EM-AM4024

High-End Processor AMC based on
4th Generation Intel® Core™ i7 Technology

Outstanding Performance

- 4th Generation Intel® Core™ i7 with 1.8 or 2.4 GHz Quad Core Performance

Impressive Capacity

- Up to 16 GB ECC Memory DDR3 1600 MHz
- Up to 64 GB NAND Flash

Comprehensive Connectivity

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

Performance & Throughput

The EM-AM4024 is a highly integrated CPU board implemented as a Single Mid-size (Full-size on project request) Advanced Mezzanine Card (AMC) for ATCA and MicroTCA applications. The design is based on the 4th Generation Intel® Core™ i7 processor platform combined with the mobile Intel® QM87 Express Chipset.

The EM-AM4024 supports up to 16 GB dual-channel Double Data Rate (DDR3) memory with Error Checking and Correcting (ECC) running at 1600 MHz. A Gigabit Ethernet controller providing 2 GbE ports is directly connected to the processor via PCIe x4 Gen3 by that ensuring a maximum data throughput between processor and memory. The EM-AM4024 can be equipped optionally with an up to 64 GB SATA NAND Flash module.

Connectivity

The EM-AM4024 supports a comprehensive set of interconnecting capabilities. On the front panel the EM-AM4024 comes with a broad set of I/O interfaces – such as 2x GbE, DisplayPort, COM, USB - allowing a convenient bring up process during the application development process. A variety of high-speed interconnect ports to the backplane, such as 2 GbE ports, PCI Express®, SATA ensures a wide range of possible application use cases for the EM-AM4024.

Reliability

The processor and the memory are soldered on the EM-AM4024 which results in a higher MTBF value and a significant advantage for the cooling concept. 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 project request) provides shock & vibration resistance in demanding environmental conditions.

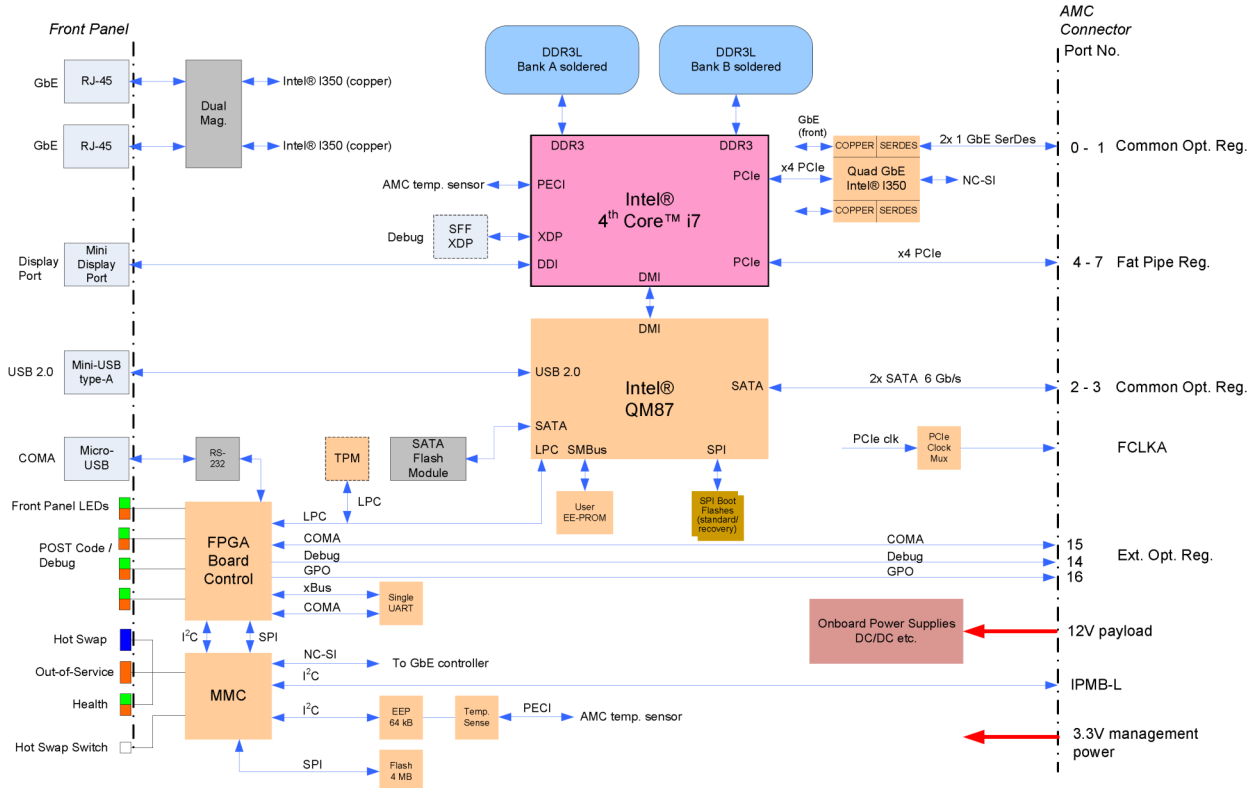
Target Applications

The EM-AM4024 is an ideal platform for high-performance computing and multi-processor systems in general. In the communication market the EM-AM4024 serves perfectly for media server, gateway applications as well as in test solutions for networking equipment. In particular the Core i7 with integrated Intel® HD Graphics 4600 / 5200 provides a signifi cant performance boost for video streaming / transcoding and IPTV applications.

AMC systems

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

EM-AM4024 single-width, mid-size AMC module



Technical Information

Form factor		Single mid-size or full-size (on project request) AMC module
CPU and PCH	**Processor** **Platform Controller Hub**	Following Intel® Core™ i7 processors – 4th Generation – are supported: - Quad Core i7-4860EQ GT3 1.8 GHz 6 MByte Cache – 47 W - Quad Core i7-4700EQ GT2 2.4 (1.7) GHz 6 MByte Cache – 47 W (37 W) Mobile Intel® 4th Generation PCH; QM87 Express Chipset Used interfaces: - 2x USB 2.0 - 2x SATA 6Gbit/s, 1x SATA 3Gbit/s - 1x DisplayPort - RTC, interrupt controller and timers
Memory	**System Memory** **NAND Flash** **Flash (BIOS)** **EEPROM**	Dual channel DDR3 memory, up to 16 GByte SDRAM memory with ECC, running at 1600 MHz Up to 64 GByte SLC NAND Flash on a dedicated SATA NAND Flash module - SATA 3Gbit/s connection from PCH QM87 Two redundant 8 MByte SPI Flash chips (2x 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 3840 x 2160 pixels @60 Hz - DisplayPort hot plug support - Dynamic Video Memory Technology - Intel® HD Graphics 4600/Intel® Iris™ Pro graphics 5200 Intel® I350 Quad Gigabit Ethernet PCI Express® 2.0 bus controller for 2x GbE ports routed to front I/O connectors Single UART, 16550 compatible Trusted Platform Module (TPM) 1.2 for enhanced hardware and software based data and system security Microcontroller with on-chip 512 kByte Flash and 56 kByte RAM FPGA-based, software-configurable, two-stage Watchdog with programmable timeout ranging from 125ms to 4096s in 16 steps
System Interconnection	**AMC Ports**	Ports 0-1: GbE Ports 2-3: SATA Ports 4-7: PCIe x4 Port 14: Debug Port 15: Serial Port 16: TCLKC / 2x GPIO FCLKA: bidirectional PCIe clock configuration TCLKA Power supply: 3.3 V management power, 12 V payload power
Front Panel Interfaces	**Gigabit Ethernet** **DisplayPort** **USB** **Serial Port** **LEDs**	2x 1000BASE-TX on RJ45 connector with integrated Speed + Activity LED 1x DisplayPort on mini DisplayPort connector 1x USB 2.0 port on 5-pin, type A Mini-USB connector 1x RS232 UART interface on microUSB connector 3x LEDs according AMC.0 spec: 4x additional control and status bicolor (red/green) LEDs
Onboard Interfaces	**Debug Interface** **I/O Extension**	JTAG port for processor emulation probe connection The I/O extension holds the following interfaces: SATA, USB, LPC interface and some power and control signals, battery input Daughter cards to connect: - SATA NAND Flash module - Battery to supply the integrated RTC with power
Miscellaneous	**Dimensions** **Board Weight** **Power Supply** **Power Consumption**	Dimensions without optional retention screws on front panel: 181.5 x 73.5 x 18.96 mm (Mid-size) 280 grams without extension modules such as the SATA Flash module or the RTC Backup Battery module 12 V payload power, 3.3 V management power 47W TDP / 37W cTDP depending on CPU type

Technical Information

Software	**BIOS** **IPMI** **Linux** **Windows** **Windriver Linux** **VxWorks**	Phoenix uEFI BIOS MMC (Module Management Controller) implementation compliant to PICMG AMC.0, MicroTCA.0 Generic BSP to be used with various Linux derivates; Verified for RedHat Fedora, RedHat Enterprise 6.x Windows7 64bit, Windows 2008 Server R2 PNE 5.x 6.9.3.x or later
Compliancy	**ATCA** **AMC/MICROTCA** **IPMI** **CE** **Vibration/Shock** **Climatic Humidity** **WEEE** **RoHS**	PICMG 3.0 AdvancedTCA Base Specification R3.0 PICMG MTCA.0 Micro Telecommunications Comp. Architecture R1.0 PICMG AMC.0 Advanced Mezzanine Card Specifi cation R2.0 PICMG AMC.1 PCI Express and Advanced Switching R2.0 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 Defi nition V1.0 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 processor version and airflow in the system) - 25 °C to +70 °C (extended, depending on processor version and 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-AM4024-1.8Q-8GB	Quad Core i7-4860EQ 1.8 GHz/47 W, 8 GByte DDR3 soldered ECC memory 1600 MHz, FP: 2x GbE, USB, DisplayPort, COM	**A01610**
EM-AM4024-2.4Q-16GB	Quad Core i7-4700EQ, 2.4 GHz/47/37 W, 16 GByte DDR3 soldered ECC memory 1600 MHz, FP: 2x GbE, USB, DisplayPort, COM	**A01583**

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**
EM-AM4024-Cables	Cable set for EM-AM4024: MiniUSB-A, Mini-DisplayPort, MicroUSB (Serial)	**A01614**

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