

## FEATURES

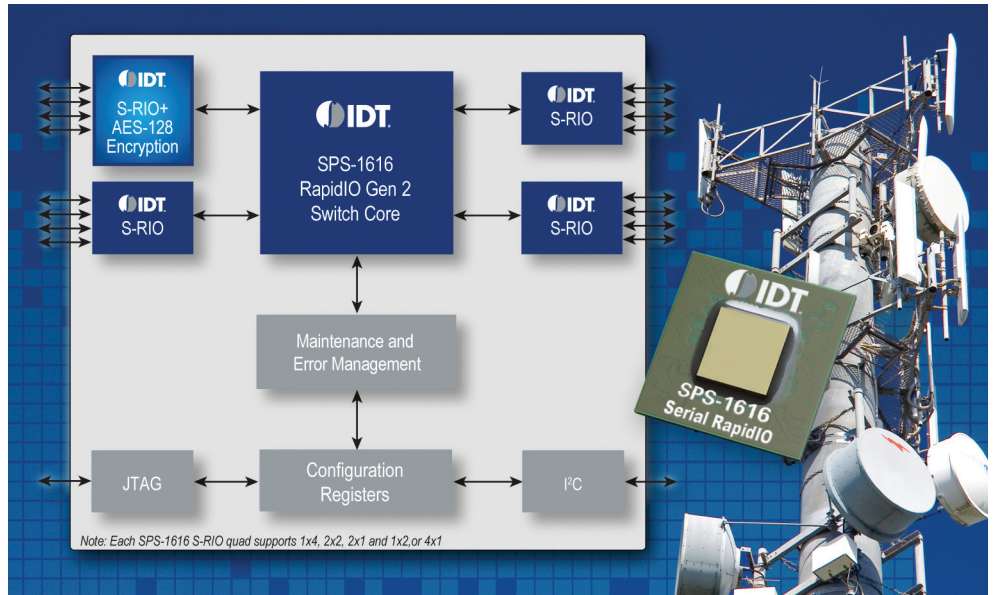
- Designed to the Serial RapidIO 2.1 Specification
- 16 lanes/4 quads
  - 1 quad configurable for AES-128 Encryption or standard RapidIO 2.1
  - 3 quads configurable for standard RapidIO 2.1 only
- Full duplex 80 Gbps non-blocking bandwidth
- Standard quads configurable as 1x4, 2x2, 2x1 and 1x2, or 4x1
- Secure quad configurable as either:
  - 4x1 with AES-128 security encryption
  - Standard RapidIO 2.1 as 1x4, 2x2, or 2x1 and 1x2, or 4x1
  - Zero impact to latency or throughput
- 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



## IDT RapidIO Gen2 AES-128 Encryption Enabled Switch

IDT is the industry's leading supplier of RapidIO® interconnect solutions, providing a broad portfolio of switches, bridges, IP, and development platforms for defense, aerospace, video, imaging, and wireless infrastructure markets. The IDT SPS-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 chassis-to-chassis links with hardware encryption and decryption

## Device Overview

The SPS-1616 is an AES-128 encryption RapidIO switch, which allows OEMs to implement hardware enabled encryption on RapidIO links that have to go outside a box, over cabling to an external network. This is ideal for applications where multiple boxes need to be cascaded to increase overall modularity and scalability of system deployment. By performing the encryption on transmit links and decryption on receive links in hardware, the SPS-1616 allows OEMs to maximize the 5 Gbps of data rate available on a x1 link with no increase to latency. This would not be possible with an encryption processor that would need to involve software in this process. By using the SPS-1616, system OEMs are able to develop high performance, scalable, RapidIO based networks. The SPS-1616 is ideal for system OEMs in meeting the security requirements for out-of-the-box cabling necessitated by the LTE specification.

In addition to the above, the SPS-1616 supports all RapidIO features available in the 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 SPS-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 SPS-1616 security features are optimized for the application needs of wireless and defense applications.

## SPS-1616 BENEFITS FOR WIRELESS

- Carrier-grade reliable packet transport with security features
- Hardware enabled security features allows OEMs to encrypt out-of-box links without software overhead and zero additional latency
- Maximizes available bandwidth on out-of-box links and meets LTE specification requirements
- Enables Wireless OEMs to develop scalable, stackable, small form-factor base stations while having high throughput between boxes and meeting security requirements
- SPS-1616 changes economics of network deployment by allowing OEMs to move from chassis based systems to small, scalable, modular systems improving network coverage
- Carrier-grade 6.25 Gbaud SerDes enables backplane-based modular systems and system scaling by inter-chassis cabling

## SPS-1616 BENEFITS FOR DEFENSE AND AEROSPACE

- Use security enabled link on front panel to provide network access while also protecting registers, etc. from intrusion by non-secure sources
- Serial RapidIO Error Management Extension support including Time-to-Live enables fault-tolerant systems
- 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)

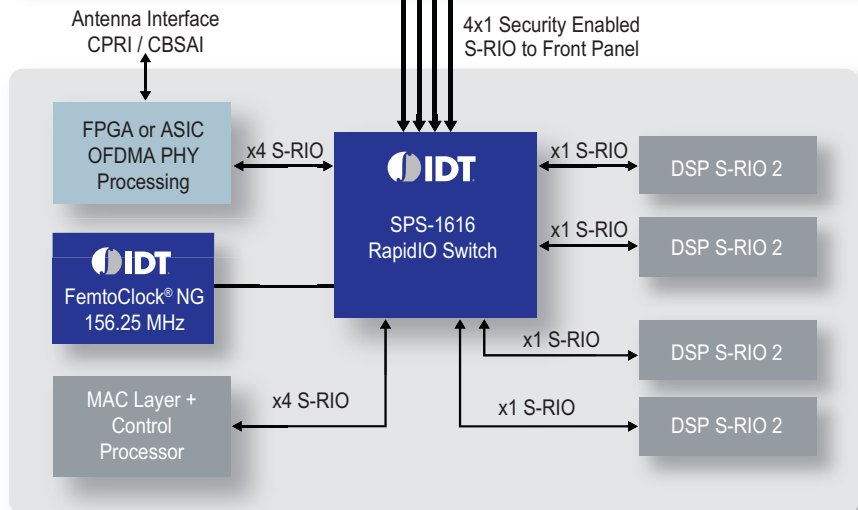
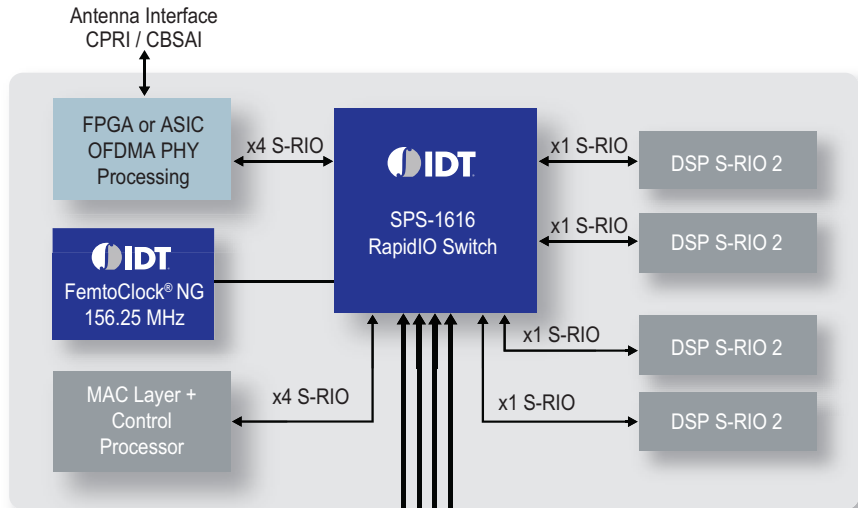
## SOFTWARE AND HARDWARE ECOSYSTEM

- 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](http://www.IDT.com/go/SRIOGen2)

## Wireless Application



## Military OpenVPX Application

