

2013

RENICE Native U3_USB3.0 SSD(Rev.0.1) DATA SHEET



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1. Introduction

1.1 Product Overview

RENICE Native U3 SSD is based on Renice U3137 USB3.0 controller. It is high-capacity flash memory-based Solid State Drive (SSD) that electrically with USB3.0 standard, downward compatibility with 480Mbps USB2.0 High Speed and 12Mbps USB2.0 Full Speed Transfer. Sustained read speed is up to 250 MB/s, and sustain write speed is up to 160 MB/s based on MLC, Much more faster in ONFI\Toggle\SLC Flash mode.

RENICE Native U3 SSD is designed on MicroB connect with USB3.0 interface. It is designed for both Consumer and Industrial field. With Window To Go technology, It could be used for System Disk, reduces the boot time and consuming far less power than a hard disk drive (HDD).

RENICE Native U3 SSD is designed to withstand harsh environments. The U3 is vibration resistant and can work in lower or higher temperature than a standard HDD. No additional drivers are required, and can be configured as a boot device or data storage device.

1.2 Feature

- **Standard USB3.0:** USB3.0I, 5.0 Gbps
- **Form factor:** (78.52mmX56.0mmX6.53mm) LxWxH
- **Connector:** MicroB stand USB3.0 Connect
- **Performance:**
 - Burst Rate: 200MB/S
 - Sequential Data Read/Write: 250/160MB/s
 - 4kb Random Read/Write IOPS: up to 25,000/8,000
 - Access Time: 0.1ms
- **Capacities:**
 - 8GB, 16GB, 32GB, 64GB, 128GB, 256GB,512GB for SLC
 - 8GB, 16GB, 32GB, 64GB, 128GB, 256GB,512GB 1TB for MLC
- **Nand flash type:** MLC\SLC\ONFI\Toggle
- **Input voltage:** 5V (±20%)
- **Temperature ranges:**
 - Operation Temperature
Standard: 0 to 70°C Industrial: -40 to 85°C
 - Storage: -50 to 95°C
- **Intelligent features:**
 - Flash management algorithm: static and dynamic wear-leveling, bad block management algorithm
 - Supports AES 128/256 hardware encryption and write protect function;
 - High and Reliable ECC capability: 12/24/40/52/64/72 ECC per 1k Byte, CRC16 per meta data

- Support SE [Safe Erase] function customization
- **RoHS compliant**
- **MTBF** :>4,000,000 Hours @40C (Tested with Telcordia SR-332 standard)

2. Block Diagram

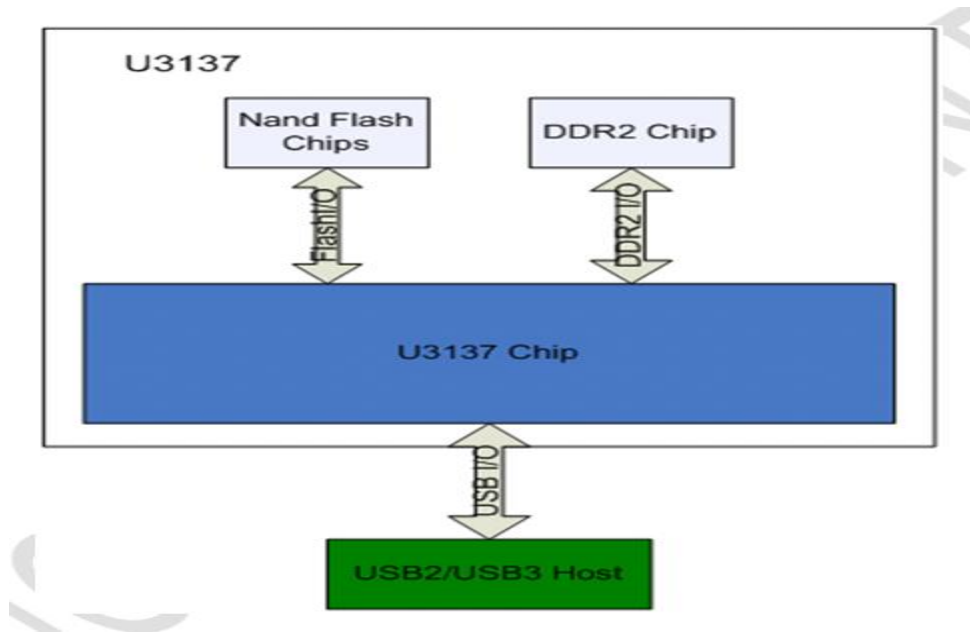


Figure 1: RENICE Native USB3.0 SSD Block Diagram

3. Product Specifications

3.1 Physical Specifications

Table 1 Physical Specifications

Form Factor		
Dimensions	Length	78.52±0.05mm
	Width	56.0±0.05mm
	Height	6.53±0.05mm
Weight		<67g
Connector		MicroB

D

Figure 2: Renice U3 SSD mechanical dimensions

3.2 Host Interface

Follow USB3.0 Stand interface

Downward compatibility with 480Mbps USB2.0 High Speed and 12Mbps USB2.0 Full Speed Transfer.

3.3 Internal MROM for Boot-loader

Robust Firmware Corruption

Maintenance and diagnostics program in MROM for recovering from drive malfunction

3.4 H/W Acceleration Engine

Internal SRAM search engine

3.5 Mobile SDRAM Interface

External DRAM with DDR2-533Mbps

4. Interface Description

4.1 Pin Assignment

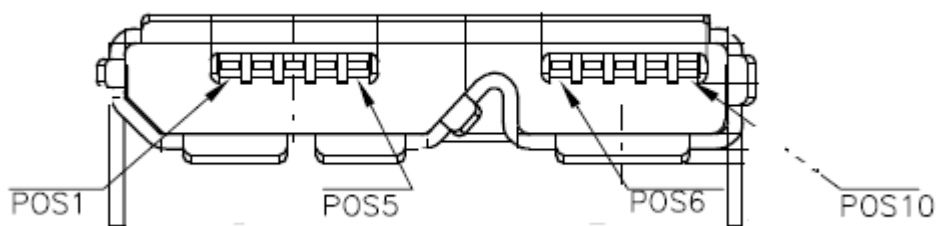


Figure 3: Pin Assignments

4.2 Pin Description

Table 3: Signal and Power segment

Pin No.	Signal Name	Description	Mating Sequence
1	VBUS	Power	Second
2	D-	USB2.0 differential pair	
3	D+		
4	ID	OTG identification	Last
5	GND	Ground for Power return	Second
6	MicB_SSTX-	SuperSpeed transmitter differential pair	Last
7	MicB_SSTX+		
8	GND_DRAIN	Ground for SuperSpeed signal return	Second
9	MicB_SSRX-	SuperSpeed receiver differential pair	Last
10	MicB_SSRX+		
Shell	Shield	Connector	First
Note: Tx and Rx are defined from the Device perspective			

5. Power Specifications

5.1 Operating Voltage

Operating voltage: 5V ($\pm 20\%$)

5.2 Power Supply Voltage

1.0V for Core, 3.3V for NAND, 1.8V for SDRAM

5.3 Power Consumption (typical)

Operation (Read/Write) – 0.8W

Idle – 0.2W

Standby -0.2W

6. Reliability Specification

6.1 Environment

Table 4: Environmental Specifications

Item	Features	
Temperature	Operation	Standard: 0~70°C
		Industrial: -40~85°C
Humidity	5-95%	
Vibration	20G(7-2000HZ)	
Shock	2,000G(@0.3ms half sine wave)	

6.2 Wear-leveling

RENICE Native U3 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 Endurance

Write endurance: >10years @ 100GB write/ day (32GB)

Read endurance: unlimited

6.4 H/W ECC and EDC for NAND Flash

ECC capability: 12/24/40/52/64/72 ECC per 1k Byte

6.5 MTBF

MTBF (Mean Time between Failures) of Renice u: >4,000,000 Hours @40C (Tested with Telcordia SR-332 standard)

7. Ordering Information

Table 8: Valid Combinations

Part Number	Description
RIS008-MU3	8GB SLC, Industrial temp -40~85°C
RIS016-MU3	16GB SLC, Industrial temp -40~85°C
RIS032-MU3	32GB SLC, Industrial temp -40~85°C
RIS064-MU3	64GB SLC, Industrial temp -40~85°C
RIS128-MU3	128GB SLC, Industrial temp -40~85°C
RIS256-MU3	256GB SLC, Industrial temp -40~85°C
RIS512-MU3	512GB SLC, Industrial temp -40~85°C
RIM008-MU3	8GB MLC, Industrial temp -40~85°C
RIM016-MU3	16GB MLC, Industrial temp -40~85°C
RIM032-MU3	32GB MLC, Industrial temp -40~85°C
RIM064-MU3	64GB MLC, Industrial temp -40~85°C
RIM128-MU3	128GB MLC, Industrial temp -40~85°C
RIM256-MU3	256GB MLC, Industrial temp -40~85°C
RIM512-MU3	512GB MLC, Industrial temp -40~85°C
RIM100-MU3	1TB MLC, Industrial temp -40~85°C

8.Part Number Naming Rule

R I S 064 - M U3

