COM Express Type 6

MSC C6C-RYZ2

AMD Ryzen™ Embedded R2000 Series
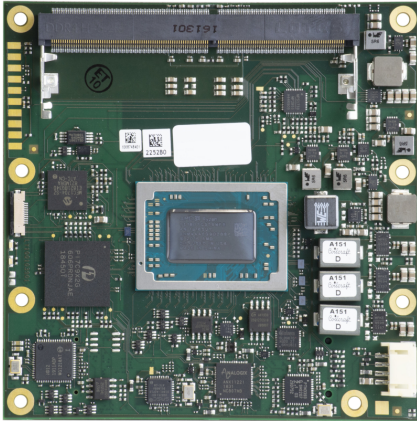
⛶	95 x 95
♨	28 / 64 W
🌡	0 +60

Description

The MSC C6C-RYZ2 module is the embedded platform for the AMD RyzenTM Embedded R2000 processor family. This versatile system-on-chip (SoC) technology combines processing, graphics and I/O functionality on a single die, allowing for outstanding compute performance in environments with constrained real-estate, power and cooling. Customers can choose from a variety of quad and dual-core processors to scale performance and capabilities according to application requirements.

The board provides up to four independent display support with up to 4k x 2k resolution, highest level graphics acceleration and hardware based video en-/decoding. Fast DDR4 memory and multiple USB 3.2/2.0 interfaces complete the compact and power saving module.

The MSC C6C-RYZ2 offers hardware based security compliant to the requirements of TCG (Trusted Computing Group) and features TPM 2.0 capability.

The Type 6 pin-out allows direct access to the latest digital display interfaces like DisplayPort, HDMI 2.0b and DVI as well as up to four USB 3.2 interfaces.

Highlights

- AMD RyzenTM Embedded R2544, quad-core Processor (3.35/3.7GHz, 8 GPU CU, 35-54W TDP)
- AMD RyzenTM Embedded R2514, quad-core Processor (2.1/3.7GHz, 8 GPU CU, 12-35W TDP)
- AMD RyzenTM Embedded R2314, quad-core Processor (2.1/3.5GHz, 6 GPU CU, 12-35W TDP)
- AMD RyzenTM Embedded R2312, dual-core Processor (2.7/3.5GHz, 3 GPU CU, 12-25W TDP)
- Up to 32 GB DDR4-3200 SDRAM, dual-channel, optional ECC
- Two SATA 6Gb/s mass storage interfaces
- Three DisplayPort/HDMI/DVI interfaces
- Embedded DisplayPort / LVDS (24 Bit, dual channel) interface
- Up to four independent displays supported
- OpenGL 4.6, OpenCL
- Resolution up to 4096 x 2160
- Up to four USB 3.2/2.0 and four USB 2.0 interfaces
- Up to eight PCI Express™ x1 lanes
- PEG configurable up to 1x8 or 2x4
- Trusted Platform Module TPM 2.0
- UEFI Firmware

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Technical Data - MSC C6C-RYZ2

Technology	x86
Formfactor	COM Express Compact
CPU	AMD RyzenTM Embedded R2544, quad-core Processor, 3.35/3.7GHz, 2MB L2 / 4MB L3, 8 GPU CU, 45W (35-54W) TDP, max. DDR4-3200; AMD RyzenTM Embedded R2514, quad-core Processor, 2.1/3.7GHz, 2MB L2 / 4MB L3, 8 GPU CU, 15W (35-12W) TDP, max. DDR4-2667; AMD RyzenTM Embedded R2314, quad-core Processor, 2.1/3.5GHz, 2MB L2 / 4MB L3, 6 GPU CU, 15W (12-35W) TDP, max. DDR4-2667; AMD RyzenTM Embedded R2312, dual-core Processor, 2.7/3.5GHz, 1MB L2 / 4MB L3, 3 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;
Chipset	Integrated in System-on-Chip
RAM	2x 260-pin SO-DIMM socket for up to 2x 16 GB DDR4 SDRAM (DDR4-3200 max); ECC option; dual channel operation Note: maximum DDR4 bandwidth depending on processor variant and assembled memory module type
Storage Interfaces	2x SATA 6Gb/s
USB	Up to 4x USB 3.2 Gen 1 / USB 2.0 4x USB 2.0 Note: Supported number of ports depending on board assembly
Serial Interfaces	2x serial ports
Bus Interfaces	PEG port max x8 (depending on processor variant) Up to four PCI Express x1 Gen3, up to four x1 Gen 2 (depending on processor and assembly variant) LPC bus (Low Pin Count bus)
Display Controller	GPU Vega core, up to 8 CUs Up to four independent displays supported (depending on processor variant)
Display Interfaces	Display Port and HDMI/DVI: Up to 3x Digital Display Interface, usable as DisplayPort 1.4 (up to 3840 x 2160 @ 60Hz)[1], also usable as HDMI 2.0b (4096 x 2160 @ 60Hz)[1] or DVI (up to 1920 x 1200 @ 60Hz) [1] Re-timer required for operation above 3Gb/s 1x Embedded DisplayPort 1.3 (on variants without LVDS only); 3840 x 2160 @ 60Hz LCD: LVDS 24bit, dual-channel (not on all variants); 1920 x 1200 @ 60Hz
Network Interface	10/100/1000Base-TX (Intel i210)
Audio Interface	High Definition Audio
Security Device	TPM 2.0 (optional)

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 21H2 LTSC Windows 11 21H2 GAC Linux, Yocto
Power Requirement	Voltage: +12V primary power supply input, +5V Stby optional Power Consumption: 28 W to 64 W (typ., variant dependent)
Environment	Ambient Temperature; 0° … 60°C (operating), -25° … 85°C (storage) Humidity: 5 … 95% (operating, non-condensing), 5 … 95% (storage, non-condensing)
Dimensions	95mm x 95mm

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Certificates	UL / CE
Cooling	Passive heat sink
	Active heat sink with fan
	Heat spreader with threaded or non-threaded standoffs
Carrier	Small carrier board (Mini-ITX) as part of a starter kit
	Evaluation board in ATX form factor

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Order Reference - MSC C6C-RYZ2

Order Number	Description	Reference	Cat*
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R2544, four-core, 3.35/3.7GHz, 35-54W TDP, 8 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-3200; 0° … 60°C	MSC C6C-RYZ2-R2544-NN221C	PV
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R2514, four-core, 2.1/3.7GHz, 12-35W TDP, 8 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2667; 0° … 60°C	MSC C6C-RYZ2-R2514-NN221C	PV
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R2314, four-core, 2.1/3.5GHz, 12-35W TDP, 6 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2667; 0° … 60°C	MSC C6C-RYZ2-R2314-NN221C	PV
tbd	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R2312, two-core, 2.7/3.5GHz, 12-25W TDP, 3 CU ; 2x DP/HDMI/DVI, Embedded DisplayPort (eDP); 1x 1GbE; 2x SATA; 2x USB3, 8x USB2; 2x PCIe Gen 3, PEG x4 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° … 60°C	MSC C6C-RYZ2-R2312-NN101C	PV

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

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Accessories

Order Number	Description	Reference
	Cooling Options	
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
84613	Heatsink for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-01 HSI-001
79792	Heatsink / heat pipe for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile with embedded heat pipe, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-01 HSI-HP-001
83859	Heatspreader for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-01 HSP-001
79793	Heatspreader / heat pipe for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile with embedded heat pipe, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-01 HSP-HP-001
83881	Heatspreader for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile, threaded standoffs (M2.5), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-02 HSP-001
83860	Heatspreader / heat pipe for C6C-RYZ, C6C-RYZ2. Single-piece aluminum profile with embedded heat pipe, threaded standoffs (M2.5), screws and thermopad for the thermal contact to SOC.	MSC C6C-RYZ-02 HSP-HP-001