IDT partners the technology of Freescale Semiconductor, one of the world's leading semiconductor companies, with IDT's industry-proven Tsi578 16/8 RapidIO switch to create an AMC form-factor development platform. The AMC combines the industry's highest performing programmable DSPs and the lowest power Serial RapidIO switch available.

### Tsi578 and Freescale AMC

The AMC leverages Serial RapidIO interconnect technology, using IDT's Tsi578 switch to cluster four Freescale MSC8144 multi-core DSPs in an AMC single-width form factor enabling the development of AdvancedTCA and MicroTCA-based systems.

### AMC Block Diagram
AMC Features

I/O Features
- Standards-based AMC Connector
- Two Gigabit Ethernet interfaces
- Two 1x/4x Serial RapidIO Ports
- TDM (16Tx, 16Rx, SYNC, CLK)

Front Panel Expansion and Debug Features
- One Gigabit Ethernet interface (RJ45)
- One JTAG interface
- One UART interface
- SPI/I2C Programming Headers

Electrical Characteristics
- Differential AC-coupled 156.25 MHz reference clock for the serial transmit and internal switching fabric domains
- Powered through an AMC connector from in a chassis or three-pin on-board power connector for a bench power supply
- PICMG AMC.0 R2 standard, single width, full height module
- 12 V DC power supply from AMC connector.
- Power requirements:
  - 3.3 V for I/O
  - 1.0 V for the MSC8144 Core
  - 1.2 V for MSC8144 M3 memory and the Tsi578 Core
  - 1.2 V, 1.5 V, and 2.5 V for Ethernet

AMC Benefits
- Tsi578-to-MSC8144 4x Serial RapidIO connections ensure high bandwidth data transfer in applications such as WiMAX, 3G LTE, and Video Conferencing
- Optimal routing of AMC with four DSPs
- Off-loads DSP termination overhead for the data plane using Serial RapidIO
- High-bandwidth Serial RapidIO data plane
- Gigabit Ethernet implemented for the control plane
- Redundant 4x Serial RapidIO interfaces to the AMC connector for high reliability applications
- Rapid development and prototyping of application software

Applications

Freescale and IDT created the AMC to address interconnect bandwidth requirements of up to 10 Gbps between on-board components in the following key applications:
- 3.5G and 4G Wireless base stations
- Radio network controllers
- Media gateways
- Video conferencing
- Radar signal processing
- High-density video conference MCU

These processing-intensive applications require high performance DSPs and the high throughput, low latency characteristics of a RapidIO solution.

Interoperability

IDT and Freescale have proven RapidIO connectivity between the IDT Tsi578 and the Freescale MSC8144 across physical, logical, and transport layers. Additionally, IDT’s Tsi578 has successfully passed interoperability testing (Level 3 certification) by RIOLAB, the world’s only independent Serial RapidIO testing facility. Visit www.rio-lab.com for more information.

Device and Board Information

About the Tsi578/Freescale MSC8144
The Tsi578 is IDT’s third-generation RapidIO switch. Supporting 80 Gbps aggregate bandwidth, the Tsi578 enables customers to develop high-performance RapidIO systems at low cost.

The Tsi578 flexible port configurations can be selected through multiple port width and speed options. The device can be configured as a 16-port 1x mode switch or an 8-port 4x mode switch (or various combinations of 1x mode and 4x mode). Each port can operate at 1.25, 2.5, or 3.125 Gbaud.

About the Freescale MSC8144
The MSC8144 takes single-chip DSP integration to a new level of sophistication, combining four StarCore® DSP cores at up to 1 GHz each, delivering the industry’s highest performance, equivalent to a 4 GHz single-core DSP. The device integrates the industry’s largest embedded memory at 10.9 MB, enabling higher throughput to memories than external DDR while reducing chip count and BOM. The part leverages dual RISC QUICCEngine technology at 400 MHz to offload networking protocols, and it offers high-speed interfaces such as the 4x mode Serial RapidIO and dual SGMII Gigabit Ethernet interfaces.

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