	Performance test & Burn in test
Tested riser card	AD963FA9 mSATA to SATA 6Gb/s Adapter
mSATA SSD	RunCore mSATA 64GB/RCP-V-T5060-MC (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:

RCP-V-T5060-MC mSATA SSD inserts to AD963FA9 adapter and fixes it with M3\*3 screws, and then connect to the P67 chipset native SATA III Port (use the Asus P8P67 M/B). SATA III Host Controller IC : SanForce SF-2281VB1-SDC / NAND Flash IC : Intel JS29F16B08CCME3

## 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 RunCore RCP-V-T5060-MC mSATA SSD assembly completed as below:



The following performance test uses 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 RCP-V-T5060-MC / 64GB mSATA SSD SATA Supported features** 

e <u>H</u> elp						
unCore SSD (60 gB)		- ] 4:	2蚓			Exit
🔮 File Benchmark	🚹 Disk mor	nitor 📢	) AAM	Rand	om Access	Extra tests
💡 Benchmark 📘	Info 🚽	Health	🔍 Erroi	r Scan 🛛 🚺	] Folder Usage	Erase Erase
Volume	Capacity	Free	Usage	File system	Serial	Alignment
₃新增磁碟區 (D:)	57238 MB	57147 MB	0%	N TFS	FAD3-509E	1 MB
48-bit Address     Read Look-Ahead     Write Cache     Host Protected Area     Device Configuration     Firmware Upgradable     Security Mode	o Overlay	WF 0.1	V Power Advau V Interfa Power SCT 1 V Native V TRIM	Management Inced Power M ace Power Ma -up in Standb Sables e Command Q	anagement nagement y ueuing (NCQ)	
Firmware version:	GF 601C031	W5.0.1	Standard:	4.	ATA8-ACS	- SATA III
Capacity:	60.0 gB (55	9 GB)	Active:		UD	MA Mode 5
Buffer:	8 (55	n/a	Average :	speed:	02	476 MB/s
			D			0.001

#### %show RCP-V-T5060-MC / 64GB mSATA SSD Health Status OK

unCore SSD (60 gB)	-	42蚓		1	Ex Ex
🔮 File Benchmark 🛛 🚹 Disk	monitor	📣 📣	M 🗾 F	Random Access	Extra tes
💡 Benchmark 🕺 Info	🕂 Health		Error Scan	📋 Folder Us	age 🚺 Era:
ID	Current	Worst	Threshold	Data	Status
(01) Raw Read Error Rate	115	115	50	117491613	ok
(05) Reallocated Sector Count	100	100	3	0	ok
(09) Power On Hours Count	0	0	0	68	ok
(OC) Power Cycle Count	100	100	0	145	ok
(AB) Program Fail Count	0	0	0	0	ok
(AC) Erase Fail Block Count	0	0	0	0	ok
(AE) Unexpected Power Loss Count	0	0	0	75	ok
(B1) Wear Range Delta	0	0	0	0	ok
(B5) Program Fail Count	0	0	0	0	ok
(B6) Erase Fail Count	0	0	0	0	ok
(BB) Reported Uncorrectable Errors	100	100	0	0	ok
(C2) Temperature	42	75	0	4915242	ok
(C3) Hardware ECC Recovered	120	120	0	117491613	ok
(C4) Reallocated Event Count	100	100	3	0	ok
(C9) Soft Read Error Rate	120	120	0	117491613	ok
(CC) Soft ECC Correction	120	120	0	117491613	ok
(E6) GMR Head Amplitude	100	100	0	100	ok
(E7) SSD Life Left	100	100	10	0	ok
(E9) Media Wearout Inidcator	0	0	0	380	ok
(EA) (unknown attribute)	0	0	0	1399	ok
(F1) LifeTime Writes from Host	0	0	0	1399	ok
(F2) LifeTime Reads from Host	0	0	0	2546	ok
Description: click on an item fo	or a detaile	d descrip	tion		
Status: n/a	or a actance	a acsemp	001		

## ※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: RunCore SSD ATA Device		
RunCore SSD ATA GFW5.0.1 msahci - OK 1024 K - OK 55.90 GB	Read:	Write:
🗷 Seq	258.37 MB/s	24.33 MB/s
☑ 4K	19.54 MB/s	26.57 MB/s
4K-64Thrd	65.72 MB/s	44.42 MB/s
Acc.time	0.208 ms	0.293 ms
Score:	111	73
	2:	38

PS: using asynchronous NAND Flash IC in AS SSD performance is poor.

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 )** 



(PS: using SanForce SF-2281VB1-SDC real-time compression feature controller, it is not supported )

CrystalDiskMark 3.0.1 x64 default random file types so performance is poor. **\*\*Benchmark (Sequential Read & Wtire / default block size= 1MB ) –All 0Xff, 1 fill** 

A 11	5 - 100	0MB 👻 D:	0% (0/56GB)	•
All	Read	[MB/s]	Write [MI	B/s]
Seq	46	9.1	483	.5
512K	41	7.3	404	.2
4K	22	.15	69.4	45
4K QD32	68	.36	355	.9

(PS: Changed to simple data types (All 0Xff, the fill), there is a good performance.)

X 혀 Untitled - ATTO Disk Benchmark File View Help D 🛎 🖬 🚳 📐 🕂 የ 📢 Force Write Access Direct 1/( [-d-] Drive: -1/0 <u>C</u>omparison Transfer Size: to 8192.0 ▼ KB 0.5 6 Overlapped I/O Total Length: 256 MB -Neither C Queue Depth: 4 -Controlled by: Start -<< Description >> . Test Results Write Write Read Read = 0.5 14392 14137 1.0 27510 28019 2.0 50186 55808 4.0 224317 114212 8.0 275937 211566 16.0 400080 324967 455442 32.0 383736 500029 64.0 428986 128.0 512246 469762 256.0 522241 523518 512.0 519971 535532 522502 516222 1024.0 549072 556663 2048.0 4096.0 516222 556663 8192.0 514984 556663 100 200 300 400 500 600 700 800 900 1000 Transfer Rate - MB / Sec 0 NUM For Help, press F1

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

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

## % show System information

File Edit Configuration Test Quick Tests Help            Pile Edit Configuration Test Quick Tests Help             Pile Edit Configuration Current configuration             Pile Edit Configuration	👸 BurnInTest V7.0 P	ro		x
Image: System Information       Image: System Information       Image: System Information       Image: System Information         System Information       Image: System Information       Image: System Information       Image: System Information         Chip Type:       ATI display adapter (0x68BA)       Image: System Information       Image: System Information         DAC Type:       Internal DAC(400MHz)       Image: System Information       Image: System Information         Memory:       1024MB       Internal DAC(400MHz)       Image: System Information         Driver provider:       ATI Technologies Inc.       Internal DAC(400MHz)       Image: System Information         Driver version:       8.820.0.0       Internal DAC(400MHz)       Image: System Information       Image: System Information         Disk volumes       1:12-2011       Monitor 1:       1280x720x32 60Hz (Primary monitor)       Image: System Information       Image: System Information         C:       Local drive, MTFS, (59.53GB total, 40.15GB free)       Image: System Informatinformation       Image: System Information <t< td=""><td>File Edit Configu</td><td>ration Test Quick Tests Help</td><td></td><td></td></t<>	File Edit Configu	ration Test Quick Tests Help		
System Information       Burn In Results       Event Log       Temperature         Chip Type:       ATI display adapter (0x68BA)	🕞 🔊 🗋 🗙	🔰 🕰 Current configuration 🕞 📂 🧮 🚷		
Chip Type:       ATI display adapter (0x668A) <ul> <li>DAC Type:</li> <li>Internal DAC(400MHz)</li> <li>Memory:</li> <li>1024M8</li> <li>BIOS:</li> <li>113-AC36800-103</li> <li>Driver provider:</li> <li>ATI Technologies Inc.</li> <li>Driver version:</li> <li>8.820.0.0</li> <li>Driver date:</li> <li>1-12-2011</li> <li>Monitor 1:</li> <li>1280x720x32 60Hz (Primary monitor)</li> </ul> <ul> <li>Disk volumes</li> <li>C: Local drive, NTFS, (59.53GB total, 40.15GB free)</li> <li>D: Local drive, 新婚離釀區, NTFS, (55.90GB total, 53.09GB free)</li> <li>E: Optical drive</li> </ul> <ul> <li>Disk drives</li> <li>Disk drives</li> <li>Z4-hour burn-in test for this mSATA SSD</li> </ul> <ul> <li>Cit his mSATA SSD</li> </ul>	System Information	Burn In Results Event Log Temperature		
Disk volumes         C: Local drive, NTFS, (59.53GB total, 40.15GB free)         D: Local drive, 新增磁碳區, NTFS, (55.90GB total, 53.09GB free)         E: Optical drive         Disk drives         磁碟穗: Model M4-CT064M4SSD2 ATA Device (Size: 59.62GB)         磁碟穗: Model RunCore SSD ATA Device (Size: 55.90GB)         Carbon Core SSD ATA Device (Size: 55.90GB)         Carbon Core SSD ATA Device (Size: 55.90GB)         Carbon Core SSD ATA Device (Size: 55.90GB)	Chip Type: DAC Type: Memory: BIOS: Driver provider: Driver version: Driver date: Monitor 1:	ATI display adapter (0x68BA) Internal DAC(400MHz) 1024MB 113-AC36800-103 ATI Technologies Inc. 8.820.0.0 1-12-2011 1280x720x32 60Hz (Primary monitor)	1	^
C: Local drive, NTFS, (59.53GB total, 40.15GB free) D: Local drive, 新增磁碟區, NTFS, (55.90GB total, 53.09GB free) E: Optical drive Disk drives 磁碟捷: Model M4-CTD64M4SSD2 ATA Device (Size: 59.62GB) 磁碟穗: Model RunCore SSD ATA Device (Size: 55.90GB) 在 24-hour burn-in test for this mSATA SSD	Disk volumes			
Disk drives 磁碟機: Model M4-CT064M4SSD2 ATA Device (Size: 59.62GB) 磁碟機: Model RunCore SSD ATA Device (Size: 55.90GB) 在了 this mSATA SSD	C: Local drive, N D: Local drive, 新 E: Optical drive	FFS, (59.53GB total, 40.15GB free) 增磁碟區, NTFS, (55.90GB total, 53.09GB free)		
磁碟穗: Model M4-CTD64M4SSD2 ATA Device (Size: 59.62GB) 磁碟穗: Model RunCore SSD ATA Device (Size: 55.90GB) Gr this mSATA SSD	Disk drives			
	磁碟機: Model M4 磁碟機: Model Ru	-CTD64M4SSD2 ATA Device (Size: 59.62GB) hCore SSD ATA Device (Size: 55.90GB)		
Optical drives	Optical drives —			
E: SONY DVD RW DRU-880S (CD-RW/DVDRW)	E: SONY DVD RW	(DRU-880S (CD-RW/DVDRW)		-
Ready	Ready			.44

# % show Disk test mode(default cyclic -- 10 ways cycle test)

Temp / Battery   🌒 🎥 Video Playback	Sound   🌌 CP	U   🗊 Printe	er   🍒 Pre-1 ports	iest   🍓 🍋 Paralle	Post- el por
🚽 2D Graphics 🧧 👌	h 3D Graphics	🔌 USB	RAM 🛷	<i>i</i>	Plug
🧊 Disk 🛛 🎯 Opti	cal Disk 🔋 📑	Logging	🙆 Errors	1 2	Vetwo
Disk selection					
Automatically select	all hard drives at	the start of te	sting		
Drive	Test Mo	de	Threshold	File size	SM
01: [Physical disk D:]	Not Tes	tina			
C: [Local drive]	Not Tes	ting			
D: 新增磁碟區 [Loca	al drive] Default	(Cydic)	NA	1.00	Ν
E: [Optical disk]	Not Tes	ting			
•					•
Edit details for drive:	D: 新增磁碟區	[Local drive]			
Test this drive	<b>v</b>				
Test mode	Default (Cyclic)			•	
File size	1.00 (% o	f disk)	Seek count	100	
		,			
Block size	256 <b>•</b> KB				
Slow drive threshold	0.0 MB/S	ec (NA = No th	nreshold warni	ng)	
Duty cycle override	% (or leav	e blank to acce	pt default)		
SMART options					
Run self test and lo	G SMART errors				
Log bad	sector increase	Bad secto	or threshold	20	
			L		

## % show Crucial mSATA 64GB/ RCP-V-T5060-MC 24-hour Burn-in test PASSED

