

RH304T Solid-State Data Recorder

3U SRIO VPX, 4.5 TB Radiation Tolerant SSSR

High capacity, high performance solution for radiation intense environments

- Proven reliability to enable on-orbit sensor data processing and storage
- High-performance system efficiently transfers significantly more data in less time
- Application-specific customization expedites schedules and minimizes full-system design costs
- Built-in error correction and NAND defect mitigation



The RH304T SSSR enables an immense storage capacity, high performance and long-term data integrity for applications with the potential for radiation exposure in space and on the ground, such as LEO satellites, high-altitude aircraft, airborne weapons and mission-critical ground computing systems. The RH304T utilizes an enhanced error correction with a unique two pass correction scheme and the latest generation 3D NAND in SLC mode, ensuring the highest possible reliability.

FEATURES

- 4.5 TB large geometry, industrial-grade SLC NAND flash memory
- Dual-Host (2 hosts with 4-Lanes each) and Dual-Port (1 host with 8-Lanes)
- All components radiation tolerant by design (except NAND) at > 100 krad
- Two pass error correction with proprietary horizontal Reed-Solomon and TLC bit sweep algorithms
- Designed for fault tolerance with multiple failed NAND flash devices
- VITA 78 3U SpaceVPX compatible, P2 unpopulated
- Ruggedized construction and assembly

Operation and Reliability

- Linear and host-addressable operating modes
- ECC corrects up to 24 errors in every 30 bytes of data

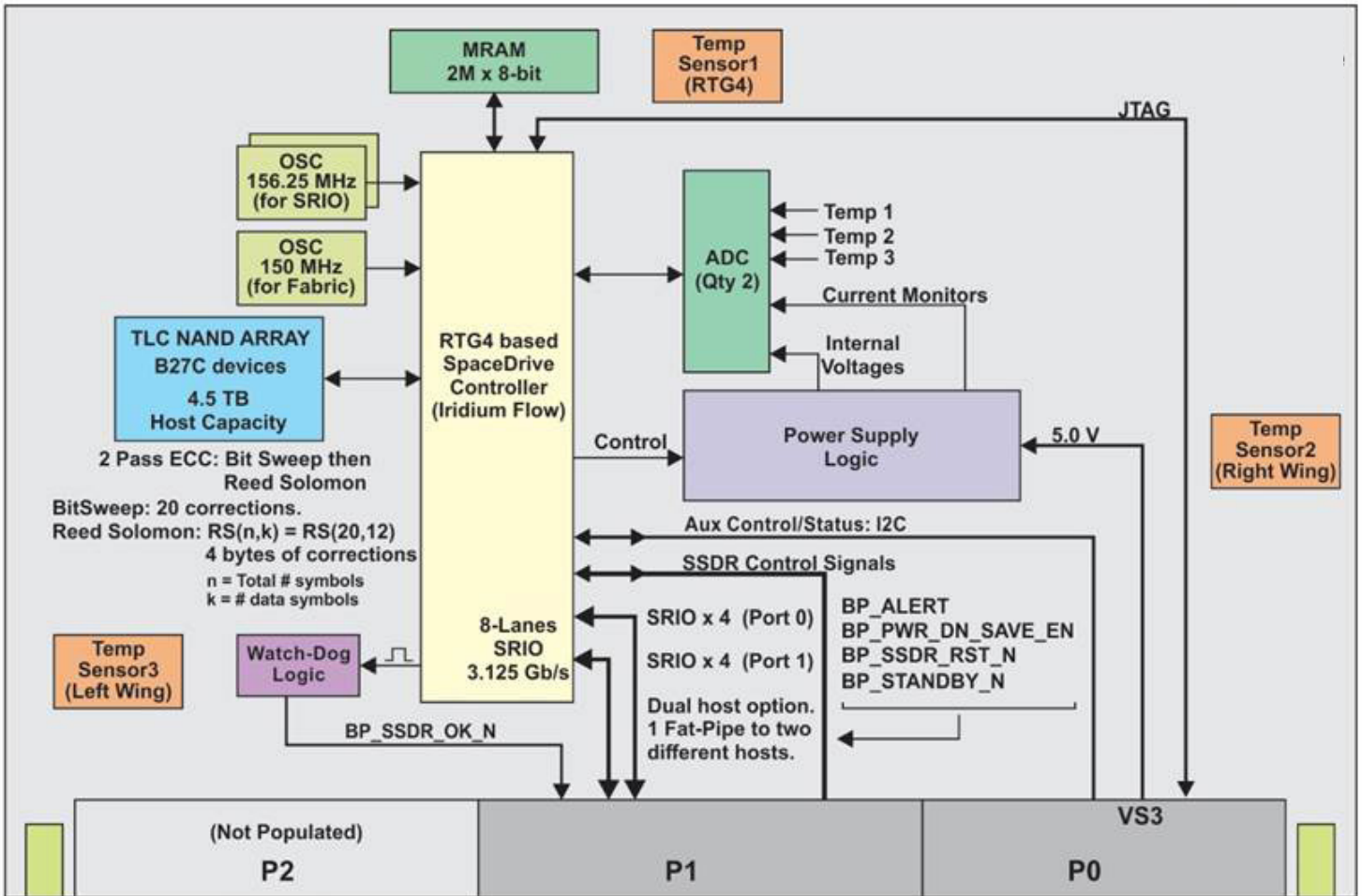
- Automatic retirement of failed blocks
- Abrupt power interruption protection
- NAND defect mitigation for factory defects and bad blocks discovered during burn-in
- Full drive erase in < 30 seconds

Performance

- SRIO interface running at 3.125 Gbps
- Dual-Port reads/writes 16 Gbps
- Dual-Host writes 9.2 Gbps, reads 8 Gbps

Package

- 3U form factor, 160 x 100mm, 1" pitch
- Weights < 750 grams
- Microprocessor and software free
- 4.5 TB capacity guaranteed constant across life



16 Gbps dual host 4.5 TB SRIO 3U SSDR configuration

Applications

- LEO satellites
- Nuclear industry
- Medical industry
- High-altitude aircraft
- Airborne weapons
- Mission-critical ground computing subsystems
- Missiles
- Launch vehicles
- Scientific missions

Radiation Tolerance

Total ionizing dose (TID) > 100 krad (all components except NAND)
 TLC NAND in SLC mode. SEE/TID testing in progress; 30 krad TID expected

RTG-4-based NAND processor and controller

Configuration upsets immunity to LET > 103 MeV.cm²/mg
 Single-event latch-up (SEL) immunity to LET > 103 MeV.cm²/mg
 Registers SEU rate < 10-12 errors/bit-day (GEO solar min)
 Single-event transient (SET) upset rate < 10-8 errors/bit-day (GEO solar min)
 TID > 100 krad

Environmental

Operating temperature: -40°C to 72°C
 Storage temperature: -55°C to 105°C
 Vibration: 3 axis, 16 Grms
 Shock: 18 total (3+, 3- per axis)

Power

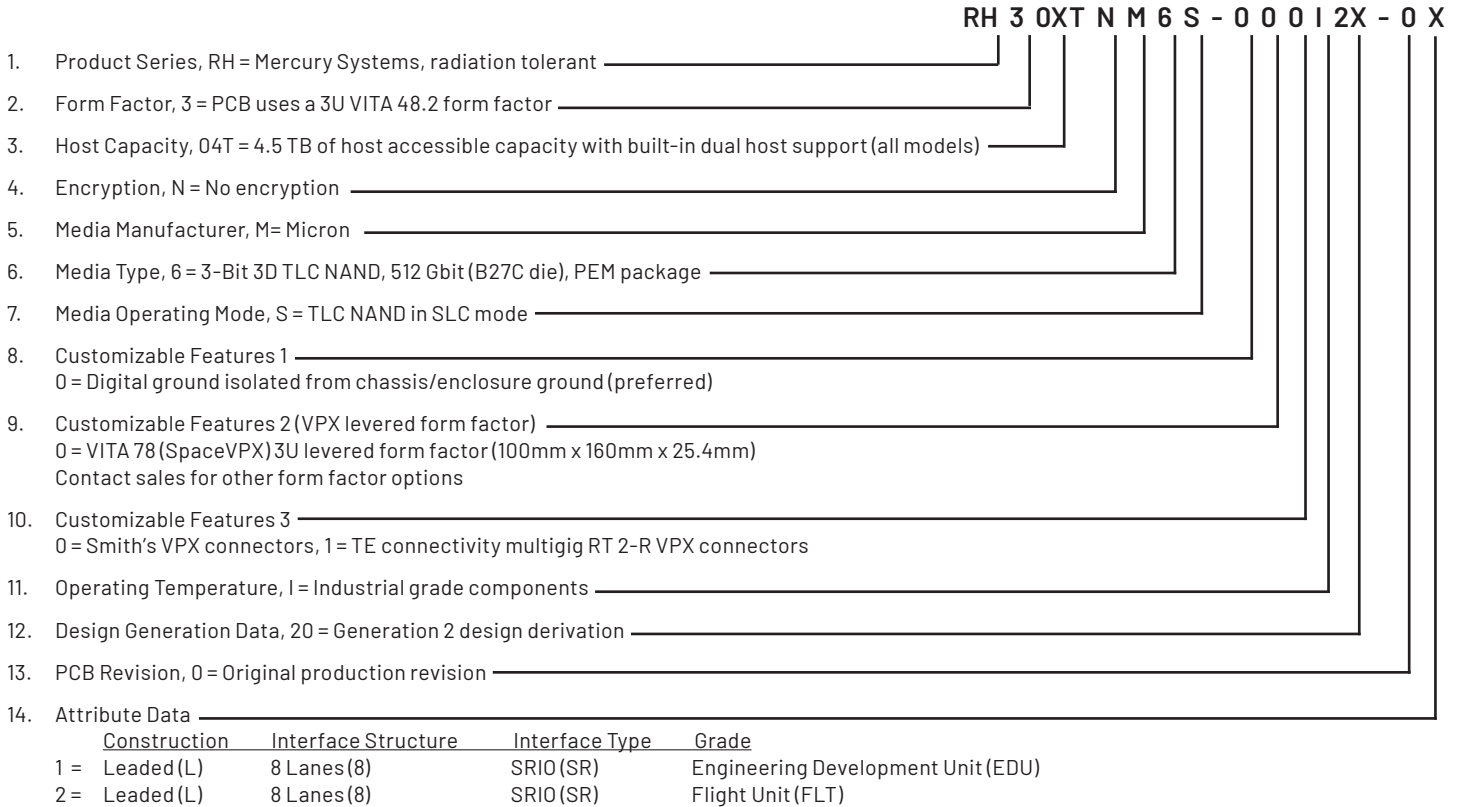
4.5V to 5.5V (5V target)
 7W idle, 25W at full performance

VPX Connectors

Smith's KVPX series
 TE connectivity multigig RT 2-R series

PART NUMBERING

Note: Dashes in part number are required



Example Part Number: RH304TNM6S-000I20-02 (Dual host, 4.5 TB, 3U VITA 78 VPX FLT unit with isolated ground, Smith's connectors, and original production PCB revision)



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