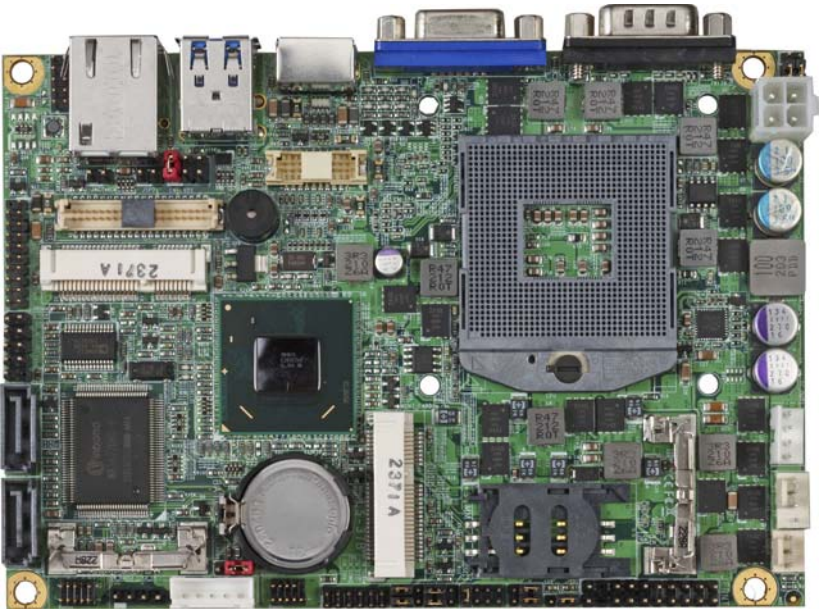


Product Test Report



Product Name	LS-37B
Product Version	A
Issued Date	2014.02.06
Report Edition	1.2
BIOS Version	1.0
Testing Engineer	PERRY
Check Engineer	JEFF

REVISION HISTORY

DATE	REVISION NO.	PAGE	DESCRIPTONS
2013.01.02	Ver. 1.0	63	Initial Release
2013.09.13	Ver. 1.1	64	Add PCI Express mini card data
2014.02.06	Ver. 1.2	65	Add Vibration Test

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1. Function test

1.1 Hardware function

Base Function Test

Item	Description	Result	Remark
1	Power Button	PASS	
2	Reset	PASS	
3	Power LED	PASS	
4	HDD LED	PASS	
5	SATA 1/2	PASS	
6	USB	PASS	
7	CN_USB1	PASS	
8	CN_USB3.0	PASS	
9	DDRIII	PASS	(Kingston 8G)
10	COM 1	PASS	(B&B BurnInTest 7.0 mouse)
11	CN_COM 2	PASS	(B&B BurnInTest 7.0 mouse)
12	VGA Port	PASS	
13	PS2	PASS	
14	CN_AUDIO	PASS	
15	CD_IN	PASS	
16	CN_DIO	PASS	(DOS)
17	CPUFAN	PASS	
18	SYSFAN	PASS	
19	MINICard 1/2	PASS	(MPX-574D2)
20	CN_DVI/DP	PASS	
21	CN_LVDS	PASS	
22	CN_INV	PASS	

23	LAN	PASS	
24	lrDA	PASS	
25	DC_IN	PASS	
26	DC_OUT	PASS	
27	RS422-485	PASS	

Jumper

Item	Description	Result
1	JRTC	PASS
2	JCSEL1	PASS
3	JCSEL2	PASS
4	JVLCD	PASS
5	JAT	PASS

1.2 BIOS function

Item	Description	Result	Remark
1	Press 'Del' to run Setup Utility	PASS	
2	Ctrl-Alt-Del – Soft-Reboot	PASS	
3	Save & Exit Setup	PASS	
4	Date & Time Setting	PASS	
5	NumLock	PASS	
6	Quick Boot	PASS	
7	Diagnostic Splash Screen	PASS	
8	Diagnostic Summary Screen	PASS	
9	Console Redirection	PASS	
10	View Error Manager Log	PASS	
11	Clear Error Manager Log	PASS	
12	Active Processor Cores	PASS	
13	Intel(R) HT Technology	PASS	
14	SATA Device	PASS	
15	Interface Combination	PASS	(IDE ∨ AHCI ∨ RAID ∨)
16	Max TOLUD	PASS	
17	DVMT Total Gfx Mem	PASS	
18	Boot Type	PASS	(CRT ∨ DVI ∨ LVDS ∨)
19	LCD Panel Type	PASS	(1280x1024)
20	Panel Color Depth	PASS	(24Bit)
21	EHCI1	PASS	
22	EHCI2	PASS	
23	USB Per-Port Disable Control	PASS	
24	Azalia	PASS	
25	PCH Internal LAN	PASS	

26	LAN OPROM Selection	PASS	
27	Wake on PCH LAN	PASS	
28	Intel(R) AMT	PASS	
29	Serial Port	PASS	
30	IR Func.	PASS	
31	Watch Dog Timer	PASS	
32	PowerLoss	PASS	Power on √ Power off √
33	CPU Warning Temp	PASS	
34	CPU Fan Feature	PASS	
35	Power On By RTC Alarm	PASS	
36	Set Supervisor Password	PASS	
37	Set User password	PASS	

1.3 Driver

CD Edition : IPCI5-1.0

1. Windows XP SP2 32-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	6.14.10.5421
3	Audio Driver	PASS	5.10.0.6083
4	LAN Driver	PASS	82579LM : 11.15.12.0

2. Windows XP SP2 64-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	6.14.10.5421
3	Audio Driver (Need UAA bus driver)	PASS	5.10.0.6083
4	LAN Driver	PASS	82579LM : 11.15.12.0

3. Windows Server 2003 32-bit Driver Test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	Audio Driver	PASS	5.10.0.6083
3	LAN Driver	PASS	82579LM : 11.15.12.0

4. Windows Server 2003 64-bit driver test

Item	Description	Result	Version
1	Chipset Driver	PASS	9.3.0.1011
2	Audio Driver	PASS	5.10.0.6083
3	LAN Driver	PASS	82579LM : 11.15.12.0

5. Windows Vista 32-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	9.17.10.2875
3	Audio Driver	PASS	6.0.1.6083
4	LAN Driver	PASS	82579LM : 12.2.45.0

6. Windows Vista 64-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	9.17.10.2875
3	Audio Driver	PASS	6.0.1.6083
4	LAN Driver	PASS	82579LM : 12.2.45.0

7. Windows Server 2008 32-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	Audio Driver	PASS	6.0.1.6083
3	LAN Driver	PASS	82579LM : 12.2.45.0

8. Windows Server 2008 64-bit driver test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	Audio Driver	PASS	6.0.1.6083
3	LAN Driver	PASS	82579LM : 12.2.45.0

9. Windows 7 32-bit Driver Test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	9.17.10.2875
3	Audio Driver	PASS	6.0.1.6083
4	LAN Driver	PASS	82579LM : 12.2.45.0
5	USB 3.0 Driver	PASS	1.0.5.235

10. Windows 7 64-bit Driver Test

Item	Description	Result	version
1	Chipset Driver	PASS	9.3.0.1011
2	VGA Driver	PASS	9.17.10.2875
3	Audio Driver	PASS	6.0.1.6083
4	LAN Driver	PASS	82579LM : 12.2.45.0
5	USB 3.0 Driver	PASS	1.0.5.235

2. Compatibility test

2.1 CPU Test

Test environment:

OS Windows XP professional SP2

Test program : PC MARK 2005

Spec Code	CPU Speed	Family	Processor	DMI	Smart Cache	Result
SR0NP	2.30 GHz	Core	i7-3610QE	5 GT/s	6 MB	PASS
SR02T	2.10 GHz	Core	i7-2710QE	5 GT/s	6 MB	PASS
SR02U	2.50 GHz	Core	i5-2510E	5 GT/s	3 MB	PASS
SR0MZ	2.50 GHz	Core	i5-3210M	5 GT/s	3 MB	PASS
SR02V	2.20 GHz	Core	i3-2330E	5 GT/s	3 MB	PASS
SH0WM	2.40 GHz	Core	i3-3120ME	5 GT/s	3 MB	PASS

2.2 Operation System Test

Item	Description	Result	Remark
1	Windows 7 64-bit	PASS	
2	Windows 7 32-bit	PASS	
3	Windows Server 2008 64-bit	PASS	
4	Windows Server 2008 32-bit	PASS	
5	Windows Vista 64-bit	PASS	
6	Windows Vista 32-bit	PASS	
7	Windows XP SP2 64-bit	PASS	
8	Windows XP SP2 32-bit	PASS	
9	Windows Server 2003 64-bit	PASS	
10	Windows Server 2003 32-bit	PASS	

2.3 Memory Test

Test environment:

OS Windows XP professional SP2

Test program : PC MARK 2005

Manufacturer	Chip	Frequency	Capacity Mbytes	Result
Kingston	ELPIDA J4208BBBG-GN-F	DDR3 1600	8 GB	PASS
Kingston	Kingston D2568JPUCPGD9U	DDR3 1333	4 GB	PASS
ADATA	ELPIDA J1108BDBG-DJ-F	DDR3 1066	1GB	PASS
ADATA	Hynix H5TQ1G83AFP-G7C	DDR3 1066	2 GB	PASS
Transcend	SEC 813 HCF8 K4B1G0846D	DDR3 1066	1GB	PASS
Transcend	SEC 843 HCH9 K4B1G0846D	DDR3 1066	2GB	PASS

2.4 VGA Graphic Quality Test

Test environment:

OS Windows XP professional SP2 32/64-bit

Driver version :

Resolution	Color	Result	Remark
800*600	16 / 32bit	PASS	
1024*768	16 / 32bit	PASS	
1152*864	16 / 32bit	PASS	
1280*600	16 / 32bit	PASS	
1280*720	16 / 32bit	PASS	
1280*768	16 / 32bit	PASS	
1280*800	16 / 32bit	PASS	
1280*960	16 / 32bit	PASS	
1280*1024	16 / 32bit	PASS	
1360*768	16 / 32bit	PASS	
1366*768	16 / 32bit	PASS	
1400*1050	16 / 32bit	PASS	
1440*900	16 / 32bit	PASS	
1600*900	16 / 32bit	PASS	
1680*1050	16 / 32bit	PASS	
1792*1344	16 / 32bit	PASS	
1856*1392	16 / 32bit	PASS	
1920*1080	16 / 32bit	PASS	

2.5 Audio

Test environment:

OS Windows XP professional SP2 32-bit

Driver version : 5.10.0.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows XP professional SP2 64-bit

Driver version : 5.10.0.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows Server 2003 32-bit

Driver version : 5.10.0.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows Server 2003 64-bit

Driver version : 5.10.0.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows Vista 32 bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows Vista 64 bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
4	CDIN	PASS	

OS Windows Server 2008 32-bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows Server 2008 64-bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows 7 32-bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

OS Windows 7 64-bit

Driver version : 6.0.1.6083

Item	Description	Result	Remark
1	2 CH	PASS	
2	Microphone	PASS	
3	CDIN	PASS	

2.6 HDD Test

Test environment:

OS Windows XP professional SP2

Model	Interface	Capacity	Size Detect	Data Transfer
Western Digital WD10EALX-009BA0	SATA	1.0 TB	PASS	PASS
Western Digital WD3200AAJS-00YZCA0	SATA	320 GB	PASS	PASS
Western Digital WD5000AAKX-001CA0	SATA	500 GB	PASS	PASS
Western Digital WD5000AAKS-00V1A0	SATA	500 GB	PASS	PASS

2.7 CD-ROM Test

Test environment:

OS Windows XP professional SP2

Model	Interface	Detect	Data Transfer	Play CD
LG DVD GH20NS15	SATA	PASS	PASS	PASS
ASUS DRW-24D1ST	SATA	PASS	PASS	PASS
MATSHITA BD-CMB UJ-120	USB	PASS	PASS	PASS
LITEON DVD ETAU108	USB	PASS	PASS	PASS

2.8 USB device Test

1. Windows XP SP2 32/64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
CD ROM	PASS	
USB Mass storage	PASS	

2. Windows Server 2003 32/64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
CD ROM	PASS	
USB Mass storage	PASS	

3. Windows Vista 32/64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
CD ROM	PASS	
USB Mass storage	PASS	

4. Windows Server 2008 32/64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
CD ROM	PASS	
USB Mass storage	PASS	

5. Windows 7 32/64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
CD ROM	PASS	
USB Mass storage	PASS	
USB 3.0	PASS	

2.9 Serial Port Test

1. MS-DOS

Item	Description	Result	Remark
1	RS-422 & RS-485	PASS	
2	CHKIT	PASS	

2. Windows XP SP2 32-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	
3	b&b com port test	PASS	

3. Windows XP SP2 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

4. Windows Server 2003 32-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	
3	b&b com port test	PASS	

5. Windows Server 2003 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

6. Windows Vista 32-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

7. Windows Vista 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

8. Windows Server 2008 32-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	
3	b&b com port test	PASS	

9. Windows Server 2008 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

10. Windows 7 32-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

11. Windows 7 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

2.10 PS2 Keyboard 、 Mouse Test

1. MS-DOS

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

2. Windows XP SP2 32/64-bit

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

3. Windows Server 2003 32/64-bit

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

4. Windows Vista 32/64-bit

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

5. Windows server 2008 32/64-bit

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

6. Windows 7 32/64-bit

Item	Description	Result	Remark
1	Keyboard LED Status Test	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

2.11 LAN Test

Data Transfer Test environment:

-CAT 6 UTP 100M

-8 HR. continuous

1. Windows XP SP2 32/64-bit

32-bit driver version : 11.15.12.0 ; 64-bit driver version : 11.15.12.0

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

2. Windows Server 2003 32/64-bit

32-bit driver version : 11.15.12.0 ; 64-bit driver version : 11.15.12.0

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

3. Windows Vista 32/64-bit

32-bit driver version : 12.2.45.0 ; 64-bit driver version : 12.2.45.0

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

4. Windows Server 2008 32/64-bit

32-bit driver version : 12.2.45.0 ; 64-bit driver version : 12.2.45.0

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

5. Windows Server 7 32/64-bit (System's original driver)

32-bit driver version : 12.2.45.0 ; 64-bit driver version : 12.2.45.0

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

2.12 Power Supply Test

Item	TYPE	Description	Result	Remark
1	Adapter	LI SHIN 0227B19120 120W	PASS	
2	ATX Power	SWITCHING POWER SUPPLY MC-B350ATX	PASS	
3	ATX Power	snake PT-300W 300W	PASS	
4	DC Power	GWINSTEK SPS-3610	PASS	

2.13 PCI Express mini card

Motherboard	PCI Express mini card	Result	Remark
LS-37B	MPX-574D	PASS	
	MPX-574D2	PASS	
	MPX-643	PASS	
	MPX-750	PASS	
	MPX-827	PASS	
	MPX-885	PASS	
	MPX-954	PASS	
	MPX-2515	PASS	
	MPX-3132	PASS	
	MPX-5201	PASS	
	MPX-6864	PASS	
	MPX-7202	PASS	
	MPX-9125	PASS	
	MPX-24794G2	PASS	
	MPX-25858	PASS	
	MPX-TP4R	PASS	
MPX-SDVOD	PASS	ONLY MINI_CARD 1	

Attention: MPX-3132 needs to into BIOS setting

=> Advanced => South Bridge Configuration

=> SB PCI Express Config

=> PCI Express Root Port 3&5

=> PCIe Speed [Gen1]

Then load driver to usb floppy from

<http://www.siliconimage.com/support/>

Motherboard	PCI Express mini card	Result	Remark
LS-37BS	MPX-574D	PASS	ONLY MINI_CARD 1
	MPX-574D2	PASS	ONLY MINI_CARD 1
	MPX-643	PASS	ONLY MINI_CARD 1
	MPX-750	PASS	ONLY MINI_CARD 1
	MPX-827	PASS	
	MPX-885	PASS	ONLY MINI_CARD 1
	MPX-954	PASS	ONLY MINI_CARD 1
	MPX-3132	PASS	ONLY MINI_CARD 1
	MPX-5201	PASS	ONLY MINI_CARD 1
	MPX-6864	PASS	ONLY MINI_CARD 1
	MPX-7202	PASS	ONLY MINI_CARD 1
	MPX-9125	PASS	ONLY MINI_CARD 1
	MPX-24794G2	PASS	
	MPX-25858	PASS	ONLY MINI_CARD 1
	MPX-TP4R	PASS	
MPX-SDVOD	PASS	ONLY MINI_CARD 1	

Attention: MPX-3132 needs to into BIOS setting

=> Advanced => South Bridge Configuration

=> SB PCI Express Config

=> PCI Express Root Port 3

=> PCIe Speed [Gen1]

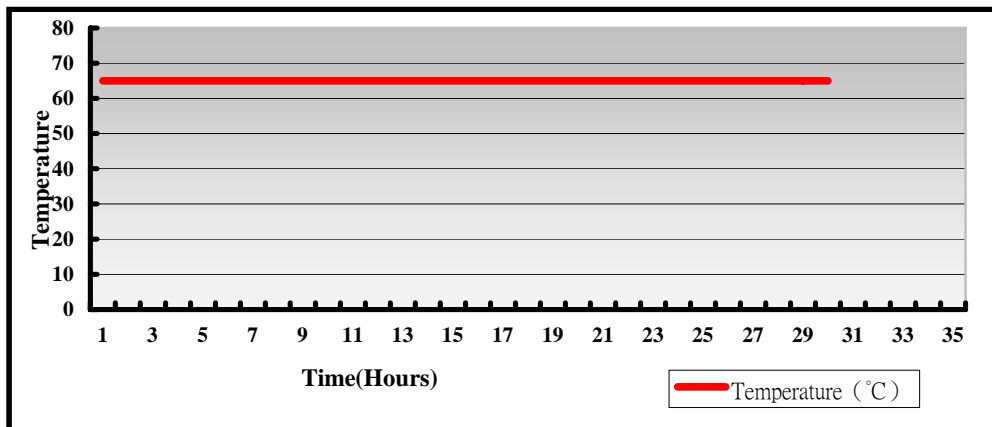
Then load driver to usb floppy from

<http://www.siliconimage.com/support/>

3. Environmental test

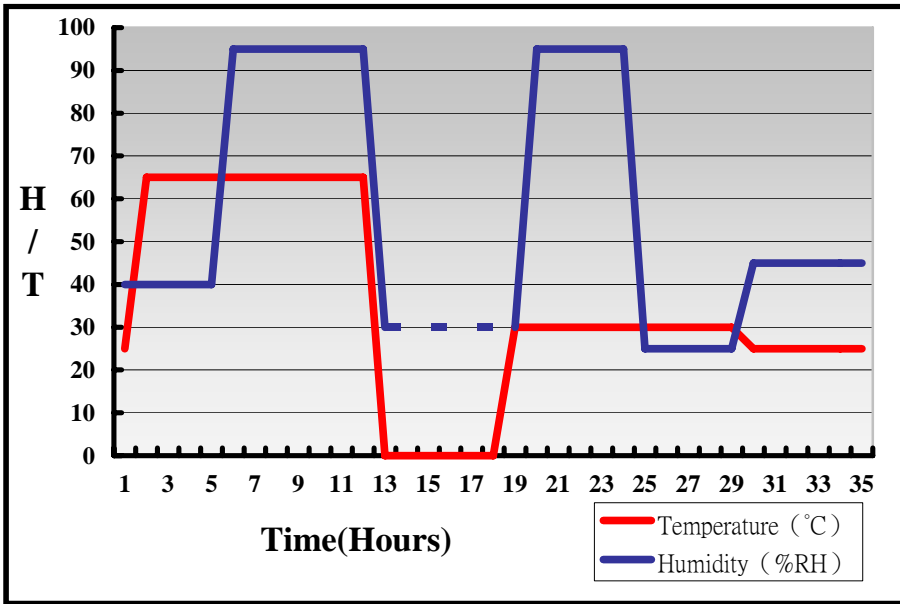
3.1 Temperature Test

System Board	LS-37B
CPU	Intel® Core™ i7-3610QE 2.30GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Western Digital WD10EALX-009BA0 1.0TB
Operating OS	Windows XP
Test Equipment	GIANT FORCE (GTH-150-60-CP-AR)
Test Program	3DMark 2003+Prime95-266



Hardware Device list:

System Board	LS-37B
CPU	Intel® Core™ i7-3610QE 2.30GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Western Digital WD10EALX-009BA0 1.0TB
Operating OS	Windows XP
Test Equipment	GIANT FORCE (GTH-150-60-CP-AR)
Test Program	3DMark 2003+Prime95-266



Definition : When the temperature is 30 degrees below arrive, humidity measurements have not, so by the dashed line express.

Boot Up Test:

Hardware Device list:

System Board	LS-37B
CPU	Intel® Core™ i7-3610QE 2.30GHz
Memory	Kingston DDR3 1600 4GB (Kingston D2568JPUCPGD9U)
HDD	Western Digital WD10EALX-009BA0 1.0TB

Temperature	Result	Remark
65°C	PASS	50 Times
-20°C	PASS	50 Times

3.2 Thermal measurements at various points on the board

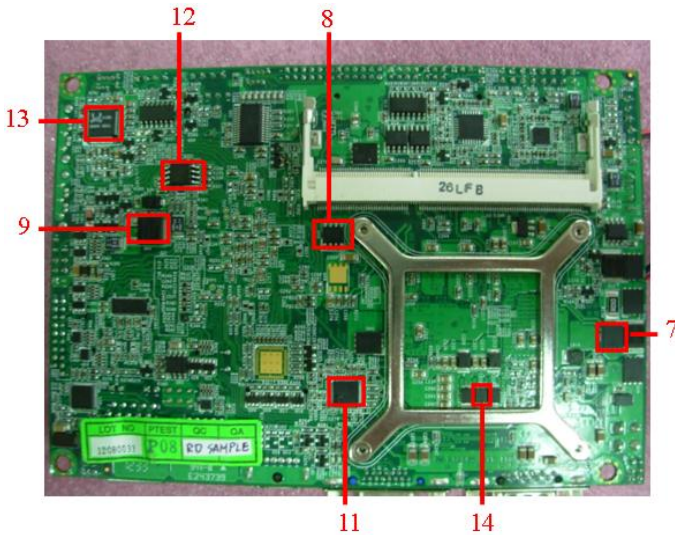
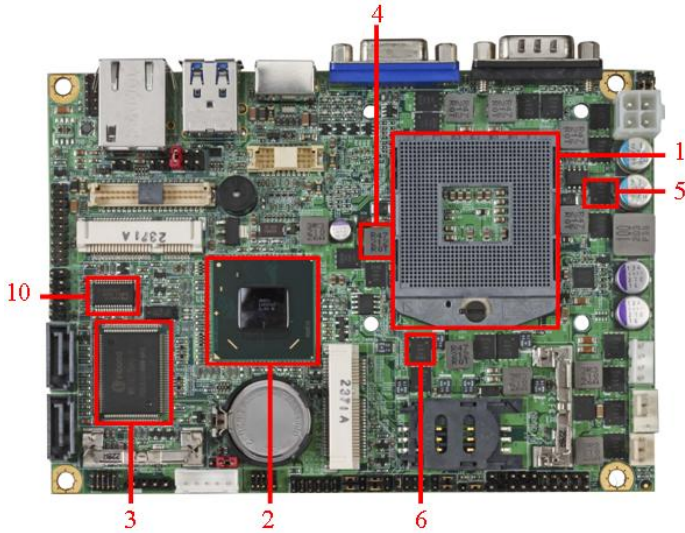
Test Environment :

CPU	Intel® Core™ i7-3610QE 2.30GHz
Memory	Kingston DDR3 1600 4GB (Kingston D2568JPUCPGD9U)
HDD	Western Digital WD5000AAKX-221CA0 500GB
Power	SWITCHING POWER SUPPLY MC-B350ATX
Operating System	Windows XP SP2 32-bit
Test Program	3DMark 2003 + Prime 95-266

Test Result:

Item	Environmental temperature	26°C
1	CPU	71°C
2	PCH(QM77)	50.8°C
3	LPCIO	45.7°C
4	L7	48.8°C
5	Q8	59.8°C
6	Q17	62.1°C
7	Q40	56.3°C
8	Q49	63.3°C
9	Q64	54.8°C
10	U9	48.5°C
11	U15	53.6°C

12	U25	51.7°C
13	U28	60.5°C
14	C219	61.4°C



4. Reliability Test

4.1 Power Consumption Test

1. Test Environment:

Motherboard	LS-37B
CPU	Intel® Core™ i7-2710QE 2.10GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Solid State Disk 2.5" SATAII 32G (BIWIN)

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.56	30.72	6.97(2884)	83.64
19V	1.81	34.39	4.38(2891)	83.22

1.a. Test Environment:

The same as above but with LCD panel

Display Panel	AUO M170EG01 17"LCD
----------------------	----------------------------

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	4.42	53.04	8.98(2883)	107.76
19V	2.98	56.62	6.08(2859)	115.52

2.Test Environment:

Motherboard	LS-37B
CPU	Intel® Core™ i7-3610QE 2.30GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Solid State Disk 2.5" SATAII 32G (BIWIN)

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.77	33.24	6.05(4848)	72.6
19V	1.87	35.53	3.95(4875)	75.05

2.a.Test Environment:

The same as above but with LCD panel

Display Panel	AUO M170EG01 17"LCD
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Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	4.40	52.8	8.19(4832)	98.28
19V	2.99	56.81	5.30(4969)	100.7

3.Test Environment:

Motherboard	LS-37B
CPU	Intel® Core™ i5-2510E 2.50GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Solid State Disk 2.5" SATAII 32G (BIWIN)

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.53	30.36	4.98(5187)	59.76
19V	1.81	34.39	3.03(5175)	57.57

3.a.Test Environment:

The same as above but with LCD panel

Display Panel	AUO M170EG01 17"LCD
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Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	4.67	56.04	7.06(5204)	84.72
19V	3.15	59.85	4.52(5210)	85.88

4.Test Environment:

Motherboard	LS-37B
CPU	Intel® Core™ i5-3210M 2.50GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Solid State Disk 2.5” SATAII 32G (BIWIN)

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	1.92	23.04	4.45(6640)	53.4
19V	1.30	24.7	2.85(6613)	54.15

4.a.Test Environment:

The same as above but with LCD panel

Display Panel	AUO M170EG01 17”LCD
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Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	3.97	47.64	6.57(6580)	78.84
19V	2.64	50.16	4.23(6624)	80.37

5.Test Environment:

Motherboard	LS-37B
CPU	Intel® Core™ i3-3120ME 2.40GHz
Memory	Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
HDD	Solid State Disk 2.5” SATAII 32G (BIWIN)

Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.02	24.24	3.48(6412)	41.76
19V	1.30	24.7	2.23(6497)	42.37

5.a.Test Environment:

The same as above but with LCD panel

Display Panel	AUO M170EG01 17”LCD
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Power Supply : snake 350W(12V)

AC ADAPTER : LI SHIN 0227B19120(19V)

Voltage	MS-DOS Boot up		Win7(32Bit) 3DMARK 2003 + PRIME 95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	3.82	45.84	5.55(6437)	66.6
19V	2.58	49.02	3.59(6414)	68.21

5. Performance Test

5.1 Performance Test 8.0

Windows 7 x32

WEIGHTED SUITE	Test Environment	Result	Remark
Performance Test 8.0	Intel® Core™ I7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	Summary 1627.4 CPU Mark 5857 2D Graphics Mark 526 3D Graphics Mark 418.3 Memory Mark 1360 Disk Mark 883

Windows 7 x32

WEIGHTED SUITE	Test Environment	Result	Remark
Performance Test 8.0	Intel® Core™ I5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	Summary 1080.1 CPU Mark 3051 2D Graphics Mark 357.8 3D Graphics Mark 408.3 Memory Mark 1370 Disk Mark 914

Windows 7 x32

WEIGHTED SUITE	Test Environment	Result	Remark
Performance Test 8.0	Intel® Core™ I3-2330E 2.20GHz Kingston DDR3 1600 4GB (Kingston D2568JPUCPGD9U) Western Digital WD5000AAKX-221CA0 500GB	PASS	Summary 1010.7 CPU Mark 2165 2D Graphics Mark 348.0 3D Graphics Mark 249.7 Memory Mark 983 Disk Mark 840

5.2 3D MARK(2001 、 2003 、 2005)

Windows XP SP2 32-bit

WEIGHTED SUITE	Test Environment	Result	Remark
3DMARK2001 Score	Intel® Core™ I7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	16598
3DMARK2003 Score		PASS	4848
3DMARK2005 Score		PASS	6247

Windows XP SP2 32-bit

WEIGHTED SUITE	Test Environment	Result	Remark
3DMARK2001 Score	Intel® Core™ I5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	14475
3DMARK2003 Score		PASS	6640
3DMARK2005 Score		PASS	5792

Windows XP SP2 32-bit

WEIGHTED SUITE	Test Environment	Result	Remark
3DMARK2001 Score	Intel® Core™ i3-3120ME 2.40GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD5000AAKX-221CA0 500GB	PASS	13017
3DMARK2003 Score		PASS	6412
3DMARK2005 Score		PASS	5365

5.3 3D MARK2006

Windows XP SP2 32-bit

Item	WEIGHTED SUITE	Test Environment	Result	Remark
1	3DMARK Score	Intel® Core™ I7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	3473
2	SM2.0 Score		PASS	1000
3	HDR/SM3.0 Score		PASS	1455
4	CPU Score		PASS	5474

Windows XP SP2 32-bit

Item	WEIGHTED SUITE	Test Environment	Result	Remark
1	3DMARK Score	Intel® Core™ I5-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB	PASS	3199
2	SM2.0 Score		PASS	956
3	HDR/SM3.0 Score		PASS	1346
4	CPU Score		PASS	3472

Windows XP SP2 32-bit

Item	WEIGHTED SUITE	Test Environment	Result	Remark
1	3DMARK Score	Intel® Core™ i3-3120ME 2.40GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD5000AAKX-221CA0 500GB	PASS	3005
2	SM2.0 Score		PASS	908
3	HDR/SM3.0 Score		PASS	1273
4	CPU Score		PASS	2864

5.4 PC MARK2002

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	CPU Score	PASS	14006
2	Memory Score	PASS	54966
3	HDD Score	PASS	2839

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	CPU Score	PASS	13124
2	Memory Score	PASS	46449
3	HDD Score	PASS	2785

Test Environment

Intel® Core™ i3-3120ME 2.40GHz
Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)
Western Digital WD5000AAKX-221CA0 500GB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	CPU Score	PASS	10214
2	Memory Score	PASS	37694
3	HDD Score	PASS	2526

5.5 PC MARK2004

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP PS2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	N/A
2	CPU Score	PASS	N/A
3	Memory Score	PASS	14629
4	Graphic Score	PASS	6028
5	HDD Score	PASS	8110

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP PS2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	N/A
2	CPU Score	PASS	N/A
3	Memory Score	PASS	10874
4	Graphic Score	PASS	5727
5	HDD Score	PASS	8158

Test Environment

Intel® Core™ i3-3120ME 2.40GHz

Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)

Western Digital WD5000AAKX-221CA0 500GB

Windows XP PS2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	N/A
2	CPU Score	PASS	N/A
3	Memory Score	PASS	9543
4	Graphic Score	PASS	5218
5	HDD Score	PASS	6484

5.6 PC MARK2005

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	8324
2	CPU Score	PASS	11665
3	Memory Score	PASS	10802
4	Graphic Score	PASS	4294
5	HDD Score	PASS	8328

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	7505
2	CPU Score	PASS	9641
3	Memory Score	PASS	9541
4	Graphic Score	PASS	4005
5	HDD Score	PASS	8259

Test Environment

Intel® Core™ i3-3120ME 2.40GHz

Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)

Western Digital WD5000AAKX-221CA0 500GB

Windows XP SP2 32-bit

Item	Weighted Suite	Result	Remark
1	PCMark Score	PASS	6165
2	CPU Score	PASS	7743
3	Memory Score	PASS	8276
4	Graphic Score	PASS	3722
5	HDD Score	PASS	6937

5.7 AQUAMARK3

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	GFX	ASS	5388
2	CPU	PASS	17422
3	AquaMark3 TRISCORE	PASS	46673

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	GFX	PASS	5097
2	CPU	PASS	15402
3	AquaMark3 TRISCORE	PASS	43774

Test Environment

Intel® Core™ i3-3120ME 2.40GHz

Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)

Western Digital WD5000AAKX-221CA0 500GB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	GFX	PASS	4302
2	CPU	PASS	13396
3	AquaMark3 TRISCORE	PASS	37072

5.8 CINEBENCH

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	OpenGL	PASS	8.42 fps
2	CPU	PASS	5.06 pts

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	OpenGL	PASS	8.28 fps
2	CPU	PASS	2.72 pts

Test Environment

Intel® Core™ i3-3120ME 2.40GHz

Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)

Western Digital WD5000AAKX-221CA0 500GB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	OpenGL	PASS	7.37 fps
2	CPU	PASS	2.27 pts

5.9 ZD CPUMARK

Test Environment
Intel® Core™ i7-3610QE 2.30GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	SCORE	PASS	516

Test Environment
Intel® Core™ i5-3210M 2.50GHz Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F) Western Digital WD10EALX-009BA0 1.0TB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	SCORE	PASS	486

Test Environment

Intel® Core™ i3-3120ME 2.40GHz

Kingston DDR3 1600 8GB (ELPIDA J4208BBBG-GN-F)

Western Digital WD5000AAKX-221CA0 500GB

Windows XP SP2

Item	WEIGHTED SUITE	Result	Remark
1	SCORE	PASS	376

5.10 Storage Performance

5.10.1 HDD

Test environment:

OS Windows XP professional SP2

Program (HD Tune)

HDD Model	Interface	Capacity	Average	Burst Rate	Access time
Western Digital WD5000AAKX-221CA0	SATA	500 GB	100.7 MB/sec	164.3 MB/sec	15.6 ms
Western Digital WD10EALX-009BA0	SATA	1.0TB	102.8 MB/sec	152.8 MB/sec	12.9 ms
Solid State Disk 2.5" SATAII 32G (BIWIN)	SATA	32 GB	142.7 MB/sec	101.4 MB/sec	0.120 ms
USB 2.0 Flash Disk	USB	2 GB	15.3 MB/sec	15.6 MB/sec	7.59 ms
JetFlash Transcend	USB	16 GB	25.9 MB/sec	26.6 MB/sec	0.769 ms

OS Windows 7 (32Bit)

Program (HD Tune)

HDD Model	Interface	Capacity	Average	Burst Rate	Access time
Western Digital WD5000AAKX-221CA0	SATA	500 GB	100.5 MB/sec	160.7 MB/sec	15.6 ms
Western Digital WD10EALX-009BA0	SATA	1.0TB	99.3 MB/sec	160.7 MB/sec	13.8 ms
Solid State Disk 2.5" SATAII 32G (BIWIN)	SATA	32 GB	139.7 MB/sec	101.4 MB/sec	0.127 ms
USB 2.0 Flash Disk	USB	2 GB	15.5 MB/sec	15.7 MB/sec	7.58 ms
JetFlash Transcend	USB	16 GB	23.6 MB/sec	28.0 MB/sec	0.862 ms
Kingston DT HyperX3.0(64GB)	USB3.0	64 GB	245.3 MB/sec	130.3 MB/sec	0.502 ms

5.10.2 CD-ROM

Test environment:

OS Windows XP professional SP2

Program (NERO)

CD-ROM Model	Interface	Average Speed	Full Read	Burst Rate	CD
LG DVD GH20NS15	SATA	34.05 x	183 ms	37 MB/s	52 X CD-R
ASUS DRW-24D1ST	SATA	34.20 x	170 ms	41 MB/s	52 X CD-R
MATSHITA BD-CMB UJ-120	USB	18.08 x	263 ms	17 MB/s	52X CD-R
LITEON DVD ETAU108	USB	18.53 x	254 ms	16 MB/s	52X CD-R

5.11 Vibration Test

Motherboard	LS-37B_A by Rick			
Test Equipment	VS-5060L			
Amplitude	Degree	Frequency	Time (1min/1Time)	Result
0.75mm	40°	5 → 55 → 5 Hz	10	PASS
1.00mm	55°	5 → 55 → 5 Hz	10	PASS
1.25mm	70°	5 → 55 → 5 Hz	10	PASS
1.5mm	90°	5 → 55 → 5 Hz	10	PASS
1.5mm	90°	5 → 55 → 5 Hz	120	PASS