Performance test & Burn in test				
Tested riser card	AD963FA9 mSATA to SATA 6Gb/s Adapter			
mSATA SSD	Crucial mSATA 64GB/ M4-CT064M4SSD3 (SATA III 6Gb/s)			
Test Environment				
M/B	Asus P8P67 (Intel P67 Chipsets)			
CPU	Intel I5-2500, 3.3MHz/ 6G Cache/ 5GT			
RAM	Kingston KVR1333D3N9K2/4G, DDR3-1333MHz,4GB(2GB DIMM* 2)			
Power	TC START W500, 500W ATX,12V V2.2 Power Supplier			
VGA	MSI R6700, AMD HD6700 Series			
Operate System:	WIN 7 64bit OS			

Suggestion:

Please use the motherboard containing native SATA 6Gb/s Port to test, which can provide more correct I/O performance. (such as Intel 6 Series chipsets or AMD 9 Series Chipsets).

If you are using a motherboard plus SATA III host bus adapter which is non-native 6Gb/s Port or SATA to PCI-e adapter to provide 6Gb/s Port, the I/O performance testing result will be very much lower than the native SATA III Port or maybe not match the mSATA SSD.

Notice:

1. mSATA SSD I/O performance -- depends on the Controller IC.

2. mSATA SSD I/O performance - -depends on the NAND Flash IC.

- a. Toggle DDR mode or ONFI synchronous NAND Flash IC, will show good performance
- b. Traditional asynchronous or SDR NAND Flash IC, will show poor performance

Install:

M4-CT064M4SSD3 mSATA SSD inserts to AD963FA9 adapter and fixes it with M3*3 screws, and then connected to the P68 chipset native SATA III Ports (use the Asus P8P67 M/B).

SATA III Host Controller IC : Marvell 88SS9174-BLD2 / NAND Flash IC : Micron MT29F128G08CFAAB [Explain]

MT29F128G08CFAAB NAND FLASH Features:

·support ONFI 2.2 synchronous mode

-12 = 166 MT/s (MT/s is MegaTransfer/Sec, 166MHz)

Reference to Micron 64Gb,128Gb, 256Gb, 512Gb Asynchronous/Synchronous NAND Features datasheet

SSD I/O performance measurements

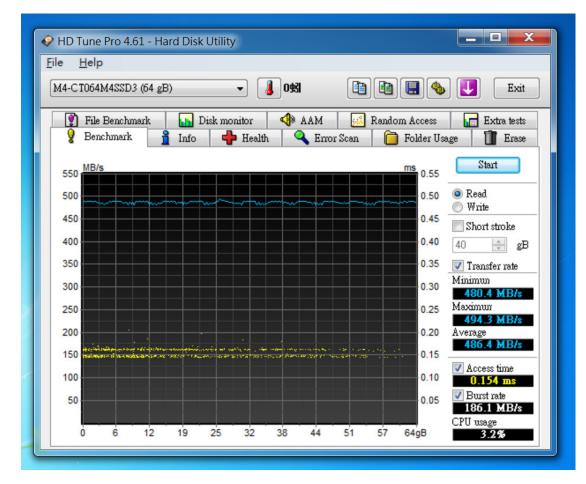
Block sizes

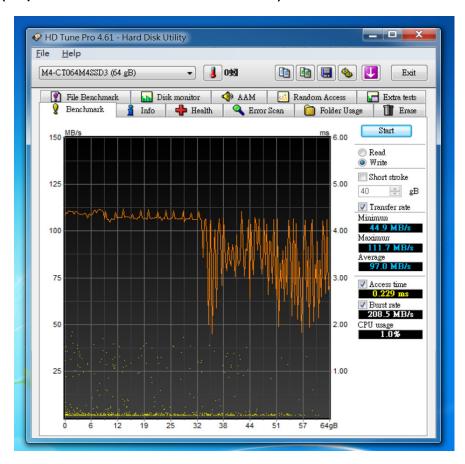
Data transfer always takes place in blocks during access to a SSD. The size of the transferred data blocks depends on features of the operating system and/or the application.

AD963FA9, and Micron M4-CT064M4SSD3 mSATA SSD assembly completed as below:



The following performance test use HD Tune pro 4.61 original software(no partition) ***Benchmark (Sequential Read / default block size= 64KB)**





※Benchmark (Sequential Write / default block size= 64KB)

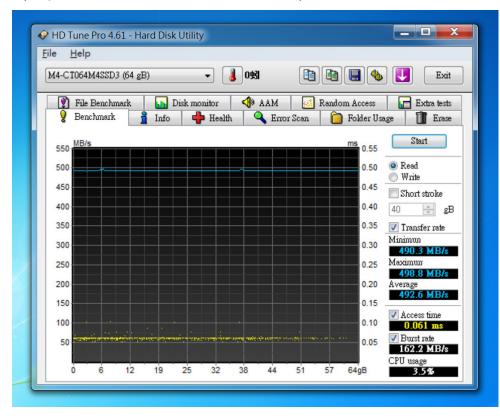
The following performance test uses HD Tune pro 4.61(partition and formatted by win 7 NTFS Type) **** show M4-CT064M4SSD364/ 64GB mSATA SSD SATA Supported features**

14-CT064M4SSD3 (64						
	gB)	-] 0	蚓			Ex
👔 File Benchmark	🚺 Disk n	nonitor 🛛 🏹) AAM	🛃 Rand	om Access	📻 Extra tes
💡 Benchmark	👖 Info 🛛 🛛	🕂 Health	🔍 Erro:	r Scan 🛛 📔] Folder Usage	Era:
Volume	Capacity	Free	Usage	File system	Serial	Alignment
——新增磁碟區 (D:)	61054 MB	60963 MB	0%	NTFS	9613-FB12	1 MB
Write Cache Host Protected An Device Configura Firmware Upgrad	tion Overlay		Power SCT 1 Native	e Command Q	0	
🔽 Security Mode			📝 TRIM			
Firmware version: Serial number: 0	000000012140	000F	Standard: Supporte			- SATA III MA Mode 5
			Active:	μ.		MA Mode 5 MA Mode 5
	04.U gB (
Capacity: Buffer:	64.0 gB (.99.00B) n/a	Average :	speed:		508 MB/s

%showM4-CT064M4SSD364/ 64GB mSATA SSD Health Status OK

M4-CT064M4SSD3 (64 gB)					
👔 File Benchmark 🛛 🚹 Disk	monitor	AA 🚯	.M 🗾 F	landom Access	📊 Extra test
🂡 Benchmark 🕺 Info	🕂 Health	٩,	Error Scan	📋 Folder U	sage 🚺 Eras
D	Current	Worst	Threshold	Data	Status
(01) Raw Read Error Rate	100	100	50	0	ok
(05) Reallocated Sector Count	100	100	10	0	ok
(09) Power On Hours Count	100	100	1	68	ok
(OC) Power Cycle Count	100	100	1	136	ok
(AA) (unknown attribute)	100	100	10	0	ok
(AB) Program Fail Count	100	100	1	0	ok
(AC) Erase Fail Block Count	100	100	1	0	ok
(AD) (unknown attribute)	100	100	10	19	ok
AE) Unexpected Power Loss Count	100	100	1	109	ok
(B5) Program Fail Count	100	100	1	458869	ok
(B7) (unknown attribute)	100	100	1	0	ok
(B8) End To End Error Detection	100	100	50	0	ok
(BB) Reported Uncorrectable Errors	100	100	1	0	ok
(BC) Command Timeout	100	100	1	0	ok
(BD) (unknown attribute)	100	100	1	48	ok
(C2) Temperature	100	100	0	0	ok
(C3) Hardware ECC Recovered	100	100	1	0	ok
(C4) Reallocated Event Count	100	100	1	0	ok
(C5) Current Pending Sector	100	100	1	0	ok
(C6) Offline Uncorrectable	100	100	1	0	ok
(C7) Ultra DMA CRC Error Count	100	100	1	0	ok
(CA) Data Address Marker errors	100	100	1	0	ok
(CE) Flying Height	100	100	1	0	ok
Description: click on an item fo tatus: n/a	r a detailei	d descrip	tion		

※Benchmark (Sequential Read / default block size= 64KB)



The following performance test uses AS SSD Benchmark 1.6 (partition and formatted by win 7 NTFS Type) ***Benchmark (Read & Write by MB/s / default block size= 16MB)**

D: M4-CT064M4SSD3 ATA De M4-CT064M4SSD3 000F msahci - OK 1024 K - OK 59 62 GB	Read:	Write:	
✓ Seq	495.33 MB/s	110.65 MB/s	
☑ 4K	23.28 MB/s	57.00 MB/s	
4K-64Thrd	256.39 MB/s	98.53 MB/s	
Acc.time	0.089 ms	0.351 ms	
Score:	329	167	
	653		

D: M4-CT064M4SSD3 ATA De	Read:	Write:		
000F msahci - OK 1024 K - OK 59.62 GB	Nodu.	Wind.		
16MB	30.96 iops	6.92 iops		
☑ 4K	5959 iops	14592 iops		
4K-64Thrd	65635 iops	25222 iops		
☑ 512B	11224 iops	2847 iops		
Score:	329	167		
	653			
	1	;;		

The following performance test uses CrystalDiskMark 3.0.1 x64 (partition and formatted by win 7 NTFS Type) ***Benchmark (Sequential Read & Wtire / default block size= 1MB)**

The second s	kMark 3.0.1 x64 (E) 主題(T) 說明(H) 語言 5 ▼ 1000MB ▼ D	
All	Read [MB/s]	
Seq	527.4	115.1
512K	416.9	114.9
4K	25 .84	63. 91
4K QD32	245.0	114.7

The following performance test uses ATTO Disk BenchMark (partition and formatted by win 7 NTFS Type)

File View Help	
Drive: [-d-] ▼ Force Write Access Transfer Size: 0.5 ▼ to 8192.0 ▼ KB Total Length: 256 MB ▼	ss V Direct I/(1/0 Comparison Querlapped I/0 Neither Queue Depth: 4
Controlled by:	Start
<< Description >> Test Results	*
Write Read	Write Read 27008 26112 51968 50688 86859 103455 111885 225902 115970 327827 116851 374631 116857 398094 117384 410820 117384 437819 117384 531313 117477 539267 117477 539267 117477 539267 117477 539267 117477 539267 117477 539267 117477 539267 117477 539267 117477 500578
0 100 200 300 400 500 600 700 80 Transfer Rate - MB / Sec	0 900 1000
l For Help, press F1	NUM

The following Burn in test uses BurnInTest v7.0 Pro (partition and formatted by win 7 NTFS Type) **% show System information**

🔁 BurnInTest V7.0 Pro	
File Edit Configuration Test Quick Tests Help	
🛃 🗊 📋 💥 🔇 🕰 Current configuration 🕞 🍉 🧱 🔞	
System Information Burn In Results Event Log Temperature	
UAL Lype: Internal DAL(400MHz)	· ·
Memory: 1024MB	
BIOS: 113-AC36800-103	
Driver provider: ATI Technologies Inc.	
Driver version: 8.820.0.0	
Driver date: 1-12-2011	
Monitor 1: 1280x720x32 60Hz (Primary monitor)	
Disk volumes	
C: Local drive, NTFS, (59.53GB total, 40.15GB free) D: Local drive, 新增磁碟區, NTFS, (59.62GB total, 59.53GB free) E: Optical drive	
Disk drives	
磁碟穩: Model M4-CT064M4SSD2 ATA Device (Size: 59.62GB) AGR Hour burn-in test GR Market: Model M4-CT064M4SSD3 ATA Device (Size: 59.62GB) AGR Hour burn-in test for this mSATA SSD	<
Optical drives	
E: SONY DVD RW DRU-880S (CD-RW/DVDRW)	\bigcirc
Network	
Ready	
	2 4 2 2 4 2

Show Disk test mode(default cyclic -- 10 ways cycle test)

J Temp / Battery Video Playback	Sound 🥥 CP			fest 🍓	Post-Te: l norts
	3D Graphics	a usb	RAM	-	Plug-in
-		Logging	A Errors	1 -	letwork
Disk selection				4 .5	
Automatically selec	t all bard drives at	the start of to	esting		
Automatically selec	t air naru unves at	ule start of te	sung		_
Drive	Test Mo	de	Threshold	File size	SM
00: [Physical disk D:]	Not Tes	ting			
C: [Local drive]	Not Tes	-			
D: 新增磁碟區 [Loc	-		NA	1.00	N
E: [Optical disk]	Not Tes	ung			
					•
Edit details for drive:		esal drival			P
Test this drive		Local univej			
	Default (Cyclic)			-	
				•	
File size	1.00 (% of	disk)	Seek count	100	
Block size	256 🔻 KB				
Slow drive threshold	0.0 MB/Se	c (NA = No t	hreshold warni	(pa	
Duty cycle override	% (or leave	e blank to acce	ept default)		
SMART options		-			
Run self test and l					
Log bac	sector increase	Bad section	or threshold	20	

% show Crucial mSATA 64GB/ M4-CT064M4SSD3 24-hour Burn in test PASSED

😰 BurnInTest V7.0 Pro	X
File Edit Configuration Test Quick Tests Help	
🕞 🗊 📋 💥 🛐 🖎 Current configuration 👻 🍉 📕 🥝	
System Information Burn In Results Event Log Temperature	
Results for PERRY-PC	
Test configuration file: LastUsed.bitcfg Status: IDLE Start time: Fri Sep 28 19:05:03 2012 Stop time: Sat Sep 29 19:05:11 2012 Duration: 024h 00m 08s	3
BurnInTest test result	
Test Name Disk (D:) Temperature PASSED	
View errors by categories OK	
Ready	