Tsi577™ Serial RapidIO® Switch

Integrated Device Technology

POWER MANAGEMENT | ANALOG & RF | **INTERFACE & CONNECTIVITY** | CLOCKS & TIMING | MEMORY & LOGIC | TOUCH & USER INTERFACE | VIDEO & DISPLAY | AUDIO

FEATURES

Serial RapidIO Interfaces

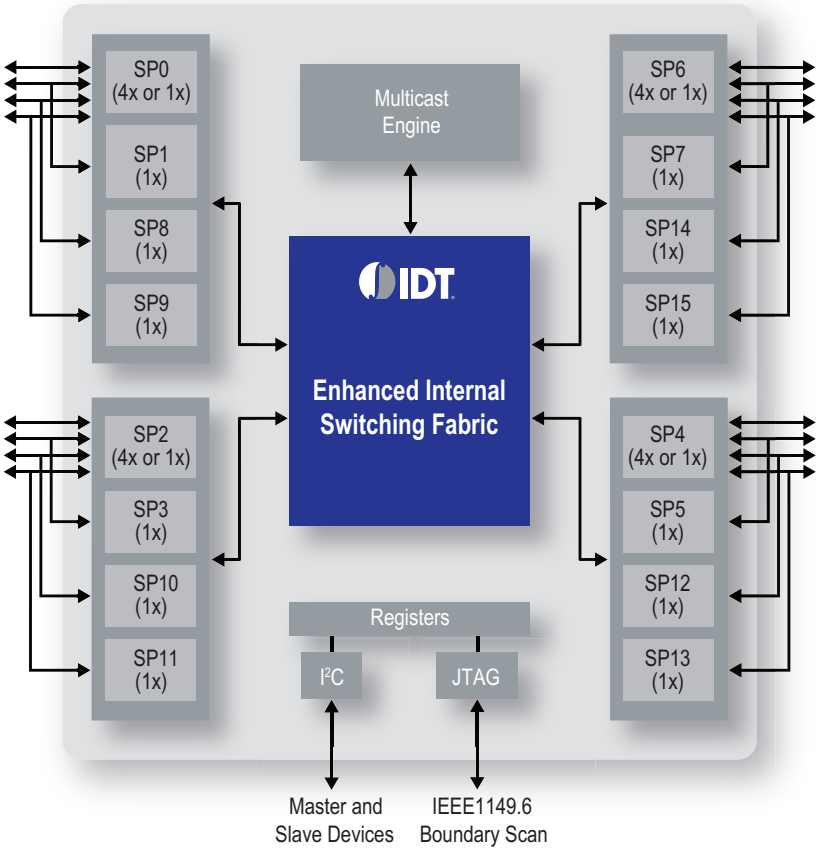
- 40 Gbps aggregate bandwidth
- Low latency with cut-through capability
- Enhanced SerDes for low power solution
- *RapidIO Interconnect Specification (Revision 1.3)* compliant
- High performance hardware multicast

The Tsi577 enhances system scalability and performance through support for mixed port configurations and extensive fabric management features.

- Error management extensions
  - Proactive issue notification
- Port flexibility fulfills multiple I/O bandwidth requirements:
  - Up to four 4x mode ports or sixteen 1x mode ports
  - Port frequency configuration to 1.25, 2.5, and 3.125 Gbps
  - Support for mixed speed and width configurations
- Integrated high-speed, full-duplex SerDes with 8b/10b encoding
  - Receiver equalization, transmit pre-emphasis, transmit voltage swing
  - IEEE 1149.6 support
  - Lane swap to ease signal layout routing
- Enhanced non-blocking internal switching fabric
  - Traffic management through scheduling algorithms
  - Performance monitoring on individual ports
  - Programmable buffer depth
  - Provisions to eliminate low priority packet starvation
- Supports packet routing tables for 64,000 endpoints

Other Device Capabilities

- I²C Interface
  - Master and Slave
  - Configuration through register initialization
- Hot Swap-enabled Ports
  - Enables use in field replaceable blade applications



Device Overview

The IDT Tsi577™ is IDT's fifth-generation RapidIO switch. Supporting 40 Gbps aggregate non blocking bandwidth at lower power than previous generation RapidIO switches.

Using the Tsi577, flexible port configurations can be selected through multiple port width and speed options. The Tsi577 can be configured as a 16-port 1x mode switch or a 4-port 4x mode switch (or various combinations of 1x and 4x modes). Each port on the device can be a single 4x mode port or four 1x mode ports and can operate at 1.25 Gbaud, 2.5 Gbaud, or 3.125 Gbaud (or any speed in between on a quad grouping basis).

The Tsi577 contains all the benefits of the previous RapidIO switch generations, including:

- Industry best Multicast performance
- Traffic management through scheduling algorithms
- Programmable buffer depth
- Fabric performance monitoring to supervise and manage traffic flow
- Reduced number of clocks
- Smaller Package size for 16x1 solutions
- Low short and long reach power
- Industry best signal integrity
- 110 ns cut-through latency

BENEFITS

- Scalability: Single solution for mesh, fabric, and aggregated systems
- Performance: Improved system and distributed processing performance
- Power: SerDes implementation for low power solution
- Ease of Design: Simplified board layout with one clock source

Specifications

- Technology: 0.13um
- Voltage: 1.2V and 3.3V
- Low power consumption
- Package: 21mm x 21mm, 1mm ball pitch Wirebond HSBGA
- Rated for commercial and industrial temperatures
- Forward compatible with the Tsi576 Serial RapidIO Switch allowing easy migration for existing systems.

Target Markets

The Tsi577 is targeted at the following applications:

- Chip-to-chip DSP and processor aggregation
- Board-to-board backplane interconnect
- Chassis-to-chassis interconnect over copper or optics

Design Support Tools

IDT is committed to helping customers minimize their time to market. That's why we provide one of the highest levels of design support in the industry, including:

- Application notes
- Evaluation boards
- IC models
- Hardware and software development tools

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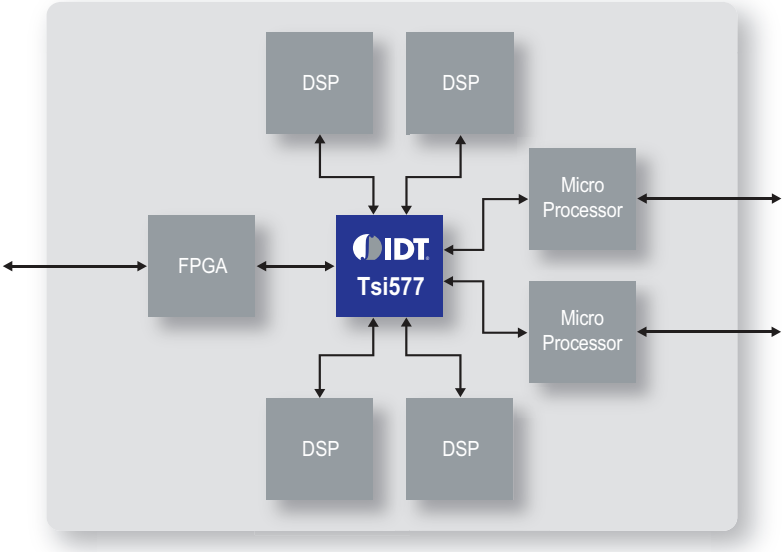
Typical Applications

The Tsi577 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 Tsi577 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.

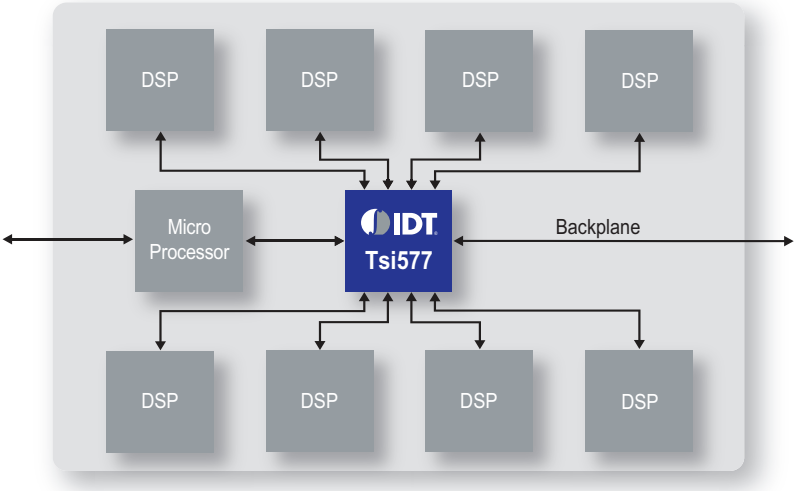
In wireless baseband, the Tsi577 provides a local interconnect between DSPs used for chip rate processing assist and symbol rate processing. This provides a scalable architecture to support more subscribers per card.

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 Tsi577.

Video Infrastructure Card



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