

R2036F SATA III to M.2 NGFF 2-port RAID Card

RAID 1 Mode Performance & Burn In Test Rev. 1.0

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1. Overview

R2036F RAID card offers SATA 3 interface, built-in 2-port M.2 67-pin B key connector can be combined M.2 NGFF SSD into a RAID 0, RAID 1, JBOD mode of operation.

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: R2036F RAID Card and M.2 NGFF SSD(LGT-128M6G/128GBx2)



R2036F Adapter

R2036F + M.2 SSD

LGT-128M6G x2pcs

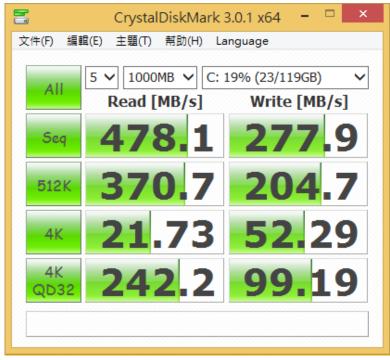
2.3 Install Hardware

2.3.1 Insert M.2 SSDx2 into R2036F converter's B key connector, and then with coppers, and screws to fix SSDs. (Please refer to the Installation Notes).
 Connect R2036F converter to SATA III Port of ASRock Z97 Extreme6.

2.4 BIOS & Windows 8 OS environment setup

2.4.1 Install Windows 8.1 x64 OS.

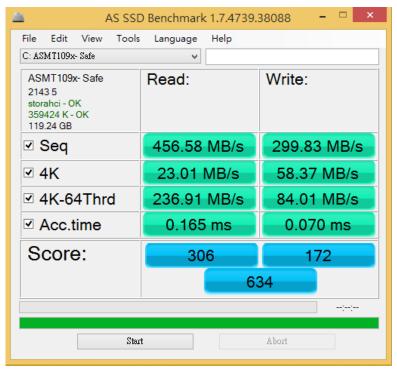
- 2.5 CrystalDiskMark 3.0.1 x64 performance test
 ※Benchmark (Sequential Read & Write / default = 1MB)
 - 2.5.1 Used LITE-ON LGT-128M6Gx2 in **Z97 Extreme 6 RAID 1** performance as below:



2.6 AS SSD Benchmark 1.7 performance test

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

2.6.1 Used <u>LITE-ON LGT-128M6Gx2</u> in **Z97 Extreme 6 RAID 1** performance as below:



2.7 ATTO Disk Benchmark performance test

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

2.7.1 Used LITE-ON LGT-128M6Gx2 in **Z97 Extreme 6 RAID 1** performance as below:

🗀 Untitled - ATTO Disk Benchm	ark – 🗆 🗙			
File View Help				
Drive: [-c-] - Force Write Access	Direct 1/0			
Transfer Size: 0.5 💌 to 8192.0 💌 KB	 ○ I/O <u>C</u>omparison ○ Overlapped I/O 			
Total Length: 256 MB 💌	 <u>O</u>verlapped I/O <u>N</u>either 			
	Queue Depth: 4 💌			
Controlled <u>by:</u>	,			
	Start			
<< Description >>	^			
Test Devils	¥			
Test Results Write Read	Write Read			
0.5	26112 31409			
1.0	40676 60416 87370 113188			
	134904 192105 172268 258025			
16.0	193242 331356			
32.0	217167 387082 241425 447331			
128.0	270744 459009			
	284837 464703 320328 495954			
1024.0	211783 497102			
2048.0	319566 513752 173932 436987			
8192.0	288020 379861			
0 100 200 300 400 500 600 700 800 900 1000 Transfer Bate - MB / Sec				
For Help, press F1				

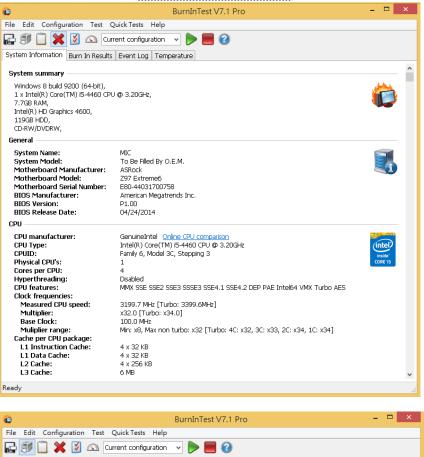
2.8 AnvilBenchmark_V110_B337

2.8.1 Used <u>LITE-ON LGT-128M6Gx2</u> in **Z97 Extreme 6 RAID 1** performance as below:

🔁 Anvil's Storage Utilities 1.1.0 (2014-January-1) – 🗖 🗙							
File Benchmarks	IOmeter System	n Info Settings	Test size 1GB	▼ Drive 🔳 c: []		✓ Screenshot Help	
SSD Benchr	SSD Benchmark ASMT109x- Safe 128GB/2143						
Read	Resp. time	MB read	IOPS	MB/s			
Seg 4MB	8.6680ms	2,048.0	115.37	461.47			
4K	0.1832ms	2,040.0	5,458.20	21.32			
4K 0D4	0.1748ms	1.117.3	22,881.24	89.38			
4K QD16	0.2548ms	3,066.2	62,794.58	245.29	Run read	1,627.50	
32K	0.2854ms	1,644.5	3,504.46	109.51			
128K	0.6567ms	2,858.3	1,522.78	190.35		2,778.82	
Write	Resp. time	MB written	IOPS	MB/s	Run	2,778.82	
Seq 4MB	13.4258ms	1.024.0	74.48	297.93			
4K.	0.0720ms	542.9	13,891.57	54.26		1,151.32	
4K QD4	0.1483ms	640.0	26,964.14	105.33	Run write	1,151.32	
4K QD16	0.5853ms	640.0	27,336.06	106.78			
Microsoft Windows 8.1 専業版 64 位元 Build (9600)						ASMT109x- Safe 128GB/2143 5 Drive C: 118.9/94.9GB free (79.8%)	
Z97 Extreme6/P1.00, CPUSocket Intel(R) Core(TM) i5-4460 CPU @ 3.20GHz			Notes :			NTFS - Cluster size 40968 Storage driver storahci	
Memory : 7,882 MB					Alignment 359424KB OK		
Professional Edition Alignment 399248 OK Compression 100% (Incompressible)							
						1	

3. Burn In Tests and Results

- 3.1 BurnInTest v7.1 Pro
 - 3.1.1 system information for LITE-ON LGT-128M6Gx2 RAID 1 as below:

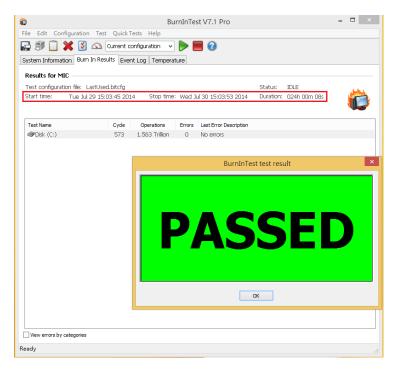


File Edit Configuration Test	Quick Tests Help	
a 🔊 🚺 🗶 🚺 🗠	irrent configuration 🖂 ⊳ 📕 🕢	
System Information Burn In Result	s Event Log Temperature	
Memory		
Total Physical Memory:	7882MB	STOR.
Available Physical Memory:	6617MB	An
Memory devices:		A.
Slot 1:	4GB DDR3 SDRAM PC3-12800	
	Kingston 9905584-014.A00LF, serial#: 876230684, wk/yr: 18/2014	
Slot 2:	1.5V, Clk: 800.0MHz, Timings 11-11-11-28 (@ Max. freq.) Not populated	
Slot 2:	4GB DDR3 SDRAM PC3-12800	
360.3.	Kingston 9905584-014.A00LF, wk/vr: 18/2014	
	1.5V, Clk: 800.0MHz, Timings 11-11-11-28 (@ Max. freq.)	
Slot 4:	Not populated	
Virtual Memory:	C:\pagefile.sys (allocated base size 1920MB)	
Graphics		
Intel(R) HD Graphics 4600		
Chip Type:	Intel(R) HD Graphics Family	
DAC Type:	Internal	
Memory:	2304MB	
BIOS:	Intel Video BIOS	
Driver provider: Driver version:	Intel Corporation 10,18,10,3496	
Driver version: Driver date:	3-11-2014	
Monitor 1:	1920×1080×32 59Hz (Primary monitor)	
Disk volumes		
C: Local drive, NTFS, (118,90GE	total 96.0368 free)	
D: Optical drive		
Disk drives		
· 磁噪機: Model: ASMT109x- Safe	Serial: 0123456789 (Disk: 0, Size: 119.24GB, Volumes: C)	(SV)
Optical drives		
eady		

3.1.2 show LITE-ON LGT-128M6Gx2 RAID 1 test mode(default cyclic -- 10 ways cycle test)

õ		BurnInTest V7.1 Pro – 🗆 🗙
File Edit Configuration Test (Quick Tests Help	p
	rent configuration	
System Information Burn In Results	Event Log Ter	mperature
Memory		BurnInTest Preferences
Total Physical Memory:	7882MB	Durhamest Preferences
Available Physical Memory:	6617MB	Temp / Battery 🚯 Sound 🕼 CPU 🗊 Printer
Memory devices:		
Slot 1:	4GB DDR3 SDR Kinaston 9905!	
	1.5V. Ck: 800.	
Slot 2:	Not populated	
Slot 3:	4GB DDR3 SDR	
	Kingston 9905	
	1.5V, Ck: 800.	
Slot 4: Virtual Memory:	Not populated C:\pagefile.svs	
	C:\pagenie.sys	
Graphics		C: [Local drive] Default (Cyclic) NA 1.00 N D: [Optical disk] Not Testing
Intel(R) HD Graphics 4600		D: [Opucar disk] Not resung
Chip Type:	Intel(R) HD Gr	
DAC Type:	Internal	
Memory:	2304MB	
BIOS: Driver provider:	Intel Video BIC Intel Corporatio	
Driver version:	10.18.10.3496	Eucletais for arres C. [Local arres]
Driver date:	3-11-2014	Test this drive 🗹
Monitor 1:	1920x1080x32	Test mode Default (Cyclic) V
Disk volumes		File size 1.00 (% of disk) Seek count 100
C: Local drive, NTFS, (118.90GB total, 96.03GB fre D: Optical drive		Block size 256 V KB
		Slow drive threshold 0.0 MB/Sec (NA = No threshold warning)
		Duty cycle override % (or leave blank to accept default)
Disk drives		SMART options
磁碟機: Model: ASMT109x- Safe Serial: 012345678		Run self test and log SMART errors
		Log bad sector increase Bad sector threshold 20
Optical drives		
Ready		確定 取満 説明
noudy		

3.1.3 show LITE-ON LGT-128M6Gx2 RAID 1 24-hour Burn-in test PASSED



4. Summary

- 4.1 R2036F is SATA III Interface, I/O speed, max. to 600MB/s.
- 4.2 R2036F adapter I/O performance is based on M.2 SSD.