



Features

- MLC-NAND flash technology
- Built with DRAM cache
- Support Trim command set
- Support Native Command Queuing (NCQ)
- Support S.M.A.R.T. command set and utility
- Support Power Loss Protection
- Capacities from 128GB up to 512GB

Specification

- **Compatibility**
 - SATA Revision 3.2
 - ATA-8 ACS4 command set
- **Declarations**
 - RoHS & REACH compliant
- **Flash technology**
 - MLC-NAND flash technology
- **Form-factor**
 - Standard mSATA form factor
 - Compliant with JEDEC MO-300A
 - mini PCI-e connector with 52 pins SATA pin out
- **Host Interface**
 - mini PCI-e connector with 52 pins SATA pin out
- **Performance**
 - **Data transfer rate**
 - SATA 1.5Gb/s, 3.0Gb/s, 6.0Gb/s
 - **Sequential read**
 - 540 MB/sec (Max.)
 - **Sequential write**
 - 520 MB/sec (Max.)
 - **4KB random read**
 - 89.8K IOPS (Max.)
 - **4KB random write**
 - 90.5K IOPS (Max.)
- **Environmental**
 - **Operating temp.**
 - STD. 0°C~+70°C/W.T. -40°C~+85°C
 - **Non-operating temp**
 - STD. -20°C~+80°C/W.T. -50°C~+95°C
 - **Humidity**
 - 10% ~ 95% non-condensing
 - **Vibration**
 - 80 Hz to 2K Hz, 20G, 3axes
 - **Shock**
 - 0.5ms, 1500G, 3 axes
 - **Altitude**
 - 70,000 feet

- **Power consumption**
 - **Power requirement**
 - +3.3V ± 5%
 - **Reading mode**
 - 2,380 mW (Max.)
 - **Writing mode**
 - 3,600 mW (Max.)
 - **Idle mode**
 - 615 mW (Max.)
- **Reliability**
 - **Wear-leveling**
 - Static and Dynamic wear-leveling algorithms
 - Up to 1,028 TBW at 512GB Capacity (Sequential Write)
 - **TBW**
 - Up to 3,000 times
 - **Erase counts**
 - Up to 3,000 times
 - **ECC**
 - 120 bits per 2K bytes block
- **Physical specification**
 - **Weight (Max.)**
 - 8g
 - **Dimension (WxL)**
 - 29.80 x 50.80 (mm)
 - **Conformal coating**
 - Optional
 - **Warranty**
 - 2 years or within 3,000 erasing counts

Part Number List

Capacity	0°C~+70°C	Capacity	-40°C~+85°C
128GB	SBMSR128G-PHCTM-(W/T/WT)	128GB	WBMSR128G-PHCTM-(W/T/WT)C
256GB	SBMSR256G-PHCTM-(W/T/WT)	256GB	WBMSR256G-PHCTM-(W/T/WT)C
512GB	SBMSR512G-PHCTM-(W/T/WT)	512GB	WBMSR512G-PHCTM-(W/T/WT)C

Part Number Decoder

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Example

W	B	M	S	R	5	1	2	G	-	P	H	C	T	M	-	W	T	C	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--

X1 Grade

S : Standard grade operating temp. 0°C~+70°C
 W : Wide temp. grade operating temp. -40°C~+85°C

X2 The material of casing

B : Bare (without casing)

X3 X4 X5 Product category

MSR : Mini SATA Module (mSATA) w/ DRAM cache

X6 X7 X8 X9 Capacity

128G : 128GB 512G : 512GB
 256G : 256GB

X11 Controller

P : PHANES Series

X12 Controller version

A, B, C, D.....

X13 Controller grade

C : Commercial grade

X14 Flash IC brand

T : Toshiba NAND flash IC

X15 Flash IC type

M : MLC-NAND flash IC

X17 X18 X19 X20 Reserved for specific requirements

Blank : Standard product w/o thermal sensor and conformal-coating
 W : Write Protection Switch (optional)
 T : Thermal Sensor (optional)
 WT : Write Protection Switch + Thermal Sensor (optional)
 C : Conformal coating (optional)

SLC

aSLC

MLC

3D-NAND

DRAM Module

Adapter

Card-drive