# AM F5x/msd

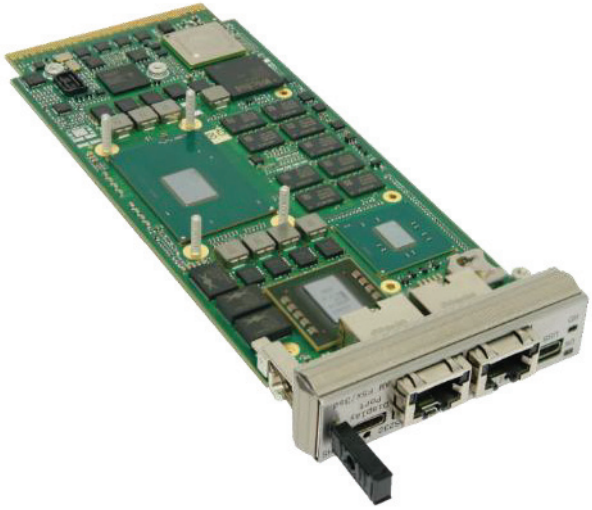
## N, E - Series

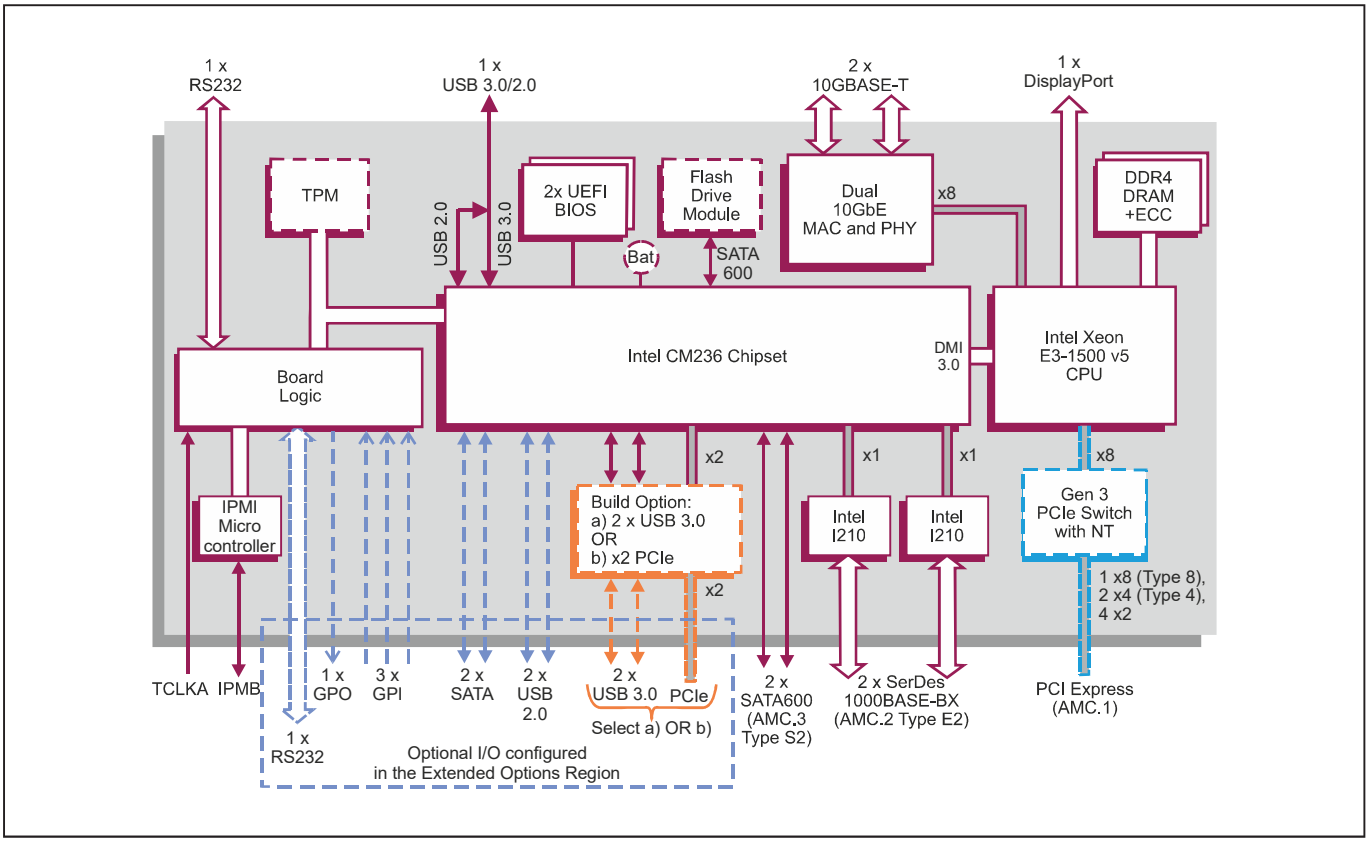
# AdvancedMC® Module based on Intel® Xeon® Processor E3-1500 v5 Product Family

## Key Features

AM F5x/msd is an AdvancedMC® Single Module (Mid-size or Full-size) based on an Intel® Skylake microarchitecture processor for long life-cycle, high performance applications. Compatible with legacy AMC modules.

- 4-core Intel® Xeon® processor variants for CPU or GPU intensive processing loads
- Gen 3 PCI Express® fabric interface options for flexible connection to other payloads
- Front panel connections including:
  - 2 x 10GBASE-T Ethernet for networking
  - DisplayPort™ v1.2, USB 3.0 and Serial interfaces for configuration
- Optional Flash Drive Module for local boot and data storage
- Optional I/O in extended options region



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# Specification

### AdvancedMC Computer Board

- AdvancedMC (AMC) Module utilizing the Intel Xeon Processor E3-1500 v5 Product Family
- AMC form factor is a Single Module supporting:
  - → Mid-size front panel
  - → Full-size front panel
- AMC Fabric Interface supports:
  - → PCI Express (PCIe )

### Central Processor

- Intel Xeon processors supported
- 4-core Intel Xeon Processor E3-1515M v5:
  - → 8 Mbytes Cache, 2.80 GHz
  - → Intel® Iris™ Pro Graphics P580
- 4-core Intel Xeon Processor E3-1505M v5:
  - → 8 Mbytes Cache, 2.80 GHz
  - → Intel HD Graphics P530
- 4-core Intel Xeon Processor E3-1505L v5:
  - → 8 Mbytes Cache, 2.00 GHz
  - → Intel HD Graphics P530
- utilizes the Intel CM236 Chipset

### DRAM

- 16 Gbytes soldered DDR4 ECC DRAM:
  - → single bit error correction
  - → dual channel architecture
- accessible from processor and AMC connector

### PICMG AdvancedMC Interfaces

- PCIe fabric connection (build option):
  - → AMC.1 Type 8 or Type 4 (1 x8 or 2 x4 PCIe port)
  - → plus user configurable to 4 x2 PCIe port
  - → support for Gen 1, Gen 2 and Gen 3
  - → transfer rate up to 8 Gbps
  - → supported by a DMA engine in the PCIe switch
  - → external or on-board fabric clock support
- hot swap compliant to AMC.0
- rear I/O compliant to AMC specification

### Storage Interfaces

- up to 4 x SATA interfaces:
  - → AMC.3 Type S2 (2 x SATA600)
  - → 2 x SATA in AMC connector extended options region (build option)
- optional SATA600 Flash Drive Module

### Ethernet Interfaces

- dual SerDes interfaces via AMC connector:
  - → AMC.2 Type E2 (2 x 1000BASE-BX)
  - → implemented using two Intel Ethernet Controller I210-IS devices
- 2 x front panel 10 Gigabit Ethernet interfaces via RJ45 connectors:
  - → 10GBASE-T
  - → 1000BASE-T
  - → 100BASE-TX full-duplex
  - → implemented using an Intel Ethernet Controller X540-AT2 device

### Serial Interfaces

- 1 x RS232 interface via front panel Micro USB connector:
  - → supports TxD and RxD
- 1 x RS232 interface in AMC connector extended options region (build option):
  - → TxD, RxD, RTS and CTS
- 16550 compatible UARTs

### Display Interface

- 1 x DisplayPort™ v1.2 interface via front panel Mini DisplayPort connector:
  - → up to 3840 x 2160 @ 60 Hz
  - → resolution is dependent on the device driver
- support for Microsoft DirectX 12
- support for OpenGL 4.4 under Windows and Linux
- support for OpenCL 2.1

### Stereo Audio Interface

- DisplayPort interface supports stereo audio

### Other Peripheral Interfaces

- PC-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 GPO and 3 x GPI in AMC connector extended options region (build option)
- up to 5 x USB ports:
  - → 1 x USB 2.0/3.0 via front panel (USB Type C connector)
  - → 2 x USB 2.0 in AMC connector extended options region (build option)
  - → option for 2 x USB 3.0 (replaces x2 PCIe port) in AMC connector extended options region (build option)
- option for x2 PCIe port (replaces 2 x USB 3.0) in AMC connector extended options region (build option):
  - → supports 1 x2 or 2 x1 PCIe ports (up to Gen 2)

### Telecom Clock

- TCLKA clock input to board logic:
  - → increments 32-bit counter in board logic

### Software Support

- supports Linux , Windows and VxWorks
- Fabric Interconnect Networking Software (FIN-S):
  - → allows applications on multiple processor boards to efficiently communicate with each other over the fabric
  - → optional software, see separate datasheet

### Board Security Features

- option for Trusted Platform Module (TPM 2.0)
- option for Sanitization Utility Software Package
- option for proprietary board-level security features

### Firmware Support

- UEFI 2.4 boot firmware (BIOS):
  - → UEFI 2.4 support
  - → includes Compatibility Support Module
  - → implements Secure Boot
- optional Fast Boot solution based on the Intel Firmware Support Package (Intel FSP)
- LAN boot firmware included

### Non-Volatile Memory

- 16 Mbytes of BIOS Flash EEPROM, dual redundant devices

### IPMI

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

### Electrical Specification

- typical current consumption for 4-core Intel Xeon E3-1505M v5 processor with 16 Gbytes DRAM:
  - → +12V @ 2.5A typical voltage 2V
- +3.3V @ less than 0.13A, voltage 5%

### Safety

- PCB (PWB) manufactured with flammability rating of UL94V-0

### Environmental Specification

- operating temperature:
  - → 0 C to +55 C (N-Series)
  - → -25 C to +70 C (E-Series, selected processor)
  - → all processors for Full-size AMC
  - → selected processor for Mid-size AMC
- non-operating 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 panel: 19mm (0.75 inches)

### Compatible with Legacy Modules

- factory build options enable compatibility with legacy AMC processor modules, e.g.:
  - → AM 91x/11x and AM 91x/31x
  - → AM 92x/11x and AM 92x/31x
  - → AM 95x/11x and AM 95x/31x

Please contact your local Concurrent Technologies sales office for further details on board build options and accessories.

Datasheet Code 1775/0519