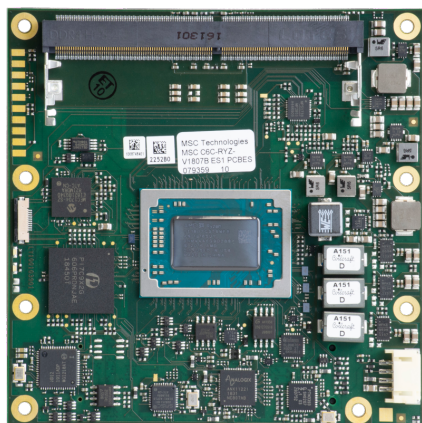


MSC C6C-RYZ

AMD Ryzen™ Embedded Series



95 x 95



28 / 64 W



-40 +85

COM  **Express**

Description

The MSC C6C-RYZ module is the embedded platform for the AMD Ryzen™ Embedded V1000 and R1000 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 3.1/2.0 interfaces complete the compact and power saving module.

The MSC C6C-RYZ 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 3.1 interfaces supporting the fastest peripherals currently available.

Highlights

- AMD Ryzen™ Embedded V1807B, quad-core Processor (3.35/3.8GHz, 11 GPU CU, 35-54W TDP)
- AMD Ryzen™ Embedded V1756B, quad-core Processor (3.25/3.6GHz, 8 GPU CU, 35-54W TDP)
- AMD Ryzen™ Embedded V1605B, quad-core Processor (2.0/3.6GHz, 8 GPU CU, 12-25W TDP)
- AMD Ryzen™ Embedded V1404I, quad-core Processor (2.0/3.6GHz, 8 GPU CU, 12-25W TDP), industrial temperature range
- AMD Ryzen™ Embedded V1202B, dual-core Processor (2.3/3.2GHz, 3 GPU CU, 12-25W TDP)
- AMD Ryzen™ Embedded R1606G, dual-core Processor (2.6/3.5GHz, 3 GPU CU, 12-25W TDP)
- AMD Ryzen™ Embedded R1505G, dual-core Processor (2.4/3.3GHz, 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
- DirectX 12, OpenGL 4.6, OpenCL 2.1
- Resolution up to 4096 x 2160
- Up to four USB 3.1/2.0 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-RYZ

Technology	x86
Formfactor	COM Express Compact
CPU	<p>AMD Ryzen™ Embedded V1807B, quad-core Processor, 3.35/3.8GHz, 2MB L2 / 4MB L3, 11 GPU CU, 45W (35-54W) TDP, max. DDR4-3200;</p> <p>AMD Ryzen™ Embedded V1756B, quad-core Processor, 3.25/3.6GHz, 2MB L2 / 4MB L3, 8 GPU CU, 45W (35-54W) TDP, max. DDR4-3200;</p> <p>AMD Ryzen™ Embedded V1605B, quad-core Processor, 2.0/3.6GHz, 2MB L2 / 4MB L3, 8 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;</p> <p>AMD Ryzen™ Embedded V1404I, quad-core Processor, 2.0/3.6GHz, 2MB L2 / 4MB L3, 8 GPU CU, 15W (12-25W) TDP, max. DDR4-2400, industrial temperature range;</p> <p>AMD Ryzen™ Embedded V1202B, dual-core Processor, 2.3/3.2GHz, 1MB L2 / 4MB L3, 3 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;</p> <p>AMD Ryzen™ Embedded R1606G, dual-core Processor, 2.6/3.5GHz, 1MB L2 / 4MB L3, 3 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;</p> <p>AMD Ryzen™ Embedded R1505G, dual-core Processor, 2.4/3.3GHz, 1MB L2 / 4MB L3, 3 GPU CU, 15W (12-25W) TDP, max. DDR4-2400;</p>
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
Storage Interfaces	2x SATA 6Gb/s
USB	Up to 4x USB 3.1/2.0, 4x USB 2.0
Serial Interfaces	2x serial ports
Bus Interfaces	<p>PEG port max x8 (depending on processor variant)</p> <p>Up to four PCI Express x1 Gen3, up to four x1 Gen 2 (depending on processor and assembly variant)</p> <p>LPC bus (Low Pin Count bus)</p>
Display Controller	<p>GPU Vega core, up to 11 CUs</p> <p>Up to four independent displays supported (depending on processor variant)</p>
Display Interfaces	<p>Display Port and HDMI/DVI:</p> <p>Up to 3x Digital Display Interface, usable as DisplayPort 1.4 (up to 3840 x 2160 @ 120Hz, HBR3)¹, also usable as HDMI 2.0b (4096 x 2160 @ 60Hz)² or DVI (up to 1920 x 1200 @ 60Hz)</p> <p>1 Re-timer required for HBR3 support</p> <p>2 Re-timer required for operation above 3Gb/s</p> <p>1x Embedded DisplayPort 1.3 (on variants without LVDS only); 3840 x 2160 @ 60Hz</p> <p>LCD: LVDS 24bit, dual-channel (not on all variants); 1920 x 1200 @ 60Hz</p>
Network Interface	10/100/1000Base-TX (Intel i210)

Audio Interface	High Definition Audio
Security Device	TPM 2.0 (optional)
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 (64-bit) Windows 10 Linux, Yocto
Power Requirement	<p>Voltage: +12V primary power supply input, +5V Stby optional</p> <p>Power Consumption: 28 W to 64 W (typ., variant dependent)</p>

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 95mm x 95mm

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

Order Reference - MSC C6C-RYZ

Order Number	Description	Reference	Cat*
83345	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen V1756B, four-core, 3.25/3.6GHz, 35-54W TDP, 8 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe x1 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-RYZ-V1756B-NN221C PCBFTX	OR
83347	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen V1605B, four-core, 2.0/3.6GHz, 12-25W TDP, 8 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe x1 Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° ... 60°C	MSC C6C-RYZ-V1605B-NN221C PCBFTX	PV
83351	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen V1404I, four-core, 2.0/3.6GHz, 12-25W TDP, 8 CU ; 3x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe x1 Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; -40° ... 85°C	MSC C6C-RYZ-V1404I-NN221I PCBFTX	PV
83349	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen V1202B, two-core, 2.3/3.2GHz, 12-25W TDP, 3 CU ; 3x DP/HDMI/DVI, Embedded DisplayPort (eDP); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 4x PCIe x1 Gen 3, 4x PCIe Gen 2, PEG x8 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° ... 60°C	MSC C6C-RYZ-V1202B-NN120C PCBFTX	OR
83353	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R1606G, two-core, 2.6/3.5GHz, 12-25W TDP, 3 CU ; 2x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 2x USB3, 8x USB2; 2x PCIe x1 Gen 3, 4x PCIe Gen 2, PEG x4 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° ... 60°C	MSC C6C-RYZ-R1606G-NN221C PCBFTX	PV
83355	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R1505G, two-core, 2.4/3.3GHz, 12-25W TDP, 3 CU ; 2x DP/HDMI/DVI, Embedded DisplayPort (eDP); 1x 1GbE; 2x SATA; 2x USB3, 8x USB2; 2x PCIe x1 Gen 3, PEG x4 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° ... 60°C	MSC C6C-RYZ-R1505G-NN100C PCBFTX	PV
76062	COM Express Type 6 Compact module (95mm x 95mm); CPU: AMD Ryzen R1505G, two-core, 2.4/3.3GHz, 12-25W TDP, 3 CU ; 2x DP/HDMI/DVI, LVDS (24 Bit, dual channel); 1x 1GbE; 2x SATA; 3x USB3, 8x USB2; 2x PCIe x1 Gen 3, 4x PCIe Gen 2, PEG x4 Gen 3; TPM 2.0; 2x socket for DDR4 or DDR4ECC SO-DIMM; DDR4-2400; 0° ... 60°C	MSC C6C-RYZ-R1505G-NN221C PCBFTX	OR

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

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-RYZ-0x HSI-xxx, PWM fan 80x80x15mm.	MSC C6C-FANKIT-01-HSF-001
84613	Heatsink for C6C-RYZ. 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. 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. 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. 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. 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. 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
Memory Options		
89532	16GB DDR4 2666 SO-DIMM, Sorting Wide Temp.	MOD SODIMM DDR4 16GB PC4-21300 CL19 2B
95549	16GB DDR4-2666 SO-DIMM, ECC	MOD SODIMM DDR4 16GB PC4-21300 CL19 2B
89646	4GB DDR4 2400 SO-DIMM, Wide Temp.	MOD SODIMM DDR4 4GB PC4-19200 CL17 1B
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

Accessories

Order Number	Description	Reference
89531	8GB DDR4-3200 SO-DIMM, Sorting Wide Temp.	MOD SODIMM DDR4 8GB PC4-25600 CL22 1B

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