

# RH304T Solid-State Data Recorder

## 3U SRIO VPX, 4.5 TB Radiation Tolerant SSDR

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 SSDR 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

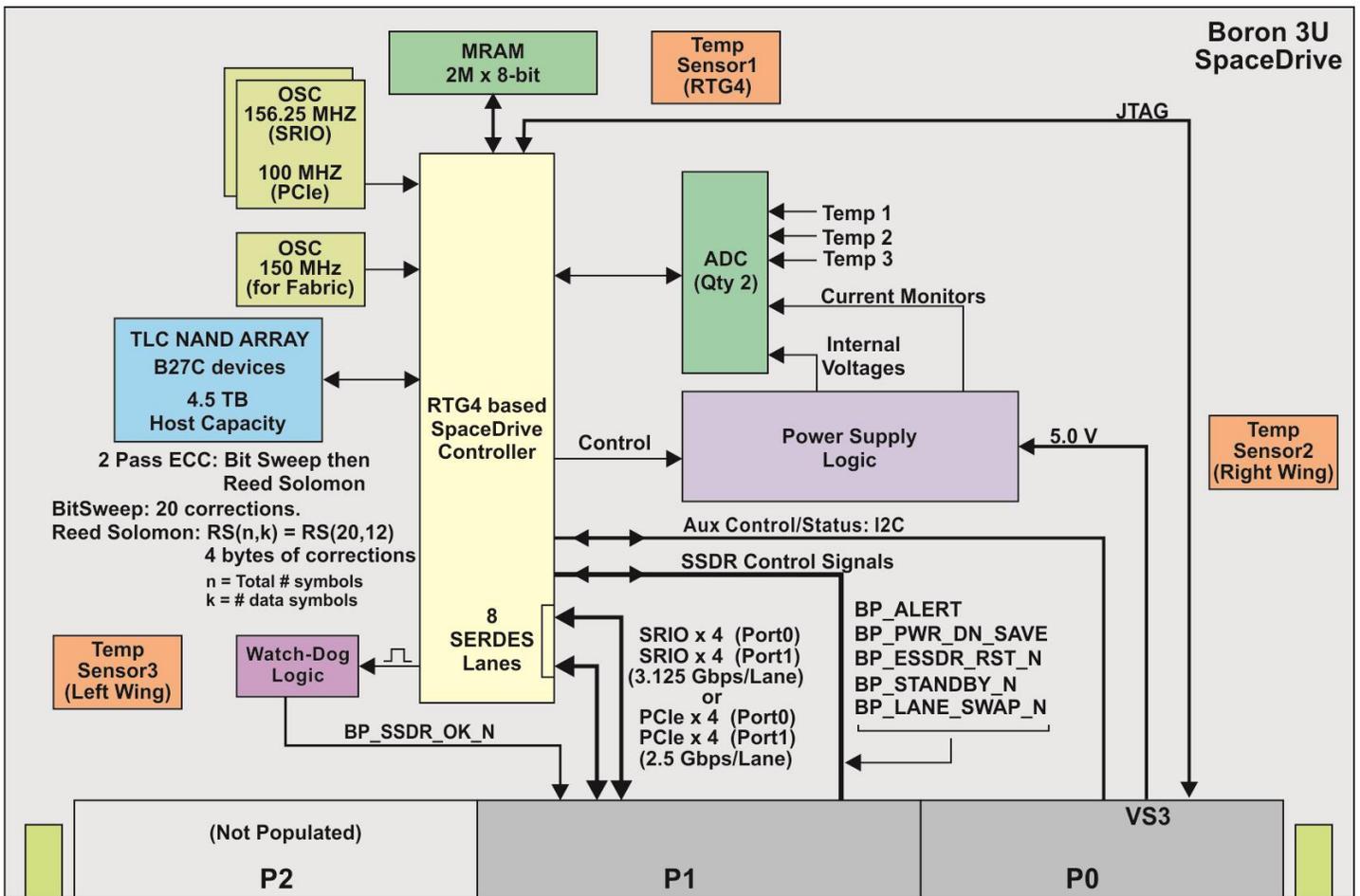
### Package

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 SSSDR 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.cm<sup>2</sup>/mg

Single-event latch-up (SEL) immunity to LET > 103 MeV.cm<sup>2</sup>/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: -L+0°C to 72°C

Storage temperature: -55°C to 105°C

Vibration: 3 axis, 16 Grms

Shock: 18 total (3+, 3- per axis)

**Power**

L+.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

RH 3 0XT N M 6 S - 0 0 0 I 2X - 0 X

- 1. Product Series, RH = Mercury Systems, radiation tolerant \_\_\_\_\_
- 2. Form Factor, 3 = PCB uses a 3U VITA 48.2 form factor \_\_\_\_\_
- 3. Host Capacity, 04T = 4.5 TB of host accessible capacity with built-in dual host support (all models) \_\_\_\_\_
- 4. Encryption, N = No encryption \_\_\_\_\_
- 5. Media Manufacturer, M= Micron \_\_\_\_\_
- 6. Media Type, 6 = 3-Bit 3D TLC NAND, 512 Gbit (B27C die), PEM package \_\_\_\_\_
- 7. Media Operating Mode, S = TLC NAND in SLC mode \_\_\_\_\_
- 8. Customizable Features 1 \_\_\_\_\_  
0 = Digital ground isolated from chassis/enclosure ground (preferred)
- 9. Customizable Features 2 (VPX levered form factor) \_\_\_\_\_  
0 = VITA 78 (SpaceVPX) 3U levered form factor (100mm x 160mm x 25.4mm)  
Contact sales for other form factor options
- 10. Customizable Features 3 \_\_\_\_\_  
0 = Smith's VPX connectors, 1 = TE connectivity multigig RT 2-R VPX connectors
- 11. Operating Temperature, I = Industrial grade components \_\_\_\_\_
- 12. Design Generation Data, 20 = Generation 2 design derivation \_\_\_\_\_
- 13. PCB Revision, 0 = Original production revision \_\_\_\_\_
- 14. Attribute Data \_\_\_\_\_
 

	Construction	Interface Structure	Interface Type	Grade
1 =	Leaded (L)	8 Lanes (8)	SRIO (SR)	Engineering Development Unit (EDU)
2 =	Leaded (L)	8 Lanes (8)	SRIO (SR)	Flight Unit (FLT)

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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