

Report NO: 17I010011

ICS-6270

Intel® Apollo Lake**4~6 LANs DIN Rail Network Appliance****Firewall Product****P5****Compatibility Test Report**

Summary	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Pass with Deviation (Comment: <u>LAN 4~6 bandwidth only 700MB</u>)			
	Test Results Category			
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date

2017-10-12

QE Manager

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Version Released Records

Date	Version	Change History	Note
01/27/2016	A0	1. First release	

Note :

For all test items in this report, 3 results have been defined and described as following:

Pass: Functionality work perfectly

Fail: Functionality failed and must be resolved in the next version

N/A: Functionality Not Applicable or Not Available

This test report would be updated when re-test completed in product next change version.

Specification Validation

Main Specification

Item	Specification	Result			Note
		Pass	Fail	N/A	
Form Factor	Desktop 4~6 Ports DIN Rail Network Appliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Processor	Intel Apollo Lake E3900 Series	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chipset	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System Memory	1 x 204-pin DDR3L 1867MHz, SODIMM Up to 8GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ethernet	4 x Intel i211 (Co-lay Intel i210) GbE Port, (supports addition 2Port via daughter board)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bypass	Supports 1 Pair on main board, LAN1 and 2, (Daughter board supports 1 Pair, LAN5, 6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BIOS	AMI BIOS ROM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Serial ATA	1 x SATA II port on board, 1 x CFAST Card socket(Co-lay mSATA)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Serial Port	1 x RS-232/422/485, ESD protection, 15KV for all signals 1 x isolated RS-232/422/485 via daughter board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Keyboard and Mouse	Reserve pin-header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Universal Serial Bus	2 x USB 3.0 Type A on I/O side 1 x USB 2.0 internal 2x5 pin header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Expansion Interface	1xMini-Card socket (full-size) with SIM socket via main board 1xMini-Card socket (full-size) via daughter board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
RTC	Internal RTC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TPM	Optional TPM v1.2 9660/TPM2.0 9665	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TPM 2.0
Display	1 x VGA port via main board or 1 x VGA/DP port via daughter board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Watchdog Timer	1~255 step by software programmable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Storage	CFAST socket x 1 (Co-lay mSATA) 1 x SATA II Port, 1 x 2.5" HDD Bay (TBD)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO	Reserve internal pin header 8-bit Digital I/O interface (4-in /4-out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Power Requirement	+9~36V DC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Front I/O panel	2 x USB 3.0 Ports 4 x RJ-45 Port with LEDs (Optional up to 6 x RJ-45 Ports with LEDs via daughter board) 1 x RS-232/422/485 COM Port 1 x isolated RS-232/422/485 COM Port (Optional via daughter board) 1 x Software Programmable button 1 x Display Port (Co-lay VGA port) 1 x Power LED, 1 x HDD LED, 1 x Bypass LED (Optional), 1 x Status LED (Optional)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Top I/O Panel	1 x 2 PIN terminal block (co-lay 6 PIN terminal block)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows 10 Enterprise 64bit English	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Linux	Ubuntu16.10 x86_64 kernel 4.8.0-24-generic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Testing environment 1. Linux as first priority
	CentOS7 kernel: 3.10.0-514.el7.x86_64	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Platform Information

Item	Device Information	Note
Product of department	NSD	
System Model	ICS-6270 A1.0	
PCB Model / Version	ICS-6270 A0.1	
BIOS / Version	ICS-6270 R1.1(S270AM11) (08/23/2017)	
Driver folder	\\nas3\sap-beta\Products\ICS-6270	
CPU Type	Intel ® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)	
Memory Type	Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D	
SATA HDD	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.	
USB DVD-ROM	Pioneer 8X (DVR-XD11T)	
VGA Monitor	Philips 244E2SB/96 24"	
CFast	Innodisk.DECFA-64GD07RC2DC-26 SATA3.MLC.64GB	
Daughter Board	PER-T461 A0.1	
NIM Card	N/A	
Operating System	<input type="checkbox"/> CentOS7 kernel: 3.10.0-514.el7.x86_64	
	<input type="checkbox"/> Ubuntu16.10 x86_64 kernel 4.8.0-24-generic	
	<input type="checkbox"/> Windows 10 Enterprise 64bit English version	
Power Supply	ATX Power Supply : N/A	
	Adapter : FSP060-DBAB1 12V/5A	
Battery Model	N/A	
Chipset Information		
SOC Chipset	Intel Apollo Lake N4200	
Super IO Chipset	ITE IT8728F	
Ethernet Chipset	Intel i211	

Summary Table of contents:

1. Mechanism Construction Test	7
1.1. Mechanism construction check	7
2. Basic Function Test.....	8
2.1. CPU Function Test.....	8
2.2. Memory Function Test.....	8
2.3. SATA / CF Function Test.....	9
2.4. Video Function Test	10
2.5 Console Function Test.....	10
2.6 Com Port Function Test	11
2.7 USB ports Function Test	11
2.8 LED / LCM / Button Function Test	11
2.9. Bypass Function Test	13
2.10. LAN Function Test.....	13
2.11. TPM2.0 Function Test	14
2.12. Jumper and connector Function Test	15
3. Time Accuracy Test.....	16
3.1. System Clock & RTC Clock Test.....	16
4. Power Consumption Test	17
4.1. Power Consumption.....	17
4.2. Wide Voltage Test	17
4.3. PC Health Status	18
4.4. CMOS Battery Test	18
5. Hardware Compatibility Test	19
5.1. CPU Compatibility Test	19
5.2. Memory Compatibility Test.....	19
5.3. SATA Compatibility Test.....	20
5.4. Flash Card Compatibility Test	21
5.5. USB Compatibility Test	21
6. O.S Compatibility Test	22
6.1. Linux OS Compatibility Test	22
6.2. Windows OS Compatibility Test.....	24
7. BIOS Function Test	25
7.1. Flash BIOS	25
7.2. Advanced Test	25
7.3. Chipset Test.....	25
7.4. Boot Test	26
7.5. CMOS Backup / Clear CMOS Test	26
7.6 Supervisor / User Password Test	26
7.7 Negative Test.....	26
8. Stability Test.....	27
8.1. LAN Endurance Test	27
8.2. Reboot Test	27
8.3. ACPI S5 Cold Boot Test.....	28
8.4. Memory Test.....	28
9. LAN Performance Test	29
9.1 DUT and Test Equipments	29
9.2 RFC-2544 performance test (2 port)	30
9.3 RFC-2544 performance test (6 ports).....	31

1. Mechanism Construction Test

1.1. Mechanism construction check

Procedure:

Step1. Insert NIM, CFast and expansion card.

Step2. Check the symbol of front and rear I/O

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	System case shouldn't interfere with assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	NIM slot shouldn't interfere with assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3	CFast slot shouldn't interfere with assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Expansion slot shouldn't interfere with assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	I/O symbol should correct.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2. Basic Function Test

2.1. CPU Function Test

Configuration:

CPU: Intel® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)

Memory: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D

Procedure:

Step1. Connected CPU with product specification max supported.

Step2. Boot into BIOS manual and check CPU information is correct.

Step4. Confirm CPU max speed can meet CPU specification in OS environment.

```
<#watch -n 1 "cat /proc/cpuinfo | grep MHz">
```

Step5. Install and execute benchmark AP "sysbench", recode the benchmark.

<Reference: http://wiki.mikejung.biz/Benchmarking#Install_Sysbench_on_CentOS_7>

```
<# wget ftp://ftp.gnome.org/mirror/fedora/epel/6/x86_64/sysbench-0.4.12-5.el6.x86_64.rpm>
```

```
<#wget
```

```
  http://downloads.mysql.com/archives/mysql-5.1/MySQL-shared-compat-5.1.49-1.rhel5.x86\_64.rpm>
```

```
<#rpm -iv MySQL-shared-compat-5.1.49-1.rhel5.x86_64.rpm>
```

```
<#yum install postgresql-libs.x86_64>
```

```
<#rpm -iv sysbench-0.4.12-5.el6.x86_64.rpm>
```

```
<1 thread #sysbench --test=cpu --cpu-max-prime=20000 run>
```

```
<8 threads #sysbench --test=cpu --cpu-max-prime=20000 --num-threads=4 run>
```

Test result:

No.	Test item	Result			Remark	
		Pass	Fail	N/A		
1	System can boot properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2	BIOS\CPU information is correct.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3	CPU speed should meet specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4	Recode CPU Benchmark	Intel 2.5G	1 thread	21.2174 s		
			4 threads	5.3642 s		

2.2. Memory Function Test

Configuration:

CPU: Intel® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)

Memory: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D

Procedure:

Step1. Connected memory with product specification max supported.

Step2. Boot into BIOS manual and check memory information is correct.

Step3. Slot test.

Step4. Execute benchmark AP" sysbench", recode the benchmark.

<Reference: <http://ssorc.tw/4882>>

```
<read # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G
  --memory-oper=read run >
```

```
<write # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G run >
```


Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	System should boot properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	BIOS\Memory information is correct.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Slot 1 System should boot up properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.	Recode Memory Benchmark	read	Transferred:131072.0MB/s Total time:0.0312s		
		write	Transferred:131072.0MB/s Total time:0.2071s		

2.3. SATA / CF Function Test

Configuration:

CPU: Intel ® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)

Memory: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D

SATA: Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.

CFast: Innodisck.DECFA-64GD07RC2DC-26 SATA3.MLC.64GB.CFAST.

Procedure:

Step1. Connect SATA HDD / SSD and CF.

Step2. Boot into BIOS manual and check SATA/CF information is correct.

Step3. Install Linux OS with SATA storage / CF.

Step4. Check SATA/CF read/write speed can meet the specification.

<update# yum update>

<install# yum install hdparm -y>

<check HDD# fdisk -l>

<Read command#: hdparm -tT /dev/sdaX>

<Write command#: #time dd if=/dev/zero of=/var/test bs=2k count=1000000>

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	SATA storage and CF information should correct during POST and OS.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	SATA ports speed should meet specification. (SATAII max read speed > 150MB/s) (SATAIII max read speed > 300MB/s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SATA 1 port Read: 516.72 MB/s Write: 285 MB/s
3	CFast R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Read: 290.85 MB/s Write: 138 MB/s

2.4. Video Function Test

Procedure:

Step1. Connect VGA monitor.

Step2. Install Linux OS to DUT system.

Step3. After installation and boot to Linux OS for test X-windows mode and Text mode.

Test result:

No.	Test item		Result			Remark
			Pass	Fail	N/A	
1	Display shouldn't loss during OS installation.	VGA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Display shouldn't flicker during POST and OS.	VGA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	VGA should display normal with x-window and text mode.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1920x1080

2.5 Console Function Test

Procedure:

Step1. Execute "Hyper-Terminal" in HOST PC.

Step2. Boot up DUT system and press ESC key of HOST keyboard to boot into BIOS manual.

Step3. To check HOST keyboard can control properly in BIOS manual.

Step4. DUT boot to DOS (USB flash) and check console redirection work properly.

Step5. Under Linux OS, install minicom AP and check console transmission.

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Console support BIOS display and control.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200
2	Console support DOS display and command typing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200
3	Under Linux OS, console support minicom transmission.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200 ttyS1

2.6 Com Port Function Test

Procedure:

- Step1. Execute "Hyper-Terminal" in Server PC.
- Step2. Install "minicom" on DUT. <apt-get install minicom or yum install minicom>
- Step3. To run "minicom" and set com port for test. (#minicom -s)(com1=ttyS0; com2=ttyS1....)
- Step4. Connect "Null cable" between Server PC and DUT.
- Step5. Transmit words between server and DUT.

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Transmission words should not loss or error.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	COM1: ttyS0

2.7 USB ports Function Test

Procedure:

- Step1. Connect USB keyboard and check it works properly under BIOS/DOS/Linux.
- Step2. Connect USB DVD ROM, check system can boot from USB DVD ROM and USB DVD ROM can work properly under Linux OS.
- Step3. Connect USB2.0/3.0 Flash, check system can boot from USB flash and USB flash can work properly under Linux OS.
- Step4. Check USB2.0/3.0 flash read speed can meet the Flash specification.
<Read command#: hdparm -t /dev/sdaX>

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Boot from USB DVD ROM and drive should work properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2
2	USB 1.1 / 2.0 /3.0 devices (Flash, keyboard, mouse, DVD ROM) can work properly on USB 3.0 ports.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2
3	USB3.0 R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2 Read:87.79 MB/s

2.8 LED / LCM / Button Function Test

Procedure:

- Step1. Check power LED when system power on.
- Step2. Check HDD LED blinks when install OS to HDD/CF.
- Step3. Check Bypass LED when AAeon Test AP set Bypass status.
- Step4. Check Test AP resume are correct which press LCM function button.
(Up/Down/ESC/Enter)
- Step5. Check Test AP resume is correct which press program reset button.
SDK: Button <1.#make clean 2# make 3# ./button>
- Step6. Check status LED action same with Test AP setting.
- Step7. To check Ethernet LED status can follow below methods.
 - A. Use LAN cable to connect 1GB switch between Server PC and DUT, transmit some packets between Server PC and DUT.
 - B. Use LAN cable to connect 100MB switch between Server PC and DUT, transmit some packets between Server PC and DUT.
 - C. Use LAN cable to connect 10MB switch between Server PC and DUT, transmit some packets between Server PC and DUT.

	Speed LED
10GB/s	Color Blue
1GB/s	Color Orange
100MB/s	Color Green
10MB/s	Color Blank

	Link/Act LED
Un-Linked	TBD
Linked	TBD
Transmit	LED Blink

Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Power LED should turn on when system power on.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	HDD LED should blinks when install OS to HDD and CF.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Bypass LED should turn on when SDK set bypass status.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Status LED color and action should same with SDK setting.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SDK: LED
5	Reset value of SDK should show high when press the program reset button.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Open: show high Press: show low
6	LCM value of SDK should show correct when press LCM function button.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SDK: LCM ./lcm -getkey return ./lcm -lcm on ./lcm -lcm off ./lcm -set String
7	10G connection LAN LED action as below: Speed LED: Green Link LED: Blue / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8	1000M connection LAN LED action as below: Speed LED: Orange Link LED: Yellow / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	100M connection LAN LED action as below: Speed LED: Green Link LED: Yellow / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	10M connection LAN LED action as below: Speed LED: blank Link LED: Yellow / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	1000M connection LAN LED action as below: Speed LED: Orange Link LED: Yellow / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PER-T461 (fiber)

2.9. Bypass Function Test

Procedure:

- Step1. Under Linux, execute AAEON SDK(LanByPass) to test Bypass function under power on and power off mode.
- Step2. SDK set "power on" is "PassTru and "power off" is "ByPass, and remove the AC power cord. (G3 status)
- Step3. BIOS set power on is "PassTru" and power off is "Bypass", boot up system from G3 status..
- Step4. SDK set "power on" is "PassTru" and "WDT-ByPass", execute watch Dog.

Test result:

No.	Test item	Power on	Power off	Result			Remark
				Pass	Fail	N/A	
1	PassTru / ByPass should work properly by SDK control.	Bypass	Bypass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SDK: LanByPass onboard: LAN1-2 Daughter board : LAN5-6
		Bypass	PassTru	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		PasTru	Bypass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		PassTru	PassTru	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	LAN should switch to ByPass mode when system AC loss.(G3 status)	PassTru	ByPass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Boot up from G3, LAN should switch to PassTru.	PassTru	ByPass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	WDT ByPass should work properly.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.10. LAN Function Test

Configuration:

- 1G switch: D-Link DGS-1210-16
- 100M switch D-Link DES-1008A
- 10M HUB SVEC FD916H
- 100 meters CAT6 cable

Procedure:

- Step1. Each LAN port connect DHCP server.
- Step2. Connect internet and ping Google (8.8.8.8).
- Step3. Each LAN port connect host PXE PC and DUT BIOS enable PXE function.
- Step4. BIOS select boot from LAN.
- Step11. Test each LAN port WOL function properly which from OS shutdown and Dos power off.
- Step12. Client PC to install and execute iperf and host PC execute iperf -s (Windows OS)
- Step13. Iperf test with 1G, 100M, 10M switch/Hub.
- ```
<#yum install iperf>
<#iperf -c 192.168.3.58 -w 100M -t 60 -i 1>
```

## Test result:

| Test item                                                                                          | LAN 1~3 1G                          |                          |                                     | LAN 4~6 1G                          |                          |                                     | Note               |
|----------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------|
|                                                                                                    | Pass                                | Fail                     | N/A                                 | Pass                                | Fail                     | N/A                                 |                    |
| Internet Browser (DHCP Server)<br>Ping website(8.8.8.8) should work properly                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                    |
| LAN Boot (PXE)<br>Boot from LAN should work properly                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                    |
| Wake On LAN<br>WOL should work properly when resume from S5/Dos off                                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                    |
| 1Gbps connection<br>Iperf test result should not loss and max bandwidth must be in 900MB or more.  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | LAN 4~6 only 700MB |
| 100Mbps connection<br>Iperf test result should not loss and max bandwidth must be in 90MB or more. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                    |
| 10Mbps connection<br>Iperf test result should not loss and max bandwidth must be in 9MB or more.   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                    |

## 2.11. TPM2.0 Function Test

## Procedure:

Step1. Enable BIOS\TPM device and status.

Step2. `$ wget https://drive.google.com/open?id=0B2qBRy2H60mEaF9NTG5tWWWVIRzA`  
`<#get eltt2 >`

Step3. `$ unzip ELTT2_v1.0_Released.zip.`

Step4. `$ dmesg | grep -i tpm`

`<#to check if tpm module has been loaded during boot process>`

Step5. Do the following command to rebuild the tool:

a. `$ cd ./eltt2/eltt2/`

b. `$ make clean`

c. `$ make`

Step6. `$ sudo ./eltt2 -g`

`#to read the tpm information:`

Step7. `$ ls /dev/tpm*`

`# check if the tpm device has been included in the system devices`

Step8. `$ sudo ./eltt2 -a 61`

`# encrypt ascii 61 with sha-1 algorithm`

## Test result:

| No. | Test item                                                     | Result                              |                          |                          | Remark |
|-----|---------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------|
|     |                                                               | Pass                                | Fail                     | N/A                      |        |
| 1   | TPM 2.0 information should show correct.                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 2   | "hash value extracted from tpm response" should show correct. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

## 2.12. Jumper and connector Function Test

Configuration:

Procedure:

Step1. Connect power button cable to CN1, check if power on /off can work properly.

Step2. Connect PS/2 keyboard / mouse to CN12, check if keyboard / mouse can work properly

Step3. Connect PWB/Reset/HDD LED/PWR LED cable to FP1, check if each function can work properly

Step4. JP1 jumper set 2-3 close, check if system auto power on when insert AC power cord.

Step5. Use meter to measure the CFD voltage.

Step6. Connect IPMI module and open JP3, check if IPMI function can work properly.

Step7. Remove AC cable and CMOS jumper set 2-3 close, check if CMOS all data will be cleaned.

Test result:

| No. | Test item                  | Result                              |                          |                          | Remark |
|-----|----------------------------|-------------------------------------|--------------------------|--------------------------|--------|
|     |                            | Pass                                | Fail                     | N/A                      |        |
| 1   | CN1 DC-IN                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 2   | CN2 PS/2 Keyboard, mouse.  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 3   | CN3 Digital I/O            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 4   | CN4 Mini PCI-e SOCKET      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 5   | CN5 SIM CARD SOCKER        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 6   | CN7 CMOS Setting Selection | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 7   | CN9 SATA POWER             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 8   | CN15 Reset                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 9   | CN16 Power Button          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 10  | CN24 CFast CARD SOCKET     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

### 3. Time Accuracy Test

#### 3.1. System Clock & RTC Clock Test

Procedure:

Step1. Check RTC time deviation after 24 hrs at power on status.

Step2. Check RTC time deviation after 24 hrs at power off status.

Step3. Press power button to check system with "beep" sound.

Step4. Run watchdog timer test with last version SDK.

```
<#chmod 777 superio>
```

```
<#./superio -w 10> to set time for 10sec, 60sec, 255sec
```

Test Result:

Under Room Temperature: 26 °C

| No. | Test item                                   | Actual |     | Result                              |                          |                          | Remark |
|-----|---------------------------------------------|--------|-----|-------------------------------------|--------------------------|--------------------------|--------|
|     |                                             |        |     | Pass                                | Fail                     | N/A                      |        |
| 1   | RTC Clock in Power On less 2 sec deviation  | -1     | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 2   | RTC Clock in Power Off less 2 sec deviation | 0      | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 3   | System boot on in 60 sec                    | 9.45   | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 4   | Watch dog time in 6+/-10% sec               | 10.63  | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 5   | Watch dog time in 60+/-10% sec              | 61.91  | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 6   | Watch dog time in 255+/-10% sec             | 268.28 | sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |



## 4. Power Consumption Test

| Configuration |                                                            |
|---------------|------------------------------------------------------------|
| CPU           | Intel ® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz) |
| Memory        | Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D        |
| Storage       | Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.           |
| O.S           | Ubuntu16.10 x86_64 kernel 4.8.0-24-generic                 |

### 4.1. Power Consumption

| Test Equipment                                                                                        |                        |        |   |      |   |                                 |
|-------------------------------------------------------------------------------------------------------|------------------------|--------|---|------|---|---------------------------------|
| Equipment                                                                                             | Programmable DC Source |        |   |      |   |                                 |
| Manufacturer                                                                                          | Chroma                 |        |   |      |   |                                 |
| Model name                                                                                            | 62012P-600-8           |        |   |      |   |                                 |
| Power Supply                                                                                          | Current                | P      |   | Note |   |                                 |
| Full Loading Mode<br>Test AP: Stress Test                                                             | (+ 12 V)               | 1.2352 | A | 14.8 | W | # stress -c 4 (CPU total cores) |
| Win. Idle mode: Measure the current value when system in windows mode and without running any program | (+ 12 V)               | 0.8333 | A | 9.99 | W |                                 |
| S5 mode: Measure the current value when system in S5 mode of windows and without running any          | (+ 12 V)               | 0.2302 | A | 2.8  | W |                                 |

### 4.2. Wide Voltage Test

#### 4.2.1. Wide Voltage Test

Test Point:

Test voltage range is follow specification.

| Test Environment<br>(a. System should boot properly<br>(b. System wasn't halt in following status. )  | DC Power (9V~36V) | Current |   | Note |
|-------------------------------------------------------------------------------------------------------|-------------------|---------|---|------|
| Full Loading Mode<br>Test AP: Stress Test                                                             | Min(+8.55V)       | 2.32    | A |      |
|                                                                                                       | Max(+37.8V)       | 0.54    | A |      |
| Win. Idle mode: Measure the current value when system in windows mode and without running any program | Min(+8.55V)       | 1.18    | A |      |
|                                                                                                       | Max(+37.8V)       | 0.32    | A |      |

#### 4.2.2. DC Adapter Compatibility Test

Test Point:

Confirm each adapter can be compatible with wide voltage design.

| Adapter Information<br>(a. System boot to OS should work properly. |                   |            | Result                              |                          |                          | Note |
|--------------------------------------------------------------------|-------------------|------------|-------------------------------------|--------------------------|--------------------------|------|
| AAEON P/N                                                          |                   | Pass       | Fail                                | N/A                      |                          |      |
| 12V                                                                | FSP084-DIBAN2 84W | 1255900841 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| 12V                                                                | FSP084-DMAA1 84W  | 1757908403 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

|     |                        |            |                                     |                          |                          |  |
|-----|------------------------|------------|-------------------------------------|--------------------------|--------------------------|--|
| 19V | FSP120-ABAN2 120W      | 1255901202 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 19V | FSP120-AAB 120W        | 1757912005 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 24V | SINPRO MPU100-108 100W | XXXXXXXXXX | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

### 4.3. PC Health Status

Procedure:

- Step1. Use meter to measure each voltage of H/W monitor supported.  
 Step2. Use thermometer to measure each Temp of H/W monitor supported.  
 Step3. Use Tachometer to measure each FAN speed of H/W monitor supported.

Test Result:

| H/W monitor                                                     | Result                              |                          |                          | BIOS   |                  | Actual |                  | Note |
|-----------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------|------------------|--------|------------------|------|
|                                                                 | Pass                                | Fail                     | N/A                      |        |                  |        |                  |      |
| (+) Vcore<br>Actual and monitor must be $\pm 5\%$               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.284  | V                | 1.27   | V                |      |
| (+) VMEM<br>Actual and monitor must be $\pm 5\%$                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.236  | V                | 1.23   | V                |      |
| (+) 12V<br>Actual and monitor must be $\pm 5\%$                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12.096 | V                | 12.05  | V                |      |
| (+) 5V<br>Actual and monitor must be $\pm 5\%$                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5.040  | V                | 5.03   | V                |      |
| (+) 5VDual<br>Actual and monitor must be $\pm 5\%$              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5.040  | V                | 5.03   | V                |      |
| VBAT<br>Actual and monitor must be $\pm 5\%$                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3.024  | V                | 3.00   | V                |      |
| CPU Temp<br>Actual and monitor must be $\pm 15^\circ\text{C}$   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 47     | $^\circ\text{C}$ | 36     | $^\circ\text{C}$ |      |
| System Temp<br>Actual and monitor must be $\pm 5^\circ\text{C}$ | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 29     | $^\circ\text{C}$ | 29.4   | $^\circ\text{C}$ |      |

### 4.4. CMOS Battery Test

Procedure:

- Step1. DUT AC loss, use meter to measure voltage of CMOS battery  
 Step2. Use ammeter to measure current of CMOS battery.

Test Result:

0(Calculate result= $225\text{mA}/\text{measured current} / 365\text{days}/24\text{hours}$ )

| Check item                                                                                            | Measured Voltage |   | Measured Current |               | Calculate Result |       | Result                              |                          |                          | Note |
|-------------------------------------------------------------------------------------------------------|------------------|---|------------------|---------------|------------------|-------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                       |                  |   |                  |               |                  |       | Pass                                | Fail                     | N/A                      |      |
| Battery leakage<br>1. Voltage should be $>3\text{V}$ .<br>2. Calculated result should be $> 5$ years. | 3.04             | V | 3.3              | $\mu\text{A}$ | 7.78             | years | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 5. Hardware Compatibility Test

### 5.1. CPU Compatibility Test

Procedure:

If Step1. Check CPU information and frequency should show correct value during POST screen and O.S.

<Linux CPU info # dmidecode -t processor|grep "Version:">

Step2. CPU supported must meet specification.

Test Result:

| Test item                                                     | Result                              |                          |                          | Note |
|---------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                               | Pass                                | Fail                     | N/A                      |      |
| Below CPU information and frequency should show correct value |                                     |                          |                          |      |
| Intel ® Celeron® Processor N4200<br>(2M Cache, up to 2.5 GHz) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Intel ® Celeron® Processor N3350<br>(2M Cache, up to 2.4 GHz) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

### 5.2. Memory Compatibility Test

Procedure:

Step1. Boot up function test

Step2. Check Memory frequency should show correct value during POST screen and O.S.

<<Linux Memory info # dmidecode -t memory|grep "Size:">

Step3. Memory supported must meet specification.

Test Result:

| Test item                                                            | AAEON P/N       | Result                              |                          |                          | Note |
|----------------------------------------------------------------------|-----------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                      |                 | Pass                                | Fail                     | N/A                      |      |
| a. Boot up normal.                                                   |                 |                                     |                          |                          |      |
| b. Below Memory Information and frequency should show correct value. |                 |                                     |                          |                          |      |
| Transcend DDR3L-1600 2GB(SEC 501<br>BYMA K4B2G0846Q)                 | AP-DR968D3002GK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Transcend DDR3L-1600 4GB(SEC 446<br>XYKO K4B4G0846D)                 | AP-DR968D3004G6 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Transcend DDR3L-1600 8GB(SEC 443<br>BYKO K4B4G0846D)                 | 968D3008G7      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| InnoDisk DDR3L-1600 2GB(SEC 434<br>BYKO K4B2G0846Q)                  | AP-DR968D3002GX | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| InnoDisk DDR3L-1600 4GB(SEC<br>K4B4G0846E)                           | 968D3004GZ      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| InnoDisk DDR3L-1600 8GB(SEC<br>K4B4G0846E)                           | 968D3008GW      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

### 5.3. SATA Compatibility Test

#### 5.3.1 UEFI Mode

Procedure:

OS: Ubuntu16.10 x86\_64 kernel 4.8.0-24-generic

Test Result:

| Test item                                                                         | Result                                                                                              |                                     |                                     | Note                     |                          |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
|                                                                                   | Pass                                                                                                | Fail                                | N/A                                 |                          |                          |  |
| Below SATA devices information and size should show correct value with UEFI mode. |                                                                                                     |                                     |                                     |                          |                          |  |
| SATAII                                                                            | TOSHIBA MK1676GSX 2.5"<br>160GB                                                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| SATAII                                                                            | HITACHI HTS543225A7A384 2.5" 250GB                                                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| SATAIII                                                                           | WD WD10SPCX 2.5" 1TB                                                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| SATAIII                                                                           | HGST HTS541010A9E680 2.5" 1TB                                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| SATAIII                                                                           | WD WD5000BPKX 2.5" 500GB                                                                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| SSD                                                                               | Transcend TS32GSSD370<br>2.5".32GB.SATA III SSD MLC.                                                | 968C032G2D                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | Transcend.TS64GSSD370<br>2.5".64GB. SATA III.SSD.MLC                                                | 968C64G003                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | Transcend.TS128GSSD370<br>2.5" SATA3 SSD.128GB.MLC.                                                 | 968C128G0W                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | 2.5" .16GB 3MG2-P<br>15nm.SATA III MLC<br>SSD.Innodisk MLC .0°C ~<br>+70°C.DGS25-16GD81BC3SC<br>-26 | AP-SS968C016G3K                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | (TF)2.5".32GB 3MG2-P<br>15nm.SATA SSD<br>MLC.0~70°C.HIGH<br>IOPS.innodisk.DGS25-32GD8<br>1BC3DC-26  | AP-SS968C032G1P                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | (TF)2.5".64GB.SATA MLC<br>SSD .3MG2-P<br>15nm.0~70°C.HIGH<br>IOPS.innodisk.DGS25-64GD8<br>1BC3QC-26 | 968C064G39                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | 2.5' MLC SSD 128GB 3MG2-P<br>15nm.SATA<br>0°C~+70°C.InnoDisk.DGS25-A<br>28D81BC3QC-26               | AP-SS968C128G1P                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| SSD                                                                               | 2.5".256GB.SATA MLC SSD<br>3MG2-P 15nm.0~70°C.HIGH<br>IOPS.innodisk.DGS25-B56D81<br>BC3QC-26        | AP-SS968C256G16                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

## 5.4. Flash Card Compatibility Test

Procedure:

Step1. Connect Flash card and boot into BIOS, check Flash card information is correct.

Step2. Boot into OS.

Step3. Test Flash read / write function.

OS: Ubuntu16.10 x86\_64 kernel 4.8.0-24-generic

Test Result

| Test Item                                                | AAEON P/N           | Result                              |                          |                          | Note |
|----------------------------------------------------------|---------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                          |                     | Pass                                | Fail                     | N/A                      |      |
| a. CFAST information and size should show correct value. |                     |                                     |                          |                          |      |
| b. R/W function should work properly.                    |                     |                                     |                          |                          |      |
| Innodisk.DECFA-04GD07AC2DT-26<br>4G.SLC                  | 968C004G0P          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| InnoDisk.DECFA-08GD07RC2SC-26<br>8GB.MLC.3ME.            | AP-SS968C00<br>8G10 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Innodisk.3ME.DECFA-16GD07RC2DC-<br>26 16GB.MLC.          | 968C016G4C          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Innodisk.DECFA-32GD07RC2DC-26<br>SATA3.MLC.32GB          | 968C032G2B          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Innodisk.DECFA-64GD07RC2DC-26<br>SATA3.MLC.64GB.CFAST.   | AP-SS968C06<br>4G2T | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Innodisk.DECFA-A28D07RC2DC-26<br>SATA3.MLC.128GB         | AP-SS968C12<br>8G19 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 5.5. USB Compatibility Test

Procedure:

Step1. Insert USB device to USB2.0 / 3.0 ports.

Step2. Test each USB device function.

OS: Ubuntu16.10 x86\_64 kernel 4.8.0-24-generic

Test Result

| Test Item                                  |                                     | Result                              |                          |                          | Note |
|--------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                            |                                     | Pass                                | Fail                     | N/A                      |      |
| USB devices function should work properly. |                                     |                                     |                          |                          |      |
| keyboard                                   | Microsoft 1366                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Mouse                                      | Microsoft MSK-1113(B)               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| DVD ROM                                    | Pioneer DVR-XD11T                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| HUB                                        | cliptec USB 2.0 4 port HUB          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
|                                            | axpro USB 3.0 4 port HUB            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| HDD                                        | Transcend TS500GSJ25D3 USB3.0 500GB | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| USB2.0<br>Flash                            | Sandisk cruzer 8GB                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
|                                            | Transcend 16GB                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| USB3.0<br>Flash                            | SONY 32GB                           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
|                                            | Transcend JetFlash 790 32GB         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
|                                            | Transcend JetFlash 700 8GB          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 6. O.S Compatibility Test

### 6.1. Linux OS Compatibility Test

#### Procedure:

Step1. Install Linux x86 & x64 serial from USB DVD ROM.

Step2. Enter lspci command detect H/W.

Step3. Enter dmesg or dmesg|more, review dmesg log to find out the error and warning key words.

Step4. Install all required driver to system.

Step5. Execute the following command to test driver and verify

#### Step 5.1 Driver install

(1) checked whether the command "Insmod drivename" can function normally, or not.

(2) checked whether the command "rmmod drivename" can successful uninstall the driver, or not

#### Step 5.2 Force speed

(1) Execute command "ethtool -s ethx autoneg off speed 1000" ,link cable to confirm speed light is orange

(2) Execute command "ethtool -s ethx autoneg off speed 100" ,link cable to confirm speed light is green

(3) Execute command "ethtool -s ethx autoneg off speed 10" ,link cable to confirm speed light is blank

#### Step 5.3 ifconfig Ethernet

(1) Execute command "ifdown ethx" close ethernet interface

(2) Execute command "ifup ethx" start ethernet interface

#### Step 5.4 Jumbo Frame

Setting #ifconfig LAN mtu 9000

Check #ifconfig LAN (mtu will change from 1500 to 9000)

Step 6 Enter ping Google command (ping 8.8.8.8), test network function is whether normal

Step 7 Execute command "init 0" or "shutdown -h" to shutdown system.

Step 8 Execute command "init 6" or "reboot" to reset system.

#### Test result:

##### 6.1.1 CentOS7 kernel:3.10.0-514.el7.x86\_64

| Test Item                                               | Result                                                                                                 |                                     |                          | Note                     |  |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
|                                                         | Pass                                                                                                   | Fail                                | N/A                      |                          |  |
| System should not any error during install process.     | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| lspci to check H/W device.                              | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| Record log file which was error or warring key words.   | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| System should not error during LAN driver installation. | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| Force speed                                             | LAN connection speed should show 1000Mb when execute command " ethtool -s ethx autoneg off speed 1000" | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | LAN connection speed should show 100Mb when execute command " ethtool -s ethx autoneg off speed 100"   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | LAN connection speed should show 10Mb when execute command " ethtool -s ethx autoneg off speed 10"     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

|          |                                                                                    |                                     |                          |                          |  |
|----------|------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
| Ifconfig | Ethernet interface should be closed when execute command “ifdown ethx”             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|          | Ethernet interface should be started when execute command “ifup ethx”              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Jumbo    | Jumbo function should work properly                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|          | Connected internet and ping the website should work properly.<br>(Google: 8.8.8.8) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Shutdown | System should be shutdown when execute command "init 0"                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Reboot   | System should be reset when execute command "init 6"                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

## 6.1.2 Ubuntu16.10 x86\_64 kernel 4.8.0-24-generic

| Test Item                                               | Result                                                                                                 |                                     |                          | Note                     |  |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
|                                                         | Pass                                                                                                   | Fail                                | N/A                      |                          |  |
| System should not any error during install process.     | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| lspci to check H/W device.                              | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| Record log file which was error or warning key words.   | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| System should not error during LAN driver installation. | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                          |  |
| Force speed                                             | LAN connection speed should show 1000Mb when execute command “ ethtool -s ethx autoneg off speed 1000” | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | LAN connection speed should show 100Mb when execute command “ ethtool -s ethx autoneg off speed 100”   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | LAN connection speed should show 10Mb when execute command “ ethtool -s ethx autoneg off speed 10”     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Ifconfig                                                | Ethernet interface should be closed when execute command “sudo nmcli networking off”                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | Ethernet interface should be started when execute command “sudo nmcli networking on”                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Jumbo                                                   | Jumbo function should work properly                                                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                         | Connected internet and ping the website should work properly.<br>(Google: 8.8.8.8)                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Shutdown                                                | System should be shutdown when execute command "init 0"                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Reboot                                                  | System should be reset when execute command "init 6"                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

## 6.2. Windows OS Compatibility Test

### Procedure:

- Step1. Install Windows OS from USB DVD ROM.
- Step2. Install all required driver to system.
- Step3. Connect internet, check each LAN port function.
- Step4. Insert USB flash, check each USB port function.
- Step5. ACPI S5 and reset function test.
- Step6. ACPI S3 and S4 function test if support graphics driver.

### Test result:

#### 6.2.1 Windows 10 Enterprise 64bit English version

| Test Item                                                     | Result                                                                                   |                                     |                          | Note                                |  |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--|
|                                                               | Pass                                                                                     | Fail                                | N/A                      |                                     |  |
| System should not any error during install process.           | <input checked="" type="checkbox"/>                                                      | <input type="checkbox"/>            | <input type="checkbox"/> | UEFI mode                           |  |
| All required driver should be installed.                      | <input checked="" type="checkbox"/>                                                      | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |  |
| Connected internet and ping the website should work properly. | <input checked="" type="checkbox"/>                                                      | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |  |
| USB ports should work properly.                               | <input checked="" type="checkbox"/>                                                      | <input type="checkbox"/>            | <input type="checkbox"/> | X2                                  |  |
| Shutdown                                                      | System should be shutdown when click "shutdown" icon                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |  |
| Reboot                                                        | System should be reset when click "Reset" icon.                                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |  |
| S3                                                            | System should be sleep when click "Sleep" icon and resume function should work properly. | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
| S4                                                            | System should be sleep when click "Sleep" icon and resume function should work properly. | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |



## 7. BIOS Function Test

Procedure:

- Step1. Flash BIOS process will complete and run correctly
- Step2. Press Keyboard " DEL " Key into BIOS.
- Step3. To ensure the BIOS setting can be controlled correctly.
- Step4. Please add or del test item from your test BIOS Version.

Test Result:

### 7.1. Flash BIOS

| Test Item<br>(Following item should work properly) | Result                              |                          |                          | Note |
|----------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                    | Pass                                | Fail                     | N/A                      |      |
| *Execute Go.bat for flash BIOS                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| *Press keyboard Del into BIOS setup                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

### 7.2. Advanced Test

| Test Item<br>(Following item should work properly) | Result                              |                                     |                                     | Note                         |                                                                               |                  |
|----------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------|-------------------------------------------------------------------------------|------------------|
|                                                    | Pass                                | Fail                                | N/A                                 |                              |                                                                               |                  |
| Trusted Computing                                  | security device support             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | Enable Disable                                                                |                  |
|                                                    | TPM 2.0 Device Found                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | Linux                                                                         |                  |
|                                                    | TPM Clear                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
| CPU Configuration                                  | CPU info.                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
|                                                    | Intel VT                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
|                                                    | EIST                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
| SATA Configuration                                 | SATA info.                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
|                                                    | SATA controller                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
|                                                    | CFast controller                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
| USB Configuration                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                              |                                                                               |                  |
| Hardware Monitor                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                              |                                                                               |                  |
| SIO configuration                                  | Serial Port 1                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | RS232/422/485                                                                 |                  |
|                                                    | Serial Port 2                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
| Serial Port Console Redirection                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Baud rate: 9600/38400/115200 |                                                                               |                  |
| LAN Bypass Config                                  | Status LED                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | LED off/RED on/RED Blink/RED Fast Blink/Green on/Green Blink/Green Fast blink |                  |
|                                                    | LAN kit1                            | Power on                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>                                                      | PassTru / Bypass |
|                                                    |                                     | Power off                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>                                                      | PassTru / Bypass |
|                                                    | LAN kit2                            | Power on                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>                                                      | PassTru / Bypass |
|                                                    |                                     | Power off                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>                                                      | PassTru / Bypass |
|                                                    | WDT                                 | System Reset                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>                                                      |                  |
| Force Bypass                                       |                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     |                                                                               |                  |
| Digital IO Port Configuration                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                              |                                                                               |                  |

### 7.3. Chipset Test

| Test Item<br>(Following item should work properly) | Result               |                                     |                          | Note                     |  |
|----------------------------------------------------|----------------------|-------------------------------------|--------------------------|--------------------------|--|
|                                                    | Pass                 | Fail                                | N/A                      |                          |  |
| North Bridge                                       | Memory Configuration | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|                                                    | Primary Display      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

#### 7.4. Boot Test

| Test Item<br>(Following item should work properly) | Result                              |                          |                          | Note |
|----------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                    | Pass                                | Fail                     | N/A                      |      |
| Quiet Boot                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Network Stack                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Boot From Hard Disk                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Boot From USB HDD                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Boot From USB CD-ROM                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Boot from LAN                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| Disable                                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

#### 7.5. CMOS Backup / Clear CMOS Test

| Test Item<br>(Following item should work properly) | Result                              |                          |                          | Note                        |
|----------------------------------------------------|-------------------------------------|--------------------------|--------------------------|-----------------------------|
|                                                    | Pass                                | Fail                     | N/A                      |                             |
| Clear CMOS Test by Jumper                          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clear All data and password |
| Clear CMOS Test by remove CMOS battery             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clear All data and password |

#### 7.6 Supervisor / User Password Test

| Test Item<br>(Following item should work properly) | Result                              |                          |                          | Note |
|----------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                    | Pass                                | Fail                     | N/A                      |      |
| Administrator Password                             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |
| User Password                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

#### 7.7 Negative Test

##### 7.7.1 USB Keyboard Negative Test

| Methods                                                                                                                                                                                       | Result                              |                          |                          | Note |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                                                                                                               | Pass                                | Fail                     | N/A                      |      |
| <ol style="list-style-type: none"> <li>1. Boot into BIOS setup manual.</li> <li>2. Press NumLock or ScrLk and press arrow key.</li> <li>3. confirm arrow key function are normally</li> </ol> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

##### 7.7.2 UEFI Mode Negative Test

| Methods                                                                                                                                                                                                                      | Result                              |                          |                          | Note |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                                                                                                                                              | Pass                                | Fail                     | N/A                      |      |
| <ol style="list-style-type: none"> <li>1. Install Windows with UEFI mode.</li> <li>2. Clear CMOS.</li> <li>3. Confirm BIOS\Boot device was not loss "Windows boot manager" and should boot into Windows properly.</li> </ol> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 8. Stability Test

### 8.1. LAN Endurance Test

#### Configuration:

CPU: Intel® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)  
RAM: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D  
Storage: Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.  
Graphics: Onboard Graphics  
OS: Ubuntu16.10 x86\_64 kernel 4.8.0-24-generic  
LAN: Intel I211AT

#### Procedure:

- Step1. Use SmartBits to test LAN endurance.  
Step2. Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>  
<LAN5-LAN6 bi-directional>  
Step3. To set Frame size=1518 / loading=67 / time=43200sec

#### Test Result:

| Test item                                                             | Result                              |                          |                          | Note |
|-----------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                       | Pass                                | Fail                     | N/A                      |      |
| Onboard LAN1~6 Endurance Test<br><Test result should not frame loss.> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

#### Throughput Detail Report

[Summary Report](#) [Stray Frames Report](#) [Port Errors Report](#) [Packet Rate Report](#)

| Name       | Time              | FrameSize | ILoad    | TxFrames    | RxFrames    | LostFrames | Lost (%) | Throughput | Tx fps | Tx L2 bps  | Rx fps | Rx L3 bps  | Rx L2 bps  |
|------------|-------------------|-----------|----------|-------------|-------------|------------|----------|------------|--------|------------|--------|------------|------------|
| Total      | 07/14/17 03:40:43 | 1518      | 67.00000 | 16466839512 | 16466839512 | 0          | 0.00000  | 67.00000   | 326723 | 4019999868 | 326723 | 3920676074 | 4019999868 |
| A Group    | 07/14/17 03:40:43 | 1518      | 67.00000 | 16466839512 | 16466839512 | 0          | 0.00000  | 67.00000   | 326723 | 4019999868 | 326723 | 3920676074 | 4019999868 |
| A 1-1->1-2 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |
| A 1-2->1-1 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |
| A 1-3->1-4 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |
| A 1-4->1-3 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |
| A 2-1->2-2 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |
| A 2-2->2-1 | 07/14/17 03:40:43 | 1518      | 67.00000 | 2744473252  | 2744473252  | 0          | 0.00000  | N/A        | 54454  | 669999978  | 54454  | 653446012  | 669999978  |



### 8.2. Reboot Test

#### Under Room Temperature:

OS: Windows 10 Enterprise 64bit

Test Tool: Passmark rebooter.exe

| Test item                                                                                                                                             | Result                              |                          |                          | Note |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                                                                       | Pass                                | Fail                     | N/A                      |      |
| Reboot test for 500 cycles<br><a. System should not error or hang during testing.><br><b. Device manager should not loss any devices or yellow bang > | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

### 8.3. ACPI S5 Cold Boot Test

Under Room Temperature:

OS: Windows 10 Enterprise 64bit

| Test item                                                                                                      | Result                              |                          |                          | Note                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                | Pass                                | Fail                     | N/A                      |                                                                                                                                                          |
| S5(standby power) cold boot over 500 cycles<br>< System should complete 500 cycles without any error or hang.> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. "PassMark Rebooter" set 500 cycles ; delay 30sec and enable "auto load Rebooter at startup".<br>2. On/off fixture cycle time to set 150sec. (AT mode) |

### 8.4. Memory Test

Configuration:

Tool: Memtest86+ V7.1 Free

Memory information: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D

| Test item                                                                | Result                              |                          |                          | Note |
|--------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                          | Pass                                | Fail                     | N/A                      |      |
| Memory Test for 3 loops.<br>< Memtest result should not error or hang..> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 9. LAN Performance Test

### 9.1 DUT and Test Equipments

#### 9.1.1. DUT Specification

##### Hardware:

- Model name: ICS-6270 (ICS-6270 A0.1)
- CPU: Intel ® Celeron® Processor N4200 (2M Cache, up to 2.5 GHz)
- RAM: Transcend DDR3L 8GB Samsung SEC 449 BYKO K4B4G0846D
- HDD: Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.

##### Software:

- BIOS: ICS-6270 R0.5(S270AM05)(04/13/2017)
- Operating System: CentOS7 kernel: 3.10.0-514.el7.x86\_64

#### 9.1.2. Test Equipments Specification

##### SPIRENT Smartbits

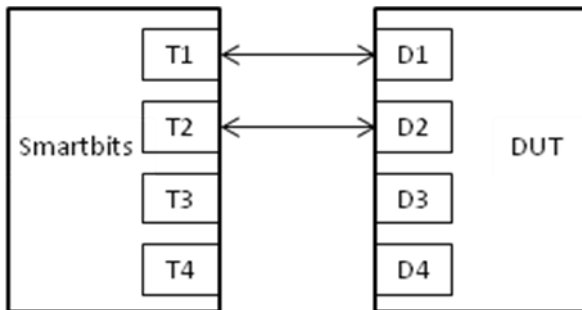
- Chassis: SPIRENT Smartbits 600B
- Chassis Version: 2.80.003 (Cur) 2.50.000
- Chassis Serial #: 06014047
- Library: 6.00-29
- API: 5.50.42.01
- File: 0550042
- Module: 2 \* LAN-3324A SmartMetrics XD 4-Port 10/100/1000Base-T Gigabit Ethernet
- Test Software: SmartFlow5.50.42.1

## 9.2 RFC-2544 performance test (2 port)

### 9.2.1. Throughput test (2 port)

#### Test Description:

1. In DUT System, set routing function enabled.  
`<# echo 1 > /proc/sys/net/ipv4/ip_forward>`
2. Test Configuration as below Figure.

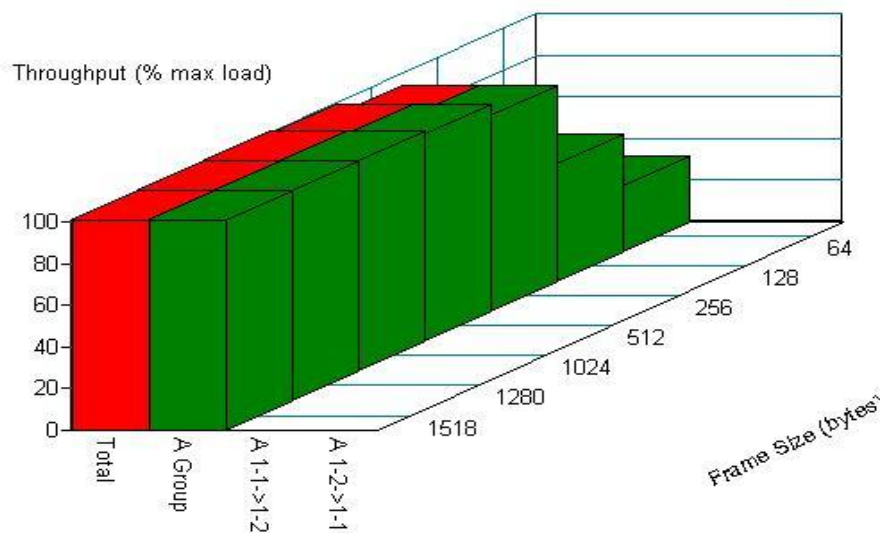


3. Smartflow\Test Group to add port1<->port2 with Bi-directional,
4. The tester set loading traffic from 1% to 100% and the traffic step is 50%.
5. Interaction Constants Duration Time Set to 60 Sec.
6. Test all LAN ports performance.

#### Test Result:

Test Group: <LAN1-LAN2 bi-directional>

| Speed:<br>1000_Full | Frame Size(bytes) |        |         |          |         |         |         |
|---------------------|-------------------|--------|---------|----------|---------|---------|---------|
| LAN ports           | 64                | 128    | 256     | 512      | 1024    | 1280    | 1518    |
| 1-2                 | 31.164            | 55.914 | 93.8125 | 99.2265  | 100     | 100     | 100     |
| 3-4                 | 31.9375           | 54.46  | 86.8515 | 84.53125 | 97.679  | 100     | 100     |
| 5-6                 | 32.71             | 55.914 | 74.4765 | 69.8359  | 85.3046 | 86.0781 | 88.3984 |



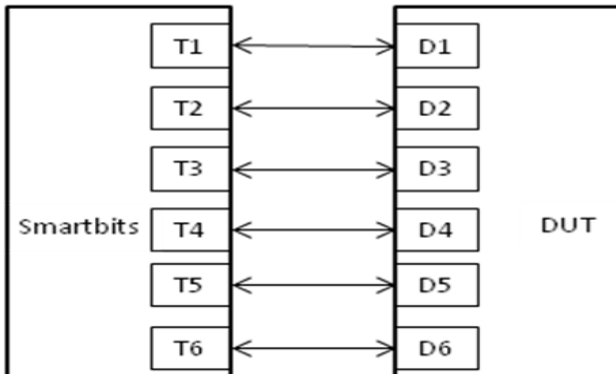
Throughput vs Frame Size

## 9.3 RFC-2544 performance test (6 ports)

### 9.3.1. Throughput test

#### Test Description:

- In DUT System, set routing function enabled.  
<# echo 1 > /proc/sys/net/ipv4/ip\_forward>
- Test Configuration as below Figure.

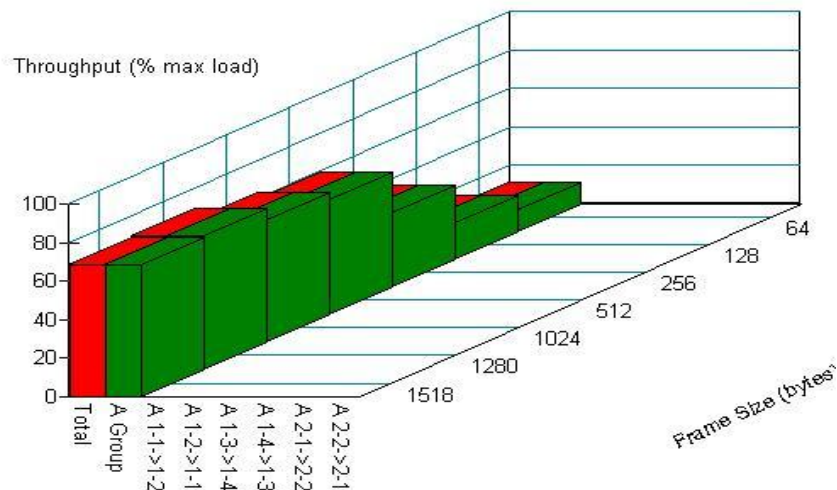


- Smartflow\Test Group to add port1<->port2 with Bi-directional, port3<->port4 with Bi-directional, port5<->port6 with Bi-directional.
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

#### Test Result:

Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>  
<LAN5-LAN6 bi-directional>

| Speed:<br>1000_Full | Frame Size(bytes) |        |        |       |        |         |        |
|---------------------|-------------------|--------|--------|-------|--------|---------|--------|
| LAN ports           | 64                | 128    | 256    | 512   | 1024   | 1280    | 1518   |
| 1 ~6                | 11.0546           | 18.789 | 38.125 | 59.00 | 62.875 | 69.0625 | 68.189 |



Throughput vs Frame Size