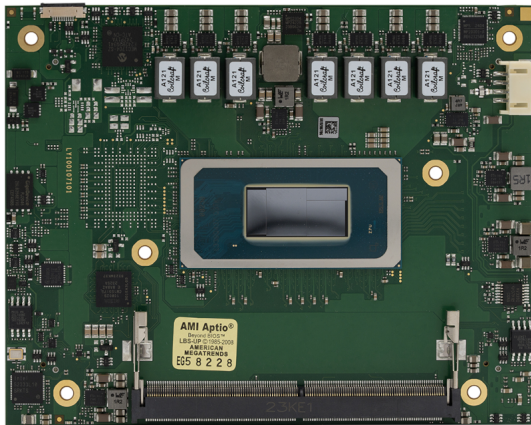


MSC HCA-MLH

Intel® Core™ Ultra Processors



120 x 95



tbd



0 +60



COM+HPC®

Description

The MSC HCA-MLH COM-HPC Client module features the Intel® Core™ Ultra processor, providing developers with a powerful workhorse to boost their target applications. The module is ideal for challenging tasks in robotics, medical, public safety, and gaming that require uncompromising performance. The architecture scales up to sixteen cores and twenty-two threads at 28/15W thermal design power (TDP). Together with the integrated AI accelerator (NPU) and up to 128 GPUs, the processor greatly supports AI projects and compute intense duties.

For highest data throughput the module enables fast DDR5 memory technology. Up to two SO-DIMMs can be installed for a total memory capacity from eight to ninety-six GB. Up to sixteen PCIe Gen 4 lanes and an eight lane PEG port (PCIe Gen 5) allow for accessing external accelerators, storage, and I/O at high throughput. Two Ethernet interfaces provide up to 2.5GbE bandwidth each based on the Intel i226 network controller.

System investments are well protected through long-term availability of the module, designed, and manufactured by Tria Technologies. In addition, the COM-HPC standard enables performance scaling and migrating applications to future technology upgrades when they become available.

Highlights

- COM-HPC Client, Size A module
- Intel® Core™ Ultra Processors Series 1 and 2
- Up to sixteen cores, twenty-two threads
- Integrated AI accelerator (NPU) Intel® AI Boost
- Up to 96GB DDR5-6400 SDRAM, dual channel, IB-ECC
- Intel® Arc™ Graphics, up to 8 Xe cores (128 EUs)
- Three DisplayPort/HDMI interfaces
- Embedded DisplayPort interface
- Four independent display streams
- Up to sixteen PCI Express® Gen 4 lanes
- PEG 1x8, PCIe Gen 5 (optional)
- Two USB4, two USB 3.2 Gen1/2 and eight USB 2.0 ports
- Two UARTs
- Optional on-board NVMe SSD, up to 1TB
- Up to two SATA 6Gb/s mass storage interfaces
- Two 1 / 2.5 Gb Ethernet ports (Intel® i226)
- Trusted Platform Module TPM 2.0
- Long-term product availability for selected variants

Technical Data - MSC HCA-MLH

Technology	x86
Formfactor	COM-HPC Size A
CPU	<p>Intel® Core™ Ultra Processors Series 2:</p> <p>Intel® Core™ Ultra 9 processor 285H 6P+8E+2LPE/22T, 2.9GHZ, 8Xe/128EUs, 24MB L3, vPRO®, 45W BP</p> <p>Intel® Core™ Ultra 7 processor 265H 6P+8E+2LPE/22T, 2.2GHZ, 8Xe/128EUs, 24MB L3, vPRO®, 28W BP</p> <p>Intel® Core™ Ultra 7 processor 255H 6P+8E+2LPE/22T, 2.0GHZ, 8Xe/128EUs, 24MB L3, 28W BP</p> <p>Intel® Core™ Ultra 5 processor 235H 4P+8E+2LPE/18T, 2.4GHZ, 8Xe/128EUs, 18MB L3, vPRO®, 28W BP</p> <p>Intel® Core™ Ultra 5 processor 225H 4P+8E+2LPE/18T, 1.7GHZ, 7Xe/112EUs, 18MB L3, 28W BP</p> <p>Intel® Core™ Ultra 7 processor 265U 2P+8E+2LPE/14T, 2.1GHZ, 4Xe/64EUs, 12MB L3, vPRO®, 15W BP</p> <p>Intel® Core™ Ultra 7 processor 255U 2P+8E+2LPE/14T, 2.0GHZ, 4Xe/64EUs, 12MB L3, 15W BP</p> <p>Intel® Core™ Ultra 5 processor 235U 2P+8E+2LPE/14T, 2.0GHZ, 4Xe/64EUs, 12MB L3, vPRO®, 15W BP</p> <p>Intel® Core™ Ultra 5 processor 225U 2P+8E+2LPE/14T, 1.5GHZ, 4Xe/64EUs, 12MB L3, 15W BP</p> <p>Intel® Core™ Ultra Processors Series 1:</p> <p>Intel® Core™ Ultra 7 processor 165H 6P+8E+2LPE/22T, 1.4GHZ, 8Xe/128EUs, 24MB L3, vPRO®, 28W BP</p> <p>Intel® Core™ Ultra 7 processor 155H 6P+8E+2LPE/22T, 1.4GHZ, 8Xe/128EUs, 24MB L3, 28W BP</p> <p>Intel® Core™ Ultra 5 processor 135H 4P+8E+2LPE/18T, 1.7GHZ, 8Xe/128EUs, 18MB L3, vPRO®, 28W BP</p> <p>Intel® Core™ Ultra 5 processor 125H 4P+8E+2LPE/18T, 1.2GHZ, 7Xe/112EUs, 18MB L3, 28W BP</p> <p>Intel® Core™ Ultra 7 processor 165U 2P+8E+2LPE/14T, 1.7GHZ, 4Xe/64EUs, 12MB L3, vPRO®, 15W BP</p> <p>Intel® Core™ Ultra 7 processor 155U 2P+8E+2LPE/14T, 1.7GHZ, 4Xe/64EUs, 12MB L3, 15W BP</p> <p>Intel® Core™ Ultra 5 processor 135U 2P+8E+2LPE/14T, 1.6GHZ, 4Xe/64EUs, 12MB L3, vPRO®, 15W BP</p> <p>Intel® Core™ Ultra 5 processor 125U 2P+8E+2LPE/14T, 1.3GHZ, 4Xe/64EUs, 12MB L3, 15W BP</p> <p>Note: P core base frequency at processor base power (BP) shown, other clock frequencies at different power levels supported</p>
Chipset	Integrated into SoC
RAM	2x 262-pin SO-DIMM socket for up to 2x 48GB DDR5 SDRAM; DDR5-6400 Series 2 processors; DDR5-5600 Series 1 processors; dual channel operation; minimum capacity 1x 8GB single channel operation; inband ECC (IB-ECC) option (OS dependent)
Storage Interfaces	2x SATA channels (up to 6Gb/s), optional optional on-board NVMe, 64GB to 1TB

USB	2x USB4 on COM-HPC USB[0:1]_SSTX/RX 2x USB 3.2 (Gen 1 & 2) on COM-HPC USB[2:3]_SSTX/RX 8x USB 2.0 on COM-HPC USB[0:7]
Serial Interfaces	2x high-speed serial ports
Bus Interfaces	PCI Express® Graphics (PEG) 1x8, PCIe Gen 5 on COM-HPC PCIe[16:23] ¹ PCI Express® Gen 4, up to 2x4 on COM-HPC PCIe[8:15] PCI Express® Gen 4, up to 8 lanes, flexible bifurcation options on COM-HPC PCIe[0:7] ¹ Available on H-series processors
Display Controller	Intel® Arc™ Graphics, up to 8 Xe cores / 128 execution units (EU) H.264/AVC, H.265/HEVC, AV1, MJPEG encode/decode/transcode
Display Interfaces	Four independent display streams 2x USB4/USB-C ports (DP tunneling) 3x Digital Display Interface (DP 2.1, HDMI 2.1) 1x Embedded DisplayPort 1.4b
Network Interface	Two 10/100/1000Base-TX, 2.5G ² based on Intel i226-LM ² Available bandwidths depending on carrier design
Audio Interface	High Definition Audio
Security Device	TPM 2.0
Miscellaneous	Watchdog Timer: Initiates system reset, programmable Fan Supply: 4-pin header for CPU fan, PWM speed controlled and PWM speed control for system fan supported RTC battery: external System Monitoring: voltage, temperature, CPU fan, system fan
Feature Highlights	COM-HPC Client

Firmware	<p>UEFI Firmware: AMI Aptio® V</p> <p>Security: TPM 2.0 support, TCG compliant</p> <p>Power Management: ACPI Active fan control</p> <p>USB: USB legacy support (keyboard, mouse, storage)</p> <p>Monitoring: System Monitoring Health Monitoring</p> <p>MSC Adv. Boot Device Selection: Boot device priority setting based on physical interfaces</p>
OS Support	<p>Windows 10 IoT Enterprise 2021 LTSC Windows 11 IoT Enterprise LTSC (future availability) BSP for Linux (Yocto)</p>
Power Requirement	<p>Voltage: +8V to +20V, +5V Stby optional, +3V RTC voltage</p> <p>Power Consumption: tbd W to tbd W (typ.)</p>
Environment	<p>Ambient Temperature: 0° ... 60°C (operating) -25° ... 85°C (storage)</p> <p>Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)</p>
Dimensions	120 x 95
Certificates	UL / CE

Order Reference - MSC HCA-MLH

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 7 265H 16C/22T, vPro 2.2GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4; 2x SATA, 2x USB3, 8x USB2, PEG Gen 5 x8; PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-265H-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 5 235H 14C/18T, vPro 2.4GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PEG Gen 5 x8; PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-235H-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 7 265U 12C/14T, vPro 2.1GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-265U-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 5 235U 12C/14T, vPro 2.0GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-235U-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 7 155H 16C/22T, 1.4GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4; 2x SATA, 2x USB3, 8x USB2, PEG Gen 5 x8; PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-155H-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 5 125H 14C/18T, 1.2GHz, 28W BP; Graphics: Intel Arc 112 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PEG Gen 5 x8; PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-125H-NN0100C PCBFTX	OR

Order Reference - MSC HCA-MLH

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 7 155U 12C/14T, 1.7GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-155U-NN0100C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Core Ultra 5 125U 12C/14T, 1.3GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x eDP; 2x CSI; Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x USB4 2x SATA, 2x USB3, 8x USB2, PCIe Gen 4 3x4 + 4x1; 2x socket for DDR5; 0...+60°C.	MSC HCA-MLH-125U-NN0100C PCBFTX	OR

Accessories

Order Number	Description	Reference
Carrier Options		
114609	COM-HPC Client Carrier Board with 1x PEG x16, 1x PCIe x16, 3x PCIe x4 slots; 2x USB 4 Gen 2x2, 2x USB 3.2 Gen 2x1, 2x 1G/2.5G/10GBASE-T, 2x SATA; 3x DisplayPort, 1x eDP; audio module socket; 1x M.2 socket; 24pin ATX and ATX12V power connectors; Dimensions: 305mm x 244mm (ATX form factor);	MSC HC-MB-EV BRDFTX
Cooling Options		
114469	Passive Heatsink for HCA-MLH consisting of a single-piece aluminum profile with fins, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-MLH-01 HSI-001
114471	Heatspreader for HCA-MLH. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-MLH-01 HSP-001
114482	Heatspreader / heat pipe for HCA-MLH. Single-piece aluminum profile with embedded heat pipe, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to CPU, chipset, NVMe.	MSC HCA-MLH-01 HSP-HP-001
114470	Passive heatsink / heat pipe for HCA-MLH consisting of a single-piece aluminum profile with fins (rotated orientation) and embedded heatpipe, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-MLH-02 HSI-HP-001
114483	Heatspreader for HCA-MLH. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-MLH-02 HSP-001

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