Tsi576™
Serial RapidIO® Switch

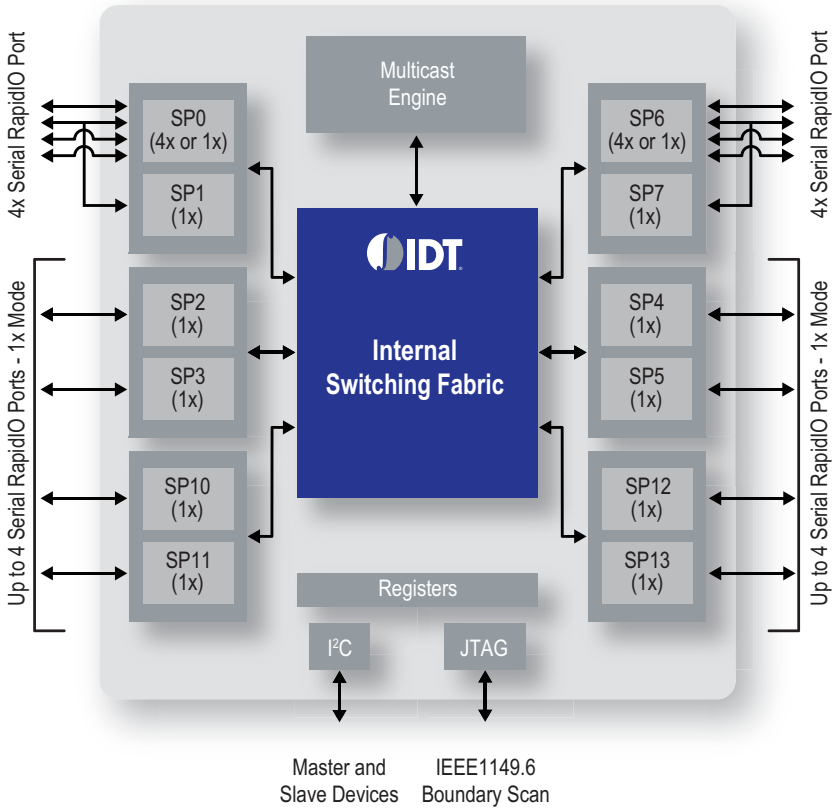
FEATURES

Serial RapidIO Interfaces

- 40 Gbps aggregate bandwidth
- RapidIO Interconnect Specification (Revision 1.3) compliant
- Low latency with cut-through capability
- Port flexibility fulfills multiple I/O bandwidth requirements:
  - Up to twelve 1x mode ports or two 4x mode plus eight 1x mode ports
  - Port frequency configuration to 1.25, 2.5, and 3.125 Gbps
  - Support for mixed speed configurations
  - Multicast Event Control Symbol
- Low Power
  - 200 mW per port power dissipation
  - Programmable SerDes
  - Configurable on port width and speed
  - Per port power down
- High performance hardware multicast provides us packet replication on any number of ports
- Error management extensions
  - Proactive issue notification of endpoints connected to switch, supports port writes
- Integrated high-speed, full-duplex SerDes with 8b/10b encoding
  - Receiver equalization, transmit pre-emphasis, transmit voltage swing
  - IEEE 1149.6 and 1149.1 JTAG support
  - Lane swap to ease signal layout routing
- Full duplex, line rate termination, non-blocking fabric
  - First-come/first-served, SP1 and SP2 scheduling algorithms, supports traffic shaping per ingress port based on board and system level traffic models
  - Performance monitoring on individual ports
  - Programmable buffer management to ensure dedicated bandwidth for high priority packets
  - Provisions to eliminate low priority packet starvation
  - Low Latency through packet cut-through
  - Prevention of head-of-line blocking
- Supports packet routing tables for 64,000 endpoints

Other Device Capabilities

- I²C Interface
- Master and Slave
- Configuration through register initialization
- Hot-swappable ports
- Enables use in field replaceable blade applications



Device Overview

The Tsi576™ is part of IDT's third generation RapidIO switch family supporting 40 Gbps aggregate bandwidth. The Tsi576 enables customers to develop systems with robust features and high performance at low cost.

The Tsi576 provides designers and architects with maximum scalability to design the device into a wide range of applications. Flexible port configurations can be selected through multiple port width and frequency options. Each of the ports can be run at 1.25 Gbaud, 2.5 Gbaud or 3.125 Gbaud.

Building on IDT's industry leading RapidIO switch family, the Tsi576 contains all the benefits of its predecessors plus enhances the fabric switching capabilities through the addition of multicast, traffic management through scheduling algorithms, programmable buffer depth, and fabric performance monitoring to supervise and manage traffic flow.

Embedded applications further benefit from the ability of the Tsi576 to route packets to multiple endpoints through hierarchical lookup tables, independent unicast and multicast routing mechanisms, and error management extensions that provide proactive issue notification to the fabric controller. In addition, the Tsi576 supports both in-band serial RapidIO access and out-of-band access to the full fabric register set through the I²C interface.

BENEFITS

- Improves overall system performance through easy implementation of distributed processing between DSPs in clusters.
- Offers the best cost to performance ratio for aggregation of local traffic to backplane in this type of heterogeneous port mix.
- Frees DSPs resources for actual application processing versus terminating protocol stacks in software.
- Lowers power usage to only 200 mW per port through industry leading PHY technology
- Reduces complexity of clock circuit design by requiring only one clock input
- Increases signal integrity at the board and system level
- Uses I²C in ATCA systems - the IPMI controller can interrogate the Tsi576 through I²C

Specifications

- Technology: 0.13um
- Voltage: 1.2V and 3.3V
- Low power consumption
- Package: 399 ball, 21mm x 21mm, 1mm ball pitch FCBGA
- Rated for commercial and industrial temperatures

Target Markets

- Wireless Infrastructure
  - – Node B, Radio Network Controller, Media Gateway
- Video Infrastructure
  - – Broadcast, imaging, and encoding
- Communications Wireline Infrastructure
  - – Multiservice WAN Switches, 1 to 10 Gbit Ethernet Switches, 1 to >10Gbit Routers, DSLAMs
- Storage
  - – Storage Area Networks, Network Attached Storage, High-Performance Work Stations, Multi-service Access Nodes, Carrier-grade VoIP
- Military
  - – Radar and signal processing
  - – Image processing
  - – Acoustic signal processing
- Architecture Standards
  - – ATCA, MicroTCA, VXS, VPX

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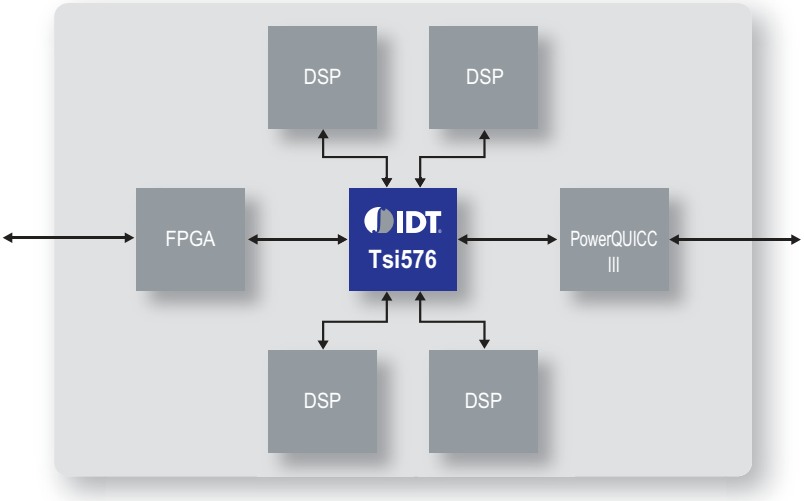
Typical Applications

The Tsi576 can be used in many embedded communication applications. It is designed for systems with chip-to-chip DSP and processor aggregation, and connecting to network/backplanes.

The Tsi576 provides traffic aggregation through packet prioritization when it is used with RapidIO-enabled I/O devices. When it is in a system with multiple RapidIO-enabled processors it provides high performance peer-to-peer communication through its non-blocking switch fabric.

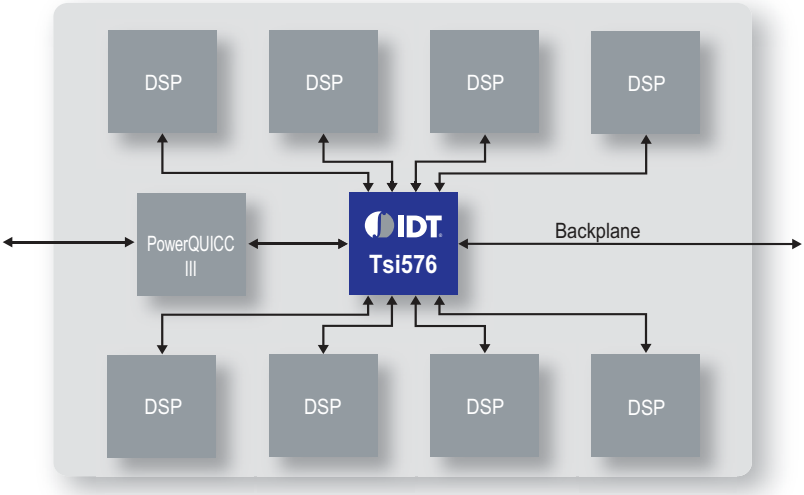
In wireless baseband, the Tsi576 provides a local interconnect between DSP used for chip rate processing assist and symbol rate processing. This provides a scalable architecture to support more subscribers per card.

Wireless Baseband Card



In video infrastructure cards, equipment vendors must maximize the number of DSPs per card to manage compression and decompression algorithms. These DSPs are controlled by a local processor and all these components are linked together by a low power, small form factor, low latency, multicast enabled Tsi576.

Video Infrastructure Card



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