

RH3440 Solid-State Data Recorder

3U SRIO VPX Radiation Tolerant SSSDR

Compact, TRL 9 flight proven 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 RH3440 is the world's first commercially available, high-density SSSDR in a compact 3U form factor. Precision-engineered and purpose-built to withstand harsh, radiation intense environments on earth and beyond, the RH3440 serves industry needs for reliable, SWaP-optimized storage solutions. Plus, the RH3440 offers long-term data integrity with Mercury proprietary defect mitigation and the most powerful error correction code (ECC) available.

FEATURES

440 GB large geometry, industrial-grade SLC NAND flash memory

All components radiation tolerant by design (except NAND) at > 100 krad

Proprietary horizontal Reed-Solomon algorithm for error correction

Designed for fault tolerance with multiple failed NAND flash devices

VPX compatible, VITA 48.2 compliant, P2 unpopulated

NAND screened to NASA EEE-INST-002

Ruggedized construction and assembly

Operation and Reliability

Linear and host-addressable operating modes

ECC fully corrects 6 in every 28 host data bytes

Automatic retirement of failed blocks

Abrupt power interruption protection

Full drive erase in < 30 seconds

NAND defect mitigation for factory defects and bad blocks discovered during burn-in

Performance

SRIO interface running at 3.125 Gbit/s

4-lane writes 1160 MB/s, reads 1040 MB/s

1-lane writes 250 MB/s, reads 225 MB/s

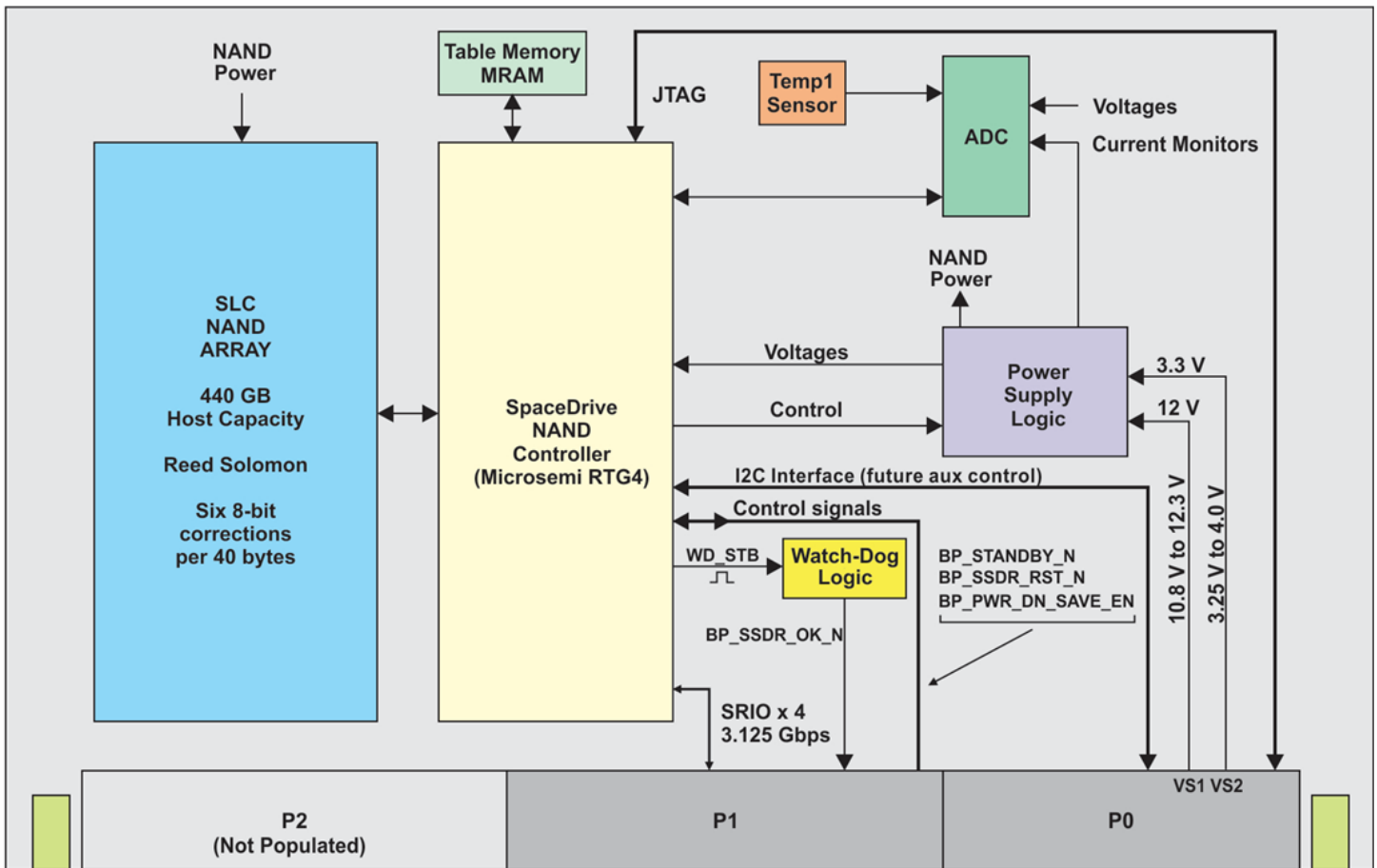
Package

3U form factor, 160 x 100 mm size, 1" pitch

Weights < 620 grams

Microprocessor and software free

440 GB capacity guaranteed constant across life



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)
 SLC NAND TID > 30 krad

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

10.8V to 12.3V (12V target)
 3.25V to 4.00V (3.4V target)
 7W idle, 14W 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 3 440 N M 2 S - 0 0 0 I XX - XX

1. Product Series, RH = Mercury Systems, radiation tolerant
2. Form Factor, 3 = PCB uses a 3U VITA 48.2 form factor
3. Host Capacity, 440 = 440 GB of host accessible capacity
4. Encryption, N = No encryption
5. Media Manufacturer, M = Micron
6. Media Type, 2 = 1-Bit SLC NAND, 32-GBit M73A die
7. Media Operating Mode, S = SLC mode
8. Customizable Features 1
0 = Digital ground isolated from chassis/enclosure ground (preferred)
1 = Digital ground connected to chassis/enclosure ground
9. Customizable Features 2, 0 = Standard product
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
P2 = Generation 1 design derivation - PCB revision 2, P3 = Generation 1 design derivation, PCB revision 3
13. Attribute Data

	Construction	Interface Structure	Interface Type	Interface Options	Grade
-01	Leaded (L)	4 Lanes (4)	SRIO (SR)		Eng Dev Unit (EDU)
-02	Leaded (L)	4 Lanes (4)	SRIO (SR)		Flight Unit (FLT)
-03	Leaded (L)	1 Lane (1)	SRIO (SR)		Eng Dev Unit (EDU)
-04	Leaded (L)	1 Lane (1)	SRIO (SR)		Flight Unit (FLT)
-M3	Leaded (L)	1 Lane (1)	SRIO (SR)	2.5V Logic Level for BP_PWR_DN_SAVE_EN	Eng Dev Unit (EDU)
-M4	Leaded (L)	1 Lane (1)	SRIO (SR)	2.5V Logic Level for BP_PWR_DN_SAVE_EN	Flight Unit (FLT)

Example Part Number: RH3440NM2S-000IP2-01 (440 GB EDU with isolated ground and Smith's connectors)



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