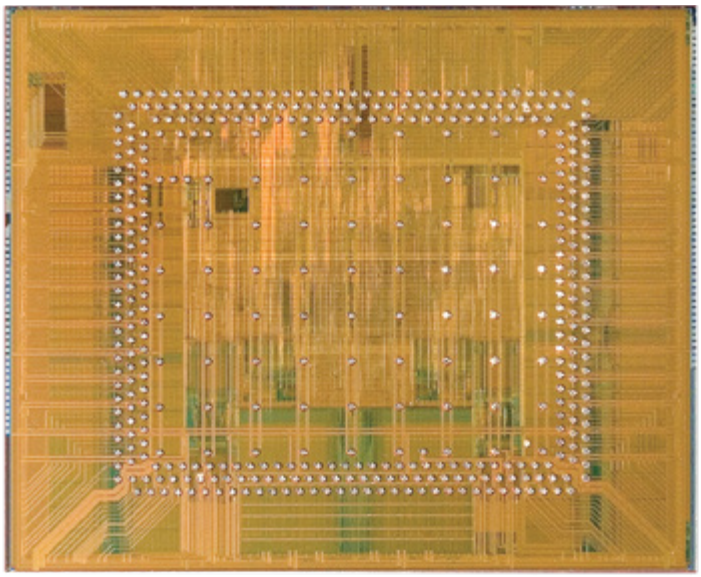
BAE SYSTEMS

SpaceWire 4-port router radiation-hardened ASIC



BAE Systems' SpaceWire is a fully ECSS-E-ST-50-12C-compliant, application-specific integrated circuit that incorporates quad SpaceWire, high-speed, point-to-point LVDS interfaces, a SpaceWire router, and dual PCI 2.0-compliant bus ports.

It supports data rates up to 260 MHz per link. The integrated LVDS I/O are cold-spareable, ESD-protected, and do not require the use of external LVDS drivers and receivers. The interconnected SpaceWire links and router form a spacecraft network. SpaceWire ASIC can also be used as a stand-alone link. It implements the SpaceWire reliable transport layer and includes an embedded microcontroller to enable hardware delivery and software-based management support, including the cyclic redundancy check CRC generation and header append and strip mechanism. The SpaceWire ASIC design leverages the BAE Systems Power PCI Bridge design.

BAE Systems' Spacewire radiation-hardened ASIC

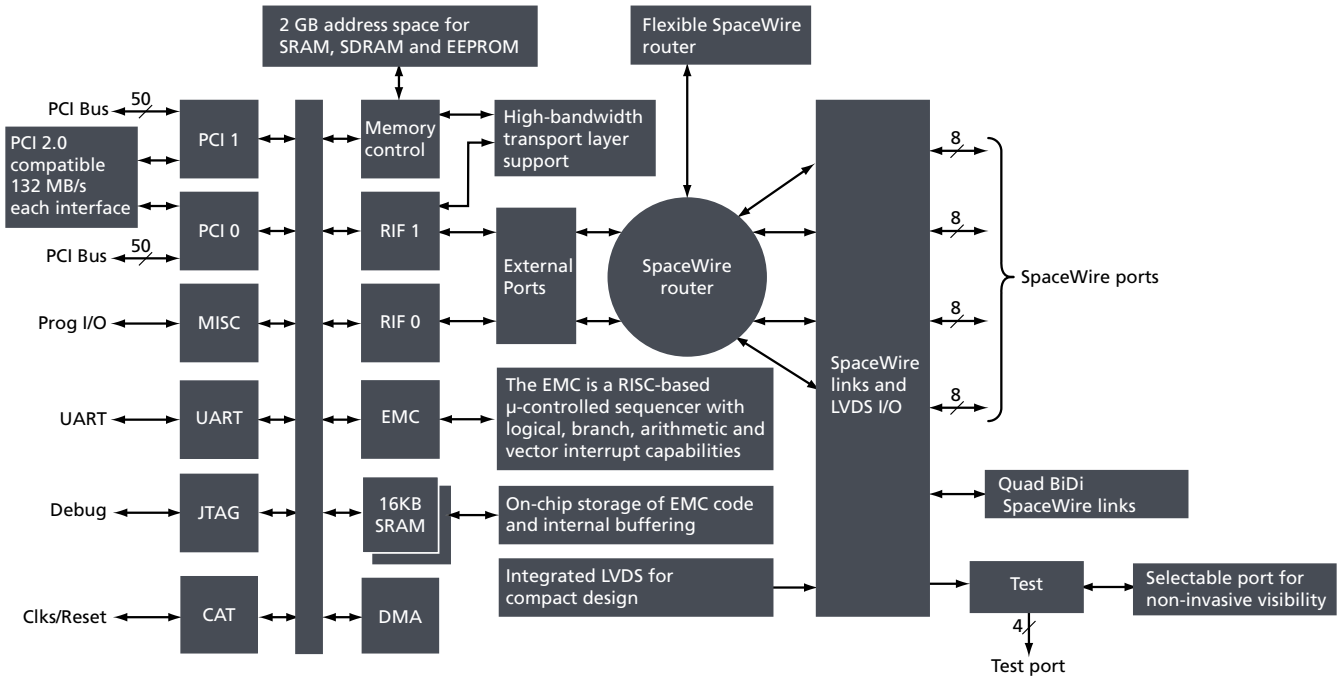
This product comes with a C compiler for the embedded microcontroller (EMC). The EMC is a programmable processor that can be used for monitoring and controlling all the functional cores in the ASIC.

The SpaceWire ASIC operates over the full military temperature range and requires a 3.3V ±10 percent I/O and 2.5V ±10 percent core voltage. BAE Systems' enhanced bulk complementary metal-oxide semiconductor technology is radiation-hardened through the use of advanced proprietary design, layout, and process hardening techniques. The SpaceWire ASIC is fabricated with space-qualified R25 radiation-hardened technology, and is designed for use in systems operating in radiation environments.

Development was sponsored by NASA's Glenn Research Center and Goddard Space Flight Center, including the joint-ASIC development with NASA Goddard.

Key features

- Standard microcircuit drawing #5962R08A04
- QML-compliant part
- SpaceWire interface
  - 260 MHz
  - Compliant-standard four ports
- Memory interface
  - Electrically erasable, programmable, read only memory for initialization
  - Memory storage: synchronous dynamic random-access memory or static random-access memory
- Dual-user PCI ports
  - Up to 33 MHz operation
  - 32-bit address/data bus
- Test interfaces
  - 16550 UART
  - JTAG
  - Non-invasive SpaceWire data access
- Operating temperature range -55 degrees celsius to 125 degrees celsius
- Packaging
  - TRL-9-qualified, 32 mm ceramic column grid array
- Radiation levels
  - Total ionizing dose >2 × 105 rad (Si)
  - Single-event upset <1x10-9 upsets/bit day
  - Latchup-immune



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Cleared for open publication on 06/08