

Report NO: 20UP010005

UPX-ISHI5

UP Whiskey lake project

Board / System Level Product Bulletin Compatibility Test Report

Summary	☐ Pass ☐ Fail ☒ Pass with Deviation (Comment: _For 40 pin HAT connector, customer (Intel) has validated both Main board and daughter board (including 40 pin HAT) by themselves and give AAEON the green light that we can go to MP immediately)			
	Test Results Category			
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date

2020-05-27

QE Manager

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Test Engineer

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Specification Validation

Main Specification

Item	Specification	Result			Note
		Pass	Fail	N/A	
Form Factor	120mm x 122mm	☒	☐	☐	
Processor	Intel Core i5-8365UE	☒	☐	☐	
Memory	1 x SO-DIMM, default 8 GB SO-DIMM , MAX 16 GB	☒	☐	☐	
Graphics	Intel® Graphics , GEN 9, 1 xHDMI 1.3, 1 x DP1.2, 1 x eDP	☒	☐	☐	
Storage	1 x eMMC ver 5.1 64GB 2 x SATA3 (6Gb/s): a. 1 x SATA connector b. 1 x M.2 2280 PCIE/SATA (auto detect)	☒	☐	☐	
Ethernet	2x i210	☒	☐	☐	
Audio	HDMI Audio x1, DP Audiox1, ALC892 for Audio Out/Mic In	☒	☐	☐	
USB	4x USB3.1, 1x USB2.0 (pin-header)	☒	☐	☐	
COM Port	Fintech F81801, 2x RS232/422/485 (Selectable in BIOS) 1x RS-232 (TTL signal From SHUR-10pin USB connector)	☒	☐	☐	
Expansion Slot	1x M.2 (2230 E Key) (1x PCIe1, 1x USB2.0), 1x M.2 2280 M/B-key(2 x PCIe) , B key with with SIM card 1x M.2 3042/3052 B-key	☒	☐	☐	
Expansion HAT(40pin)	Enable ISH signals • I2C x 3, 1.8V and 3.3V. (VCC & VIO) by dip switch • UART x 2 for debug • SPI x 1 • GPIO x 8 (confirm with Leon)	☐	☐	☒	For programmers to develop software

UPX-ISHI5 Compatibility Test Report

Internal I/O	1x eDP with Backlight control Header	☒	☐	☐	
	1x10 pin 1x USB2.0 / 1x HSUART (TTL)	☒	☐	☐	
	1x SATA Connector with power connector (5V, GND)	☒	☐	☐	
	1x 4 pin Fan connector	☒	☐	☐	
	1x Power Button header	☒	☐	☐	
	1x Reset Pin header	☒	☐	☐	
	1x M.2 2230/ E Key	☒	☐	☐	
	1x M.2 2280 M/B-key	☒	☐	☐	
	1x M.2 3042/3052 B-key	☒	☐	☐	
	1x 40 pin HAT connector , ISH pin define	☐	☐	☒	For programmers to develop software
	2x 10 pin RS232/422/485 pin header	☒	☐	☐	
External I/O ports	2x RJ45 Ethernet Connector	☒	☐	☐	
	1 x HDMI/DP STACK Connector	☒	☐	☐	
	1 x USB 3.1 STACK Connector for 2 ports (Front)	☒	☐	☐	
	1 x USB 3.1 STACK Connector for 2 ports (Rear)	☒	☐	☐	
	1x Power Button / LED	☒	☐	☐	
	1x Audio Jack (Line out + MIC)	☒	☐	☐	
	1x DC connector (Lockable)	☒	☐	☐	
Others	Power 12~ 24V (+-5%) Input	☒	☐	☐	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows 10 English 64bit	☒	☐	☐	

Platform Information

Item	Device Information	Note
Product of department	UP	
Model / Version	ISH-WHL01	
CPU Board	ISH-WHL01 A0.1 0 0	
BIOS / Version	UPX-ISH R0.8 (UISHAM08) (05/12/2020)	
Driver folder	20190819	
CPU Type	Intel(R) Core i5-8365U 1.80GHz	
Memory Type	Transcend DDR4-2400 16GB	
SATA SSD	Transcend 2.5" 128GB(SSD420K)	
SATA DVD-ROM	LG 20X(GH20NS15)	
USB DVD-ROM	Lite-on 8X(eNAU808)	
HDMI	CHIMEI 22"(22SH-L)	
DP	EIZO 23"(EV2335W)	
Operating System	☒ Windows 10 Enterprise English Version 64Bit V1903	
Power Supply	DC Adapter : FSP 12V(FSP120-AHAN3)	
Chipset Information		
SOC Chip	Whisky lake SOC	
Super IO Chipset	Fintech F81801	
Audio Chipset	Realtek ALC892	
Ethernet Chipset	Intel I210	

Summary Table of contents:

1. Hardware Compatibility.....	6
1.1. CPU Compatibility Test	6
1.2. Memory Compatibility Test.....	6
1.3. SATA Compatibility Test.....	6
1.4. Flash Card Compatibility Test	7
1.5. Monitor Compatibility Test	8
2. Basic Function Test.....	9
2.1. Video Function Test	9
2.2. Audio Function Test.....	10
2.3. LAN Function Test	10
2.4. COM Ports Test.....	11
2.5. RS-422 / RS-485 Test.....	11
2.6. USB Port Integration Test.....	11
2.7. TPM Function Test.....	12
2.8. HAT40 Connect ISH board	12
2.9. Jumper and Connector Function Test.....	14
3. Expansion card and Application Test	15
3.1. PCI Express Bear Card Test.....	15
3.2. Expansion Slot Compatibility Test	15
3.3. Expansion Card Integration Test	15
3.4. Display port Converter Compatibility Test	15
4. Power Consumption Test	16
4.1. Power Consumption.....	16
4.2. PC Health Status	16
4.3. Wide Voltage Test.....	17
4.4. CMOS Battery Test	17
5. Time Accuracy Test.....	18
5.1. System Clock & RTC Clock Test.....	18
6. O.S. Compatibility Test	19
6.1. Windows 10 Enterprise English Version 64Bit V1903	19
7. BIOS Function Test	20
7.1. Advanced Test	20
7.2. Chipset Test.....	21
7.3. Boot Test.....	21
7.4. Clear CMOS and Load Default Test.....	21
7.5. Administrator / User Password Test.....	21
7.6. Negative Test.....	21
8. Performance Test	23
8.1. System Performance Test.....	23
8.2. Performance of Storage Interface Test	24
9. Stability test.....	26
9.1. Run In Test.....	26
9.2. Reboot Test	26
9.3. ACPI G3 Cold Boot Test	26
9.4. ACPI S5 Cold Boot Test.....	27
9.5. Memory Test.....	27
9.6. System stability after S3 / S4 / S5 cycles	27
9.7. G3 cold boot test.....	27
9.8. Heavy loading test with Max/Min voltage.	28
10. Front Panel Button and Mechanical Check.....	29
10.1. Mechanical Check.....	29

1. Hardware Compatibility

1.1. CPU Compatibility Test

CPU Information (Information and frequency should show correct value)	Result			Note
	Pass	Fail	N/A	
Intel® Core™ i5-8365UE Processor 6M Cache, 1.80GHz, up to 4.10 GHz	☒	☐	☐	

1.2. Memory Compatibility Test

Memory Information (a. Information and frequency should show correct value. b. System should boot up and into OS normally.)	AAEON P/N	Result			Note
		Pass	Fail	N/A	
DDR4 SO-DIMM					
Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)	TS0ABSGSB00A A	☒	☐	☐	
Transcend DDR4-2400 8GB(SEC 616 K4A4G085WE BCRC)	968D4008GL	☒	☐	☐	
Transcend DDR4-2400 4GB(SEC 616 K4A4G085WE BCRC)	TS8ABSESE00A A	☒	☐	☐	
Innodisk DDR4 2400 16GB (SEC K4A8G085WB)	AP-DR968D4016 GB	☒	☐	☐	
Innodisk DDR4 2400 8GB (SEC K4A4G085WE)	AP-DR968D4008 GC	☒	☐	☐	
Innodisk DDR4 2400 4GB (SEC K4A4G085WE)	AP-DR968D4004 GC	☒	☐	☐	
Kingston DDR4 2400 16GB (Micron 7VE75 D9VPP)	N/A	☒	☐	☐	
Kingston DDR4 2400 8GB (Micron 7TE77 D9VPP)	AP-DR968D4008 GE	☒	☐	☐	
Kingston DDR4 2400 4GB (Micron 7VE75 D9WFH)	N/A	☒	☐	☐	
Innodisk DDR4 2666 4GB (SEC K4A4G085WE)	(M4S0-4GSSNCI K-26)	☒	☐	☐	
Innodisk DDR4 2666 8GB (SECK4A8G085WC)	(M4S0-8GS1NCI K-26)	☒	☐	☐	
Innodisk DDR4 2666 8GB (SEC K4A4G085WE)	(M4S0-8GSSOCI K-26)	☒	☐	☐	
Innodisk DDR4 2666 16GB (SEC K4A8G085WC)	(M4S0-AGS1OCI K-26)	☒	☐	☐	
Transcend DDR4 2666 4GB TS512MSH64V6H (SEC K4A4G085WF)	TS512MSH64V6 H	☒	☐	☐	
Transcend DDR4 2666 8GB TS1GSH64V6B (SEC K4A8G085WC)	TS1GSH64V6B	☒	☐	☐	
Transcend DDR4 2666 16GB TS2GSH64V6B (SEC K4A8G085WC)	TS2GSH64V6B	☒	☐	☐	

1.3. SATA Compatibility Test

1.3.1 Onboard SATA(AHCI) Test

SATA Device Information (Information and size should show correct value with AHCI mode)	AAEON P/N	Result			Note
		Pass	Fail	N/A	

UPX-ISHI5 Compatibility Test Report

Main Board project test with 80~100cm SATA cable , typical #1709070800

SATAII	Seagate 2.5" SATAII ST9120823AS 120GB 5400rpm	N/A	☒	☐	☐	
SATAII	Toshiba 2.5" SATAII MK1676GSX 160GB 5400rpm	N/A	☒	☐	☐	
SATAIII	500GB		☒	☐	☐	
SATAIII	TOSHIBA 3.5" SATAIII HDS721010DLE630 1TB 7200rpm	N/A	☒	☐	☐	
SATAIII	WD 3.5" SATAIII WD20EZR 2TB 7200rpm	N/A	☒	☐	☐	
SATAIII	Seagate 3.5" SATAIII ST3000DM001 3TB 7200rpm	N/A	☒	☐	☐	
DVD	ASUS BW-14D1XT	N/A	☒	☐	☐	
SSD	Transcend ,TS512GSSD420K-AA 512GB MLC	968C512G06	☒	☐	☐	
SSD	Phison SSBP064GTB3C0-S11 64GB ,3D TLC	N/A	☒	☐	☐	
SSD	Phison SSBP128GTB3C0-S11 128GB ,3D TLC	N/A	☒	☐	☐	
SSD	Intel SSD 545s Series 128GB	AP-SS968C128 G40	☒	☐	☐	
SSD	Transcend TS32GSSD370 2.5".32GB.SATA III SSD MLC.	968C032G2D	☒	☐	☐	
SSD	Innodisk 3MG2-P MLC 16GB DGS25-16GD81BC3SC-26	AP-SS968C016 G3K	☒	☐	☐	
SSD	Innodisk 3MG2-P MLC 32GB DGS25-32GD81BC3DC-26	AP-SS968C032 G1P	☒	☐	☐	
SSD	Innodisk 3MG2-P MLC 64GB DGS25-64GD81BC3QC-26	968C064G39	☒	☐	☐	
SSD	Innodisk 3MG2-P MLC 128GB DGS25-A28D81BC3QC-26	AP-SS968C128 G1P	☒	☐	☐	
SSD	Innodisk 3MG2-P MLC 256GB DGS25-B56D81BC3QC-26	AP-SS968C256 G16	☒	☐	☐	

1.4. Flash Card Compatibility Test

M.2 Information (a. Information and size should show correct value (b. R/W and HDD LED should work properly)	AAEON P/N	Result			Note
		Pass	Fail	N/A	
2242 size					
Innodisk 3ME3 M.2 2242 SSD, 8GB	CTOS	☒	☐	☐	
Innodisk 3ME3 M.2 2242 SSD, 16GB	CTOS	☒	☐	☐	
Innodisk 3ME3 M.2 2242 SSD, 32GB	CTOS	☒	☐	☐	
Innodisk 3ME3 M.2 2242 SSD, 64GB	CTOS	☒	☐	☐	
Innodisk 3ME3 M.2 2242 SSD, 128GB	CTOS	☒	☐	☐	
Phison SSMP064GTB3C0-S11 M.2 2242 64GB, 3D TLC 64 layer,	N/A	☒	☐	☐	
Phison SSMP128GTB3C0-S11 M.2 2242 128GB, 3D TLC 64 layer,	N/A	☒	☐	☐	
Phison SSMP256GTB3C0-S11 M.2 2242 256GB, 3D TLC 64 layer,	N/A	☒	☐	☐	
2280 size					
Transcend TS32GMTS800-AA 32GB, M.2 2280 SSD, SATA3, MLC	CTOS	☒	☐	☐	

UPX-ISHI5 Compatibility Test Report

Transcend TS64GMTS800-AA 64GB, M.2 2280 SSD, SATA3, MLC	CTOS	☒	☐	☐	
Transcend TS128GMTS800-AA 128GB, M.2 2280 SSD, SATA3, MLC	CTOS	☒	☐	☐	
Transcend TS256GMTS800-AA 256GB, M.2 2280 SSD, SATA3, MLC	CTOS	☒	☐	☐	

1.5. Monitor Compatibility Test

Monitor Information a. Monitor should display under DOS and OS environment. b. Monitor should not appear ghost or ripples.	Result			Note
	Pass	Fail	N/A	
HDMI (Test with 5M HDMI cable/ Bravo-u)				
*Samsung LU28D	☒	☐	☐	*Must test monitor (Tested 3 monitors at least)
*ASUS VE228	☒	☐	☐	
CHIMEI 22SH-L	☒	☐	☐	
Display port				
*Samsung LU28D	☒	☐	☐	(Tested 3 monitors at least)
EIZO EV2335W	☒	☐	☐	
Dell P2416D	☒	☐	☐	

2. Basic Function Test

2.1. Video Function Test

2.1.1. Single Output Function Test

Configuration													
CPU	Intel(R) Core i5-8365U 1.80GHz												
Memory	Transcend DDR4-2400 16GB												
SATA SSD	Transcend 2.5" 128GB(SSD420K)												
HDMI	CHIMEI 22"(22SH-L)												
Display port	SAMSUNG 28"(U28D590D)												
eDP	AAEON FLT-101JDH-M11 10.1"												
Operating system	Windows 10 Enterprise English Version 64Bit V1903												
Color Quality	☒ 16bit ☐ 24bit ☒ 32bit												
Resolution	HDMI			DP			eDP			N/A			Note
	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	
800X600	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1024X600	☐	☐	☒	☐	☐	☒	☐	☐	☒	☐	☐	☒	
1024X768	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1280X600	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1280X720	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1280X768	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1280X800	☒	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☒	
1280X1024	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1360X768	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1366X768	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1600X900	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1600X1200	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1680X1050	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1920X1080	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
1920X1200	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☐	☒	
2048X1152	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☐	☒	
2560X1440	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☐	☒	
3840 X 2160	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
EDID check	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
Hot plug	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
Rotation(0/90/180/270)	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	
UEFI Display	☒	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐	☒	

Note: Pay attention to Full Screen under POST screen and Text Mode.

2.1.2. Multi-Display Output Test

Selection	Output	Result			Note
		Pass	Fail	N/A	
Dual Display Clone	HDMI + DP	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	HDMI + eDP	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	DP + eDP	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Triple Display Clone	HDMI + DP + eDP	☒	☐	☐	
Extended Desktop		☒	☐	☐	

2.1.3. Boot up Without Display Test

Process step:

1. BIOS disable LVDS.
2. Power on without inserting any VGA/DVI/HDMI/DP connector until system reaches Windows desktop
3. Plug VGA connector into test machine while system reaches Windows then check Graphics driver and display.
4. Check VGA output Brightness is normal and it shows "Ghost Image" / "Flicker" or not
5. Repeat step2~4 for DVI / HDMI / DP testing.

Test item		Result			Note
		Pass	Fail	N/A	
Display should working normal in Windows Desktop	HDMI	☒	☐	☐	
	Display port	☒	☐	☐	

2.1.4. LCD Panel Test

eDP

eDP Panel Model (eDP display should full screen and no flicker)			Result			Note
			Pass	Fail	N/A	
18bit	1024x600	AAEON FLT-0700X0ETTXBHM1 7"	☒	☐	☐	
18bit	1280x800	AAEON FLT-101JDH-M11 10.1"	☒	☐	☐	

2.2. Audio Function Test

[] No Support

Function Test	Result			Note
	Pass	Fail	N/A	
L (Left) Channel	☒	☐	☐	
R (Right) Channel	☒	☐	☐	
MICROPHONE	☒	☐	☐	
HDMI Audio	☒	☐	☐	
DP Audio	☒	☐	☐	

2.3. LAN Function Test

[] No Support

Connect two computers via different speed LAN HUB by using "Ping" instruction (1000 times) Command: ping xxx.xxx.xx.xx -l 65500 -n 1000									
1000Mbps LAN HUB		D-Link DGS-108							
100Mbps LAN HUB		Accton Desktop-3005							
10Mbps LAN HUB		SVEC FD916H							
OnBoard LAN1		Intel I210 Gigabit Network				MAC Address		00-07-32-61-58-FE	
OnBoard LAN2		Intel I210 Gigabit Network				MAC Address		00-07-32-61-58-FF	
LAN Speed	Link / Speed LED	Active LED	LAN 1			LAN 2			Note
			Pass	Fail	N/A	Pass	Fail	N/A	
1000Mbps Ping loss ≤ 1			☒	☐	☐	☒	☐	☐	
100Mbps Ping loss ≤ 1			☒	☐	☐	☒	☐	☐	

UPX-ISHI5 Compatibility Test Report

10Mbps Ping loss ≤ 1									
Wake On LAN (WOL should work properly when resume from S3/S4/S5)	S3								
	S4								
	S5								
LAN Boot (PXE) (Boot from LAN should work properly)									
Internet Browser (DHCP Server) (Visit the website should work properly)									
Access 1GB file from ftp. (Access file should not stop or error.)									
Iperf (Windows) \$sudo iperf3 -c xx.xx.xx.xx -w 1M -i 1 -t 60 (Gigabit LAN bandwidth should > 900Mbps)									

2.4. COM Ports Test

Test Item	Result			Note
	Pass	Fail	N/A	
Serial Modem Dial Out	☒	☐	☐	
Serial Modem Ring In	☒	☐	☐	Test by Modem
Transmission Test <115200bps / 15M>	☒	☐	☐	

2.5. RS-422 / RS-485 Test

Test Item	Result			Note
	Pass	Fail	N/A	
RS-422 for COM1/2	☒	☐	☐	Use loopback and WINSSD.exe to test RS-422 in Windows
	☒	☐	☐	1. The communication between the RS-422 port of two boards is linked by one 1.2km cable on Windows Terminal. 2. Confirm RS422 can work properly from G3 status 3. Test baud rate is 115200bps
RS-485 for COM1/2	☒	☐	☐	Use ICP CON I-7044D D/IO Module in Windows(Support Auto flow control)
	☒	☐	☐	1. The communication between the RS-485 port of two boards is linked by one 1.2km cable on Windows Terminal 2. Confirm RS485 can work properly from G3 status 3. Test baud rate is 115200bps.

2.6. USB Port Integration Test

USB Port		USB2.0 ports (under OS)			USB3.0 ports (under OS)			Note
		Pass	Fail	N/A	Pass	Fail	N/A	
USB3.0 HDD:	Transcend TS500GSJ25D3 500GB	☒	☐	☐	☒	☐	☐	

UPX-ISHI5 Compatibility Test Report

USB2.0 Flash:	Transcend 16GB	☒	☐	☐	☒	☐	☐	
USB3.1 Flash	ADATA UC350 USB3.1 32GB	☒	☐	☐	☒	☐	☐	
	Transcend USB3.1 64GB	☒	☐	☐	☒	☐	☐	
	Sandisk 128GB	☒	☐	☐	☒	☐	☐	
USB DVD ROM:	Lite-on eNAU808	☒	☐	☐	☒	☐	☐	
USB keyboard:	Logitech K200	☒	☐	☐	☒	☐	☐	
USB mouse:	Logitech M-U0026	☒	☐	☐	☒	☐	☐	
USB FDD:	Mitsumi D353GUE	☒	☐	☐	☒	☐	☐	
USB2.0 HUB:	SENSE 01-ELS 190 4 port Hub	☒	☐	☐	☒	☐	☐	
Test item					Result			Note
					Pass	Fail	N/A	
USB3.1 ports with power in S3 mode					☒	☐	☐	
USB3.1 ports with power in S5 mode					☒	☐	☐	

Remark: USB3.1 include GEN1 or GEN2 ports

2.7. TPM Function Test

Test item		Result			Note
		Pass	Fail	N/A	
TPM driver and version check in device manager		☒	☐	☐	
TPM Administration under OS	TPM Information check	☒	☐	☐	
	Clear TPM	☒	☐	☐	
BitLocker Test	Encryption test	☒	☐	☐	
	Recovery key test	☒	☐	☐	
	Decryption test	☒	☐	☐	

2.8. HAT40 Connect ISH board

Test item		Result			Note
		Pass	Fail	N/A	
1	+V3.3_HAT	☐	☐	☒	
2	+V5_HAT	☐	☐	☒	
3	+V3.3_HAT	☐	☐	☒	
4	+V5_HAT	☐	☐	☒	
5	+V1.8_HAT	☐	☐	☒	
6	VIO_3V3OR1V8	☐	☐	☒	
7	+V1.8_HAT	☐	☐	☒	
8	ISH_GPIO_0	☐	☐	☒	
9	GND	☐	☐	☒	
10	ISH_GPIO_1	☐	☐	☒	

UPX-ISHI5 Compatibility Test Report

11	ISH_I2C0_SCL	☐	☐	☒	
12	ISH_GPIO_2	☐	☐	☒	
13	ISH_I2C0_SDA	☐	☐	☒	
14	ISH_GPIO_3	☐	☐	☒	
15	GND	☐	☐	☒	
16	ISH_GPIO_4	☐	☐	☒	
17	ISH_I2C1_SCL	☐	☐	☒	
18	ISH_GPIO_5	☐	☐	☒	
19	ISH_I2C1_SDA	☐	☐	☒	
20	ISH_GPIO_6	☐	☐	☒	
21	GND	☐	☐	☒	
22	ISH_GPIO_7	☐	☐	☒	
23	ISH_I2C2_SCL	☐	☐	☒	
24	ISH_GPIO_8	☐	☐	☒	
25	ISH_I2C2_SDA	☐	☐	☒	
26	ISH_GPIO_9	☐	☐	☒	
27	GND	☐	☐	☒	
28	ISH_GPIO_10	☐	☐	☒	
29	ISH_UART0_TXD	☐	☐	☒	
30	GND	☐	☐	☒	
31	ISH_UART0_RXD	☐	☐	☒	
32	ISH_SPI_CS0#	☐	☐	☒	
33	GND	☐	☐	☒	
34	ISH_SPI_CS1#	☐	☐	☒	
35	ISH_UART1_TXD	☐	☐	☒	
36	ISH_SPI_CLK	☐	☐	☒	
37	ISH_UART1_RXD	☐	☐	☒	
38	ISH_SPI_MISO	☐	☐	☒	
39	GND	☐	☐	☒	
40	ISH_SPI_MOSI	☐	☐	☒	

Note: This feature is for programmer to develop F/W.

2.9. Jumper and Connector Function Test

Test item		Result			Note
		Pass	Fail	N/A	
Power button	One touch for power on.	☒	☐	☐	
	One touch for power off in BIOS manual.	☒	☐	☐	
	One touch for system shutdown in Windows environment. (power manager need to set "press PWB for shutdown.)	☒	☐	☐	
	> 4sec for H/W shutdown in Windows environment. (power manager need to set "press PWB do nothing.)	☒	☐	☐	
Power LED behavior	S1(boot up): Power LED on	☒	☐	☐	
	S3: Power LED off	☒	☐	☐	
	S4: Power LED off	☒	☐	☐	
	S5: Power LED off	☒	☐	☐	
CPU FAN	full speed can meet FAN specification	☒	☐	☐	

3. Expansion card and Application Test

3.1. PCI Express Bear Card Test

Test point: Make sure PCIe power, wake# and MLW are correct.

Test item		Result			Note
		Pass	Fail	N/A	
Mini PCIe bear card	3.3V,1.5, Reset Power LED	☒	☐	☐	
	Wake #	☒	☐	☐	
	Max Link Width test result GENx / x1	☒	☐	☐	GEN3/x1

3.2. Expansion Slot Compatibility Test

Test point: Make sure expansion slots are compatible with expansion cards.

M.2 PCI-e Card		Result			Note
		Pass	Fail	N/A	
Size 3042	Quectel EM06-E 4G	☒	☐	☐	If M/B support SIM slot 1. Ping 168.95.1.1 for 1000 clcyes, loss<2 times. Download 1GB file from website.
Size 3052	Quectel RM500Q-GL 5G	☒	☐	☐	
M.2 PCI-e Card		Result			Note
		Pass	Fail	N/A	
Size 2230	Intel Dual Band Wireless-AC 7265NHW	☒	☐	☐	
Size 2230	Intel 8260NGW 802.11AC+BT	☒	☐	☐	*需注意 reboot 後，device 是否 lost. (Apollo 有發生)
Size 2230	Qualcomm Atheros QCNFA364A WIFI + BT	☒	☐	☐	#9686666654
Size 2280	Kingston SHPM2280P2/240G GEN2 x4 240G	☒	☐	☐	
Size 2280	Intel 760P series 256GB GEN3 x4 256GB	☒	☐	☐	

3.3. Expansion Card Integration Test

Test Item	Result			Note
	Pass	Fail	N/A	
1. Connect devices to all of expansion slots. 2. No error during OS and driver installation 3. All of expansion cards should work normal.	☒	☐	☐	

3.4. Display port Converter Compatibility Test

Test Item			Result			Note
			Pass	Fail	N/A	
DP to HDMI converter: LPC-1504	DOS display	Full screen	☒	☐	☐	
	OS display	Full screen	☒	☐	☐	Max resolution: 1920 x 1080
DP to DVI converter: LPC-1503	DOS display	Full screen	☒	☐	☐	
	OS display	Full screen	☒	☐	☐	Max resolution: 1920 x 1080

4. Power Consumption Test

Configuration	
CPU	Intel(R) Core i5-8365U 1.80GHz
Memory	Transcend DDR4-2400 16GB
Storage	Transcend 2.5" 128GB(SSD420K)
O.S	Windows 10 Enterprise English Version 64Bit V1903

4.1. Power Consumption

Test Equipment						
Equipment	Multi-Range DC Power Supply					
Manufacturer	GW INSTEK					
Model name	PSW 80-27					
Test Environment						
DC source	GW PSW-80-27					
Other device	Logitech K/B(K200) Logitech MS(M-U0026)					
Power Supply		Current		P		Note
(Full Loading Mode) Windows with Prime 95 Full Loading Test	(+ 24V)	1.12	A	13.44	W	
Full Loading Total Watt	13.44 (W)					
S3 mode: Measure the current value when system in S3 mode of windows and without running any	(+ 24V)	0.19	A	2.28	W	
Suspend Total Watt	2.28 (W)					
Win. Idle mode: Measure the current value when system in windows mode and without running any program	(+ 24V)	0.43	A	5.16	W	CPU utilization must< 2% while idle mode
Idle Total Watt	5.16 (W)					
S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+ 24V)	0.18	A	2.16	W	
Suspend Total Watt	2.16 (W)					

4.2. PC Health Status

Test Point:

Voltage deviation: $\pm 5\%$.

Fan speed deviation: $\pm 10\%$

CPU DTS Temp deviation: $\pm 15^{\circ}\text{C}$

System Temp deviation: $\pm 5^{\circ}\text{C}$

H/W monitor	Result			BIOS		Actual		Note
	Pass	Fail	N/A					
(+) VCC3V Actual and monitor must be $\pm 5\%$	☒	☐	☐	3.408	V	3.4	V	
(+) VSB3V Actual and monitor must be $\pm 5\%$	☒	☐	☐	3.424	V	3.4	V	

UPX-ISHI5 Compatibility Test Report

(+) VIN1 Actual and monitor must be $\pm 5\%$	☒	☐	☐	0.744	V	0.74	V	
(+) VIN2 Actual and monitor must be $\pm 5\%$	☒	☐	☐	5.087	V	5.08	V	
VBAT Actual and monitor must be $\pm 5\%$	☒	☐	☐	3.152	V	3.06	V	
Fan Speed Actual and monitor must be $\pm 10\%$	☒	☐	☐	4387	rpm	4463	rpm	
CPU DTS Temp Actual and monitor must be $\pm 15^{\circ}\text{C}$	☒	☐	☐	36	$^{\circ}\text{C}$	30	$^{\circ}\text{C}$	
System Temp Actual and monitor must be $\pm 5^{\circ}\text{C}$	☒	☐	☐	28	$^{\circ}\text{C}$	26	$^{\circ}\text{C}$	

4.3. Wide Voltage Test

4.3.1. Wide Voltage Test

Test Point:

Confirm DUT can work on maximum and minimum voltage.

Test item (a. System should not hang or shutdown.) (b. System should boot up properly.)	DC Power (12V~24V)	Result			Note
		Pass	Fail	N/A	
Minimum voltage test: CPU full Loading for 3 minute. <Tool: Prime 95>	Min(+12V)	☒	☐	☐	
Maximum voltage test: G3(AC loss) cold boot over 10 cycles	Max(+24V)	☒	☐	☐	

4.3.2. DC Adapter Compatibility Test

Test Point:

Confirm each adapter can be compatible with wide voltage design.

Adapter Information (a. System boot to OS should work properly.)		AAEON P/N	Result			Note
			Pass	Fail	N/A	
12V	FSP060-DIBAN2 60W	N/A	☒	☐	☐	

4.4. CMOS Battery Test

Test Point: Calculated result should be > 5 years.

Battery: CR2032

Capacity 225mAh

Check item	Measured Voltage		Measured Current		Calculate Result		Result			Note
							Pass	Fail	N/A	
Battery leakage 1. Voltage should be >3V. 2. Calculated result should be > 5 years.	3.08	V	2.3	uA	11.16	years	☒	☐	☐	

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

5. Time Accuracy Test

5.1. System Clock & RTC Clock Test

Under Room Temperature:

Function \ Item	Time Interval	Criteria	Actual	Result			Note
				Pass	Fail	N/A	
RTC Clock in Power On Mode	24 hrs	+/-2 sec	-1.5 Sec	☒	☐	☐	
RTC Clock in Power Off Mode	24 hrs	+/-2 sec	+0.5 Sec	☒	☐	☐	

6. O.S. Compatibility Test

6.1. Windows 10 Enterprise English Version 64Bit V1903

64bit Driver Information	
Chipset Software	Intel(R) Chipset Device Software 10.1.19.1 (01/07/2019)
Graphics Media	Intel(R) UHD Graphics 620 25.20.100.6577 (2/7/2019)
Audio Driver	Intel(R) Display Audio 10.26.0.6 (1/8/2019)
	Realtek High Definition Audio 6.0.1.8186 (6/14/2017)
LAN Driver	Intel(R) I210 Gigabit Network Connection 12.15.184.1 (1/11/2019)
	Intel(R) I210 Gigabit Network Connection #2 12.15.184.1 (1/11/2019)

Note: There are 3 unknown device (2 for unknown device, 1 for USB unknown device) appear in device manager after driver installation.

Install OS to SATA SSD:

Installation	Result			Note
	Pass	Fail	N/A	
English Windows 10 Enterprise 64bit UEFI	☒	☐	☐	

Test Results:

Test Results:

Test Item	Result			Note	
	Pass	Fail	N/A		
Single Display					
HDMI -- Full Screen	☒	☐	☐		
DP -- Full Screen	☒	☐	☐		
eDP -- Full Screen	☒	☐	☐		
Multi display	☒	☐	☐		
Basic Function Test					
Usable memory	64bit: 16 GB	☒	☐	☐	
USB Mouse and Keyboard		☒	☐	☐	
COM Port Mouse detect		☒	☐	☐	
RS422/485 for COM1/2		☒	☐	☐	
USB 2.0	USB2.0	☒	☐	☐	
Removable	USB3.0	☒	☐	☐	
Devices	Safe to remove icon	☒	☐	☐	
TPM 2.0 detection.		☒	☐	☐	
LAN Function Test					
LAN1 --- Auto		☒	☐	☐	
LAN2 --- Auto		☒	☐	☐	
Audio Function Test					
Line Out Test		☒	☐	☐	
Microphone Test		☒	☐	☐	
HDMI Audio		☒	☐	☐	
DP Audio		☒	☐	☐	
Start Menu					
Log off User		☒	☐	☐	
Shut down (S5)		☒	☐	☐	
Sleep (S3)		☒	☐	☐	
Restart		☒	☐	☐	
Hibernate (S4)		☒	☐	☐	

7. BIOS Function Test

Configuration	
CPU	Intel(R) Core i5-8365U 1.80GHz
Memory	Transcend DDR4-2400 16GB
Storage	Transcend 2.5" 128GB(SSD420K)
O.S	Windows 10 Enterprise English Version 64Bit V1903

Test Point:

Confirm BIOS control items are working correctly.

7.1. Advanced Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
* CPU configuration	Information	☒	☐	☐	
	Hyper-threading	☒	☐	☐	Enable/Disable
	Turbo boost	☒	☐	☐	
* SATA configuration	SATA information	☒	☐	☐	
	Hot plug	☒	☐	☐	
USB configuration	xDCI Support	☒	☐	☐	
Super IO configuration	Serial port 1	☒	☐	☐	Enable/Disable
	RS232	☒	☐	☐	
	RS422	☒	☐	☐	
	RS485	☒	☐	☐	
	Serial port 2	☒	☐	☐	
	RS232	☒	☐	☐	
	RS422	☒	☐	☐	
Connectivity Configuration	CNVI Mode	☒	☐	☐	
	Network Stack	☒	☐	☐	Enable/Disable
Restore AC Power Loss	Power on	☒	☐	☐	
	Power Off	☒	☐	☐	
	Last State	☒	☐	☐	
Power Mode	ATX	☒	☐	☐	
	AT	Auto power on	☒	☐	
		PWB no function	☒	☐	
		Disable S3/S4	☒	☐	
		PWR LED and FAN still running when S5 shutdown.	☒	☐	
		Support UEFI and legacy mode.	☒	☐	
S5 RTC Wake up	Wake system with Dynamic time	☒	☐	☐	
	Wake system with fixed time	☒	☐	☐	
HAT40	GPIO	☐	☐	☒	
Trusted Computing	TPM SUPPORT	☒	☐	☐	
	Clear TPM	☒	☐	☐	
Smart FAN	FAN	Disable	☒	☐	4500rpm
		Manual	☒	☐	0~255 Test with level 255/127/10/0

UPX-ISHI5 Compatibility Test Report

		RPM	☒	☐	☐	
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7.2. Chipset Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
System Agent (SA) Configuration	*Memory Configuration	☒	☐	☐	
	Aperture Size	☒	☐	☐	128MB~2048MB

7.3. Boot Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Quiet Boot		☒	☐	☐	
WDT Function		☒	☐	☐	Test 5 sec
Launch PXE OpROM		☒	☐	☐	
UEFI Boot From Hard Disk		☒	☐	☐	
UEFI Boot From CDROM		☒	☐	☐	
UEFI Boot From USB HDD		☒	☐	☐	
UEFI Boot From USB CD-ROM		☒	☐	☐	
UEFI Boot from LAN		☒	☐	☐	
Disable		☒	☐	☐	

7.4. Clear CMOS and Load Default Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Clear CMOS by remove battery(under G3 status)		☒	☐	☐	Clear date, time, setting, password
Load default	Date, time, password should be kept	☒	☐	☐	
	BIOS setting should be restored to default.	☒	☐	☐	
	Boot option priorities should restore from disable to default.	☒	☐	☐	

7.5. Administrator / User Password Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Administrator Password		☒	☐	☐	Upassw0rd
User Password		☒	☐	☐	

7.6. Negative Test

7.6.1 USB Keyboard Negative Test

Methods	Result			Note
	Pass	Fail	N/A	
1. Boot into BIOS setup manual. 2. Press NumLock or ScrLk and press arrow key. 3. confirm arrow key function are normally	☒	☐	☐	

7.6.2 Suspend S3 Negative Test

Methods		Result			Note
		Pass	Fail	N/A	
1. Resume from S3. 2. Confirm com ports(RS232/422/485), smartfan, LVDS backlight control, USB ports, HDMI/DP audio can work properly.	RS232/422/485	☒	☐	☐	
	USB ports	☒	☐	☐	
	DP/HDMI audio	☒	☐	☐	

7.6.3 UEFI Mode Negative Test

Methods		Result			Note
		Pass	Fail	N/A	
1. Install Windows with UEFI mode. 2. Clear CMOS. 3. Confirm BIOS\Boot device was not loss "Windows boot manager" and should boot into Windows properly.		☒	☐	☐	

8. Performance Test

Configuration	
CPU	Intel(R) Core i5-8365U 1.80GHz
Memory	Transcend DDR4-2400 16GB
Storage	Transcend 2.5" 128GB(SSD420K)
O.S	Windows 10 Enterprise English Version 64Bit V1903

8.1. System Performance Test

Test Result: (Display set 1920*1080 test)

Testing Software	Criteria	Result		
		Pass	Fail	N/A
PCMark 8 Creative / Run Conventional	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.	☒	☐	☐
	Score	Note		
PCMarks	3343	Reference score:		
Test duration	48 min 24 s			
Web Browsing-Jungle Pin	0.30663 s			
Web Browsing-Azononia	0.13353 s			
Video To Go part 1	6.43400 s			
Video To Go part 2	9.00200 s			
Music To Go	9.59800 s			
Video Editing 4k part 1 conventional	10.89944 s			
Video Editing 4k part 2 conventional	136.21203 s			
Mainstream Gaming part 1	10.43 FPS			
Mainstream Gaming part 2	5.65 FPS			
Video Group Chat v2- Video Group Chat playback1 v2	30.01 fps			
Video Group Chat v2- Video Group Chat playback2 v2	30.01 fps			
Video Group Chat v2- Video Group Chat playback3 v2	30.01 fps			
Video Group Chat encoding v2	65.66667 ms			
Advanced Photo Editing1	0.42494 s			
Advanced Photo Editing2	32.26002 s			

<Remark: reference score is from AAEON benchmark score table.>

Testing Software	Criteria	Result		
		Pass	Fail	N/A
3DMark-v2-3-3693 \ Sky Diver	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.	☒	☐	☐
	Score	Note		
Score	4036	Reference score:		
Graphics score	3776			
Graphics test 1	17.12 FPS			
Graphics test 2	17.36 FPS			
Physics score	6595			
8 threads	85.85 FPS			
24 threads	60.18 FPS			
48 threads	38.19 FPS			

UPX-ISHI5 Compatibility Test Report

96 threads	22.21 FPS	
Combined score	3793	
Combined test	15.61 FPS	

Testing Software	Criteria	Result		
		Pass	Fail	N/A
3DMark-v2-3-3693 \ Fire Strike	1. No error or hang during test. 2. To compare with reference score and the deviation < -20%.	☒	☐	☐
	Score	Note		
Score	977	Reference score:		
Graphics score	1062			
Graphics test 1	4.81 FPS			
Graphics test 2	4.45 FPS			
Physics score	7653			
Physics test	24.30 FPS			
Combined score	337			
Combined test	1.57 FPS			

Testing Software	Criteria	Result		
		Pass	Fail	N/A
Performance Test 8.0	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.	☒	☐	☐
	Score	Note		
PassMark Rating	3101	Reference score:		
CPU Mark	7585	Reference score:		
2D Graphics Mark	668			
3D Graphics Mark	1069			
Memory Mark	2194			
Disk Mark	3348			

8.2. Performance of Storage Interface Test

SATA Performance				
SATA SSD	Transcend 512GB(SSD420K)			
CPU	Intel(R) Core i5-8365U 1.80GHz			
Memory	Transcend DDR4-2400 16GB			
OS	Windows 10 Enterprise English Version 64Bit V1903			
Item	Comment / (unit)	Software	Score	Note
SATAIII ports	Maximum Read	ATTO Disk Benchmark	558 MB/s	SATAII 150~300MB SATAIII up 300M/B
	Maximum Write	ATTO Disk Benchmark	468 MB/s	

USB3.1/2.0 Performance				
USB3.1 GEN2 SSD	CyberSLIM USB3.1 GEN2 (Kingston A1000 480G) , R/W:1032/805 MB/s			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
USB3.1 GEN2 ports x4	Maximum Read	ATTO Disk Benchmark	1058 MB/s	>850MB/s
	Maximum Write	ATTO Disk Benchmark	945 MB/s	
USB2.0 ports	Maximum Read	ATTO Disk Benchmark	44.59 MB/s	>20MB/s

UPX-ISHI5 Compatibility Test Report

	Maximum Write	ATTO Disk Benchmark	30.27 MB/s	
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M.2 Performance				
M.2 (PCIe-interface)	Intel 760p Series 256GB GEN3 x4 (R/W:3210 / 1315MB/s)			
M.2 (SATA interface)	Transcend TS256GMTS800 256GB (R/W:540/310MB/s)			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
M.2 (PCI-e interface)	Maximum Read	ATTO Disk Benchmark	1532 MB/s	GEN2/4x: 1400MB/s GEN3/4x: 3000MB/s
	Maximum Write	ATTO Disk Benchmark	1158 MB/s	
M.2 (SATA interface)	Maximum Read	ATTO Disk Benchmark	561 MB/s	SATAII 150~300MB SATAIII up 300M/B
	Maximum Write	ATTO Disk Benchmark	315 MB/s	

9. Stability test

Configuration	
CPU	Intel(R) Core i5-8365U 1.80GHz
Memory	Transcend DDR4-2400 16GB
Storage	Transcend 2.5" 128GB(SSD420K)
OS	Windows 10 Enterprise 64bit V1903
Environment	Under room temperature.

9.1. Run In Test

OS: Windows 10 Enterprise English 64bit

Test Item		Result			Note
		Pass	Fail	N/A	
Burn In Test V9(1012 above) Duty: 100 Time: over 12 hours <System should not error or hang during testing.>	CPU	☒	☐	☐	
	RAM	☒	☐	☐	
	COM	☒	☐	☐	Speed Set "Cycle to 115200."
	GPU	☒	☐	☐	
	Video	☒	☐	☐	
	2D	☒	☐	☐	
	3D	☒	☐	☐	DirectX: 9 or 12
	Disk	☒	☐	☐	
	Sound	☒	☐	☐	
	Network <Advanced>	☒	☐	☐	
	USB				
	2.0	☒	☐	☐	
	3.0	☒	☐	☐	

9.2. Reboot Test

OS: Windows 10 Enterprise English 64bit

Test Tool: Passmark rebooter.exe

Test item	Result			Note
	Pass	Fail	N/A	
Reboot test for 500 cycles <a. System should not error or hang during testing.> <b. Device manager should not loss any devices or yellow bang >	☒	☐	☐	

9.3. ACPI G3 Cold Boot Test

OS: DOS or UEFI shell

Test Point:

1. Make sure system boot up is stable.
2. Make sure boot function support AC power restored in short time.

Test item	Result			Note
	Pass	Fail	N/A	
G3(AC loss) cold boot over 1000 cycles Setting: Power on- 40sec ; Power off—20sec. <Criteria:	☒	☐	☐	☒ BIOS select " power on" or ☐ Jumper setting auto power button

UPX-ISHI5 Compatibility Test Report

a. loss rate: 0 /1000 times. b. RTC date and time should not loss.>				
G3(AC loss) cold boot over 20 cycles Setting: Power on- 40sec ; Power off- 5sec. <Criteria: a. loss rate: 0 /20 times. b. RTC date and time should not loss.>	☒	☐	☐	H/W [auto power button] need to set enable..

9.4. ACPI S5 Cold Boot Test

OS: Windows 10 Enterprise English 64bit

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

9.5. Memory Test

OS: UEFI

Tool: Passmark Memtest version 8.2 Pro

Memory information: Transcend DDR4-2400 16GB

Test item		Result			Note
		Pass	Fail	N/A	
Memory Test for 4 loops. < Memtest result should not error or hang..>	16GB	☒	☐	☐	

Remark:

9.6. System stability after S3 / S4 / S5 cycles

OS: Windows 10 Enterprise English 64bit

Test item	Criteria	Result			Note
		Pass	Fail	N/A	
System stability after S3 cycles <Perform S3 cycles 3 times>	1.SUT boots to OS successfully. 2. No yellow bang observed if all the drivers are installed 3.SUT does S3-resume cycles successfully without any issues	☒	☐	☐	
System stability after S4 cycles <Perform S4 cycles 3 times>	1.SUT boots to OS successfully. 2. No yellow bang observed if all the drivers are installed 3.SUT does S4-resume cycles successfully without any issues	☒	☐	☐	
System stability after S5 cycles <Perform S5 cycles 3 times>	1.SUT boots to OS successfully. 2. No yellow bang observed if all the drivers are installed 3.SUT does S5-resume cycles successfully without any issues	☒	☐	☐	

9.7. G3 cold boot test.

9.7.1 Max and Min voltage test

OS: DOS or UEFI shell

Condition:

1. BIOS select "power on" mode.
2. On/off fixture set power on -40sec; power off -20sec.
3. Max voltage: SPEC supported voltage input +5%, example 12V+5%=12.6V
4. Min voltage: SPEC supported voltage input -5%, example 12V-5%=11.4V
5. If width voltage input, test voltage follow SPEC, example 9~36, or 12~24±5%

Test item	Voltage	Criteria	Result			Note
			Pass	Fail	N/A	
Max voltage input / 1000 times power on/off	24	a. loss rate: 0 /1000 times.	☒	☐	☐	
Min voltage input / 1000 times power on/off	12	b. RTC date and time should not loss.	☒	☐	☐	

9.7.2 AC power restored in short time test

OS: DOS or UEFI shell

Condition:

1. H/W [auto power button] need to set enable.
2. On/off fixture set power on -40sec; power off -5sec.

Test item	Criteria	Result			Note
		Pass	Fail	N/A	
AC power restored in short time / 20 times power on/off	loss rate: 0 /20 times.	☒	☐	☐	

9.8. Heavy loading test with Max/Min voltage.

OS: Windows10 Enterprise 64bit

AP: Intel TAT or Prime95 (Use TAT as first priority)

Test item	Voltage	Criteria	Result			Note
			Pass	Fail	N/A	
Max voltage input / 8 hours heavy loading	24	System no power down, hang or BSOD	☒	☐	☐	
Min voltage input / 8 hours heavy loading	12		☒	☐	☐	

10. Front Panel Button and Mechanical Check

10.1. Mechanical Check

Test Item	Result			Note
	Pass	Fail	N/A	
System Case construction check	☒	☐	☐	
Expansion slots construction check	☒	☐	☐	
I/O symbol check	☒	☐	☐	