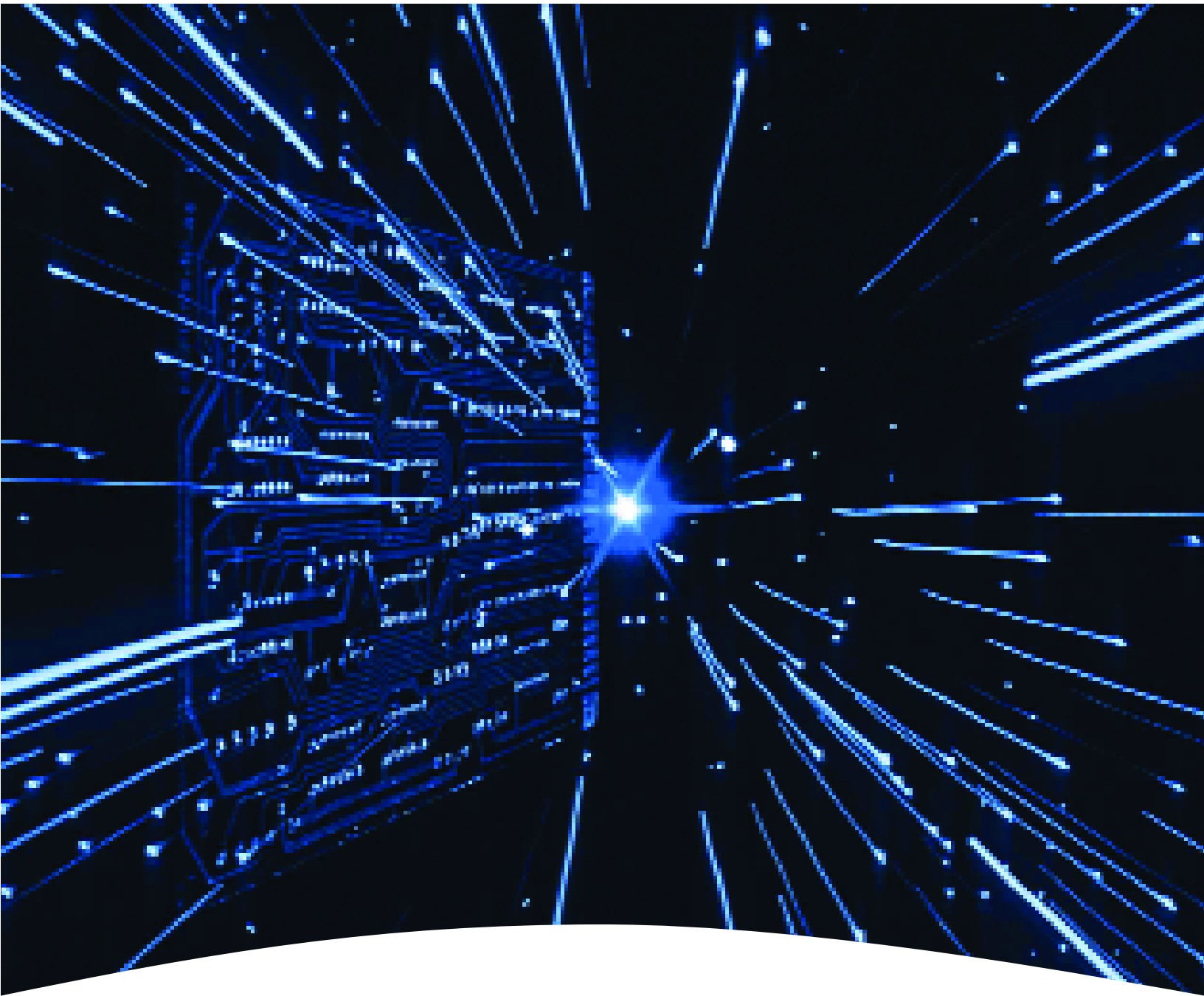


High-Speed Data Networking Technology



**Honeywell's Serializer/Deserializer (SerDes)
macro solution enabling high-speed
data communications**

Honeywell

Leveraging Commercial Technologies for Military Systems

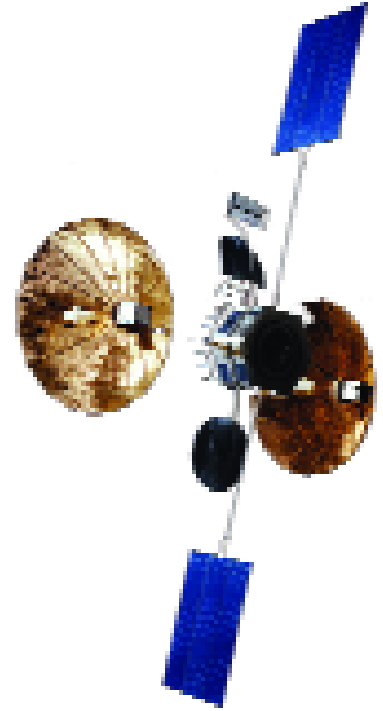
SerDes (Serializer/Deserializer) is a serial architecture for high-speed servers and communications networking systems that is a vital building block for commercial high-speed data communications. Now Honeywell is enabling optimized communication systems with a SerDes macro-cell for next-generation aerospace systems.

Communication networks developed with SerDes-embedded integrated circuits (ASICs) achieve significantly lower power, higher data throughput and more efficient ASIC area usage than traditional approaches for high-speed backplanes and box-to-box networking systems.

When implemented on Honeywell's 150-nanometer (nm) Silicon On Insulator ASIC platform, SerDes offers communication reliability and efficiencies required in sophisticated systems.

Honeywell's 150-nm HX5000 ASIC family, available as radiation-tolerant or radiation-hardened, features the following performance options:

- Up to 12M gates
- Standard cell library, embedded memories, PLL, DLL and specialized I/Os
- Low power dissipation
- Full military temp (-55C° to 125C°)
- SerDes macrocell

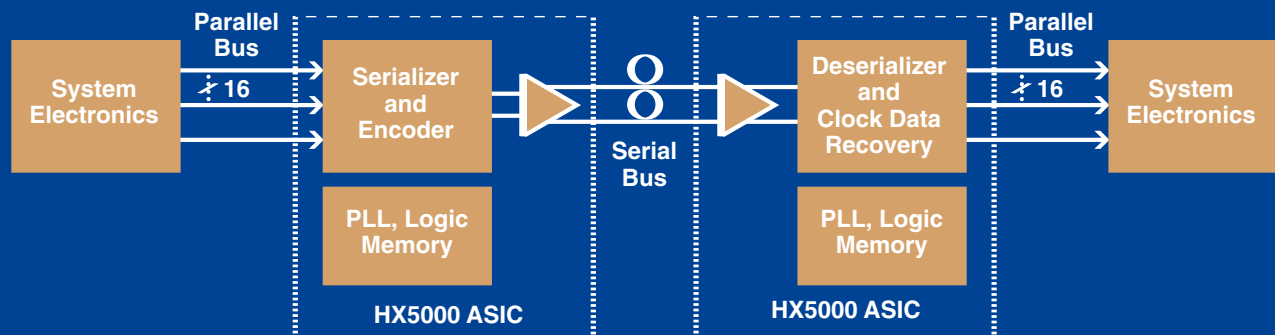


How SerDes Functions

A SerDes or serializer/deserializer converts parallel data to serial data and vice-versa. Honeywell's SerDes macro is embedded into an ASIC to perform data serializing/deserializing, formatting and encoding/decoding. Specifically, SerDes translates internal parallel bus data into serial data, formats it to the proper protocol, encodes and transmits. The receiver decodes serial data and converts it back into parallel data for processing.

SerDes chips are used in communications systems for point-to-point data transfer in high-speed data networking applications such as routers, backplanes and access switches, storage area network equipment and high-speed automatic test equipment.

Honeywell's SerDes macro, designed in SOI CMOS, increases bandwidth, decreases power consumption, and reduces the required signal pins and board/backplane routes. This equates to a significant reduction in overall system cost.



Example of a single channel transmission

Enabling Advanced Communications

Complex communication networks require sophisticated enablers like SerDes to reduce system cost, space and power. Next-generation space and military electronic system incorporating higher speed digital communications technologies – for aircraft, satellite and human space protocols – require Honeywell’s SerDes. Here’s why:

High Bandwidth

Honeywell’s SerDes supports data rates up to 4.25 Gbps per channel. Our macro was designed specifically to support 10 Gigabit dual attachment unit interface (XAUI) supporting 4 x 3.125 Gbps operation for 10 G Ethernet, and 4 x 3.1875 Gbps for 10 G Fibre Channel. 1G Ethernet and 1G/2G and 4G Fibre Channel are also supported.

Low Power

Low power consumption is achieved through both the SerDes serial architecture and the Honeywell 1.8 volt, 150-nm Silicon On Insulator (SOI) process. By using a serial I/O bus rather than parallel I/O bus, the number of output drivers is greatly reduced. The low operating voltage and small geometries of this technology further reduces on-chip power. This results in a typical power consumption of 1.7 Watts for 8 lanes operating at 4.25 Gbps.

Low I/O count

By using SerDes, board-level interconnects are typically reduced by as much as 70 percent over a parallel architecture approach. The lower I/O count drives a smaller package, reduces connector depths and relieves board routing congestion.

High Signal Integrity and Low Bit Error Rate (BER)

Honeywell’s SerDes macro provides several features to maximize data transmission performance. To improve signal integrity and improve BER, the SerDes has programmable output signal swing, pre-emphasis and equalization. This allows for reliable communications over 40 inches of backplane or 15 meters of cable.

High Flexibility

Honeywell’s SerDes macro provides programmability to meet different protocol requirements. It includes capabilities for individual channel programmability, selectable data rate and selectable signal shaping for optimization of individual channels.

Honeywell’s SerDes serves a wide variety of communication protocols:

- 1G Ethernet, 10G Ethernet XAUI and 10G Fibre Channel XAUI transceivers and MAC layer devices
- 1G/2G/4G Fibre Channel transceivers, Host Bus Adapters, and Switches
- IEEE 801.11AE compliant

SerDes is an ideal solution for delivering high data throughput while reducing the number of interconnects.

Data Communication Features

- Scalable SerDes macro
- Data rates up to 4.25 Gbps
- 1.8 Volt operation
- 1.7 W (typical) for 8 channels at 4.25 Gbps
- 8B10B encoder/decoder
- Integrated PLL
- High Signal Integrity
 - 8-Level Tx driver pre-emphasis
 - 8-Level Rx equalization
- Bit Error Rate < 10⁻¹⁴ (typical)



High-Speed Data Networking Technology

Partner with Honeywell

Honeywell provides complete design, manufacturing, test and packaging services through experts in design and ASIC implementation. And, by teaming up with the best-of commercial providers, Honeywell has created a path to first pass success of design and development of next-generation ASICs with embedded SerDes.

In addition to design support of very deep submicron, multi-million gate ASIC products, Honeywell offers SerDes design services, as well as post-manufacturing system integration support.

For more information about Honeywell's exciting, advanced SerDes technology or for assistance in developing your solution, call 1-800-323-8295 or visit www.myspaceparts.com

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