



SATAIII M.2 2280 Solid State Drive

MMST350

128GB、256GB、512GB、1TB

Product Datasheet

Version 1.7

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



Revision History

Revision	Date	Modified By	Description
1.0	2018/01/30	Rain Wang	Initial Release
1.1	2018/07/17	Rain Wang	Modify 3.3.1 / 3.3.2 /3.3.3 /3.4.2
1.2	2018/08/13	Rain Wang	Modify 6.1 (Height 0.80+0.10mm)
1.3	2018/08/19	Rain Wang	Modify 3.1 /3.3.1 Performance 128GB (Read / Write:500/450 MB/s) 256GB / 512GB (Write: 450 MB/s)
1.4	2019/2/25	Rain Wang	Increase 1TB Spec.
1.5	2019/7/25	Rain Wang	Detail modification
1.6	2020/10/20	Taocheng. Meng	Add Product Number
1.7	2021/01/05	Qunhong. Zhang	Update Power Consumption

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



Content

Revision History	2
1. General Description	5
2. Product Overview	5
3. Product Specification	6
3.1 Key Feature	6
3.2 Capacity	7
3.3 Performance	7
3.3.1 Read/Write & CDM Performance	7
3.3.2 Read/Write & AS-SSD Performance	7
3.4 Electrical	8
3.4.1 Operating Voltage	8
3.4.2 Power Consumption	8
3.5 Environmental Conditions	9
3.6 Reliability	9
3.6.1 MTBF	9
3.6.2 TBW	9
4. S.M.A.R.T Support	10
5. Pin assignment and descriptions	11
5.1 M.2B+M Key Interface	11
5.2 Dual Key B+M	12
6. Product Mechanical Specification	13
6.1 Dimensions and Weight	13

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



6.2 Dimension Drawing 14

Jiangsu Huacun Electronic Technology
Confidential
不准复印

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



1. General Description

The MMST350 series is the M.2 2280 SSD that include capacity range from 128GB to 1TB. MMST350 series designed with SATAIII interface and complies with SATA Rev3.1 spec. MMST350 features distinct advantages of NAND Flash Disk than traditional HDD as well supports NCQ command set, S.M.A.R.T. feature and Trim command.

MMST350 is a cost effective solution with high performance and low power consumption which uses high performance flash memory using TLC NAND flash with DDRII interface to perform high sequential and random access capability.

2. Product Overview

The following table lists the models of MMST350 series SSD.

No.	Product Name	Capacity	NAND Flash	Form Factor
1	HC128GS6KA7T	128GB	3D TLC	M.2 2280 SATA
2	HC256GS6KA7T	256GB	3D TLC	M.2 2280 SATA
3	HC512GS6KA7T	512GB	3D TLC	M.2 2280 SATA
4	HC001TS6KA7T	1TB	3D TLC	M.2 2280 SATA

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



3. Product Specification

3.1 Key Feature

- Capacity : 128GB/256GB/512GB/1TB
- Form-Factor : M.2 22mm x80mm
- Flash Interface :
 - Mounted 1pcs to 4pcs of BGA package
 - Support NV-DDRII / Toggle DDRII
- SATA Interface Compatibility
 - Complies With SATA Rev3.1/6Gbps/Backward
 - Complies With ATA-8 Standard
 - S.M.A.R.T. / NCQ / TRIM Supported
- Specific Feature
 - MTBF : 2,000,000 hours
 - TBW : 128GB/100, 256GB/200, 512GB/400, 1TB/800
 - Performance : Read up to 550MB/s & Write up to 500MB/s
 - IOPS (4K-64 Thrd) : Read 45K & Write 74K
- Input Power : DC 3.3V +/-5%
- RoHS Compliant
- Power Consumption (Maximum) : <1.1 W
- Operating Temperature Range : 0℃ ~ 70℃
- Storage Temperature Range : -40℃ ~ 85

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



3.2 Capacity

Model	MMST350			
Capacity	128GB	256GB	512GB	1TB

3.3 Performance

3.3.1 Read/Write & CDM Performance

Item	Crystal Disk Mark 8.0.1 (x64)			
Capacity	128GB (MB/s)	256GB (MB/s)	512GB (MB/s)	1TB (MB/s)
Sequential Q32 Read	500	550	550	550
Sequential Q32 Write	470	500	500	550
4K-Q32T1 Read	200	250	250	300
4K-Q32T1 Write	200	250	350	350
Note:1.) Seq. Read & Write speed test by CDM, The Test Platform Z370, Test system Win10 (64Bit). 2.) Performance may vary based on SSD capacity, hardware test platform, test software, Operating system, and other system variables.				

3.3.2 Read/Write & AS-SSD Performance

Item	AS SSD BenchMark 2.0			
Capacity	128GB (MB/s)	256GB (MB/s)	512GB (MB/s)	1TB (MB/s)
Sequential Read	470	520	520	520
Sequential Write	460	470	470	470
Capacity	128GB (iops)	256GB (iops)	512GB (iops)	1TB (iops)
4K-64Thrd Read	28000	45000	45000	45000
4K-64Thrd Write	70000	74000	74000	74000
Note:1.) Seq. Read & Write speed test by AS-SSD with Random pattern, The Test Platform Z370 Test system Win10 (64Bit). 2.) Performance may vary based on SSD capacity, hardware test platform, test software, Operating system, and other system variables				

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



3.4 Electrical

3.4.1 Operating Voltage

Item	Operating Voltage
Input Power	DC 3.3V $\pm$ 5%
Maximum Ripple	100mV p-p or less

3.4.2 Power Consumption

Mode	128GB	256GB	512GB	1TB	Unit
Idle	0.2640	0.2871	0.3795	0.3842	W
Sleep	0.005	0.005	0.005	0.005	W
Sequential Read	0.9230	0.9240	1.0296	1.0310	W
Sequential Write	0.8320	0.8712	0.9042	0.9068	W
Note: : 1.) Measured by CDM(Crystal Disk Mark 8.0.1 (x64), The test result is the maximum value. 2.) The system conditions and test environment may affect test result					

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province



3.5 Environmental Conditions

Item	Operating	Non-Operating
Temperature	0° C to 70° C	-40° C to 85° C

3.6 Reliability

3.6.1 MTBF

Item	Value
MTBF	2, 000, 000 Hours
Remark: Mean Time Between Failures (MTBF)	

3.6.2 TBW

Total Byte Written (TBW)	128GB	256GB	512GB	1TB
	100	200	400	800

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province

4. S. M. A. R. T Support

The S.M.A.R.T is about the computer data drive monitoring system during operation and response the drive status and “health”. S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology; often written as SMART) is a monitoring system included in computer hard disk drives (HDDs), solid-state drives (SSDs). Its primary function is to detect and report various indicators of drive reliability with the intent of anticipating imminent hardware failures

When S.M.A.R.T. data indicates a possible imminent drive failure, software running on the host system may notify the user so preventative action can be taken to prevent data loss, and the failing drive can be replaced and data integrity maintained. Below table shows the S.M.A.R.T. command set.

ID	Attribute Name	Comment
0x01	Read Error Rate	TotalNewBadCnt/TotalHostRdCnt
0x05	Reallocated Sectors Count	TotalNewBadCnt
0x09	Power-On Hours Count	Number of hours elapsed in the power-on state. The value shall be incremented by one every one hour.
0x0C	Drive Power Cycle Count	Number of device power cycling. The value shall be incremented by one on each power cycling after disk initialization is done
0xA0	Online Uncorrect Sector Count	Uncorrectable Sector Count when read/write
0xA1	Number Of Valid SpareBlocks	Number of vaild spare block
0xA3	Number of initial invalid block	Number of initial invalid block
0xA4	Totla Erase Count (TLC Block)	Total erase count
0xA5	Maximum P/E Cycles (TLC)	Maximum erase count
0xA6	Minimum P/E Cycles (TLC)	Mimimum Erase count
0xA7	Average P/E Cycles (TLC)	Average erase count
0xA8	Max Erase Count in Spec	Max Erase Count of Spec
0xA9	Remain Life Percentage	Remain Life(%)
0xAF	Worst Component Program Fail Count	Program fail count in worst die
0xB0	Worst Component Erase Fail Count	Erase fail count in worst die

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province

0xB1	Wearleveling Count	Total wearlevel count
0xB2	Grown Bad Block Count	Runtime invalid block count
0xB5	Program Fail Count	Total program fail count
0xB6	Erase Fail Count	Total Erase fail count
0xC0	Sudden Power Count	Number of times unexpected power off occurred. (power off when drive is in active state) The value shall be incremented by one on each unexpected power off.
0xC2	Enclosure Temperature	On-chip temperature sensor value.
0xC3	Hardware ECC recovered	Retry Pass Count
0xC4	Reallocation Event Count	Retry Fail Count
0xC5	Current Pending Sector Count	waiting move sector count
0xC6	Reported Uncorrectable Errors	Total uncorrectable count when off-line
0xC7	CRC Error Count	UltraDMA CRC Error Count
0xE8	Available Reserve Space	Remain Space(%)
0xF1	Host 32MB/unit Written (TLC)	Total LBAs Written (each write unit = 32MB)
0xF2	Host 32MB/unit Read (TLC)	Total LBAs Read (each read unit = 32MB)
0xF5	NAND 32MB/unit Written (TLC)	Total sector write to flash (each write unit = 32MB)

5. Pin assignment and descriptions

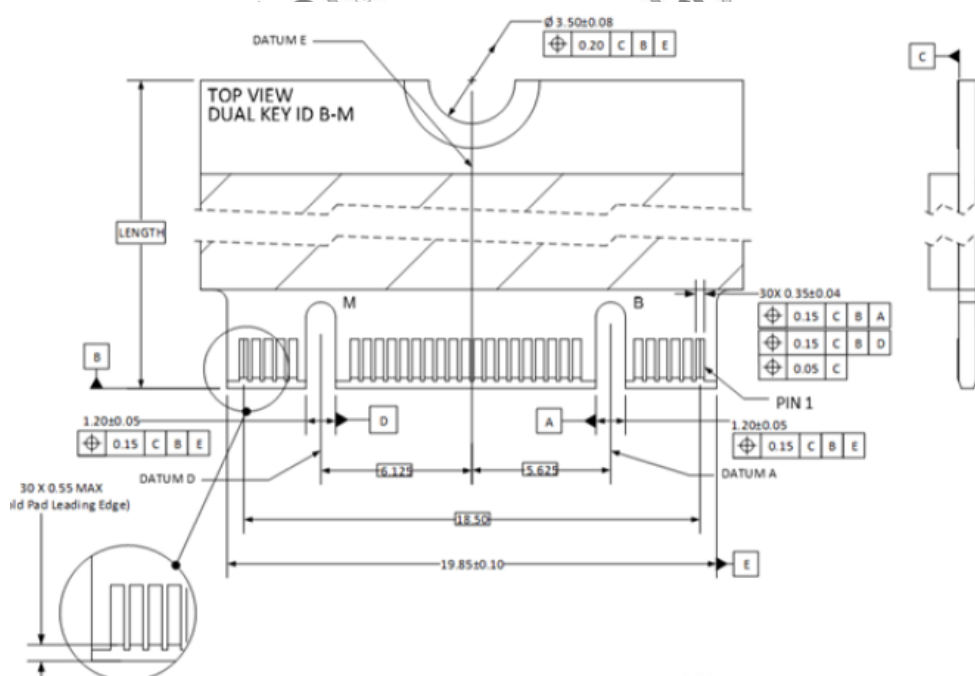
5.1 M. 2B+M Key Interface

74	3.3V	CONFIG_2=GND	75
72	3.3V	GND	73
70	3.3V	GND	71
68	SUSCLK (32KHz) (I) (0/3.3V)	CONFIG_1=GND	69
66	M Key	N/C	67
64	M Key	M Key	65
62	M Key	M Key	63
60	M Key	M Key	61
58	Reserved for MFG_CLOCK	M Key	59
56	Reserved for MFG_CLOCK	GND	57
54	N/C	N/C	55
52	N/C	N/C	53
50	N/C	GND	51
48	N/C	SATA-A+	49
46	N/C	SATA-A-	47
44	N/C	GND	45
42	N/C	SATA-B-	43
40	N/C	SATA-B+	41

江苏华存电子科技	江苏省南通市通州区新世纪大道 266 号 C4 楼 9 层(南通高新区江海智汇园)
Jiangsu Huacun Electronic Technology	9F, C4 Building, 266 New Century Avenue, Tongzhou District, Nantong City, Jiangsu Province

38	DEVSLP (I) (0/3. 3V)	GND	39
36	N/C	N/C	37
34	N/C	N/C	35
32	N/C	GND	33
30	N/C	N/C	31
28	N/C	N/C	29
26	N/C	GND	27
24	N/C	N/C	25
22	N/C	N/C	23
20	N/C	CONFIG_0=GND	21
18	B Key	B Key	19
16	B Key	B Key	17
14	B Key	B Key	15
12	B Key	B Key	13
10	DAS/DSS# (I/O)	N/C	11
8	N/C	N/C	9
6	N/C	N/C	7
4	3. 3V	N/C	5
2	3. 3V	GND	3
-		CONFIG_3=GND	1

5.2 Dual Key B+M





6. Product Mechanical Specification

6.1 Dimensions and Weight

Model	Length (mm)	Width (mm)	Height (mm)	Weight (Gram)
128GB	22 ± 0.15	80 ± 0.15	0.80 ± 0.10	Max 6
256GB	22 ± 0.15	80 ± 0.15	0.80 ± 0.10	Max 6
512GB	22 ± 0.15	80 ± 0.15	0.80 ± 0.10	Max 6
1TB	22 ± 0.15	80 ± 0.15	0.80 ± 0.10	Max 6

6.2 Dimension Drawing

Unit : mm

