

Report NO: 171010012

FWS-2273

INTEL Apollo Lake 7 LANs Network Appliance

Firewall Product P5

Compatibility Test Report

Summary	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Pass with Deviation (Comment: 1. <u>There is limitation for Power Button 4sec force shutdown, the behavior from shutdown became to reset.</u> 2. <u>LAN4~7 performance of bandwidth and throughput are lower than LAN1~3, other functions are working properly.</u> 3. <u>System boot time need 35 sec while PXE feature is enable.</u>			
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
2017-10-19	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.	

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 7-port Network Appliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Processor	Onboard Intel N3350 SoC Processor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chipset	Intel® Apollo Lake	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System Memory	1 x 204-pin DDR3L 1866MHz SODIMM, Up to 8GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Graphics controller	Intel® HD Graphics 500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ethernet	INTEL i211 , Gigabit Copper Ethernet x 5, INTEL i210, Gigabit SFP Ethernet x 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bypass	Pair, LAN1-4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BIOS	AMI BIOS ROM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Serial ATA	1 x SATA III port 1 x CF socket, co-lay CFAST	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Serial Port	RJ45 Type x 1 (on front panel)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LCM	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Keyboard and Mouse	Reserve pin-header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Universal Serial Bus	2 x USB 3.0 Type A on I/O side	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Expansion Interface	1 x Full size Mini-Card (PCIe + USB) with SIM socket 1 x Full size Mini-Card (USB only) with SIM socket	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
RTC	Internal RTC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TPM	BOM Optional TPM v1.2 9660/TPM2.0 9665	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TPM2.0
Display	1 x HDMI port	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Watchdog Timer	0~255	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO	8bits, BIOS default 4 bits input, 4bits output.	<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"/>	
Front I/O panel	1 x Power LED 1 x Status LED 1 x HDD Active LED 14 X LAN LEDs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rear I/O panel	2 x USB 3.0 Ports 5 x RJ-45 Ports with LEDs 2 x SFP Ports with LEDs 1 x RJ-45 Console 1 x 12V DC Power Input 1 x Software Programmable button 1 x Power button	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Linux Kernel 4.1 above		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Testing environment 1. Linux as first priority
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Platform Information

Item	Device Information	Note
Product of department	NSD	
System Model	FWS-2273	
PCB Model / Version	NMB-2273 A0.1	
BIOS / Version	FWS-2273 R1.1(K273AM11) (08/21/2017)	
Driver folder	\FWS-2273\20170707	
CPU Type	Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz	
Memory Type	Transcend DDR3L-1600 8GB(SEC 443 BYKO K4B4G0846D)	
SATA HDD	Innodisk 3MG2-P SATAIII 32GB	
USB DVD-ROM	ASUS SBW-06D2X	
VGA Monitor	N/A	
HMDI Monitor	Dell U2713HM	
Compact Flash	Innodisk iCF9000 32GB	
CFast	Innodisk 3ME3 128GB	
mSATA	N/A	
Daughter Board	N/A	
	N/A	
NIM Card	N/A	
	N/A	
Operating System	<input checked="" type="checkbox"/> CENTOS7(1611) 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	
Power Supply	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 5, INTEL i210, Gigabit SFP Ethernet x 2	

Summary Table of contents:

1. Hardware Compatibility Test	6
1.1. CPU Compatibility Test	6
1.2. Memory Compatibility Test.....	6
1.3. SATA Compatibility Test	7
1.4. Flash Card Compatibility Test	8
1.5. USB Compatibility Test	8
2. Basic Function Test.....	10
2.1. CPU Function Test.....	10
2.2. Memory Function Test.....	10
2.3. SATA / CF Function Test.....	11
2.4. Video Function Test	11
2.5 Console Function Test.....	12
2.6 USB ports Function Test	12
2.7 LED / LCM / Button Function Test	13
2.8. Bypass Function Test.....	14
2.9. LAN Function Test.....	14
2.10. Digital IO Function Test.....	15
2.11. TPM2.0 Function Test	16
2.12. Jumper and connector Function Test	16
3. Expansion card and Application Test	17
3.1. PCI-Express Bear Card Test:	17
3.2. PCI-Express Compatibility Test:	17
3.3. Expansion Card Integration Test	18
4. Time Accuracy Test.....	18
4.1. System Clock & RTC Clock Test.....	18
5. Power Consumption Test	19
5.1. Power Consumption.....	19
5.2. PC Health Status	19
5.3. CMOS Battery Test	20
7. O.S Compatibility Test	21
7.1. Linux OS Compatibility Test	21
7.2. Windows OS Compatibility Test (Not support)	23
8. BIOS Function Test	25
8.1. Flash BIOS	25
8.2. Advanced Test	25
8.3. Chipset Test.....	26
8.4. Boot Test	26
8.5. CMOS Backup / Clear CMOS Test	26
8.6. AAEON Tag Check Utility.....	26
8.7. Supervisor / User Password Test	26
8.8. Negative Test.....	27
9. Stability Test.....	28
9.1. Run in Test.....	28
9.2. Cold Boot Test	28
9.3. Memory Test.....	29
10. Mechanism Construction Test	30
10.1. Mechanism construction check.....	30
11. 1G LAN Performance Test	31
11.1. DUT and Test Equipment	31
11.2. RFC-2544 performance test (2 port)	32
11.3. RFC-2544 performance test (6 ports)	33
11.4. LAN Endurance Test.....	34

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.					
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		<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 IDE mode, check SATA devices information/ size should show correct value in BIOS setup.

Step2. BIOS select AHCI mode, check SATA devices information/ size should show correct value in BIOS setup.

Step3. Boot into OS, check SATA devices information/size should show correct value.

OS: Ubuntu16.04.2 kernel:4.8.0-36-generic x86_64

Test Result:

Test item	Result			Note		
	Pass	Fail	N/A			
b. Below SATA devices information and size should show correct value with AHCI mode.						
SATAII	Toshiba MK1676GSX 2.5" 160GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAII	Fujitsu MHZ2080BH 2.5" 80GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAIII	WD WD5000LPVT 2.5" 500GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAIII	HGST HTS541010A9E680 2.5" 1TB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAIII	WD WD10SPCX 2.5" 1TB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAIII	WD WD20EZRX 3.5" 2TB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SATAIII	Seagate ST3000DM001 3.5" 3TB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SSD	Transcend TS32GSSD370 2.5".32GB.SATA III SSD MLC.	968C032G2D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	Transcend.TS64GSSD370 2.5".64GB. SATA III.SSD.MLC	968C64G003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.	968C128G0W	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	2.5" .16GB 3MG2-P 15nm.SATA III MLC SSD.Innodisk MLC .0°C ~ +70°C.DGS25-16GD81BC3SC-2 6	AP-SS968C016G3 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	(TF)2.5".32GB 3MG2-P 15nm.SATA SSD MLC.0~70°C.HIGH IOPS.innodisk.DGS25-32GD81 BC3DC-26	AP-SS968C032G1 P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	(TF)2.5".64GB.SATA MLC SSD .3MG2-P 15nm.0~70°C.HIGH IOPS.innodisk.DGS25-64GD81 BC3QC-26	968C064G39	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	2.5' MLC SSD 128GB 3MG2-P 15nm.SATA 0°C~+70°C.InnoDisk.DGS25-A2 8D81BC3QC-26	AP-SS968C128G1 P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	2.5".256GB.SATA MLC SSD 3MG2-P 15nm.0~70°C.HIGH IOPS.innodisk.DGS25-B56D81B C3QC-26	AP-SS968C256G1 6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	Intel SSD 540s Series 120GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SSD	ADATA SX900 128GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1.4. Flash Card Compatibility Test

Procedure:

- Step1. Connect Flash card and boot into BIOS, check Flash card information is correct.
- Step2. Boot into OS.
- Step3. Test Flash read / write function.

OS: Ubuntu16.04.2 kernel:4.8.0-36-generic x86_64

Test Result

Test Item	AAEON P/N	Result			Note
		Pass	Fail	N/A	
a. CF information and size should show correct value.					
b. R/W function should work properly.					
Innodisk iCF9000 64GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk iCF9000 32GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend CF220I 4GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk iCF4000 16GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk iCF8000 4GB standard	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend TS4GCF266 4GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
a. CFast information and size should show correct value.					
b. R/W function should work properly.					
Innodisk.DECFA-04GD07AC2DT-26 4G.SLC	968C004G0P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
InnoDisk.DECFA-08GD07RC2SC-26 8GB.MLC.3ME.	AP-SS968C00 8G10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk.3ME.DECFA-16GD07RC2DC-26 16GB.MLC.	968C016G4C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk.DECFA-32GD07RC2DC-26 SATA3.MLC.32GB	968C032G2B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk.DECFA-64GD07RC2DC-26 SATA3.MLC.64GB.CFAST.	AP-SS968C06 4G2T	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk.DECFA-A28D07RC2DC-26 SATA3.MLC.128GB	AP-SS968C12 8G19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1.5. USB Compatibility Test

Procedure:

- Step1. Insert USB device to USB2.0 / 3.0 ports.
- Step2. Test each USB device function.

OS: Ubuntu16.04.2 kernel:4.8.0-36-generic x86_64

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"/>	
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2. Basic Function Test

2.1. CPU Function Test

Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz
Memory: Transcend DDR3L-1600 8GB(SEC 443 BYKO K4B4G0846D)

Procedure:

Step1. Connected CPU with product specification max supported.
Step2. Boot into BIOS manual and check CPU information is correct.
Step4. Confirm CPU max speed can meet CPU specification in OS environment.
<#watch -n 1 "cat /proc/cpuinfo | grep MHz">
Step5. Install and execute benchmark AP "sysbench", recode the benchmark.
<Reference: http://wiki.mikejung.biz/Benchmarking#Install_Sysbench_on_CentOS_7>
<# wget ftp://ftp.gnome.org/mirror/fedora/epel/6/x86_64/sysbench-1.0.6-1.el6.x86_64.rpm>
<#wget
http://downloads.mysql.com/archives/mysql-5.1/MySQL-shared-compat-5.1.49-1.rhel5.x86_64.rpm>
<#rpm -iv MySQL-shared-compat-5.1.49-1.rhel5.x86_64.rpm>
<#yum install postgresql-libs.x86_64>
<#rpm -iv sysbench-1.0.6-1.el6.x86_64.rpm>
<1 thread #sysbench --test=cpu --cpu-max-prime=20000 run>
<8 threads #sysbench --test=cpu --cpu-max-prime=20000 --num-threads=2 run>

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	System can boot properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	BIOS\CPU information is correct.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	CPU speed should meet specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Recode CPU Benchmark	Intel	1 thread	10.0013s	
		2.29G	2 threads	10.0017s	

2.2. Memory Function Test

Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz
Memory: Transcend DDR3L-1600 8GB(SEC 443 BYKO K4B4G0846D)

Procedure:

Step1. Connected memory with product specification max supported.
Step2. Boot into BIOS manual and check memory information is correct.
Step3. Slot test.
Step4. Execute benchmark AP" sysbench", recode the benchmark.
<Reference: <http://ssorc.tw/4882>>
<read # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G --memory-oper=read run >
<write # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G run >

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	

1	System should boot properly.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	BIOS\Memory information is correct.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Slot 1	System should boot up properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	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:9811.85MB/s Total time:0.1026 s			
		write	Transferred:5738.82MB/s Total time:0.1766s			

2.3. SATA / CF Function Test

Configuration:

SATA: Intel SSD 540s series 120GB

CF: Innodisk iCF9000 32GB

CFast: Innodisk 3ME3 128GB

Procedure:

Step1. Connect SATA HDD / SSD and CF.

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

Step3. Install Linux OS with SATA storage / CF.

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

<update# yum update>

<install# yum install hdparm -y>

<check HDD# fdisk -l>

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

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

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	SATA storage and CF information should correct during POST and OS.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	SATA ports speed should meet specification. (SATAII max read speed > 150MB/s) (SATAIII max read speed > 300MB/s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SATA port Read: 530 MB/s Write: 520 MB/s
3	CF R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Read:83 MB/s Write: 52 MB/s
4	CFast R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Read: 170MB/s Write: 154MB/s

2.4. Video Function Test

Procedure:

Step1. Connect VGA monitor.

Step2. Install Linux OS to DUT system.

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

Test result:

No.	Test item		Result			Remark
			Pass	Fail	N/A	
1	Display shouldn't loss during OS installation.	HDMI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Display shouldn't flicker during POST and OS.	HDMI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	EDID check	HDMI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	HDMI should display normal with x-window and text mode.		<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 DOS (USB flash) and check console redirection work properly.
- Step5. Under Linux OS, install minicom AP and check console transmission.

Test Result:

No.	Test item		Result			Remark
			Pass	Fail	N/A	
1	Console support BIOS display and control.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200
2	Console support shell display and command typing.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200
3	Under Linux OS, console support minicom transmission.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 9600/38400/115200 ttyS0

2.6 USB ports Function Test

Procedure:

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

Test Result:

No.	Test item		Result			Remark
			Pass	Fail	N/A	
1	Boot from USB DVD ROM and drive should work properly.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2
2	USB 1.1 / 2.0 /3.0 devices (Flash, keyboard, mouse, DVD ROM) can work properly on USB 3.0 ports.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2

3	USB2.0 R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	USB3.0 R/W speed should meet specification.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB1/2 Read:98.45 MB/s Write:40 MB/s

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	TBD
Linked	TBD
Transmit	LED Blink

Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Power LED should turn on when system power on.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	HDD LED should blinks when install OS to HDD and CF.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Bypass LED should turn on when SDK set bypass status.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Status LED color and action should same with SDK setting.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SDK: LED
5	Reset value of SDK should show high when press the program reset button.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Open: show high Press: show low
6	LCM value of SDK should show correct	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SDK: LCM

	when press LCM function button.				./lcm -getkey return ./lcm -lcmon ./lcm -lcloff ./lcm -set String
7	10G connection LAN LED action as below: Speed LED: Green Link LED: Blue / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8	1000M connection LAN LED action as below: Speed LED: Orange Link LED: 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.

Test result:

No.	Test item	Power on	Power off	Result			Remark
				Pass	Fail	N/A	
1	PassTru / ByPass should work properly by SDK control.	Bypass	Bypass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SDK: LanByPass onboard:
		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	Modify Bypass 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:

(PXE and WOL support or not, define in SPEC)

- 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 and Dos power off.
 - 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 1~5 1G                          |                          |                          | LAN 6~7 1G                          |                          |                          | Note                                                                                |
|----------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------------------------------------------------------|
|                                                                                                    | Pass                                | Fail                     | N/A                      | Pass                                | Fail                     | N/A                      |                                                                                     |
| Internet Browser (DHCP Server)<br>Ping website(8.8.8.8) should work properly                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                                                                     |
| LAN Boot (PXE)<br>Boot from LAN should work properly                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LAN1~7                                                                              |
| 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"/> | LAN4/5 fail                                                                         |
| 1Gbps connection<br>Iperf test result should not loss and max bandwidth must be in 900MB or more.  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LAN4 797Mbps<br>LAN5 806Mbps<br>LAN6 799Mbps<br>LAN7:805Mbps<br>Pass with deviation |
| 100Mbps connection<br>Iperf test result should not loss and max bandwidth must be in 90MB or more. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LAN1~5                                                                              |
| 10Mbps connection<br>Iperf test result should not loss and max bandwidth must be in 9MB or more.   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LAN1~5                                                                              |

2.10. 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 SDK. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

## 2.11. TPM2.0 Function Test

Procedure:

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

## 2.12. Jumper and connector Function Test

Configuration:

Procedure:

- Step1. Connect power button cable to CN1, check if power on /off can work properly.
- Step2. Connect PS/2 keyboard / mouse to CN12, check if keyboard / mouse can work properly
- Step3. Connect PWB/Reset/HDD LED/PWR LED cable to FP1, check if each function can work properly
- Step4. JP2 jumper set 2-3 close, check if system auto power on when insert AC power cord.
- Step5. Use meter to measure the CFD voltage.
- Step6. Connect IPMI module and open JP3, check if IPMI function can work properly.
- Step7. Remove AC cable and CMOS jumper set 2-3 close, check if CMOS all data will be cleaned.

Test result:

| No. | Test item    | Result                                |                                     |                          | Remark                   |  |
|-----|--------------|---------------------------------------|-------------------------------------|--------------------------|--------------------------|--|
|     |              | Pass                                  | Fail                                | N/A                      |                          |  |
| 1   | Power switch | System on /off under BIOS.            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 2   |              | System shutdown or suspend when press | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |



|   |                                           |                                                       |                                     |                          |                          |                     |
|---|-------------------------------------------|-------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|---------------------|
|   |                                           | PWB under OS.                                         |                                     |                          |                          |                     |
| 3 |                                           | System force shutdown when press PWB > 4SEC under OS. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Pass with deviation |
| 4 | JP2 Auto power 1-2 disable<br>2-3 enable  |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |
| 5 | CFD voltage 1-2 5V<br>2-3 3.3V            |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |
| 6 | CN12 1-3 2-4 Normal<br>3-5 4-6 Clear CMOS |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |
| 7 | PS/2 Keyboard , mouse                     |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |
| 8 | USB2.0 pin header                         |                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                     |

### 3. Expansion card and Application Test

#### 3.1. PCI-Express Bear Card Test:

Procedure:

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

Step2. Execute test command for PCIe lanes & width test.

OS: UEFI Windows10 Enterprise 64bit

Test result:

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

#### 3.2. PCI-Express Compatibility Test:

Procedure:

Step1. Connect PCI-e device and boot into OS.

Step2. Test PCI-e card basic function.

OS: Ubuntu16.04.2 kernel:4.8.0-36-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 option ROM               |
| AAEON PER-C11L Intel 82574 Gigabit LAN card + USB port                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | USB interface was tested on Mini card1 & 2. |
| AzureWave AW-NB159H 802.11b/g/n RTL8723BE combo module                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                             |
| AzureWave AW-CB161H 802.11a/b/g/n/ac(PCI-e Wireless+ USB Bluetooth) Realtek RTL8821AE | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                             |
| Bointec DPE909-AA WIFI                                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                             |

|                                             |                                     |                          |                          |                                                                                                                                     |
|---------------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Quectel UC20 3G Card (USB interface)        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Ping 168.95.1.1 for 1000 clcyes, loss<2 times.<br>2. Download 1GB file from website.<br>Tested on Mini card1 and Mini card2 slot |
| Sierra Wireless AirPrime MC7304 Qualcomm 4G | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Tested on Mini card1 and Mini card2 slot                                                                                            |

Remark: PCIe interface by BOM option.

### 3.3. Expansion Card Integration Test

Procedure:

Step1. Connect devices to all of expansion slots.

Step2. Install OS.

Step3. Test expansion cards basic function.

OS: Ubuntu16.04.2 kernel:4.8.0-36-generic x86\_64

| Test Item          |                                            | Result                              |                          |                          | Remark |
|--------------------|--------------------------------------------|-------------------------------------|--------------------------|--------------------------|--------|
|                    |                                            | Pass                                | Fail                     | N/A                      |        |
| OS installation    | No error during OS and driver installation | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| Expansion function | All of expansion cards should work normal. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input 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.

<#chmod 777 superio>

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

Test Result:

Under Room Temperature: 26 °C

| No. | Test item                                   | Actual |     | Result                              |                          |                          | Remark |
|-----|---------------------------------------------|--------|-----|-------------------------------------|--------------------------|--------------------------|--------|
|     |                                             |        |     | Pass                                | Fail                     | N/A                      |        |
| 1   | RTC Clock in Power On less 2 sec deviation  | -0.5   | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 2   | RTC Clock in Power Off less 2 sec deviation | +0.5   | 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               | 10.5   | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 5   | Watch dog time in 60+/-10% sec              | 63     | Sec | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 6   | Watch dog time in 255+/-10% sec             | 264    | 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 3MG2-P SATAIII 32GB                            |
| 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                  | 11.76 | 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                  | 7.8   | W                                 |
| S5 mode: Measure the current value when system in S5 mode of windows and without running any          | +12V                  | 1.68  | 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"/> | 1.15 V | 1.13 V  |      |
| (+) VMEM<br>Actual and monitor must be ±5%   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.38 V | 1.36 V  |      |
| (+) 12V<br>Actual and monitor must be ±5%    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12 V   | 12.04 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"/> | 5.02 V | 5.02 V  |      |
| VBAT<br>Actual and monitor must be ±5%       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3.12 V | 3.09 V  |      |

|                                                      |                                     |                          |                          |      |     |      |     |  |
|------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|-----|------|-----|--|
| Chassis FAN Speed<br>Actual and monitor must be ±10% | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4590 | rpm | 4500 | rpm |  |
| CPU Temp<br>Actual and monitor must be ±15°C         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 52   | °C  | 50.5 | °C  |  |
| System Temp<br>Actual and monitor must be ±5°C       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 47   | °C  | 44   | °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. | 3.02             | V | 3.7              | uA | 6.9              | years | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

## 7. O.S Compatibility Test

### 7.1. Linux OS Compatibility Test

Procedure:

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

Step2. Enter lspci command detect H/W.

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

Step4. Install all required driver to system.

Step5. Execute the following command to test driver and verify

Step 5.1 Driver install

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

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

Step 5.2 Force speed

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

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

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

Step 5.3 ifconfig Ethernet

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

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

Step 5.4 Jumbo Frame

Setting #ifconfig LAN mtu 9000

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

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

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

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

Step 9 Execute command "systemctl suspend -i" to suspend system.

Test result:

7.1.1 CENTOS7(1611) kernel:3.10.0-514.el7.x86\_64

| Test Item                                                           | Result                              |                                     |                          | Note                                |
|---------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|
|                                                                     | Pass                                | Fail                                | N/A                      |                                     |
| System should not any error during install process.                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| lspci to check H/W device.                                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| Record log file which was error or warring key words.               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| System should not error during LAN driver installation.             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | igb-5.3.5.4.tar.gz                  |
| Monitor should display normal and should detect monitor EDID.       | VGA                                 | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                                                     | HDMI                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Transmission should work properly. Baud rate: 115200bps             | Console                             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
|                                                                     | Com2                                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| USB ports should work properly and speed should meet specification. | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |

|                                                                                 |                                                                                                        |                                     |                          |                                     |                                       |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|---------------------------------------|
| Force speed                                                                     | LAN connection speed should show 1000Mb when execute command " ethtool -s ethx autoneg off speed 1000" | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
|                                                                                 | LAN connection speed should show 100Mb when execute command " ethtool -s ethx autoneg off speed 100"   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
|                                                                                 | LAN connection speed should show 10Mb when execute command " ethtool -s ethx autoneg off speed 10"     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| Ifconfig                                                                        | Ethernet interface should be closed when execute command ""ifdown ethx"                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
|                                                                                 | Ethernet interface should be started when execute command ""ifup ethx"                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| Jumbo                                                                           | Jumbo function should work properly                                                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| Connected internet and ping the website should work properly. (Google: 8.8.8.8) | Onboard port1~7                                                                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| Shutdown                                                                        | System should be shutdown when execute command "init 0"                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| Reboot                                                                          | System should be reset when execute command "init 6"                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                       |
| suspend                                                                         | Suspend and resume function should work normal                                                         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | HDMI no display<br>Kernel not support |

7.1.2 Ubuntu16.04.2 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"/> |                                     |                                                            |
| lspci to check H/W device.                                          | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |                                                            |
| Record log file which was error or warring key words.               | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |                                                            |
| System should not error during LAN driver installation.             | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | igb-5.3.5.4.tar.gz                  |                                                            |
| Monitor should display normal and should detect monitor EDID.       | VGA                                                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                            |
|                                                                     | HDMI                                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                                            |
| Transmission should work properly. Baud rate: 115200bps             | Console                                                                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                                            |
|                                                                     | Com2                                                                                                   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                            |
| USB ports should work properly and speed should meet specification. | <input checked="" type="checkbox"/>                                                                    | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |                                                            |
| Force speed                                                         | LAN connection speed should show 1000Mb when execute command " ethtool -s ethx autoneg off speed 1000" | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                                                            |
|                                                                     | LAN connection speed should show 100Mb when execute command " ethtool -s ethx autoneg off speed 100"   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | LAN6/7 fiber are not support                               |
|                                                                     | 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"/>            | LAN6/7 fiber are not support                               |
| 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.<br>(Google: 8.8.8.8) | Onboard port1~7                                                                        | <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"/> |  |
| 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"/>            |  |
| Suspend                                                                            | Suspend and resume function should work normal                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |  |

## 7.2. Windows OS Compatibility Test (Not support)

Procedure:

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

Test result:

### 7.2.1 Windows 10 Enterprise 64bit English version

| Test Item                                                                          | Result                              |                          |                                     | Note                                |  |
|------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--|
|                                                                                    | Pass                                | Fail                     | N/A                                 |                                     |  |
| System should not any error during install process.                                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | UEFI mode                           |  |
| All required driver should be installed.                                           | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                     |  |
| Connected internet and ping the website should work properly.<br>(Google: 8.8.8.8) | Onboard port1~8                     | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" 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"/> |  |
| USB ports should work properly and speed should meet specification.                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | USB3.0 X4                           |  |
| Monitor should display normal and should detect monitor EDID.                      | VGA                                 | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |  |
|                                                                                    | HDMI                                | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |  |
| Transmission should work properly.<br>Baud rate: 115200bps                         | Console (COM0)                      | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |  |
|                                                                                    | COM1                                | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |  |

|          |                                                                                          |                          |                          |                                     |  |
|----------|------------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|--|
| Shutdown | System should be shutdown when click "shutdown" icon                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
| Reboot   | System should be reset when click "Reset" icon.                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
| S3       | System should be sleep when click "Sleep" icon and resume function should work properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |
| S4       | System should be sleep when click "Sleep" icon and resume function should work properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |  |



## 8. 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:

### 8.1. 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"/> |      |

### 8.2. 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 2.3GHz                                                |                                |
| Trusted Computing                                  | security device support | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Enable Disable                                                                |                                |
|                                                    | TPM status              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input 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"/>            |                                                                               |                                |
| SmartFAN                                           | FAN1                    | Full                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | 4530                           |
|                                                    |                         | Manual                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | 255/127/10/0: <set 0=1119 rpm> |
|                                                    |                         | auto                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | Source: System Temp            |
| 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 checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      |                                |
|                                                    |                         | Power off                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      |                                |
|                                                    |                         | Last state                          | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input 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"/>            |                                                                               |                                |
| LAN Bypass Config                                  | Status LED              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | LED off/RED on/RED Blink/RED Fast Blink/Green on/Green Blink/Green Fast blink |                                |
|                                                    | LAN kit1                | Power on                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | PassTru / Bypass               |
|                                                    |                         | Power off                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | PassTru / Bypass               |
|                                                    | LAN kit2                | Power on                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                      | PassTru / Bypass               |

|                                 |                              |              |                                     |                          |                          |                  |
|---------------------------------|------------------------------|--------------|-------------------------------------|--------------------------|--------------------------|------------------|
|                                 |                              | Power off    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | PassTru / Bypass |
|                                 | WDT                          | System Reset | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                  |
|                                 |                              | Force Bypass | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                  |
| Serial port console redirection | Enable / disable             |              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                  |
|                                 | Baud rate: 9600/38400/115200 |              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                  |

### 8.3. 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 |

### 8.4. Boot Test

| Test Item<br>(Following item should work properly) |  |  | Result                              |                          |                          | Note                                   |
|----------------------------------------------------|--|--|-------------------------------------|--------------------------|--------------------------|----------------------------------------|
|                                                    |  |  | Pass                                | Fail                     | N/A                      |                                        |
| Quiet Boot                                         |  |  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                        |
| Network Stack                                      |  |  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Support LAN1 ~7<br>Pass with deviation |
| 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"/> |                                        |

### 8.5. CMOS Backup / Clear CMOS Test

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

### 8.6. AAEON Tag Check Utility

| Test Item<br>(Following item should work properly) |  |  | Result                   |                          |                                     | Note         |
|----------------------------------------------------|--|--|--------------------------|--------------------------|-------------------------------------|--------------|
|                                                    |  |  | Pass                     | Fail                     | N/A                                 |              |
| Check AAEON BIOS OK                                |  |  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AONCHECK.EXE |

### 8.7. 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"/> |  |

## 8.8. Negative Test

### 8.8.1 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"/> |      |

### 8.8.2 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: Innodisk DDR3L 1600 8GB SEC K4B4G0846D  
 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 V3.3.  
 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 V3.3<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 checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | ttyS0                    |                     |
|                                                                                                                      | 2D                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |                     |
|                                                                                                                      | 3D                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |                     |
|                                                                                                                      | Disk                                | SATA                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                     |
|                                                                                                                      |                                     | CF                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                     |
|                                                                                                                      |                                     | CFast (option)                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | CFast colay with CF |
|                                                                                                                      | Sound                               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                          |                     |
| Network<br><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: Innodisk DDR3L 1600 8GB SEC K4B4G0846D  
 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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> Jumper set 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: Innodisk DDR3L 1600 8GB SEC K4B4G0846D

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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

### 9.3. Memory Test

Configuration:

OS: UEFI

Tool: Passmark Memtest version7.0 UEFI

Memory information: Innodisk DDR3L 1600 8GB SEC K4B4G0846D

| Test item                                                                   | Result                              |                          |                          | Note |
|-----------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                             | Pass                                | Fail                     | N/A                      |      |
| Memory Test for 4 loops.<br>< Memtest result should not error or<br>hang..> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

Remark: If system support UEFI mode only, the test tool is [Memtest86 Version 5.0 Experimental UEFI Beta]

## 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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 3   | CF slot shouldn't interfere with assembly        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 4   | Expansion slot shouldn't interfere with assembly | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |
| 5   | I/O symbol should correct.                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |        |

## 11. 1G LAN Performance Test

### 11.1. DUT and Test Equipment

#### 11.1.1. DUT Specification

##### Hardware:

- Model name: FWS-2273 (NMB-2273 A0.1)
- CPU: Intel Celeron N3350 1.1GHz (BIOS fix on 2.4GHz)
- RAM: InnoDisk DDR3L-1600 8GB(SEC K4B4G0846E)
- HDD: Innodisk 3MG2-P 32GB
- NIM module: N/A

##### Software:

- BIOS: FWS-2273 R0.1 (K273AM01)(6/30/2017)
- 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 Equipments Specification

##### SPIRENT Smartbits

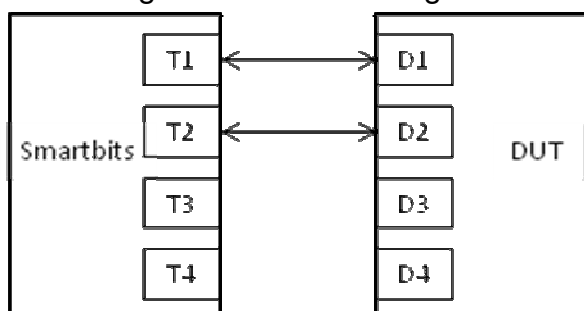
- Chassis: SPIRENT Smartbits 600B
- Chassis Version: 2.80.003 (Cur) 2.50.000
- Chassis Serial #: 06014047
- Library: 6.00-29
- API: 5.50.42.01
- File: 0550042
- Module: 2 \* LAN-3324A SmartMetrics XD 4-Port 10/100/1000Base-T Gigabit Ethernet
- Test Software: SmartFlow5.50.42.1

## 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.

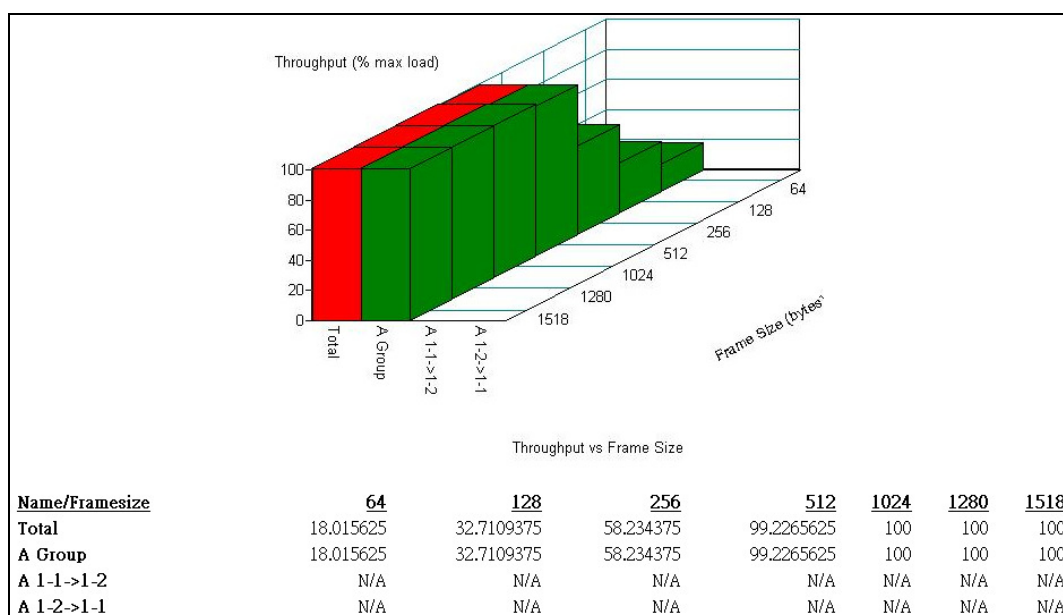


- Smartflow\Test Group to add port1<->port2 with Bi-directional,
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

#### Test Result:

Test Group: <LAN1-LAN2 bi-directional>

| Speed:<br>1000_Full | Frame Size(bytes) |        |        |        |        |        |        |
|---------------------|-------------------|--------|--------|--------|--------|--------|--------|
|                     | 64                | 128    | 256    | 512    | 1024   | 1280   | 1518   |
| LAN ports           |                   |        |        |        |        |        |        |
| 1-2                 | 18.0156           | 32.710 | 58.234 | 99.226 | 100    | 100    | 100    |
| 3-4                 | 24.976            | 44.312 | 77.570 | 85.304 | 96.906 | 100    | 100    |
| 5-6                 | 16.468            | 29.617 | 53.593 | 71.382 | 86.851 | 89.171 | 90.718 |
| 6-7                 | 15.695            | 28.070 | 50.5   | 70.609 | 86.851 | 86.851 | 89.171 |



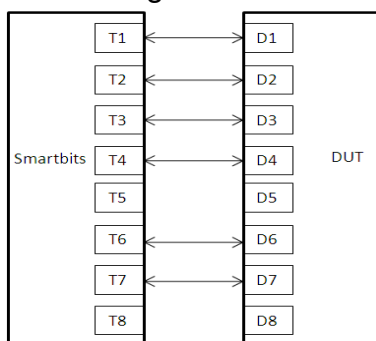


### 11.3. RFC-2544 performance test (6 ports)

#### 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.

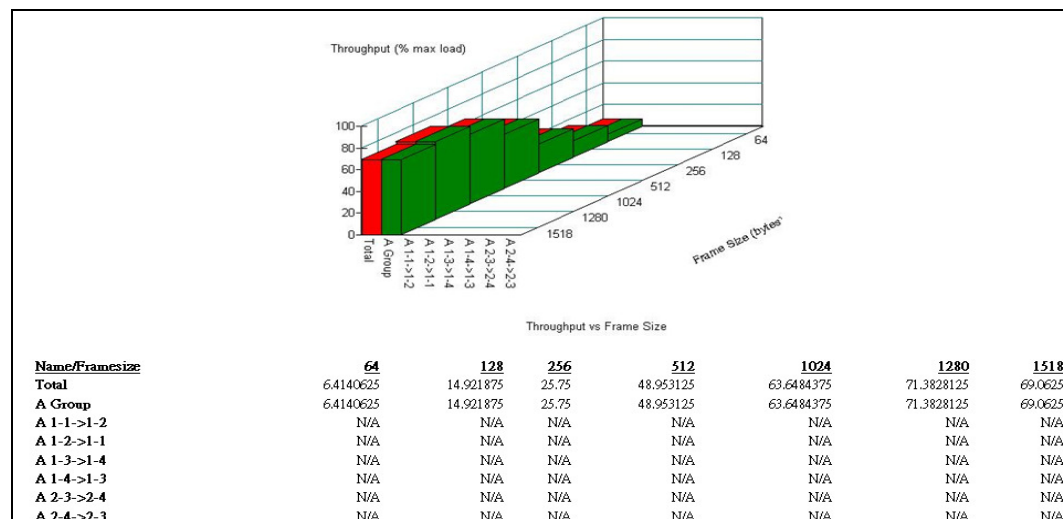


- Smartflow\Test Group to add port1<->port2 with Bi-directional, port3<->port4 with Bi-directional, port6<->port7 with Bi-directional
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

##### Test Result:

Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>  
<LAN6-LAN7 bi-directional>

| Speed:<br>1000_Full | Frame Size(bytes) |        |        |        |        |        |        |
|---------------------|-------------------|--------|--------|--------|--------|--------|--------|
| LAN ports           | 64                | 128    | 256    | 512    | 1024   | 1280   | 1518   |
| 1 ~6                | 6.414             | 14.922 | 25.750 | 48.953 | 63.648 | 71.383 | 69.063 |



### 11.4. LAN Endurance Test

#### Configuration:

CPU: Intel® Celeron® Processor N3350 2M Cache, up to 2.4 GHz  
 RAM: Innodisk DDR3L 1600 8GB SEC K4B4G0846D  
 Storage: Transcend USB3.0 Flash 8GB  
 Graphics: Onboard Graphics  
 OS: CentOS7  
 LAN: Intel I211AT, Intel I210 Fiber

#### Procedure:

- Step1. Use SmartBits to test LAN endurance.
- Step2. Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>  
<LAN6-LAN7 bi-directional>
- Step3. To set Frame size=1518 / loading=69% / time=43200sec

#### Test Result:

| Test item                                                             | Result                              |                          |                          | Note |
|-----------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|------|
|                                                                       | Pass                                | Fail                     | N/A                      |      |
| Onboard LAN1~7 Endurance Test<br><Test result should not frame loss.> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |      |

#### Throughput Detail Report

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

| Name                 | Time              | FrameSize | ILoad    | TxFrames    | RxFrames    | LostFrames | Lost (%) | Throughput | Tx fps | Tx L2 bps  | Rx fps | Rx L3 bps  | Rx L2 bps  |
|----------------------|-------------------|-----------|----------|-------------|-------------|------------|----------|------------|--------|------------|--------|------------|------------|
| <b>Total</b>         | 07/11/17 08:31:56 | 1518      | 69.00000 | 16958387472 | 16958387472 | 0          | 0.00000  | 69.00000   | 336476 | 4139999989 | 336476 | 4037711303 | 4139999989 |
| <b>A Group</b>       | 07/11/17 08:31:56 | 1518      | 69.00000 | 16958387472 | 16958387472 | 0          | 0.00000  | 69.00000   | 336476 | 4139999989 | 336476 | 4037711303 | 4139999989 |
| <b>A 1-1-&gt;1-2</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |
| <b>A 1-2-&gt;1-1</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |
| <b>A 1-3-&gt;1-4</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |
| <b>A 1-4-&gt;1-3</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |
| <b>A 2-3-&gt;2-4</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |
| <b>A 2-4-&gt;2-3</b> | 07/11/17 08:31:56 | 1518      | 69.00000 | 2826397912  | 2826397912  | 0          | 0.00000  | N/A        | 56079  | 689999998  | 56079  | 672951884  | 689999998  |