**AMC Module**

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**4th Generation Intel® Core™ Processor AdvancedMC™ Module, with Serial RapidIO®**

**APPLICATIONS**

The AM C1x/msd is a high performance Single Module, Full-size or Mid-size, AdvancedMC™ processor module supporting a 4th generation Intel® Core™ processor (2-core or 4-core) and the Intel® QM87 PCH with up to 16 Gbytes of DDR3L-1600 ECC DRAM. The AM C1x/msd is designed in compliance to AMC.0, AMC.4 Type 5 and Type 10 (single or dual x4 Serial RapidIO®), AMC.2 Type E2 (2 x Gigabit Ethernet) and AMC.3 Type S2 (2 x SATA ports). The module also features up to three USB 2.0 ports, two RS232 ports, two additional SATA ports, a x2 PCIe Gen 2 port, and two 10 Gigabit Ethernet interfaces. Supporting full hot swap and IPMI capabilities with a range of industry standard operating systems, the AM C1x/msd is designed for use in AdvancedTCA® or MicroTCA™ applications in the telecommunications, scientific, and defense markets. Application examples include media-servers or blade-servers.

**HIGHLIGHTS**

- Single Module, Full-size or Mid-size, AdvancedMC™ processor module:
  - compliant to AMC.0
- Can be configured for compliance with the requirements of the SCOPE Alliance
- 4th generation Intel® Core™ processor:
  - 4-core Intel Core i7-4700EQ
  - 2-core Intel Core i5-4410E
  - includes Intel® Advanced Vector Extensions 2 (AVX2)
  - includes Intel® AES New Instructions (AES-NI)
- Up to 16 Gbytes of DDR3L-1600 DRAM with ECC
- Up to two x4 Serial RapidIO® fabric ports:
  - AMC.4 Type 5 or AMC.4 Type 5 and Type 10
  - Gen 1 and Gen 2
- 4 x Ethernet interfaces:
  - AMC.2 Type E2 (2 x Gigabit interfaces, SerDes type)
  - 2 x 10GBase-T interfaces via front panel
- Up to 3 x external USB 2.0 ports:
  - 1 front and optionally 2 rear
- Support for onboard SATA Flash Disk Module
- Up to 4 x Serial ATA interfaces on rear I/O:
  - AMC.3 Type S2
  - optionally two additional interfaces
- 2 x RS232 serial channel interfaces:
  - 1 front and optionally 1 rear
- Dual 8 Mbytes of BIOS Flash EPROM
- Hot swap compliant:
  - compliant to AMC.0
- IPMI (Intelligent Platform Management Interface):
  - IPMI Version 1.5 according to AMC.0
- Watchdog timer and Long Duration Timer
- Support for Linux® and VxWorks®
Central Processor
- 4th generation Intel® Core™ processor:
  - 4-core Intel® Core™ i7-4700EQ processor up to 3.4 GHz, 6M Last Level cache
  - 2-core Intel® Core™ i5-4410E processor 2.9 GHz, 3M Last Level cache
  - Intel® Advanced Vector Extensions 2 (AVX2)
  - Intel® AES New Instructions (AES-NI)
  - utilizes the Intel® QM87 Platform Controller Hub

DRAM
- up to 16 Gbytes soldered DDR3L-1600 ECC DRAM:
  - single bit error correction
  - peak bandwidth of 25 Gbytes/s
  - dual channel architecture
  - accessible from processor and AMC connector

PICMG® AdvancedMC™ Interfaces
- hot swap compliant to AMC.0
- factory build options for single or dual x4 Serial RapidIO® (Gen 1 and Gen 2) fabric connection:
  - AMC.4 Type 5 or AMC.4 Type 5 and Type 10
- rear I/O compliant to AMC.4 specification
- can be configured for compliance with the requirements of the SCOPE Alliance

Ethernet Interfaces
- dual SerDes interfaces via AMC connector:
  - AMC.2 Type E2
  - supporting 1000Base-BX
- 2 x front panel 10 Gbit Ethernet interfaces implemented with Intel® X540AT2 controller supporting:
  - 10GBase-T
  - 1000Base-T
  - 100Base-TX full duplex

Storage Interfaces
- up to 5 x Serial ATA interfaces:
  - AMC.3 Type S2
  - optionally two additional interfaces in AMC connector extended options region
  - supports an optional SATA Flash Disk Module with a minimum capacity of 8 Gbytes

Serial Interfaces
- up to 2 x RS232 serial channels:
  - 1 channel via IEEEl1994 front panel connector (adapter cable available)
  - optionally 1 channel in AMC connector extended options region
  - 16550 compatible UART
  - modem control signals supported:
    - front channel supports TxD, RxD, CTS and RTS
    - rear channel supports TxD, RxD, CTS and RTS

Other Peripheral Interfaces
- PCIe-compatible Real Time Clock
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability
- CPU temperature monitor; voltages monitor:
  - all accessible via IPMI
- 1 x 3 USB 2.0 ports:
  - 1 port via front panel
  - optionally 2 ports in AMC connector extended options region
- PCI Express Gen 2 x2 port option in AMC connector extended options region

Software Support
- support for Linux® and VxWorks®

Firmware Support
- Insyde Software InsydeH20™ BIOS:
  - includes Compatibility Support Module
  - Intel® Platform Innovation Framework for EFI
  - LAN boot firmware included

Flash EPROM
- dual 8 Mbytes of BIOS SPI Flash EPROM

User EEPROM
- 8 Kbytes Flash memory primarily for User data
- storage of OS boot parameters

Telecoms Clock
- TCLKA clock input to board logic
- increments 64-bit counter in board logic

IPMI
- IPMI Version 1.5 according to AMC.0
- on-board BMC (Board Management Controller)
- supports 8 Kbytes of non-volatile memory

Safety
- PCB (PWB) manufactured with flammability rating of 94V-0

Electrical Specification
- typical current figure with 4-core Intel Core i7-4700EQ processor operating at 2.4 GHz, 8 Gbytes DRAM, single Serial RapidIO:
  - +12V @ 3.3A, voltage ±2V
  - +3.3V @ less than 0.15A, voltage ±5%

Environmental Specification
- operating temperature:
  - 0°C to +55°C (N-Series)
- storage temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing

Mechanical Specification
- AMC.0 Single Module form-factor
- 180.6mm x 73.5mm (7.1 inches x 2.9 inches)
- Full-size panel: 29mm (1.1 inches):
  - Mid-size variants available, contact sales

ORDERING INFORMATION
<table>
<thead>
<tr>
<th>Order Number</th>
<th>Product Description (Hardware)</th>
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<tbody>
<tr>
<td>AM C1x/msd-yz</td>
<td>4th generation Intel Core processor where x = processor core selection and m = front panel size where s = processor speed variant</td>
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For the order number suffix (d-yz) options please contact your local sales office:
where d = DRAM size
where yz = I/O Configuration

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<thead>
<tr>
<th>d =</th>
<th>up to 16 Gbytes DRAM</th>
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Specification subject to change: E and OE.