4.6, Vulkan 1.2, oneVPL, HDCP 2.3 Graphics Hardware Virtualization (SRIOV)
	Digital Display Interface	DDI 0/1 supporting DP1.4a, HDMI2.0b, DVI
	USB	Up to 3x USB4, supporting DP alternative mode, Thunderbolt 4 capable (TBC) Note: 3x USB4 ports muxed with DDI 0/1 and USB3 port 2; BIOS code modification by project basis and a re-timer with PD on the carrier are required.
	eDP	eDP 1.4b, 4 lanes
Audio	Chipset	Integrated on SoC
	Interface	HDA (I2S and SoundWire, TBC)
	Audio Codec	On COM-HPC mini Base Carrier (Realtek solution on carrier)
Camera	MIPI-CSI	2x MIPI-CSI, 4 lanes through on-board FFC connector (TBC)
NBASE-T Ethernet	Intel® MAC/PHY	Up to 2x Intel® Ethernet Connection I226 Series (I226 supports TSN by build option)
	Interface	2x 2.5GbE and 1000/100/10 Mbit/s Ethernet connection Note: NBASE-T_1 muxed with PCIe lane7/SATA port 0; default is NBASE-T_1.

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Specifications

Multi I/O and Storage	USB	3x USB 3.x/2.0 (USB ports 0,1,2) 5x USB 2.0 (USB ports 3,4,5,6,7) Note: USB port 2 muxed with USB4; USB4 availability by project basis
	SATA	Up to 2x SATA (SATA 0, 1) Note: SATA 0 muxed with PCIe lane7; SATA 1 muxed with PCIe lane6; support by project basis
	Serial	2x UART ports with console redirection (UART from SoC by project basis)
	GPIO	12x GPIO (GPI with interrupt, TBC) (GPIO from SoC by project basis)
	On-board Storage	NVMe SSD by project basis for 28W SoC SKU only
TPM (Optional)	Chipset	Infineon
	Type	TPM 2.0 (SPI based)
Power	Standard Input	AT: 12V±5%
	Wide Input	AT: 8.5-20V
	Power States	C1-C6, S0, S3, S4, S5 (Wake on USB S3/S4, WOL S3/S4/S5) (TBC)
Mechanical and Environmental	Form Factor	PICMG COM-HPC: Rev 1.2 mini Type
	Dimensions	95 x 75 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, TBC)
	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 LTSC, Windows 11 IoT Enterprise LTSC
		Ubuntu 64-bit (TBC)

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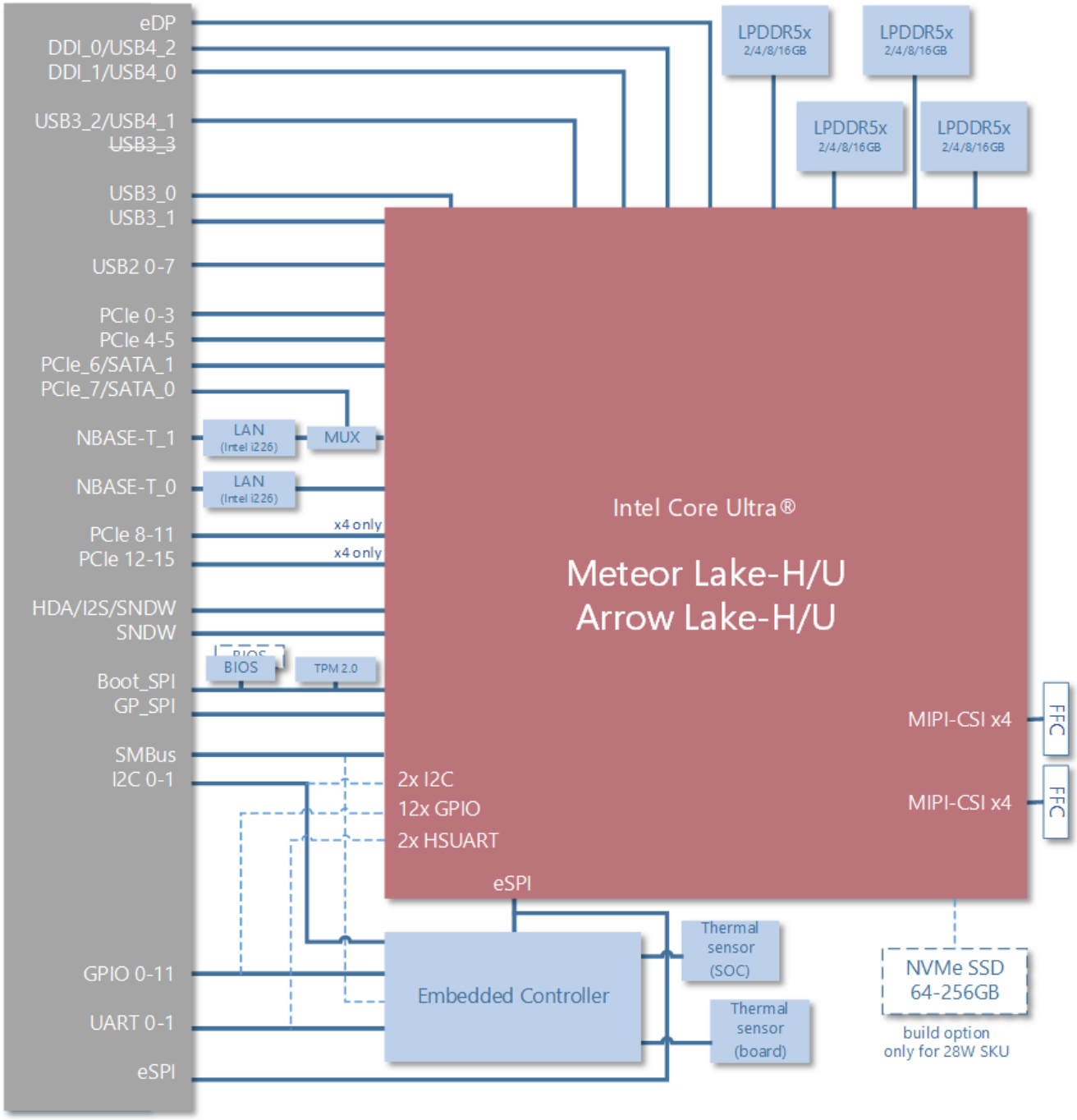
Block diagram



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CPU SKUs

Processor	Cores/Threads	Cache	TDP	Graphics
Core Ultra 7 165H	6P+8E/20T	24MB	28W	8Xe Intel ARC Graphics
Core Ultra 7 155H	6P+8E/20T	24MB	28W	8Xe Intel ARC Graphics
Core Ultra 5 135U	4P+8E/16T	18MB	28W	8Xe Intel ARC Graphics
Core Ultra 5 125U	4P+8E/16T	18MB	28W	8Xe Intel ARC Graphics
Core Ultra 7 165U	2P+8P/12T	12MB	15W	4Xe Intel Graphics
Core Ultra 7 155U	2P+8P/12T	12MB	15W	4Xe Intel Graphics
Core Ultra 5 135U	2P+8P/12T	12MB	15W	4Xe Intel Graphics
Core Ultra 5 125U	2P+8P/12T	12MB	15W	4Xe Intel Graphics

Note: All SKUs have 2 additional low-power E-cores.

Ordering Information

Module	
COM-HPC-mMTL-125H-8G	COM-HPC mini module with Meteor Lake Core Ultra 5 125H, 8GB LPDDR5

Note: For certain processor or memory capacity SKUs not listed, please contact our ADLINK representative.

Accessories

Heat Spreaders	
HTS-cMTL-B	Heatspreader for COM-HPC-mMTL with threaded standoffs for bottom mounting
Active Heatsinks	
THSF-mMTL-B	High-profile Heatsink with Fan for COM-HPC-mMTL with threaded standoffs for bottom mounting

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