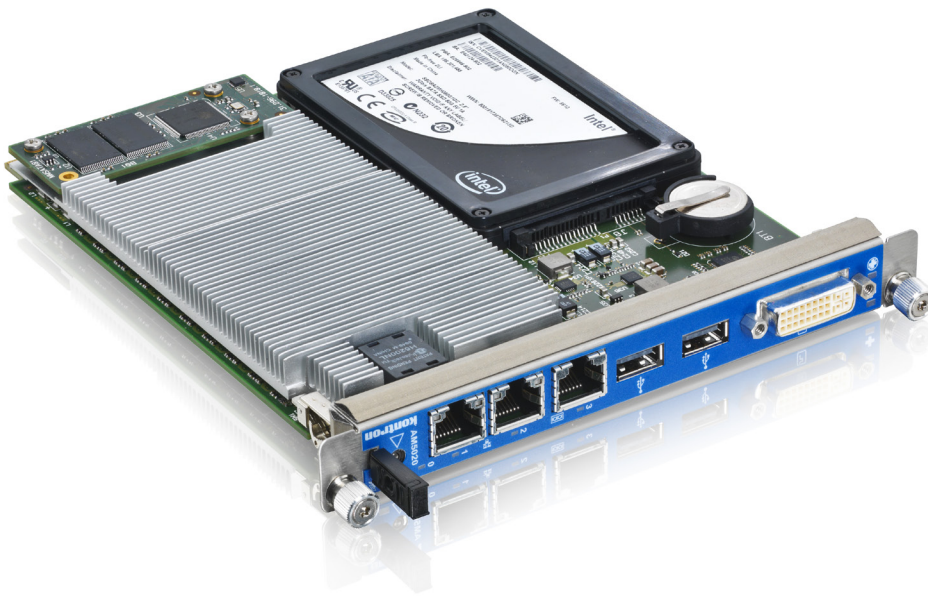


# » AM5020 «



## High-End Processor AMC based on Intel® Core™ i7 Technology

### Outstanding Performance

- » Intel® Core™ i7 with 2.0 GHz or 2.53 GHz

### Impressive Capacity

- » Up to 8 GB ECC Memory DDR3 1066 MHz
- » Up to 32 GB NAND Flash

### Comprehensive Connectivity

- » 4x GbE, 4x SATA, 2x PCIe x4, 2x USB, DVI-D
- » onboard SATA HDD, onboard SATA Flash

# AM5020

## Premium class performance AMC module

### » Performance

The AM5020 is a highly integrated CPU board implemented as a Double Mid-size Advanced Mezzanine Card (AMC) for MicroTCA applications. The design is based on the Intel® Core™ i7 processor platform combined with the mobile Intel® QM57 Express Chipset. The board supports the Intel® Core™ i7-610E and the Intel® Core™ i7-620LE processors in 32 nm technology with 64 kB L1 cache, 256 kB L2 cache and 4 MB L3 cache in a BGA package with frequencies ranging from 2.0 GHz up to 2.53 GHz. The processor and the memory are soldered on the AM5020 which results in higher Mean Time Between Failures (MTBF) and a significant improvement in cooling.

### » Throughput

The AM5020 includes up to 8 GB, dual-channel Double Data Rate (DDR3) memory with Error Checking and Correcting (ECC) running at 1066 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.

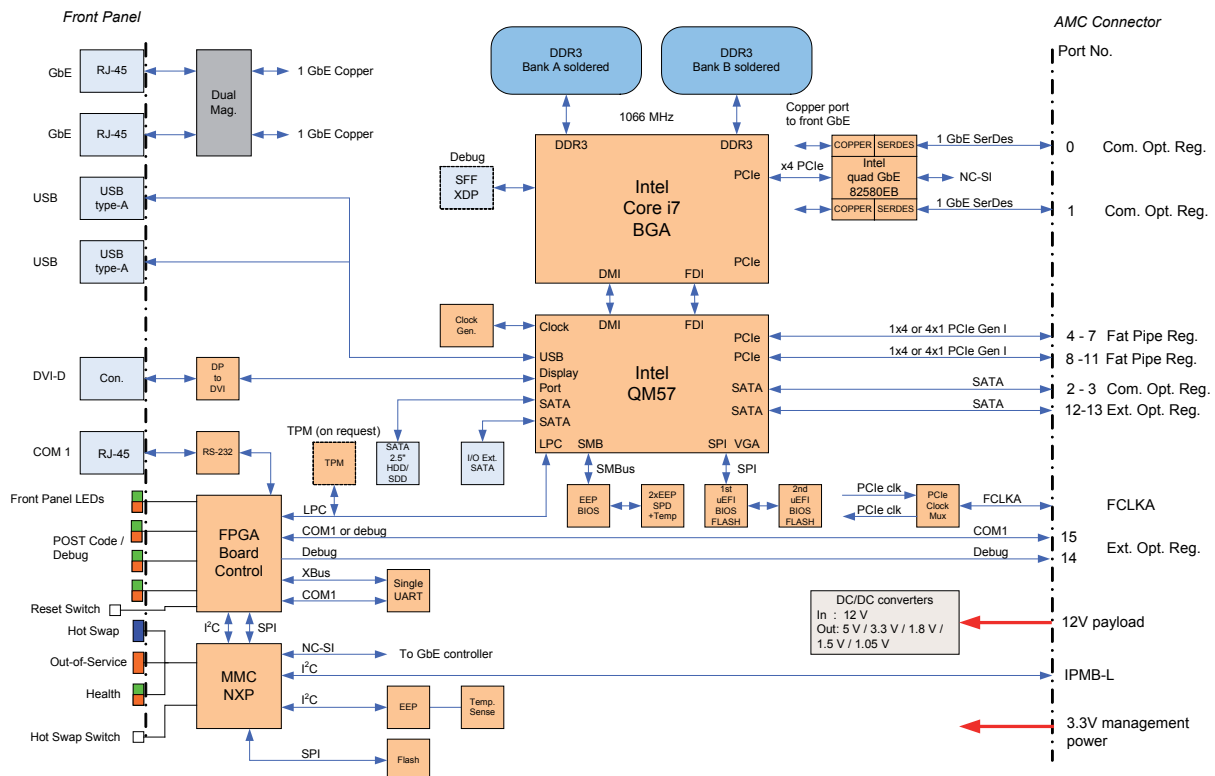
### » Connectivity

Supporting the PICMG sub-specifications AMC.1/.2/.3 the AM5020 ensures a comprehensive set of interconnecting capabilities. The AM5020 is available with a broad range of I/O connectivity resulting in two GbE RJ45 ports, two USB, one DVI-D, one COM port to the front panel as well as a variety of high-speed interconnect topologies to the system, such as Dual Gbe SerDes connection and Dual Serial ATA storage interface in the Common Options Region, two x4 or eight x1 PCI Express in the Fat Pipes Region, and dual Serial ATA storage interface, a DisplayPort (on request), and a Debug port in the Extended Options Region.

The AM5020 can be equipped optionally with an 2.5" HDD/ SSD drive and a NAND Flash memory module with up to 32GB.

### » AMC systems

With the OM6062 AMC system Kontron offers the corresponding system solution for the AM5020. The OM6062 is a fully featured compact AMC system for up to 6 double-width, mid-size AMCs. It applies to entry level designs and compact system designs including an MCH with unmanaged GbE switching capabilities. Target applications include, but are not limited to, image processing, data processing, motion control, process control, as well as test and measurement.



## Technical Information

<b>Form Factor</b>	Double mid-size AMC module
<b>CPU and PCH</b>	
Processor	<p>The AM5020 supports the following microprocessors:</p> <ul style="list-style-type: none"> <li>» Intel® Core™ i7-610E (SV) processor with ECC, 2.53 GHz, 4 MB L3 cache</li> <li>» Intel® Core™ i7-620LE (LV) processor with ECC, 2.0 GHz, 4 MB L3 cache</li> </ul> <p>Cache Structure:</p> <ul style="list-style-type: none"> <li>» 64 kB L1 cache for each core</li> <li>» 32 kB instruction cache</li> <li>» 32 kB data cache</li> <li>» 256 kB L2 shared instruction/data cache for each core</li> <li>» 4 MB L3 shared instruction/data cache shared between both cores</li> </ul> <p>Further processor features:</p> <ul style="list-style-type: none"> <li>» Two execution cores</li> <li>» Intel® Hyper-Threading Technology (Intel® HT Technology)</li> <li>» Intel® 64 Architecture</li> <li>» Intel® Turbo Boost Technology</li> <li>» Intel® Intelligent Power Sharing (IPS)</li> </ul>
Platform Controller Hub	<p>Mobile Intel® QM57 Express Chipset:</p> <ul style="list-style-type: none"> <li>» Two x4 or eight x1 PCI Express 2.0 ports operating at 2.5 GT/s</li> <li>» SATA host controller with six ports, 3 Gbit/s data transfer rate and RAID 0/1/5/10 support</li> <li>» USB 2.0 host interface with up to 14 USB ports available (two USB 2.0 ports are used on the AM5020)</li> </ul>
<b>Memory</b>	
System Memory	Dual channel DDR3 memory, up to 8 GB DDR3 SDRAM memory with ECC, running at 1066 MHz
NAND Flash	Up to 32 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
<b>Onboard Controllers</b>	
VGA	<p>Built-in Intel 3D Graphics accelerator for enhanced graphics performance:</p> <ul style="list-style-type: none"> <li>» Supports resolutions up to 2560 x 1600 pixels @ 60 Hz</li> <li>» Dynamic Video Memory Technology</li> </ul>
Gigabit Ethernet	<p>One Intel 82580EB Quad Gigabit Ethernet PCI Express bus controller</p> <ul style="list-style-type: none"> <li>» Two interfaces routed to front I/O connectors</li> <li>» Two interfaces routed to the AMC connector</li> </ul>
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 125 ms to 256 s in 12 steps
RTC	Integrated in QM57 and CMOS RAM with backup, battery replaceable
<b>AMC System Interconnect</b>	
Gigabit Ethernet	Two 1000BASE-BX (SerDes) (Common Options Region ports 0-1)
Serial ATA	Two SATA ports (Common Options Region ports 2-3) Two SATA ports (Extended Options Region ports 12-13)
PCI Express	Two x4 or eight x1 PCI Express interfaces on AMC ports 4-11 (Fat Pipes Region)
Debug Interface	One Debug port (Extended Options Region port 14)
Serial Port	COM1 (LVTTTL) (Extended Options Region port 15)
Display Port	One DisplayPort on request (Extended Options Region ports 17-20)
FCLKA	Bidirectional PCI Express clock configuration
<b>Front Panel Interfaces</b>	
Gigabit Ethernet	Two 1000BASE-TX on RJ45 connector
DVI-D	One 29-pin VGA DVI-D connector for digital monitor
USB	Two USB 2.0 port on 5-pin, type A Mini-USB connector
Serial Port	One RS232 UART interface on RJ45 connector
LEDs	Three Module Management LEDs Four User-Specific LEDs Ethernet LEDs
<b>Onboard Interfaces</b>	
Onboard SATA	SATA extension connector for the SATA Flash module SATA connector for connecting an onboard SATA 2.5" HDD/SSD
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, USB, LPC interface and some power and control signals, battery input
<b>Compliance</b>	
MicroTCA	PICMG MTCA.0 Micro Telecommunications Comp. Architecture R1.0 PCI Express: PCI Express Base Specification Revision 1.0a

## Technical Information

AMC	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	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
<b>General</b>	
Dimensions	Dimensions without retention screws on front panel: Mid-size: 180.6 mm x 148.5 mm x 18.96 mm
Board Weight	Mid-size: approx. 300 grams (with heat sink, without HDD/SSD)
MTBF	184303 h acc. Bellcore Issue 6, Ground Benign, Controlled, 30 C
Power Supply	12 V payload power, 3.3 V management power
Power Consumption	i7-620LE (LV) 2.0 GHz: max 30 W (graphics idle), max 38 W (with graphics load) i7-610E (SV) 2.53 GHz: max 36 W (graphics idle), max 49 W (with graphics load)
<b>Environmental</b>	
Temperature range	-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
Humidity	Operational: 5%-90% (non-condensing) Non-Operating: 5%-95% (non-condensing)
<b>Software</b>	
BIOS	AMI uEFI BIOS
IPMI	MMC (Module Management Controller) implementation compliant to PICMG AMC.0, Kontron own IP
Linux	Generic BSP to be used with various Linux derivatives; Verified for Fedora 13, RedHat 6
Windows	Windows® XP SP3 / XPembedded, Windows® 7 (32/64 bit), Windows® 2008 Server R2
WindRiver Linux	PNE 3.x or later
VxWorks	VxWorks BSP 6.8 or later

## Ordering Information

Article	Description
<b>Processor Modules</b>	
<a href="#">AM5020MR-2.0D-4GS</a>	Core™ i7-620LE LV 2.0 GHz, Dual Core, 4 GB soldered SDRAM DDR3 1066GHz with ECC
<a href="#">AM5020MR-2.53D-4GS</a>	Core™ i7-610E SV 2.53 GHz, Dual Core, 4 GB soldered SDRAM DDR3 1066GHz with ECC
<b>Accessories</b>	
<a href="#">AM5020-FLASH-16GB</a>	16 GByte NAND-Flash SATA module
<a href="#">AM5020-FLASH-32GB</a>	32 GByte NAND-Flash SATA module

For further order options please contact the local sales office

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