



EM-AM4022

High-End Processor AMC based on
3rd Generation Intel® Core™ i7 Technology



Outstanding Performance

- ✿ 3rd Generation Intel® Core™ i7 with 2.1 GHz Quad Core Performance

Impressive Capacity

- ✿ 8 GB ECC Memory DDR3 1600 MHz
- ✿ Up to 64 GB NAND Flash

Comprehensive Connectivity

- ✿ 4x GbE, DisplayPort, USB, SATA, PCI Express® and more

Performance & Throughput

The EM-AM4022 is a highly integrated CPU board implemented as a Single Mid-size or Full-size Advanced Mezzanine Card (AMC) for ATCA and MicroTCA applications. The design is based on the 3rd Generation Intel® Core™ i7 processor platform combined with the mobile Intel® QM77 Express Chipset. The board supports the Intel® Core™ i7-3612QE (2.1 GHz Quad Core) in 22 nm technology in a BGA package. Other processors are available on request. The processor and the memory are soldered on the EM-AM4022 which results in higher Mean Time Between Failures (MTBF) and a significant improvement in cooling.

Throughput

The EM-AM4022 includes 8 GB dual-channel Double Data Rate (DDR3) memory with Error Checking and Correcting (ECC) running at 1600 MHz. The graphics and memory controller is integrated in the processor. One quad Gigabit Ethernet controller directly connected to the processor ensures maximum data throughput between processor and memory. The EM-AM4022 can be equipped optionally with an up to 64 GB NAND Flash memory module which can be directly mounted on the EM-AM4022.

Connectivity

Supporting the PICMG sub-specifications AMC.1/.2/.3 the EM-AM4022 ensures a comprehensive set of interconnecting capabilities. The EM-AM4022 is available with a high-resolution DisplayPort on the front panel. Further interfaces include one USB 2.0 host interface and two Gigabit Ethernet ports to the front as well as a variety of high-speed interconnect topologies to the system, such as Dual Gigabit SerDes connection and Dual Serial ATA storage interface in the Common Options Region, two x4 or one x8 PCI Express in the Fat Pipes Region, and various interfaces in the Extended Options Region available on request— among them SATA, USB, DisplayPort.

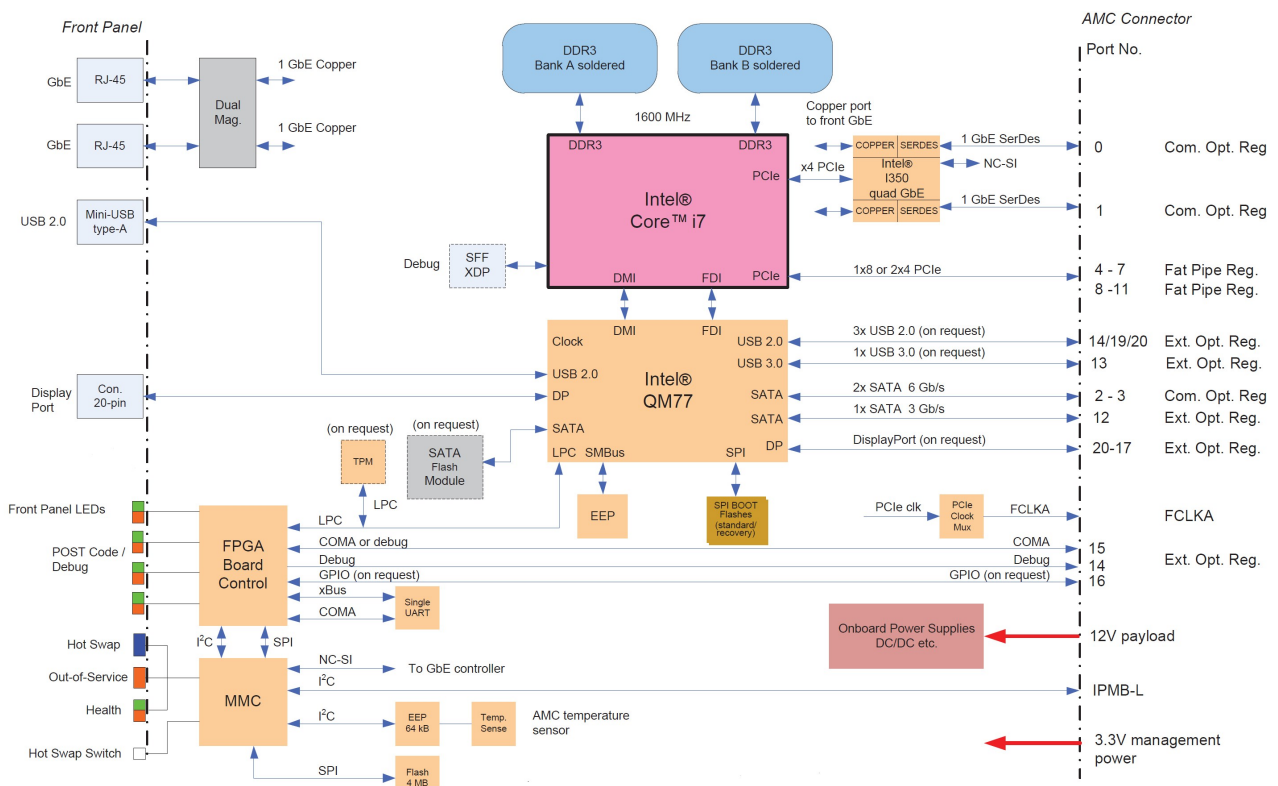
Reliability

The careful design and selection of high temperature resistant components together with the elaborated heat sink construction ensures a high product reliability. A front panel design according MicroTCA.1 (on request) provides shock & vibration resistance in demanding environmental conditions.

AMC systems

EMCOMO also offers a choice of AMC systems for the EM-AM4024. In these systems the EM-AM4022 can be combined with I/O cards, DSP cards and different processor boards.

EM-AM4022 single-width, mid-size AMC module



Technical Information

Form factor		Single mid-size or full-size (on request) AMC module
CPU and PCH	Processor Platform Controller Hub	The AM4022 supports the following microprocessors: - Intel® Core™ i7-3612QE (SV) processor with ECC, 2.1 GHz, 6 MByte L3 cache - Intel® Core™ i7-3555LE (LV) processor with ECC, 2.5 GHz, 4 MByte L3 cache Mobile Intel® 3rd Generation PCH; QM77 Express Chipset, Used interfaces: - 3x USB 2.0, 1x USB 3.0 - 2x SATA 6Gbit/s, 2x SATA 3Gbit/s - 2x DisplayPort - RTC, interrupt controller and timers
Memory	System Memory NAND Flash Flash (BIOS) EEPROM	Dual channel 8 GByte DDR3 SDRAM memory with ECC, running at 1600 MHz Up to 64 GByte SLC NAND Flash on a dedicated SATA NAND Flash module Two redundant 8 MByte SPI Flash chips (2 x 8 MByte) for uEFI BIOS controlled by the MMC Serial EEPROM (24LC64) 64 kbit
Onboard Controllers	Graphics Gigabit Ethernet UART TPM MMC Watchdog	Built-in Intel® 3D Graphics accelerator for enhanced graphics performance: - Supports resolutions up to 2560 x 1600 pixels @ 60 Hz - DisplayPort hot plug support - Dynamic Video Memory Technology 1x Intel® I350 Quad Gigabit Ethernet PCI Express 2.0 bus controller - Two interfaces routed to front I/O connectors - Two interfaces routed to the AMC connector EXAR XR16L580IL single UART, 16550 compatible Infineon SLB9635TT TPM 1.2 controller (on request) NXP LPC2368 controller with on-chip 512 kByte Flash and 56 kByte RAM FPGA-based, software-configurable, two-stage Watchdog with programmable timeout ranging from 125 ms to 4096 s in 16 steps
System Interconnection	AMC Ports	Ports 0-1: GbE Ports 2-3: SATA 6Gb/s Ports 4-11: 2x PCIe x4 or 1x PCIe x8 Port 12: SATA 3Gb/s Port 13: USB 3.0 Port 14: Debug or USB 2.0 Port 15: COM Port 16: 4x GPIO Note: AMC port 12 - 20 connectivity available on project request FCLKA PCI Express clock configuration configurable: disabled/enabled to AMC connector
Front Panel Interfaces	Gigabit Ethernet DisplayPort USB LEDs	2x 1000BASE-TX on RJ45 connector 1x DisplayPort on standard 20-pin DisplayPort connector 1x USB 2.0 port on 5-pin, type A Mini-USB connector 3x Module Management LEDs, Four User-Specific LEDs, Ethernet LEDs
Onboard Interfaces	Debug Interface I/O Extension	JTAG port for processor emulation probe connection; Serial POST Code (LVTTTL) interface on AMC port 14 The I/O extension holds the following interfaces: SATA, LPC interface and some power and control signals, battery input
Miscellaneous	Dimensions Board Weight MTBF Power Supply Power Consumption	Dimensions without optional retention screws on front panel: 181.5 x 73.5 x 18.96 mm 247 grams without extension modules such as the SATA Flash module or the RTC Backup Battery module 205712 h acc. Bellcore Issue 6, Ground Benign, Controlled, 30 °C 12 V payload power, 3.3 V management power i7-3612QE 2.1 GHz typ.: 31 W, max.: 50 W

Technical Information

Software	BIOS IPMI Linux Windows Windriver Linux VxWorks	AMI uEFI BIOS MMC (Module Management Controller) implementation compliant to PICMG AMC.0, own IP Red Hat Enterprise 6 Red Hat Fedora 17 Windows 7 64-bit Windows 2008 Server R2 PNE 4.x Version 6.9.2
Compliance	ATCA AMC/MICROTCA IPMI SATA CE Vibration/Shock Climatic Humidity WEEE RoHS	PICMG 3.0 AdvancedTCA Base Specification R3.0 PICMG MTCA.0 Micro Telecommunications Comp. Architecture R1.0; PCI Express®: PCI Express® Base Specification Revision 1.0a PICMG AMC.0: Advanced Mezzanine Card Specification R2.0 PICMG AMC.1: PCI Express® and Advanced Switching R1.0 PICMG AMC.2: Gigabit Ethernet R1.0 PICMG AMC.3: Storage Interfaces R1.0 IPMI Intelligent Platform Management Interface Spec. V2.0 IPMI - Platform Management FRU Information Definition V1.0 Serial ATA: Serial ATA 2.5 Specification EN55022, EN55024, EN61000-6-2/-6-3, EN300386, EN60950-1 IEC60068-2-6 / IEC60068-2-27 IEC60068-2-78 Directive 2002/96/EC Directive 2002/95/EC
Environmental	OPERATING TEMP. HUMIDITY	- 5 °C to +55 °C (standard, depending on airflow in the system) - 40 °C to +70 °C (storage) passive module heat sink, forced system airflow Operational: 5 %-90 % (non-condensing), Non-Operating: 5 %-95 % (non-condensing)

Ordering Information

Configuration	Description	Order Code
EM-AM4022-2.1Q-8GB	Quad Core i7-3612QE 2.1 GHz, 8 GByte DDR3 soldered ECC memory 1600 MHz, FP: 2x GbE, USB, DisplayPort	A01365

Accessories

EM-AM402x-Flash-64G	64 GByte SATA NAND Flash Modul for EM-AM402x	A01611
EM-AM402x-Flash-32G	32 GByte SATA NAND Flash Modul for EM-AM402x	A01612
EM-AM402x-BAT	Battery module for EM-AM402x	A01613

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