

R2096E SATA 3 to mSATA 2-port & M.2 2-port RAID

RAID 0 Mode Performance & Burn In Test Rev. 1.0

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1. Overview

R2096E RAID card offers SATA 3 interface, built-in 2-port SATA 7-pin connector & 2-port M.2 B key connector, can be combined two SATA interface SSD into a RAID 0, RAID 1, JBOD mode. **This test report is based SATA III 128GB SSD x2, RAID 0 set as a benchmark.**

2. Tools and Results of Performance Measurement

2.1 Test Platform

M/B :	ASRock Z97 Extreme 6
CPU :	Intel i5-4426, 3.2GHz/ 6M Cache/ LGA1150
Memory :	Kingston KVR16N11S8/4, DDR3-1600MHz, 8G(4GB DIMM*2)
ATX Power :	FSP RAIDER 550, 550W ATX , 12V V2.2 Power Supply
Graphic :	Z97 Chipsets built-in HD Graphics 4600
OS :	Microsoft Windows 8.1 64bit OS

2.2 Test target: R2096E RAID Card and Crucial M550 CT128M550SSD1 2.5" 128GB



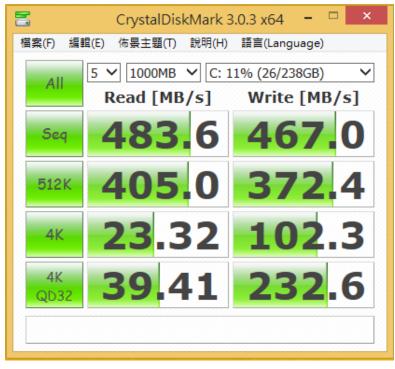
R2096E Adapter

CT128M550SSD1 / 128GB x2

2.3 Install Hardware

- 2.3.1 Use two SATA 7pin cable, connect the two groups 2.5 "SSD to R2096E array card, and then with coppers, and screws to fix SSDs. (Please refer to the Installation Notes). using SATA 7pin signal cable, connect the array card to SATA III Port of ASRock Z97 Extreme6 M/B.
- 2.4 BIOS & Windows 8 OS environment setup
 - 2.4.1 Install Windows 8.1 x64 OS.

- 2.5 CrystalDiskMark 3.0.3 x64 performance test
 ※Benchmark (Sequential Read & Write / default = 1MB)
 - 2.5.1 Used Crucial CT128M550SSD1/128GBx2 in RAID 0 performance as below:



2.6 AS SSD Benchmark 1.7 performance test

※Benchmark (Read & Write by MB/s, default block size = 16MB)

2.6.1 Used Crucial CT128M550SSD1/128GBx2 in RAID 0 performance as below:

🚢 AS SSD Benchmark 1.7.4739.38088 – 🗆 🗙								
File Edit View Tools Language Help								
C: ASMT109x- Fast	C: ASMT109x- Fast							
ASMT109x- Fast 2143 5 storahci - OK 359424 K - OK 238.48 GB	Read:	Write:						
I Seq	489.40 MB/s	488.47 MB/s						
☑ 4K	24.68 MB/s	93.19 MB/s						
☑ 4K-64Thrd	37.11 MB/s	137.00 MB/s						
☑ Acc.time	0.168 ms	0.049 ms						
Score:	111	279						
	457							
Start Abort								

2.7 ATTO Disk Benchmark performance test

%Benchmark (Sequential Read / default block size = 8MB)

2.7.1 Used Crucial CT128M550SSD1/128GBx2 in RAID 0 performance as below:

🚊 Untitled - ATTO Disk Benchma	ark – 🗆 🗙						
File View Help							
Drive: [-c-] Force Write Access	Direct I/O						
Transfer Size: 0.5 ▾ to 8192.0 ▾ KB	C 1/0 Comparison						
Total Length: 256 MB	 <u>O</u>verlapped I/O <u>N</u>either 						
	Queue Depth: 4 💌						
Controlled by:							
	Start						
<< Description >>	^						
T ID A	×						
Test Results Write — Read —	Write Read						
0.5	43136 14172						
	78884 26812 143433 48398						
	276959 72048 436378 120356						
16.0	448777 170655						
32.0	425237 216089						
64.0	502530 312125 456769 379272						
256.0	415245 453451						
512.0	407492 501748						
1024.0	513752 522502 522502 516222						
4096.0	489176 518715						
8192.0	462819 526344						
0 100 200 300 400 500 600 700 800 900 1000 Transfer Rate - MB / Sec							
 For Help, press F1 //							

2.8 AnvilBenchmark_V110_B337

2.8.1 Used Crucial CT128M550SSD1/128GBx2 in RAID 0 performance as below:

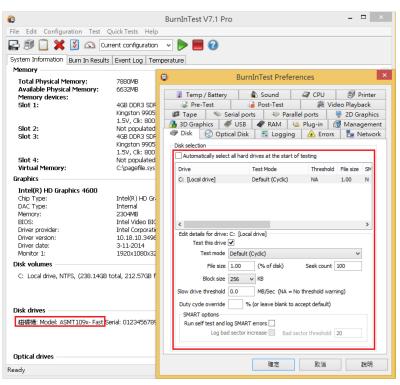
•	🖻 🛛 🛛 🖕 🕒 Anvil's Storage Utilities 1.1.0 (2014-January-1) – 🗖 🗡								
File	Benchmark	s IOmeter System	n Info Settings	Test size 1GB	🔹 Drive 🔳 c: []		✓ Screenshot Help		
SS	D Bench	mark					ASMT109x- Fast 256GB/2143 5		
	Read	Resp. time	MB read	IOPS	MB/s				
	Seq 4MB	8.5449ms	2,048.0	117.03	468.11				
C	4K	0.1822ms	267.9	5,486.98	21.43				
	4K QD4	0.4165ms	469.0	9,604.67	37.52		1,221.39		
	4K QD16	1.6626ms	469.9	9,623.63	37.59	Run read	1,221.39		
	32K	0.2710ms	1,731.7	3,690.26	115.32				
	128K	0.5033ms	3,729.4	1,986.88	248.36		3,740.09		
	Write	Resp. time	MB written	IOPS	MB/s	Run	3,740.09		
	Seq 4MB	8.6055ms	1,024.0	116.21	464.82				
	4K	0.0387ms	640.0	25,853.90	100.99		2,518.71		
	4K QD4	0.0562ms	640.0	71,120.83	277.82	Run write	2,518.71		
	4K QD16	0.2297ms	640.0	69,672.29	272.16				
		8.1 64 位元 Build (9600)		Defense			ASMT109x- Fast 256GB/2143 5		
	Z97 Extreme6/P1.00, CPUSocket			Drives :			Drive C: 238.1/212.3GB free (89.2%) NTFS - Cluster size 4096B		
	Intel(R) Core(TM) i5-4460 CPU @ 3.20GHz Memory : 7,880 MB			Notes :			Storage driver storahci		
	rofessional E						Alignment 359424KB OK		
							Compression 100% (Incompressible)		

3. Burn In Tests and Results

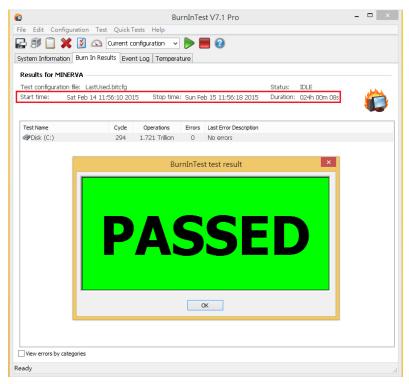
- 3.1 BurnInTest v7.1 Pro
 - 3.1.1 system information for Crucial CT128M550SSD1/128GBx2 in RAID 0 as below:



3.1.2 show 2.5" SSD/128GBx2 in RAID 0 test mode(default cyclic -- 10 ways cycle test)



3.1.3 show Crucial CT128M550SSD1/128GBx2 in RAID 0 24-hour Burn-in test PASSED



4. Summary

- 4.1 R2096E is SATA III Interface, I/O speed, max. to 600MB/s.
- 4.2 R2096E adapter I/O performance is based on SATA III 2.5" SSD.