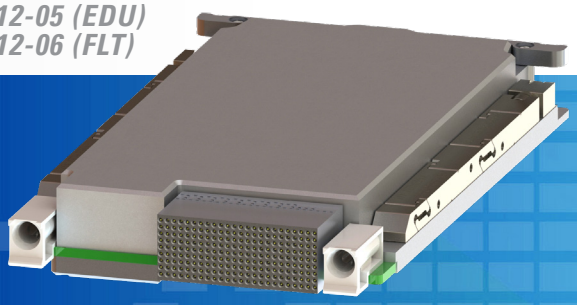
DATASHEET

TRRUST-Stor® 3U VPX SRIO SpaceDrive
Radiation-Tolerant Twin Port 18 G-bit/s 480 GB Solid State Drive

Models RH3480NM2S-000I12-01 (EDU)
RH3480NM2S-000I12-02 (FLT)
RH3480NM2S-000I12-03 (EDU)
RH3480NM2S-000I12-04 (FLT)
RH3480NM2S-000I12-05 (EDU)
RH3480NM2S-000I12-06 (FLT)

- **Dual host option, 1 Fat Pipe per host**
- **Innovative Mercury SpaceDrive NAND controller**
- **3U VPX form-factor**
- **Radiation-tolerant solid state storage**
- **480 GB large geometry SLC NAND**
- **Very strong ECC corrects multiple failed NAND devices**



IN DEVELOPMENT*

Mercury's TRRUST-Stor series of radiation-tolerant solid state drives represent the world's first commercially available, customizable SpaceDrives precision-engineered for the harshest operating environments on earth and beyond. Although designed for space applications, this series of compact, high reliability drives are perfect for applications with potential for radiation exposure, including high-altitude aircraft, airborne weapons, and mission-critical ground computing systems.

The TRRUST-Stor RH3480 is a feature derivation of the popular 440 GB 3U SpaceDrive featuring stronger ECC and twice the RW performance. Like all Mercury SpaceDrives, the RH3480 pairs Mercury's proprietary Horizontal Error Correction (HEC) with large geometry industrial-grade Single-Level Cell (SLC) NAND flash memory to create one of the world's most reliable storage devices. Designed for fault-tolerance with multiple failed NAND flash devices, the RH3480 offers long-term data integrity for applications where device repair or replacement might not be possible. Recognizing that no two mission requirements are identical, power consumption, ECC, capacity and spare devices are tunable against performance to create the perfect set of features as required by each unique mission.

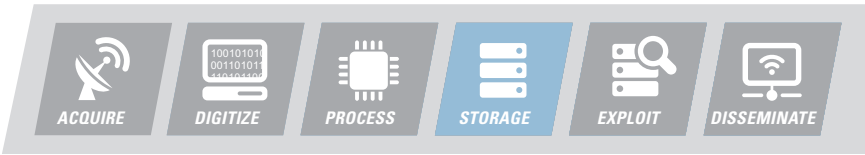
Standard Features

- Standard 3U VPX form factor: 160mm tall x 100mm x 25.4mm
- Twin 4-Lane SRIO interface
- Performance:
  - 8-Lane SRIO (@ 3.125 Gb/s) as two 4-Lane ports, Port0, Port1
  - 2300 MB/s SRIO (18.4 Gbits/sec)
  - Time to fill entire SpaceDrive (480 GB): 3.4 minutes
  - Options for Dual host, and 1-Lane SRIO
- Radiation-tolerant design:
  - RTG4-based NAND processor/controller
  - NAND flash: TID > 30K rad
  - All other devices: Radiation tolerant by design
- VPX connectors:
  - Guide blocks has no keying
  - Smiths KVPX Series
    500 mate/unmated cycles
  - TE connectivity MultiGig RT 2-R Series
    500 mate/unmated cycles
- Operating modes: Linear and Host Addressable
  - Linear Mode: Sequential data recording (Data recorder mode)
  - Host Addressable: Random RW
  - Random sector read operations: At any time, both modes.
- Capacity to host:
  - 480 GB guaranteed constant across entire life
- Error correction:
  - Mercury proprietary Horizontal Reed Solomon algorithm
  - Fully corrects 5 host data bytes
  - Significantly extends NAND endurance and lifespan
- Bad block table: Supports field upgrades
- Mercury proprietary defect mitigation
  - Mitigates all factory defects
  - Mitigates all bad blocks discovered during burn-in.
- NAND endurance:
  - Minimum 60,000 drive over writes
  - Up to 20 drive over-writes/day for 7 years
  - TBW: 28 PB minimum
- Minimum 3 month retention at EOL

Other features:

- HotSwap devices (On-The-Fly failing device replacement)
- 512K MRAM reserved for OS File Allocation Table

Mercury Systems is a leading commercial provider of secure sensor and safety-critical processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.



Reliability:

- Single 5V supply
- Rad-Tolerant components (by design)
- Microprocessor-free design
- State machine driven, no software
- Automatic block retirement
- Abrupt power interruption protection
- Corruption free design
- UBER: Better than 1E-19
- Full Drive Erase: < 30 seconds
- Status data:
  - All voltages, 3 temperature sensors
  - Spare blocks remaining, Total Bytes written
  - Erase cycle count, ECC errors, hot swap assignment
  - Over 50 status values
- 100% dynamic burn-in
- Ruggedized construction and assembly
- Weight (Preliminary): < 750 grams
- Power: 5V (up to 25W)
- BOM, schematics and design document available on request
- Rail temperature: -40 °C to +72 °C
- Storage temperature: -55 °C to +105 °C
  - Operation or storage at temperatures above 85 ºC reduces data retention time

Applications include:

- Low Earth Orbit Satellites (LEO); Contact Mercury for other orbit solutions
- Missiles
- Launch vehicles
- Scientific payloads
- Terrestrial applications with radiation exposure

Part Numbering *(dashes in the part number are required)*

R H3 480 N M 2 S - 0 0 0 I 12 - 0X

Product Series
R = Mercury Systems, (Rad-Tolerant series)

Form Factor
H3 = 3U VPX

NAND Capacity
480 = Host accessible capacity in gigabytes

Encryption
N = None

Media Manufacturer
M = Micron

Media Type
2 = 1 bit SLC NAND 32 Gb (M73A die)

Mode
S = SLC mode

Customizable Features Field One
0 = Digital ground isolated from chassis/enclosure ground (preferred)
1 = Digital ground connected to chassis/enclosure ground

Customizable Features Field Two
0 = Standard 3U form factor (100mm wide x 160 mm length)
2 = 3U enclosure length extension: 100mm x 220mm
3 = 3U enclosure width/length extension: 233mm x 220mm

Customizable Features Field Three
0 = Standard product
1 = TE Connectivity MultiGig RT 2-R connectors

Operating Temperature
I = Industrial (-40 °C to +85 °C)

Generation Data
12 = Generation 1 design derivation 2

Attribute Field

- 01	Construction:	Leaded (L)
	Interface Structure:	8 Lanes (8)
	Interface Type:	SRIO (SR)
	Grade:	Engineering Development Unit (EDU)
- 02	Construction:	Leaded (L)
	Interface Structure:	8 Lanes (8)
	Interface Type:	SRIO (SR)
	Grade:	Flight Unit (FLT)
-03	Construction:	Leaded (L)
	Interface Structure:	1 Lane (1)
	Interface Type:	SRIO (SR)
	Grade:	Engineering Development Unit (EDU)
-04	Construction:	Leaded (L)
	Interface Structure:	1 Lane (1)
	Interface Type:	SRIO (SR)
	Grade:	Flight Unit (FLT)
-05	Construction:	Leaded (L)
	Interface Structure:	4 Lanes Host 1, 4 Lanes Host 2 (DH4)
	Interface Type:	SRIO (SR)
	Grade:	Engineering Development Unit (EDU)
-06	Construction:	Leaded (L)
	Interface Structure:	4 Lanes Host 1, 4 Lanes Host 2 (DH4)
	Interface Type:	SRIO (SR)
	Grade:	Flight Unit (FLT)

Example part Number: RH3480NM2S-000I12-01 (EDU)

Need More Help? Need a Variant of This Product?

Contact Mercury's Secure SSD application engineering team at secure.ssd@mrcy.com

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