

# BU281F / Rev1.0 Converter Card

# Performance & Burn In Test Rev. 1.0

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# 1. Overview

BU281F adapter, support Mini PCIe 2 ports connector to convert mSATA SSD into SATA SATA III standard interface.

# 2. Tools and Results of Performance Measurement

### 2.1 Test Platform

M/B :	ASRock Z170 Extreme 7+
CPU :	Intel <b>i5-6400,</b> 2.7GHz/ 6M Cache/ LGA1151
Memory :	Kingston KVR21N15D8/8, DDR4-2133MHz, 16G(8GB DIMM*2)
ATX Power :	FSP RAIDER 550, 550W ATX, 12V V2.2 Power Supply
Graphic :	Z170 Chipsets built-in HD Graphics 530
Cable:	SATA Express cable
OS :	Microsoft Windows 8.1 64bit OS

### 2.2 Test target: BU281F adapter and SSD(LITE-ON S930/256GB)



BU281F Adapter

BU281F + LITE-ON S930 SSD

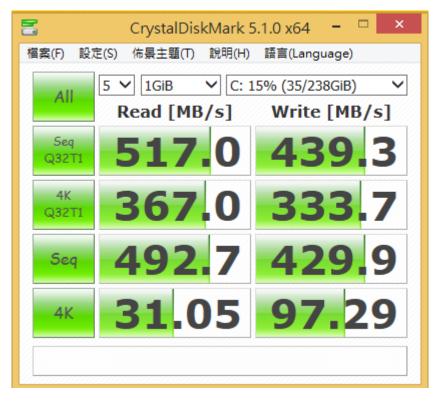
LITE-ON S930 mSATA SSD x2

### 2.3 Install Hardware

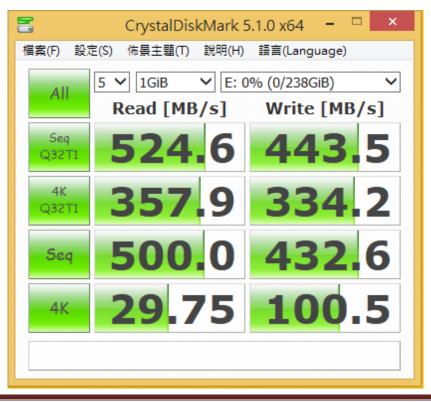
Insert mASTA SSD into BU2821 converter's Mini PCIe connector, and then with coppers, and screws to fix SSDs. (Please refer to the Installation Notes). Connect BU281F converter to **SATA Express of ASRock Z170 Extreme 7+**.

- 2.4 BIOS & Windows 8.1 OS environment setup
  - 2.4.1 One port installs win8.1 64bit OS
  - 2.4.2 Another port formatted SSD to NTFS Mode. Don't install any program.

- 2.5 CrystalDiskMark 5.1.0 x64 performance test
   ※Benchmark (Sequential Read & Write / default = 1MB)
  - 2.5.1 LITE-ON S930/256GB with WIN 8.1 OS performance as below:



2.5.2 LITE-ON S930/256GB without WIN 8.1 OS performance as below:



## 2.6 AS SSD Benchmark 1.8 performance test

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

2.6.1 LITE-ON S930/256GB with WIN 8.1 OS performance as below:

🛎 🛛 AS SSE	D Benchmark 1.8.5636.	37293 <mark>-</mark> 🗆 🗙			
File Edit View Tools Language Help					
C: LITEON \$930 256 V 1 GB V					
LITEON \$930 256 V.01 iaStorA - OK 359424 K - OK 238.47 GB	Read:	Write:			
<mark> </mark>	470.01 MB/s	423.90 MB/s			
<b>⊻</b> 4K	23.43 MB/s	76.92 MB/s			
☑ 4K-64Thrd	298.72 MB/s	254.10 MB/s			
☑ Acc.time	0.047 ms	0.046 ms			
Score:	369	373			
	9:	937			
Start Abort					

## 2.6.2 LITE-ON S930/256GB without WIN 8.1 OS performance as below:

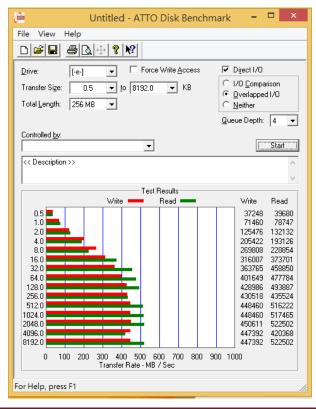
🛎 AS SSE	) Benchmark 1.8.5636.	37293 <mark>- 🗆 ×</mark>			
File Edit View Tools E: LITEON \$930 256	Language Help v 1 GB v				
LITEON S930 256 V.01 iaStorA - OK 1024 K - OK 238.47 GB	Read:	Write:			
⊡ Seq	467.60 MB/s	424.70 MB/s			
<b>☑</b> 4K	23.38 MB/s	77.20 MB/s			
☑ 4K-64Thrd	284.84 MB/s	278.02 MB/s			
☑ Acc.time	0.043 ms	0.050 ms			
Score:	355	398			
	940				
Ster	t	Abort			

#### 2.7 ATTO Disk Benchamrk 2.47 performance test

2.7.1 LITE-ON S930/256GB with WIN 8.1 OS performance as below:

🔁 Untitled - ATTO Disk Benchma	ark – 🗆 🗙
File View Help	
Drive: [-c-] ▼ Force Write Access Transfer Size: 0.5 ▼ to 8192.0 ▼ KB Total Length: 256 MB ▼	Direct I/0     Direct I/0     Domparison     Qverlapped I/0     Neither     Queue Depth: 4
Controlled <u>by:</u>	
<b>_</b>	Start
<< Description >>	< >
Test Results	
Write —— Read ——	Write Read
0.5 1.0 2.0 4.0 8.0 16.0 32.0 54.0 128.0 256.0 512.0 1024.0 2048.0 80 2048.0 8192.0 8192.0	36352         39040           70180         77922           124452         132544           204398         191561           262766         223854           313491         375565           361090         455442           404866         473134           430045         486711           437559         441687           448460         517465           447392         516222           448460         518715           446329         418496           446329         518715
0 100 200 300 400 500 600 700 800 90 TransferRate-MB/Sec	0 1000
For Help, press F1	

#### 2.7.2 LITE-ON S930/256GB without WIN 8.1 OS performance as below:



# 2.8 AnvilBenchmark\_V110\_B337

2.8.1 LITE-ON S930/256GB with WIN 8.1 OS performance as below:

<b>@</b>		Anvil's Sto	~ orage Utilities 1.	1.0 (2014-Januai	y-1)	- 🗆 ×
File Benchmarks	IOmeter System	n Info   Settings	Test size 1GB	🔹 Drive 🔳 c: []		✓ Screenshot Help
SSD Benchr	nark					LITEON S930 256 256GB/V.01
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	8.4844ms	2,048.0	117.86	471.45		
4K	0.1566ms	311.9	6,387.71	24.95		
4K QD4	0.1584ms	1,232.9	25,250.42	98.63		1,620.58
4K QD16	0.2841ms	2,750.2	56,324.18	220.02	Run read	1,620.58
32K	0.2760ms	1,700.0	3,622.80	113.21		
128K	0.7013ms	2,676.3	1,425.91	178.24		3,767.29
Write	Resp. time	MB written	IOPS	MB/s	Run	3,767.29
Seg 4MB	9.7031ms	1,024.0	103.06	412.24		
4K	0.0532ms	640.0	18,788.22	73.39		<sup>2,146.71</sup> 2,146.71
4K QD4	0.0735ms	640.0	54,386.99	212.45	Run write	2,146.71
4K QD16	0.2333ms	640.0	68,570.14	267.85		
Z170 Extreme7+/P2.	6400 CPU @ 2.70GHz	i (9600)	Drives : Notes :			LITEON 5930 256 256GB/V.01 Drive C: 238.1/202.5GB free (85.1%) NTFS - Cluster size 40968 Storage driver iaStorA 14.5.0.1081
Professional Ed	lition					Alignment 359424KB OK Compression 100% (Incompressible)

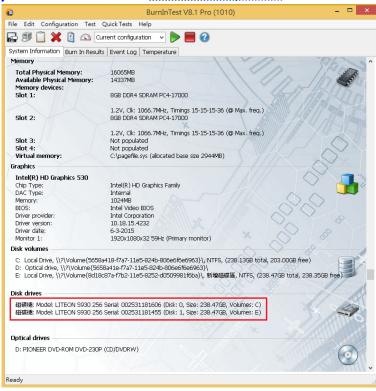
# 2.8.2 LITE-ON S930/256GB without WIN 8.1 OS performance as below:

ile Benchmark		n Info Settings	Test size 1GB	💌 Drive 🖃 e: (新		✓ Screenshot Help
SD Bench	mark					LITEON \$930 256 256GB/
Dentil		MD as ad				
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	8.3926ms	2,048.0	119.15	476.61		
4K	0.1461ms	334.1	6,842.36	26.73		
4K QD4	0.1638ms	1,192.2	24,415.40	95.37		1,630.26
4K QD16	0.2812ms	2,778.5	56,903.07	222.28	Run read	1,630.26
32K	0.2752ms	1,705.3	3,633.99	113.56		
128K	0.6982ms	2,688.4	1,432.27	179.03		3,721.02
Write	Resp. time	MB written	IOPS	MB/s	Run	3,721.02
Seq 4MB	9.7656ms	1,024.0	102.40	409.60		
4K	0.0513ms	640.0	19,482.41	76.10		2,090.76
4K QD4	0.0825ms	640.0	48,458.66	189.29	Run write	2,090.76
4K QD16	0.2318ms	640.0	69,023.44	269.62		
Microsoft Windows	8.1 専業版 64 位元 Buik	d (9600)				LITEON 5930 256 256GB/V.01
Z170 Extreme7+/P2			Drives :			Drive E: 238.5/238.4GB free (99.9%) NTFS - Cluster size 4096B
Intell HT Corel TM1 i5-	-6400 CPU @ 2.70GHz		Notes :			Storage driver iaStorA 14.5.0.1081

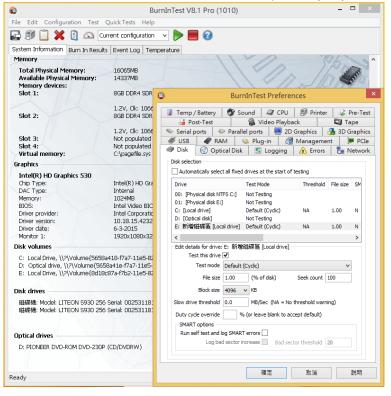
Minerva Innovation Company

## 3. Burn In Tests and Results

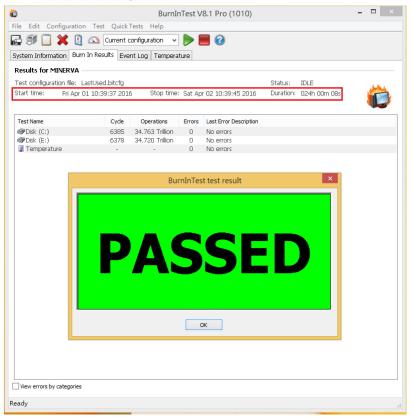
- 3.1 BurnInTest v8.1 Pro
  - 3.1.1 system information for LITE-ON S930/256GB as below:



#### 3.1.2 show LITE-ON S930/256GB Disk test mode( 10 ways cycle test)



3.1.3 show LITE-ON S930/256GB 24-hour Burn-in test PASSED



#### 4. Summary

- 4.1 mSATA SSD is SATA III Interface, I/O speed, max. to 600MB/s.
- 4.2 BU281F adapter I/O performance is based on mSATA SSD.