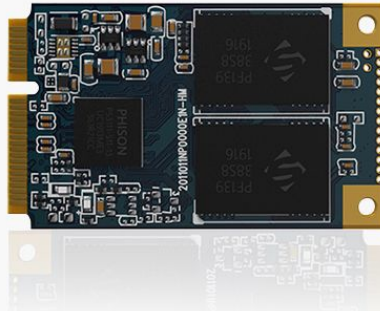# Longline
mSATA SSD
Solid State Drive

Longline 240GB MSATA SSD 520/420 MB/s LNG500MS/240G

LNG SSD

LONGLINE SERIES

PRODUCT DATASHEET

1.0 PRODUCT DESCRIPTION

1.1 PRODUCT OVERVIEW

The introduction of the LONGLINE mSATA is full consists of semiconductor devices using NAND flash memory which provide high reliability and high performance for a storage media. And opens up some very exciting possibilities for the Industrial and Commercial storage market. The mSATA are substantially smaller, lighter weight and consume less power compared to hard drives, yet have sufficient storage space to load an O/S and serve as a bootable drive for embedded applications. Moreover, these devices have excellent resistance to shock, vibration, dust, temperature extremes and other environmental hazards.

LONGLINE mSATA which features outstanding performance. Available in 32GB to 1TB capacities, this drives electrically complied with the SATA-II/SATA-III standards and is electrically compatible with a serial ATA disk drive.

Measuring 51mm x 30mm x 4.3mm, the mSATA is very small in volume and Super Speed, it can match and satisfy different customer's demand. It can easily mount on notebook without any cable, and provides fast read and writes speed, high reliability it an ideal storage solution for the server and mobile environment.

- Casino Gaming
- Embedded / Industrial Systems
- Enterprise Computing
- Notebook
- Medical Industry
- Military and Aerospace

1.2 PRODUCT FEATURES

- Capacity: 64GB, 128GB, 256GB, 512GB, 1TB
- 1G~8G bits Internal Cache
- Form Factor: MO-300A
- Supports 1-port mini-SATA 1.5/3.0/6.0Gbps SATA I/II/III protocol.
- SMART feature set and 48-bit Address feature set
- Ultra-rugged and reliable
- High-speed performance
- Silent, no moving parts
- Data retention: JESD47 compliant
- Proprietary wear leveling algorithms

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- 100% tested hardware and software

Operating Voltage Requirement: V_{cc} = 3.0V

+/-5% **Operating System:** Supported by all

operating systems **Interface:** SATA

Installation Requirements:

- System Hardware which supports SATA -II/SATA -III standards
- System Hardware includes SATA socket or transfer board

2.0 PHYSICAL SPECIFICATIONS
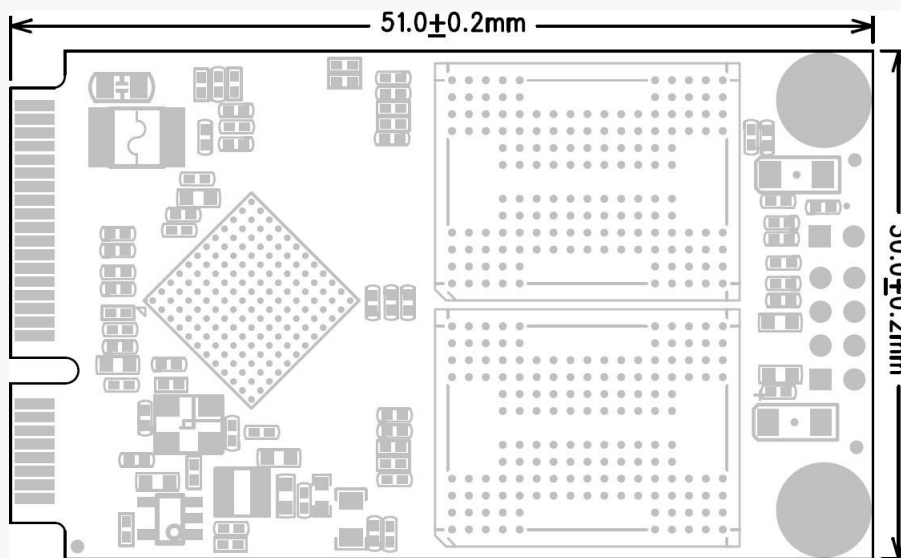
2.1 MECHANICAL SPECIFICATIONS

Length: 51.0 ± 0.20 mm

Width: 30.0± 0.20

mm Thickness:

4.85mm(max)

Figure 1   :   mSATA SSD Outline Drawing.

3.0 ELECTRICAL SPECIFICATIONS

Operating Voltage: V_{cc} = 3.3V ±5%

Modes: SATA 6.0Gbps (SATA-III) or SATA 3.0Gbps (SATA-II) or SATA 1.5Gbps (SATA-I) standards

3.1 PERFORMANCE SPECIFICATIONS

Access Time: 0.1 ms

Seek Time: 0 ms

Mount Time: Dependent on system HW and SW

Power on to Ready: Dependent on system HW and SW

Data Transfer Time: Rated Data Transfer Speeds are maximums based on Crystal Disk Mark 6.0

* mini SATA SSD Port and the installation of an enhanced driver required for maximum speed

Table 1 : Data Transfer Speed (R / W) up to :

Capacity	Data Transfer Speed (R / W)—MB/s Up to			
	Seq. read	Seq. write	4K Q32T1 read	4K Q32T1 write
120GB/128GB	550	480	220	210
240GB/256GB	550	500	220	210
480GB/512GB	550	500	230	210
960GB/1TB	550	500	260	270

3.2 POWER AND TEMPERATURE CONDITIONS

Table 2: Absolute Maximum Ratings

Symbol	Rating	Value	Unit
V_{IN}	Input Voltage	3.0V +/-5%	V
T_{STG}	Storage Temperature	-55 to 115	°C
T_{OPR}	Commercial Grade	0 to +70	°C
	Industrial Grade	-40 to +85	°C

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Table 3:Power consumption

Capacity	Product status(W)		
	Idle	Read	Write
120GB/128GB	0.49	2.44	4.10
240GB/256GB	0.53	2.58	4.28
480GB/512GB	0.50	2.48	4.26
960GB/1TB	0.51	2.80	4.26

3.3 TOTAL BYTES WRITTEN

Table 4: TBW and Daily Usage Guideline results

Capacity	TBW	Daily Usage Guideline
120GB/128GB	50TB	45GB/day
240GB/256GB	100TB	90GB/day
480GB/512GB	200TB	180GB/day
960GB/1TB	400TB	360GB/day

TBW: Total Bytes Written (TBW according to flash)

Definition and conditions of TBW are based on JEDEC

standard Daily usage guidelines value is calculated by

dividing TBW by 365*3

4.0 ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:

Commercial Grade: 0°C to

+70°C Industrial Grade: -40°C

to +85°C **Humidity:** 5% to

~98% RH **Operating Shock:**

1500G **Operating Vibration:**

16G

Operating Altitude: Operation: 120,000ft

5.0 QUALITY AND RELIABILITY SPECIFICATIONS

Data Retention: JESD47 compliant

Wear Leveling: Static and dynamic wear-leveling algorithm.

Bad Block Management: Failed Blocks of Flash will be replaced with new ones by the SSD.

ECC/EDC (Error Correction Code/Error Detection Code):

- Built in error detection and correction will correct physical bit errors in NAND. Drives use LDPC ECC

- 16bit CRC to ensure storage-data integrity between controller and NAND Flash device

MTBF: >1,000,000 hours

6.0 COMPLIANCE SPECIFICATIONS

All mSATA MO-300 SSD are compliant with the following standards and regulations:

- RoHS
- CE
- FCC

7.0 PIN DESCRIPTIONS

7.1 DATA PIN ASSIGNMENTS

Table 5: Pin Assignment

Pin	Signal Name	Description	Pin	Signal Name	Description
1	N/A	N/A	2	+3.3V	3.3V source
3	N/A	N/A	4	GND	Return Current Path
5	N/A	N/A	6	N/A	N/A
7	N/A	N/A	8	N/A	N/A
9	GND	Return Current Path	10	N/A	N/A
11	N/A	N/A	12	N/A	N/A
13	N/A	N/A	14	N/A	N/A
15	GND	Return Current Path	16	N/A	N/A
17	N/A	N/A	18	GND	Return Current Path

19	N/A	N/A	20	N/A	N/A
21	GND	Return Current Path	22	N/A	N/A
23	+B(port1)	SATA Differential TX+based on SSD	24	+3.3V	3.3V source
25	-B(port1)	SATA Differential TX-based on SSD	26	GND	Return Current Path
27	GND	Return Current Path	28	N/A	N/A
29	GND	Return Current Path	30	N/A	N/A
31	-A(Port1)	SATA Differential RX-based on SSD	32	N/A	N/A
33	+A(Port1)	SATA Differential RX+based on SSD	34	GND	Return Current Path
35	GND	Return Current Path	36	Reserved	NO Connect
37	GND	Return Current Path	38	Reserved	NO Connect
39	+3.3V	3.3V source	40	N/A	N/A
41	+3.3V	3.3V source	42	N/A	N/A
43	GND	Return Current Path	44	N/A	N/A
45	Reserved	NO Connect	46	N/A	N/A
47	N/A	N/A	48	N/A	N/A
49	N/A	N/A	50	GND	Return Current Path
51	GND	Return Current Path	52	+3.3V	3.3V source

8.0 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 precautions
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 connector

INSTALLATION

System Requirements

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

1. Mounting Screws (If needed)

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

Port driver is needed to be made to use the SSD in Linux OS platforms.

USING THE SSD IN OTHER O/S

Port driver is needed to be made to use the SSD in other OS platforms.