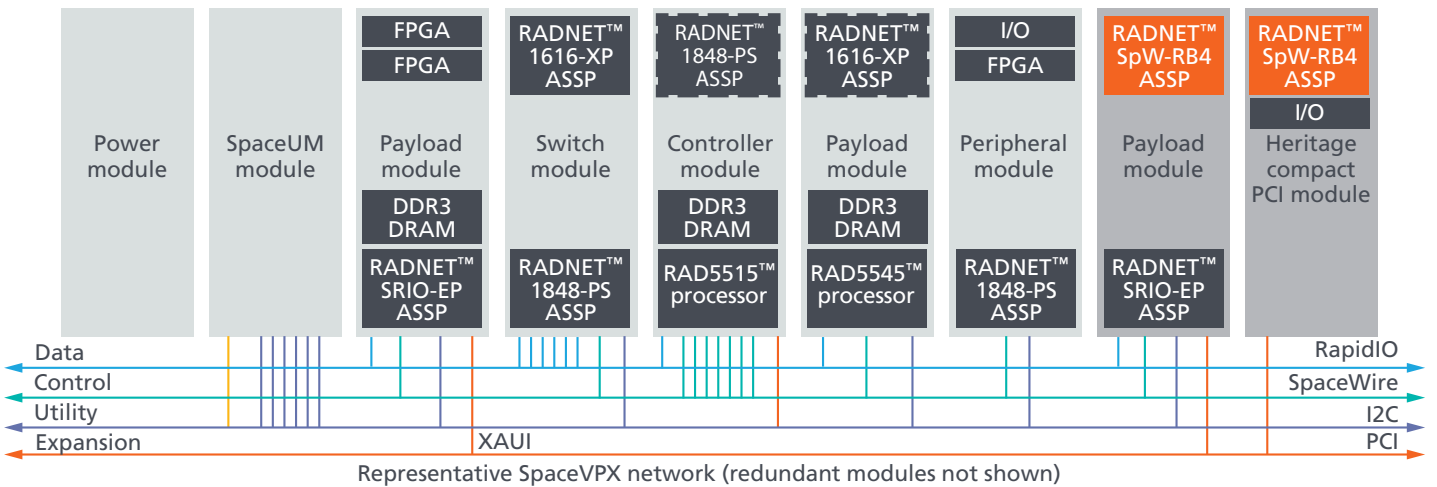
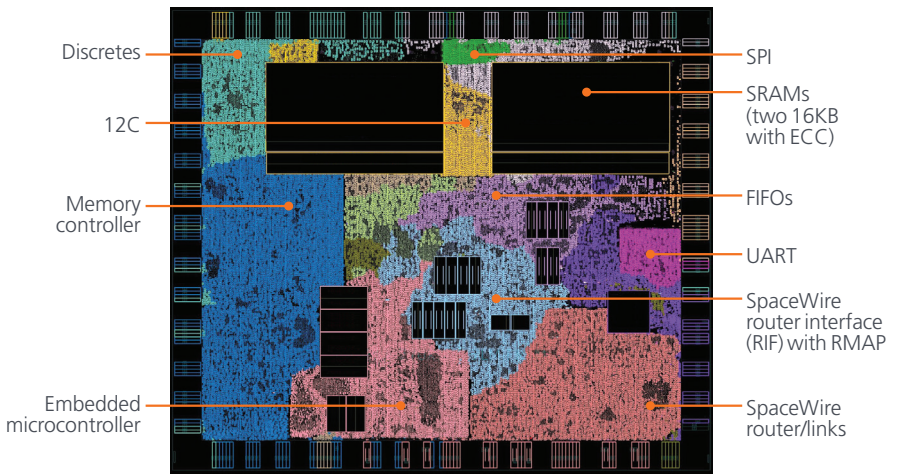


RADNET™ SpW-EP radiation-hardened SpaceWire endpoint ASSP

The RADNET SpW-EP application specific standard product (ASSP) provides a low-power, high-performance connection between SpaceWire fabric, remote instruments and peripherals through a variety of matched interfaces.

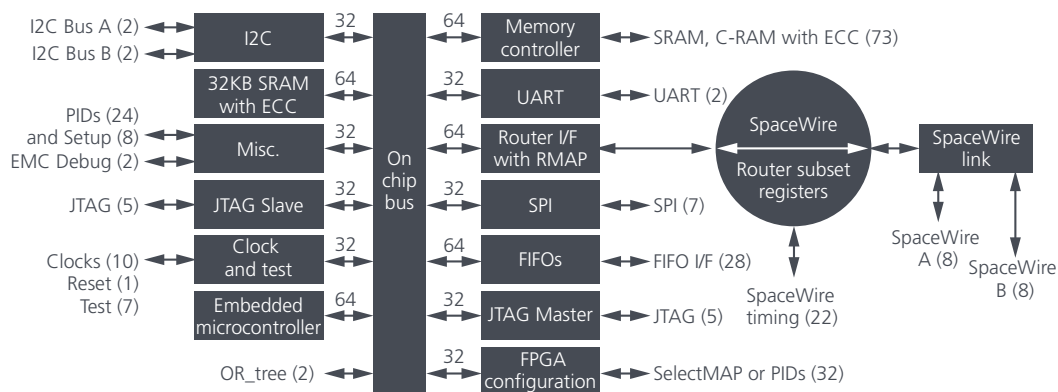
The RADNET SpW-EP ASSP is a member of the RADNET family of high-performance radiation-hardened networking products, offering a simplified and dependable entry point to adopt the SpaceWire protocol with enhanced addressable network management features and high radiation resistance.



Key features and benefits

- Embedded controller provides support for protocol extensions and remote processing
- SpaceWire high-speed point-to-point serial link with low voltage differential signaling (LVDS) interfaces and remote memory access protocol (RMAP) support
- SpaceWire link data rates are supported up to 320 MHz, typically yielding 256 Mb/s per link
- 32 KB block of embedded SRAM is protected with ECC and provided for code or data storage
- 32-bit single bit error correction/double bit error detection (SEC/DED), error-protected external memory interface is available
- Four 32-bit up/down timers that are clocked and triggered internally or externally
- One internal 32-bit watchdog timer and SpaceWire TIC In/Out and time code support
- Phase-locked loop and various divisors
- RMAP function is supported and leveraged by newly available SpaceWire middleware for network discovery and management
- Integrated LVDS physical-layer circuits are cold sparable, requiring no additional external components
- 32-bit RISC architecture embedded microcontroller enables users to autonomously manage SpaceWire or the auxiliary JTAG, FIFO, UART, 8- or 16-bit SelectMAP, serial peripheral interface (SPI), and inter-integrated circuit (I2C) interfaces
- External interface supports the use of either SRAM, PROM, or non-volatile Chalcogenide RAM

Hardware block diagram



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Cleared for open publication on 00/00

Specifications

Technology	Radiation-hardened by design RH15™ circuit library Trusted foundry 150 nm CMOS process 360-pin, 25mm ceramic column grid array 180-340-pin ceramic quad flat pack (future)
Temperature	Operating at -55 to +125 degrees Celsius
Radiation-hardness	Total ionizing dose: 1 Mrad (Si) Single event upset (SEU): <1E-10 upsets/bit-day Latch-up immune
Power Supply	1.5 V +/- 5 percent core 3.3 V PCI, +/- 10 percent I/O
Power dissipation	0.1 to 1.4 watts typical, depends on combination of active interfaces 1.4A maximum operational current
Interfaces	
Memory	2GB SRAM/PROM interface with selectable parity or SEC/DED error connecting code
Input/output	One external SpaceWire port with dual LVDS physical layer (PHY); up to 320 Mbaud/lanes Port supports DMA-controlled RMAP access to the internal registers and memory 32 discretes with clocks and timers 32-bit bi-directional FIFO interface 16-bit SelectMAP FPGA interface Dual I2C interfaces Serial peripheral interface (SPI) 16550 UART interface
Test and debug	JTAG master and slave interfaces

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 CS-17-A05-03