

SUPERTALENT MSATA II DATASHEET

SATA SOLID STATE DRIVE



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1.0 PRODUCT DESCRIPTION

1.1 PRODUCT OVERVIEW

A Solid State Disk (SSD) is a storage device that is based on semiconductors rather than rotating magnetic platters. Most SSDs, including Super Talent's mSATA offerings, are based on NAND Flash chips because they are fast, highly reliable, widely available and non-volatile. This mSATA is specified in JEDEC standard MO-300B. It is internally SATA II interface SSD using mini PCIe formfactor. **We offer the world first customizable design with this product line. (see page 6)**

1.2 TARGET APPLICATIONS

- Military and Aerospace
- Enterprise Computing
- Embedded / Industrial Systems
- Medical Industry
- Netbook

1.3 PRODUCT FEATURES

- Capacity: 30GB-120GB
- Form Factor: JEDEC MO-300B mSATA Full size (50.80mm x 29.85mm x Max 4.85mm)
- SATA Interface : SATA-II 3.0Gb/s
- High-speed performance
- Minimum 10 year data retention
- Built in wear leveling algorithm
- Built in error detection and correction
- Silent, no moving parts
- 100% tested HW and SW
- Designed and Manufactured in USA
- **World 1st customizable dimension offering for customer design-ins (see page 6)**

1.4 SYSTEM REQUIREMENTS

Operating Voltage Requirement: $V_{cc} = 3.3V \pm 10\%$

Operating System: Supported by all Operating Systems

Interface: mSATA interface

Device Connector: mini PCIe type 52pins

Installation Requirements: System Mounting Hardware as required

2.0 PRODUCT ORDERING PART NUMBERS

2.1 ORDERING PART STRUCTURE

Prefix X	Product Type X	Density XX	Flash Component XX	Technology X	Form Factor XX	Casing X
S-OEM	G - hmini PCIe MLC	30	N7-MC 64Gb MLC	4 – SF2141	SM-mSATA	Blank–No case
		30	R7-ONFi 64Gb MLC			
		60	N8-MC 128Gb MLC			
		60	R8-ONFi 128Gb MLC			
		12	R9-ONFI 256Gb MLC	8 – SF2181		

Table 1: Ordering Part Structure

2.2 VALID ORDERING PART NUMBERS

Product Family	Capacity	Flash	Form Factor	Casing	OEM Part Number
mSATA	30GB	Async MLC	mSATA Full size	No Case	SG30N74SM
	30GB	Sync MLC	mSATA Full size	No Case	SG30R74SM
	60GB	Async MLC	mSATA Full size	No Case	SG60N84SM
	64GB	Sync MLC	mSATA Full size	No Case	SG60R84SM
	120GB	Sync MLC	mSATA Full size	No Case	SG12R98SM

Table 2: Valid Ordering Part Numbers

3.0 PHYSICAL SPECIFICATIONS

3.1 MECHANICAL SPECIFICATIONS

Length: 50.80 ± 0.15 mm

Width: 29.85 ± 0.15 mm

Thickness: Max. 4.85 mm

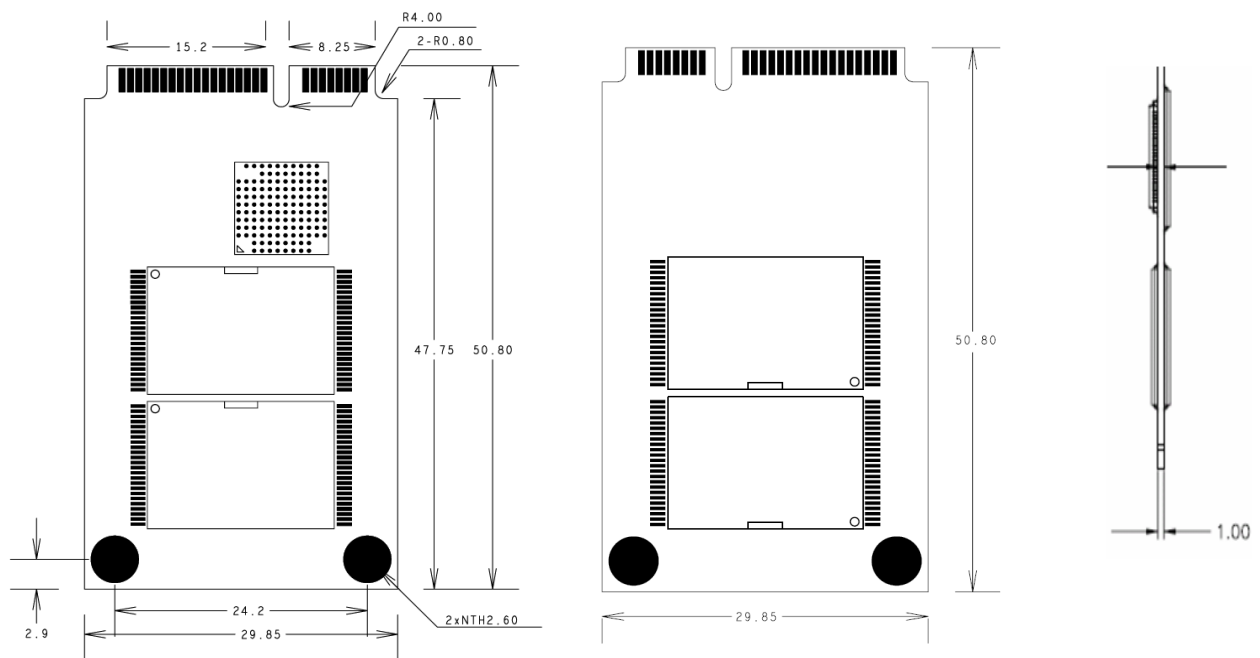


Figure 1: mSATA Full Size SSD Outline Drawing

World 1st custom fitting: Length and width can be customizable only for OEM customers.

4.0 ELECTRICAL SPECIFICATIONS

Operating Voltage: $V_{cc} = 3.3V \pm 10\%$

Sector Size: SSDs do not have sectors in the traditional HDD sense, but all SuperTalent SSDs are compatible with systems expecting 512Byte sector structures.

Modes: SATA 1.5/3.0Gb/s

4.1 PERFORMANCE SPECIFICATIONS

Access Time: 0.1 ms

Seek Time: 0 ms

Mount Time: Dependent on system HW and SW

Power on to Ready: 0.5 seconds (Max)

Data Transfer Time: Rated Data Transfer Speeds are maximums based on CrystalDiskMark or ATTO benchmark

Device	Sequential Read Max (MB/Sec)	Sequential Write Max (MB/Sec)
SG30N74SM	270	250
SG30R74SM	270	250
SG60N84SM	280	260
SG60R84SM	280	260
SG12R98SM	280	260

Table 3: Data Transfer Time Specifications

4.2 ABSOLUTE MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{cc}	Power Supply Voltage	-0.3 to 5.5	V
V_{IN}	Input Voltage	-0.3 to $V_{cc}+0.3$	V
T_{STG}	Storage Temperature	-40 to 125	°C
T_{OPR}	Operating Temperature	0 to 70	°C

Table 4: Absolute Maximum Ratings

4.3 RECOMMENDED DC OPERATING CONDITIONS

Symbol	Parameter	Min	Typ.	Max	Unit
V _{CC}	Power Supply Voltage	3.0	3.3	3.6	V
V _{IH}	High Level Input Voltage	2.0	-		V
V _{IL}	Low Level Input Voltage		-	0.8	V

Table 5: Recommended DC Operating Conditions

5.0 ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: Commercial Temp Range Only

- Commercial 0°C to 70°C

Humidity: 5% to ~98% RH

Operating Shock: 1500G

Operating Vibration: 16G

Operating Altitude: TBD

6.0 QUALITY AND RELIABILITY SPECIFICATIONS

Data Retention: Up to 10 years

Wear Leveling: Superior wear-leveling

Security: Data Encryption. 256-bit AES-compliant

Bad Block Management: Drive will self identify bad blocks and remap physical to logical addresses to avoid bad blocks.

ECC/EDC (Error Correction Code/Error Detection Code): Built in error detection and correction will correct physical bit errors in NAND. 55BCH.

MTBF: >2,000,000 hours

Power Cycle: TBD

Note: MTBF and FIT Rate calculated based on component values

Security: Integrity Data Security

Automatically stores data in a secure, AES-256 encrypted format. This also prevents would-be thieves from extracting data directly from the flash memory should they ever have access to the drive.

7.0 COMPLIANCE SPECIFICATIONS

All mSATA SSD is compliant with the following standards and regulations:

- RoHS

8.0 PIN DESCRIPTIONS

8.1 PIN ASSIGNMENTS

Pin	Symbol	Pin	Symbol
1	NC	2	3.3V
3	NC	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	TxP	24	3.3V
25	TxN	26	GND
27	GND	28	NC
29	GND	30	NC
31	RxN	32	NC
33	RxP	34	GND
35	GND	36	NC
37	GND	38	NC
39	3.3V	40	GND
41	3.3V	42	NC
43	GND	44	NC
45	NC	46	NC

Pin	Symbol	Pin	Symbol
47	NC	48	NC
49	DA/DSS	50	GND
51	Presence Detection	52	3.3V

Table 6: Pin Signal Assignment

9.0 INSTALLATION

BEFORE GETTING STARTED

1. Back Up Your Data

VISUAL INSPECTION

1. Before unpacking and handling the SSD, discharge the static electricity by touching the metal chassis of your computer or by using an anti-static wrist strap
2. Inspect the box and device for the following
 - a. Box is damaged or water-stained
 - b. Any damage to the SSD

HANDLING THE SSD

1. Be cautious when unpacking, installing, and handling the SSD drive. Misuse of the SSD voids all warranty. Follow the succeeding instructions when managing the SSD
2. Follow all ESD pre-cautions
3. Always operate the SSD within environmental conditions
4. Never switch DC power to the drive by plugging an electrically live source cable into the drive's power pins
5. Ensure correct connector polarity whenever connecting the drive to the PC

INSTALLATION

System Requirements

To install the SSD in your computer, ensure that you have the following items:

1. mSATA interface connector on motherboard

Install the SSD

Follow these steps to install the SSD

1. Power down the PC
2. Remove the computer system outside cover
3. Insert the SSD to the connector on motherboard
4. Replace the PC cover
5. Power on the PC
6. A BIOS sign-on message appears and displays a key sequence to enter the BIOS setup. Set up the BIOS to recognize the SSD.
7. Installation is complete

USING THE SSD IN A MS-DOS OS

The SSD is already partitioned and formatted by NTFS, so if you want to install MS-DOS O/S on the SSD, it should be re-partitioned and re-formatted. After installing the SSD, it must be installed as a disk drive under DOS. Run the DOS commands as listed below and follow the instructions displayed for each command.

1. Run the DOS FDISK program to partition the SSD
2. Verify that the partition is active and ready for formatting
3. Run the DOS FORMAT command to high-level format the SSD

USING THE SSD IN A WINDOWS OS

No modifications need to be made to use the SSD in a Windows OS platform

USING THE SSD IN A LINUX O/S

No modifications need to be made to use the SSD in a Linux OS platform

USING THE SSD IN OTHER O/S

No modifications need to be made to use the SSD in other OS platforms

FOR MORE INFORMATION

For Technical Support:

If additional support is needed, please visit the Super Talent Web site at www.supertalent.com for the following topics:

- **Warranty Services:** Includes the warranty service policy and the RMA request forms.
- **Technical Information:** Includes product data sheets and various SSD whitepapers.
- **Tools Section:** Includes frequently asked questions (FAQs).

For More Information or Further Technical Support Please Contact:

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CHANGE RECORD

Version	Release Date	Changes
1.0	Jan. 05, 2012	Initial Release in new template

Table 7: Change Record