

Report NO: 17D010009

UP-APL01

Apollo Lake

Board / System Level Product P5 Compatibility Test Report

Summary	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Pass with Deviation (Comment: <u>There is limitation for Power Button 4sec force shutdown, the behavior from shutdown became to reset.</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

2017-07-31

KJ Wang

Louie Lee

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	

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	
CPU	Intel® Apollo Lake SoC N4200/N3350	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Memory	Onboard Single/Dual Channel LPDDR4 memory, Max 4GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Graphics	Intel® Graphics , GEN 9, DX*12.0, Open GL*4.3, Open CL*2.0 Full Profile, 1xHDMI, 1xDP,1xeDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Storage	1xeMMC ver 5.1 (32GB), 2xSATA3 (6Gb/s) (1xSATA connector, 1 mSATA)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ethernet	2x Realtek 8111G	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Audio	HDMI Audio x2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MIPI-CSI	CSI 1x4Channel(8M) 1x 2 channel(2M)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB	3x USB3.0, 1x USB 3/2 OTG, 2x USB2.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Expansion Slot	1x minicard (Full Size) (Autoswitch with mSATA), 1x M.2 (2230 E Key)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Expansion HAT (40pin)	28xGPIO, 2xSPI, 2x I2C, 1x ADC, 1x I2S, 2x PWM, 1x UART, 3V3, 5V, GND	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test with 28xGPIO function
Expansion HAT (60pin)	1x SD, 20 expansion pin from FPGA, HSUARTx1 , 2x I2C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Internal I/O Connectors	1x eDP with Backlight control Header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x CSI 2 Lane Header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x CSI 4 Lane Header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x 10 pin USB2.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x SATA Connector with power connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x 2 pin Fan connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x Power Button header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x Reset Pin header	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x M.2 2230/ E Key	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x Mini Card(Full-size) (autoswitch with mSATA)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x 40 pin HAT connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1x 60 pin EXT-HAT connector	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
External I/O Connectors	1x RJ45 STACK Connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1 x HDMI STACK Connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1 x USB 3.0 STACK Connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1 x USB 3.0 single Connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1 x USB 3.0 OTG	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x Power Button	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1x DC connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Power	5V DC Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows10 English 64bit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Linux	Kernel 2.6 above	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Android	Android 6.x	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Platform Information

Item	Device Information	Note
Product of department	DMS	
PCB Model / Version	UP-APL01 A1.0	
CPU Board	UP-APL01 A1.0	
Carrier Board	N/A	
BIOS / Version	UP-APL01 R1.9 (UPA1AM19)(07/05/2017)	
Driver folder	UP-APL01\20170322	
CPU Type	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)	
Memory Type	Onboard LPDDR4 memory 8GB	
SATA HDD	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.	
eMMC	Onboard Sandisk DF4128 128GB	
USB DVD-ROM	ASUS SBW-06D2X-U	
HDMI Monitor	Dell U2713HM	
eDP panel	eDP panel 1280x800	
mSATA	Innodisk 3ME3 128GB	
M.2 2230 Expansion Board	Intel 8260NGW 802.11AC+BT	
Mini PCI-e	AzureWave AW-CB161H 802.11a/b/g/n/ac(PCI-e Wireless+ USB Bluetooth) Realtek RTL8821AE	
Operating System	<input checked="" type="checkbox"/> English Ubuntu16.10 Kernel 4.8.0-22-generic x86_64	
	<input type="checkbox"/> Windows 7 Ultimate SP1 32/64Bit	
	<input type="checkbox"/> Windows 8.1 Enterprise English Version 32/64Bit	
	<input checked="" type="checkbox"/> Windows 10 Enterprise English Version 64Bit	
Power Supply	ATX Power Supply : N/A	
	AT Power Supply: N/A	
	DC Adapter : MeanWell GST60A05-P1J 5V/6A Powertron PA1024-050IB400 5V/4A	
Battery Model	N/A	
Chipset Information		
SOC	Intel Apollo Lake	
Super IO Chipset	N/A	
Audio Chipset	N/A	
Ethernet Chipset	Realtek RTL8111G Gigabit Ethernet	

Summary Table of contents:

- 1. Hardware Compatibility 7
 - 1.1. CPU Compatibility Test7
 - 1.2. Memory Compatibility Test.....7
 - 1.3. SATA Compatibility Test7
 - 1.4. Flash Card Compatibility Test8
 - 1.5. Monitor Compatibility Test8
- 2. Basic Function Test..... 9
 - 2.1. Video Function Test9
 - 2.2. Audio Function Test10
 - 2.3. LAN Function Test10
 - 2.4. Expansion HAT (40pin).....11
 - 2.5. Expansion HAT (60pin).....11
 - 2.6. CSI 2 Lane Header11
 - 2.7. CSI 4 Lane Header11
 - 2.8. FAN / GPIO control11
 - 2.9. USB Port Integration Test.....11
 - 2.10. Jumper and Connector Function Test.....12
- 3. Expansion card and Application Test 13
 - 3.1. Expansion Slot Compatibility Test13
 - 3.2. Expansion Card Integration Test13
- 4. Power Consumption Test 14
 - 4.1. Power Consumption.....14
 - 4.2. PC Health Status14
 - 4.3. CMOS Battery Test15
- 5. Time Accuracy Test..... 16
 - 5.1. System Clock & RTC Clock Test.....16
 - 5.2. Booting Timer Test16
 - 5.3. Watchdog Timer Test16
- 6. O.S. Compatibility Test 17
 - 6.1. English Ubuntu16.10 Kernel 4.8.0-22-generic x86_6417
 - 6.2. Windows 10 Enterprise English Version 64Bit.....18
- 7. BIOS Function Test 19
 - 7.1. Advanced Test19
 - 7.2. Chipset Test.....19
 - 7.3. Boot Test20
 - 7.4. CMOS Backup / Clear CMOS Test20
 - 7.5. AAEON Tag Check Utility.....20
 - 7.6. Supervisor / User Password Test20
 - 7.7. Hi-safe Test.....20
 - 7.8. Negative Test.....21
- 8. Performance Test 22
 - 8.1. System Performance Test.....22
 - 8.2. Storage Performance Test23
- 9. Stability test..... 24
 - 9.1. Run In Test.....24
 - 9.2. Reboot Test24
 - 9.3. ACPI G3 Cold Boot Test24
 - 9.4. ACPI S5 Cold Boot Test.....25
 - 9.5. Memory Test.....25
 - 9.6. System stability after S3 / S4 / S5 cycles.....25

1. Hardware Compatibility

1.1. CPU Compatibility Test

CPU Information (Information and frequency should show correct value)	Result			Note
	Pass	Fail	N/A	
Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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

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	
Onboard LPDDR4 memory 2GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	*
Onboard LPDDR4 memory 4GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Onboard LPDDR4 memory 8GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1.3. SATA Compatibility Test

1.3.1 Onboard SATA(IDE / AHCI) Test

SATA Device Information (Information and size should show correct value with IDE and AHCI mode)		AAEON P/N	Result			Note
			Pass	Fail	N/A	
Main Board project test with 80~100cm SATA cable , typical #1709070800						
SATAII	Seagate ST9160412AS 160GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SATAII	Toshiba MK1676GSX 160GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SATAIII	WD WD5000LPVT 500GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SATAIII	HGST HTS725050A7E630 500GB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SATAIII	WD Slim WD10SPCX 1TB	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SATAIII	HGST HTS541010A9E680 1TB	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"/>	
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-26	AP-SS968C016 G3K	<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.DGS25-32GD81B C3DC-26	AP-SS968C032 G1P	<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.DGS25-64GD81B C3QC-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-A28 D81BC3QC-26	AP-SS968C128 G1P	<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-B56D81BC 3QC-26	AP-SS968C256 G16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1.4. Flash Card Compatibility Test

m-SATA 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	
Full Size					
Transcend.TS16GMSA370 Full-size mSATA.16GB.MLC.	AP-SS968C016 G2Z	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend.TS32GMSA370 Full-size mSATA.32GB.MLC.	968C032G32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend.TS64GMSA370 (TF)Full-size.64GB.mSATA.MLC	968C064G2K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk full size mSATA.8GB 3ME3	CTOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk full size mSATA.16GB 3ME3	CTOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk full size mSATA.32GB 3ME3	CTOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk full size mSATA.64GB 3ME3	CTOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk full size mSATA.128GB 3ME3	CTOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	*Must test monitor (Tested 3 monitors at least)
Dell U2713HM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PHILIPS 288P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DP				
*Samsung LU28D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	*Must test monitor (Tested 3 monitors at least)
Dell U2713HM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PHILIPS 288P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2. Basic Function Test

2.1. Video Function Test

2.1.1. Single Output Function Test

Configuration													
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)												
Memory	Onboard LPDDR4 memory 8GB												
SATA HDD	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.												
eDP	eDP panel 1280x800												
HDMI	Samsung LU28D 3840x2160												
DP	Philips 288P 3840x2160 30Hz												
Operating system	Windows10 Enterprise 64bit (V1607)												
Color Quality	<input checked="" type="checkbox"/> 16bit <input type="checkbox"/> 24bit <input checked="" type="checkbox"/> 32bit												
Resolution	eDP			HDMI			DP			N/A			Note
	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	Pass	Fail	N/A	
800X600	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1024X768	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1280X600	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1280X720	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1280X768	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1280X800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1280X1024	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1360X768	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1366X768	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1600X900	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1600X1200	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1680X1050	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1920X1080	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1920X1200	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2048X1152	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2160x1440	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2560X1440	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3840 X 2160	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
EDID check	Built-in display			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Hot plug	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rotation(0/90/180/270)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Boot Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UEFI only

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extended Desktop		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dual Display Clone	HDMI + eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extended Desktop		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dual Display Clone	DP + eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extended Desktop		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Triple Display Clone	HDMI+DP+eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extended Desktop		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	eDP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not support hot plug

2.2. Audio Function Test

Function Test	Result			Note
	Pass	Fail	N/A	
HDMI Audio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DP Audio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.3. LAN Function Test

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-1210-16								
100MBps LAN HUB		D-Link DES-1008A								
10MBps LAN HUB		SVEC FD916H								
OnBoard LAN1		Realtek RTL8111G Gigabit Ethernet					MAC Address		00-07-32-3F-C9-D3	
OnBoard LAN2		Realtek RTL8111G Gigabit Ethernet					MAC Address		00-07-32-3F-C9-D2	
LAN Speed	Link / Speed LED	Active LED	LAN 1			LAN 2			Note	
			Pass	Fail	N/A	Pass	Fail	N/A		
1000MBps			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
100MBps			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
10MBps			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Wake On LAN			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S3/S4/S5	
LAN Boot (PXE)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Internet Browser (DHCP Server)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Access 1GB file. Download from ftp http://xxx.xx.14.125/			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Iperf bandwidth test in Linux environment. (#iperf3 -c 172.xx.xx.xx -w 100M -i 1 -t 60)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

2.4. Expansion HAT (40pin)

Test item	Result			Note
	Pass	Fail	N/A	
28xGPIO, 2xSPI, 2x I2C, 1x ADC, 1x I2S, 2x PWM, 1x UART, 3V3, 5V, GND	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Use BIOS to test High / low control for 28 ports GPIO.

2.5. Expansion HAT (60pin)

Test item	Result			Note
	Pass	Fail	N/A	
1x SD, 20 expansion pin from FPGA, HUARTx1 , 2x I2C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPEC not support.

2.6. CSI 2 Lane Header

Test item	Result			Note
	Pass	Fail	N/A	
CSI 2 Lane Header 2M camera function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.BIOS select : Front Camera\OV2740 2.OS must use Win10 V14393 3.Installation guide refer to [Install Camera driver SOP ver2]

2.7. CSI 4 Lane Header

Test item	Result			Note
	Pass	Fail	N/A	
CSI 4 Lane Header 8M camera function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.BIOS select: Rear Camera\IMX135 2.OS must use Win10 V14393 3.Installation guide refer to [Install Camera driver SOP ver2]

2.8. FAN / GPIO control

Test item	Result			Note
	Pass	Fail	N/A	
FAN enable / disable control (Intel GPIO tool \ GPIO36 PWM2 \ Level 1 \ Tx enable \ Rx disable \ update)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.9. USB Port Integration Test

Item	USB Port	USB2.0 ports (under OS)			USB3.0/OTG ports (under OS)			Note
		Pass	Fail	N/A	Pass	Fail	N/A	
USB HDD:	Transcend TS500GSJ25D3 500GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB Flash:	PNY USB3.0 128GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Transcend USB3.0 32GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	KingSton Ultimate USB3.0 16GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Sandisk cruzer 8GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB DVD ROM:	ASUS SBW-06D2X-U	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB keyboard:	Logitech K200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB mouse:	Logitech M-U0003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB FDD:	Mitsumi D353GUE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB2.0 HUB:	Mini 4ports USB2.0 HUB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.10. Jumper and Connector Function Test

Test item			Result			Note
			Pass	Fail	N/A	
Power button	One touch for power on or power off	OS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		BIOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	> 4sec for power off when system halt.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pass with deviation	
Reset button, system reset under DOS or Windows.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Power LED, active when system boot.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
FAN	full speed can meet FAN specification		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

3. Expansion card and Application Test

3.1. Expansion Slot Compatibility Test

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

Mini PCI Express Card		Result			Note
		Pass	Fail	N/A	
Full size	AAEON PER-C11L Gigabit LAN card	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Full size	AAEON PER-C41C-A10 4 port RS-232	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Half size	AzureWave AW-NB159H 802.11b/g/n RTL8723BE combo module	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Half size	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"/>	
Half size	Bointec DPE909-AA WIFI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
M.2 PCI-e Card		Result			Note
		Pass	Fail	N/A	
Size 2230	Intel Dual Band Wireless-AC 7265NHW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Size 2230	Intel 8260NGW 802.11AC+BT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

4. Power Consumption Test

Configuration	
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)
Memory	Onboard LPDDR4 memory 8GB
Storage	Onboard eMMC 128GB
O.S	Windows10 Enterprise 64bit English version / V1607

4.1. Power Consumption

Test Equipment					
Equipment	DC source				
Manufacturer	HOLA				
Model name	DP-3010				
Test Environment					
USB keyboard/mouse	Logitech				
AC / DC source	HOLA DP-3010				
Power Supply	Current	P		Note	
(Full Loading Mode) Windows with Prime 95 Full Loading Test	(+5V) 3.01 A	15.05	W	Prime95 Version 259	
Full Loading Total Watt	15.05(W)				
S3 mode: Measure the current value when system in S3 mode of windows and without running any	(+5V) 0.13 A	0.65	W		
Suspend Total Watt	0.65 (W)				
Win. Idle mode: Measure the current value when system in windows mode and without running any program	(+5V) 0.53 A	2.65	W		
Idle Total Watt	2.65 (W)				
S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+5V) 0.12 A	0.6	W	Erp disable	
Suspend Total Watt	0.6 (W)				

4.2. PC Health Status

Test Point:

Voltage deviation: ±5%.

Fan speed deviation: ±10%

CPU DTS Temp deviation: ±15°C

System Temp deviation: ±5°C

Voltage Monitoring Test	Result			BIOS	Actual	Note
	Pass	Fail	N/A			
CPU DTS Temp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	38 ° C	35.2 ° C	

4.3. CMOS Battery Test

Test Point: Calculated result should be > 5 years.

Battery: CR2032

Capacity 225mA

Check item	Measured Voltage		Measured Current		Calculate Result		Result			Note
	Value	Unit	Value	Unit	Value	Unit	Pass	Fail	N/A	
Battery leakage 1. Voltage should be >3V. 2. Calculated result should be > 5 years.	3.06	V	3.2	uA	8.02	years	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Calculate result=225mA/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	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
RTC Clock in Power Off Mode		24 hrs	+/-2 sec	+1	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

5.2. Booting Timer Test

Installation	Actual		Note
System Booting Time	8.5	Sec	Press the Power Button till "Beep" Sound appears

5.3. Watchdog Timer Test

Use Function as below: Hi-Safexxxx

[X] No Support.

Time-Out Interval	Criteria	Actual		Result			Note
				Pass	Fail	N/A	
10 sec	+/- 10%		Sec	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
60 sec	+/- 10%		Sec	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
255 sec	+/- 10%		Sec	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note : Under Room Temperature:

6. O.S. Compatibility Test

6.1. English Ubuntu16.10 Kernel 4.8.0-22-generic x86_64

Driver Information:

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

Install OS to SATA HDD:

Installation	Result			Note
	Pass	Fail	N/A	
English Ubuntu16.10 Kernel 4.8.0-22-generic x86_64	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type uname -a

Test Result:

Test Item	Result			Note
	Pass	Fail	N/A	
Display Function Test				
DP -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3840x2160
HDMI -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3840x2160
eDP -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DP +HDMI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DP + eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HDMI + eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Network Function Test				
Connect to Internet – LAN 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Connect to Internet – LAN 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Audio Function Test				
Play Audio Function Test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Play Audio Test
HDMI / DP audio function Test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Base Function Test				
Mouse Test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Keyboard Test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Console Redirection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
DVD-ROM Test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	USB
USB 2.0/3.0 Removable Devices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X Windows Application				
Start Button Office	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Office function
X-Window	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Startx – Desktop in Linux
Command Test On Text Mode: Attention Delay Phenomenon				
uname -a	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Show information
Shutdown	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Init 0 or shutdown -h now
Restart the Computer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Init 6 or shutdown -r now
ls / clear; cd /dev /ls -l	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Command instruction

6.2. Windows 10 Enterprise English Version 64Bit

64bit Driver Information	
Chipset Software	Intel Chipset Device Software 10.1.1 (06/03/2015)
Graphics Media	Intel HD Graphics 21.20.16.4550 (11/11/2016)
Audio Driver	Intel Display Audio 10.22.0.96 (10/5/2016)
LAN Driver	Intel PCIe GBE Family Controller 10.12.1007.2016 (10/7/2016)

Install OS to SATA HDD/ mSATA Card:

Installation	Result			Note
	Pass	Fail	N/A	
English Windows10 Enterprise 64bit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	UEFI mode

Test Results:

Test Item	Result			Note	
	Pass	Fail	N/A		
Single Display					
HDMI -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3840*2160	
DP -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3840*2160	
eDP -- Full Screen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1280*800	
Multi display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Basic Function Test					
Usable memory	32bit: MB	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	64bit: 7.85GB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB Mouse and Keyboard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
USB 2.0	USB2.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X2 , CN16
Removable	USB3.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X3
Devices	Safe to remove icon	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LAN Function Test					
LAN1 --- Auto	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
LAN2 --- Auto	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Audio Function Test					
HDMI Line out	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
DP Line out	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Start Menu					
Log off User	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Shut down (S5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sleep (S3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Restart	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Hibernate (S4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

7. BIOS Function Test

Configuration	
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)
Memory	Onboard LPDDR4 memory 8GB
Storage	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.
O.S	Windows10 Enterprise 64bit English version / V1607

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		
* S5 RTC Wake up	Wake system with Dynamic time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Wake system with fixed time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ACPI Setting	Enable ACPI auto conf.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enable/disable
	Enable Hibernation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	ACPI Sleep State	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S3/disable
* CPU configuration	Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Active Processor core	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Core2/3/4 (core1 fixed)
	Virtualization Technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enable/Disable
	EIST	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enable/Disable disable=1.1GHz
	Turbo boost	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DTS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Customer requirement
USB configuration	XHCI Hand-off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	USB Mass Storage Driver	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Network Stack configuration	IPV4 PXE support	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Console Redirection		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	HAT40 test with GPIO function.
HAT configurations	HAT40 28 pin GPIO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	HAT60	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not support
CRB	Front Camera\OV2740	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Rear Camera\IMX135	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7.2. Chipset Test

Test Item (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"/>		
South Bridge	HD audio config	HD Audio support	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		HD audio DSP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Default is enable.(customer requirement)
	SATA config.	information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Enable/disable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		AHCI mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		RAID mode	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Next BIOS version will remove this select item.
		Hot plug	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	eMMC enable/disable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	eMMC speed	HS400	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W: 275/126MB/s
HS200		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W: 175/100MB/s	

	DDR50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R/W: 87/78MB/s
	SD support	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	SDIO support	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Mini PCIe / mSATA switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	ISH Controller	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test by customer.

7.3. Boot Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Quiet Boot	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bootup Numlock state	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
OS select	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test windows / Linux
Boot From Hard Disk	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From CDROM	<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 Floppy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From USB CD-ROM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot from LAN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Disable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7.4. CMOS Backup / Clear CMOS Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
CMOS Backup	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear date, time, setting, password
Clear CMOS Test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Clear date, time, setting, password Not support Jumper

7.5. AAEON Tag Check Utility

Test Item (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 , not support legacy

7.6. Supervisor / User Password Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Administrator Password	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Upassw0rd
User Password	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Just press [Enter]

7.7. Hi-safe Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Version(20130823)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not support Hi-safe
System Information	CPU Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Model Name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Display Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	RAM Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H/W Monitor	Info	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fan Speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DIO	DIO1~4 High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIO1~4 Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIO5~8 High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	DIO5~8 Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
WatchDog	10sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 11 sec
	1min	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 65sec
	255sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 270sec
	Auto Reload	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SMBus	SMBus IO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SMBus Address 0xF040
	Read Byte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Slave Address A0h,A2h,A4h
	Read Word	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Result / Read	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Smart FAN	Chipset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fan Speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CPU, SYS, SYS2
	Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Speed control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Off Speed TMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Full Speed TMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7.8. Negative Test

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

7.9.2 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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	DIO	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	SmartFan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	LVDS Backlight control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	USB ports	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DP/HDMI audio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7.9.3 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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

8. Performance Test

Configuration	
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz) Intel® Celeron® Processor N3350 (2M Cache, up to 2.4 GHz)
Memory	Onboard LPDDR4 memory 8GB Onboard LPDDR4 memory 4GB
Storage	Onboard eMMC 128GB Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.
O.S	Windows10 Enterprise 64bit English version / V1607

8.1. System Performance Test

Test Result: (Display set 1920*1080 test)

Testing Software	Scope		Note
	N4200	N3350	
PCMark 8 (Creative)			
PCMarks	1563	1214	PCMarks
Web Browsing-Jungle Pin	0.525s	0.528s	
Web Browsing-Amazonia	0.185s	0.187s	
Video Group Chat v2- Video Group Chat playback1 v2	30.0fps	30.0fps	
Video Group Chat v2- Video Group Chat playback2 v2	30.0fps	30.0fps	
Video Group Chat v2- Video Group Chat playback3 v2	30.0fps	30.0fps	
Video Group Chat v2- Video Group Chat encoding v2	1801.0ms	393.3ms	
Photo Editing v2	1.191s	1.919s	
Batch Photo Editing v2	82.5s	112.5s	
Video Editing 1 v2	33.8s	45.0s	
Video Editing 2 v2	642.3s	680.5s	
Mainstream Gaming part 1	5.5FPS	3.6FPS	
Mainstream Gaming part 2	2.7FPS	1.9FPS	
Video To Go part 1	11.6s	11.9S	
Video To Go part 2	15.8s	16.3S	
Music To Go	26.19s	56.53S	
Benchmark duration	1h32min18s	1h51min15s	

Testing Software	Scope		Note
	N4200	N3350	
3Dmark2006 v120			
3Dmark Score	4509	3153	
SM2.0 Score	1579	1142	
HDR/SM3.0 Score	1795	1267	
CPU Score	2965	1719	
Benchmark (B)	-	-	
Average Efficiency	-	-	
3Dmark11 Professional Edition Performance 1280*720 (Default)			
3Dmark 11Score	P956	P595	
Graphics Score	859	537	
Physics Score	2379	1313	

Combined Score	916	591	
Testing Software	Scope		Note
	N4200	N3350	
Performance Test 8.0			
PassMark Rating	1217.5	1027.8	
CPU Mark	2474	1311	
2D Graphics Mark	262.9	262.7	
3D Graphics Mark	507	429.1	
Memory Mark	1079	938	
Disk Mark	1030	2790	
CD Mark	N/A	N/A	

8.2. Storage Performance Test

SATA Performance				
SATA SSD	ADATA SX900 128GB			
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)			
Memory	Onboard LPDDR4 memory 8GB			
OS	Windows10 Enterprise 64bit English version / V1607			
Item	Comment / (unit)	Software	Score	Note
SATAIII	Maximum Read	ATTO Disk Benchmark	555MB/s	SATAII 150~300MB SATAIII up 300M/B
	Maximum Write	ATTO Disk Benchmark	521MB/s	

USB3.0/2.0 Performance				
USB Flash	KingSton Ultimate USB3.0 16GB			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
USB3.0 x3	Maximum Read	ATTO Disk Benchmark	132MB/s	
	Maximum Write	ATTO Disk Benchmark	75MB/s	
USB3.0 OTB	Maximum Read	ATTO Disk Benchmark	128MB/s	
	Maximum Write	ATTO Disk Benchmark	71MB/s	
USB2.0 x2 CN16	Maximum Read	ATTO Disk Benchmark	43MB/s	
	Maximum Write	ATTO Disk Benchmark	40MB/s	

mSATA / eMMC performance				
mSATA	Innodisk 3ME3 128GB			
eMMC	Onboard eMMC 128GB			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
mSATA	Maximum Read	ATTO Disk Benchmark	228MB/s	
	Maximum Write	ATTO Disk Benchmark	137MB/s	
eMMC	Maximum Read	ATTO Disk Benchmark	275 MB/s	
	Maximum Write	ATTO Disk Benchmark	126 MB/s	

9. Stability test

Configuration	
CPU	Intel® Pentium® Processor N4200 (2M Cache, up to 2.5 GHz)
Memory	Onboard LPDDR4 memory 8GB
Storage	Onboard eMMC 128GB
O.S	Windows10 Enterprise 64bit English version / V1607

9.1. Run In Test

Under Room Temperature:

OS: Windows 10 Enterprise English 64bit

Test Item	Result			Note	
	Pass	Fail	N/A		
Burn In Test V8.1(1020 above) Duty: 100 Time: over 12 hours <System should not error or hang during testing.>	CPU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	RAM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	COM	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	GPU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Video	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	2D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Disk	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Sound	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Network <Advanced>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Parallel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	USB	2.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X4

Note: COM PORT Speed Set to 115200.

9.2. Reboot Test

Under Room Temperature:

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

9.3. ACPI G3 Cold Boot Test

Under Room Temperature:

OS: Windows10 Enterprise 64bit V1607

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- 180sec ; Power off-- 20sec. <loss rate: 0 /1000 times>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> BIOS select “ power on” or <input checked="" type="checkbox"/> Jumper setting auto power button
G3(AC loss) cold boot over 20 cycles Setting: Power on- 40sec ; Power off- 5sec. <loss rate: 0 /20 times>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	H/W [auto power button] sets enable.

9.4. ACPI S5 Cold Boot Test

Under Room Temperature:

OS: Windows10 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.>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. “PassMark Rebooter” set 500 cycles ; delay 30sec and enable “auto load Rebooter at startup”. 2. On/off fixture cycle time to set 150sec. D160807QED02

9.5. Memory Test

Under room temperature:

OS: UEFI

Tool: Memtest86 Version 7.1 Experimental UEFI

Memory information: Onboard LPDDR4 memory 8GB.

Test item	Result			Note
	Pass	Fail	N/A	
Memory Test for 3 loops. < Memtest result should not error or 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]

9.6. System stability after S3 / S4 / S5 cycles

Under Room Temperature:

OS: Windows 10 Enterprise English 64bit

Test item	Criteria	Result			Note
		Pass	Fail	N/A	
System stability after S3 cycles <Perform S3 cycles 5 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System stability after S4 cycles <Perform S4 cycles 5 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System stability after S5 cycles <Perform S5 cycles 5 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	