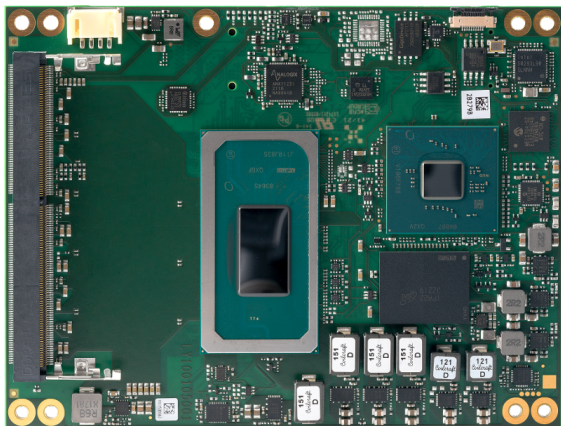




MSC C6B-TLH

Intel® Core™ 11th Generation



 125 x 95

 35 / 60 W

 -40 +85



IoT Solutions
Alliance

COM  Express

Description

The MSC C6B-TLH COM Express module features the 11th Gen Intel® Core™ vPro®, Intel® Xeon® W-11000E Series, and Intel® Celeron® processors, giving application designers a great variety of choices of power efficient and performant compute solutions. CPU core count scales from two cores/two hyper threads up to eight cores/sixteen hyper threads. Processor variants with 25W and 45/35W thermal design power (TDP) are available. With eight PCIe Gen 3 lanes and a sixteen lane PEG port based on PCIe Gen 3 and 4, the module is well equipped to handle demanding I/O traffic. The Ethernet controller based on Intel i225 provides 1GbE and 2.5GbE bandwidth and offers TSN capability for real-time application. For further real-time support, TCC is enabled on boards equipped with the Intel® Xeon® W-11000E Series processor.

Board memory capacities is configurable from 8GB to 64GB via two SO-DIMM sockets. Error correction code (ECC) is optionally supported by dedicated module variants and use of ECC SO-DIMMs. Selected variants of the MSC C6B-TLH can be operated at extended temperature range with full 24/7 utilization. This supports system designs exposed to harsh environmental conditions that require a reliable compute engine.

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

- 11th Gen Intel® Core™ processors
- Scalable CPU performance
- Up to eight cores, 16 threads
- Up to 64GB DDR4-3200 SDRAM, dual channel
- Optional ECC
- Intel® UHD Graphics
- Three DisplayPort/HDMI interfaces
- LVDS and Embedded DisplayPort interface
- Up to four independent displays
- Eight PCI Express® x1 lanes, configurable up to x4, Intel® RST support
- PEG configurable as 1x16 or 2x8 or 1x8 + 2x4, PCIe Gen 4 / 3
- Four USB 3.1 Gen1/2 and eight USB 2.0 ports
- Two UARTs
- Optional on-board NVMe SSD, up to 1TB
- Four SATA 6Gb/s mass storage interfaces
- 1 / 2.5 Gb Ethernet port
- TSN, TCC support (optional)
- Trusted Platform Module TPM 2.0
- Industrial temperature range and 24/7 support
- Long-term product availability

Technical Data - MSC C6B-TLH

Technology	x86
Formfactor	COM Express Basic
CPU	<p>Intel® Core™ Processor i7-11850HE, 8C/16T, 2.6/4.7 GHz, 32EUs, 24M L3, 45/35W TDP/cTDP down</p> <p>Intel® Core™ Processor i5-11500HE, 6C/12T, 2.6/4.5 GHz, 32EUs, 12M L3, 45/35W TDP/cTDP down</p> <p>Intel® Core™ Processor i3-11100HE, 4C/8T, 2.4/4.4 GHz, 16EUs, 8M L3, 45/35W TDP/cTDP down</p> <p>Intel® Celeron® Processor 6600HE, 2C/2T, 2.6 GHz, 16EUs, 8M L3, 35W TDP</p> <p>Intel® Xeon® Processor W-11865MRE, 8C/16T, 2.6/4.7 GHz, 32EUs, 24M L3, 45/35W TDP/cTDP down, extended temperature</p> <p>Intel® Xeon® Processor W-11555MRE, 6C/12T, 2.6/4.5 GHz, 32EUs, 12M L3, 45/35W TDP/cTDP down, extended temperature</p> <p>Intel® Xeon® Processor W-11155MRE, 4C/8T, 2.4/4.4 GHz, 16EUs, 8M L3, 45/35W TDP/cTDP down, extended temperature</p> <p>Intel® Xeon® Processor W-11865MLE, 8C/16T, 1.5/4.5 GHz, 32EUs, 24M L3, 25W TDP</p> <p>Intel® Xeon® Processor W-11555MLE, 6C/12T, 1.9/4.4 GHz, 32EUs, 12M L3, 25W TDP</p> <p>Intel® Xeon® Processor W-11155MLE, 4C/8T, 1.8/3.1 GHz, 16EUs, 8M L3, 25W TDP</p> <p>Notes: Support for 24/7 operation supported by selected processor variants. Please see the order reference for details. Additional configuration settings may apply. Max. turbo frequencies vary based on processor variant and number of active cores. Please contact Avnet Embedded for further information.</p>
Chipset	Intel® Platform Controller Hubs (PCH) RM590E, QM580E or HM570E
RAM	<p>2x 260-pin SO-DIMM socket for up to 2x 32GB DDR4 SDRAM (DDR4-3200¹); dual channel operation; minimum capacity 1x 8GB single channel operation; ECC option²</p> <p>¹ Depending on SO-DIMM type</p> <p>² ECC supported on models with industrial processor variants (Intel® Xeon® W-11000E Series Processor) and PCH RM590E</p>
Storage Interfaces	4x SATA channels (up to 6Gb/s) optional on-board NVMe, 64GB to 1TB
USB	4x USB 3.1 (Gen 1 & 2), 8x USB 2.0
Serial Interfaces	2x high-speed serial ports from PCH

Bus Interfaces	8x PCI Express® x1 Gen 3, 1x PCI Express® Graphics (PEG) x 16 Gen 4 and 3 LPC bus (Low Pin Count bus; no DMA support)
Display Controller	Integrated Intel® UHD graphics Up to 32 execution units (EU) 3D Acceleration: DirectX® 12.1, OpenGL 4.6, OpenCL™ 2.0; Video Decode/Encode: MPEG2, JPEG, HEVC, VP9, SCC, AV1, AVC
Display Interfaces	Four independent displays supported 3x Digital Display Interface (DP 1.4, HDMI 2.0b) 1x Embedded DisplayPort 1.4b 1x LVDS 24bit, dual-channel;
Network Interface	10/100/1000Base-TX, 2.5G, TSN support I-Temp variants: Intel® i225-IT (1GBit maximum at extended temperatures) C-Temp variants: Intel® i225-LM
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	Type 6 pin-out

Firmware	UEFI Firmware: AMI Aptio® V Security: TPM 2.0 support, TCG compliant Power Management: ACPI Active fan control USB: USB legacy support (keyboard, mouse, storage) Monitoring: System Monitoring Health Monitoring MSC Adv. Boot Device Selection: Boot device priority setting based on physical interfaces
OS Support	Windows 10 IoT Enterprise RS5 (64bit) BSP for Linux (Yocto)
Power Requirement	Voltage: +8.5V to +20V, +5V Stby optional Power Consumption: 35W to 60W (typ.)
Environment	Ambient Temperature: 0° ... 60°C (operating) -25° ... 85°C (storage) Extended temp. variants: -40 ... +85°C (operating) Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)
Dimensions	125 x 95
Certificates	UL / CE

Order Reference - MSC C6B-TLH

Order Number	Description	Reference	Cat*
94744	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel i7-11850HE 8C/16T, 2.6GHz, 45/35W cTDP; PCH: QM580E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4; 0...+60°C.	MSC C6B-TLH-11850HE-NN0301C PCBFTX	PV
94720	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel i5-11500HE 6C/12T, 2.6GHz, 45/35W cTDP; PCH: QM580E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4; 0...+60°C.	MSC C6B-TLH-11500HE-NN0301C PCBFTX	PV
110532	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel i3-11100HE 4C/8T, 2.4GHz, 45/35W cTDP; PCH: HM570E; Graphics: Intel UHD 16 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4; 0...+60°C.	MSC C6B-TLH-11100HE-NN0301C PCBFTX	PV
94750	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Celeron 6600HE 2C/2T, 2.6GHz, 35W TDP; PCH: HM570E; Graphics: Intel UHD 16 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4; 0...+60°C.	MSC C6B-TLH-6600HE-NN0301C PCBFTX	OR
94748	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11865MRE 8C/16T, 2.6GHz, 45/35W cTDP; PCH: RM590E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-IT Gbit, TSN; HD audio; TPM 2.0; 1TB NVMe 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; -40...+85°C, recommended for 24/7 operation.	MSC C6B-TLH-11865MRE-NA1301I PCBFTX	OR
94752	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11555MRE 6C/12T, 2.6GHz, 45/35W cTDP; PCH: RM590E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-IT Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; -40...+85°C, recommended for 24/7 operation.	MSC C6B-TLH-11555MRE-NN1301I PCBFTX	PV

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

Order Reference - MSC C6B-TLH

Order Number	Description	Reference	Cat*
94718	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11155MRE 4C/8T, 2.4GHz, 45/35W cTDP; PCH: RM590E; Graphics: Intel UHD 16 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-IT Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; -40...+85°C, recommended for 24/7 operation.	MSC C6B-TLH-11155MRE-NN1301I PCBFTX	PV
94746	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11865MLE 8C/16T, 1.5GHz, 25W TDP; PCH: RM590E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; 0...+60°C, recommended for 24/7 operation.	MSC C6B-TLH-11865MLE-NN1301C PCBFTX	PV
94742	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11555MLE 6C/12T, 1.9GHz, 25W TDP; PCH: RM590E; Graphics: Intel UHD 32 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; 0...+60°C, recommended for 24/7 operation.	MSC C6B-TLH-11555MLE-NN1301C PCBFTX	PV
94716	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel W-11155MLE 4C/8T, 1.8GHz, 25W TDP; PCH: RM590E; Graphics: Intel UHD 16 EUs; 3x DP/HDMI; 1x LVDS; 1x eDP; Ethernet: Intel i225-LM Gbit, TSN; HD audio; TPM 2.0; 64GB NVMe 4x SATA, 4x USB3, 8x USB2, PEG x16 Gen 4, PCIe Gen 3 1x4+4x1; 2x socket for DDR4 or DDR4ECC SO-DIMM; 0...+60°C, recommended for 24/7 operation.	MSC C6B-TLH-11155MLE-N61301C PCBFTX	PV

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

Accessories

Order Number	Description	Reference
Cooling Options		
89031	Passive Heatsink for C6B-TLH 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-TLH-01 HSI-001
89032	Passive Heatsink / heat pipe for C6B-TLH 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-TLH-01 HSI-HP-001
89033	Heatspreader for C6B-TLH. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC C6B-TLH-01 HSP-001
89034	Heatspreader / heat pipe for C6B-TLH. 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-TLH-01 HSP-HP-001
89035	Heatspreader for C6B-TLH. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC C6B-TLH-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-0x HSI-xxx, MSC C6C-EL-0x HSI-xxx, MSC C6C-RYZx-0x HSI-xxx, PWM fan 80x80x15mm.	MSC C6C-FANKIT-01-HSF-001
Memory Options		
97869	16GB DDR4-3200 SO-DIMM, Commercial Temp.	MOD SODIMM DDR4 16GB PC4-25600 CL22 2B
93762	16GB DDR4-3200 SO-DIMM, Wide Temp.	MOD SODIMM DDR4 16GB PC4-25600 CL22 2B
97871	32GB DDR4-3200 SO-DIMM, Commercial Temp.	MOD SODIMM DDR4 32GB PC4-25600 CL22 2B
97867	8GB DDR4-3200 SO-DIMM, ECC, Commercial Temp.	MOD SODIMM DDR4 8GB PC4-25600 CL22 1B
89531	8GB DDR4-3200 SO-DIMM, Sorting Wide Temp.	MOD SODIMM DDR4 8GB PC4-25600 CL22 1B
98048	8GB DDR4-3200 SO-DIMM, Commercial Temp.	MOD SODIMM DDR4 8GB PC4-25600 CL22 1B

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