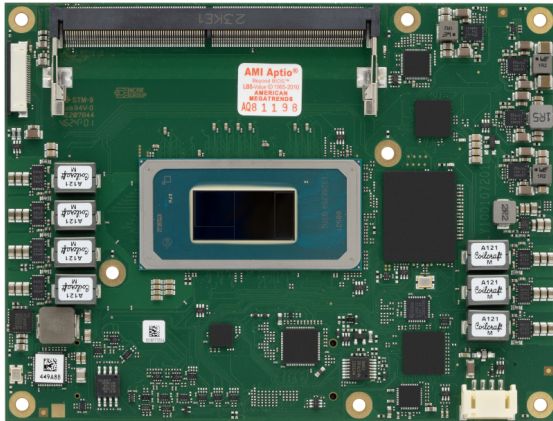


## MSC C6B-MLH

### Intel® Core™ Ultra Processors



125 x 95



tbd



0 +60



COM  Express

## Description

The MSC C6B-MLH COM Express 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 4) allow for accessing external accelerators, storage, and I/O at high throughput. The Ethernet interface provides up to 2.5GbE bandwidth 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 Express standard enables performance scaling and migrating applications to future technology upgrades when they become available.

## Highlights

- COM Express Type 6, Basic 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
- LVDS and Embedded DisplayPort interface
- Four independent display streams
- Up to sixteen PCI Express® Gen 4 lanes
- PEG 1x8, PCIe Gen 4 (optional)
- Up to two USB4 ports
- Three 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
- 1 / 2.5 Gb Ethernet port (Intel® i226)
- Trusted Platform Module TPM 2.0
- Long-term product availability for selected variants

## Technical Data - MSC C6B-MLH

<b>Technology</b>	x86
<b>Formfactor</b>	COM Express Basic
<b>CPU</b>	<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>
<b>Chipset</b>	Integrated into SoC
<b>RAM</b>	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)
<b>Storage Interfaces</b>	Up to 2x SATA channels (up to 6Gb/s) optional on-board NVMe, 64GB to 1TB

# COM Express Type 6

<b>USB</b>	Up to 2x USB4 (mutually exclusive with DDI 1, 2) 3x USB 3.2 (Gen 1 & 2), 8x USB 2.0
<b>Serial Interfaces</b>	2x high-speed serial ports
<b>Bus Interfaces</b>	PCI Express® Gen 4, 1x8, on COMe PCIe[24:31], PEG port, optional <sup>1</sup> PCI Express® Gen 4, 1x4, on COMe PCIe[20:23], optional PCI Express® Gen 4, 1x4, on COMe PCIe[16:19] Up to eight PCI Express® Gen 4 lanes on COMe PCIe[0:7], flexible bifurcation options, up to 5 root ports LPC bus (Low Pin Count bus, no DMA support) <sup>1</sup> Available on H-series processors
<b>Display Controller</b>	Intel® Arc™ Graphics, up to 8 Xe cores / 128 execution units (EU) H.264/AVC, H.265/HEVC, AV1, MJPEG encode/decode/transcode.
<b>Display Interfaces</b>	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 1x LVDS 24bit, dual-channel;
<b>Network Interface</b>	10/100/1000Base-TX, 2.5G <sup>2</sup> based on Intel i226-LM <sup>2</sup> Available bandwidths depending on carrier design
<b>Audio Interface</b>	High Definition Audio
<b>Security Device</b>	TPM 2.0
<b>Miscellaneous</b>	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
<b>Feature Highlights</b>	Type 6 pin-out

# COM Express Type 6

<b>Firmware</b>	<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>
<b>OS Support</b>	<p>Windows 10 IoT Enterprise 2021 LTSC Windows 11 IoT Enterprise LTSC (future availability) BSP for Linux (Yocto)</p>
<b>Power Requirement</b>	<p>Voltage: +8.5V to +20V, +5V Stby optional, +3V RTC voltage</p> <p>Power Consumption: tbd W to tbd W (typ.)</p>
<b>Environment</b>	<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>
<b>Dimensions</b>	125 x 95
<b>Certificates</b>	UL / CE

## Order Reference - MSC C6B-MLH

Order Number	Description	Reference	Cat*
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 7 265H 16C/22T, vPro 2.2GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA; 3x USB3, 8x USB2, PEG x8 Gen 4, PCIe G4 1x4, PCIe G4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-265H-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 5 235H 14C/18T, vPro 2.4GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PEG x8 Gen 4, PCIe G4 2x4, PCIe G4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-235H-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 7 265U 12C/14T, vPro 2.1GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-265U-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 5 235U 12C/14T, vPro 2.0GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-235U-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 7 155H 16C/22T, 1.4GHz, 28W BP; Graphics: Intel Arc 128 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PEG x8 Gen 4, PCIe G4 2x4, PCIe G4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-155H-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 5 125H 14C/18T, 1.2GHz, 28W BP; Graphics: Intel Arc 112 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PEG x8 Gen 4, PCIe G4 2x4, PCIe G4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-125H-NN30JC PCBFTX	OR

## Order Reference - MSC C6B-MLH

Order Number	Description	Reference	Cat*
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 7 155U 12C/14T, 1.7GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-155U-NN30JC PCBFTX	OR
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Core Ultra 5 125U 12C/14T, 1.3GHz, 15W BP; Graphics: Intel 64 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; 2x CSI; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 3x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 4 6x; 2x socket for DDR5; 0...+60°C.	MSC C6B-MLH-125U-NN30JC PCBFTX	OR

## Accessories

Order Number	Description	Reference
<b>Carrier Options</b>		
111650	COM Express Type 6 Evaluation Carrier Board with various PCI Express x1, x4 and x16 slots, USB 3.0/2.0, GbE, M.2, SD card socket, SATA, DisplayPort, LVDS, eDP, VGA, HD audio interfaces; ATX power connector. Dimensions: 305 x 244 mm (ATX form factor)	MSC C6-MB-EV4 PCBFTX
<b>Cooling Options</b>		
114058	Passive Heatsink for C6B-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 C6B-MLH-01 HSI-001
114175	Passive Heatsink / heat pipe for C6B-MLH consisting of a single-piece aluminum profile with fins and embedded heatpipe, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC C6B-MLH-01 HSI-HP-001
114057	Heatspreader for C6B-MLH. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC C6B-MLH-01 HSP-001
114176	Heatspreader / heat pipe for C6B-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 C6B-MLH-01 HSP-HP-001
114177	Heatspreader for C6B-MLH. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC C6B-MLH-02 HSP-001

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