ShenZhen Renice Technology Co., Ltd

6U Open VPX Storage

Datasheet

V1.0

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CATALOGUE

1. Introduction

1.1 Product Overview

Renice 6U Serial ATA (SATA)-based Open VPX Storage delivers high capacity data storage for military, aerospace and industrial applications requiring rugged, secure and durable mass data storage. .
Utilizing the unique firmware architecture, it can support input voltage either 5V or 12V. Features include one-key physical destruction and logical destroy, can achieve 1 channel SATA, 2 channels SATA and 4 channels SATA.

1.2 Feature

- **Host Interface:** VPX interface, SATA 6.0Gbps (1 lane, 2 lanes, 4 lanes)
- **Form Factor:** 6U (233.35mmX160.0mmX25.1mm) L×W×H
- **Connector:** VPX P0, P1, P2, P3, P4, P5, P6
- **Performance:**
  -Max. Sequential Data Read/ Write (1 SATA): 530/500MB/s
  -Access Time: <0.1ms
- **Max. Capacity:** 32TB
- **Power Management:**
  -Input Voltage: 5V (±5%) or 12V (±5%)
- **Temperature Range:**
  -Operation: -40°C ~+85°C (Industrial)
  -Storage: -50°C ~+ 95°C
- **Intelligent Features:**
- Flash management algorithm: static and dynamic wear-leveling, bad block management algorithm
- SMART (Self-Monitoring, Analysis and Reporting Technology)
- Built-in voltage detector, support over-voltage & over-current protection
- Real-time high performance AES-128 and AES-256 encryption
- Supports logical destroy and physical destruction
- Supports BCH ECC 80-Bit/1KB
- Write endurance: >35 years @ 100GB write/day (1TB MLC SSD)
- Read endurance: JESD47 compliant
- Date retention: JESD47 compliant
- **MTBF:** >4000,000 hours @25C

2. Functional Block Diagram
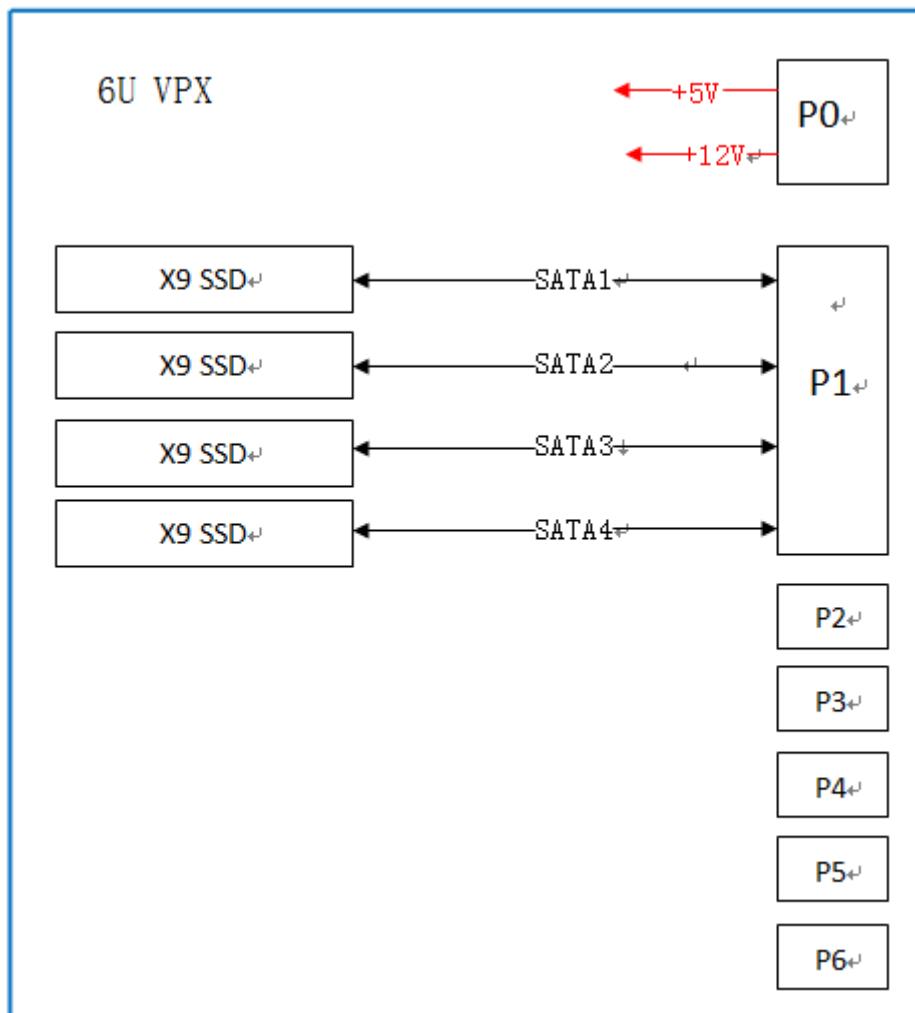
Figure 1: Renice **VPX** (4 channels **X9 SSD**) Block Diagram

3. Product Specification

3.1 Physical Specifications

Form Factor		6U
Dimensions	Length	233.35±0.25mm
	Width	160.0±0.25mm
	Height	25.1±0.25mm
Weight		80g
Connector		VPX P0,P1,P2,P3,P4,P5,P6
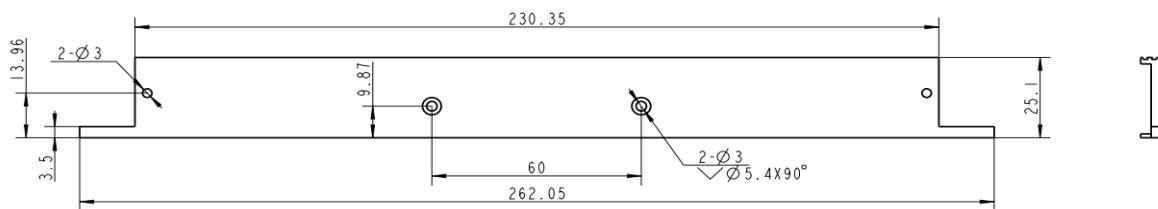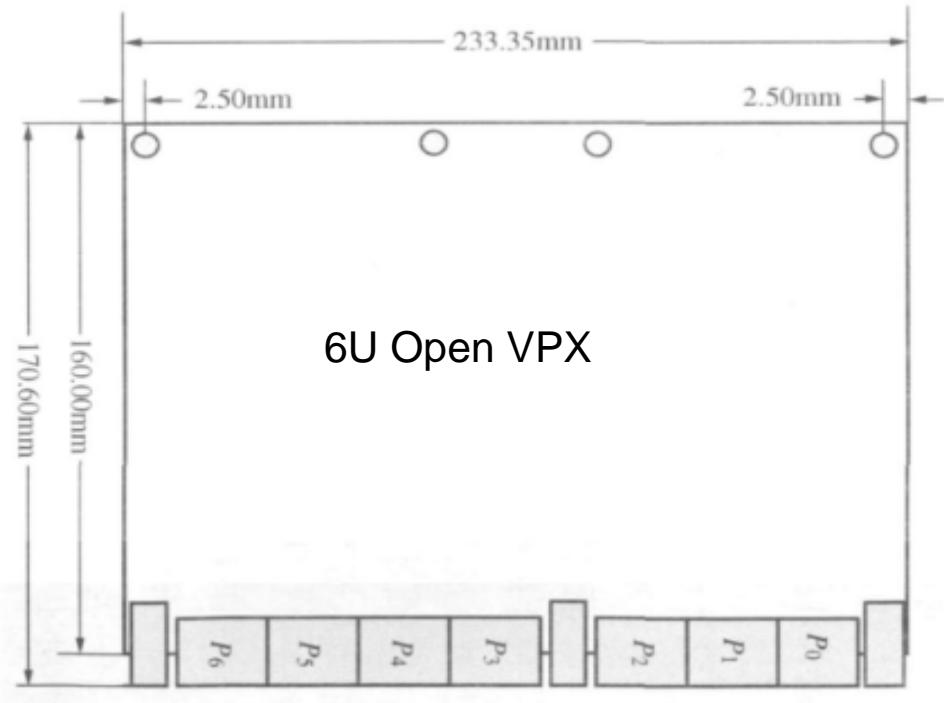
Figure 2: 6U VPX mechanical dimension

3.2 Host Interface

● 1.5 / 3.0 / 6.0Gbps SATA I / II / III interface (1 channel)

● Native Command Queuing (NCQ)

● Spread-Spectrum Clocking (SSC)

● Interface Power Management (IPM)

4. Interface Description

4.1 Pin Assignment

P0: Power voltage definition

|	G line	F line	E line	D line	C line	B line	A line
1	N/C	N/C	N/C	N/C	12V	12V	12V
2	N/C	N/C	N/C	N/C	12V	12V	12V
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: SATA Signal

	G line	F line	E line	D line	C line	B line	A line
1	SERASE-IN	GND	N/C	N/C	GND	N/C	N/C
2	GND	N/C	N/C	GND	N/C	N/C	GND
3	SERASE-IN	GND	N/C	N/C	GND	N/C	N/C
4	GND	N/C	N/C	GND	N/C	N/C	GND
5	SERASE-IN	GND	N/C	N/C	GND	N/C	N/C
6	GND	N/C	N/C	GND	N/C	N/C	GND
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
9	N/C	GND	SATA_TX_0_N	SATA_TX_0_P	GND	SATA_RX_0_N	SATA_RX_0_P
10	GND	SATA_TX_1_N	SATA_TX_1_P	GND	SATA_RX_1_N	SATA_RX_1_P	GND
11	N/C	GND	SATA_TX_2_N	SATA_TX_2_P	GND	SATA_RX_2_N	SATA_RX_2_P
12	GND	SATA_TX_3_N	SATA_TX_3_P	GND	SATA_RX_3_N	SATA_RX_3_P	GND
13	N/C	GND	N/C	N/C	GND	N/C	N/C
14	GND	N/C	N/C	GND	N/C	N/C	GND
15	N/C	GND	N/C	N/C	GND	N/C	N/C
16	GND	N/C	N/C	GND	N/C	N/C	GND

P2, P3, P4, P5, P6: null

5. Power Specifications

5.1 Operating Voltage

Operating voltage: 5V (±5%) or 12 V (±5%)

5.2 Power Consumption (typical)

Operation (Read/ Write): 8.5W / 18W @ 2TB
Idle: 3.5W

6. Reliability Specification

6.1 Environment

Item	Features	
Temperature	Operation	Industrial: -40°C~+85°C
Humidity	5-95%	
Vibration	16.4 G (10Hz-2000Hz)	
Shock	1500G (@0.5ms Half-sine wave) 50G (@11ms Half-sine wave)	

6.2 Wear-leveling

Renice 6U Open VPX SATA storage supports 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

Programmable BCH strength (8-bit~80-bit) and Codeword size (512/ 1024 Bytes).

6.4 Power Failure Protection

Renice 6U Open VPX SATA storage adopts on board DDR and Tantalum capacitor. Data will be written to DDR firstly an 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: JESD47compliant

6.6 MTBF

MTBF (Mean Time between Failures) : >4,000,000 hours
Data retention (25°C): > 10 years

7. One-key Destruction (Optional)

7.1 Technical process of physical and logical destruction

Renice 6U VPX storage is designed with logical and physical destruction function. To execute the destruction function, an external hardware button is requested to connect with P1 connector. Touch the button for more than 5 seconds, the SERASE_IN signal is sent by G1, G3 or G5 to trigger the data destruction function and start data erasing or burning the NAND flashes. The destruction will not be stopped even if the power off, it will be continued automatically when power is back on.

7.2 Pin definition of physical and logical destruction

Pin No.	Pin Name
G1	SERASE_IN
G3	SERASE_IN
G5	SERASE_IN

8.RAID0 (Optional)

Renice 6U Open VPX SATA storage supports RAID0 with 2 or 4 disks. RAID0 can combine several SSDs as one logical disk. The data read/ write can operate synchronously on each SSD. But can deliver different data into different disks. Thereby it highly improved the read/write performance of SSDs.

9.Ordering Information

Part Number	Description
RIM01T-VZ6U	6U VPX SATAIII 1TB MLC Industrial Storage
RIM02T-VZ6U	6U VPX SATAIII 2TB MLC Industrial Storage
RIM04T-VZ6U	6U VPX SATAIII 4TB MLC Industrial Storage
RIM08T-VZ6U	6U VPX SATAIII 8TB MLC Industrial Storage
RIM16T-VZ6U	6U VPX SATAIII 16TB MLC Industrial Storage
RIM32T-VZ6U	6U VPX SATAIII 32TB MLC Industrial Storage

10.Part Number Naming Rule

R I M 04T - V Z 6U

Renice

Temp. Range:
I-Industrial

Flash Type:
M:MLC
S:SLC

Capacities:
01T:1TB
02T:2TB
04T: 4TB
08T: 8TB
16T: 16TB
32T:32TB

VPX Interface

Controller

6U Series