

Report NO: 18I010005

# FWS-2276

## INTEL Apollo Lake 4 LANs Network Appliance

### Firewall Product Bulletin Compatibility Test Report

Summary	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Pass with Deviation Comment: 1. LAN endurance test passed with 98% loading.			
Test Results Category				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date	QE Manager	Test Engineer
2018-06-20	KJ Wang	Louie Lee

**Version Released Records**

Date	Version	Change History	Note
01/27/2016	A0	1. First release	
01/06/2017	A1	1. Add NIM card compatibility test. 2. Add 10G · 40G LAN function test. 3. Update BIOS test plan. 4. Update Stability test item. 5. Add 10G, 40G Throughput performance test.	
07/17/2017	A2	1. Add Linux Burnintest 2. Add PCIe GEN3 bear card test	

**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-port Network Appliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Processor	Onboard Intel Apollo Lake SoC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System Memory	On-board LPDDR4 1GB, co-lay 1 x 204-pin DDR3L 1866MHz SODIMM, Up to 8GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Graphics controller	Intel Integrated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ethernet	INTEL i211 (Co-lay with INTEL i210), Gigabit Ethernet x 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bypass	X1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BIOS	AMI BIOS ROM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Storage	1 x SATA III port on board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	On-board 8GB/16GB eMMC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Serial Port	RJ45 console	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Keyboard and Mouse	Reserve pin-header	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Universal Serial Bus	2 x USB 3.0 Type A on I/O side	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Expansion Interface	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
RTC	Internal RTC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TPM	BOM Optional TPM2.0 9665	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Display	Micro HDMI x 1	<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"/>	
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	1 x 12V DC power in connector / 40W Power Adapter 4-pin DC power out connector for SATA device	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System FAN	1 x System FAN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Front I/O panel	1 x Power LED 1 x Status LED 1 x HDD Active LED 1 x Bypass LED 8 X LAN LEDs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rear I/O panel	2 x USB 3.0 Ports 4 x RJ-45 Ports with LEDs 1 x RJ-45 Console 1 x 12V DC Power Input 1 x Software Programmable button 1 x Power button 2 x Antenna hole	<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 64 bits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Linux	Cent OS 5.2 or above	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Linux Kernel 4.1 above	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Yocto* Tool based Embedded Linux	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

### Platform Information

Item	Device Information	Note
Product of department	NSD	
System Model	FWS-2276	
PCB Model / Version	NMB-2276 A1.0	
BIOS / Version	CS:8097h, FWS-2276 R1.1(K276AM11) (05/25/2018)	
Driver folder	FWS-2276\20180613	
CPU Type	Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz	
Memory Type	InnoDisk DDR3L-1600 8GB(SEC K4B4G0846E)	
	Onboard LPDDR4 4GB	
	Onboard LPDDR4 2GB	
	Onboard LPDDR4 1GB	
SATA HDD	Innodisk SATADOM-SH 3ME3 32GB (DESSH-32GD09BC1SC-26A)	
USB DVD-ROM	ASUS SBW-06D2X	
VGA Monitor	N/A	
HMDI Monitor	Philips 288P / Dell U2713HM / ASUS VE288	
eMMC	Onboard eMMC KingSton 16GB / 8GB	
CFast	N/A	
mSATA	N/A	
Daughter Board	N/A	
	N/A	
NIM Card	N/A	
	N/A	
Operating System	<input checked="" type="checkbox"/> CentOS7 kernel:3.10.0-514.el7.x86_64	
	<input checked="" type="checkbox"/> Ubuntu16.04.2 kernel 4.8.0-36-generic x86_64	
	<input type="checkbox"/> Windows 10 Enterprise 64bit English version	
Adapter	FSP040-RHAN2 12V 3.33A	
	FSP060-DIBAN2 12V 5A	
Battery Model	N/A	
Chipset Information		
Chip	Intel Apollo Lake	
Super IO Chipset	ITE IT8728F	
Ethernet Chipset	INTEL i211 , Gigabit Copper Ethernet x 4	

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# 1. Hardware Compatibility Test

## 1.1. CPU Compatibility Test

Procedure:

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 N3350 2M Cache, up to 2.4 GHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 1.2. 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.					
Onboard LPDDR4 1GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Memtest
Onboard LPDDR4 2GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Memtest
Onboard LPDDR4 4GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Memtest
Transcend DDR3L-1600 2GB(SEC 501 BYMA K4B2G0846Q)	AP-DR968D30 02GK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR3L-1600 4GB(SEC 446 XYKO K4B4G0846D)	AP-DR968D30 04G6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR3L-1600 8GB(SEC 443 BYKO K4B4G0846D)	968D3008G7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
InnoDisk DDR3L-1600 2GB(SEC 434 BYKO K4B2G0846Q)	AP-DR968D30 02GX	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
InnoDisk DDR3L-1600 4GB(SEC K4B4G0846E)	968D3004GZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
InnoDisk DDR3L-1600 8GB(SEC K4B4G0846E)	968D3008GW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DSL DDR3L 2GB (Hynix H5TC2G83EFR PBA 247EA)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
KingSton DDR3L 1600 4GB D5128ED1FPGGBU	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ADATA DDR3L-1600 4GB(Micro 3YE77 D9QBJ)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR3L 1333 2GB Hynix H5TC2G83EFR	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DSL DDR3L 1333 4GB Hynix H5TC4G83AFR	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Innodisk DDR3L 1333 8GB H5TC4G83AFR	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR3L 1866 4GB 512M*8,Micron.MT41K512M8DA-107.	AP-DR968D30 4G0W	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR3L 1866 8GB 512M*8,Micron.MT41K512M8DA-107	AP-DR968D30 8G0D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR3L 1866 4GB 512M*8. Samsung.K4B4G0846X.	AP-DR968D30 4G0V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR3L 1866 8GB 512M*8. Samsung.K4B4G0846X	AP-DR968D30 8G0C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### 1.3. SATA Compatibility Test

#### 1.3.1 SATA AHCI Mode

Procedure:

Step1. BIOS select AHCI mode, check SATA devices information/ size should show correct value in BIOS setup.

Step2. Boot into OS, check SATA devices information/size should show correct value.

OS: CentOS7 kernel:3.10.0-514.el7.x86\_64

Test Result:

Test item	Result			Note	
	Pass	Fail	N/A		
Below SATA devices information and size should show correct value with AHCI mode.					
SATAII	ATP IG SATADOM 8GB AF8GSSEI-LE1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W 109/48MB/s
SATAII	Innodisk SATADOMD150SH-L 8GB (DESB0-08GJ30AWCDS-D57)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W 63/40MB/s
SATAIII	Innodisk SATADOM-SH 3ME3 32GB (DESSH-32GD09BC1SC-26A)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W 128/42MB/s

## 2. Basic Function Test

### 2.1. CPU Function Test

Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
Memory: InnoDisk DDR3L-1600 8GB(SEC K4B4G0846E)

Procedure:

- Step1. Connected CPU with product specification max supported.
- Step2. Boot into BIOS manual and check CPU information is correct.
- Step3. 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.  
<1 thread #sysbench --test=cpu --cpu-max-prime=20000 run>  
<2 threads #sysbench --test=cpu --cpu-max-prime=20000 --num-threads=2 run>

Test result:

No.	Test item	Result			Note
		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"/>	2.39GHz
4	Recode CPU Benchmark	Intel	1 thread	21.0392s	
		2.39G	2 threads	11.0505s	

### 2.2. Memory Function Test

Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
Memory: InnoDisk DDR3L-1600 8GB(SEC K4B4G0846E)

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.  
<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			Note
		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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	System should boot up properly.
	Slot 2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Slot 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Slot 4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Slot 1 + 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Slot 2 + 4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Slot 1+2+3+4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



4.	Recode Memory Benchmark	read	Transferred:27763.73MB/s Total time:0.0369 s
		write	Transferred:4794.23MB/s Total time:0.2136s

### 2.3. SATA / eMMC Function Test

Configuration:

SATA DOM: Innodisk 3ME3 32GB SATA DOM

eMMC: onboard eMMC 16GB

Procedure:

Step1. Connect SATA HDD / SSD and CF.

Step2. Boot into BIOS manual and check SATA and eMMC information are correct.

Step3. Install Linux OS with SATA storage / eMMC.

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

<Ubuntu tool: Disk Benchmark>

Test result:

No.	Test item	Result			Note
		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 port Read:100MB/s Write:42.3 MB/s
3	eMMC R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	eMMC 16GB Read:234MB/s Write:68MB/s
4		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	eMMC 8GB Read:230MB/s Write:41MB/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.

Step4. Check EDID function if kernel supported.

Test result:

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

5.	VGA EDID should function properly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6	HDMI EDID should function properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 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 UEFI shell (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			Note
		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 UEFI shell display and command typing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200 (DOS display is passed)
3	Under Linux OS, console support minicom transmission.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200 ttyS0

## 2.6 USB ports Function Test

### 2.6.1 USB basic 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			Note
		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	USB2.0 R/W speed should meet specification.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	USB3.0 R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2 Read:104 MB/s Write: 67MB/s

### 2.6.2 USB compatibility test

Procedure:

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

Step2. Test each USB device function.

Test Result

Test Item		Result			Note
		Pass	Fail	N/A	
USB devices function should work properly.					
keyboard	Logitech K200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mouse	Logitech M-U0003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DVD ROM	ASUS SBW-06D2X-U	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HUB	Mini 4ports HUB High speed USB2.0	<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 Flash	Sandisk cruzer 8GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Transcend16GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB3.0 Flash	Kingston Ultimate G2 16GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Transcend 32GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	PNY 128GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.7 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
40GB/s	Color Blue
10GB/s	Color Blue
1GB/s	Color Orange
100MB/s	Color Green
10MB/s	Color Blank

	Link/Act LED
Un-Linked	Blank
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"/>	eMMC is not support HDD LED
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 -lcmon ./lcm -lcmoff ./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"/>	Not support 10G
8	1000M connection LAN LED action as below: Speed LED: Orange Link LED: Green / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	100M connection LAN LED action as below: Speed LED: Green Link LED: Green / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	10M connection LAN LED action as below: Speed LED: blank Link LED: Green / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 2.8. 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.
- Step5. SDK set "save to BIOS" and reboot to BIOS, check BIOS Bypass value.

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
		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"/>	
5	Save to BIOS			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 2.9. 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. ; 10G & 40G LAN port connect to Host PC
  - Step2. Connect internet and ping Google (8.8.8.8) ; 10G & 40G ping Host PC.
  - Step3. Each LAN port connect host PXE PC and DUT BIOS enable PXE function.
  - Step4. BIOS select boot from LAN.
  - Step5. Test each LAN port WOL function properly which from OS shutdown.
  - Step6. Client PC to install and execute iperf and host PC execute iperf -s
  - Step7. Iperf test with 1G, 100M, 10M switch/Hub. ; 10G & 40G iperf test with Host PC.
- ```
<#yum install iperf>
<#iperf -c 192.168.3.58 -w 100M -t 60 -i 1>
```

### Test result:

| Test item                                                                                           | LAN 1~2 1G                          |                          |                                     | LAN 3~4 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"/>            |                                  |
| 10G / 40G ping Host PC<br>Ping Host PC should work properly                                         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" 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"/>            | Legacy LAN1/2<br>UEFI LAN1/2/3/4 |
| Wake On LAN<br>WOL should work properly when resume from S5                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                  |
| 40Gbps connection<br>Iperf test result should not loss and max bandwidth must be in 20Gbps or more. | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                  |
| 10Gbps connection<br>Iperf test result should not loss and max bandwidth must be in 9Gbps or        | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                  |

|                                                                                                      |                                     |                          |                          |                                     |                          |                          |  |
|------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--|
| more.                                                                                                |                                     |                          |                          |                                     |                          |                          |  |
| 1Gbps connection<br>lperf test result should not loss and max bandwidth must be in 900Mbps or more.  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 100Mbps connection<br>lperf test result should not loss and max bandwidth must be in 90Mbps 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>lperf test result should not loss and max bandwidth must be in 9Mbps or more.   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

### 2.10. TPM2.0 Function Test

Procedure:

- Step1. Enable BIOS\TPM device and status.
- Step2. \$ wget https://drive.google.com/open?id=0B2qBRy2H60mEaF9NTG5tWWVIRzA  
<#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"/> |        |

### 2.11. Digital IO Function Test

Procedure:

- Step1. Use SDK to set DIO high/low output.
- Step2. Use meter to measure DIO output value.

Test result:

| No. | Test item                                 | Result                              |                          |                          | Remark |
|-----|-------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------|
|     |                                           | Pass                                | Fail                     | N/A                      |        |
| 1   | DIO ports should be controlled correct by | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

|      |  |  |  |  |
|------|--|--|--|--|
| SDK. |  |  |  |  |
|------|--|--|--|--|

## 2.12. Jumper and connector Function Test

Configuration:

Procedure:

- Step1. Test power button function under BIOS and OS environment.
- Step2. Test PS/2 keyboard / mouse under BIOS and OS environment.
- Step3. Connect PWB/Reset/HDD LED/PWR LED cable to FP1, check if each function can work properly
- Step4. Set keyboard lock jumper to close and check PS/2 keyboard function.
- Step5. Set “auto power on” jumper” to enable & disable and test auto power on feature.
- Step6. Use meter to measure the CFD voltage.
- Step7. Connect IPMI module and open JP3, check if IPMI function can work properly.
- Step8. 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   | Power switch                                                  | System on /off under BIOS.                            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                       |
|     |                                                               | System shutdown or suspend when press PWB under OS.   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                       |
|     |                                                               | System force shutdown when press PWB > 4SEC under OS. | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Shutdown behavior will refer to BIOS\AC loss setting. |
| 2   | PS/2 Keyboard, mouse.                                         | <input type="checkbox"/>                              | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |                                                       |
| 3   | FP1 1-2 Power Button / 5-6 PWR LED<br>3-4 Reset / 7-8 PWR LED | <input type="checkbox"/>                              | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |                                                       |
| 4   | FP2 2-4 PS/2 keyboard lock                                    | Close: keyboard should not work.                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                       |
| 5   | Auto power 1-2 disable<br>2-3 enable                          |                                                       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Default AT mode                                       |
| 6   | CFD voltage 1-2 5V<br>2-3 3.3V                                |                                                       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                       |
| 7   | IPMI PWRBTN close with IPMI<br>Open W/O IPMI                  |                                                       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                       |
| 8   | Clear CMOS 1-3 2-4 Normal<br>3-5 4-6 Clear CMOS               |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                       |

### 3. Expansion card and Application Test

#### 3.1. PCI-Express Bear Card Test: [X] Not support

Procedure:

Step1. Connect PCIe bear card and boot into DOS or Windows.

Step2. Execute test command for PCIe MLW test.

OS: UEFI Windows10 Enterprise 64bit or DOS

Test result:

| Test Item | Result                            |                          |                          | Remark                              |  |
|-----------|-----------------------------------|--------------------------|--------------------------|-------------------------------------|--|
|           | Pass                              | Fail                     | N/A                      |                                     |  |
| Mini PCIe | 1.5V, 3.3V, reset power LED check | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
|           | Wake# function                    | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
|           | PCIe x1 / GEN2                    | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |

Remark: GENx by specification supported.

#### 3.2. Mini PCIe Compatibility Test: [X] Not support

Procedure:

Step1. Connect Mini PCIe device and boot into OS.

Step2. Test PCI-e card basic function.

OS: Ubuntu16.04.2 x86\_64 kernel 4.10.0-27-generic x86\_64

Test result:

| Test Item                                                                             | Result                   |                          |                                     | Remark                                                                                  |
|---------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|-----------------------------------------------------------------------------------------|
|                                                                                       | Pass                     | Fail                     | N/A                                 |                                                                                         |
| Function should work properly as below item                                           |                          |                          |                                     |                                                                                         |
| AAEON PER-V09V                                                                        | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Not support Legacy                                                                      |
| AAEON PER-C11L Intel 82574 Gigabit LAN card + USB port                                | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                                                         |
| AAEON PER-C41C-A10 4 port RS-232                                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | lspci<br>dmesg  grep ttyS*                                                              |
| AzureWave AW-NB159H 802.11b/g/n RTL8723BE combo module                                | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                                                         |
| AzureWave AW-CB161H 802.11a/b/g/n/ac(PCI-e Wireless+ USB Bluetooth) Realtek RTL8821AE | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                                                         |
| Bointec DPE909-AA WIFI                                                                | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                                                         |
| Quectel UC20 3G Card (USB interface)                                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                                                         |
| Sierra Wireless AirPrime MC7304 Qualcomm 4G                                           | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Ping 168.95.1.1 for 1000 clcyes, loss<2 times.<br>2. Download 1GB file from website. |

#### 3.3. Expansion Card Integration Test [X] Not support

Procedure:

Step1. Connect devices to all of expansion slots.

Step2. Install OS.

Step3. Test expansion cards basic function.

OS: Ubuntu16.04.2 kernel:4.10.0-27-generic x86\_64

| Test Item       | Result                                     |                          |                          | Remark                              |  |
|-----------------|--------------------------------------------|--------------------------|--------------------------|-------------------------------------|--|
|                 | Pass                                       | Fail                     | N/A                      |                                     |  |
| OS installation | No error during OS and driver installation | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |



|                    |                                            |                          |                          |                                     |  |
|--------------------|--------------------------------------------|--------------------------|--------------------------|-------------------------------------|--|
| Expansion function | All of expansion cards should work normal. | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
|--------------------|--------------------------------------------|--------------------------|--------------------------|-------------------------------------|--|

## 4. Time Accuracy Test

### 4.1. 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.

<#./wdt -t 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  | +0.5   | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 2   | RTC Clock in Power Off less 2 sec deviation | +1     | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 3   | System boot on in 60 sec                    | 8      | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 4   | Watch dog time in 6+/-10% sec               | 10.47  | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 5   | Watch dog time in 60+/-10% sec              | 61     | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 6   | Watch dog time in 255+/-10% sec             | 260    | sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

## 5. Power Consumption Test

| Configuration |                                                         |
|---------------|---------------------------------------------------------|
| CPU           | Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz |
| Memory        | Transcend DDR3L-1600 8GB(SEC 443 BYKO K4B4G0846D)       |
| Storage       | Innodisk 3ME3 32GB SATA DOM+ onboard eMMC 16GB          |
| O.S           | Ubuntu16.04.2 kernel 4.8.0-36-generic x86_64            |

### 5.1. Power Consumption

| Test Equipment                                                                                        |                       |      |                                   |
|-------------------------------------------------------------------------------------------------------|-----------------------|------|-----------------------------------|
| Equipment                                                                                             | Digital Multimeter    |      |                                   |
| Manufacturer                                                                                          | HOLA                  |      |                                   |
| Model name                                                                                            | DM-1240               |      |                                   |
| Test Environment                                                                                      |                       |      |                                   |
| DC adapter                                                                                            | FSP040-RHAN2 12V3.33A |      |                                   |
| USB keyboard /mouse                                                                                   | Microsoft 1366 / 1113 |      |                                   |
| Power Supply                                                                                          |                       | P    | Note                              |
| Full Loading Mode<br>Test AP: Stress Test                                                             | +12V                  | 9.6  | W # stress –c 2 (CPU total cores) |
| Win. Idle mode: Measure the current value when system in windows mode and without running any program | +12V                  | 5.76 | W                                 |
| S5 mode: Measure the current value when system in S5 mode of windows and without running any          | +12V                  | 1.08 | W                                 |

### 5.2. 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 ±5%  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.16 V   | 1.13 V   |      |
| (+) VMEM<br>Actual and monitor must be ±5%   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.36 V   | 1.36 V   |      |
| (+) 12V<br>Actual and monitor must be ±5%    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12.24 V  | 12.1 V   |      |
| (+) 5V<br>Actual and monitor must be ±5%     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5.02 V   | 5.02 V   |      |
| (+) 5VDual<br>Actual and monitor must be ±5% | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5.04 V   | 5.02 V   |      |
| VBAT<br>Actual and monitor must be ±5%       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3.26 V   | 3.1 V    |      |
| Chassis FAN Speed                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4500 rpm | 4500 rpm |      |

|                                                |                                     |                          |                          |    |    |    |    |  |
|------------------------------------------------|-------------------------------------|--------------------------|--------------------------|----|----|----|----|--|
| Actual and monitor must be ±10%                |                                     |                          |                          |    |    |    |    |  |
| CPU Temp<br>Actual and monitor must be ±15°C   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 50 | °C | 47 | °C |  |
| System Temp<br>Actual and monitor must be ±5°C | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 54 | °C | 50 | °C |  |

### 5.3. 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:

(Calculate result=225mAh/measured current / 365days/24hours)

| Check item                                                                                | Measured Voltage |   | Measured Current |    | Calculate Result |       | Result                              |                          |                          | Note |
|-------------------------------------------------------------------------------------------|------------------|---|------------------|----|------------------|-------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                           |                  |   |                  |    |                  |       | Pass                                | Fail                     | N/A                      |      |
| Battery leakage<br>1. Voltage should be >3V.<br>2. Calculated result should be > 5 years. | 3.09             | V | 3.7              | uA | 6.9              | years | <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. Install all required driver to system.

Step3. Execute the following command to test LAN basic control.

Step 5.1 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 5.2 ifconfig Ethernet

- (1) Execute command “ifdown ethx” close ethernet interface
- (2) Execute command “ifup ethx” start ethernet interface

Step 5.3 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) or HOST PC, test networks function are whether normal

Step.7 Test USB R/W, check USB ports function.

Step.8 Execute “minicom” to test COM ports function.

Step 9 Execute command “init 0” or “shutdown –h” to shutdown system.

Step 10 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"/> |                          |  |
| System should not error during LAN driver installation. | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | igb-5.3.5.4.tar.gz       |  |
| 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                             | Onboard port1~4                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

|                                                     |                                                         |                                     |                          |                          |              |
|-----------------------------------------------------|---------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------|
| the website should work properly. (Google: 8.8.8.8) |                                                         |                                     |                          |                          |              |
| USB2.0 /3.0 function should work properly           |                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |              |
| COM ports function should work properly.            |                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Console port |
| 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 Ubuntu16.04.2 x86\_64 kernel 4.8.0-36-generic 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"/> |                                     |                                                            |
| System should not error during LAN driver installation.                         | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | igb-5.3.5.12.tar.gz                 |                                                            |
| 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"/>            | Ubuntu16.04 is not support ifdown ethx ; ifup ethx command |
|                                                                                 | 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. (Google: 8.8.8.8) | Onboard port1~4                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                                            |
|                                                                                 | NIM module: port 1~8 <NIM-C13B>                                                                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                            |
| Ping the HOST PC should work properly.                                          | 10G NIM module: port 1~4 <NIM-S26C>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                            |
| Ping the HOST PC should work properly.                                          | 40G NIM module: port 1~2 <NIM-S26B>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                            |
| USB2.0 /3.0 function should work properly                                       |                                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | USB3.0 x2                                                  |
| COM ports function should work properly.                                        |                                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Console port                                               |
| 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"/>            |                                                            |

## 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                                 |                                     |                                                                               |                |
| CPU Configuration                                  | CPU info.                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
|                                                    | Virtualization              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
|                                                    | EIST                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Default disable, fix on 2.4GHz                                                |                |
| Trusted Computing                                  | security device support     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Enable Disable                                                                |                |
|                                                    | TPM status                  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Enable Disable                                                                |                |
|                                                    | Clear TPM                   | <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"/>            |                                                                               |                |
| USB configuration                                  | Legacy USB support          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                                                               |                |
| SIO configuration                                  | Serial Port 1               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
| HW Monitor                                         | Temp / voltage Value        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
| DIO                                                |                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 0~7                                                                           |                |
| Power manager                                      | Power Mode                  | AT                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      |                |
|                                                    |                             | ATX                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      |                |
|                                                    | AC power loss               | Power on                            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/>                                           | H/W is AT mode |
|                                                    |                             | Power off                           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/>                                           |                |
|                                                    |                             | Last state                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/>                                           |                |
|                                                    | RTC wake system from S5     | Fixed Time                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      |                |
| Dynamic Time                                       |                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
| Status LED                                         | 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 |                |
| Bypass                                             | 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 config.                                        | Force Bypass / system reset | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |
| Serial port                                        | Enable / disable            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                                                                               |                |

|                     |                                 |                                     |                          |                          |                                                                                            |
|---------------------|---------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------------------------------------------------------------------------|
| console redirection | Baud rate:<br>9600/38400/115200 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                                                                            |
| SmartFAN            | Enable / Disable                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Disable: 9246rpm                                                                           |
|                     | Manual mode                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Test with desktop 4pin PWM FAN<br>255:4560rpm<br>127:2576rpm<br>50: 1216rpm<br>10: 1173rpm |
|                     | Auto mode                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Test with desktop 4pin PWM FAN                                                             |

### 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"/> |                          |                          |
|                                                    | Graphics Configuration | Primary Display                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | IGD                      |
|                                                    |                        | IGFX boot display                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | HDMI                     |
| South Bridge                                       | SCC                    | Enable/disable                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|                                                    |                        | HS400                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Read/Write: 234/68 MB/s  |
|                                                    |                        | HS200                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Read/Write: 170/68 MB/s  |
|                                                    |                        | DDR50                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Read/Write: 84.7/53 MB/s |

### 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"/> |                         |
| CSM support                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                         |
| Launch PXE ROM                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Legacy / support LAN1/2 |
| Network Stack                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | UEFI / Support LAN1 ~4  |
| 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. Clear CMOS and Load Default Test

| Test Item<br>(Following item should work properly) |                                     | Result                              |                          |                          | Note                                |
|----------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
|                                                    |                                     | Pass                                | Fail                     | N/A                      |                                     |
| Clear CMOS by jumper (under G3 status)             |                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clear date, time, setting, password |
| Clear CMOS by remove battery(under G3 status)      |                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clear date, time, setting, password |
| Load default                                       | Date, time, password should be kept | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     |
|                                                    | BIOS setting should be restored to  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     |

|  |                                                                |                                     |                          |                          |  |
|--|----------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
|  | default.                                                       |                                     |                          |                          |  |
|  | Boot option priorities should restore from disable to default. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

### 7.6. AAEON Tag Check Utility

| Test Item<br>(Following item should work properly) | Result                              |                          |                          | Note                            |
|----------------------------------------------------|-------------------------------------|--------------------------|--------------------------|---------------------------------|
|                                                    | Pass                                | Fail                     | N/A                      |                                 |
| Check AAEON BIOS OK                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | AONCHECK.EXE<br>Not support DOS |

### 7.7. 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"/> |      |

### 7.8. Negative Test

#### 7.8.1 USB Keyboard Negative Test

| Methods                                                                                                                         | Result                              |                          |                          | Note |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                                                 | Pass                                | Fail                     | N/A                      |      |
| 1. Boot into BIOS setup manual.<br>2. Press NumLock or ScrLk and press arrow key.<br>3. confirm arrow key function are normally | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

#### 7.8.2 UEFI Mode Negative Test

| Methods                                                                                                                                                        | Result                              |                          |                          | Note |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                                                                                                                | Pass                                | Fail                     | N/A                      |      |
| 1. Install Windows with UEFI mode.<br>2. Clear CMOS.<br>3. Confirm BIOS\Boot device was not loss "Windows boot manager" and should boot into Windows properly. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |



## 9. Stability Test

### 9.1. Run in Test

**Configuration:**

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
 RAM: Onboard LPDDR4 2GB  
 Storage: Innodisk 3ME3 32GB SATA DOM / onboard eMMC 16GB  
 Graphics: Onboard Graphics  
 OS: Ubuntu16.04.2 Kernel 4.8.0-36-generic x86\_64

**Procedure:**

Step1. Install test AP : Burnintest Linux V3.4.  
 Step2. Select test item: CPU, RAM, COM, 2D, 3D, Disk, Network / loading select 100%.

**Test Result:**

| Test Item                                                                                                            | Result            |                                     |                                     | Note                                |                          |  |
|----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--|
|                                                                                                                      | Pass              | Fail                                | N/A                                 |                                     |                          |  |
| Burn In Test Linux V3.4<br>Duty: 100<br>Time: over 12 hours<br><br><System should not error or hang during testing.> | CPU               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |  |
|                                                                                                                      | RAM               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |  |
|                                                                                                                      | COM               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | ttyS0                    |  |
|                                                                                                                      | Disk              | SATA                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |  |
|                                                                                                                      |                   | eMMC                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |  |
|                                                                                                                      | Network <default> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |  |

Note: COM PORT Speed Set [cycle to 115200].

### 9.2. Cold Boot Test

#### 9.2.1 ACPI G3 Cold Boot Test

**Configuration:**

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
 RAM: Onboard LPDDR4 2GB  
 Storage: Transcend USB3.0 Flash 8GB  
 Graphics: Onboard Graphics  
 OS: UEFI

**Procedure:**

Step1. Set auto power on jumper for enable or set BIOS\restore AC loss for always on.  
 Step2. Set power on with 90 second and power off with 20 second.  
 Step3. Run the on/off test over 1000 cycles to test system boot up stability at room temp.  
 Step4. Set H/W auto power on.  
 Step5. Set power on with 60 second and power off with 5 second.  
 Step6. Run the on/off test over 20 cycles to test system AC power restored in short time

**Test Result:**

| Test item                                                                                                          | Result                              |                          |                                     | Note                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                                                                                                                    | Pass                                | Fail                     | N/A                                 |                                                                                                                      |
| AC loss cold boot over 1000 cycles<br><loss rate: 0 /1000 times>                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> Jumper set auto power button<br><input checked="" type="checkbox"/> BIOS select " power on" |
| G3(AC loss) cold boot over 20 cycles<br>Setting: Power on- 60sec ;<br>Power off- 5sec.<br><loss rate: 0 /20 times> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Jumper set auto power button<br>Not support auto power button                    |

### 9.2.2 Power Button Cold Boot Test

Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
 RAM: Onboard LPDDR4 2GB  
 Storage: Transcend USB3.0 Flash 8GB  
 Graphics: Onboard Graphics  
 OS: UEFI

Procedure:

- Step1. Set auto power on jumper for disable.
- Step2. Set each ON/OFF cycle with 180 second.
- Step3. Run the power button on/off test over 500 cycles to test system boot up stability at room temp.

Test Result:

| Test item                                                      | Result                   |                          |                                     | Note                      |
|----------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|---------------------------|
|                                                                | Pass                     | Fail                     | N/A                                 |                           |
| Power button boot over 500 cycles<br><loss rate: 0 /500 times> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Not support power button. |

### 9.3. Memory Test

Configuration:

OS: UEFI

Tool: Passmark Memtest version7.4 UEFI

Memory information: Onboard LPDDR4 1GB  
 Onboard LPDDR4 2GB  
 Onboard LPDDR4 4GB  
 Innodisk DDR3L-1600 8GB(SEC 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"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> |      |

## 10. Mechanism Construction Test

### 10.1. Mechanism construction check

Procedure:

Step1. Insert NIM, CF 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   | CF slot shouldn't interfere with assembly        | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" 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"/>            |        |

## 11. 1G LAN Performance Test

### 11.1. DUT and Test Equipment

#### 11.1.1. DUT Specification

##### Hardware:

- Model name: FWS-2276 (FWB-2276 A0.1)
- CPU: Intel Celeron N3350 1.1GHz (BIOS fix on 2.4GHz)
- RAM: Onboard LPDDR4 4GB
- HDD: Innodisk SSD 3MG2-P 32GB

##### Software:

- BIOS: FWS-2276 R0.1 (K276AM01)
- Operating System: CentOS7 kernel 3.10.0-229.el7.x86\_64
- LAN driver: igb5.3.2 Intel Gigabit Ethernet Network Driver

#### 11.1.2. Test Equipment Specification

##### SPIRENT Smartbits

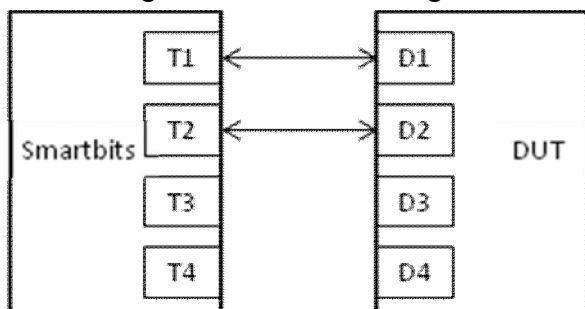
- Chassis: SPIRENT Smartbits 600B
- Chassis Version: 2.80.003 (Cur) 2.50.000
- Chassis Serial #: 06014047
- Library: 6.00-29
- API: 5.50.42.01
- File: 0550042
- Module: 2 \* LAN-3324A SmartMetrics XD 4-Port 10/100/1000Base-T Gigabit Ethernet
- Test Software: SmartFlow5.50.42.1

## 11.2. RFC-2544 performance test (2 port)

### 11.2.1. Throughput test (2 port)

#### Test Description:

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

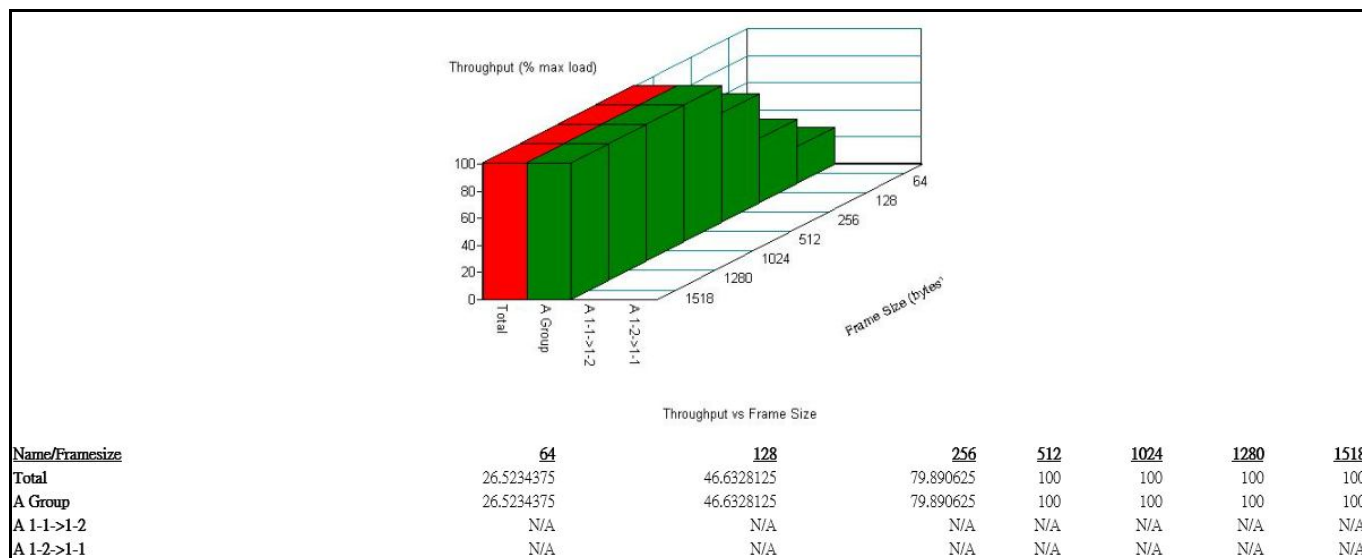


- Smartflow\Test Group to add port1<->port2 with Bi-directional,
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

#### Test Result:

Test Group: <LAN1-LAN2 bi-directional>

| Speed:<br>1000_Full | Frame Size(bytes) |       |       |     |      |      |      |
|---------------------|-------------------|-------|-------|-----|------|------|------|
| LAN ports           | 64                | 128   | 256   | 512 | 1024 | 1280 | 1518 |
| 1-2                 | 26.52             | 46.63 | 79.89 | 100 | 100  | 100  | 100  |
| 3-4                 | 24.2              | 42.76 | 74.47 | 100 | 100  | 100  | 100  |

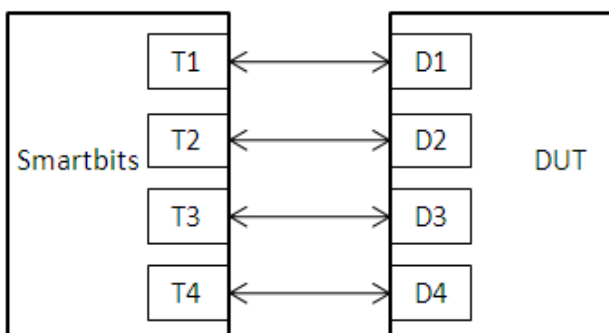


### 11.3. RFC-2544 performance test (4 ports)

#### 11.3.1. Throughput test

##### Test Description:

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

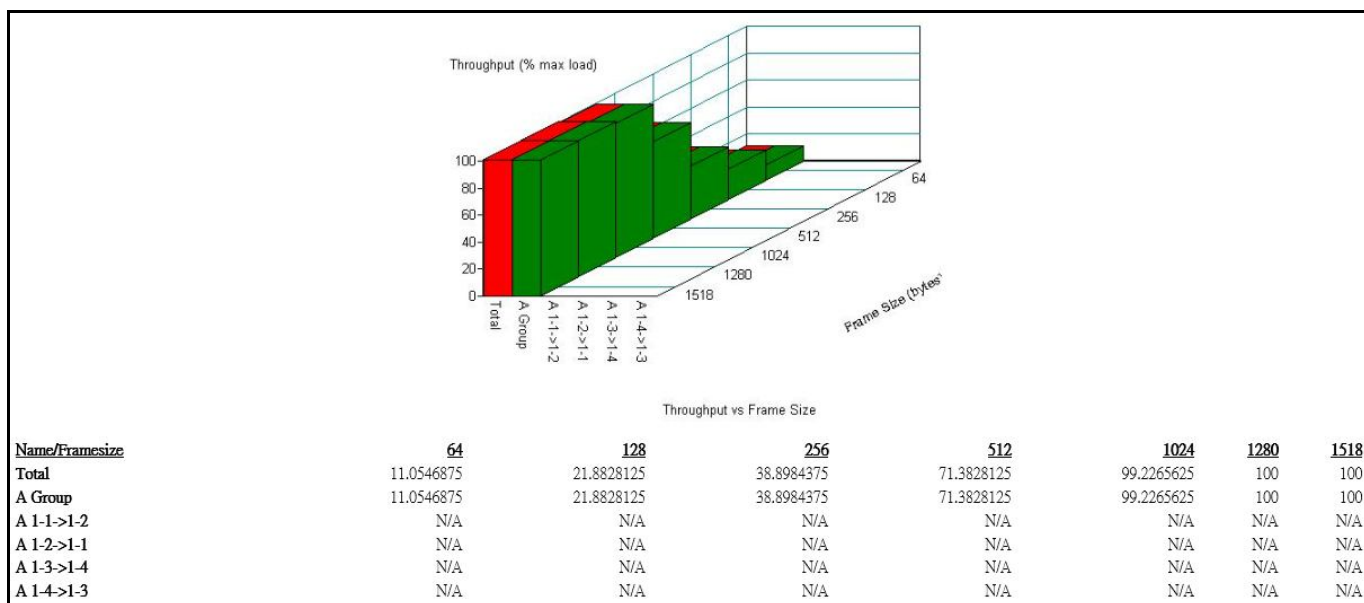


- Smartflow\Test Group to add port1<->port2 with Bi-directional, port3<->port4 with Bi-directional.
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

##### Test Result:

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

| Speed:<br>1000_Full | Frame Size(bytes) |       |       |       |       |      |      |
|---------------------|-------------------|-------|-------|-------|-------|------|------|
| LAN ports           | 64                | 128   | 256   | 512   | 1024  | 1280 | 1518 |
| 1 ~4                | 11.05             | 21.88 | 38.89 | 71.38 | 99.22 | 100  | 100  |



### 11.4. LAN Endurance Test

**Configuration:**

CPU: Intel Celeron N3350 1.1GHz (BIOS fix on 2.4GHz)  
 RAM: Onboard LPDDR4 4GB  
 Storage: Innodisk SSD 3MG2-P 32GB  
 OS: CentOS7 kernel 3.10.0-229.el7.x86\_64  
 LAN: Intel I211AT x4

**Procedure:**

- Step1. Use SmartBits to test LAN endurance.
- Step2. Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>
- Step3. To set Frame size=1518 / loading=98 / time=43200sec

**Test Result:**

| Test item                                                             | Result                              |                          |                          | Note                |
|-----------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|---------------------|
|                                                                       | Pass                                | Fail                     | N/A                      |                     |
| Onboard LAN1~4 Endurance Test<br><Test result should not frame loss.> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Pass with deviation |

| Throughput Detail Report                                                                                                                 |                   |           |          |             |             |            |          |            |        |            |        |            |            |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|----------|-------------|-------------|------------|----------|------------|--------|------------|--------|------------|------------|
| <a href="#">Summary Report</a> <a href="#">Stray Frames Report</a> <a href="#">Port Errors Report</a> <a href="#">Packet Rate Report</a> |                   |           |          |             |             |            |          |            |        |            |        |            |            |
| Name                                                                                                                                     | Time              | FrameSize | ILoad    | TxFrames    | RxFrames    | LostFrames | Lost (%) | Throughput | Tx fps | Tx L2 bps  | Rx fps | Rx L3 bps  | Rx L2 bps  |
| Total                                                                                                                                    | 01/19/18 07:01:22 | 1518      | 98.00000 | 13763328856 | 13763328856 | 0          | 0.00000  | 98.00000   | 318596 | 3919999959 | 318596 | 3823146904 | 3919999959 |
| A Group                                                                                                                                  | 01/19/18 07:01:22 | 1518      | 98.00000 | 13763328856 | 13763328856 | 0          | 0.00000  | 98.00000   | 318596 | 3919999959 | 318596 | 3823146904 | 3919999959 |
| A 1-1->1-2                                                                                                                               | 01/19/18 07:01:22 | 1518      | 98.00000 | 3440832214  | 3440832214  | 0          | 0.00000  | N/A        | 79649  | 979999990  | 79649  | 955786726  | 979999990  |
| A 1-2->1-1                                                                                                                               | 01/19/18 07:01:22 | 1518      | 98.00000 | 3440832214  | 3440832214  | 0          | 0.00000  | N/A        | 79649  | 979999990  | 79649  | 955786726  | 979999990  |
| A 1-3->1-4                                                                                                                               | 01/19/18 07:01:22 | 1518      | 98.00000 | 3440832214  | 3440832214  | 0          | 0.00000  | N/A        | 79649  | 979999990  | 79649  | 955786726  | 979999990  |
| A 1-4->1-3                                                                                                                               | 01/19/18 07:01:22 | 1518      | 98.00000 | 3440832214  | 3440832214  | 0          | 0.00000  | N/A        | 79649  | 979999990  | 79649  | 955786726  | 979999990  |