RapidIO

DATASHEET

MERCURY COMPUTER SYSTEMS

Ensemble MPC-102 Dual-Core 8641D AMC Module

Dual-Core Processing Power and Flexible High-Bandwidth I/O

- Freescale™ MPC8641D processor delivers up to 15 GFLOPS
- Fully compatible with both ATCA and µTCA Ensemble™ platforms
- Choice of serial RapidIO® or PCI Express® switch fabrics
- I/O of 16 Gbps handles streaming datasets

The Ensemble™ MPC-102 Dual-Core 8641D AMC Module from Mercury Computer Systems combines dual-core processing power and flexible I/O for AdvancedTCA® (ATCA) and MicroTCA® (µTCA) platforms. The MPC-102 supports an MPC8641D Power Architecture™ processor running at up to 1.06 GHz, combined with memory and I/O options for maximum application flexibility. The module is a single-width AMC, either mid-height or full-height, differing only by faceplate. It includes an IPMI controller, firmware, and IPMI links for chassis management-based control and configuration.

The MPC-102 is well suited to provide high-performance computing for applications as diverse as wireless base stations, wafer lithography, and test and measurement in telecom, industrial control, silicon inspection, and other industries.

Memory for Dual-Core Processing

The MPC-102 Module has a dual-core MPC8641D processor, 128 MB of NOR flash, and two DDR2 memory buses, one for each of the processor's independent memory controllers. Although each DDR2 memory bus has its own bank of memory, both banks of memory are available to both processing cores.

Switch-Fabric Choices

Switch-fabric communications via the AMC connector can use either serial RapidIO® or PCI Express®. For 1x/4x serial RapidIO (AMC fat pipe Ports 4-7), each link provides a peak data transfer rate of 2.5 Gbps, resulting in a peak aggregate transfer rate of nearly 10 Gbps for the 4x connection. The PCI Express fabric option is x8, x4, x2, x1 PCI Express at AMC fat pipe Ports 8-11 and 4-7.

Gigabit Ethernet and SATA

The module has four Ethernet connections: two to the front panel and two to the AMC connector. The front panel connections are 10/100/1000Base-T. The AMC connector supports dual 1000Base-BX Ethernet connections at AMC common option Ports 0-1. A serial ATA (SATA) interface to the AMC connector supports efficient movement of data to disk storage.

Ensemble Platform

The MPC-102 AMC Module contributes a cost-effective, high-performance dual-core processor to the Ensemble Serial RapidIO ATCA Platform. The Ensemble Platform is a standards-based solution built around the power, functionality, and scalability of serial RapidIO, AdvancedMC®, AdvancedTCA, and MicroTCA. The platform supports a variety of I/O sources and heterogeneous processing endpoints, thereby reducing integration costs, improving efficiency, and minimizing risks in design of next-generation applications.

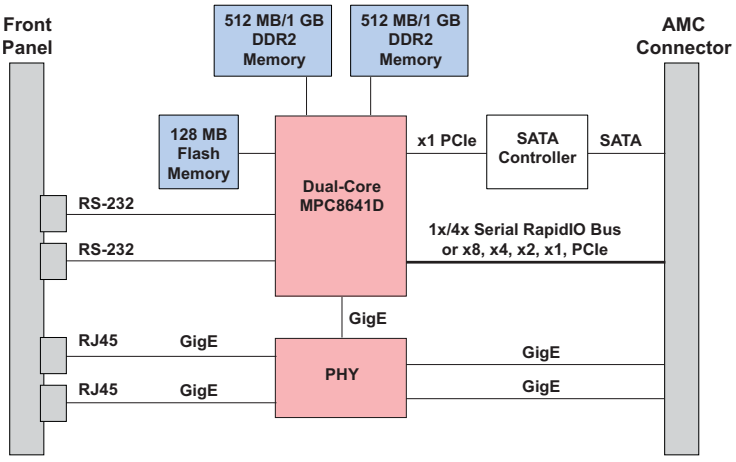

Figure 1. *Ensemble MPC-102 block diagram*

The Ensemble Platform has many advantages that accelerate application development activities:

- The variety of heterogeneous Ensemble AMCs allows developers to customize applications with options to plug in host processors, radio cards, or a network interface card (NIC) AMC.
- AMCs can be combined with Ensemble carrier boards that provide RapidIO chip-to-chip and across-the-chassis connectivity, enabling seamless scaling from a single-sector system to multisector, multi-antenna, multicarrier base-station implementations.
- Ensemble offers developers the flexibility to easily expand specific processing nodes to address application performance bottlenecks. Additional FPGA or DSP modules over RapidIO can be used to support specific application requirements.
- The homogeneous RapidIO interconnect among processing nodes enables ease of programming of DSPs, communication processors, and FPGAs.

Specifications

Processor

Freescale MPC8641D processor
- Dual-core (e600) Power Architecture
- Up to 1.06 GHz

Memory

Flash
- 128-MB NOR

DDR2 SDRAM
- 2 banks
- Up to 1 GB each

Memory buses
- 2
- Each at up to 400 MHz
- 64 bits wide

AMC connector

Switch-fabric options
- 1x/4x serial RapidIO
  - AMC fat pipe Ports 4-7
- x8, x4, x2, x1 PCI Express
  - AMC fat pipe Ports 8-11 and 4-7, not AMC.1 compliant

Dual 1000Base-BX Ethernet connections
- AMC common option Ports 0-1

Serial ATA (SATA) connection
- AMC common option Port 2

IPMB

Renesas HD64-F2166 micro-controller
FRU 4-KB serial EPROM
Two NE1618DS temperature sensors with diodes
- One external diode
- One internal diode to the 8641D

IPMB-L 2-wire interface to carrier
Voltage monitoring

Front-Panel I/O

Two RJ45 10/100/1000Base-T Ethernet ports
MPC8641D UART via micro-DB9 and DB9 Y-cable
IPMI UART or second MPC8641D UART, jumper selectable

Mechanical

Full-height
- Width: 73.81 mm; Depth: 180.6 mm; Height: 28.96 mm

Mid-height
- Width: 73.81 mm; Depth: 180.6 mm; Height: 18.96 mm

Supports AMC B+ bays

Test and Development

16-pin JTAG MPC8641D emulator connector
14-pin JTAG/programming header for IPMI controller
ICT test points
Full JTAG chain from AMC connector

Power Consumption

Consult factory.

Software Support

Linux® and VxWorks® support

1299.02E-1008-DS-MPC102

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