Report NO: 17IP010003

EMB-Q170A

Intel® Q170 Express Chipset

P5
Compatibility Test Report

Summary	☐ Pass ☐ Fail ☒ Pass with Deviation (Comment: HDD LED will always on while inserted M.2 SSD: [Kingston Predator PCIe 240G]; tested with [Samsung MZVPV128HDGM PCIe SSD 128GB], HDD LED will work properly)			
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
2017/04/17	KJ Wang	Jack Huang Louie Lee

Version Released Records

Date	Version	Change History	Note
5/26/2015	C0	1. Add UEFI,GPS,CANBUS,POE, Cold boot test item	

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 will 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® Skylake-S LGA 1151 socket Processor, Max. 65W TDPs	☒	☐	☐	
Chipset	Intel® Q170 Express Chipset	☒	☐	☐	
Memory	2 x SO-DIMM, Max. 32GB, DDR4 2133/1867 MHz, Non-ECC (Vertical Type), Dual channel memory architecture	☒	☐	☐	
Graphics	Intel® Graphics HD	☒	☐	☐	
I/O Chipset	NCT6791D	☒	☐	☐	
Storage	2 x SATA 6Gb/s	☒	☐	☐	
Ethernet	1 x Intel PCIe Gb LAN 219LM for vPro 1 x Intel PCIe Gb LAN 211AT	☒	☐	☐	
Audio	Realtek® ALC887 with Amp.	☒	☐	☐	
TPM	Infineon SLB9635 TT 1.2 (optional, default: no)	☒	☐	☐	
BIOS	128Mbit Flash ROM, AMI BIOS	☒	☐	☐	
H/W Monitor	Temperature Monitor on CPU/Chassis Voltage Monitor on Vcore/5V/12V Fan Monitor on CPU/Chassis	☒	☐	☐	
WatchDog Timer	1~255 step by software program	☒	☐	☐	
Smart Fan Control	CPU Fan / Chassis Fan	☒	☐	☐	
Wake On LAN / PXE	Yes (WOL / PXE)	☒	☐	☐	
Power State	S3, S4, S5	☒	☐	☐	
Graphics Multi Display	DP+DP+DP, DP+DP+VGA,	☒	☐	☐	
VGA	Up to 1920 x 1200 @ 60 Hz	☒	☐	☐	
HDMI	Up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz, with Digital Audio (Standard 1.4)	☒	☐	☐	
DP	Up to 4096 x 2304 @ 60 Hz, with Digital Audio (Standard 1.2)	☒	☐	☐	
LVDS	No	☒	☐	☐	
Backlight Control	No	☒	☐	☐	
Storage	2 x SATA 6Gb/s, 1 x M.2 slot(M-key), 22 x 80mm (SATA, 4 x PCIe) @ bottom side	☒	☐	☐	
USB	4 x USB 3.0 ports (4 ports in Rear	☒	☐	☐	

Item	Specification	Pass	Fail	N/A	Note
	IO) 6 x USB 2.0 ports (2 ports in Rear IO, 4 ports at mid board)				
Display I/O	1 x VGA, 1 x DP, 2 x HDMI / DP Combo	☒	☐	☐	
Audio I/O	Mic-in, Line-out, 1 x internal speaker (When Line out plug-in audio jack of rear IO, the speak would be mute)	☒	☐	☐	
LAN I/O	2 x RJ-45	☒	☐	☐	
Serial Port	1 x RS-232 (mid board) 1 x RS-232/422/485 supports 5V/12V/RI option (mid board)	☒	☐	☐	
Parallel Port	NO	☒	☐	☐	
PS/2 Port	1 x KB/MS	☒	☐	☐	
DIO	8-bit Digital I/O interface (4-in /4-out)	☒	☐	☐	
FAN	1 x CPU Fan connector (4-pin) 1 x Chassis Fan connector (4-pin)	☒	☐	☐	
Back Panel I/O Ports	1 x PS/2 for KB/MS +2 x USB 2.0 1 x HDMI/DP Combo 1 x HDMI/DP Combo 1 x VGA, 1 x DP 1 x LAN (RJ45) + 2 x USB 3.0 1 x LAN (RJ45) + 2 x USB 3.0 1 x Audio jacks for Min-in & Line out	☒	☐	☐	
Internal I/O Connectors	1 x PCIe[x16] Slot 1 x M.2 slot(M-key), 22 x 80mm (SATA, 4 x PCIe) @ bottom side 2 x SATA 6Gb/s 2 x USB 2.0 connectors support additional 4 USB ports (2.00 mm) 2 x boxer header for COM (COM1: RS-232/422/485 supports 5V/12V/RI, COM2: RS-232) 1 x Digital I/O box header 1 x 4 PIN (2x2) internal power connector 1 x 4 PIN CPU Fan connector 1 x 4 PIN Chassis Fan connector 1 x Front Panel connector 1 x Speaker for 2W/4Ω 1 x Chassis Intrusion follow ASUS pin out 1 x Buzzer on board 1 x AT/ATX mode select jumper (default: No) 1 x clear CMOS jumper	☒	☐	☐	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows 7, 32bit / 64bit	☒	☐	☐	
	Windows 8.1 64bit	☒	☐	☐	
	Windows 10 64bit	☒	☐	☐	

| Linux | Linux-Ubuntu16.04 | ☒ | ☐ | ☐ | |

Platform Information

Item	Device Information	Test Item
PCB Model / Version	EMB-Q170A A1.02	
Carrier Board	N/A	
BIOS / Version	EMB-Q170A R1.2 (E17AAM12)(02/14/2017) BIOS Release CS:4258h	
Driver	\\nas3\SAP-BETA\Products\EMB-Q170A\20170214	
CPU Type	Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)	
Memory Type	Transcend DDR4 2133 8GB SEC K4A4G085WD	
SATA HDD	Seagate ST500DM002 SATAIII 3.5" 500GB/7200rpm	
SATA DVD-ROM	Pioneer DVR-217	
USB DVD-ROM	ASUS-SDRW-08D2S-U	
VGA Monitor	Dell U2713HM	
DP Monitor	Samsung U28D590D 28' 3840* 2160	
Operating System	☒ English Ubuntu 16.04 Kernel 4.4.0-23-generic x86_64	
	☒ Windows 7 Ultimate SP1 English Version 32/64 Bit	
	☒ Windows 8.1 Enterprise English Version 64Bit	
	☒ Windows 10 Enterprise English Version 64Bit	
Power Supply	ATX Power Supply : Be quiet E7-550W	
	Chipset Information with 8.1 Enter English Version 64 Bit Driver Version	
Chipset Software	Intel Chipset Device Software 10.1.1(06/03/2015)	
PCH Bridge	Intel Q170	
Super IO Chipset	NuvoTon NCT6791D	
VGA Chipset	Intel HD Graphics 530 20.19.15.4474 (06/13/2016)	
Audio Chipset	Realtek High Definition Audio 6.0.1.7541 (6/18/2015)	
	Intel Display Audio 8.20.0.922 (04/16/2016)	
Ethernet Chipset	Intel® Ethernet Connection I219-LM: 12.15.23.1(05/10/2016)	
	Intel® I211 Gigabit Network Connection: 12.14.7.0(06/18/2015)	
ME	Intel Management Engine Interface 11.0.0.1172 (10/08/2015)	

Summary Table of contents:

1. Hardware Test

1.1. CPU Compatibility Test

CPU Information	Result			Note
	Pass	Fail	N/A	
Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz) 65W	☒	☐	☐	
Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz) 65W	☒	☐	☐	
Intel® Core™ i3-6100 Processor (3M Cache, 3.70 GHz) 51W	☒	☐	☐	
Intel® Core™ i7-6700TE Processor 8M Cache, up to 3.40 GHz 35W	☒	☐	☐	
Intel® Core™ i5-6500TE Processor (6M Cache, up to 3.30 GHz) 35W	☒	☐	☐	
Intel Pentium G4400 3.3GHz	☒	☐	☐	

1.2. Memory Compatibility Test

Memory Information (a. Information and frequency should show correct value. b. Memtest result should not error or halt)	AAEON P/N	Result			Note
		Pass	Fail	N/A	
DDR4 SO-DIMM					
DSL DDR4 2133 4GB SEC K4A4G085WD	N/A	☒	☐	☐	*
DSL DDR4 2133 8GB SEC K4A4G085WD	N/A	☒	☐	☐	
ADATA DDR4 2133 4GB SEC K4A4G085WD	N/A	☒	☐	☐	
ADATA DDR4 2133 8GB SEC K4A4G085WD	N/A	☒	☐	☐	
innodisk DDR4 2133 4GB SEC K4A4G085WD	N/A	☒	☐	☐	
innodisk DDR4 2133 8GB SEC K4A4G085WD	N/A	☒	☐	☐	
Transcend DDR4 2133 4GB SEC K4A4G085WD	N/A	☒	☐	☐	
Transcend DDR4 2133 8GB SEC K4A4G085WD	N/A	☒	☐	☐	
Transcend DDR4 2133 16GB SEC K4A8G085WB	N/A	☒	☐	☐	
ADATA DDR4 2133 16GB AD4S2133316G15-BSSB SEC K4A8G085WB	N/A	☒	☐	☐	
Transcend DDR4-2400 4GB(SEC 637 K4A4G085WE BCRC)	N/A	☒	☐	☐	
Transcend DDR4-2400 8GB(SEC 616 K4A4G085WE BCRC)	N/A	☒	☐	☐	
Transcend DDR4-2400 16GB(SEC 622 K4A8G085WB BCRC)	N/A	☒	☐	☐	

1.3. SATA Compatibility Test
1.3.1 Onboard SATA(AHCI) Test

SATA Device Information	AAEON P/N	Result	Note

(Information and size should show correct value with IDE and AHCI mode)			Pass	Fail	N/A	
SATAII	Seagate ST9160412AS 2.5' 160GB/5400rpm	N/A	☒	☐	☐	
SATAIII	Seagate ST500DM002 SATAIII 3.5" 500GB/7200rpm	N/A	☒	☐	☐	
SATAIII	Seagate ST30000DM001-2Y/P SATAIII 3.5" 3TB/7200rpm	N/A	☒	☐	☐	
SATAIII	Seagate ST500LT012 2.5" 500GB/7200 rpm	N/A	☒	☐	☐	
SATAIII	WD WD500AKX SATAIII 3.5" 500GB/7200rpm	N/A	☒	☐	☐	
SATAIII	WD WD3200BEVT 2.5' 320G/7200rpm	N/A	☒	☐	☐	
SATAIII	TOSHIBA DT01ACA050 500GB/7200rpm	N/A	☒	☐	☐	
SSD	Transcend TS32GSSD370 2.5".32GB.SATA III SSD MLC.	968C032G2D	☒	☐	☐	
SSD	Transcend.TS64GSSD370 2.5".64GB. SATA III.SSD.MLC	968C64G003	☒	☐	☐	
SSD	Transcend.TS128GSSD370 2.5" SATA3 SSD.128GB.MLC.	968C128G0W	☒	☐	☐	
SSD	Intel 520 128G SSD	N/A	☒	☐	☐	
SSD	OCZ Trion 100 240G	N/A	☒	☐	☐	
SSD	ADATA SX900 128GB SATA 6GB SSD	N/A	☒	☐	☐	
SSD	OCZ Vector 150 120G	N/A	☒	☐	☐	
DVD	Pioneer DVR-217	N/A	☒	☐	☐	
DVD	ASUS BW-14D1XT	N/A	☒	☐	☐	

1.3.2 Onboard SATA (RAID) Test

SATA RAID Test (RAID function should work properly)		Result			Note
		Pass	Fail	N/A	
RAID-0 (HDDx2) Striping/Span Test	1. Seagate ST500LT012 2.5" 500GB/7200 rpm	☒	☐	☐	
	2. Seagate ST500LT012 2.5" 500GB/7200 rpm	☒	☐	☐	
RAID-1 (HDDx2) Mirror Test	1 WD WD3200BEVT 2.5' 320G/7200rpm	☒	☐	☐	
	2 WD WD3200BEVT 2.5' 320G/7200rpm	☒	☐	☐	
RAID-5 (HDDx3) Striping/Span Test Rotation Parity	1 Seagate ST500LT012 2.5" 500GB/7200 rpm	☒	☐	☐	
	2 Seagate ST500LT012 2.5" 500GB/7200 rpm	☒	☐	☐	
	3 Transcend TS256GMTS800 256GB M.2	☒	☐	☐	

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	
Transcend TS256GMTS800 256GB M.2	N/A	☒	☐	☐	SATA Mode

		Pass	Fail	N/A	
Transcend TS128GMTS800 128GB M.2	AP-SS968C128 G1G	☒	☐	☐	SATA Mode
Transcend TS64GMTS800 64GB M.2	AP-SS968C064 G2X	☒	☐	☐	SATA Mode
Transcend TS326GMTS800 32GB M.2	AP-SS968C032 G1L	☒	☐	☐	SATA Mode
Kingston Predator PCIe 240G	N/A	☒	☐	☐	PCIe Mode HDD LED always on, pass with deviation.
Samsung MZVPV128HDGM PCIe SSD 128GB	N/A	☒	☐	☐	PCIe Mode (HDD LED blink)

1.5. Power Supply Compatibility Test

Power Supply Information a. System boot to OS should work properly. b. System OS shutdown function should work properly.	Result			Note
	Pass	Fail	N/A	
SeaSonic SSR-450RM 450W 80plus Gold	☒	☐	☐	
FSP AS550 550W 80plus Gold	☒	☐	☐	*Must
Cooler Master RS-750-AMAA-G1 750W 80plus Gold	☒	☐	☐	
Be quiet E7-550W	☒	☐	☐	
EMACS HG2-6400P 250W	☒	☐	☐	
Antec NEO ECO 520C 520W	☒	☐	☐	
AcBel iPower85 650 600W (PCA014)	☒	☐	☐	

1.6. USB Compatibility Test

USB device Information		Result			Note
		Pass	Fail	N/A	
DVD ROM	Pioneer BDR-XD04T	☒	☐	☐	Install Win8
DVD ROM	ASUS-SDRW-08D2S-U	☒	☐	☐	Install Win7
DVD ROM	Pioneer DVR XD10T	☒	☐	☐	
Blu-Ray	Pioneer BDR-XD04T	☒	☐	☐	
USB Flash	USB3.0 Kingston DT Ultimate G2 32GB	☒	☐	☐	
USB Flash	USB2.0 ADATA C802 2GB	☒	☐	☐	
USB Flash	USB3.0 Trannscend 8GB	☒	☐	☐	
USB Flash	USB3.0 SanDisk Extreme 64GB	☒	☐	☐	

1.7. Keyboard/Mouse Compatibility Test

Keyboard/mouse Information		Result			Note
		Pass	Fail	N/A	
PS/2 Keyboard	ATake KJ-118	☒	☐	☐	
	GoodVision JSKJ-8831	☒	☐	☐	
PS/2 Mouse	Genius NetScroll 120	☒	☐	☐	
	Kinyo KM-V2	☒	☐	☐	
USB Keyboard	Microsoft 1366	☒	☐	☐	
	Logitech K200	☒	☐	☐	
USB Mouse	Microsoft 1113	☒	☐	☐	
	Logitech M-U0003	☒	☐	☐	

1.8. Monitor Compatibility Test

Monitor Information	Result	Note

a. Monitor should display under DOS and OS environment. b. Monitor should not appear ghost or ripples.	Pass	Fail	N/A	
VGA				
ASUS VG23AH 1920*1080	☒	☐	☐	
BenQ 2410LX 1920*1080	☒	☐	☐	
Dell 2710HM 2048*1152	☒	☐	☐	
PHILIPS 288P 28' 3840* 2160	☒	☐	☐	VGA Only 1920*1080
Display port				
BenQ 2410LX 1920*1080	☒	☐	☐	
Samsung U28D590D 28' 3840* 2160	☒	☐	☐	
Dell 2710HM 2560*1440	☒	☐	☐	
PHILIPS 288P 28' 3840* 2160	☒	☐	☐	

2. Basic Function Test

2.1. Video Function Test

2.1.1. Single Output Function Test

	Hardware Information with Windows 8.1 Enterprise English Version 64 Bit Driver Version
CPU	Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz)
Memory	innodisk DDR4 2133 8GB SEC K4A4G085WD *2pcs
SATA HDD	TOSHIBA DT01ACA050 SATAIII 3.5" 500GB/7200rpm
VGA	Dell U2713HM 2048*1152
Display port 1	samsung U28D590D 28' 3840* 2160
Display port 2	samsung U28D590D 28' 3840* 2160
Display port 3	samsung U28D590D 28' 3840* 2160
Color Quality	☒16bit ☐24bit ☒32bit

Resolution	VGA			DP1			DP2			DP3			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	VGA + DP1	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	VGA + DP2	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	VGA + DP3	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	DP1 + DP2	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	DP1 + DP3	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Dual Display Clone	DP2 + DP3	☒	☐	☐	

		Pass	Fail	N/A	
Extended Desktop		☒	☐	☐	
Triple Display Clone	VGA + DP1+ DP2	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Triple Display Clone	VGA + DP1+ DP3	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Triple Display Clone	DP1+ DP2+ DP3	☒	☐	☐	
Extended Desktop		☒	☐	☐	
Triple Display Clone	VGA+ DP2+ DP3	☒	☐	☐	
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	VGA	☒	☐	☐	
	DP1	☒	☐	☐	
	DP2	☒	☐	☐	
	DP3	☒	☐	☐	

2.2. Audio Function Test

〔 〕 No Support

Function Test	Result			Note
	Pass	**Fail**	**N/A**	
L (Left) Channel	☒	☐	☐	
R (Right) Channel	☒	☐	☐	
AMP (Left and Right)	☒	☐	☐	AMP should mute when Audio jack plug in
MICROPHONE	☒	☐	☐	
DP1 audio line out	☒	☐	☐	
DP2 audio line out	☒	☐	☐	
DP3 audio line out	☒	☐	☐	

2.3. LAN Function Test

〔　〕No Support

Connect two computers via different speed LAN HUB by using "Ping" instruction (1000 times)									
1000MBps LAN HUB		D-Link DGS-1008D							
100MBps LAN HUB		HP J4095A 24 Ports							
10MBps LAN HUB		SVEC FD916H							
OnBoard LAN1	Intel PCIe Gb LAN I211					MAC Address		00-07-32-33-49-82	
OnBoard LAN2	Intel PCIe Gb LAN I219-LM					MAC Address		00-07-32-33-49-81	

LAN Speed	Link / Speed LED	Active LED	LAN 1			LAN 2			Note
			Pass	Fail	N/A	Pass	Fail	N/A	
1000MBps			☒	☐	☐	☒	☐	☐	
100MBps			☒	☐	☐	☒	☐	☐	
10MBps			☒	☐	☐	☒	☐	☐	
Wake On LAN			☒	☐	☐	☒	☐	☐	S3/S4/S5　(S3/S4 fail)
LAN Boot (PXE)			☒	☐	☐	☒	☐	☐	
Internet Browser (DHCP Server)			☒	☐	☐	☒	☐	☐	

Wake up Test	Pass	Fail	N/A	Note
Wake up from PCI-e 16X slot Test with Intel GIGABIT CT DESKTOP ADAPTER	☒	☐	☐	S3/S4/S5

2.3.2. Throughput Test

DUT Platform Information:

☐	Fedora Core 14 – Kernel	
☐	Cent OS5.6	
☒	English Ubuntu 14.10 Kernel 3.16.0-23-generic	
☐	Red Hat	

Note : Connection-Level Performance (Interaction Constants Duration Time Set to <u>60</u> Sec.)

Graphics Media	Ubuntu 14.10 Default setting
LAN	LAN1→Intel PCIe Gb LAN I211 < Intel /1000 Network Driver e igb-5.3.3.2.tar
	LAN2→Intel PCIe Gb LAN I219 < Intel /1000 Network Driver e1000e-3.2.7.1.tar
Audio Driver	Ubuntu 14.10 Default setting

SMB Platform Information:

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

Test Result:

1.   Half Direction (LAN1: Intel i211 → LAN2: Intel i219)
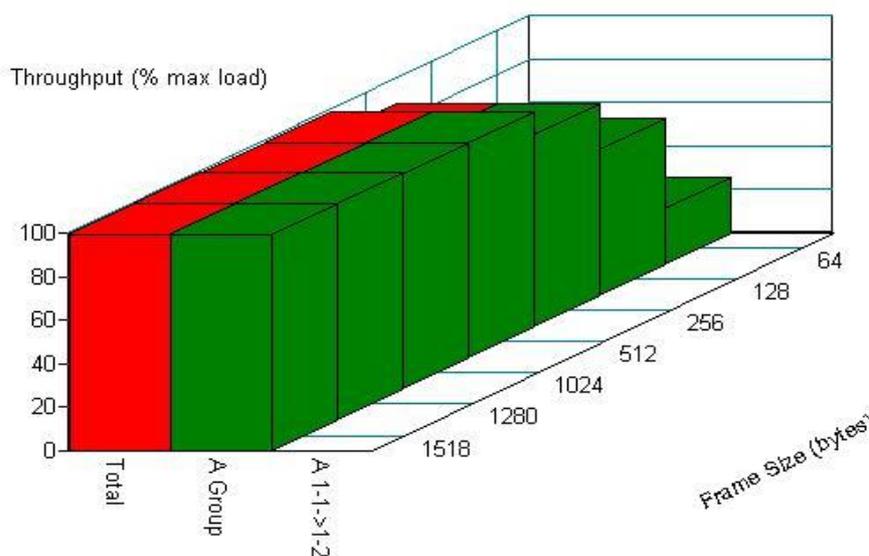
Throughput vs Frame Size

Name/Framesize	64	128	256	512	1024	1280	1518
Total	24.9765625	66.7421875	87.625	98.453125	98.453125	99.2265625	99.2265625
A Group	24.9765625	66.7421875	87.625	98.453125	98.453125	99.2265625	99.2265625
A 1-1->1-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2.   Binary Direction (LAN1: Intel i211 → LAN2: Intel i219)
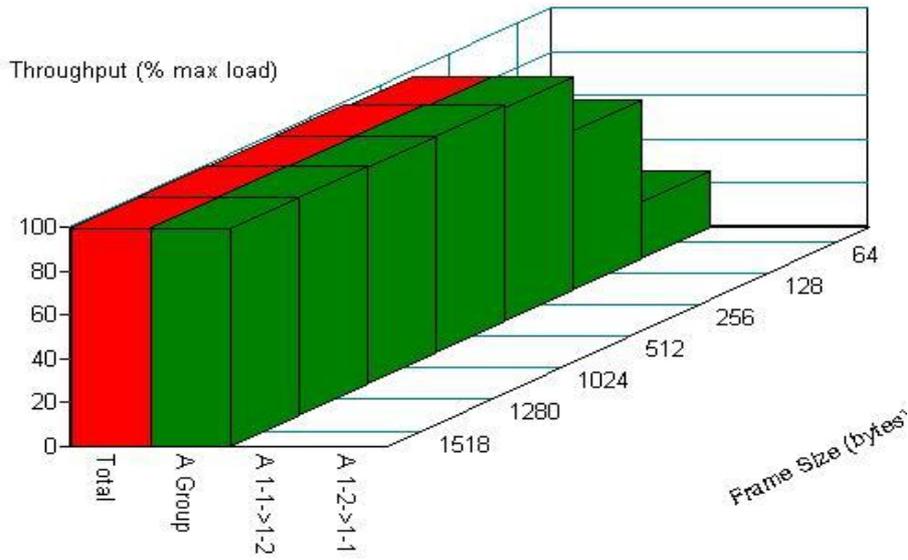
Throughput vs Frame Size

Name/Framesize	64	128	256	512	1024	1280	1518
Total	24.9765625	72.15625	96.90625	98.453125	98.453125	99.2265625	99.2265625
A Group	24.9765625	72.15625	96.90625	98.453125	98.453125	99.2265625	99.2265625
A 1-1->1-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 1-2->1-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2.4. Connector and Jumper Test

〔   〕No Support

Function Test					Result			Note
					Pass	Fail	N/A	
CPU FAN1					☒	☐	☐	
CHA FAN1					☒	☐	☐	
Debug1					☒	☐	☐	
CLRTC					☒	☐	☐	
CHASSIS1					☒	☐	☐	
COM1_V1					☒	☐	☐	RI/5V/12V
AT/ATX Mode					☒	☐	☐	1-2 ATX / 2-3 AT
F_Fpanel2	S0	S3	S4	S5				
#7	H	L	L	L	☒	☐	☐	7-GND
#8	H	H	L	L	☒	☐	☐	8-GND
#9	H	H	H	L	☒	☐	☐	10-GND

3. Integration Test

	Hardware Information with Windows 7 Ultimate English Version 32 Bit Driver Version
CPU	Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz) 65W
Memory	ADATA DDR4 2133 4GB SEC K4A4G085WD
SATA HDD	Seagate ST500DM002 SATAIII 3.5" 500GB/7200rpm
	Chipset Information with 8.1 Enterprise English 64 Bit Driver Version
Chipset Software	Intel Chipset Device Software 10.1.1(06/03/2015)
PCH Bridge	Intel Q170
Super IO Chipset	NuvoTon NCT6791D
VGA Chipset	Intel HD Graphics 530 20.19.15.4474 (06/13/2016)
Audio Chipset	Realtek High Definition Audio 6.0.1.7541 (6/18/2015)
	Intel Display Audio 8.20.0.922 (04/16/2016)
Ethernet Chipset	Intel® Ethernet Connection I219-LM: 12.15.23.1(05/10/2016)
	Intel® I211 Gigabit Network Connection: 12.14.7.0(06/18/2015)
ME	Intel Management Engine Interface 11.0.0.1172 (10/08/2015)

3.1. USB Port Integration Test

Item \ USB Port	Boot			Function(Win 8.1)			Note
	Pass	Fail	N/A	Pass	Fail	N/A	
USB HDD	☒	☐	☐	☒	☐	☐	
USB FDD Mitsumi D353GUE	☒	☐	☐	☒	☐	☐	
ASUS SDRW-08D2S-U	☒	☐	☐	☒	☐	☐	
USB Hub Test (Connect USB Device) HUB Port1: USB Keyboard / HUB Port2: USB Mouse / HUB Port3: USB HDD							
USB 2.0 HUB PowerSync / USB 2.0 4 Port HU-155				☒	☐	☐	

3.2. Digital I/O Port Test

DIO Address ( )	Result			Note
	Pass	Fail	N/A	
DIO VCC +5.0V	☒	☐	☐	

3.3. COM Port Integration Test

Test Item		Result			Note
		Pass	Fail	N/A	
Serial Modem Dial Out		☒	☐	☐	
Serial Modem	Ring In	☒	☐	☐	Test by Modem S3/S4/S5/DOS off
	+12V	☒	☐	☐	Test by Multimeter
	+5V	☒	☐	☐	Test by Multimeter

3.4. 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
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

3.5. Display port Converter Compatibility Test

Test Item			Result			Note
			Pass	Fail	N/A	
DP to HDMI converter: LPC-1504	DOS display	Full screen	☒	☐	☐	
	OS display	Full screen	☒	☐	☐	Max resolution: 3840*2160
DP to DVI converter: LPC-1503	DOS display	Full screen	☒	☐	☐	
	OS display	Full screen	☒	☐	☐	Max resolution: 3840*2160

4. Application Test

4.1. PCI-Express Function Test

PCI-Express x1		Function Test			Note
		Pass	**Fail**	**N/A**	
SUNIX SATA1414 eSATA & SATAII x1Express card	1x slot	☐	☐	☒	GEN1
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
Intel GIGABIT CT DESKTOP ADAPTER	1x slot	☐	☐	☒	68-05-CA-02-61-C3
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
Realtek PCI-E GIGA Lan (PETL01B)	1x slot	☐	☐	☒	
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
Uptech UTB242 / USB3.0	1x slot	☐	☐	☒	
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
DigiFusion PTU302A/ USB3.0	1x slot	☐	☐	☒	
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
DigiFusion SATAIII 6G card PES311A	1x slot	☐	☐	☒	
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	
SFPX84 Rev.A8.2 1X Graphics card	1x slot	☐	☐	☒	
	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	

PCI-Express x4		Function Test			Note
		Pass	**Fail**	**N/A**	
PLEXTOR PCI- Express x4 SSD M6e 128GB	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	W;338.65 MB/Sec R:749.12 MB/Sec
Kingston Predator PCIe 240G M.2 +SilverStone ECM20 PCI- Express x4	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	W;645.27 MB/Sec R:1535.82 MB/Sec
Intel GIGABIT ET2 Quad Port Svr Adptr (E1G44ET2BLK)	8x slot	☐	☐	☒	
	16x slot	☒	☐	☐	

PCI-Express x16	Function Test			Note
	Pass	**Fail**	**N/A**	
EVGA GT740 PCI-e3.0 (NVIDIA Chipset) PCI-Express x16 VGA Card	☒	☐	☐	3Dmark2006 score:15656
GIGABYTE GVR5670C-1GI (ATI Chipset) (ATI Chipset)PCI-Express x16 VGA Card	☒	☐	☐	3Dmark2006 score:9802
MSI MS-V040 RX1650-TD512E(ATI Chipset)	☒	☐	☐	3Dmark2006 score:1606
ASUS GTX680-2GD5 GEN3 (NVIDIA Chipset)PCI-Express x16 Graphics Card	☒	☐	☐	3Dmark2006 score:28277
ASUS GT620-1GD3-L-V2 PCI-e2.0 (NVIDIA Chipset) PCI-Express x16 VGA Card	☒	☐	☐	3Dmark2006 score:5866

ASUS RADEON R7250 (AMD Chipset) PCI-Express x16 VGA Card (Only x8)		☒	☐	☐	3Dmark2006 score:13515
Bear Card	4X GEN2	☐	☐	☒	
	8X GEN2	☐	☐	☒	
	16X GEN2	☒	☐	☐	

5. Power Consumption Test

Hardware Information with Windows 8.1 Enterprise English Version 32 Bit Driver Version	
CPU	Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz) 65W
Memory	DSL DDR4 2133 8GB SEC K4A4G085WD *2pcs
SATA HDD	Seagate ST500DM002 SATAIII 3.5" 500GB/7200rpm

5.1. AT/ATX Power Consumption

Test Equipment	
Equipment	AC/DC Digital Clamp meter
Manufacturer	KYORITSU
Model name	2010

Test Environment	
ATX Power Model	EMACS HG2-6400P 400W
Keyboard/Mouse	PS/2 keyboard Kinyo VKB-768; PS/2 Mouse Genius NetScroll 120
Note	Power consumption does not include HDD consumption.

Power Supply		ATX Power				Note
(Full Loading Mode) Windows 7 with Prime 95 Full Loading Test	(+12V)	5.93		71.16		Prime95 Version 259
	(+5V)	0.43		2.19		
	(+3.3V)	0.87	A	2.57	W	
	(-12V)	0.02		0.24		
	(5VSB)	0.73		3.65		
Full Loading Total Watt		79.81 (W)				
S3 mode: Measure the current value when system in S3 mode of windows and without running any	(+12V)	0		0		
	(+5V)	0		0		
	(+3.3V)	0	A	0	W	
	(-12V)	0		0		
	(5VSB)	0.06		0.3		
Suspend Total Watt		0.3 (W)				
Win. Idle mode: Measure the current value when system in windows mode and without running any program	(+12V)	0.63		7.56		
	(+5V)	0.40		2		
	(+3.3V)	0.85	A	2.81	W	
	(-12V)	0.04		0.6		
	(5VSB)	0.61		3.05		
Idle Total Watt		16.02 (W)				
Power on - Boot sequence: Measure the maximum current value of between system power on and boot-up to O.S.	(+12V)	3.13		37.56		
	(+5V)	0.41		2.05		
	(+3.3V)	0.93	A	3.23	W	
	(-12V)	0.05		0.6		
	(5VSB)	0.86		4.3		
Power On Total Watt		47.74 (W)				
S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+12V)	0		0		Erp disable
	(+5V)	0		0		
	(+3.3V)	0	A	0	W	
	(-12V)	0		0		
	(5VSB)	0.06		0.3		
Suspend Total Watt		0.3 (W)				
S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+12V)	0		0		Erp Enable < 0.5W
	(+5V)	0		0		
	(+3.3V)	0	A	0	W	
	(-12V)	0		0		
	(5VSB)	0.01		0.05		
Suspend Total Watt		0.05 (W)				

5.2. PC Health Status

Test Point: The value between Actual Voltage and Voltage Monitor must be + /- 5%

Voltage Monitoring Test	Result			BIOS (V)		Actual (V)		Note
	Pass	Fail	N/A					
CPU Temperature	☒	☐	☐	34℃		31.2℃		
System Temperature	☒	☐	☐	32℃		30.8℃		
CPU Fan Speed	☒	☐	☐	2789	RPM	2798	RPM	
System Fan1 Speed	☒	☐	☐	2824	RPM	2802	RPM	
+12V	☒	☐	☐	12.096V		12.01V		
+5V	☒	☐	☐	5.180V		5.15V		
Vcore	☒	☐	☐	1.216V		1.21V		
3VSB	☒	☐	☐	3.408V		3.38V		
+3.3V	☒	☐	☐	3.392V		3.37V		
VBAT	☒	☐	☐	3.120V		3.07V		

5.3. 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
							Pass	Fail	N/A	
Battery leakage	3.02	V	4.0	uA	6.42	years	☒	☐	☐	

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

6. Time Accuracy Test

6.1. System Clock & RTC Clock Test

Under Room Temperature: 26 ºC

Item Function	Time Interval	Criteria	Actual		Result			Note
					Pass	Fail	N/A	
RTC Clock in Power On Mode	24 hrs	+/-2 sec	+1	Sec	☒	☐	☐	
RTC Clock in Power Off Mode	24 hrs	+/-2 sec	+1	Sec	☒	☐	☐	

6.2. Booting Timer Test

Installation	Actual		Note
System Booting Time	7.5	Sec	Press the Power Button till "Beep" Sound appears

6.3. Watchdog Timer Test

Use Function as below:

〔　〕No Support. Test with Hi-Safe20160811

Time-Out Interval	Margin for error	Actual		Result			Note
				Pass	Fail	N/A	
10 sec	+ / - 10 %	10.1	Sec	☒	☐	☐	
60 sec	+ / - 10 %	61	Sec	☒	☐	☐	
255 sec	+ / - 10 %	257	Sec	☒	☐	☐	

Note : Under Room Temperature: 26℃ / DOS Mode

7. O.S. Compatibility Test

7.1. English Ubuntu 16.04 Kernel 4.4.0-23-generic x86_64

〔 〕No Support
Driver Information:

Chipset Software	System default
Graphics Media	System default
Audio Driver	System default
LAN Driver <i211>	System default e1000e 3.2.6-K
LAN Driver <i219>	System default e1000e 3.2.6-K

Install OS to SATA HDD:

Installation	Result			Note
	Pass	Fail	N/A	
English Ubuntu 16.04 Kernel 4.4.0-23-generic x86_64	☒	☐	☐	Type uname –a AHCI

Test Result:

Test Item	Result			Note
	Pass	Fail	N/A	
Display Function Test				
VGA -- Full Screen	☒	☐	☐	2048*1152
DP -- Full Screen	☒	☐	☐	3840*2160
DP -- Full Screen	☒	☐	☐	3840*2160
DP -- Full Screen	☒	☐	☐	3840*2160
Multi-Display VGA+DP	☒	☐	☐	
Multi-Display VGA+DP+DP	☒	☐	☐	
Multi-Display DP+DP+DP	☒	☐	☐	
Network Function Test				
Connect to Internet – LAN 1	☒	☐	☐	I219
Connect to Internet – LAN 2	☒	☐	☐	I211
Audio Function Test				
Play Audio Function Test	☒	☐	☐	Play Audio Test
Base Function Test				
Mouse Test	☒	☐	☐	PS/2 USB
Keyboard Test	☒	☐	☐	PS/2 USB
USB 2.0 Removable Devices	☒	☐	☐	
USB3.0 Removable Devices	☒	☐	☐	
Console Test	☒	☐	☐	Support com1/com2 <minicom -s>
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
Halt	☒	☐	☐	Power Off Mode
ls / clear ……; cd /dev /ls –l	☒	☐	☐	Command instruction

7.2. Windows 7 Ultimate English Version 32/64Bit

〔 X 〕x32/64 Driver Information:

Chipset Software	Intel Chipset Device Software 10.1.1(06/03/2015)
Graphics Media	Intel HD Graphics 530 20.19.15.4474 (06/13/2016)
	Intel HD Graphics 530 20.19.15.4501 (08/11/2016)
Audio Driver	Realtek High Definition Audio 6.0.1.7541 (6/18/2015)
	Intel Display Audio 6.16.0.3197 (05/10/2016)
LAN Driver	Intel® Ethernet Connection I219-LM: 12.13.17.4 (06/18/2015)
	Intel® I211 Gigabit Network Connection: 12.13.27.0(6/05/2015)
ME Driver	Intel Management Engine Interface 11.0.0.1176 (12/24/2015)

Install OS to SATA HDD:

Installation	Result			Note
	Pass	Fail	N/A	
English Windows 7 Ultimate ACPI Mode	☒	☐	☐	32bit AHCI mode; (SATA M.2) 64bit AHCI mode (PCIe M.2)

Test Results:

Test Item		Result			Note
		Pass	Fail	N/A	
Single Display					
VGA -- Full Screen		☒	☐	☐	2048*1152
DP -- Full Screen		☒	☐	☐	3840*2160
DP -- Full Screen		☒	☐	☐	3840*2160
DP -- Full Screen		☒	☐	☐	3840*2160
Boot - Windows 7 Ultimate Advanced Options Menu					
Safe Mode		☒	☐	☐	
Basic Function Test					
Usable memory	32bit	2.89G	☒	☐	☐	BIOS control
	64bit:	32GB	☒	☐	☐	
PS/2 Mouse and Keyboard		☒	☐	☐	
USB Mouse and Keyboard		☒	☐	☐	
COM Port Mouse detect		☒	☐	☐	X2
TPM		☒	☐	☐	
USB Removable Devices	USB2.0	☒	☐	☐	X6
	USB3.0	☒	☐	☐	X4
	Safe to remove icon	☒	☐	☐	
LAN Function Test					
LAN1 --- Auto		☒	☐	☐	I219-LM
LAN2 --- Auto		☒	☐	☐	I211
Audio Function Test					
Line Out Test		☒	☐	☐	
Microphone Test		☒	☐	☐	
DP1 Audio line out		☒	☐	☐	
DP2 Audio line out		☒	☐	☐	
DP3 Audio line out		☒	☐	☐	
Start Menu					
Log off User		☒	☐	☐	
Shut down (S5)		☒	☐	☐	
Standby(S3)		☒	☐	☐	
Restart		☒	☐	☐	
Hibernate (S4)		☒	☐	☐	

7.3. Windows 8.1 Enterprise English Version 64Bit

〔 X 〕64 Driver Information:

Chipset Software	Intel Chipset Device Software 10.1.1(06/03/2015)
Graphics Media	Intel HD Graphics 530 20.19.15.4501 (08/11/2016)
Audio Driver	Realtek High Definition Audio 6.0.1.7541 (6/18/2015)
	Intel Display Audio 8.20.0.950 (06/27/2016)
LAN Driver	Intel® Ethernet Connection I219-LM: 12.13.17.4(06/18/2015)
	Intel® I211 Gigabit Network Connection: 12.14.7.0(06/18/2015)
ME Driver	Intel Management Engine Interface 11.0.0.1176 (12/24/2015)

Install OS to SATA HDD:

Installation	Result			Note
	Pass	Fail	N/A	
English Windows 8.1 Enterprise ACPI Mode	☒	☐	☐	64bit AHCI mode(UEFI)

Test Results:

Test Item		Result			Note
		Pass	Fail	N/A	
Single Display					
VGA -- Full Screen		☒	☐	☐	2048*1152
DP -- Full Screen		☒	☐	☐	3840*2160
DP -- Full Screen		☒	☐	☐	3840*2160
DP -- Full Screen		☒	☐	☐	3840*2160
Boot - Windows 8.1 Enterprise Advanced Options Menu					
Safe Mode		☒	☐	☐	
Basic Function Test					
Usable memory	64bit: 32GB	☒	☐	☐	
PS/2 Mouse and Keyboard		☒	☐	☐	
USB Mouse and Keyboard		☒	☐	☐	
COM Port Mouse detect		☒	☐	☐	
TPM		☒	☐	☐	
USB Removable Devices	USB2.0	☒	☐	☐	X6
	USB3.0	☒	☐	☐	X4
	Safe to remove icon	☒	☐	☐	
LAN Function Test					
LAN1 --- Auto		☒	☐	☐	I219-LM
LAN2 --- Auto		☒	☐	☐	I211
Audio Function Test					
Line Out Test		☒	☐	☐	
Microphone Test		☒	☐	☐	
DP1 Audio line out		☒	☐	☐	
DP2 Audio line out		☒	☐	☐	
DP3 Audio line out		☒	☐	☐	
Start Menu					
Log off User		☒	☐	☐	
Shut down (S5)		☒	☐	☐	
Standby(S3)		☒	☐	☐	
Restart		☒	☐	☐	
Hibernate (S4)		☒	☐	☐	

7.4. Windows 10 Enterprise English Version 64Bit

〔 X 〕64 Driver Information:

Chipset Software	Intel Chipset Device Software 10.1.1(06/03/2015)
Graphics Media	Intel HD Graphics 530 20.19.15.4501 (08/11/2016)
Audio Driver	Realtek High Definition Audio 6.0.1.7541 (6/18/2015)
	Intel Display Audio 8.20.0.950 (06/27/2016)
LAN Driver	Intel® Ethernet Connection I219-LM: 12.13.17.4(06/18/2015)
	Intel® I211 Gigabit Network Connection: 12.12.226.0(05/04/2015)
ME Driver	Intel Management Engine Interface 11.0.0.1176 (12/24/2015)

Install OS to SATA HDD:

Installation	Result			Note
	Pass	Fail	N/A	
English Windows 10 Enterprise V1607	☒	☐	☐	64bit RAID0 mode(UEFI)

Test Results:

Test Item	Result			Note
	Pass	Fail	N/A	
Single Display				
VGA -- Full Screen	☒	☐	☐	2048*1152
DP -- Full Screen	☒	☐	☐	3840*2160
DP -- Full Screen	☒	☐	☐	3840*2160
DP -- Full Screen	☒	☐	☐	3840*2160
Multi display	☒	☐	☐	
Basic Function Test				
Usable memory 64bit: 32GB	☒	☐	☐	
PS/2 Mouse and Keyboard	☒	☐	☐	
USB Mouse and Keyboard	☒	☐	☐	
COM Port Mouse detect	☒	☐	☐	
TPM	☒	☐	☐	
USB Removable Devices USB2.0	☒	☐	☐	X6
USB3.0	☒	☐	☐	X4
Safe to remove icon	☒	☐	☐	
LAN Function Test				
LAN1 --- Auto	☒	☐	☐	I219-LM
LAN2 --- Auto	☒	☐	☐	I211
Audio Function Test				
Line Out Test	☒	☐	☐	
Microphone Test	☒	☐	☐	
DP1 Audio line out	☒	☐	☐	
DP2 Audio line out	☒	☐	☐	
DP3 Audio line out	☒	☐	☐	
Start Menu				
Log off User	☒	☐	☐	
Shut down (S5)	☒	☐	☐	
Standby(S3)	☒	☐	☐	
Restart	☒	☐	☐	
Hibernate (S4)	☒	☐	☐	

8. BIOS Function Test

	Hardware Information with Windows 8.1 Enterprise English Version 32Bit Driver Version
CPU	Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)
Memory	Transcend DDR4 2133 8GB SEC K4A4G085WD
SATA HDD	Toshiba HDKPC05A0A02 S SATAIII 3.5" 500GB/7200rpm

8.1. Advanced Test

Test Item			Result			Note
			Pass	Fail	N/A	
CPU configuration	Hyper-threading		☒	☐	☐	Enable/Disable
	Virtualization Technology		☒	☐	☐	Enable/Disable
Trusted Computing	Security Device Support		☒	☐	☐	Enable/Disable
	TPM Clear		☒	☐	☐	
	Device Select		☒	☐	☐	
SATA configuration	SATA controller		☒	☐	☐	Enable/Disable
	AHCI mode		☒	☐	☐	
	RAID mode		☒	☐	☐	
AMT Configuration	Intel AMT		☒	☐	☐	Enable/Disable
S IO configuration	Serial port 1		☒	☐	☐	Enable/Disable
	RS232		☒	☐	☐	
	RS422		☒	☐	☐	
	RS485		☒	☐	☐	
	Serial port 2		☒	☐	☐	Enable/Disable
NCT6791D HW Monitor (Smart Fan Configuration)	CPU FAN	Manual Mode	☒	☐	☐	127: 2146rpm
		Disabled Mode	☒	☐	☐	4400rpm
		Auto CPU temp	☒	☐	☐	
		Auto Sys temp	☒	☐	☐	
	CHA FAN1	Manual Mode	☒	☐	☐	127: 2500 rpm
		Disabled Mode	☒	☐	☐	4500rpm
		Auto CPU temp	☒	☐	☐	
		Auto Sys temp	☒	☐	☐	
USB configuration	Legacy USB Support		☒	☐	☐	
Digital IO Port Configuration	DIO1~8		☒	☐	☐	Test under Dos and OS
Power Management	Power Mode	ATX	☒	☐	☐	
		AT	☒	☐	☐	
	Restore AC Power Loss	Power on	☒	☐	☐	
		Power Off	☒	☐	☐	
		Last State	☒	☐	☐	
S5 RTC Wake up	Wake system with Dynamic time		☒	☐	☐	
	Wake system with fixed time		☒	☐	☐	
LAN & Wakeup Configuration	Resume on PCIE/RI		☒	☐	☐	
	Resume on PME#		☐	☐	☒	
Case open warning	Enable / disable / clear		☒	☐	☐	

8.2. Chipset Test

Test Item			Result			Note
			Pass	Fail	N/A	
System Agent (SA) Configuration	Primary Display	Auto	☒	☐	☐	PEG>IGFX
		IGFX	☒	☐	☐	
		PEG	☒	☐	☐	
	Primary IGFX Boot Display	VBIOS Default	☒	☐	☐	Support primary and secondary IGFX Boot Display .
		CRT	☒	☐	☐	
		DP1	☒	☐	☐	
		DP2	☒	☐	☐	
		DP3	☒	☐	☐	
	Secondary IGFX Boot Display	Disable	☒	☐	☐	
		CRT	☒	☐	☐	
		DP1	☒	☐	☐	
		DP2	☒	☐	☐	
		DP3	☒	☐	☐	
	Memory Configuration		☒	☐	☐	
	PEG Port GEN speed		☒	☐	☐	Test with bear card
	Max TOLUD		☒	☐	☐	Dynamic/ 1G ~3.25G
PCH-IO Configuration	PCIe x4 (M.2 Slot) Speed		☒	☐	☐	Test with M.2 Kingston predator PCIe 240G GEN3:R/W= 1400MB/s ; 654MB/s GEN2:R/W= 1400MB/s ; 651MB/s GEN1:R/W= 859MB/s ; 653Mb/s
	HD Audio		☒	☐	☐	

8.3. Boot Test

Test Item	Result			Note
	Pass	Fail	N/A	
Quiet Boot	☒	☐	☐	
Launch PXE ROM	☒	☐	☐	
Boot From Hard Disk	☒	☐	☐	
Boot From CDROM	☒	☐	☐	
Boot From USB HDD	☒	☐	☐	
Boot From USB Floppy	☒	☐	☐	
Boot From USB CD-ROM	☒	☐	☐	
Boot from LAN	☒	☐	☐	
Disable	☒	☐	☐	Not support disable UEFI boot manager.

8.4. CMOS Backup / Clear CMOS Test

Test Item	Result			Note
	Pass	Fail	N/A	
CMOS Backup	☒	☐	☐	Clear all setting
Clear CMOS Test	☒	☐	☐	Clear all setting

8.5. AAEON Tag Check Utility

Test Item	Result			Note
	Pass	Fail	N/A	
Check AAEON BIOS OK	☒	☐	☐	AONCHECK.EXE

8.6. Supervisor / User Password Test

Test Item	Result	Note

	Pass	Fail	N/A	
Administrator Password	☒	☐	☐	
User Password	☒	☐	☐	

8.7. Hi-safe Test

Test Item		Result			Note
		Pass	Fail	N/A	
Version(20160811)		☒	☐	☐	E17AA
System Information	CPU Information	☒	☐	☐	
	Model Name	☒	☐	☐	
	Display Information	☒	☐	☐	
	RAM Information	☒	☐	☐	
H/W Monitor	Info	☒	☐	☐	
	Fan Speed	☒	☐	☐	
	Temperature	☒	☐	☐	
	Voltage	☒	☐	☐	
DIO	DIO1~4 High	☒	☐	☐	
	DIO1~4 Low	☒	☐	☐	
	DIO5~8 High	☒	☐	☐	
	DIO5~8 Low	☒	☐	☐	
WatchDog	10sec	☒	☐	☐	
	1min	☒	☐	☐	
	255sec	☒	☐	☐	
	Auto Reload	☒	☐	☐	
SMBus	SMBus IO	☒	☐	☐	SMBus Address 0xF040
	Read Byte	☒	☐	☐	Slave Address A0h,A4h
	Read Word	☒	☐	☐	
	Result / Read	☒	☐	☐	
Smart FAN	Chipset	☒	☐	☐	
	Fan Speed	☒	☐	☐	CPU, SYS,
	Temperature	☒	☐	☐	
	Speed control	☒	☐	☐	
	Off Speed TMP	☒	☐	☐	
	Full Speed TMP	☒	☐	☐	

8.8. Hi-Manager Test

Test Item		Result			Note
		Pass	Fail	N/A	
Version(20150205)		☒	☐	☐	
Power control	Power on	☒	☐	☐	
	Power off	☒	☐	☐	
	Reset	☒	☐	☐	
	Power on from G3 state	☒	☐	☐	
Group Management		☒	☐	☐	
Event log		☒	☐	☐	
Alarm Clock	Set Alarm Time	☒	☐	☐	
	Recurring Alarm	☒	☐	☐	
Remote Recovery	Remote Reboot	☒	☐	☐	
	Reboot from CD ROM				
	Reboot from ISO				
	Reboot to BIOS				
KVM		☒	☐	☐	Test with i5-6550 RealVNC →VNC-viewer-5.05

Schedule	☒	☐	☐	

8.9. Negative Test

8.9.1 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	☒	☐	☐	

8.9.2 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 can work properly.	RS232/422/485	☒	☐	☐	
	DIO	☒	☐	☐	
	SmartFan	☒	☐	☐	
	LVDS Backlight control	☐	☐	☒	
	USB ports	☒	☐	☐	
	DP Audio	☒	☐	☐	

8.9.3 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.	☒	☐	☐	

9. Performance Test

	Hardware Information with Windows 8.1 Enterprise English Version 64 Bit Driver Version
CPU	Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)
Memory	DSL DDR4 2133 8GB SEC K4A4G085WD *2pcs
SATA HDD	Seagate Z2AK5KEE SATAIII 3.5" 500GB/7200rpm

9-1. Performance Test

Test Result: (Display set 1920*1080 test)

Testing Software	Scope		Note
	AAEON	Ref.	
PCMark2005			Windows 7
PCMark	11058	-	
CPU	16220	-	
Memory	12994	-	
Graphics	4078	-	PCMarks
HDD	7351	-	
Benchmark (B)	-		
Average Efficiency	-		
PCMark Vantage			
PCMarks	13493	-	
Memories	7242	-	
TV and Movies	N/A	-	
Gaming	9400	-	
Music	9935	-	
Communications	21741	-	PCMarks
Productivity	9599	-	
HDD	5175	-	
Benchmark (B)	-		
Average Efficiency	-		

Testing Software	Scope		Note
	AAEON	Ref.	
CPUmark99			Windows 8.1
CPU mark99	719	-	

Testing Software	Scope		Note
	AAEON	Ref.	
3Dmark2006 v120			Windows 8.1
3Dmark Score	10420	-	
SM2.0 Score	3603	-	
HDR/SM3.0 Score	4057	-	
CPU Score	8320	-	
Benchmark (B)	-		
Average Efficiency	-		
3Dmark Vantage			Windows 8.1

3Dmark SCORE	P7874	-	
GPU Score	6331		
CPU Score	29255	-	
3Dmark11 Professional Edition			Windows 8.1
Extreme 1920*1080			
3Dmark 11Score	X501	-	
Graphics Score	441	-	
Physics Score	9287	-	
Combined Score	585	-	
Performance 1280*720			
3Dmark 11Score	P1944	-	
Graphics Score	1678	-	
Physics Score	9772	-	
Combined Score	1927	-	
Entry 1024*600			
3Dmark 11Score	E3546	-	
Graphics Score	3139	-	
Physics Score	9747	-	
Combined Score	2603	-	

Testing Software	**Scope**		**Note**
	AAEON	**Ref.**	
Performance Test 7.0			
PassMark Rating	2467.7	-	
CPU Mark	12113.9	-	
2D Graphics Mark	445.0	-	
3D Graphics Mark	962.4	-	
Memory Mark	4278.1	-	
Disk Mark	882.2	-	
CD Mark	N/A	-	

SATA Performance				
SATA HDD	Intel 520 120GB SSD (AHCI mode)			
M.2(SATA)	Transcend TS256GMTS800 256GB			
M.2(PCI-e 4X)	Kingston Predator PCIe 240G			
CPU	Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)			
Memory	DSL DDR4 2133 8GB SEC K4A4G085WD *2			
OS	Windows8.1 Pro 64bit			
Item	Comment / (unit)	Software	Score	Note
SATA3 (SATA3_6G_1)	Maximum Write	ATTO Disk Benchmark	493.674 MB/s	
	Maximum Read	ATTO Disk Benchmark	546.588 MB/s	
SATA3 (SATA3_6G_2)	Maximum Write	ATTO Disk Benchmark	513.752 MB/s	
	Maximum Read	ATTO Disk Benchmark	546.588 MB/s	
M.2 (SATA3_6G)	Maximum Write	ATTO Disk Benchmark	318.806 MB/s	
	Maximum Read	ATTO Disk Benchmark	547.729M B/s	

M.2 (PCI-e 4X)	Maximum Write	ATTO Disk Benchmark	653.1 MB/s	
	Maximum Read	ATTO Disk Benchmark	1487.7 MB/s	

USB3.0/2.0 Performance				
USB Flash	Sony USB3.0 32GB			
Item	Comment / (unit)	Software	Transfer Rate (MB/s)	Note
USB3.0 (USB port 1)	Maximum Read	ATTO Disk Benchmark	181.1 MB/s	
	Maximum Write	ATTO Disk Benchmark	40.5 MB/s	
USB3.0 (USB port 2)	Maximum Read	ATTO Disk Benchmark	176.3 MB/s	
	Maximum Write	ATTO Disk Benchmark	59.5 MB/s	
USB3.0 (USB port 3)	Maximum Read	ATTO Disk Benchmark	180.2 MB/s	
	Maximum Write	ATTO Disk Benchmark	41.0 MB/s	
USB3.0 (USB port 4)	Maximum Read	ATTO Disk Benchmark	180.2 MB/s	
	Maximum Write	ATTO Disk Benchmark	37.9 MB/s	
USB2.0 (USB port 5)	Maximum Read	ATTO Disk Benchmark	39.2 MB/s	
	Maximum Write	ATTO Disk Benchmark	25.0 MB/s	
USB2.0 (USB port 6)	Maximum Read	ATTO Disk Benchmark	38.9 MB/s	
	Maximum Write	ATTO Disk Benchmark	24.0 MB/s	
USB2.0 (USB port 7)	Maximum Read	ATTO Disk Benchmark	38.9 MB/s	
	Maximum Write	ATTO Disk Benchmark	24.9 MB/s	
USB2.0 (USB port 8)	Maximum Read	ATTO Disk Benchmark	39.2 MB/s	
	Maximum Write	ATTO Disk Benchmark	30.5 MB/s	
USB2.0 (USB port 9)	Maximum Read	ATTO Disk Benchmark	38.8 MB/s	
	Maximum Write	ATTO Disk Benchmark	20.6 MB/s	
USB2.0 (USB port 10)	Maximum Read	ATTO Disk Benchmark	38.8 MB/s	
	Maximum Write	ATTO Disk Benchmark	24.9 MB/s	

10. Negative Test

10.1. Run In Test

Under Room Temperature: 26 ºC

OS: Windows 8.1 Enterprise English 64bit

Test Item		Result			Note
		Pass	**Fail**	**N/A**	
Burn In Test V8.1(1015) Duty: 100 Time: over 12 hours <System should not error or hang during testing.>	CPU	☒	☐	☐	
	RAM	☒	☐	☐	
	COM	☒	☐	☐	X2
	Video	☒	☐	☐	
	2D	☒	☐	☐	
	3D	☒	☐	☐	
	Disk	☒	☐	☐	
	Sound	☒	☐	☐	
	Network	☒	☐	☐	
	Parallel	☒	☐	☐	
	USB 2.0	☒	☐	☐	X6
	USB 3.0	☒	☐	☐	X4

Note: COM PORT Speed Set to 115200.

10.2. Reboot Test

Under Room Temperature: 26 ºC

OS: Windows 8.1 Enterprise English 64bit

Test Tool: Passmark rebooter.exe

Test item	Result			Note
	Pass	**Fail**	**N/A**	
Reboot test for 1000 cycles <System should not error or hang during testing.>	☒	☐	☐	

10.3. ACPI G3 Cold Boot Test

Under Room Temperature:

OS: DOS

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. <loss rate: 0 /1000 times>	☒	☐	☐	☒BIOS select " power on" or ☐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>	☒	☐	☐	H/W [auto power button] need to set enable..

10.4. ACPI S5 Cold Boot Test

Under Room Temperature: 26 ºC

OS: Windows

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.

10.5. Memory Test

Under room temperature:

OS: DOS

Tool: Memtest86+ V5.01 above

Memory information: ADATA DDR4 2133 16GB x 2 AD4S2133316G15-BSSB SEC
K4A8G085WB.

Test item	Result			Note
	Pass	**Fail**	**N/A**	
Memory Test for 3 loops. < Memtest result should not error or hang..>	☒	☐	☐	

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