Shenzhen Renice Technology Co., Limited

U3 1.8" Native USB3.0 SSD

Datasheet



V1.0

2014- 10- 14

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1. Introduction

1.1 Product Overview

Renice Native U3 SSD is based on Renice U3137 USB3.0 controller. It is a 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 250MB/s, and sustain write speed is up to 160MB/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:** USB3.0, 5.0Gbps
● **Form factor:** 78.52mm x 56.0mm x 6.53mm (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:** 256GB~1TB (MLC)
128GB~512GB (SLC)
● **NAND Flash type:** MLC\ SLC\ ONFI\ Toggle
● **Input voltage:** 5V (±20%)
● **Temperature ranges:**
- Operation: -40°C to +85°C(Wider temperature is supported according to customer requirement)
- Storage: -50°C 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 Secure Erase function customization
● **MTBF**: >4,000,000 Hours @40C

2. Block Diagram

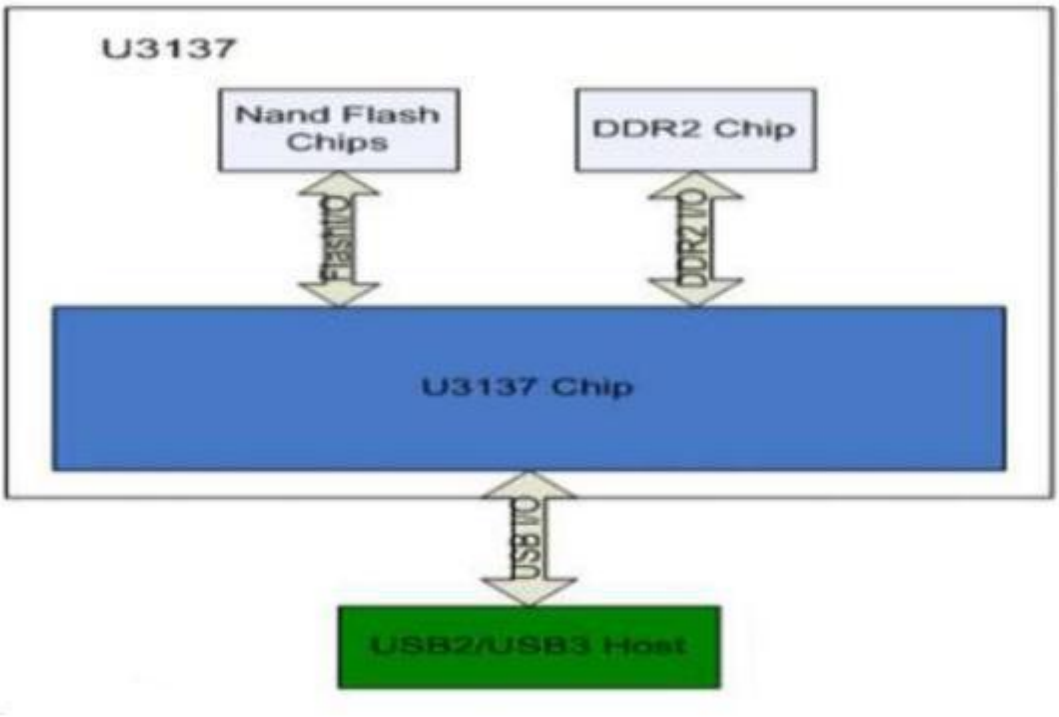


Figure 1: Renice Native USB3.0 SSD Block Diagram

3. Product Specifications

3.1 Physical Specifications

Table 1: Physical Specifications

Form Factor		USB3.0
Dimensions	Length	78.5±0.05mm
	Width	56.0±0.05mm
	Height	6.53±0.05mm
Weight		<67g
Connector		MicroB

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 diagnostic program in MROM for recovering from drive malfunction

3.4 H/W Acceleration Engine

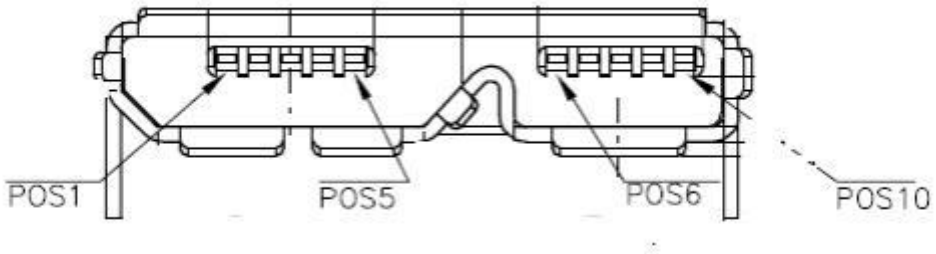
Internal SRAM search engine

3.5 Mobile SDRAM Interface

External DRAM with DDR2-533Mbps

4. Interface Description

4.1 Pin Assignment



Fingure2: Pin Assignments

4.2 Pin Description

Table 2: Signal and Power Assignment

Pin No.	Signal Name	Description	Mating Sequence
1	VBUS	Power	Second
2	D-	USB2.0 differential pair	Last
3	D+		
4	ID	OTG identification	
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(±20%)

5.2 Power Supply Voltage

1.0V for Core,3.3V for NAND and 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 3: Environmental Specifications

Item	Features	
Temperature	Operating	Industrial: -40°C~+85°C
Humidity	5-95%	
Vibration	20 G (7-2,000HZ)	
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 types of flash memory at same level of erase cycles to improve lifetime limitation of NAND based storage.

6.3Endurance

Write endurance: > 5 years @ 100GB write/day (128GB MLC)

Read endurance: unlimited

6.4 MTBF

MTBF (Mean Time between Failures) of Renice U3: >4,000,000 Hours @40C (Tested with Telcordia SR-332 standard).

6.5 Power Failure Protection

Renice Native USB3.0 SSD adopts on board SDRAM and Tantalum Capacitor to protect data integrity on sudden power-off. Data will be written to SDRAM firstly and then to NAND Flash. In case of power loss, the capacitors will support the transferring of data from SDRAM to NAND Flash successfully.