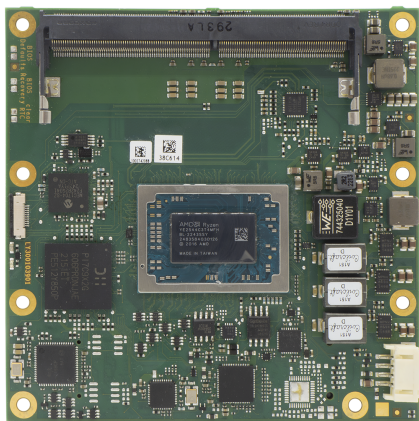


## MSC C6C-RYZ2

### 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 Ryzen™ 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 Ryzen™ Embedded R2544, quad-core Processor (3.35/3.7GHz, 8 GPU CU, 35-54W TDP)
- AMD Ryzen™ Embedded R2514, quad-core Processor (2.1/3.7GHz, 8 GPU CU, 12-35W TDP)
- AMD Ryzen™ Embedded R2314, quad-core Processor (2.1/3.5GHz, 6 GPU CU, 12-35W TDP)
- AMD Ryzen™ 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

## Technical Data - MSC C6C-RY22

<b>Technology</b>	x86
<b>Formfactor</b>	COM Express Compact
<b>CPU</b>	AMD Ryzen™ Embedded R2544, quad-core Processor, 3.35/3.7GHz, 2MB L2 / 4MB L3, 8 GPU CU, 45W (35-54W) TDP, max. DDR4-3200; AMD Ryzen™ Embedded R2514, quad-core Processor, 2.1/3.7GHz, 2MB L2 / 4MB L3, 8 GPU CU, 15W (35-12W) TDP, max. DDR4-2667; AMD Ryzen™ Embedded R2314, quad-core Processor, 2.1/3.5GHz, 2MB L2 / 4MB L3, 6 GPU CU, 15W (12-35W) TDP, max. DDR4-2667; AMD Ryzen™ Embedded R2312, dual-core Processor, 2.7/3.5GHz, 1MB L2 / 4MB L3, 3 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;
<b>Chipset</b>	Integrated in System-on-Chip
<b>RAM</b>	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
<b>Storage Interfaces</b>	2x SATA 6Gb/s
<b>USB</b>	Up to 4x USB 3.2 Gen 1 / USB 2.0 4x USB 2.0 Note: Supported number of ports depending on board assembly
<b>Serial Interfaces</b>	2x serial ports
<b>Bus Interfaces</b>	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)
<b>Display Controller</b>	AMD Radeon Graphics, up to 8 CUs  Up to four independent displays supported (depending on processor variant)
<b>Display Interfaces</b>	Display Port and HDMI/DVI:  Up to 3x Digital Display Interface, usable as DisplayPort 1.4 (up to 3840 x 2160 @ 60Hz) <sup>1</sup> , also usable as HDMI 2.0b (4096 x 2160 @ 60Hz) <sup>1</sup> or DVI (up to 1920 x 1200 @ 60Hz)  <sup>1</sup> 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
<b>Network Interface</b>	10/100/1000Base-TX (Intel i210)
<b>Audio Interface</b>	High Definition Audio
<b>Security Device</b>	TPM 2.0 (optional)

<b>Miscellaneous</b>	<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>
<b>Feature Highlights</b>	Type 6 pin-out
<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>	Windows 10 21H2 LTSC Windows 11 21H2 GAC Linux, Yocto
<b>Power Requirement</b>	<p>Voltage: +12V primary power supply input, +5V Stby optional</p> <p>Power Consumption: 28 W to 64 W (typ., variant dependent)</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>	95mm x 95mm

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<b>Certificates</b>	UL / CE
<b>Cooling</b>	Passive heat sink Active heat sink with fan Heat spreader with threaded or non-threaded standoffs
<b>Carrier</b>	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*
113799	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 PCBFTX	PV
113797	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 PCBFTX	PV
113795	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 PCBFTX	PV
113793	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 PCBFTX	PV

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

## Accessories

Order Number	Description	Reference
<b>Cooling Options</b>		
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
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
<b>Memory Options</b>		
95549	16GB DDR4-2666 SO-DIMM, ECC	MOD SODIMM DDR4 16GB PC4-21300 CL19 2B
83003	4GB DDR4-2400 SoDimm, 1.2V, ECC	MOD SODIMM DDR4 4GB PC4-19200 CL17 1B
78199	4GB DDR4 2666 SO-DIMM	MOD SODIMM DDR4 4GB PC4-21300 CL19 1B
83004	4GB DDR4-2666 SO-DIMM, ECC	MOD SODIMM DDR4 4GB PC4-21300 CL19 1B

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