MSC C6C-GX
AMD Embedded G-Series SOC
Type 6 Pin-out

Description
The MSC C6C-GX module is based on AMD’s Embedded G-Series SOC platform, a high-performance, low-power System-on-Chip (SOC) solution with outstanding HD graphics and multimedia capabilities for embedded applications.

The G-Series SOC brings dual independent display support, DirectX 11.1, fast DDR3 memory and USB 3.0 on a compact, power saving and cost-efficient module.

Different G-Series SOCs with dual- and quad-core processors are supported by this design. Besides an extensive set of interfaces and features, the MSC C6C-GX offers hardware based security compliant to the requirements of TCG (Trusted Computing Group).

The new Type 6 pin-out allows direct access to the latest digital display interfaces like DisplayPort 1.2, HDMI 1.4a and DVI. USB 3.0 interfaces support the fastest peripheral devices currently available.

95x95
12 / 30 W
Medium

Highlights
- AMD GX-420CA quad-core 2.0GHz, 25W TDP, Radeon HD 8400E
- AMD GX-415GA quad-core 1.5GHz, 15W TDP, Radeon HD 8330E
- AMD GX-217GA dual-core 1.65GHz, 15W TDP, Radeon HD 8280E
- AMD GX-210HA dual-core 1.0GHz, 9W TDP, Radeon HD 8310E
- Integrated AMD HD 8000E graphics
- Up to 16GB DDR3 SDRAM, dual-channel
- Two SATA 3Gb/s mass storage interfaces
- MicroSD card socket
- DisplayPort/HDMI/DVI interface
- LVDS/Embedded DisplayPort interface
- VGA interface
- Two independent displays supported
- DirectX 11.1, OpenGL 4.2, OpenCL 1.2
- Two USB
- 3.0 and six USB 2.0 interfaces
- Trusted Platform Module (optional)
- Extended temperature variants [on request]
Technical Data – MSC C6C-GX

Module Standard
PICMG COM Express™ Standard COM.0
Type 6 compliant interface, “compact” form factor

Core Logic, Memory
CPU
AMD GX-420CA quad-core 2.0GHz, 2 MB L2, 25W TDP, Radeon HD 8400E
AMD GX-415GA quad-core 1.5GHz, 2 MB L2, 15W TDP, Radeon HD 8330E
AMD GX-217GA dual-core 1.65GHz, 1 MB L2, 15W TDP, Radeon HD 8280E
AMD GX-210HA dual-core 1.0GHz, 1 MB L2, 9W TDP, Radeon HD 8310E

AMD Technologies: AMD64 64-bit ISA
Instruction sets: SSE1,2,3, SSSE3 ISA, SSE4A, MMX™

Chipset
Integrated in SOC

Memory
2x 204-pin SO-DIMM socket for up to 16GB DDR3 SDRAM (DDR1333/1600)

Storage Interfaces
SATA
2x SATA channels (up to 3 Gb/s)

SSD
MicroSD card socket, bootable

Bus Interfaces
USB
6 x USB 2.0
2 x USB 3.0

PCI Express™
Three x1 channels PCI Express Gen 2, one PCI Express Graphics (PEG) x4

LPC
Low Pin Count bus for legacy interfaces

Display Interfaces
Graphics Controller
Integrated AMD HD 8000E Series graphics
3D Acceleration (DirectX® 11.1, OpenGL 4.2, OpenCL 1.2)
UVD 4.2 hardware video decoder [H.264, MPEG4 (DivX), VC-1 and WMV]
VCE 2.0 Video Compression Engine (H.264, SVC)

Dual independent display support

Video Memory
UMA

LCD Interface
LVDS 24bit, dual-channel (shared with Embedded DisplayPort)
1920 x 1200 @ 60Hz

VGA Interface
Resolution up to 2048 x 1536 @ 60Hz

Display Port and HDMI Interfaces
1x Digital Display Interface (DP 1.2, DVI, HDMI 1.4a)
4096 x 2160 @30Hz, 2560 x 1600 @ 60Hz
1x Embedded DisplayPort 1.3 (shared with LVDS)
2560 x 1600 @ 60Hz

Miscellaneous
Watchdog Timer
Initiates system reset, programmable

Fan Supply
4-pin header [12V] for CPU fan, PWM speed controlled and PWM speed control for system fan supported

Real-Time Clock
Integrated in SOC, battery external

System Monitoring
Voltage, temperature, CPU fan, system fan

Network Interface
Ethernet
10/100/1000Base-TX (Intel® i210)

Audio Interface
HD audio

Security Device
Infineon Trusted Platform Module (Option)

Firmware, Software
UEFI Firmware
AMI Aptio®

Security
TPM 1.2 support, TCG compliant

Power Management
ACPI
Active fan control

USB
USB legacy support (keyboard, mouse, storage)

Video
AMD Video BIOS

HW Programming I/F
EAPI

Board Support Package (BSP)
Microsoft Windows® Embedded Standard 7, Linux (on request)

Power Supply

Power Supply Voltage
+12V +/-10%, 5V Stby optional

Power Consumption
12W (typ.) up to 30W (typ.)

Environment
Ambient Temperature
0° … 60°C (operating)
-25° … 85°C (storage)

Humidity
5 … 95% (operating, non-condensing)
5 … 95% (storage, non-condensing)

Mechanical
Dimensions
95mm x 95mm x13mm
## Order Reference – MSC C6C-GX

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
<th>Reference</th>
<th>Cat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45971</td>
<td>AMD GX-420CA quad-core 2.0GHz, 25W TDP, Radeon HD 8400E, 10/100/1000Base-TX, Type 6</td>
<td>MSC C6C-GX-004</td>
<td>PV</td>
</tr>
<tr>
<td>45969</td>
<td>AMD GX-415GA quad-core 1.5GHz, 15W TDP, Radeon HD 8330E, 10/100/1000Base-TX, Type 6</td>
<td>MSC C6C-GX-003</td>
<td>PV</td>
</tr>
<tr>
<td>45967</td>
<td>AMD GX-217GA dual-core 1.65GHz, 15W TDP, Radeon HD 8280E, 10/100/1000Base-TX, Type 6</td>
<td>MSC C6C-GX-002</td>
<td>OR</td>
</tr>
<tr>
<td>45965</td>
<td>AMD GX-210HA dual-core 1.0GHz, 9W TDP, Radeon HD 8310E, 10/100/1000Base-TX, Type 6</td>
<td>MSC C6C-GX-001</td>
<td>PV</td>
</tr>
</tbody>
</table>

1) PV = Preferred variant; OR = on Request (in OEM quantities only)

## Accessories

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Starter Kits</strong></td>
<td></td>
</tr>
<tr>
<td>tbd</td>
<td>COM Express Type 6 starter kit consisting of a Type 6 baseboard, the</td>
<td>MSC C6-SK-GX-T6T2-KIT001</td>
</tr>
<tr>
<td></td>
<td>active heatsink with fan for the COM-Express Type 6 module, and two DDR3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SO-DIMM memory modules. Please order separately the COM-Express C6C-GX module of your choice</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Carrier Boards</strong></td>
<td></td>
</tr>
<tr>
<td>41886</td>
<td>COM Express Type 6 Small Test and Evaluation Board</td>
<td>MSC C6-AD-T6T2</td>
</tr>
<tr>
<td></td>
<td>with one PCI Express socket, USB 3.0, GbE, SATA, DisplayPort, HDMI, VGA and HD audio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interfaces; ATX power connector. Also usable as Type 6 to Type 2 converter on MSC CX-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MB-EVA2. Dimensions: 140 x 184 mm</td>
<td></td>
</tr>
<tr>
<td>41857</td>
<td>COM Express Type 6 Evaluation board with various PCI Express interfaces, SATA and</td>
<td>MSC C6-MB-EVA</td>
</tr>
<tr>
<td></td>
<td>mSATA, USB 2.0/3.0, Display Port and eDP, HDMI/DVI, HD-Audio, POST code display. ATX form</td>
<td></td>
</tr>
<tr>
<td></td>
<td>factor</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cooling</strong></td>
<td></td>
</tr>
<tr>
<td>1116263</td>
<td>Passive Heatsink for C6C-GX, consisting of a single-piece aluminum profile with fins,</td>
<td>MSC C6C-GX-01 HSI-001</td>
</tr>
<tr>
<td></td>
<td>pressed in standoffs without thread [2.7mm inner diameter], screws and thermopad for the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thermal contact to SOC.</td>
<td></td>
</tr>
<tr>
<td>1116262</td>
<td>Active Heatsink for C6C-GX, consisting of a single-piece aluminum profile with fins,</td>
<td>MSC C6C-GX-01 HSF-001</td>
</tr>
<tr>
<td></td>
<td>pressed in standoffs without thread [2.7mm inner diameter], screws and thermopad for the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thermal contact to SOC. PWM fan 80x80x15mm</td>
<td></td>
</tr>
<tr>
<td>1116261</td>
<td>Heatspreader for C6C-GX. Single-piece aluminum profile, pressed in standoffs without</td>
<td>MSC C6C-GX-01 HSP-001</td>
</tr>
<tr>
<td></td>
<td>thread [2.7mm inner diameter], screws and thermopad for the thermal contact to SOC.</td>
<td></td>
</tr>
<tr>
<td>1122652</td>
<td>Heatspreader for C6C-GX. Single-piece aluminum profile, pressed in threaded standoffs</td>
<td>MSC C6C-GX-02 HSP-001</td>
</tr>
<tr>
<td></td>
<td>(M2.5), screws and thermopad for the thermal contact to SOC.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Memory Modules</strong></td>
<td></td>
</tr>
<tr>
<td>1077754</td>
<td>DDR3 SODIMM, 2GB/1333, 256Mx64, CL7, 256Mx8 based, 1rank, 1.5V</td>
<td>HMT32556BFR8C-H9N0</td>
</tr>
<tr>
<td>1081140</td>
<td>DDR3 SODIMM, 2GB, 256Mx64, PC1333</td>
<td>M471B5773DH0-CH9</td>
</tr>
<tr>
<td>1087922</td>
<td>DDR3 SODIMM 4GB PC1333 512Mx64, based on 256Mx8 2rank, 1.5V</td>
<td>HMT35156CFR8C-H9N0</td>
</tr>
<tr>
<td>1080971</td>
<td>DDR3 SODIMM 4GB PC1333, 512Mx64, 204pin, 1.5V, 256Mx8 based, 2rank</td>
<td>NT4GC64B8HB0NS-CG</td>
</tr>
</tbody>
</table>

2) Pre-qualified memory modules for the CPU product above