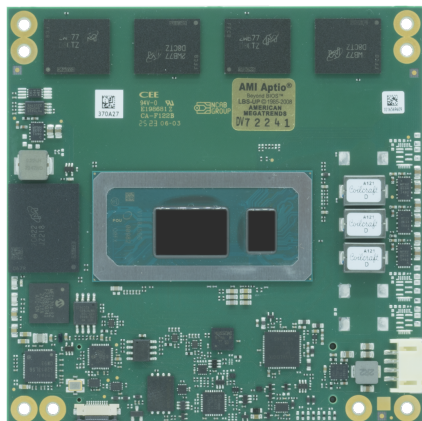


MSC C6C-ALP

Intel® Core™ 12th Generation



95 x 95



22 / 49 W



0 +60

COM  Express

Description

The MSC C6C-ALP COM Express module features the 12th Gen Intel® Core™ processor, giving application designers a great variety of choices of power efficient and performant compute solutions. The module is ideal for applications such as in medical equipment, process control, HMI terminals, transportation, and intelligent kiosk, that require outstanding performance on a small form factor. The new Intel® performance hybrid architecture combines Performance-cores and Efficient-cores with the Intel® Thread Director providing intelligent workload optimization. The architecture scales up to fourteen cores and twenty threads at 35W thermal design power (TDP). For applications with need for lower power dissipation, selected processor variants can be operated down to 12W TDP.

For highest data throughput the module enables fast LPDDR5-5200 memory technology. Carried out as memory-down, the board can be assembled with up to thirty-two GB main memory. I/O located on COM Express carrier designs can be connected to the module via up to eight PCIe Gen 3 lanes and up to sixteen lanes PCIe Gen 4. 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 Avnet Embedded. In addition, the COM Express standard enables performance scaling and migrating applications to future technology upgrades when they become available.

Highlights

- 12th Gen Intel® Core™ processors
- Scalable CPU performance
- Up to fourteen cores, twenty threads
- Up to 32GB LPDDR5-5200 main memory, memory-down
- Intel® Iris® Xe architecture Graphics, up to 96 EUs
- Three DisplayPort/HDMI interfaces
- LVDS and Embedded DisplayPort interface
- Up to four independent displays
- Up to eight PCI Express® Gen 3 lanes, flexible bifurcation options
- PCI Express® Gen 4, up to 2x4
- Optional PEG port, PCI Express® Gen 4, 1x8
- Up to two USB4, four 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

Technical Data - MSC C6C-ALP

Technology	x86
Formfactor	COM Express Compact
CPU	<p>12th Gen Intel® Core™ processors</p> <p>H-series</p> <p>Intel® Core™ i7-12800HE 6P+8E/20T, 2.4GHz, 96 EUs, 24MB L3, 45/35W cTDP</p> <p>Intel® Core™ i5-12600HE 4P+8E/16T, 2.5GHz, 80 EUs, 18MB L3, 45/35W cTDP</p> <p>Intel® Core™ i3-12300HE 4P+4E/12T, 1.9GHz, 48 EUs, 12MB L3, 45/35W cTDP</p> <p>P-series</p> <p>Intel® Core™ i7-1270PE 4P+8E/16T, 1.8GHz, 96 EUs, 24MB L3, 28/20W cTDP</p> <p>Intel® Core™ i5-1250PE 4P+8E/16T, 1.7GHz, 80 EUs, 12MB L3, 28/20W cTDP</p> <p>Intel® Core™ i3-1220PE 4P+4E/12T, 1.5GHz, 48 EUs, 12MB L3, 28/20W cTDP</p> <p>U-series</p> <p>Intel® Core™ i7-1265UE 2P+8E/12T, 1.7GHz, 96 EUs, 12MB L3, 15/12W cTDP</p> <p>Intel® Core™ i5-1245UE 2P+8E/12T, 1.5GHz, 80 EUs, 12MB L3, 15/12W cTDP</p> <p>Intel® Core™ i3-1215UE 2P+4E/8T, 1.2GHz, 64 EUs, 10MB L3, 15/12W cTDP</p> <p>Intel® Celeron® 7305E 1P+4E/5T, 1.0GHz, 48 EUs, 8MB L3, 15/12W cTDP</p> <p>Note: P core base frequency at nominal TDP shown, other clock frequencies supported</p>
Chipset	Integrated into SoC
RAM	Up to 32GB LPDDR5-5200 memory; memory-down; minimum capacity 4GB
Storage Interfaces	Up to 2x SATA channels (up to 6Gb/s) optional on-board NVMe, 64GB to 1TB
USB	Up to 2x USB4 Gen 2, shared with DDI1/2 4x USB 3.2 (Gen 1 & 2) 8x USB 2.0 Note: capabilities depending on carrier design
Serial Interfaces	2x high-speed serial ports
Bus Interfaces	<p>PCI Express® Gen 4, 1x4, on COMe PCIe[16:19]</p> <p>PCI Express® Gen 4, 1x4, on COMe PCIe[20:23], optional</p> <p>PCI Express® Gen 4, 1x8, on COMe PCIe[24:31], PEG port, optional ¹</p> <p>Up to eight PCI Express® Gen 3 lanes, flexible bifurcation options, up to 5 root ports</p> <p>LPC bus (Low Pin Count bus, no DMA support)</p> <p>¹ Available on H-series processors</p>
Display Controller	Intel® Iris® Xe architecture Graphics, Up to 96 execution units (EU) H.264/AVC, H.265/HEVC, AV1, MJPEG encode/decode/transcode.
Display Interfaces	Four independent displays supported 3x Digital Display Interface (DP 1.4a, HDMI 2.0b) 1x Embedded DisplayPort 1.4b 1x LVDS 24bit, dual-channel;
Network Interface	10/100/1000Base-TX, 2.5G ¹ based on Intel i226-LM ¹ Available bandwidths depending on carrier design

Audio Interface	High Definition Audio
Security Device	TPM 2.0
Miscellaneous	<p>Watchdog Timer: Initiates system reset, programmable</p> <p>Fan Supply: 4-pin header for CPU fan, PWM speed controlled and PWM speed control for system fan supported</p> <p>RTC battery: external</p> <p>System Monitoring: voltage, temperature, CPU fan, system fan</p>
Feature Highlights	Type 6 pin-out
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	Windows 10 IoT Enterprise 2021 LTSC BSP for Linux (Yocto)
Power Requirement	<p>Voltage: +8.5V to +20V, +5V Stby optional</p> <p>Power Consumption: 22 W to 49 W (typ., variant dependent)</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	95 x 95
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Certificates	UL / CE
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Order Reference - MSC C6C-ALP

Order Number	Description	Reference	Cat*
97987	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i7-1270PE 14C/20T, 1.8GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 1TB NVMe; 4x USB3, 8x USB2, PCIe Gen 4 1x4, PCIe Gen 3 8x; 32GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1270PE-5A301C PCBFTX	OR
97985	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i7-1270PE 14C/20T, 1.8GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 16GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1270PE-4N301C PCBFTX	OR
97981	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i5-1250PE 12C/16T, 1.7GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1250PE-3N301C PCBFTX	OR
97975	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i3-1220PE 8C/12T, 1.5GHz, 28/20W cTDP; Graphics: Intel® UHD 48 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1220PE-3N301C PCBFTX	OR
97983	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i7-1265UE 10C/12T, 1.7GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1265UE-3N301C PCBFTX	OR
97979	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i5-1245UE 10C/12T, 1.5GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 64GB NVMe; 4x USB3, 8x USB2, PCIe Gen 4 1x4, PCIe Gen 3 8x; 16GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1245UE-46301C PCBFTX	OR

*COM products are divided in two categories, „PV“ (preferred variant) and „OR“ (on request).

Order Reference - MSC C6C-ALP

Order Number	Description	Reference	Cat*
97977	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i5-1245UE 10C/12T, 1.5GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1245UE-3N301C PCBFTX	OR
97973	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel i3-1215UE 6C/8T, 1.2GHz, 15/12W cTDP; Graphics: Intel® UHD 64 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-1215UE-3N301C PCBFTX	OR
97989	COM Express Type 6 Compact module (95mm x 95mm); CPU: Intel Celeron 7305E 5C/5T, 1.0GHz, 15/12W cTDP; Graphics: Intel® UHD 48 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i226-LM Gbit, TSN; HD audio; TPM 2.0; 2x SATA, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 6x; 8GB LPDDR5-5200 memory; 0...+60°C.	MSC C6C-ALP-7305E-3N331C PCBFTX	OR

*COM products are divided in two categories, „PV“ (preferred variant) and „OR“ (on request).

Accessories

Order Number	Description	Reference
Cooling Options		
96413	Passive Heatsink for C6C-ALP and C6C-RLP consisting of a single-piece aluminum profile with fins, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to major devices.	MSC C6C-ALP-01 HSI-001
96414	Passive Heatsink / heat pipe for C6C-ALP and C6C-RLP 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 major devices.	MSC C6C-ALP-01 HSI-HP-001
96415	Heatspreader for C6C-ALP and C6C-RLP. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to major devices.	MSC C6C-ALP-01 HSP-001
96416	Heatspreader / heat pipe for C6C-ALP and C6C-RLP. Single-piece aluminum profile with embedded heat pipe, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to major devices.	MSC C6C-ALP-01 HSP-HP-001
96417	Heatspreader for C6C-ALP and C6C-RLP. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to major devices.	MSC C6C-ALP-02 HSP-001
79809	Fan kit for Heatsink MSC HCA-ALP/RLP-0x HSI-xxx, MSC C6B-ALP/RLP-0x HSI-xxx, MSC C6B-TLH-0x HSI-xxx, MSC C6C-ALP/RLP-0x HSI-xxx, MSC C6C-TLU-0x HSI-xxx, MSC C6C-WLU-0x HSI-xxx, MSC C6C-ALN/ASL-0x HSI-xxx, MSC C6C-EL-0x HSI-xxx, MSC C6C-RYZx-0x HSI-xxx, PWM fan 80x80x15mm.	MSC C6C-FANKIT-01-HSF-001

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