

96RC-ST-2C-P-TR

Test Report

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Approved by	Sophie.Song	Job Title	AKDC DQA assistant manager	Release Status	Formal Release

Revision History:

Revision Date	Revision	Description	Creator
2013/1/15	1.0	First version released	Tenthy.Zhang

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Test Result Definition

Item	Description
Pass	Compatibility test properly without any problem.
Fail	Compatibility test can't work properly and can't meet the product spec, please describe the issue to the "Remark" item in detail.
No test	No test (no test tool or device or driver not ready); please write reason to the "Remark" item.
N/A	Spec not support.
Limitation	Compatibility issue Limitation, it needs formal approval mail or other formal reply from PM or Applicant or Manufacturer.

Test Item List Summary

Num.	Test item	Result	Remark
Chapter 1	Function test	Pass	
1.1	Device Information confirm	Pass	
1.2	Basic function test	Pass	
1.2.1	RAID Level test	Pass	
1.2.2	Rebuild test	Pass	
1.2.3	Drive interface test	Pass	
1.2.4	Hybrid RAID test	Pass	
1.3	LED & Jumpers and Connectors	Pass	
Chapter 2	Compatibility test	Pass	
2.1	With OS compatibility test	Pass	
2.2	With motherboard compatibility test	Pass	
2.3	With PCIE Bus test	Pass	
Chapter 3	Performance test	Pass	
3.1	HD Tach	Pass	
3.2	HD Tune	Pass	
3.2.1	Read test	Pass	
3.2.2	Write test	Pass	
Chapter 4	Reliability test	Pass	
4.1	Room temperature test	Pass	

Engineer summary:

Appendix 1: Motherboard List

MB/SBC	Core Chipset	Remark
PCA-6010	945GC+ICH7	
PCA-6011	Intel G41+ICH7	
PCA-6194	Intel Q965+ICH8DO	
PCI-7031	Atom D510+ICH8M	

Appendix 2: HDD List

P-TD Part Number	Band	MN/PN	Remark
96ND500G-ST-WD5K3	WD	WD5000LPVT	2.5" SATA HDD
96ND1T-ST-WD5K	WD	WD10JPVT	2.5" SATA HDD
96ND1T-ST-WD5KE	WD	WD10JUCT	2.5" SATA HDD
96ND750G-ST-WD5K	WD	WD7500BPVT	2.5" SATA HDD
96ND500G-ST-WD5KE	WD	WD500LUCT	2.5" SATA HDD
96ND750G-ST-WD7K	WD	WD7500BPKT	2.5" SATA HDD
96ND320G-ST-WD7K	WD	WD3200BEKT	2.5" SATA HDD
96ND320G-ST-WD5K3	WD	WD3200BPVT	2.5" SATA HDD
96HD2000G-ST-SG7K2	Seagate	ST2000DM001	3.5" SATA HDD
96HD2000G-ST-SG7K3	Seagate	ST2000VX000	3.5" SATA HDD
96HD1T-ST-WD7K	WD	WD10EZEX	3.5" SATA HDD
96HD1000G-ST-SG7K6	Seagate	ST1000DM003	3.5" SATA HDD

Product Information

Advantech Part Number	96RC-ST-2C-P-TR
Manufacturer	Tekram
Model Number	TR-822
Device support	SATA hard drives
Number of ports	Independent internal 2 ports high speed Native Serial ATA
Array interface to the host	32 bit, 66MHz fully compliant PCI host interface
RAID controller	Silicon Image SiI3512A
RAID Levels	RAID levels 0, 1
Drive data transfer rate	Serial ATA data rates 1.5Gbps
Cache	NA
OS Support	Windows® Vista/Server 2003/2000/XP/7/2008, Linux
Operating voltage	5V / 470mA
Operating Temperature	5~50° C
PCB version	A100-10C
BIOS version	4.3.84
Card size	120mm x 64mm
ROHS Status (Yes/No)	Yes

Photo:



Test Platform


MB/SBC	PCA-6011VG		
PCB version	A101-3	CPU	Intel E2160 1.80GHz
BIOS version	6011V111	DRAM	Apacer DDR3 1333 2GB DIMM
Core Chipset	Intel G41+ICH7	Backplane	PCA-6105P3X_A101-2
VGA Chipset	G41 integrated	Other	

MB/SBC	PCA-6010G2		
PCB version	A101-2	CPU	Intel E2140 1.60GHz
BIOS version	V1.14	DRAM	Transcend DDR2 667 2GB DIMM
Core Chipset	Intel 945GC+ICH7	Backplane	PCA-6113P4R_C202-1
VGA Chipset	945GC integrated	Other	

MB/SBC	PCI-7031G2		
PCB version	A101-2	CPU	Intel Atom N450 1.66GHz
BIOS version	V1.10	DRAM	Transcend DDR2 667 1GB SODIMM
Core Chipset	Atom N450+ICH8M	Backplane	PCI-7110P3S6-00_A101-1
VGA Chipset	N450 integrated	Other	

MB/SBC	PCA-6194		
PCB version	A101-2	CPU	Intel E4700 2.60GHz
BIOS version	V1.28	DRAM	Apacer DDR2 800 2GB DIMM
Core Chipset	Intel Q965+ICH8DO	Backplane	PCA-6114P4_C101-1
VGA Chipset	Q965 integrated	Other	

Test Software

Utilities	Version / Description
Power On/Off (For Reliability test)	
Passmark BurnIn Test Pro (For Reliability test)	V7.0 build 1015
HD Tach (For Performance test)	V3.0.4.0
HD Tune (For Performance test)	V5.0

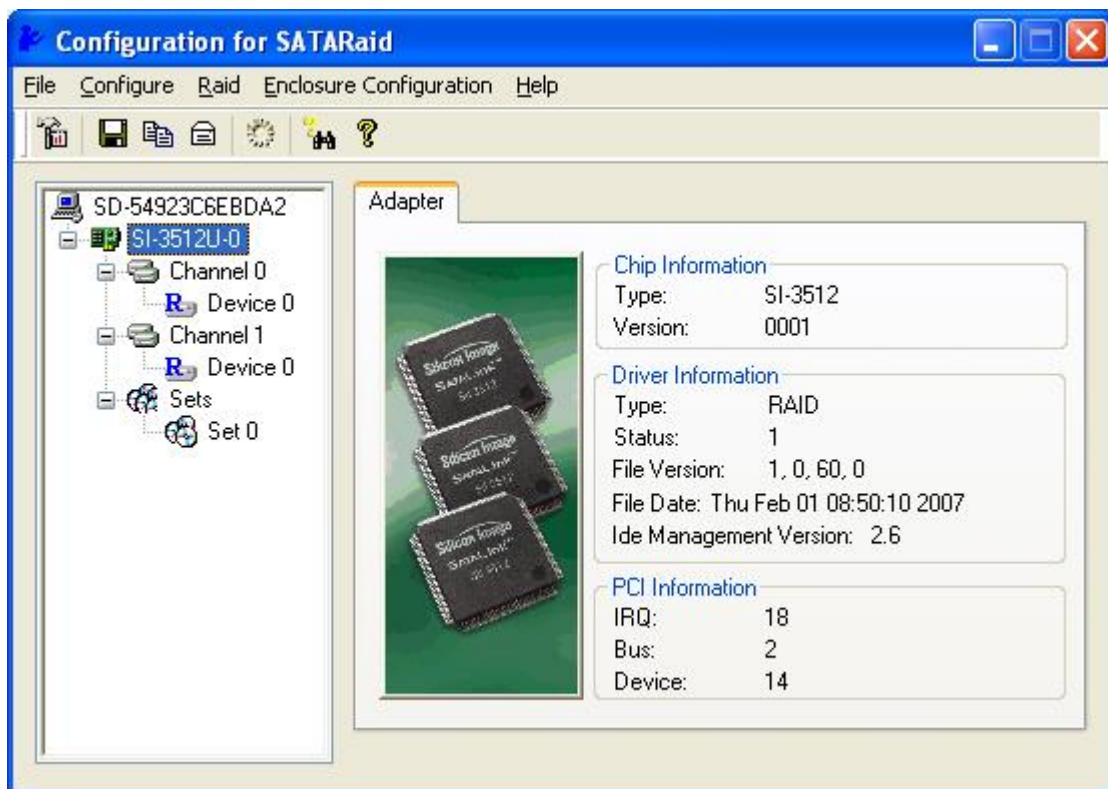
Test Item

Chapter 1: Function test

1.1 Device Information confirm

The test ensures the product meets SPEC. Check RAID card properties in GUI Storage Management Utility, and paste the screenshot of test result as below.

Test result (MB/SBC: PCA-6011):



1.2 Basic function test

1.2.1 RAID Level test

The test ensures the RAID controllers Support for RAID levels can be create and working normally.

Please see the test criteria as below:

1. The HDD disk can be detected, and the BIOS of Raid card should show the correct drive model and capacity etc information.
2. Make sure the HDD disk can build Raid, Check Raid disk size should be as below:

RAID Level	Size	fault-tolerant capability	Note
RAID 0	1+1=2	0	“N” represent disk quantity; “* 1” meaning is multiplied by the single disk capacity.
RAID 1	1+1=1	1	
RAID 5	1+1+1=(N-1)*1	1(any one)	
RAID 10	2+2=2	2	
RAID 50	3+3=(N-2)*1	2(Each one of the array)	

(Table 1)

3. OS can be installed into the RAID disk without any problem.
4. Run Burn-in test 30 minutes with the raid disk, Set disk loading 100%, all disks file size 15%, the result must be passed.
5. Run Power on/off test at least 10 times, RAID cannot lose and boot into the OS.
6. Refer to Table 1 fault-tolerant capability, RAID can boot into OS when removed the hard disk.

MB/SBC: PCA-6011_PCA-6105P3X_A101-2

Raid level	HDD	OS	Result	Remark
RAID 0	96ND500G-ST-WD5K3	Win7 32bit SP1	Pass	
	96ND1T-ST-WD5K			
RAID 1	96ND1T-ST-WD5KE	Win7 64bit	Pass	
	96ND750G-ST-WD5K			

1.2.2 Rebuild test

Pass Criteria: when a drive fails, the controller firmware automatically replaces and rebuilds the data from the failed drive to the hot spare.

Raid level	MB/SBC	HDD	OS	Result	Remark
RAID 1	PCA-6011	96ND320G-ST-WD7K	Win XP 32bit	Pass	96ND320G-ST-WD7K
		96ND320G-ST-WD5K3			Replace 96ND320G-ST-WD7K

1.2.3 Drive Interface test

The test ensures each port on the SAS RAID controller supports SAS devices, SATA II devices or both.

Pass Criteria:

1. The HDD disk can be detected, and the BIOS of Raid card should show the correct drive model and capacity etc information.
2. OS can be installed into the RAID disk without any problem.
3. Run Burn-in test 30 minutes with the raid disk, Set disk loading 100%, all disks file size 15%, the result must be passed.
4. Run Power on/off test at least 10 times, RAID cannot lose and boot into the OS.

MB/SBC: PCA-6011

Drive	Raid level	HDD	OS	Result	Remark
2.5''SATA	RAID 0	96HD2000G-ST-SG7K2	Win 2003 32bit	Pass	
		96HD2000G-ST-SG7K3			
	RAID1	96HD1T-ST-WD7K	Win7 32bit SP1	Pass	
		96HD1000G-ST-SG7K6			
3.5''SATA	RAID 0	96ND500G-ST-WD5KE	Win XP 64bit	Pass	
		96ND750G-ST-WD7K			
	RAID1	96ND320G-ST-WD7K	Win XP 32bit	Pass	
		96ND320G-ST-WD5K3			

1.3 LED & Jumpers and Connectors

The test ensures whether the LED & Jumpers and Connectors can meet the RAID card spec.

1. LED can work properly as spec define
2. Jumper can work properly as spec define

MB/SBC: PCA-6194

Jumper/ Connector	Type	Test description	Result	Remark
JP4	HDD Activity LED header	4-pin connector Connects to an LED that indicates drive activity	Pass	

Chapter 2: Compatibility test

2.1 With OS compatibility test

The test ensures mainstream windows OS can be installed into the RAID, and the Raid card can working without any problem.

Please see the test criteria as below:

1. OS can be installed into the RAID and the Partition and format function is normal.
2. The RAID Card of driver installation without any problem, and device work normally.
3. Run Burn-in test 30 minutes with the raid disk, Set disk loading 100%, all disks file size 15%, the result must be passed.

Test platform	PCA-6010	
OS	Driver	Result
Windows 7 Ultimate 32bit SP1	1.0.65.1	Pass
Windows 7 Ultimate 64bit	1.0.17.1	Pass
Windows 2003 enterprise 32bit SP2	1.0.60.0	Pass
Windows XP Standard Edition 64bit	1.0.12.0	Pass
Windows XP Professional Edition 32bit	1.0.60.0	Pass

2.2 With motherboard compatibility test

The test ensures the the configuration of RAID solution can work properly with different framework and chipsets of Motherboard.

Please see the test criteria as below:

1. The HDD disk can be detected, and the BIOS of Raid card should show the correct drive model and capacity etc information.
2. The RAID configuration can be successfully to create and initialization normal :
3. OS can be installed into the RAID and driver working without any problem.
4. Run Burn-in test 30 minutes with the raid disk, Set disk loading 100%, all disks file size 15%, the result must be passed.
5. Run Power on/off test at least 10 times, RAID cannot lose and boot into the OS.

MB/SBC: PCA-6011_PCA-6105P3X_A101-2

Item	Level	HDD	IN SLOT	OS	Result
3.5" SATA Solution	RAID 0	96HD1T-ST-WD7K	PCI1(64bit)	Win 2003 32bit	Pass
		96HD2000G-ST-SG7K3			
	RAID 1	96HD2000G-ST-SG7K2	PCI3(64bit)	Win7 32bit SP1	Pass
		96HD1000G-ST-SG7K6			
2.5"SATA Solution	RAID 0	96ND500G-ST-WD5K3	PCI2(64bit)	Win XP 32bit	Pass
		96ND500G-ST-WD5KE			
	RAID 1	96ND1T-ST-WD5KE	PCI1(64bit)	Win7 64bit	Pass
		96ND750G-ST-WD7K			

MB/SBC: PCA-6010_PCA-6113P4R_C202-1

Item	Level	HDD	IN SLOT	OS	Result
3.5" SATA Solution	RAID 0	96HD1T-ST-WD7K	PCI2(32bit)	Win7 32bit SP1	Pass
		96HD2000G-ST-SG7K3			
	RAID 1	96HD2000G-ST-SG7K2	PCI1(32bit)	Win XP 64bit	Pass
		96HD1000G-ST-SG7K6			
2.5"SATA Solution	RAID 0	96ND500G-ST-WD5K3	PCI2(32bit)	Win7 64bit	Pass
		96ND500G-ST-WD5KE			
	RAID 1	96ND1T-ST-WD5KE	PCI4(32bit)	Win XP 32bit	Pass
		96ND750G-ST-WD7K			

MB/SBC: PCI-7031_PCI-7110P3S6-00_A101-1

Item	Level	HDD	IN SLOT	OS	Result
3.5" SATA Solution	RAID 1	96HD2000G-ST-SG7K2	PPCI2(32bit)	Win7 64bit	Pass
		96HD1000G-ST-SG7K6			
2.5"SATA Solution	RAID 1	96ND1T-ST-WD5KE	PPCI2(32bit)	Win XP 64bit	Pass
		96ND750G-ST-WD7K			

MB/SBC: PCA-6194_PCA-6114P4_C101-1

Item	Level	HDD	IN SLOT	OS	Result
3.5" SATA Solution	RAID 0	96HD1T-ST-WD7K	PCI1(32bit)	Win7 32bit SP1	Pass
		96HD2000G-ST-SG7K3			
2.5"SATA Solution	RAID 1	96ND500G-ST-WD5K3	PPCI2(32bit)	Win XP 64bit	Pass
		96ND500G-ST-WD5KE			

2.3 With PCIE Bus test

The test ensures whether the PCIE bus can work properly without any error with the raid card.

Please see the test criteria as below:

1. Run copy test and the RAID can work normally in OS.
2. Run Power on/off test at least 5 times, RAID cannot lose.

MB/SBC	Backplane	PCIE list	Result	Remark
PCA-6011	PCA-6105P3X-A101-2	PCI1(64bit)	Pass	
		PCI2(64bit)	Pass	
		PCI3(64bit)	Pass	
PCA-6010	PCA-6113P4R_C202-1	PCI1(32bit)	Pass	
		PCI2(32bit)	Pass	
		PCI3(32bit)	Pass	
		PCI4(32bit)	Pass	
PCI-7031	PCI-7110P3S6-00_A101-1	PPCI1(32bit)	Pass	
		PPCI2(32bit)	Pass	
		PPCI3(32bit)	Pass	
PCA-6194	PCA-6114P4_C101-1	PCI1(32bit)	Pass	
		PCI2(32bit)	Pass	
		PCI3(32bit)	Pass	
		PCI4(32bit)	Pass	

Chapter 3: Performance test

RAID information configured:

RAID Level: RAID 1

HDD: 96HD2000G-ST-SG7K2+96HD1000G-ST-SG7K6

3.1 HD Tach

MB/SBC	RAID Level	HD Tach version 3.0.4.0			
		Burst Speed (MB/s)	Average Read (MB/s)	CPU Utilization	Random Access Time (ms)
PCA-6011	RAID 1	105.9	102.8	2%	14.6
PCI-7031	RAID 1	100.1	99.7	5%	14.7
PCA-6194	RAID 1	90.3	89.7	2%	12.0

3.2 HD Tune

3.2.1 Read Test

MB/SBC	RAID Level	HD Tune version 5.0					
		Minimum Transfer Rate (MB/s)	Maximum Transfer Rate (MB/s)	Average Transfer Rate (MB/s)	Access Time (ms)	CPU Usage	Burst Speed (MB/s)
PCA-6011	RAID 1	92.4	97.2	96.4	14.4	2.3%	97.8
PCI-7031	RAID 1	94.3	95.2	95.0	14.5	4.0%	95.1
PCA-6194	RAID 1	83.5	85.4	85.4	11.8	2.3%	84.3

3.2.2 Write test

MB/SBC	RAID Level	HD Tune version 5.0					
		Minimum Transfer Rate (MB/s)	Maximum Transfer Rate (MB/s)	Average Transfer Rate (MB/s)	Access Time (ms)	CPU Usage	Burst Speed (MB/s)
PCA-6011	RAID 1	92.4	97.2	96.4	14.4	2.3%	97.8
PCI-7031	RAID 1	94.3	95.2	95.0	14.5	4.0%	95.1
PCA-6194	RAID 1	83.5	85.4	85.4	11.8	2.3%	84.3

Chapter 4: Reliability test

4.1 Room temperature test

The test ensures the RAID card can working stable.

Please see the test criteria as below:

1. Run power on/off 100 times, successful boot rate 100%;
2. Run Passmark Burn_in, Set disk loading 100%, all disks file size 15%; the result of all disks should be passed when running Burn_in for 12 hours.

MB/SBC	RAID Level	HDD	OS	Result	Remark
PCA-6011	RAID 0	96ND500G-ST-WD5K3+ 96ND1T-ST-WD5K	Win7 32bit SP1	Pass	
PCI-7031	RAID 1	96ND1T-ST-WD5KE+ 96ND750G-ST-WD7K	Win7 64bit	Pass	