RSC-IMX51

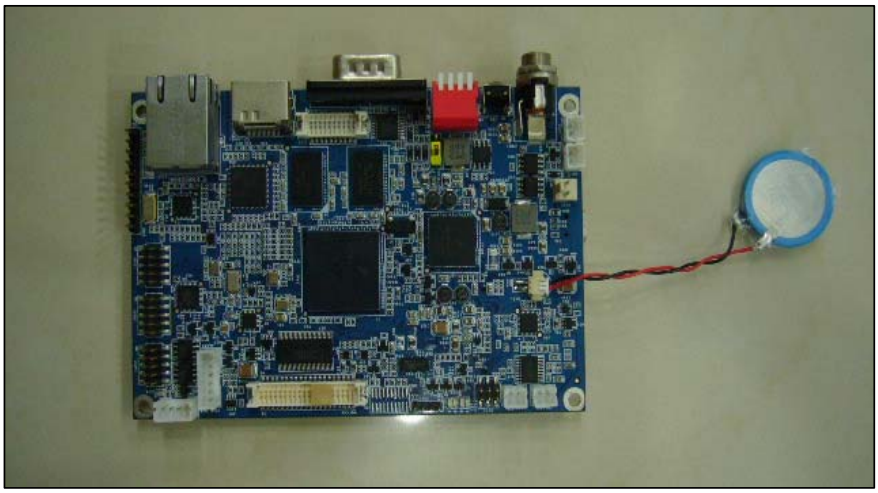
Function Test Plan/Report

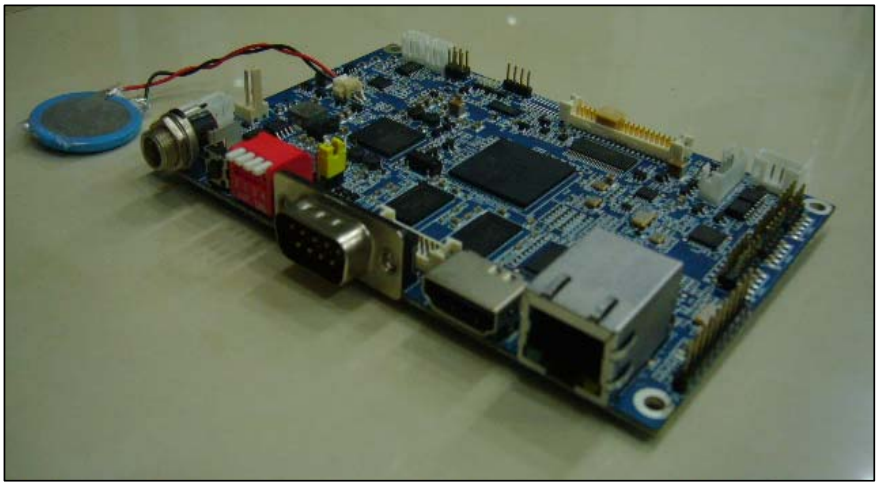
Initiated by	Linda Ren	**Job Title**	Engineer	**Originate Date**	2011/12/13
Reviewed by	Mars Lin	**Job Title**	Engineer	**Revision**	QQ4-014 Rev.B4
Approved by	Simon Lin	**Job Title**	Deputy Manager	**Release Status**	Preliminary Formal Release

Product Information

	Test Unit Information
Model	RSC-IMX51
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module
PCB version	A01
BIOS version	N/A
Product phase	EVT, DVT, PVT, Reversion, Supporting
Produced by	Linda Ren
Core Chipset	Freescale i.MX51
VGA Chipset	Freescale i.MX51
LAN1 chipset	SMSC LAN8710
Audio	Freescale SGTL5000
DRAM type	512MB DDR2 SDRAM onboard
CPU type	Freescale i.MX51 multimedia processor up to 800MHz
Test O.S.	Windows CE 6.0

Product image





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Item	Descriptions
Chapter 1: Hardware Function Test	
1.1 Bus Function Test	Function test card: ISA, PCI, PCI-E, mini PCI, Express,
1.2 Basic I/O Function Test	IDE , SATA, FDD, COM, LPT, USB, PS/2. CF, PCMCIA, Express, VGA..
1.3 Appearance / Buttons / Indicators Verification	power on, reset button, power on , HDD LED, speaker, key lock, PS/2 mini DIN, 5 mpin header, FAN, heatsink
1.4 VGA Function Test	Resolution check, Driver feature check
1.5 LAN Function Test 100Mbps	LAN indicator, WOL, Boot ROM, Auto negotiation, Cable length
Chapter 2: System stability Test	
2.1 Power On/Off, Boot and Timer Test	RTC timer, HCT System stress, Power on/off(ATX/AT mode), SW reset, HW reset
2.2 LAN Port Stress Test	LAN port Cahriot burn-in test
2.3 COM Port Stress Test	COM port 115200 Baud Rate Brun-in test
2.4 I/O Integrated Stress Test	PCI, IDE, SATA, USB full loading PASSMARK stress test

Chapter 3: Hardware Compatibility Test	
3.1 HDD/ODD Storage Compatibility Test	Various brand and capacity HDD, various CD-ROM, DVD-ROM test
3.2 Compact Flash Memory Card Compatibility Test	Various brand and capacity compct flash memory carrd test
3.3 LCD Display Compatibility Test	LCD Display
3.4 LAN Switch Compatibility Test	10/100/1000Base T LAN swutch
3.5 USB/1394 Compatibility Test	Various USB devices test(mouse, KB, WebCam, card reader, Printer, WLAN, FDD, HDD, DVD-ROM/RW, Flash disk,
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Chapter 4: Software Compatibility Test	
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Chapter 5: Reliability Test

5.1 Power Margin Test	Upper limit Middle value Low limit
5.2 Power interruption Test	100/200/500/1000ms
5.3 High Temperature Test	65℃/24hrs IEC 60068-2-2 Test:Bb
5.4 Low Temperature Test	-5℃/24hrs IEC 60068-2-1 Test:Ab
5.5 Temperature cycle test	-5℃~65℃ RH95% 8 cycles IEC 60068-2-14 Test:N
5.6 Power on cycle test	-5℃ / 1000times IEC 60068-2-1 Test:Ab
	65℃ / 1000times IEC 60068-2-2 Test:Bb
5.7 Storage test	-40℃ 24hrs 75℃/ RH95% 24hrs IEC 60068-2-3 Test:Ca
5.8 Random vibration test (operation)	1 PSD: 0.00454G²/Hz , 1.5 Grms 2 Operation mode 3 Test Frequency : 5-500Hz 4 Test Axis : X,Y and Z axis 5 30 min. per each axis 6 IEC 60068-2-64 Test:Fh
5.9 Package vibration test	1. PSD: 0.026G²/Hz , 2.16 Grms 2. Non-operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis
5.10 Package drop test	1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
5.11 Thermal and Capacitor Life time Calculation	1 Max. Loading at 60℃ 2 Capacitor life time calculation 3 IEC 60068-2-2 Test:Bb

** Notes: Test items and test contents depend on spec.

Summary

Item	Descriptions	Summary		
Chapter 1: Hardware Function Test		**PASS**	**FAIL**	**Limit.**
1.1 Basic I/O Function Test	IDE , SATA, FDD, COM, LPT, USB, PS/2. CF, PCMCIA, Express, VGA..	**23**	**0**	**0**
1.2 Appearance / Buttons / Indicators Verification	power on, reset button, power on , HDD LED, speaker, key lock, PS/2 mini DIN, 5 mpin header, FAN, heatsink	**25**	**0**	**0**
1.3 VGA Function Test	Resolution check, Driver feature check	**1**	**0**	**0**
1.4 LAN Function Test 100Mbps	LAN indicator, WOL, Boot ROM, Auto negotiation, Cable length	**4**	**0**	**0**
Chapter 2: System stability Test		**PASS**	**FAIL**	**Limit.**
2.1 Power On/Off, Boot and Timer Test	RTC timer, HCT System stress, Power on/off(ATX/AT mode), SW reset, HW reset	**2**	**0**	**0**

Basic IO Function Test

Test Engineer	Linda Ren	Date	2011/10/3	Pass	Fail	Limit.
Test Configuration				23	0	0

Item	Description			Description		
Model name	RSC-IMX51			EVT/DVT/PVT	EVT	
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	NA	BIOS version	NA			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)					
ODD type	N/A					
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program				Version		
Backplane	N/A			Version		
Produced by	Linda Ren					

I/O And Interface Function Test		Method	Test Stage	Result	Note/Issue ID
COM1(RS-232)		1. RSC-IMX51 URAT Test	EVT	Pass	
COM2(RS-232)			EVT	Pass	
COM2(RS-422)			EVT	Pass	
COM2(RS-485)			EVT	Pass	
USB1		can use any USB device	EVT	Pass	
USB2		can use any USB device	EVT	Pass	
USB3		can use any USB device	EVT	Pass	
USB4		can use any USB device	EVT	Pass	
Mini-USB connector		OTG	EVT	Pass	
Onboard 4GB MLC NAND flash with SD (eSDHC-1)		1.can read and write SDHC 2.Boot Drives	EVT	Pass	Boot Mode selector :0000
SD socket Support SDHC (eSDHC-2)		1.can read and write SDHC 2.Boot Drives	EVT	Pass	Boot Mode selector :0001
Graphic output	LVDS	Connect LVDS , display function well	EVT	Pass	
Graphic output	TTL Panel	TTL Panel , display function well	EVT	Pass	
Graphic output	HDMI	HDMI , display function well	EVT	Pass	
Touch Panel		Touch Panel function well	EVT	Pass	
GPIO (8 bit)			EVT	Pass	

Watchdog timer	Reset		EVT	Pass	
	Timer setting		DVT	Pass	
			DVT		
Audio Channel	2CH		EVT/DVT	Pass	
	Line in		EVT/DVT	Pass	
	MIC		EVT/DVT	Pass	
Play MP3 files			EVT/DVT	Pass	
Play MP4 files			EVT/DVT	Pass	

Appearance / Buttons / Indicators

Test Engineer	Linda Ren	Date	2011/10/4	Pass	Fail	Limit.
Test Configuration				25	0	0

Item	Description			Description	
Model name	RSC-IMX51			EVT/DVT/PVT	EVT
CPU type	Freescale i.MX51 multimedia processor up to 800MHz				
BIOS type	NA	BIOS version	NA		
DRAM type	512MB DDR2 SDRAM onboard				
Power type	FSP FSP060-DBAB1				
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave	
ODD type	NA			Master/Slave	
LAN Driver	SMSC LAN8710			Version	
VGA Driver	Freescale i.MX51			Version	
Audio Driver	Freescale SGTL5000			Version	
OS type	Windows CE 6.0			SP version	
Test program				Version	
Backplane	N/A			Version	
Produced by	Linda Ren				

Item	Comment	Test Stage	Result	Note/Issue ID
HW Reset	cause system reset	EVT	Pass	SW3
SW Reset	cause system reset	EVT	Pass	
CN27	Power on LED color check	EVT	Pass	
CN3	TTL Panel connector	EVT	Pass	
CN10	Touch Screen 4-wire Pin header	EVT	Pass	
CN19	Inverter Power connector & BL_PWM	EVT	Pass	
JHDMI1	HDMI connector	EVT	Pass	
JLVDS	LVDS Interface connector	EVT	Pass	
CN5	SD Card Socket	EVT	Pass	
CN7	Power on/off Switch connector	EVT	Pass	
JPWR1	12V DC-in Jack	EVT	Pass	
CN23	12V Input connector	EVT	Pass	
CN26	POE Module connector	EVT	Pass	
JPS1	AT mode setting by jumper short	EVT	Pass	
SW2	Boot Mode selector	EVT	Pass	
PWRSEL1	Power Model selector	EVT	Pass	
CN9	Serial Port 1 connector /DSUB 9-pin, Male	EVT	Pass	
JCOM1	Serial Port 2 connector / PH_5x2V, pitch 2.0mm	EVT	Pass	
JINV1	Panel Inverter	EVT	Pass	
CN12	Speaker_L connector	EVT	Pass	
CN13	Speaker_R connector	EVT	Pass	
CN14	Line_In, MIC connector	EVT	Pass	
CN28	I2C connector	EVT	Pass	
JIO1	GPIO Interface connector	EVT	Pass	
J1	Mini USB connector for Boot/Debug	EVT	Pass	

VGA

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				1	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT	EVT	
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	NA			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program				Version		
Backplane	N/A			Version		
Produced by	Linda Ren					

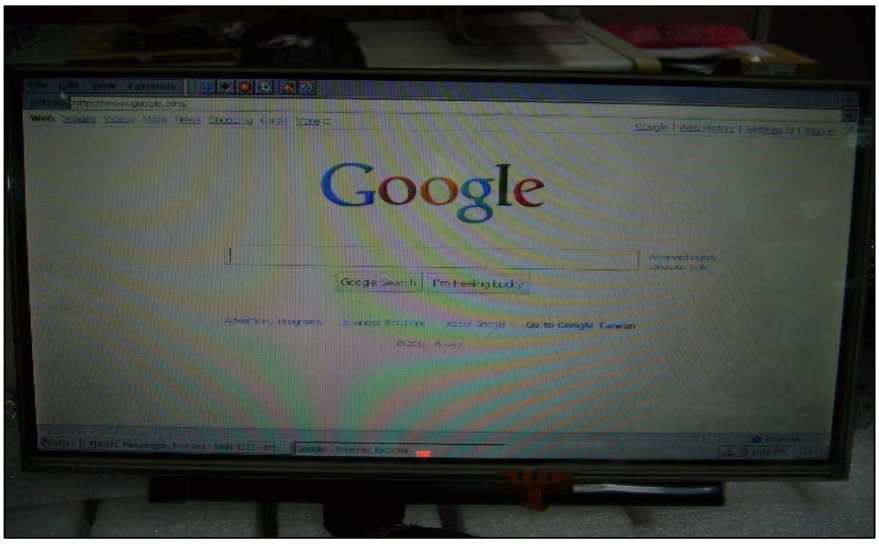
Item	Resolution	Comment	Test Stage	Result	Note/Issue ID
1280x720			DVT	Pass	

100 LAN Function

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test configuration				4	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT	EVT	
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	NA			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program	NetIQ Chariot			Version		
Backplane	NA			Version		
Produced by	Linda Ren					

LAN indicators	Color	Comment	Result	
LAN1 indicator	LED1	Flash for Active/Link	Pass	
	LED2	Speed	Pass	

Extended Function	Comment				
DHCP IP (From DQV Server)	LAN1			Pass	
Internet	LAN1			Pass	



Stability Test

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test configuration				2	0	0

Item	Description			Description	
Model name	RSC-IMX51			EVT/DVT/PVT	EVT
CPU type	Freescale i.MX51 multimedia processor up to 800MHz				
BIOS type	N/A	BIOS version	N/A		
DRAM type	512MB DDR2 SDRAM onboard				
Power type	FSP FSP060-DBAB1				
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave	
ODD type	N/A			Master/Slave	
LAN Driver	SMSC LAN8710			Version	
VGA Driver	Freescale i.MX51			Version	
Audio Driver	Freescale SGTL5000			Version	
OS type	Windows CE 6.0			SP version	
Test program				Version	
Backplane	N/A			Version	
Produced by	Linda Ren				

Power On/Off and Boot Test

Item	Comment	details		Test Stage	Result	Note/Issue ID
Power On/Off test (AT mode)	With battery		booting rate =100%	EVT/DVT	Pass	test at room temperature for 1000 duration cycles
H/W Reset test (by reset button)	H/W reset		booting rate =100%	EVT/DVT	Pass	test at room temperature for 10 duration cycles

RSC-IMX51

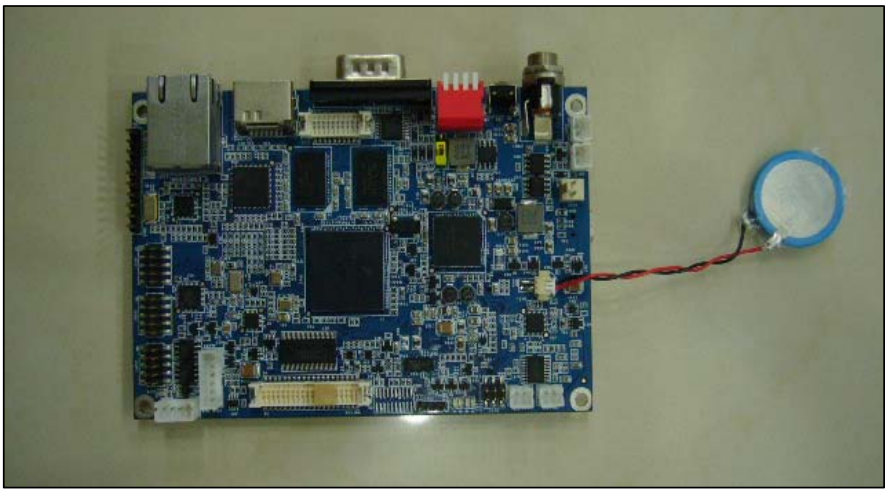
Hardware Compatibility Test Plan/Report

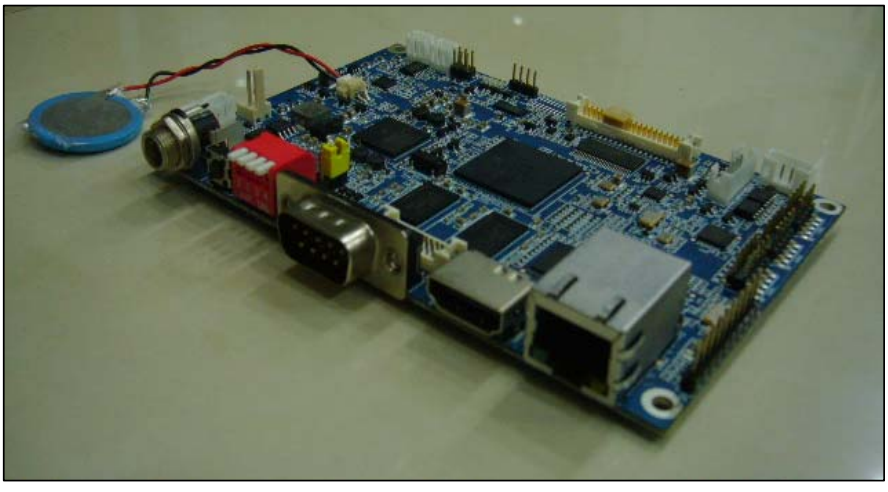
Initiated by	Linda Ren	**Job Title**	Engineer	**Originate Date**	2011/12/13
Reviewed by	Mars Lin	**Job Title**	Engineer	**Revision**	QQ4-014 Rev.B4
Approved by	Simon Lin	**Job Title**	Deputy Manager	**Release Status**	Preliminary Formal Release

Product Information

	Test Unit Information
Model	RSC-IMX51
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module
PCB version	A01
BIOS version	N/A
Product phase	EVT, DVT, PVT, Reversion, Supporting
Produced by	Linda Ren
Core Chipset	Freescale i.MX51
VGA Chipset	Freescale i.MX51
LAN1 chipset	SMSC LAN8710
Audio	Freescale SGTL5000
DRAM type	512MB DDR2 SDRAM onboard
CPU type	Freescale i.MX51 multimedia processor up to 800MHz
Test O.S.	Windows CE 6.0

Product image





Summary

Item	Descriptions	Summary		
Chapter 3: Hardware Compatibility Test		PASS	FAIL	Limit.
3.1 Storage Compatibility Test	SDHC Memory Card	6	0	0
3.2 LCD Display Compatibility Test	LCD Display	10	0	0
3.3 LAN Switch Compatibility Test	10/100/1000Base T LAN swutch	4	0	0
3.4 USB/1394 Compatibility Test	Various USB devices test(mouse, KB, Flash disk)	18	0	0
3.5 Power supply Compatibility Test	Various power supply test	8	0	0

Storage Compatibility Test

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				6	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT		
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	N/A			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program				Version		
Backplane	N/A			Version		
Produced by	Linda Ren					

SDHC Memory Card

Brand Name	Model	Type	Capacity	Mode	PN / SN	Result	Note/Issue ID	Twins
Transcend	SDHC Memory Card	2.7-3.6V	8GB	CLASS6	MMBGF08GWMCA	Pass		
Transcend	SDHC Memory Card		512MB	80X	RSDC-S2GC4	Pass		
BUFFALO	SDHC Memory Card		2GB	CLASS4	RSDC-S2GC4	Pass		
TOSHIBA	SDHC Memory Card	2.7-3.6V	4GB	CLASS6	SD-F04G	Pass		
Apacer	SDHC Memory Card		1GB	60X		Pass		
TOSHIBA	SDHC Memory Card		512MB			Pass		

LCD Display Compatibility Test

Test Engineer	Linda Ren	Date	2011/10/20	Pass	Fail	Limit.
Test Configuration				10	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT		
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	N/A			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program	Run MP4 File					
Backplane	N/A			Version		
Produced by	Linda Ren					

LCD Display

Brand and Model	Signal type	Test Item		Result	Note/Issue ID
BENQ G2400WT/ET-009B	HDMI	System power on initial test		Pass	
			1280x720	Pass	
ASUS VK246	HDMI	System power on initial test		Pass	
			1280x720	Pass	
ViewSonic VX2433wm	HDMI	System power on initial test		Pass	
			1280x720	Pass	
DELL 3008WFP	HDMI	System power on initial test		Pass	
			1280x720	Pass	
CHIMEI K5754 22GH 22'(16:10)	HDMI	System power on initial test		Pass	
			1280x720	Pass	

LAN Switch Test

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				4	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT		
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	N/A			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program				Version		
Backplane	N/A			Version		
Produced by	Linda Ren					

LAN Switch

Testing Points	Pass Critera
1. Connect LAN server through LAN switch HUB with 100M CAT5e LAN cable *2. Ping 100 times to LAN server with default 65500bytes package size*	*1. Switch/HUB and EUT LAN LED status should be correct* *2. Ping to LAN server properly without any packet lost*

Brand Name	Model	Spec	Result	Note/Issue ID
LINKSYS	SD2008	10/100/1000 8-port	**Pass**	
D-Link	DES-1008D	10 /100 Fast Ethernet /8-port	**Pass**	
3-COM	Baseline Switch 2024 3C16471	10 and 100BASE-T 24-port	**Pass**	
3-COM	Super StackII 3C16406	10 and 100BASE-T 24-port	**Pass**	

USB_1394 Devices Compatibility Test

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				18	0	0

Item	Description			Description	
Model name	RSC-IMX51			EVT/DVT/PVT	
CPU type	Freescale i.MX51 multimedia processor up to 800MHz				
BIOS type	N/A	BIOS version	N/A		
DRAM type	512MB DDR2 SDRAM onboard				
Power type	FSP FSP060-DBAB1				
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave	
ODD type	N/A			Master/Slave	
LAN Driver	SMSC LAN8710			Version	
VGA Driver	Freescale i.MX51			Version	
Audio Driver	Freescale SGTL5000			Version	
OS type	Windows CE 6.0			SP version	
Test program				Version	
Backplane	N/A			Version	
Produced by	Linda Ren				

Type	Brand Name	Model	Type	Result	Note/Issue ID
USB mouse	SONAR	M-633	USB 1.1	Pass	
USB mouse	Microsoft	X800898-133	USB 1.1	Pass	
USB mouse	GIGABYTE	GK-KM6150-M	USB 1.1	Pass	
USB mouse	Logitech	M-BT83	USB 1.1	Pass	
USB mouse	Logitech	M90	USB 2.0	Pass	
USB mouse	Microsoft	MSK-1113(B)/X820471-003	USB2.0	Pass	
USB keyboard	MI\icrosoft	1406	USB 2.0	Pass	
USB keyboard	INTOPIC	KBD-USB-19	USB 1.1	Pass	
USB keyboard	Logitech	Y-UR83	USB 1.1	Pass	
USB keyboard	GIGABYTE	GK-KM6150	USB 1.1	Pass	
USB keyboard	Logitech	Y-UR83	USB 1.1	Pass	
USB Flash disk	msystems	30MB		Pass	
USB Flash disk	ADATA	ADATE 4GB S805		Pass	
USB Flash disk	TDK	8GB	USB 1.1	Pass	
USB Flash disk	pqi	4GB	USB 1.1	Pass	
USB Flash disk	Transcend	JF V30 512MB	USB 2.0	Pass	
USB Flash disk	Transcend	4GB/TS4GJF300/56717602891	USB2.0	Pass	
USB Flash disk	Kingston	DTIG3/4GB	USB2.0	Pass	

Power Supply & Backplane Test

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				8	0	0
Item		Description		Description		
Model name	RSC-IMX51			EVT/DVT/PVT		
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	N/A	BIOS version	N/A			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave		
ODD type	N/A			Master/Slave		
LAN Driver	SMSC LAN8710			Version		
VGA Driver	Freescale i.MX51			Version		
Audio Driver	Freescale SGTL5000			Version		
OS type	Windows CE 6.0			SP version		
Test program				Version		
Backplane	N/A			Version		
Produced by	Linda Ren					

Power Supply

Brand Name	Model		DC output	Result	Note/Issue ID	
FSP	FSP060-DBAB1		12V / 60W	Pass		
FSP	FSP060-1AD101C		12V / 60W	Pass		
FSP	FSP084-DMAA1		12V / 84W	Pass		
SWITCHING	MPU50A-3		12V / 50W	Pass		
CWT	PAA050F		12V / 50W	Pass		
CWT	PAA060F		12C/ 60W	Pass		
EDAC	EA11351A-120		12V / 120W	Pass		
POWER DSINE	PD-9001GR/AC	POE	AC/55V 0.6A	Pass		

Test method :
1 On/Off test 10 times

RSC-IMX51

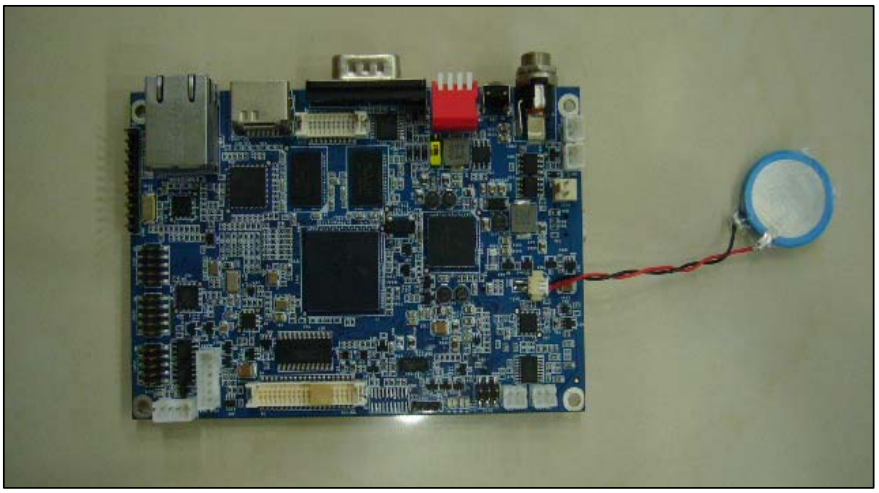
Software Compatibility Test Plan/Report

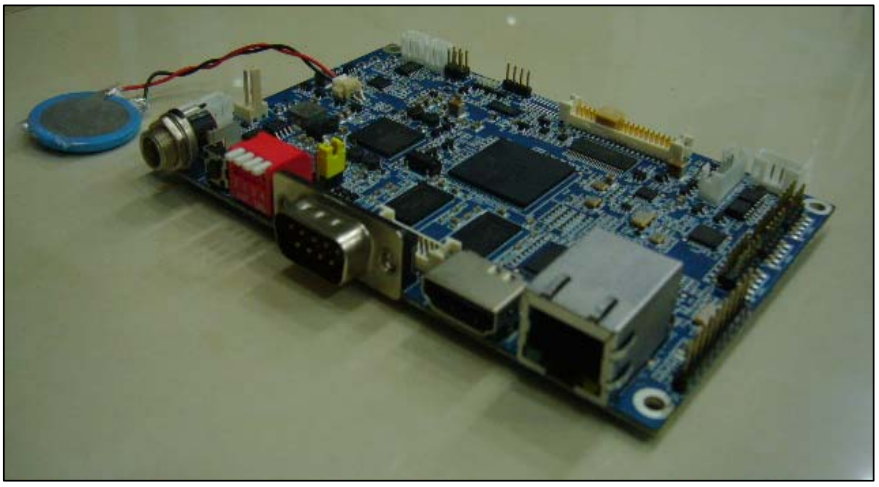
Initiated by	Linda Ren	**Job Title**	Engineer	**Originate Date**	2011/12/13
Reviewed by	Mars Lin	**Job Title**	Engineer	**Revision**	QQ4-014 Rev.B4
Approved by	Simon Lin	**Job Title**	Deputy Manager	**Release Status**	Preliminary Formal Release

Product Information

	Test Unit Information
Model	RSC-IMX51
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module
PCB version	A01
BIOS version	N/A
Product phase	EVT, DVT, PVT, Reversion, Supporting
Produced by	Linda Ren
Core Chipset	Freescale i.MX51
VGA Chipset	Freescale i.MX51
LAN1 chipset	SMSC LAN8710
Audio	Freescale SGTL5000
DRAM type	512MB DDR2 SDRAM onboard
CPU type	Freescale i.MX51 multimedia processor up to 800MHz
Test O.S.	Windows CE 6.0

Product image





Summary

Item	Descriptions	Summary		
Chapter 4: OS Compatibility Test		**Pass**	**Fail**	**Limit.**
4.1 Microsoft O.S. Compatibility Test	MS WinCE	**48**	**0**	**0**
4.2 Non-Microsoft Test	Linux	**24**	**0**	**0**
4.3 Power Consumption	1. Max. Loading, S1, S3, Battery Leak Current 2. USB power measurement	**1**	**0**	**0**

Microsoft Windows CE 6.0

Test Engineer	Linda Ren	Date	2011/10/5	Pass	Fail	Limit.
Test Configuration				24	0	0
Item				Description		
Model name	RSC-IMX51					EVT
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	NA	BIOS version	NA			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)					
ODD type	N/A					
LAN Driver	SMSC LAN8710				Version	
VGA Driver	Freescale i.MX51				Version	
Audio Driver	Freescale SGTL5000				Version	
OS type	Windows CE 6.0				SP version	
Test program					Version	
Backplane	N/A				Version	
Produced by	Linda Ren					

Language	Windows CE version	Test Stage	Result	Note/Issue ID
English	Windows CE 6.0	EVT/DVT	Pass	
Traditional Chinese		Option		
Simple Chinese		Option		
Japanese		Option		

On board built-in function	Specification	Test Stage	Result	Note/Issue ID
COM1(RS-232)		DVT	Pass	
COM2(RS-232)		DVT	Pass	
COM2(RS-422)		DVT	Pass	
COM2(RS-485)		DVT	Pass	
USB1		DVT	Pass	
USB2		DVT	Pass	
USB3		DVT	Pass	
USB4		DVT	Pass	
Mini-USB connector		DVT	Pass	
Onboard 4GB MLC NAND flash with SD (eSDHC-1)		DVT	Pass	
SD socket Support SDHC (eSDHC-2)		DVT	Pass	
LVDS		DVT	Pass	
TTL Panel		DVT	Pass	
HDMI		DVT	Pass	
Touch Panel		DVT	Pass	
GPIO (8 bit)		DVT	Pass	
Watchdog timer	Reset	DVT	Pass	
	Timer setting	DVT	Pass	
Audio Channel	2CH	DVT	Pass	
	Line in	DVT	Pass	
	MIC	DVT	Pass	
Play MP3 files		DVT	Pass	
Play MP4 files		DVT	Pass	

Non-Microsoft OS

Test Engineer	Linda Ren	Date	2011/12/2	Pass	Fail	Limit.
Test Configuration				24	0	0
Item		Description		Description		
Model name	RSC-IMX51					EVT
CPU type	Freescale i.MX51 multimedia processor up to 800MHz					
BIOS type	NA	BIOS version	NA			
DRAM type	512MB DDR2 SDRAM onboard					
Power type	FSP FSP060-DBAB1					
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)					
ODD type	N/A					
LAN Driver	SMSC LAN8710				Version	
VGA Driver	Freescale i.MX51				Version	
Audio Driver	Freescale SGTL5000				Version	
OS type	Linux					
Test program					Version	
Backplane	N/A				Version	
Produced by	Linda Ren					

	REV	Test Stage	Result	Note/Issue ID
Linux	2.6.35.3	DVT	Pass	
		Option		
		Option		
		Option		

On board built-in function	Specification	Test Stage	Result	Note/Issue ID
COM1(RS-232)		DVT	Pass	
COM2(RS-232)		DVT	Pass	
COM2(RS-422)		DVT	Pass	
COM2(RS-485)		DVT	Pass	
USB1		DVT	Pass	
USB2		DVT	Pass	
USB3		DVT	Pass	
USB4		DVT	Pass	
Mini-USB connector		DVT	Pass	
Onboard 4GB MLC NAND flash with SD (eSDHC-1)		DVT	Pass	
SD socket Support SDHC (eSDHC-2)		DVT	Pass	
LVDS		DVT	Pass	
TTL Panel		DVT	Pass	
HDMI		DVT	Pass	
Touch Panel		DVT	Pass	
GPIO (8 bit)		DVT	Pass	
Watchdog timer	Reset	DVT	Pass	
	Timer setting	DVT	Pass	
Audio Channel	2CH	DVT	Pass	
	Line in	DVT	Pass	
	MIC	DVT	Pass	
Play MP3 files		DVT	Pass	
Play MP4 files		DVT	Pass	

Power Consumption

Test Engineer	Linda Ren	Date	2011/10/19	Result	Pass
Test Configuration					
Item		**Description**		**Description**	
Model name	RSC-IMX51	PCB version	A01	EVT/DVT/PVT	
CPU type (Top loading, sped, FSB CPU)	Freescale i.MX51 multimedia processor up to 800MHz				
BIOS type	NA	BIOS version	NA		
DRAM type (Full loading memory)	512MB DDR2 SDRAM onboard				
Power type	FSP FSP060-DBAB1				
HDD type	Onboard 4GB MLC NAND Flash (eSDHC-1)			Master/Slave	
ODD type	N/A			Master/Slave	
LAN Driver	SMSC LAN8710		Version		
VGA Driver	Freescale i.MX51		Version		
Audio Driver	Freescale SGTL5000		Version		
OS type	Windows CE 6.0		SP version	SP version	
Test program			Version		
Backplane	N/A		Version		
Produced by	Linda Ren				

Testing Software (MAX. load) *Run MP4 file + ping IP*

****If LAN is on board function, all LAN ports have to connect to a switch HUB through CAT5e LAN cable, but don't need to do data transfer, or through a cross over cable connect two LAN ports is acceptable**

Condition:

Power on - Boot sequency: *Measure the maximum current value of between system power on and boot-up to O.S.*

DOS Idle mode: *Measure the current value when system in DOS mode and without running any program*

Win. Idle mode: *Measure the current value when system in windows mode and without running any program*

Max. load: *Measure the maximum current value which system under maximum load (CPU: Top speed ,RAM & Graphic: Full loading)*

Measured category:

v	Main board only
	System

Condition	Power Consumption (A or mA)						Note
	Voltage/Condition	Power on - Boot procedure	Idle Mode	Suspend	Max. load	Testing Software	
CPU type	+12V	0.42	0.37	0.14	0.42	**1**	**Include LVDS Display**
Freescale i.MX51							
Max. memory slot Qty:							
size/pcs:512MB DDR2							
Total (Watt)		5.04	4.44	1.68	5.04		

Condition		USB Power measurement (A or mA)						Note/Issue ID
		Load Voltage (4.80v~5.10v)	Current	Suspend (4.80v~5.10v)	Power off (S5)		Result	
USB1		4.970	510mA	5.009	N/A		**Pass**	
USB2		4.993	510mA	4.997	N/A		**Pass**	
USB3		4.999	510mA	5.014	N/A		**Pass**	
USB4		5.005	510mA	5.014	N/A		**Pass**	

Condition		ERP Test (off mode ＜ 0.50W)			
		Voltage Condition	Current (A)	Watt (W)	
CPU type : Freescale i.MX51 Max. memory : 512MB DDR2 SDRAM onboard	☑	12V	0.0013	0.0156W	
	☐	19V			
	☐	5VSB (ATX)			

RSC-IMX51

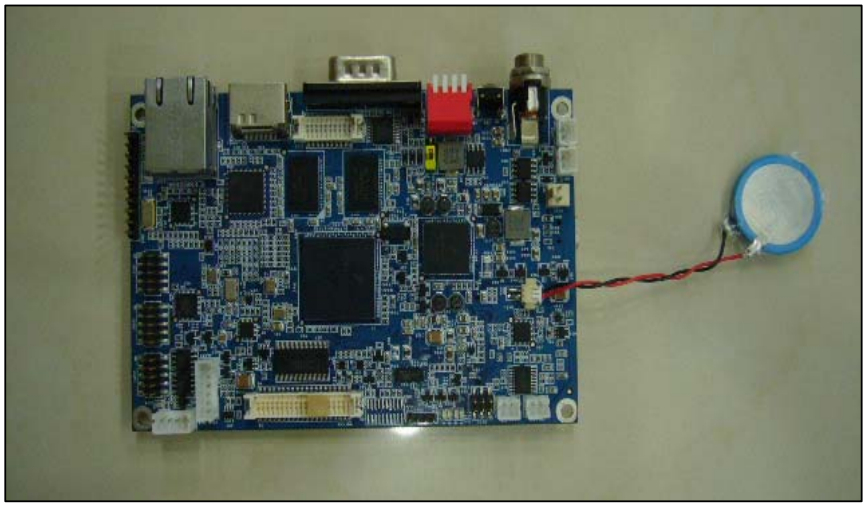
Reliability Test Plan/Report

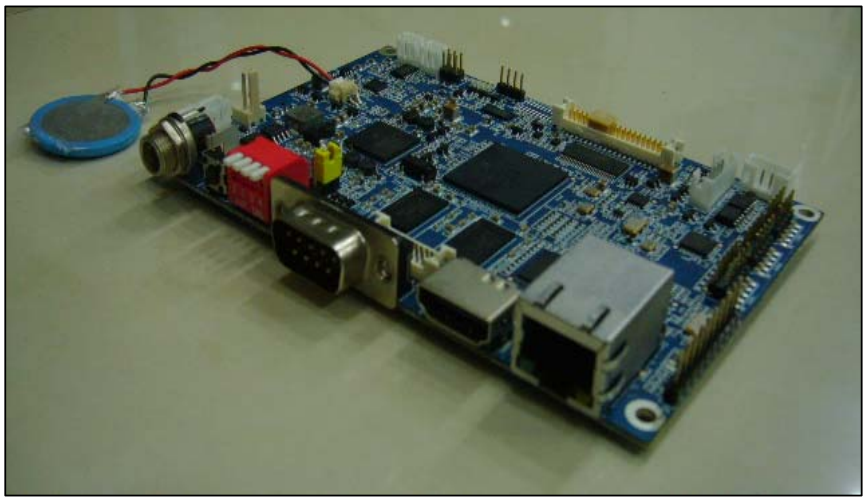
Initiated by	Linda Ren	**Job Title**	Engineer	**Originate Date**	2011/12/13
Reviewed by	Mars Lin	**Job Title**	Engineer	**Revision**	QQ4-014 Rev.B4
Approved by	Simon Lin	**Job Title**	Deputy Manager	**Release Status**	Preliminary Formal Release

Product Information

	Test Unit Information
Model	RSC-IMX51
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module
PCB version	A01
BIOS version	N/A
Product phase	EVT, DVT, PVT, Reversion, Supporting
Produced by	Linda Ren
Core Chipset	Freescale i.MX51
VGA Chipset	Freescale i.MX51
LAN1 chipset	SMSC LAN8710
Audio	Freescale SGTL5000
DRAM type	512MB DDR2 SDRAM onboard
CPU type	Freescale i.MX51 multimedia processor up to 800MHz
Test O.S.	Windows CE 6.0

Product image





Summary

Item	Descriptions	Result
Chapter 5: Reliability Test		
5.1 Power Margin Test	Upper limit Middle value Low limit	**Pass**
5.2 Power interruption Test	100/200/500/1000ms	**Pass**
5.3 High Temperature Test	65℃/24hrs IEC 60068-2-2 Test:Bb	**Pass**
5.4 Low Temperature Test	-5℃/24hrs IEC 60068-2-1 Test:Ab	**Pass**
5.5 Temperature cycle test	-5℃~65℃ RH95% 8 cycles IEC 60068-2-14 Test:N	**Pass**
5.6 Power on cycle test	-5℃ / 1000times IEC 60068-2-1 Test:Ab	**Pass**
	65℃ / 1000times IEC 60068-2-2 Test:Bb	
5.7 Storage test	-40℃ 24hrs 75℃/ RH95% 24hrs IEC 60068-2-3 Test:Ca	**Pass**
5.8 Random vibration test (operation)	1 PSD: 0.00454G²/Hz , 1.5 Grms 2 Operation mode 3 Test Frequency : 5-500Hz 4 Test Axis : X,Y and Z axis 5 30 min. per each axis 6 IEC 60068-2-64 Test:Fh	**Pass**
5.9 Package vibration test	1. PSD: 0.026G²/Hz , 2.16 Grms 2. Non-operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 min. per each axis 6. IEC 60068-2-64 Test:Fh	**Pass**
5.10 Package drop test	1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed	**Pass**
5.11 Thermal and Capacitor Life time Calculation	1 Max. Loading at 60℃ 2 Capacitor life time calculation 3 IEC 60068-2-2 Test:Bb	**Pass**

** Notes: Test items and test contents depend on spec.

Power margin Test

Test Engineer	Linda Ren	Date	2011/10/5	Result	Pass
Test Configuration					
Model name	**RSC-IMX51**				
Description	**FreeScale MCIMX51 Cortex-A8 RISC CPU Module**				
Hardware PCB version	**A01**				
BIOS version	**N/A**				
CPU Type	**Freescale i.MX51 multimedia processor up to 800MHz**				
Memory type and size	**512MB DDR2 SDRAM onboard**				
Backplane	**N/A**				
Power(or Adaptor)	**FSP FSP060-DBAB1**				
HDD Model/Spec	**Onboard 4GB MLC NAND Flash (eSDHC-1)**				
CD-ROM Model/Spec	**N/A**				
Chipset	Freescale i.MX51	Driver Ver			
VGA	Freescale i.MX51	Driver Ver			
LAN	SMSC LAN8710	Driver Ver			
Audio	Freescale SGTL5000	Driver Ver			
Touch	Freescale MC13892	Driver Ver			
Other		Driver Ver			

Power margin Test (only for single DC voltage input products)

Item	Voltage	Spec	Limit	Test Stage	Result	Note/Issue ID
DC power upper limit	12.60V	12V	+5%	EVT/DVT	Pass	
DC power low limit	11.40V	12V	-5%	EVT/DVT	Pass	

1. Adjust DC power source to Upper/Low limit.
2. ON/OFF test 10 cycles (1 minute ON and 1 minute OFF constitute 1 cycle)

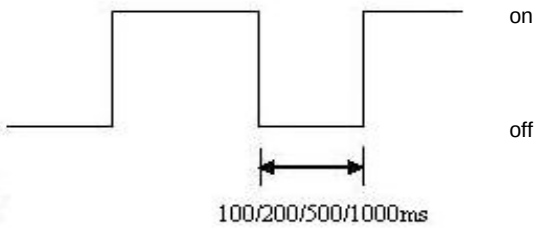
Power interruption Test

Test Engineer	Linda Ren	Date	2011/10/5	Result	Pass
Test Configuration					
Model name	RSC-IMX51				
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module				
Hardware PCB version	A01				
BIOS version	N/A				
CPU Type	Freescale i.MX51 multimedia processor up to 800MHz				
Memory type and size	512MB DDR2 SDRAM onboard				
Backplane	N/A				
Power(or Adaptor)	FSP FSP060-DBAB1				
HDD Model/Spec	Onboard 4GB MLC NAND Flash (eSDHC-1)				
CD-ROM Model/Spec	N/A				

Power interruption test

Test Condition：Environment：25℃± 2℃ ambient Humidity：50 ± 10% RH
Test time：10 times
Interval time 100ms/200ms/500ms/1000ms

Procedure：1 Input the AC voltage
2 system boot up
3 Apply switching main power switch with the specified conditions.
(In case of the products equipped with the voltage-switch unit, installed them)



Judgment Criteria：1 There must be no danger of fire.
2 It must not catch fire or produce smoke.
3 There should be no abnormal phenomenon (ex. auto-boot up)
4. There should be no abnormalities affecting the product's functions and performance

Power interruption Test

Item	Adapter	interval time	Mode	Test Stage	Result	Note/Issue ID
Power interruption Test		100ms	AT	EVT/DVT	Pass	
		200ms	AT	EVT/DVT	Pass	
		500ms	AT	EVT/DVT	Pass	
		1000ms	AT	EVT/DVT	Pass	

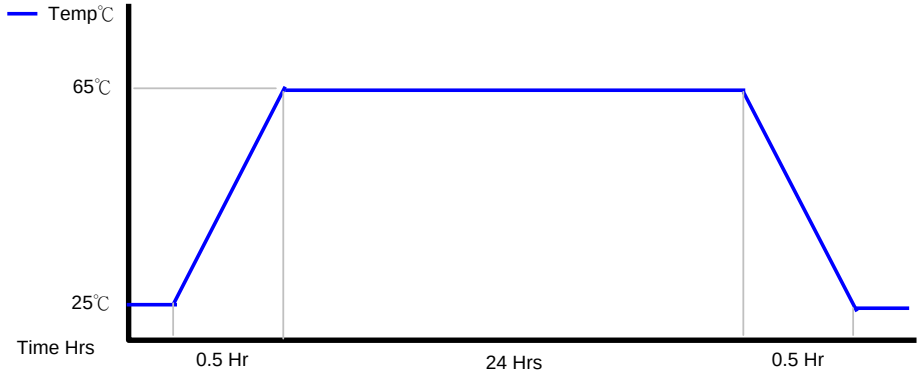
High Temperature Operation Test

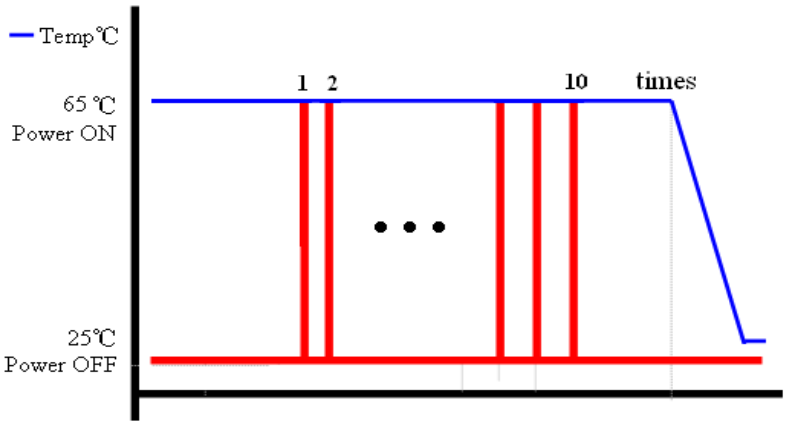
Test Engineer	Linda Ren	Date	2011/10/6	Result	Pass
Model		RSC-IMX51			
Description		FreeScale MCIMX51 Cortex-A8 RISC CPU Module			
PCB version		A01			
BIOS version		N/A			
CPU Type		Freescale i.MX51 multimedia processor up to 800MHz			
Memory type and size		512MB DDR2 SDRAM onboard			
Backplane		N/A			
Power supply		FSP FSP060-DBAB1			
HDD Model/Spec		Onboard 4GB MLC NAND Flash (eSDHC-1)			
CD-ROM Model/Spec		N/A			

High Temperature Operation Test

Test Standard：
Reference IEC60068-2-2 Testing procedures
Test Bb : Dry Heat Test

Test Condition：
1 Test Temperature : 65℃ for board level
2 Test Time : 24 hours
3 Test software : PassMark Burn in test 5.3 in Win XP/SP3
4 Executing on/off test 10 times after running burn in test 24 hours





Test equipment：
Programmable temperature & humidity chamber

use chamber		V		
Model:	Ten Billion FX1004	THS-D4T-150	KSON THS-A4T-100	RHDM-603
Date of calibration	2010/12/21	2011/6/22	2010/12/21	2011/4/18
use chamber				
Model:	RPC-60			
Date of calibration	2011/4/18			

Performance criteria：
1 All system functions must be checked with appropriate testing programs and should pass the inspection.
2 There should be no abnormalities, which coild affect the product specified functions and performances.

Test result：
There is no damage in electronic and mechanical functions.
Degradation has no been found.
Performance is maintained with no incurable physical damage or degradation.

Test picture：

Low Temperature Operation Test

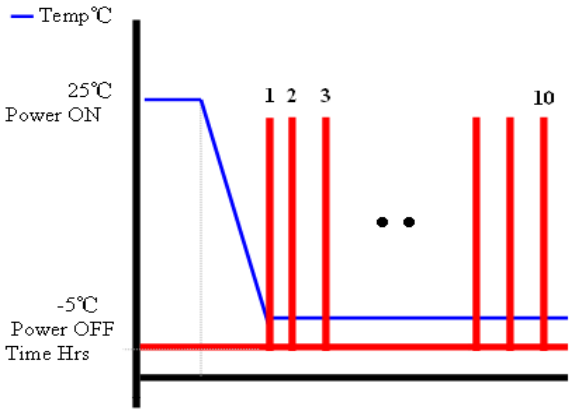
Test Engineer	Linda Ren	Date	2011/10/7	Result	Pass
Model	RSC-IMX51				
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module				
PCB version	A01				
BIOS version	N/A				
CPU Type	Freescale i.MX51 multimedia processor up to 800MHz				
Memory type and size	512MB DDR2 SDRAM onboard				
Backplane	N/A				
Power supply	FSP FSP060-DBAB1				
HDD Model/Spec	Onboard 4GB MLC NAND Flash (eSDHC-1)				
CD-ROM Model/Spec	N/A				

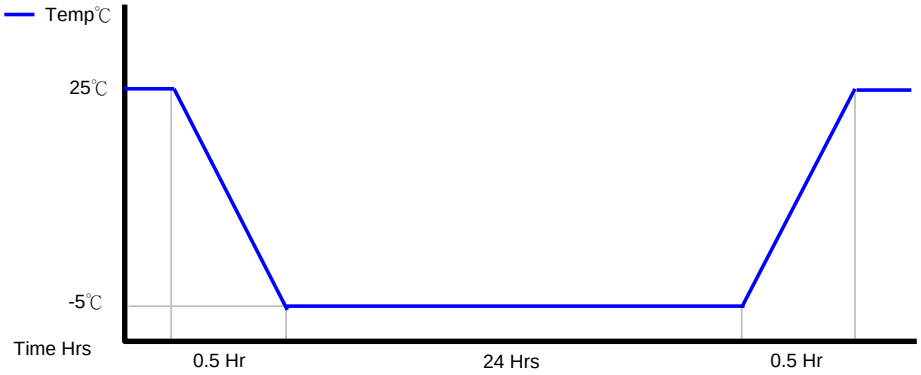
Low Temperature Operation Test

Test Standard：
Reference IEC60068-2-1 Testing procedures
Test Ab : Cold Test

Test Condition：
1 Test Temperature : -5℃
2 Test Time : 24 hours
3 Test software : PassMark Burn in test 5.3 in Win XP/SP3

Test procedure：
1 Power on at -5℃ into Win XP by manually and check device manager list, there are should be no " ! " or " ? " mark display
2 Peripheral check : with on/off test 10 times
3 After peripheral chek is finish, keep lower chamber temperature at -5℃ and running test program.





Test equipment：

Programmable temperature & humidity chamber

use chamber		V		
Model:	Ten Billion FX1004	THS-D4T-150	KSON ATH-A2C-80	KSON THS-A4T-100
Date of calibration	2010/12/21	2011/6/22	2010/11/17	2010/12/21

Performance criteria：

1 All system functions must be checked with appropriate testing programs and should pass the inspection.

2 There should be no abnormalities, which coild affect the product specified functions and performances.

Test result：

There are should be no " ! " or " ? " mark display at device manager

There is no damage in electronic and mechanical functions.

Degradation has no been found.

Performance is maintained with no incurable physical damage or degradation.

Test picture：

Temperature Cycle Operation Test

Test Engineer	Linda Ren	Date	2011/10/8	Result	Pass
Model	RSC-IMX51				
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module				
PCB version	A01				
BIOS version	N/A				
CPU Type	Freescale i.MX51 multimedia processor up to 800MHz				
Memory type and size	512MB DDR2 SDRAM onboard				
Backplane	N/A				
Power supply	FSP FSP060-DBAB1				
HDD Model/Spec	Onboard 4GB MLC NAND Flash (eSDHC-1)				
CD-ROM Model/Spec	N/A				

Temperature Cycle Operation Test

Test Standard：Reference IEC60068-2-14 Testing procedures

Test N : Change of temperature test

Test Condition：1 Test Temperature : High temperature 65℃ RH95% / Low temperature -5℃ for board level

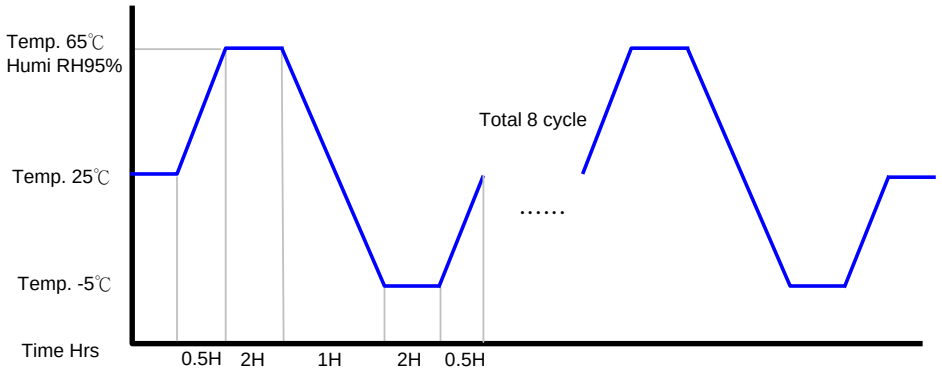
2 Test dwell Time : 2 hours

3 Temperature slope : heating 1 hour, cooling 1 hour

4 Test cycle : 8 cycles

5 Test software : PassMark Burn in test 5.3 in Win XP/SP3

6 Test environment curve



Test equipment：Programmable temperature & humidity chamber

use chamber		V		
Model:	Ten Billion FX1004	THS-D4T-150	KSON ATH-A2C-80	KSON THS-A4T-100
Date of calibration	2010/12/21	2011/6/22	2010/11/17	2010/12/21

Performance criteria：1 All system functions must be checked with appropriate testing programs and should pass the inspection.

2 There should be no abnormalities, which coild affect the product specified functions and performances.

Test result：There is no damage in electronic and mechanical functions.

Degradation has no been found.

Performance is maintained with no incurable physical damage or degradation.

Test picture：

Power On/Off Test

Test Engineer	Linda Ren	Date	2011/10/10	Result	Pass
Model		RSC-IMX51			
Description		FreeScale MCIMX51 Cortex-A8 RISC CPU Module			
PCB version		A01			
BIOS version		N/A			
CPU Type		Freescale i.MX51 multimedia processor up to 800MHz			
Memory type and size		512MB DDR2 SDRAM onboard			
Backplane		N/A			
Power supply		FSP FSP060-DBAB1			
HDD Model/Spec		Onboard 4GB MLC NAND Flash (eSDHC-1)			
CD-ROM Model/Spec		N/A			

Power On/Off Test

Test Standard：

Reference IEC60068-2-2 Testing procedures Test Bb : Dry Heat test

Reference IEC60068-2-1 Testing procedures Test Ab : Cold test

Test Condition：

Condition

1 Test temperature : -5℃

2 Power mode: AT

3 Number of test : 1000 times

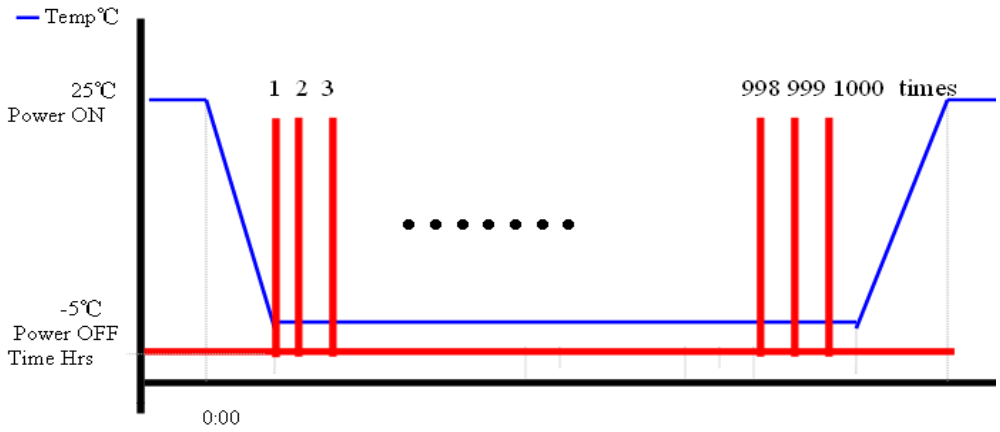
4 Test software : MS DOS

5 Step : A) System power on, record the count number then system power off

B) After 1 minutes, system power on again.

C) Recycle step A and B for 1000 times.

6 Test environment curve :



Condition II

1 Test temperature : 65℃ for board level

2 Number of test : 1000 times

3 Power mode: AT

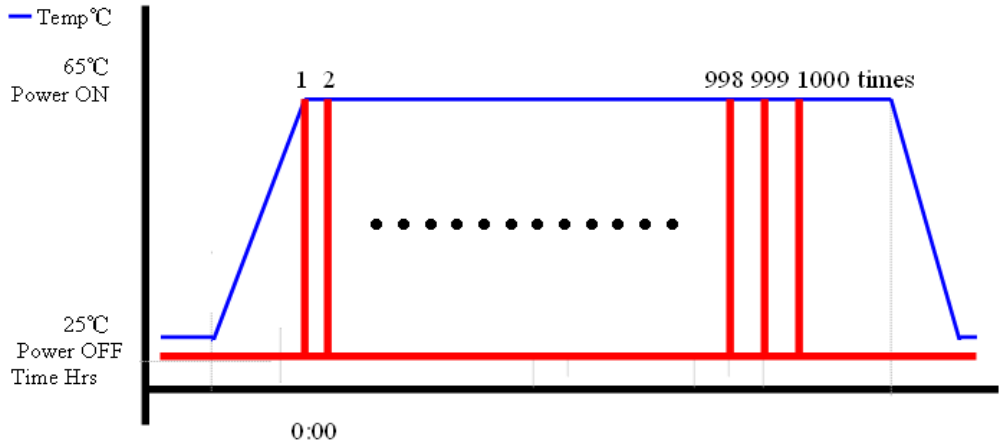
4 Test software : MS DOS

5 Step : A) System power on, record the count number then system power off

B) After 1 minute, system power on again.

C) Recycle step A and B for 1000 times.

6 Test environment curve :



Test equipment：

Programmable temperature & humidity chamber

use chamber		V		
Model:	Ten Billion FX1004	THS-D4T-150	KSON ATH-A2C-80	KSON THS-A4T-100
Date of calibration	2010/12/21	2011/6/22	2010/11/17	2010/12/21

Performance criteria：

1 All system functions must be checked with appropriate testing programs and should pass the inspection.

2 There should be no abnormalities, which coild affect the product specified functions and performances.

Test result：

There is no damage in electronic and mechanical functions.

Degradation has no been found.

Performance is maintained with no incurable physical damage or degradation.

Test temperature	Power mode	
-5℃	AT	ATX
Result	Pass	N/A
65℃	AT	ATX
Result	Pass	N/A

Test picture：

Storage Test

Test Engineer	Linda Ren	Date	2011/10/22	Result	Pass
Model	RSC-IMX51				
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module				
PCB version	A01				
BIOS version	N/A				
CPU Type	Freescale i.MX51 multimedia processor up to 800MHz				
Memory type and size	512MB DDR2 SDRAM onboard				
Backplane	N/A				
Power supply	FSP FSP060-DBAB1				
HDD Model/Spec	Onboard 4GB MLC NAND Flash (eSDHC-1)				
CD-ROM Model/Spec	N/A				

Storage Test

Test Standard：

Reference IEC60068-2-3 High temperature & Humidity storage test Test : Ca

Reference IEC60068-2-1 Cold test Test : Ab

Test Condition：

Condition

Low temperature setup

1 Test temperature : -40℃ (if system has LCD panel,storage temperature depend on panel spec.)

2 Test time : 24 hours

3 Temperature gradient 1℃/minute

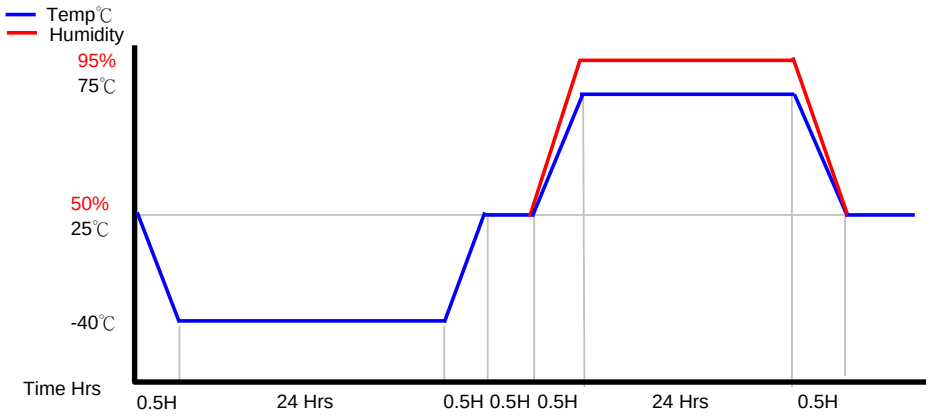
High temperature setup

1 Test temperature : 75℃

2 Test humidity : RH 95%

3 Test time : 24 hours

4 Temperature gradient 1℃/minute



Test equipment：

Programmable temperature & humidity chamber

use chamber		V			
Model:	Ten Billion FX1004	THS-D4T-150	KSON ATH-A2C-80	KSON THS-A4T-100	RHDM-603
Date of calibration	2010/12/21	2011/6/22	2010/11/17	2010/12/21	2011/4/18
use chamber					
Model:	RPC-60				
Date of calibration	2011/4/18				

Performance criteria：

1 All system functions must be checked with appropriate testing programs and should pass the inspection.

2 There should be no abnormalities, which coild affect the product specified functions and performances.

Test result：

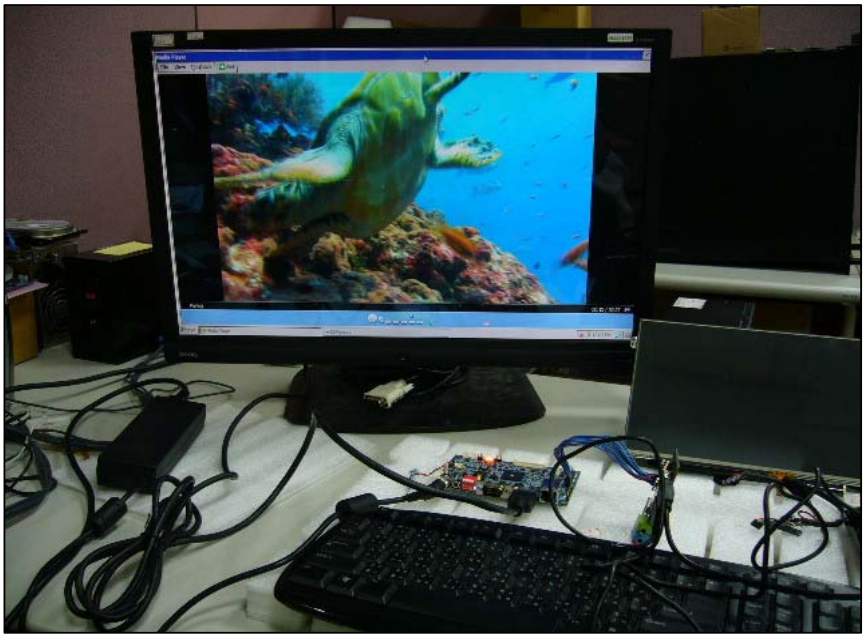
There is no damage in electronic and mechanical functions.

Degradation has no been found.

Performance is maintained with no incurable physical damage or degradation.

Test picture：

Functional Check



Random Vibration Test (Operation)

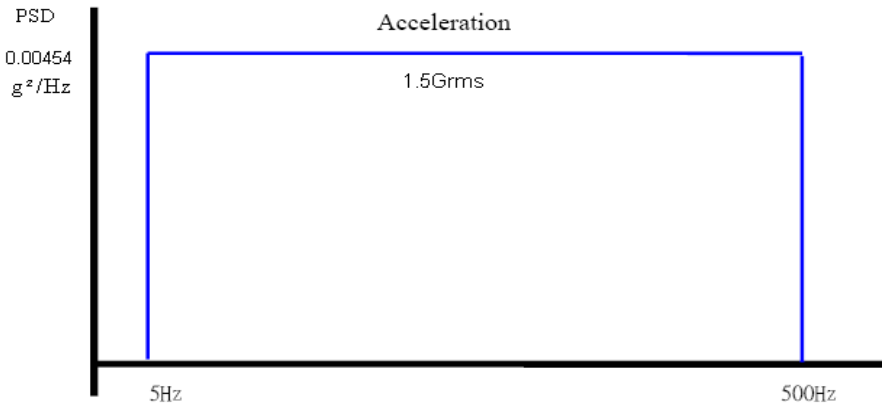
Test Engineer	Linda Ren	Date	2011/10/21	Result	Pass
Model		RSC-IMX51			
Description		FreeScale MCIMX51 Cortex-A8 RISC CPU Module			
PCB version		A01			
BIOS version		N/A			
CPU Type		Freescale i.MX51 multimedia processor up to 800MHz			
Memory type and size		512MB DDR2 SDRAM onboard			
Backplane		N/A			
Power supply		FSP FSP060-DBAB1			
HDD Model/Spec		Onboard 4GB MLC NAND Flash (eSDHC-1)			
CD-ROM Model/Spec		N/A			

Random Vibration Test (OP)

Test Standard：
Reference IEC60068-2-64 Testing procedures
Test Fh : Vibration boardband random Test

Test Condition：
1 Test PSD : 0.00454G²/Hz , 1.5 Grms
2 Test frequency : 5~500 Hz
3 Test axis : X,Y and Z axis
4 Test time : 30 min. each axis
5 System condition : Operation mode
6 Test program : Run MP4 file

Test curve：



Test equipment：
Vibration simulator system
KING DESIGN Co., Ltd.
Model : 9363EM-600F2K-40N120
Date of calibration : 12/23/2006

Performance criteria：
1 All system functions must be checked with appropriate testing programs and should pass the inspection
2 There should be no abnormalities, which coild affect the product specified functions and performances
3 The cover and connectors should work properly without any interference
4 All screws should be tightened up appropriately
5 All gaps on the surface are appropriately
6 The assembling / disassembling of the system enclosure must be smooth and no deformed parts should be found

Test result：
There is no damage in electronic and mechanical functions.
Degradation has no been found.
Performance is maintained with no incurable physical damage or degradation.

Test picture：

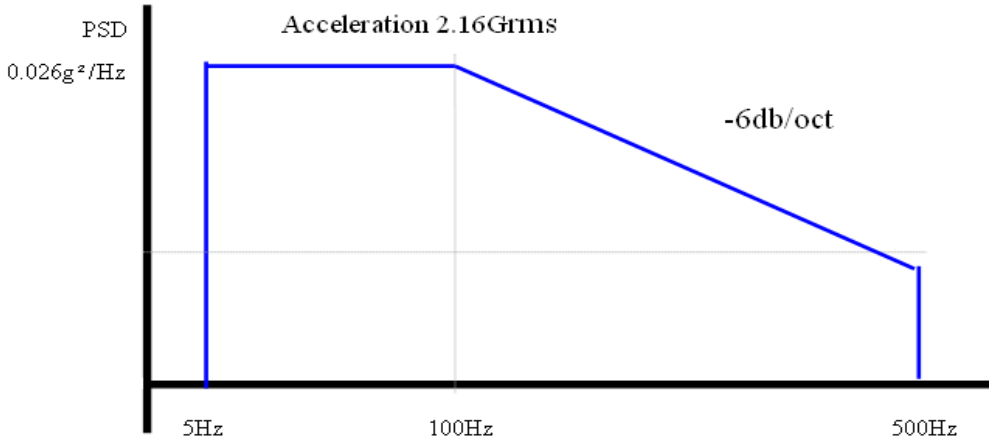
Package Vibration Test

Test Engineer	Linda Ren	Date	2011/10/21	Result	Pass
Model		RSC-IMX51			
Description		FreeScale MCIMX51 Cortex-A8 RISC CPU Module			
PCB version		A01			
BIOS version		N/A			
CPU Type		Freescale i.MX51 multimedia processor up to 800MHz			
Memory type and size		512MB DDR2 SDRAM onboard			
Backplane		N/A			
Power supply		FSP FSP060-DBAB1			
HDD Model/Spec		Onboard 4GB MLC NAND Flash (eSDHC-1)			
CD-ROM Model/Spec		N/A			

Package Vibration Test

Test Standard：
Reference IEC60068-2-64 Testing procedures
Test Fh : Vibration boardband random Test

Test Condition：
1 Test PSD : 0.026G²/Hz , 2.16 Grms
2 Test frequency : 5~500 Hz
3 Test axis : X,Y and Z axis
4 Test time : 30 minutes each axis
5 Test curve



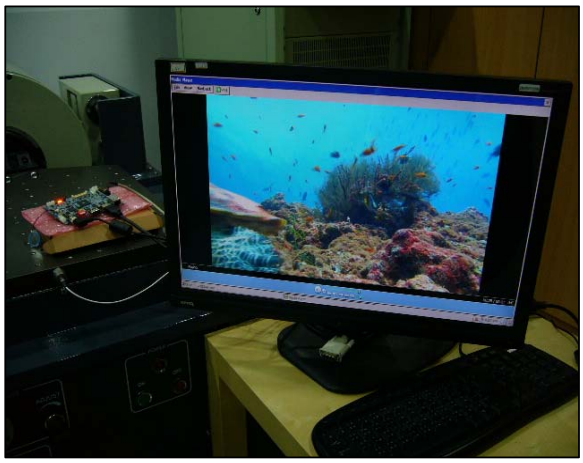
Test equipment：
Vibration simulator system
KING DESIGN Co., Ltd.
Model : 9363EM-600F2K-40N120
Date of calibration : 12/23/2006

Performance criteria：
1 All system functions must be checked with appropriate testing programs and should pass the inspection
2 There should be no abnormalities, which coild affect the product specified functions and performances
3 The cover and connectors should work properly without any interference
4 All screws should be tightened up appropriately
5 All gaps on the surface are appropriately
6 The assembling / disassembling of the system enclosure must be smooth and no deformed parts should be fo

Test result：
There is no damage in electronic and mechanical functions.
Degradation has no been found.
Performance is maintained with no incurable physical damage or degradation.

Test picture：

Functional Check



Package Drop Test

Test Engineer	Linda Ren	Date	2011/10/14	Result	Pass
Model		RSC-IMX51			
Description		FreeScale MCIMX51 Cortex-A8 RISC CPU Module			
PCB version		A01			
BIOS version		N/A			
CPU Type		Freescale i.MX51 multimedia processor up to 800MHz			
Memory type and size		512MB DDR2 SDRAM onboard			
Backplane		N/A			
Power supply		FSP FSP060-DBAB1			
HDD Model/Spec		Onboard 4GB MLC NAND Flash (eSDHC-1)			
CD-ROM Model/Spec		N/A			

Package Drop Test

Test Standard：Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed

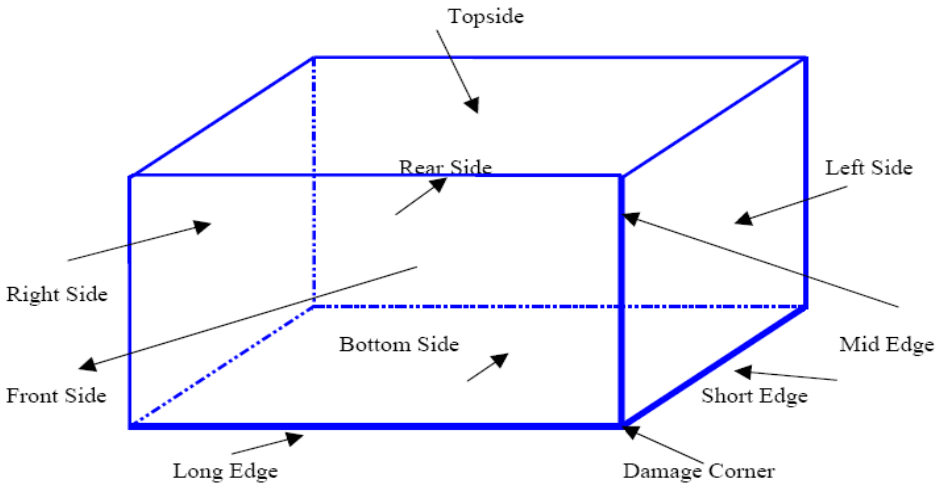
Test Ea : Drop Test

Test Condition：1 Test phase : One corner, three edges, six faces

2 Test high : 96.5 cm

3 Package weight : 0.2 kg

4 Test drawing



Test equipment：Drop test machine

J.T.M Tech.

Model : JTM-1775

Performance criteria：1 All system functions must be checked with appropriate testing programs and should pass the inspection

2 There should be no abnormalities, which coild affect the product specified functions and performances

3 The cover and connectors should work properly without any interference

4 All screws should be tightened up appropriately

5 All gaps on the surface are appropriately

6 The assembling / disassembling of the system enclosure must be smooth and no deformed parts should be found

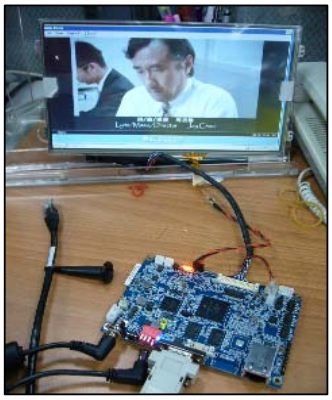
Test result：There is no damage in electronic and mechanical functions.

Degradation has no been found.

Performance is maintained with no incurable physical damage or degradation.

Test picture：

Test Photos (Before)



Functional Check

Package style (1)

Package style (2)

Drop test photos

Thermal and Capacitor Life time Calculation

Test Engineer	Linda Ren	Date	2011/10/14	Result	Pass
Model	RSC-IMX51				
Description	FreeScale MCIMX51 Cortex-A8 RISC CPU Module				
PCB version	A01				
BIOS version	N/A				
CPU Type	Freescale i.MX51 multimedia processor up to 800MHz				
Memory type and size	512MB DDR2 SDRAM onboard				
Backplane	N/A				
Power supply	FSP FSP060-DBAB1				
HDD Model/Spec	Onboard 4GB MLC NAND Flash (eSDHC-1)				
CD-ROM Model/Spec	N/A				

$$Lx = Lo \times 2^{(To - Tx)/10} \times 2^{(\Delta To - \Delta Tx)/5}$$
$$= Lo \times 2^{(105 - Tx)/10} \times 2^{(5 - \Delta Tx)/5}$$

Where: Lx = Lifetime (hours) of the capacitor to be estimated
Lo = Base lifetime (hours) of the capacitor described in the specification sheet
To = Maximum rated operating temperature
Tx = Actual ambient temperature (ºC) of the capacitor within device
(This is not the environment temperature of the device, but the environment temperature of the capacitor that has been placed within the device.)
ΔTo = Rise (ºC) in core temperature of the capacitor due to rated (permissible) maximum ripple current.

$\Delta Tx = (Ts - Tx) \times Kc$

Where: Ts = Surface temperature (ºC) of the case
Tx = Actual ambient temperature (ºC) of the capacitor
Kc = Coefficient standing for the ratio of the ΔTx to the (Ts - Tx)
For the Kc's, refer to the table below:

Kc :

Capacitor diameter (mm)	φ5- φ8	φ10	φ12.5	φ16	φ18
Kc	1.10	1.15	1.20	1.25	1.30

Life Time Estimation Formula on PX/PXA/PS/PSA series Capacitors

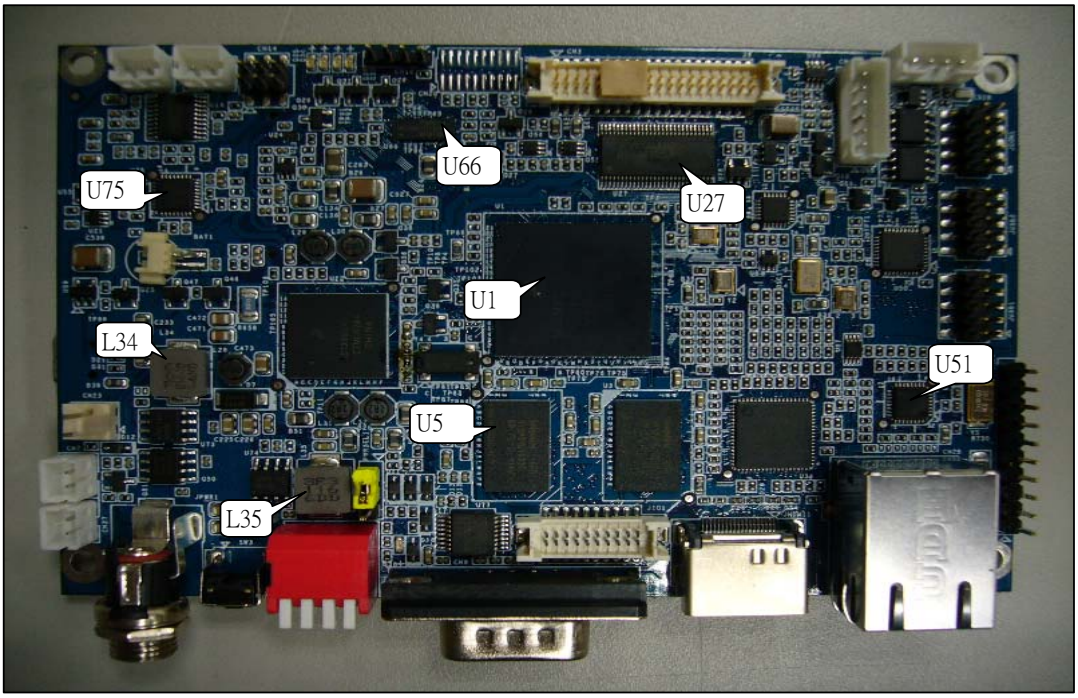
$$Lx = Lo \times 10^{(To - Tx)/20}$$
$$= 2000 \times 10^{(105 - Tx)/20}$$

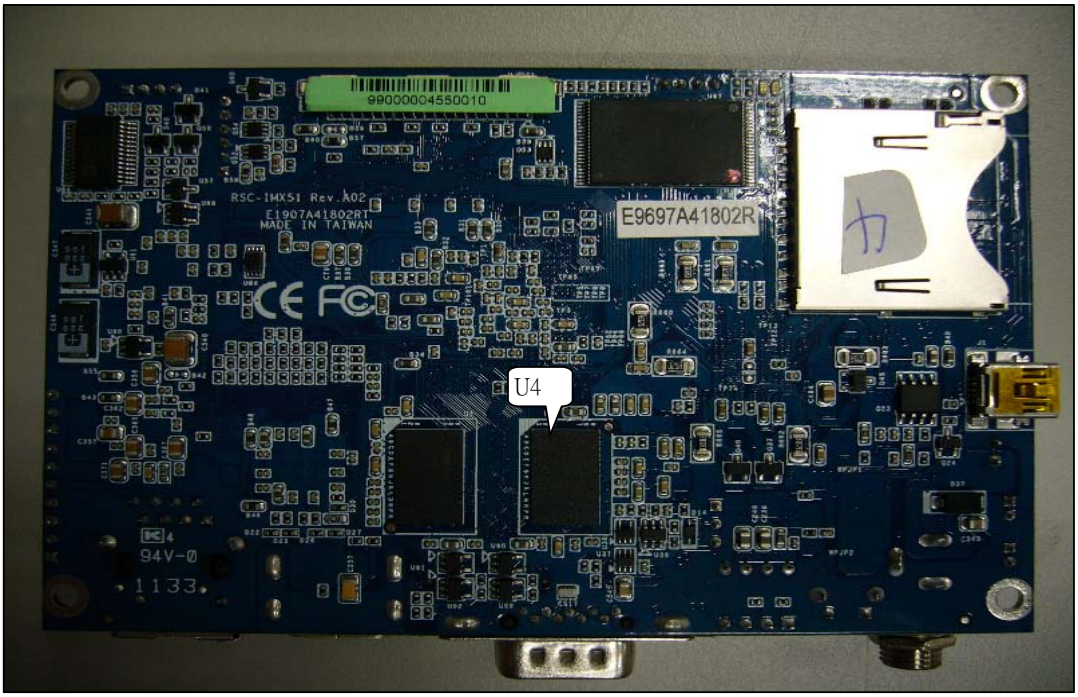
Where: Lx = Lifetime (hours) of the capacitor to be estimated
Lo = Base lifetime (hours) of the capacitor described in the specification sheet ; **2000hours for PX/PXA/PS/PSA series**
To = Maximum rated operating temperature ; **105ºC for PX/PXA/PS/PSA series**
Tx = Actual ambient temperature (ºC) of the capacitor within device
(This is not the environment temperature of the device, but the environment temperature of the capacitor that has been placed within the device.)

Measure in chamber 60℃ Run MP4 file + ping IP

Chamber								
60℃	L34	L35						
SPEC	125.00	125.00						
Ts	73.40	72.70						
SPEC - Ts	51.60	52.30						
Result	Pass	Pass						

Chamber	CPU / IMX51	PS8007SD	Audio SGTL5000	LAN8710	SDRAM	SDRAM	LVDS	
60℃	U1	U66	U75	U51	U4	U5	U27	
SPEC	105.00	85.00	85.00	85.00	85.00	85.00	150.00	
Ts	71.40	70.10	70.10	72.70	72.00	72.70	71.80	
SPEC - Ts	33.60	14.90	14.90	12.30	13.00	12.30	78.20	
Result	Pass	Pass	Pass	Pass	Pass	Pass	Pass	


U66
U75
U27
U1
L34
U51
U5
L35


99000004550010
RSC-IMX51 Rev.A02
E1907A41802RT
MADE IN TAIWAN
E9697A41802R
U4
94V-0
1133.