VPS-1616 Virtual Channel Serial RapidIO® Switch

Integrated Device Technology

FEATURES

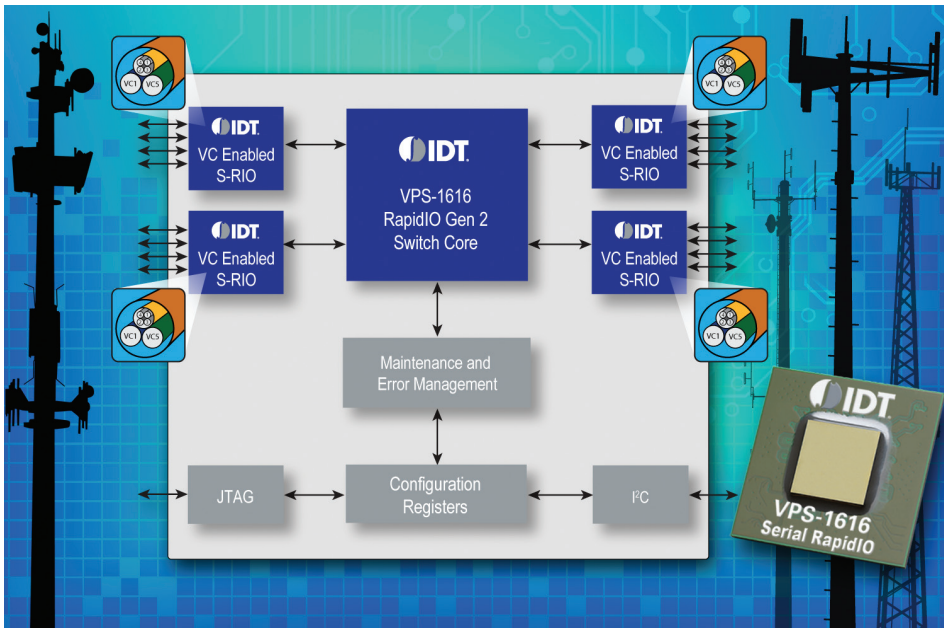
- Designed to the Serial RapidIO 2.1 Specification
- 16 lanes, with up to 4x4, 8x2, or 16x1 port configurations
- Full duplex 80 Gps non-blocking bandwidth
- Each quad configurable as 1x4, 2x2, or 4x1, supporting Virtual Channel 0, 1, and 5
- Virtual Channel Features
  - VC0 supports standard S-RIO 1.3 priorities and CRF
  - Minimum bandwidth reservation guarantees for each of VC0, VC1, and VC5 ensure throughput and deterministic latency
  - VC1 and VC5 support Continuous Transmission mode for real-time data transport
  - Buffers allocated to VC0 when VC1 and VC5 are disabled
  - Support for 64 outstanding packets for VC1 and VC5
  - "VC Migration Mode" allows for Gen 1 endpoints to communicate using VC1 and VC5
- Carrier-grade, high performance SerDes
  - 1.25, 2.5, 3.125, 5.0, or 6.25 Gbaud
  - Long reach 100 cm with 2 connectors
  - Transmit drive strength and pre-emphasis
  - Receive equalization with DFE
  - On-die scope
- Up to 40% power-per-gigabit savings vs. RapidIO 1.3 Switches
- Dynamic ingress and egress buffer management improves performance over RapidIO 1.3 switches
  - Better per-port throughput
  - Better system-level traffic engineering
- 40 multicast groups per port
- Cut-through and store-and-forward modes
- Cut-through latency of 100 ns
- RapidIO Error Management Extension support
- Error log captures sequence of errors
- Packet mirror, trace, filter per port
- Receiver- and transmitter-based flow control
- Per-port reset provides robust hot swap support
- Multicast Event Control Symbol (MECS) generation input pin
- Industrial and Commercial temperature grades

BENEFITS VS OTHER INTERCONNECT PROTOCOLS

- Drives highest performance backplane in industry with 20-Gbps data rate per link
- Lowest power per payload bit
- Ecosystem support for four levels of priority plus critical request flow, providing up to eight classes of traffic
- RapidIO standard supports arbitrary system topology with true peer-to-peer networking
- Twice the performance per link compared to 10-Gb Ethernet
- RapidIO messaging support for transfers of 4-KB messages in hardware

TARGET APPLICATIONS

- Wireless: baseband cards and backplanes in LTE/WiMAX/WCDMA/TD-SCDMA
- Defense and aerospace: RADAR, SONAR and navigation systems
- Medical imaging: CT scanners, MRIs
- Video: Teleconferencing and Head End
- Industrial control systems



IDT is the industry's leading supplier of RapidIO® interconnect solutions, providing a broad portfolio of switches, bridges, IP, and development platforms for the defense, aerospace, video, imaging, and wireless markets. The IDT VPS-1616 Serial RapidIO Gen2 switch is optimized for systems that are footprint constrained. It can support complex systems driving RapidIO links across backplanes, as well as for chip-to-chip interconnect on boards.

Device Overview

The VPS-1616 is a virtual channel enabled RapidIO switch. Using the VPS-1616, any physical link can be further subdivided into multiple virtual links or "virtual channels" as described by the RapidIO 2.1 specification. Using Virtual Channels (VC's), OEMs can design systems where the bandwidth utilization between switch to switch links is optimized for various classes of traffic. The use of Virtual channels improves overall S-RIO network traffic management, improving end application performance.

In addition to the above, the VPS-1616 supports all RapidIO features available in the pin-compatible CPS-1616 including a full, non-blocking bandwidth of 80 Gbps for up to 16 ports. The device uses a 5th generation switch fabric, building upon IDT's Gen1 switching architecture. This new switch uses patent-pending features to minimize latency, ensure scheduling fairness, and provide superior multicast throughput. The VPS-1616's 6.25 Gbaud SerDes is ideal for doing both local interconnect with low power, while also driving backplane links. This performance is realized over twice the transmission channel distance and three orders of magnitude improvement in bit error ratio (BER) compared to the very capable Gen1 standard.

Applications

IDT's Gen2 switches, in tandem with other Serial RapidIO endpoints, enable next-generation compute density and power efficiencies. This significantly increases channel capacity for 3G to 4G wireless infrastructure, media gateways, video conferencing, and defense and medical imaging systems. Full peer-to-peer networking makes systems of arbitrary topology possible. The VPS-1616 further improves system performance by using VC's to optimize the usage of available bandwidth on any physical RapidIO 2.1 link between IDT switches.

VPS-1616 BENEFITS FOR WIRELESS

- Carrier-grade reliable packet transport with virtual-channel features for optimized traffic management and S-RIO network bandwidth utilization
- VC0 supports traditional S-RIO 1.3 priorities and CRF
- VC1 and VC5 support both Reliable Transmission (RT) and Continuous Transmission mode (CT). CT mode is ideal for real-time support of video and voice traffic
- Internal packet buffer flexibility means that internal switch memory can be reallocated to VC0 when VC1 and VC5 is not used, ensuring optimum network throughput
- Carrier-grade 6.25 Gbaud SerDes enables backplane-based modular systems and system scaling by inter-chassis cabling

VPS-1616 BENEFITS FOR DEFENSE AND AEROSPACE

- Virtual Channel capability on switch-to-switch links improves performance of multi-switch cluster in an OpenVPX 24x4 port switch card
- VITA 41, OpenVPX, and ATCA fabric mappings enable rapid development of modular, standards-based systems
- RapidIO-standard, true peer-to-peer networking allows scaling of arbitrary topology and simplifies hot swap software implementation
- Per-port filter feature allows blocking errant packets or malicious attack (for example, denial of service, system memory reads and writes)

VPS-1616 BENEFITS FOR VIDEO AND IMAGING

- Continuous Transmission mode in VC1 and VC5 are ideal for real-time video and voice as packets can be dropped if necessary to guarantee latency
- 40 multicast masks per port provides strong support for broadcasting or multicasting a given data stream to multiple endpoints executing unique transforms, scaling, and CODECs
- IDT-proprietary "retransmit mimic" feature improves real-time support for latency sensitive lossy data transfers

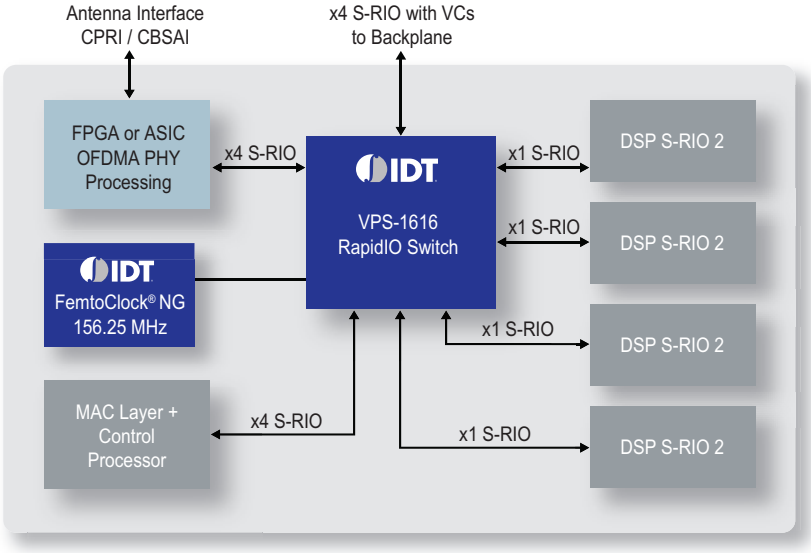
SOFTWARE AND HARDWARE ECOSYSTEM

- Serial RapidIO Development Platform Gen2 (SRDP2)
- RapidFET JTAG edition software support
- Serial RapidIO Gen2 Endpoint Intellectual Property for ASIC, CPU, DSP, and FPGAs
- Numerous partner RapidIO-enabled AMCs
- RapidIO Linux support
- Power Calculator tool
- HSPICE and IBIS models

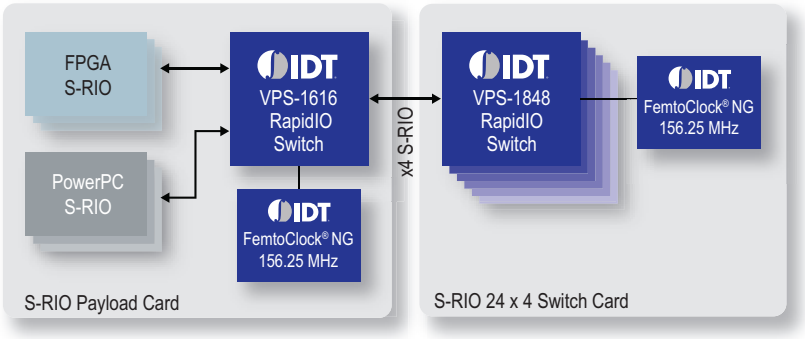
Discover what IDT know-how can do for you:

www.IDT.com/go/SRIOGen2

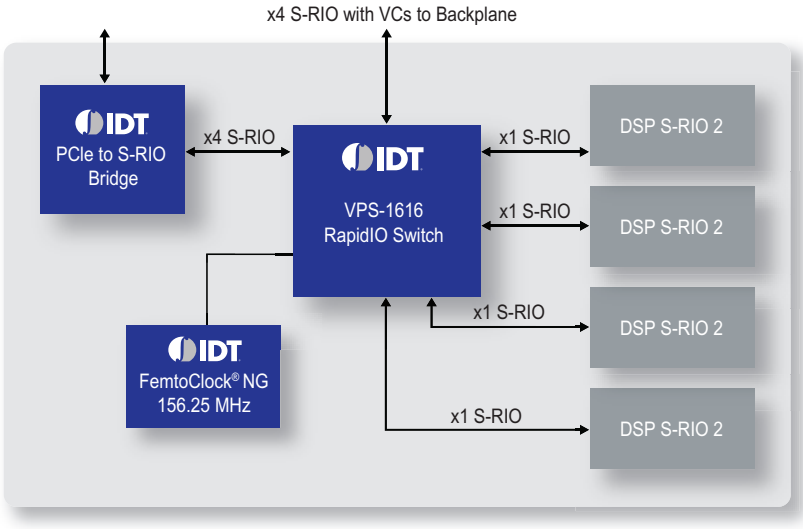
Wireless Application



Military OpenVPX Application



Imaging Application



PB_VPS-1616_REVB0211