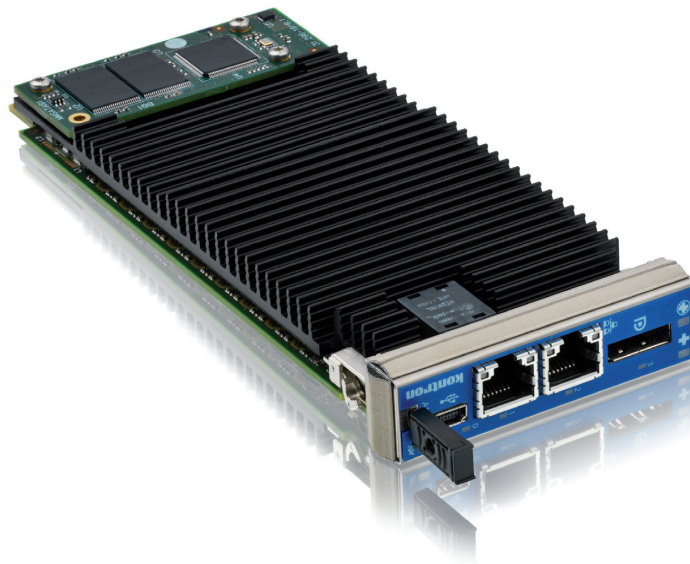


» AM4022 «



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**

Up to 8 GB ECC Memory DDR3 1600 MHz

Up to 64 GB NAND Flash

» **Comprehensive Connectivity**

4x GbE, 4x SATA, 2x PCIe x4, Graphics or COM and more

AM4022

Small, Fast, Robust

» Performance

The 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) and the Intel® Core™ i7-3555LE (2.5GHz Dual Core) processors in 22 nm technology in a BGA package. Other processors are available on request. The processor and the memory are soldered on the AM4022 which results in higher Mean Time Between Failures (MTBF) and a significant improvement in cooling.

» Throughput

The AM4022 includes up to 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 AM4022 can be equipped optionally with an up to 64 GB NAND Flash memory module which can be screwed on the AM4022.

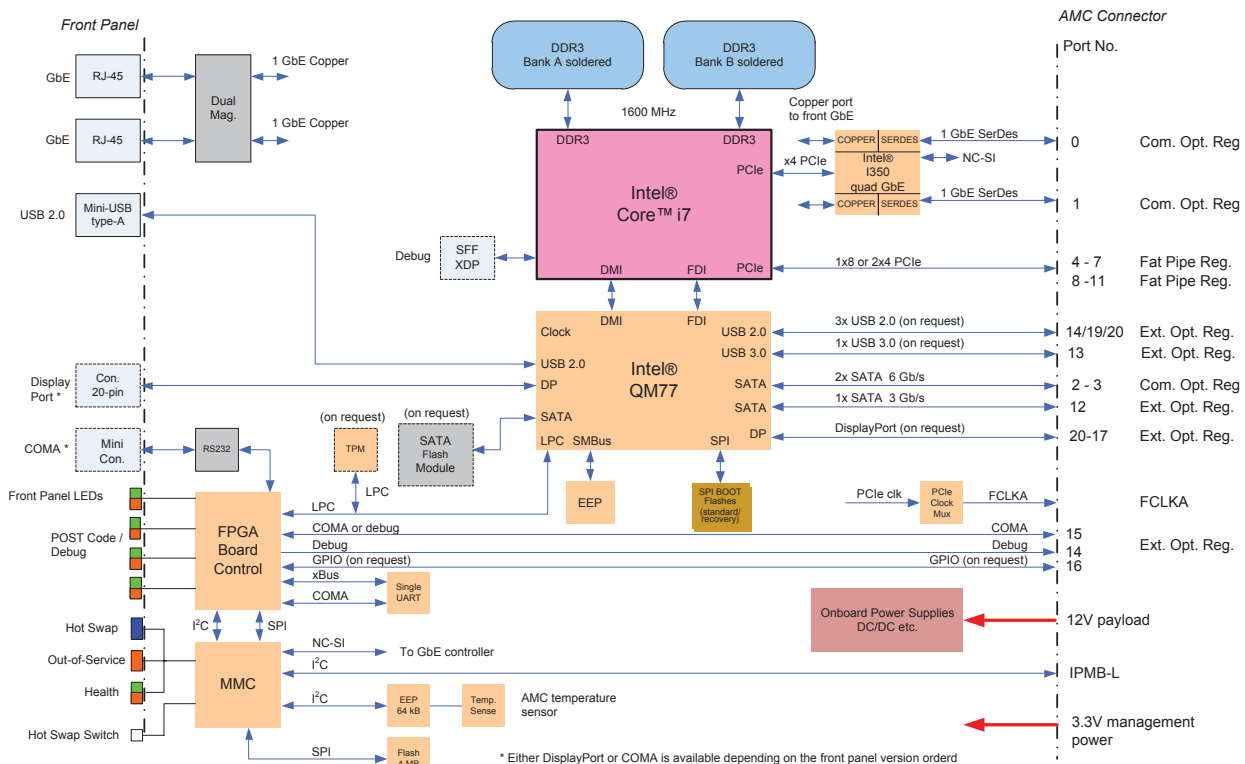
» Connectivity

Supporting the PICMG sub-specifications AMC.1/2/3 the AM4022 ensures a comprehensive set of interconnecting capabilities. The AM4022 is available with two front panel versions, one with a high-resolution DisplayPort and one with a COM port. 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.

AM4022



Technical Information

Form Factor

Single mid-size or full-size (on request) AMC module

CPU and PCH

Processor

The AM4022 supports the following microprocessors:

- » Intel® Core™ i7-3612QE (SV) processor with ECC, 2.1 GHz, 6 MB L3 cache
- » Intel® Core™ i7-3555LE (LV) processor with ECC, 2.5 GHz, 4 MB L3 cache

Note: other processor versions available on project request

Further processor features:

- » Up to four physical execution cores
- » Intel® Hyper-Threading Technology (Intel® HT Technology)
- » Intel® 64 Architecture
- » Intel® Turbo Boost Technology
- » Intel® Intelligent Power Sharing (IPS)
- » One x16 PCI Express port operating at up to 8.0 GT/s

Cache Structure:

- » 64 kB L1 cache for each core
- » 32 kB instruction cache
- » 32 kB data cache
- » 256 kB L2 shared instruction/data cache for each core
- » Up to 6 MB L3 shared instruction/data cache shared between all cores

Platform Controller Hub

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

Dual channel DDR3 memory, up to 8 GB DDR3 SDRAM memory with ECC, running at 1600 MHz

NAND Flash

Up to 64 GB SLC NAND Flash on a dedicated SATA NAND Flash module

Flash (BIOS)

Two redundant 8 MB SPI Flash chips (2 x 8 MB) for uEFI BIOS controlled by the MMC

EEPROM

Serial EEPROM (24LC64) 64 kbit

Onboard Controllers

VGA

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

When the AM4022 is populated with a COM port on the front panel, the Graphics controller is disabled.

Gigabit Ethernet

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

UART

EXAR XR16L580IL single UART, 16550 compatible

TPM

Infineon SLB9635TT TPM 1.2 controller (on request)

MMC

NXP LPC2368 controller with on-chip 512 kB Flash and 56 kB RAM

Watchdog

FPGA-based, software-configurable, two-stage Watchdog with programmable timeout ranging from 125ms to 4096s in 16 steps

System Interconnection

AMC ports

AMC port 0-1:	2x 1000BASE-BX (SerDes)	AMC port 14:	1x Debug or USB 2.0
AMC port 2-3:	2x SATA 6Gbit/s	AMC port 15:	1x COM
AMC port 4-11:	2 x4 or 1 x8 PCI Express	AMC port 16:	4x GPIO
AMC port 12:	1x SATA 3Gbit/s	AMC port 17-20:	1x DisplayPort, 2x USB 2.0
AMC port 13:	1x USB 3.0	Note: AMC port 12 - 20 connectivity available on project request	

PCI Express clock configuration configurable: disabled/enabled to AMC connector

Front Panel Interfaces

DisplayPort (Option1)

1x DisplayPort on standard 20-pin DisplayPort connector (mutual exclusive with Serial Port)

Serial Port (Option 2)

1x RS232 UART interface on 10-pin mini connector (mutual exclusive with DisplayPort)

Gigabit Ethernet

2x 1000BASE-TX on RJ45 connector

USB

1x USB 2.0 port on 5-pin, type A Mini-USB connector

LEDs

3x Module Management LEDs, Four User-Specific LEDs, Ethernet LEDs

Onboard Interfaces

Debug Interface

JTAG port for processor emulation probe connection; Serial POST Code (LVTTTL) interface on the AMC port 14

I/O Extension

The I/O extension holds the following interfaces: SATA, LPC interface and some power and control signals, battery input

Compliance

ATCA

12 V payload power, 3.3 V management power

MicroTCA

PICMG MTCA.0 Micro Telecommunications Comp. Architecture R1.0; PCI Express: PCI Express Base Specification Revision 1.0a

AMC

PICMG AMC.0: Advanced Mezzanine Card Specification R2.0

PICMG AMC.2: Gigabit Ethernet R1.0

PICMG AMC.1: PCI Express and Advanced Switching R1.0

PICMG AMC.3: Storage Interfaces R1.0

IPMI

IPMI Intelligent Platform Management Interface Spec. V2.0

IPMI - Platform Management FRU Information Definition V1.0

SATA

Serial ATA: Serial ATA 2.5 Specification

CE

EN55022, EN55024, EN61000-6-2/-6-3, EN300386, EN60950-1

Vibration/Shock

IEC60068-2-6 / IEC60068-2-27

Climatic Humidity

IEC60068-2-78

WEEE

Directive 2002/96/EC

RoHS

Directive 2002/95/EC

Technical Information (continued)

General

Dimensions	Dimensions without retention screws on front panel: Mid-size: 181.5 x 73.5 x 18.96 mm Full-size: 181.5 x 73.5 x 28.95 mm		
Board Weight	Mid-size with heat sink and without SATA Flash module: 247 grams Full-size with heat sink and without SATA Flash module: 310 grams		
MTBF	205712 h acc. Bellcore Issue 6, Ground Benign, Controlled, 30°C		
Power Supply	12 V payload power, 3.3 V management power		
Power Consumption	i7-3612QE 2.1 GHz	with COM-Port	with DP-Port
	typ:	31 W	31 W
	max:	44 W	50 W
	i7-3555LE 2.5 GHz	with COM-Port	with DP-Port
	typ:	24 W	24 W
	max:	30 W	41 W
Environmental			
Temperature range	-5°C to +55°C (standard, depending on processor version and airflow in the system) -40°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		
Humidity	Operational: 5%-90% (non-condensing), Non-Operating: 5%-95% (non-condensing)		
Software			
BIOS	AMI uEFI BIOS		
IPMI	MMC (Module Management Controller) implementation compliant to PICMG AMC.0, Kontron own IP		
Linux	Red Hat Enterprise 6; Red Hat Fedora 17, free download from Kontron web		
Windows	Windows 7 64-bit; Windows 2008 Server R2, free download from Kontron web		
WindRiver Linux	PNE 4.x		
VxWorks	Version 6.9.2		

Ordering Information

Article	Description
Processor Modules	
AM4022-SA-2.5D-4-M-COM	Intel® Core™ i7-3555LE, 2.5GHz, 4GB soldered Memory, Mid-size, 2xGbE, USB, COM, no onboard SATA-Flash
AM4022-SA-2.5D-4-M-DP	Intel® Core™ i7-3555LE, 2.5GHz, 4GB soldered Memory, Mid-size, 2xGbE, USB, DisplayPort, no onboard SATA-Flash
AM4022-SA-2.1Q-8-M-COM	Intel® Core™ i7-3612QE, 2.1GHz, 8GB soldered Memory, Mid-size, 2xGbE, USB, COM, no onboard SATA-Flash
AM4022-SA-2.1Q-8-M-DP	Intel® Core™ i7-3612QE, 2.1GHz, 8GB soldered Memory, Mid-size, 2xGbE, USB, DisplayPort, no onboard SATA-Flash
AM4022-SA-2.1Q-8-M-DP-S32	Intel® Core™ i7-3612QE, 2.1GHz, 8GB soldered Memory, Mid-size, 2xGbE, USB, DisplayPort, 32GB onboard SATA-Flash
Software	
VXW-BSP-AM4022-V6.9.2	VxWorks 6.9.2 Board Support Package for AM4022
Accessories	
CABLE-MINI-USB-TA	Adapter cable: MiniUSB-A to USB-A-Jack, 15 cm
CABLE-GRAPHIC-DP-TO-DVI	Adapter cable: DisplayPort to DVI, 19 cm
CABLE-SERIAL-10-PIN-MINI-TO-9-PIN-DSUB	Adapter cable: 10-pin Hirose to 9-pin DSub

Note: For other configuration options please contact your local sales support

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