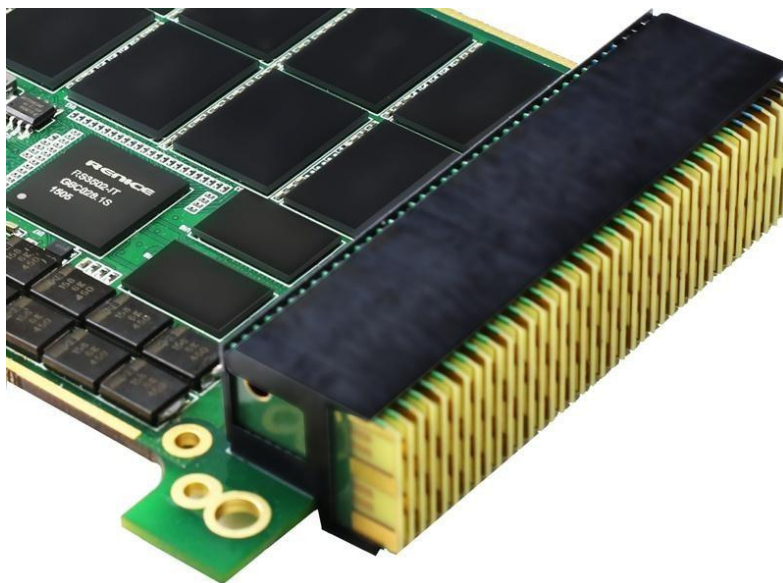


ShenZhen Renice Technology Co., Ltd

3U VPX Storage

Datasheet



V1.0

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CATALOGUE

1. INTRODUCTION.....	2
1.1 PRODUCT OVERVIEW.....	2
1.2 FEATURE.....	2
2. FUNCTIONAL BLOCK DIAGRAM.....	3
3. PRODUCT SPECIFICATIONS.....	4
3.1 PHYSICAL SPECIFICATIONS.....	4
3.2 HOST INTERFACE.....	4
4. INTERFACE DESCRIPTION.....	5
4.1 PIN DESCRIPTION.....	5
5. POWER SPECIFICATIONS.....	6
5.1 OPERATING VOLTAGE.....	6
5.2 POWER SUPPLY VOLTAGE.....	6
5.3 POWER CONSUMPTION (TYPICAL).....	6
6. RELIABILITY SPECIFICATION.....	7
6.1 ENVIRONMENT.....	7
6.2 WEAR-LEVELING.....	7
6.3 H/W ECC AND EDC FOR NAND FLASH.....	7
6.4 POWER FAILURE PROTECTION.....	7
6.5 ENDURANCE.....	7
6.6 MTBF.....	7
7. ORDERING INFORMATION.....	8
8. PART NUMBER NAMING RULE.....	9

1. Introduction

1.1 Product Overview

Renice X9 3U VPX Solid State Drive supports dual-SATAIII (6Gbps) signal. Design using SLC/MLC NAND flash technology, and utilizing a unique firmware architecture, the 3U VPX maximizes the bandwidth limitations of SATAIII giving up to 75,000/65,000 input/output operations per second (IOPS). It is a highly reliable storage solution for real time signal acquisition, processing, storage and playback implementations include :satellite navigation and communication, radar stations, aviation, naval, military, vehicle and off-site experiment.

1.2 Feature

- **HOST Interface:** VPX Interface, Dual-SATAIII 6.0Gbps (Backward compatible with SATA 3.0/1.5Gbps)
- **Form factor:** 3U (170.6mmX100.0mmX20.83mm) L×W×H
- **Connector:** VPXP0,P1,P2
- **Performance:**
 - Single SATA SSD Max Sequential Data Read/Write: 500/500MB/s
 - Single SATA SSD Read/Write IOPS: 75,000 / 65,000
 - Access Time: <0.1ms
- **Capacities:**
 - 512GB, 1TB, 2TB, 4TB, 8TB (MLC)
 - 256GB, 512GB, 1TB, 2TB (SLC)
- **Power Management:**
 - Input voltage: 5V (±5%)
- **Temperature ranges:**
 - Operation: -40 to 85°C (Industrial)
 - Storage: -50 to 95°C
- **Intelligent features:**
 - Flash management algorithm: static and dynamic wear-leveling, bad block management algorithm
 - Supports dynamic power management and SMART (Self-Monitoring, Analysis and Reporting Technology)
 - Supports BCH ECC8~80bits/512Bytes or 1KBytes
 - Support Power Failure Protection
 - TRIM support
 - Support AES-128/256 bits
 - Support NCQ
 - Support Interface Power Management
 - Support Spread-Spectrum Clocking
- **MTBF:** >3,500,000 Hours @25C

2. Functional Block Diagram

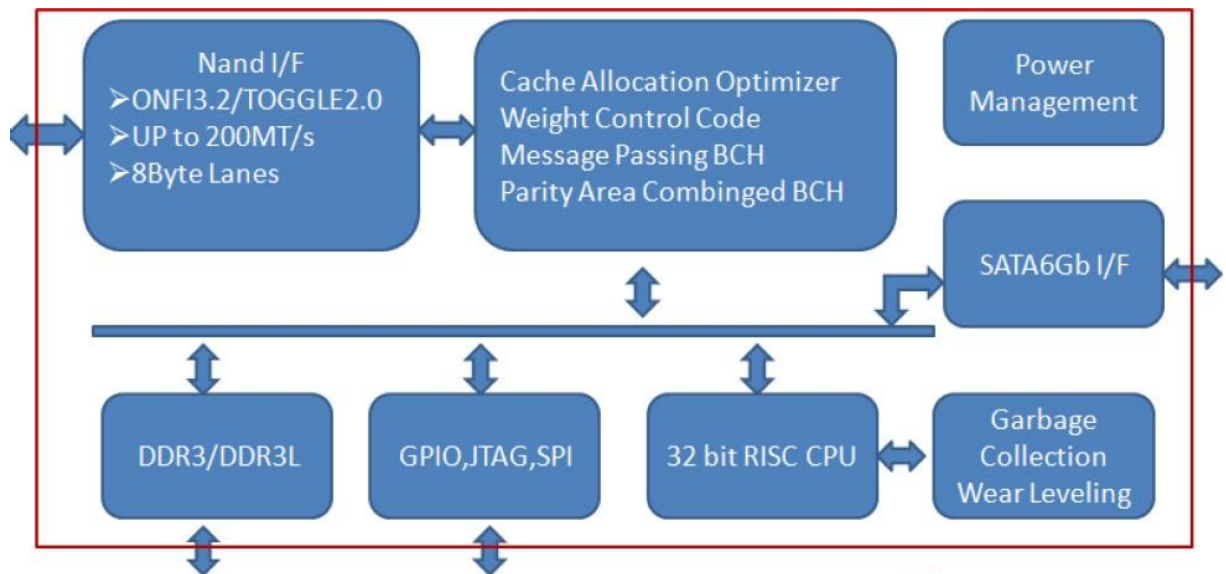


Figure 1 Renice X9 VPX Single SATAIII SSD Block Diagram

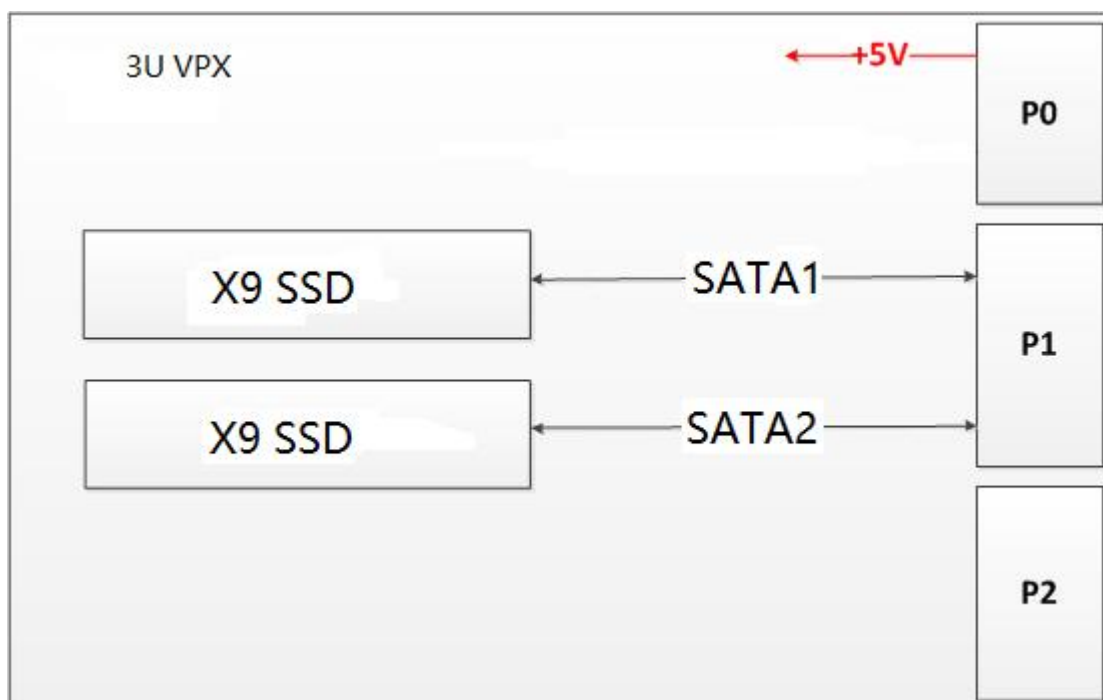


Figure 1 Renice X9 VPX Dual SATAIII SSD Block Diagram

3. Product Specifications

3.1 Physical Specifications

Table 1 Physical Specifications

Form Factor		3U
Dimensions	Length	170.6±0.25mm
	Width	100.0±0.25mm
	Height	20.83±0.25mm
Weight		
Connector		VPX P0,P1,P2

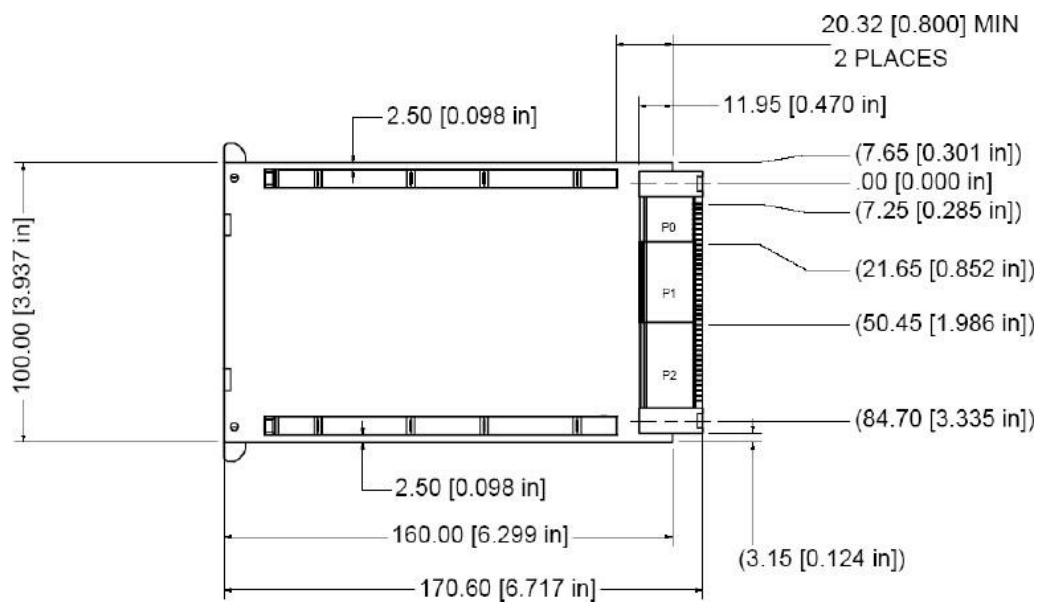


Figure 2 Renice X9 VPX SATAIII SSD mechanical dimensions

3.2 Host Interface

Dual 1.5/3.0/6.0 Gbps SATA I/II/III signal

Native Command Queuing (NCQ)

Spread-Spectrum Clocking (SSC)

Interface Power Management (IPM)

4. Interface Description

4.1 Pin Description

P0

	Row G	Row F	Row E	Row D	Row C	Row B	Row A
1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
3	5V	5V	5V	N/C	5V	5V	5V
4	N/C	N/C	GND	N/C	GND	N/C	N/C
5	N/C	N/C	GND	N/C	GND	N/C	N/C
6	N/C	N/C	GND	N/C	GND	N/C	N/C
7	N/C	GND	N/C	N/C	GND	N/C	N/C
8	GND	N/C	N/C	GND	N/C	N/C	GND

P1

P1	Row G	Row F	Row E		Row D	Row C	Row B		Row A
1	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
2	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
3	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
4	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
5	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
6	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
7	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
8	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
9	N/C	GND	N/C	SATA1_TX	SATA1_TX	GND	N/C	SATA1_RX	SATA1_RX
10	GND	SATA2_TX	SATA2_TX	N/C	GND	SATA2_RX	SATA2_RX	N/C	GND
11	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
12	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
13	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
14	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND
15	N/C	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C
16	GND	N/C	N/C	N/C	GND	N/C	N/C	N/C	GND

P2

P1	Row G	Row F	Row E		Row D	Row C	Row B		Row A
1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
4	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
5	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
6	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
7	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
8	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
9	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
10	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
11	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
12	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
13	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
14	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
15	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
16	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

5. Power Specifications

5.1 Operating Voltage

Operating voltage: 5V (±5%)

5.2 Power Supply Voltage

1.2V for Core, 1.35V for DDR3, 1.8V for IO and SPI Flash, 3.3V for NAND

5.3 Power Consumption (typical)

Operation (Read/Write) –8.5W/18W@2TB

Standby - 3.5W

6. Reliability Specification

6.1 Environment

Table 5 Environmental Specifications

Item	Features	
Temperature	Operation	Standard: 0~70°C
		Industrial: -40~+85°C
Humidity	5-95%	
Vibration	10Hz-2000Hz, 16.4 G (X, Y, Z axis, 1 hour /axis)	
Shock	Peak Acceleration: 1,500 G, 0.5ms(Half-sine wave, $\pm X, \pm Y, \pm Z$ axis, 1 time/axis)	
	Peak Acceleration: 50 G, 11ms(Half-sine wave, $\pm X, \pm Y, \pm Z$ axis, 3 times/axis)	

6.2 Wear-leveling

Renice X9 SSD support both static and dynamic wear-leveling, these two algorithms guarantee all type of flash memory at same level of erase cycles to improve lifetime limitation of NAND based storage.

6.3 H/W ECC and EDC for NAND Flash

Support BCH ECC 8~80bits/512B or 1Kbytes

6.4 Power Failure Protection

Renice X9 VPX SSD adopts on board DDR and Super Capacitor. Data will be written to DDR firstly and then to NAND flash. In case of Power Loss, the Capacitor will support the transferring of Data from DDR to NAND flash.

6.5 Endurance

Write endurance: >25 years @ 100GB write/ day (512GB MLC)

Read endurance: JESD47 compliant

6.6 MTBF

MTBF (Mean Time between Failures) of Renice X9 SSD: >3,500,000 Hours @25C

7. Ordering Information

Table 7 Valid Combinations

Capacities/Flash type	Industrial Temp	Part Number
256GB/SLC	-40 to 85°C	RIS256-S3X9V
512GB/SLC	-40 to 85°C	RIS512-S3X9V
1TB/SLC	-40 to 85°C	RIS01T-S3X9V
2TB/SLC	-40 to 85°C	RIS02T-S3X9V
512GB/MLC	-40 to 85°C	RIM512-S3X9V
1TB/MLC	-40 to 85°C	RIM01T-S3X9V
2TB/MLC	-40 to 85°C	RIM02T-S3X9V
4TB/MLC	-40 to 85°C	RIM04T-S3X9V
8TB/MLC	-40 to 85°C	RIM08T-S3X9V

8. Part Number Naming Rule

