Report NO:18E010011

PICO-KBU4

Intel Kaby Lake SoC
Pico-ITX Board

Board / System Level Product
P5
Compatibility Test Report

Summary	☒ Pass ☐ Fail ☐ Pass with Deviation (Comment: _____)			
Test Results Category				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date	QE Manager	Test Engineer
2018-05-18	KJ Wang	Leo Liu

Version Released Records

Date	Version	Change History	Note
5/26/2015	C0	1. Add UEFI,GPS,CANBUS,POE, Cold boot test item	
3/22/2016	C1	1. Add issue status 2. Update CTOS devices. 3. Add HDMI 5M cable compatibility test. 4. Modified boot up without display test. 5. Add Touch Function test. 6. Add DC adapter compatibility test 7. Add Windows10 compatibility test. 8. Update Benchmark tool. 9. Update DOS / Windows on/off test rule. 10. Add DDR4 SO-DIMM. 11. Update Linux to Ubuntu16.04 12. Add Stability Test \ Memory test.	
10/21/2016	C2	1. Remove Smartbits test item. 2. Update chapter7.2 \ LVDS type support. 3. Add chapter9.6. System stability after S3 / S4 / S5 cycles	
01/15/2018	C3	1. Modified PWB test item. 2. Update Benchmark test tool 3. Modified wide voltage test item. 4. Add Iperf for LAN performance test. 5. Defined USB3.0 power status. 6. Update POE LAN test item. 7. Add PCIe bear card test. 8. Define booting time test criteria. 9. Add TPM test item. 10. Update CTOS compatibility devices.	

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 Pass	Result Fail	Result N/A	Note
System					
Processor	7th Gen. Intel® Kabylake-U SoC Processor i7-7600U, i5-7300U,i3-7100U, Celeron 3965U	☒	☐	☐	
System Memory	DDR4 1867/2133MHz SODIMM x 1, Max up to 16GB.	☒	☐	☐	
Chipset	Intel® Kabylake-U SoC	☒	☐	☐	
I/O Chips	Fintek F81801	☒	☐	☐	
Ethernet	2 x 10/100/1000M REALTEK RTL8111G Ethernet	☒	☐	☐	
Wake on LAN	Yes	☒	☐	☐	
BIOS	SPI AMI BIOS – 128M bit ROM	☒	☐	☐	
Watchdog Timer	Fintek F81801 255 levels	☒	☐	☐	
RTC	Intel® Kabylake-U SoC	☒	☐	☐	
H/W Status Monitor	Fintek F81808 VIN1 = Vcore / Vin2 = DDR	☒	☐	☐	
Expansion Interface	1 x M.2 E-Key (2230) 1 x BIO	☒	☐	☐	
Battery	Lithium battery	☒	☐	☐	
Power Supply Request	+12V DC, AT or ATX	☒	☐	☐	
Power Consumption	TBD	☒	☐	☐	
Display	Support HDMI/TFT LCD / DDI (on BOI board)				
Chipset Memory	Intel® Kabylake-U Soc Processors integrated graphic	☒	☐	☐	
Resolution	LVDS (18/24bit) up to 1920 x1200@ 60Hz [select by BIOS or jumper] HDMI up to 4096 x 2304 (4K); Or DDI (by BIO Board optional)	☒	☐	☐	
LCD Brightness	1. PWM mode is default setting, but it can be configured into voltage mode with jumper selection. 2. The resolution of the brightness level is 10 levels, and the default setting is 80% of full scale.	☒	☐	☐	
Combination	Support dual display: LVDS + HDMI	☒	☐	☐	
I/O					
Storage	1 x SATA III	☒	☐	☐	
Solid Storage Disk interface	1 x M.2 B-Key (2242)	☒	☐	☐	
Serial Port	2 x COM ports: internal pin headers (F81801 chipset) for 2 COM ports COM 1: RS-232 COM 2:	☒	☐	☐	

		Pass	Fail	N/A	
	RS-232/RS-422/RS-485 (Ring/+5V /+12V and modify by BOM Change) RS-232 x 1, RS-232/422/485 (auto flow) x1				
USB	2 x USB 3.0/2.0 Ports(by Real IO), 2 x USB 2.0 Ports(by pin header), 1 x USB 3.0/2.0 on BIO connector(optional) USB 3.0/2.0 x 2, USB 2.0 x2, BIO reserve USB 3.0/2.0 x1	☒	☐	☐	
Digital I/O	2 IN/ 2 OUT (Default) 4 ch Digital I/O (Programmable)	☒	☐	☐	
Audio	HD Audio Codec (RealteK ALC269Q) Audio Function (1x Line out)	☒	☐	☐	
BIO	The BIO use the 80-pins connector(optional) : 1. USB 3.0 (w/USB 2.0) x1 2. PCIe x2 3. Line –out x1 4. SMBus x1 5. PowerGood/GPIO x1 6. LPC x1 (Reserve only) 7. DDI x1 => HDMI(by test board)	☒	☐	☐	

O.S. Support

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

Platform Information

Item	Device Information	Note
Product of department	ECD	
PCB Model / Version	PICO-KBU4 A0.3	
BIOS / Version	PICO-KBU4 R1.1 (ZKBUAM11) (03/19/2018)	
Driver folder	20170606	
CPU Type	Intel Core i7-7600U 2.80GHz	
Memory Type	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)	
SATA HDD	HGST 1TB(HTS541010A9E680)	
SATA DVD-ROM	Pioneer 18X(DVR-212BK)	
USB DVD-ROM	Lite-on 8X(eNAU808)	
LCD Monitor	CHIMEI 22"(22SH-L)	
LVDS	AUO M215HW03 V1 / 21"/ 1920*1080 / 48bit	
Operating System	☒ English Ubuntu 16.04 Kernel 4.4.0-21-generic x86_64	
	☒ Windows 10 Enterprise English Version 64Bit	
Power Supply	ATX Power Supply : Sseasonic 430W(SS-430GB)	
Chipset Information		
PCH Bridge	Intel® Kabylake-U SoC	
Super IO Chipset	Fintek F81801	
Audio Chipset	Realtek ALC269Q	
Ethernet Chipset	Realtek RTL8111G	

Summary Table of contents:

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™ i7-7600U Processor 4M Cache, up to 3.90 GHz / 15W	☒	☐	☐	
Intel® Core™ i5-7300U Processor 3M Cache, up to 3.50 GHz / 15W	☒	☐	☐	
Intel® Core™ i3-7100U Processor 3M Cache, up to 2.40 GHz / 15W	☒	☐	☐	
Intel® Celeron® 3965U Processor 2M Cache, up to 2.20 GHz / 15W	☒	☐	☐	

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)	N/A	☒	☐	☐	
Transcend DDR4-2400 8GB(SEC 616 K4A4G085WE BCRC)	N/A	☒	☐	☐	
Transcend DDR4-2400 4GB(SEC 616 K4A4G085WE BCRC)	N/A	☒	☐	☐	
Transcend DDR4 2133 8GB TS9AASESD00AA SEC K4A4G085WD	N/A	☒	☐	☐	
Transcend DDR4 2133 4GB TS8AASESD00AA SEC K4A4G085WD	N/A	☒	☐	☐	
DSL DDR4-2133 8GB (SEC K4A4G085WD / E)	N/A	☒	☐	☐	
DSL DDR4-2133 4GB (SEC K4A4G085WD)	N/A	☒	☐	☐	
Micro MTA16ATF2G64HZ-2G1A1 DDR4 2133 16GB Micro 6BA77 D9SRJ	N/A	☒	☐	☐	
Innodisk DDR4 2133 16GB SEC K4A8G085WB	N/A	☒	☐	☐	
InnoDisk DDR4-2133 8GB(SEC 446 BCPB K4A4G085WD)	N/A	☒	☐	☐	
InnoDisk DDR4-2133 4GB(SEC 446 BCPB K4A4G085WD)	N/A	☒	☐	☐	

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	
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 2.5" Seagate(ST500LT012)	N/A	☒	☐	☐	
SATAIII	TOSHIBA 3.5" SATAIII HDS721010DLE630 1TB 7200rpm	N/A	☒	☐	☐	
SATAIII	WD 3.5" SATAIII WD20EZRX 2TB 7200rpm	N/A	☒	☐	☐	
SATAIII	Seagate 3.5" SATAIII ST3000DM001 3TB 7200rpm	N/A	☒	☐	☐	
DVD	LG 20X(GH20NS15)	N/A	☒	☐	☐	
SSD	Transcend ,TS512GSSD420K-AA 512GB MLC	968C512G06	☒	☐	☐	
SSD	Phison SSBP064GTB3C0-S11 64GB ,3D TLC	N/A	☒	☐	☐	
SSD	Intel SSD 540s Series 120GB	AP-SS968C120 G08	☒	☐	☐	
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	☒	☐	☐	

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 22"(22SH-L)	☒	☐	☐	

2. Basic Function Test

2.1. Video Function Test

2.1.1. Single Output Function Test

Configuration	
CPU	Intel Core i7-7600U 2.80GHz
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)
SATA HDD	HGST 1TB(HTS541010A9E680)
HDMI	SAMSUNG 28"(U28D590D)
LVDS	AUO M215HW03 V1 / 21"/ 1920*1080 / 48bit
Operating system	Windows 10 Enterprise English Version 64Bit
Color Quality	⊠16bit ☐24bit ⊠32bit

Resolution	HDMI			LVDS									Note
	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	
800X600	⊠	☐	☐	⊠	☐	☐	☐	☐	☐	☐	☐	☐	
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)	⊠	☐	☐	⊠	☐	☐	☐	☐	☐	☐	☐	☐	
DOS 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 + LVDS	⊠	☐	☐	
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	☒	☐	☐	

2.1.4. LCD Panel Test
ECD standard connector

LVDS Panel Model (LVDS display should full screen and no flicker)			Result			Note
			Pass	**Fail**	**N/A**	
18bit	800x600	AUO G084SN05 V.8	☒	☐	☐	
	1024x768	AUO LED backlight G121XN01-V0 1024*768 18bit	☒	☐	☐	
	1280x800	HannStar HSD101PWW1 R0-A	☒	☐	☐	
24bit	1366x768	AUO G185XW01 V0 / 18" / 1366x768 / 24bit	☒	☐	☐	
48bit	1920x1080	AUO M215HW03 V1 / 21"/ 1920*1080 / 48bit	☒	☐	☐	

2.2. Audio Function Test
〔　〕No Support

Function Test	Result			Note
	Pass	**Fail**	**N/A**	
L (Left) Channel	☒	☐	☐	
R (Right) Channel	☒	☐	☐	
HDMI 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-1008D					
100Mbps LAN HUB		Accton Desktop-3005					
10Mbps LAN HUB		SVEC FD916H					
OnBoard LAN1	Realtek PCIe GBE			MAC Address		00-07-32-4C-E0-68	
OnBoard LAN2	Realtek PCIe GBE			MAC Address		00-07-32-4C-E0-69	

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			☒	☐	☐	☒	☐	☐	
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 (Ubuntu) $sudo iperf3 –c xx.xx.xx.xx –w 100M –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 COM2	☒	☐	☐	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 COM2	☒	☐	☐	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. Digital I/O Test

Test item	Result			Note
	Pass	**Fail**	**N/A**	
DIO VCC +5V	☒	☐	☐	

2.7. USB Port Integration Test

Item	USB Port	USB2.0 ports (under OS)			USB3.0 ports (under OS)			Note
		Pass	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
USB HDD:	Transcend TS500GSJ25D3 500GB	☒	☐	☐	☒	☐	☐	
USB2.0 Flash:	ADATA PD4 512MB	☒	☐	☐	☒	☐	☐	

		Pass	Fail	N/A	Pass	Fail	N/A	
USB3.0 Flash	Transcend JetFlash 790 64GB	☒	☐	☐	☒	☐	☐	
	Transcend JetFlash 810 32GB	☒	☐	☐	☒	☐	☐	
USB DVD ROM:	Lite-on eNAU808	☒	☐	☐	☒	☐	☐	
USB keyboard:	Logitech K200	☒	☐	☐	☒	☐	☐	
USB mouse:	Logitech M-U0026	☒	☐	☐	☒	☐	☐	
USB FDD:	HP FD-05PUB	☒	☐	☐	☒	☐	☐	
USB2.0 HUB:	Transcend USB 3.0 4 Port HUB	☒	☐	☐	☒	☐	☐	

Test item	Result			Note
	Pass	Fail	N/A	
USB3.0 ports with power in S3 mode	☒	☐	☐	
USB3.0 ports with power in S5 mode	☒	☐	☐	

2.8. Jumper and Connector Function Test

〔 〕 No Support

Test item		Result			Note
		Pass	Fail	N/A	
LVDS voltage jumper support 3.3V / 5V selection.		☒	☐	☐	
Inverter voltage jumper support 5V / 12V selection.		☒	☐	☐	
Brightness control jumper	PWM mode support 0~100% modulation.	☒	☐	☐	
	DC mode support 0~100% modulation	☒	☐	☐	
Clear CMOS will clear CMOS date , time , setting , password.		☒	☐	☐	
Buzzer and 4 pin Speaker test	System boot: one short beep.	☒	☐	☐	
	No memory found: Six short beep, three short beep, pause a period of time, and loop.	☒	☐	☐	
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.)	☒	☐	☐	
Reset button, system reset under Windows environment.		☒	☐	☐	
Power LED behavior	S1(boot up): Power LED on	☒	☐	☐	
	S3: Power LED off	☒	☐	☐	
	S4: Power LED off	☒	☐	☐	
	S5: Power LED off	☒	☐	☐	
HDD LED, active when	SATA: Active	☒	☐	☐	

SATA/M.2 access	M.2(SATA): Active	☒	☐	☐
CPU FAN	full speed can meet FAN specification	☒	☐	☐
line out work properly.		☒	☐	☐
JP3 LVDS Backlight Lightness Control Mode Selection		☒	☐	☐
JP4 LVDS Operating Voltage Selection LVDS Backlight Inverter Voltage Selection		☒	☐	☐
JP5 Clear CMOS Jumper Auto Power Button Enable/Disable Selection		☒	☐	☐
CN1 RTC Battery Connector		☒	☐	☐
CN2 HDMI		☒	☐	☐
CN4 LVDS Inverter / Backlight Connector		☒	☐	☐
CN5 LVDS Port		☒	☐	☐
CN6 LAN (RJ-45) Port1		☒	☐	☐
CN7 LAN (RJ-45) Port2		☒	☐	☐
CN9 Digital IO Port		☒	☐	☐
CN10 USB 2.0 Port 1/2		☒	☐	☐
CN11 USB 2.0/3.0 Port 3 Port 0/1		☒	☐	☐
CN14 External +12V Input		☒	☐	☐
CN15 Front Panel		☒	☐	☐
CN16 COM Port1/ COM Port2		☒	☐	☐
CN17 BIO Bank1 Connector		☒	☐	☐
CN19 LPC Port		☒	☐	☐
CN20 SATA Port		☒	☐	☐
CN21 +5V Output for SATA HDD		☒	☐	☐
CN26 M.2 (Key B) Connector		☒	☐	☐
CN27 FAN Connector		☒	☐	☐
CN30 M.2 (Key E) Connector		☒	☐	☐
DIMM1 DDR4 SO-DIMM Slot		☒	☐	☐

3. Expansion card and Application Test

3.1. 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 2230	Intel Dual Band Wireless-AC 7265NHW	☒	☐	☐	
Size 2230	Intel 8260NGW 802.11AC+BT	☒	☐	☐	
Size 2230	Qualcomm Atheros QCNFA364A WIFI + BT #9686666654	☒	☐	☐	

3.2. 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.	☒	☐	☐	

4. Power Consumption Test

Configuration	
CPU	Intel Core i7-7600U 2.80GHz
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)
Storage	HGST 1TB(HTS541010A9E680)
O.S	Windows 10 Enterprise English Version 64Bit

4.1. Power Consumption

Test Equipment	
Equipment	DC Power Supply
Manufacturer	Chroma
Model name	62012P-600-8
Test Environment	
ATX Power supply	Sseasonic 430W(SS-430GB)

Power Supply		Current		P		Note
(Full Loading Mode) Windows with Prime 95 Full Loading Test	(+12 V)	1.53	A	-	W	Prime95 Version 293
Full Loading Total Watt		18.36(W)				
S3 mode: Measure the current value when system in S3 mode of windows and without running any	(+12 V)	0.04	A	-	W	
Suspend Total Watt		0.48(W)				
Win. Idle mode: Measure the current value when system in windows mode and without running any program	(+12 V)	0.63	A	-	W	CPU utilization must< 2% while idle mode
Idle Total Watt		7.56(W)				
S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+12 V)	0.01	A	-	W	Erp disable
Suspend Total Watt		0.12(W)				

4.2. PC Health Status

Test Point:

Voltage deviation: ±5%.

Fan speed deviation: ±10%

CPU DTS Temp deviation: ±15℃

System Temp deviation: ±5℃

H/W monitor	Result			BIOS		Actual		Note
	Pass	Fail	N/A					
(+) 3.3V Actual and monitor must be ±5%	☒	☐	☐	3.360	V	3.37	V	
VCORE Actual and monitor must be ±5%	☒	☐	☐	0.816	V	0.82	V	
VMEM Actual and monitor must be ±5%	☒	☐	☐	1.184	V	1.18	V	

VBAT Actual and monitor must be ±5%	☒	☐	☐	3.184	V	3.38	V	
CPU Fan Speed Actual and monitor must be ±10%	☒	☐	☐	1261	rpm	1267	rpm	
CPU DTS Temp Actual and monitor must be ±15℃	☒	☐	☐	47	℃	37.5	℃	
System Temp Actual and monitor must be ±5℃	☒	☐	☐	33	℃	32	℃	

4.3. Wide Voltage Test

4.3.1. 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	FSP084-DIBAN2 84W	1255900841	☒	☐	☐	
12V	FSP084-DMAA1 84W	1757908403	☒	☐	☐	

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.	2.88	V	2.1	uA	12.2	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 Pass	Fail	N/A	Note
RTC Clock in Power On Mode	24 hrs	+/-2 sec	-2	Sec	☒	☐	☐	
RTC Clock in Power Off Mode	24 hrs	+/-2 sec	-1	Sec	☒	☐	☐	

5.2. Booting Time Test

Installation	Criteria	Actual		Note
System Booting Time < Press the Power Button till "Beep" Sound or display appears >	Booting time ≦12sec, Pass Booting time 13~20 sec, Enhancement Booting time > 20sec, Fail	6.35	Sec	

.

5.3. Watchdog Timer Test

Use Function as below: Hi-Safe20171201

〔　〕No Support.

Time-Out Interval	Criteria	Actual		Result Pass	Fail	N/A	Note
10 sec	+/- 10%	9	Sec	☒	☐	☐	
60 sec	+/- 10%	58	Sec	☒	☐	☐	
255 sec	+/- 10%	236	Sec	☒	☐	☐	

6. O.S. Compatibility Test

6.1. English Ubuntu 16.04.2 Kernel 4.8.0-36-generic x86_64

Driver Information:

Chipset Software	System default
Graphics Media	System default
Audio Driver	System default
LAN Driver	8.045

Install OS to SATA HDD:

Installation	Result			Note
	Pass	**Fail**	**N/A**	
English Ubuntu 16.04.2 Kernel 4.8.0-36-generic x86_64	☒	☐	☐	Type uname –a

Test Result:

Test Item	Result			Note
	Pass	**Fail**	**N/A**	
Display Function Test				
HDMI – Full Screen	☒	☐	☐	
LVDS -- Full Screen	☒	☐	☐	
HDMI + LVDS	☒	☐	☐	
Network Function Test				
Connect to Internet – LAN 1	☒	☐	☐	
Connect to Internet – LAN 2	☒	☐	☐	
Audio Function Test				
Play Audio Function Test	☒	☐	☐	Play Audio Test
HDMI audio function Test	☒	☐	☐	
Base Function Test				
Mouse Test	☒	☐	☐	
Keyboard Test	☒	☐	☐	
Console Redirection	☒	☐	☐	
DVD-ROM Test	☒	☐	☐	<IDE / SATA / USB >
USB 2.0/3.0 Removable Devices	☒	☐	☐	
X Windows Application				
Start Button Office	☒	☐	☐	Office function
X-Window	☒	☐	☐	Startx – Desktop in Linux
Command Test On Text Mode: Attention Delay Phenomenon				
uname –a	☒	☐	☐	Show information
Shutdown	☒	☐	☐	Init 0 or shutdown –h now
Restart the Computer	☒	☐	☐	Init 6 or shutdown –r now
Suspend	☒	☐	☐	Suspend icon
ls / clear ……; cd /dev /ls –l	☒	☐	☐	Command instruction

6.2. Windows 10 Enterprise English Version 64Bit

64bit Driver Information	
Chipset Software	Intel(R) Chipset Device Software 10.1.1 2015-06-03
Graphics Media	Intel(R) HD Graphics 620 21.20.16.4565 12/10/2016
Audio Driver	Intel(R) Display Audio 10.22.1.97 12/1/2016 Realtek High Definition Audio 6.0.1.7541 6/18/2015
LAN Driver	Realtek PCIe GBE Family Controller 10.23.1003.2017 10/3/2017 Realtek PCIe GBE Family Controller #2 10.23.1003.2017 10/3/2017

Install OS to SATA HDD:

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

Test Results:

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

7. BIOS Function Test

Configuration	
CPU	Intel Core i7-7600U 2.80GHz
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)
Storage	HGST 1TB(HTS541010A9E680)
O.S	Windows 10 Enterprise English Version 64Bit

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	
Dynamic Digital IO	DIO0~3		☒	☐	☐	
S5 RTC Wake up	Wake system with fixed time		☒	☐	☐	
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.	☒	☐	☐	
*CPU configuration	Information		☒	☐	☐	
	Hyper-threading		☒	☐	☐	Enabled/Disabled
	Virtualization Technology		☒	☐	☐	Enabled/Disabled
	Turbo boost		☒	☐	☐	
*SATA configuration	SATA information		☒	☐	☐	
	SATA controller		☒	☐	☐	Enabled/Disabled
	Hot plug		☒	☐	☐	
USB configuration	Legacy USB Support		☒	☐	☐	
Super IO configuration	Serial port 1		☒	☐	☐	Enabled/Disabled
	Serial port 2		☒	☐	☐	
	RS232		☒	☐	☐	
	RS422		☒	☐	☐	
	RS485		☒	☐	☐	

7.2. Chipset Test

Test Item (Following item should work properly)			Result			Note
			Pass	Fail	N/A	
North Bridge	Boot display	VBIOS	☒	☐	☐	
		LVDS	☒	☐	☐	
	LVDS	Enabled/Disabled	☒	☐	☐	
	LVDS Panel type	640x480	☒	☐	☐	
		800x480	☒	☐	☐	
		800x600	☒	☐	☐	

			Pass	Fail	N/A	
		1024x600	☒	☐	☐	
		1024x768	☒	☐	☐	
		1280x768	☒	☐	☐	
		1280x800	☒	☐	☐	
		1280x1024	☒	☐	☐	
		1366x768	☒	☐	☐	
		1440x900	☒	☐	☐	
		1600x1200	☒	☐	☐	
		1920x1080	☒	☐	☐	
		1920x1200	☒	☐	☐	
	Brightness	0~100%	☒	☐	☐	
	LVDS	Normal / inverted	☒	☐	☐	
	*Memory Configuration		☒	☐	☐	
	Max TOLUD		☒	☐	☐	Dynamic 1G~3.25G
South Bridge	HDMI Audio		☒	☐	☐	
	Resume on Ring		☒	☐	☐	Enabled /Disabled
	Resume from PCIe		☒	☐	☐	Enabled /Disabled

7.3. Boot Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Quiet Boot	☒	☐	☐	
Launch PXE OpROM	☒	☐	☐	
Boot From Hard Disk	☒	☐	☐	
Boot From CD-ROM	☒	☐	☐	
Boot From USB HDD	☒	☐	☐	
Boot From USB Floppy	☒	☐	☐	
Boot From USB CD-ROM	☒	☐	☐	
Boot from LAN	☒	☐	☐	
Disabled	☒	☐	☐	

7.4. Clear CMOS and Load Default Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Clear CMOS by jumper (under G3 status)		☒	☐	☐	Clear date, time, setting, password
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. AAEON Tag Check Utility

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Check AAEON BIOS OK	☒	☐	☐	AONCHECK.EXE

7.6. Supervisor / User Password Test

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

7.7. Hi-safe Test

Test Item (Following item should work properly)		Result			Note
		Pass	**Fail**	**N/A**	
Version(20171220)		☒	☐	☐	
System Information	CPU Information	☒	☐	☐	
	Model Name	☒	☐	☐	
	Display Information	☒	☐	☐	
	RAM Information	☒	☐	☐	Support single DIMM
H/W Monitor	Info	☒	☐	☐	
	Fan Speed	☒	☐	☐	
	Temperature	☒	☐	☐	
	Voltage	☒	☐	☐	
DIO	DIO1~4 High	☒	☐	☐	
	DIO1~4 Low	☒	☐	☐	
	DIO5~8 High	☒	☐	☐	
	DIO5~8 Low	☒	☐	☐	
WatchDog	10 sec	☒	☐	☐	Actual 9 sec
	1 min	☒	☐	☐	Actual 58 sec
	255 sec	☒	☐	☐	Actual 236 sec
	Auto Reload	☒	☐	☐	
SMBus	SMBus IO	☒	☐	☐	SMBus Address 0xA0
	Read Byte	☒	☐	☐	Slave Address A0h,A2h,A4h
	Read Word	☒	☐	☐	
	Result / Read	☒	☐	☐	
Smart FAN	Temperature	☒	☐	☐	

7.8. Negative Test

7.8.1 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	☒	☐	☐	

7.8.2 Suspend S3 Negative Test

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

7.8.3 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 Core i7-7600U 2.80GHz
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)
Storage	Intel SSD 540s Series 120GB
O.S	Windows 10 Enterprise English Version 64Bit

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	2767	Reference score:		
Test duration	53 min 13 s			
Web Browsing-Jungle Pin	0.30685 s			
Web Browsing-Amazonia	0.13346 s			
Video To Go part 1	6.96700 s			
Video To Go part 2	8.89167 s			
Music To Go	25.56367 s			
Video Editing 4k part 1 conventional	15.84671 s			
Video Editing 4k part 2 conventional	146.82719 s			
Mainstream Gaming part 1	8.29 FPS			
Mainstream Gaming part 2	4.36 FPS			
Video Group Chat v2- Video Group Chat playback1 v2	29.99 fps			
Video Group Chat v2- Video Group Chat playback2 v2	30.01 fps			
Video Group Chat v2- Video Group Chat playback3 v2	29.99 fps			
Video Group Chat encoding v2	106.66667 ms			
Advanced Photo Editing1	0.58633 s			
Advanced Photo Editing2	36.74101 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	3285	Reference score:		
Graphics score	3188			
Graphics test 1	14.52 FPS			
Graphics test 2	14.60 FPS			
Physics score	4189			
8 threads	68.49 FPS			
24 threads	42.29 FPS			
48 threads	24.50 FPS			

96 threads	0.00 FPS	
Combined score	3000	
Combined test	12.35 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	747	Reference score:		
Graphics score	815			
Graphics test 1	3.90 FPS			
Graphics test 2	3.25 FPS			
Physics score	4616			
Physics test	14.66 FPS			
Combined score	260			
Combined test	1.21 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	2670	Reference score:		
CPU Mark	5064	Reference score:		
2D Graphics Mark	698			
3D Graphics Mark	870			
Memory Mark	1958			
Disk Mark	3359			

8.2. Performance of Storage Interface Test

SATA Performance				
SATA SSD	Intel SSD 540s Series 120GB			
CPU	Intel Core i7-7600U 2.80GHz			
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)			
OS	Windows 10 Enterprise English Version 64Bit			
Item	Comment / (unit)	Software	Score	Note
SATAIII ports	Maximum Read	ATTO Disk Benchmark	563MB/s	SATAII 150~300MB SATAIII up 300M/B
	Maximum Write	ATTO Disk Benchmark	424MB/s	

USB3.0/2.0 Performance				
USB Flash	Transcend JetFlash 790 USB3.0 64GB			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
USB3.0 ports	Maximum Read	ATTO Disk Benchmark	97MB/s	CN2A
	Maximum Write	ATTO Disk Benchmark	90MB/s	
USB3.0 ports	Maximum Read	ATTO Disk Benchmark	90MB/s	CN2B

	Maximum Write	ATTO Disk Benchmark	89MB/s	
USB2.0 ports	Maximum Read	ATTO Disk Benchmark	39MB/s	CN10A
	Maximum Write	ATTO Disk Benchmark	28MB/s	
USB2.0 ports	Maximum Read	ATTO Disk Benchmark	39MB/s	CN10B
	Maximum Write	ATTO Disk Benchmark	37MB/s	

M.2 Performance				
M.2	Innodisk 3ME3 M.2 2242 SSD, 64GB			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
M.2 (SATA interface)	Maximum Read	ATTO Disk Benchmark	229MB/s	
	Maximum Write	ATTO Disk Benchmark	80MB/s	

9. Stability test

Configuration	
CPU	Intel Core i7-7600U 2.80GHz
Memory	Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)
Storage	HGST 1TB(HTS541010A9E680)
OS	Windows10 Enterprise 64bit
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 V8.1(1025 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	☒	☐	☐	
	Disk	☒	☐	☐	
	Sound	☒	☐	☐	
	Network <Advanced>	☒	☐	☐	
	USB 2.0	☒	☐	☐	
	USB 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

	Pass	Fail	N/A	
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 version7.4 UEFI
Memory information: Transcend DDR4 2400 16GB x 2 (SPEC max support size).

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

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	☒	☐	☐	

10. Front Panel Button and Mechanical Check

10.1. Front Panel Button Function Test

Test Item	Result			Note
	Pass	**Fail**	**N/A**	
M.2 slot construction check	☒	☐	☐	
Expansion slots construction check	☒	☐	☐	
I/O symbol check	☒	☐	☐	