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Technical Compliance Statement

No. ACS-E13178

The following products have been tested by us with the listed standards and found in compliance with the council EMC directive 2004/108/EC. It is demonstrative for the compliance with this EMC Directive.

Submitter : TPV Electronics (FuJian) Co., Ltd.
Shangzheng, Yuan Hong Road, Fuqing City,
Fujian Province, P.R. China

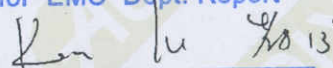
Product : LCD Monitor

Brand Name	Model No.
NEC	X462UNV
	X462UNV (C)
	MultiSync X462UNV

Test Standards :

EN 55022: 2010+AC: 2011 (Class A) AS/NZS CISPR 22: 2009+A1: 2010	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 61000-3-2: 2006+A1: 2009+A2: 2009	Electromagnetic compatibility(EMC) Part 3 :Limits Section 2 : Limits for harmonic current emissions (equipment input current $\leq$ 16A per phase)
EN 61000-3-3: 2008	Electromagnetic compatibility(EMC) Part 3 :Limits Section 3 : Limits of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current $\leq$ 16A
EN 55024: 2010	Information technology equipment-Immunity characteristics limits and methods of measurement
	IEC 61000-4-2: 2008 Electrostatic discharge
	IEC 61000-4-3: 2010 RF Field Strength susceptibility
	IEC 61000-4-4: 2012 Electrical Fast transients
	IEC 61000-4-5: 2005 Surge
	IEC 61000-4-6: 2008 Conducted Susceptibility
	IEC 61000-4-8: 2009 Magnetic field immunity
	IEC 61000-4-11: 2004 Dips / Voltage Interruption Variation

Stamp only for EMC Dept. Report

Signature: 

Ken Lu
Manager

Date : Apr. 28, 2013



The statement is based on a single evaluation of one sample of above mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. logo

EMC TEST REPORT

for

TPV Electronics (FuJian) Co., Ltd.

LCD Monitor

Brand Name	Model No.
NEC	X462UNV
	X462UNV (C)
	MultiSync X462UNV

Prepared for : TPV Electronics (FuJian) Co., Ltd.
Shangzheng, Yuan Hong Road, Fuqing City,
Fujian Province, P.R. China

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
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Report Number : ACS-E13178
Date of Test : Apr. 10~24, 2013
Date of Report : Apr. 28, 2013

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TEST REPORT VERIFICATION

Applicant : TPV Electronics (FuJian) Co., Ltd.

EUT Description : LCD Monitor

(A) Model No. & :
Brand Name

Brand Name	Model No.
NEC	X462UNV
	X462UNV (C)
	MultiSync X462UNV

(B) Power Supply : AC 100V-240V, 50/60Hz

(C) Test Voltage : AC 230V/50Hz

Measurement Standard Used:

AS/NZS CISPR 22: 2009+A1: 2010, EN 55022: 2010+AC: 2011 (Class A)

EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008

EN 55024: 2010

(IEC 61000-4-2: 2008, IEC 61000-4-3: 2010, IEC 61000-4-4: 2012,

IEC 61000-4-5: 2005, IEC 61000-4-6: 2008, IEC 61000-4-8: 2009, IEC 61000-4-11: 2004)

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the EN 55022 and EN 55024 requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

Date of Test : Apr. 10~24, 2013

Report of date: Apr. 28, 2013

Prepared by :

Miya Zhou / Assistant

Reviewed by :

Jack Zhong / Assistant Manager

Approved & Authorized Signer :



信華科技(深圳)有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章

Stamp only for EMC Dept. Report

Signature: Ken Lu 2013

Ken Lu / Manager

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION				
Description of Test Item	Standard	Results	Remark	
Conducted disturbance at mains terminals	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 29.31dB at 14.8281MHz	
Conducted disturbance at telecommunication port	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 5.34dB at 23.140MHz	
Radiated disturbance (30-1000MHz)	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 10.06dB at 151.250MHz	
Radiated disturbance (1-6GHz)	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 10.46dB at 2241.633MHz	
Harmonic current emissions	EN 61000-3-2: 2006+A1: 2009+A2: 2009	PASS	Meets the Class D requirement	
Voltage fluctuations & flicker	EN 61000-3-3: 2008	PASS	Meets the requirement	
IMMUNITY (EN 55024: 2010)				
Description of Test Item	Basic Standard	Results	Performance Criteria	Observation Criteria
Electrostatic discharge (ESD)	IEC 61000-4-2: 2008	PASS	B	A & B
Radio-frequency,Continuous radiated disturbance	IEC 61000-4-3: 2010	PASS	A	A
Electrical fast transient (EFT)	IEC 61000-4-4: 2012	PASS	B	B
Surge (Input a.c. power port)	IEC 61000-4-5: 2005	PASS	B	A
Surge(Telecommunication port)		PASS	B	B
Radio-frequency,Continuous conducted disturbance	IEC 61000-4-6: 2008	PASS	A	A
Power frequency magnetic field	IEC 61000-4-8: 2009	PASS	A	A
Voltage dips, >95% reduction	IEC 61000-4-11: 2004	PASS	B	A
Voltage dips, 30% reduction		PASS	C	A
Voltage interruptions		PASS	C	B

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description : LCD Monitor

Model Number &
Brand Name :

Brand Name	Model No.
NEC	X462UNV
	X462UNV (C)
	MultiSync X462UNV

Above all models difference are in sales marketing.

Test Model Number : X462UNV

Applicant : TPV Electronics (FuJian) Co., Ltd.
Shangzheng, Yuan Hong Road, Fuqing City, Fujian
Province, P.R. China

Max Resolution : 1920*1080@60Hz

Max Work Frequency : 148.5MHz

Panel : Manufacturer : SAMSUNG M/N: LTI460HN07

Power Cord : Unshielded, Detachable, 3m (3 pins)

DVI Cable : Shielded, Detachable, 1.8m (Bonded two ferrite cores)

VGA Cable : Shielded, Detachable, 4m (Bonded two ferrite cores)

Display Cable : Shielded, Detachable, 1.8m

HDMI Cable : Shielded, Detachable, 1.8m

Audio Cable : Shielded, Detachable, 1.8m

Remote Commander : Manufacturer: NEC, M/N: N/A

Date of Test : Apr. 10~24, 2013

Date of Receipt : Apr. 08, 2013

Sample Type : Prototype production

N/A is an abbreviation for Not Applicable.

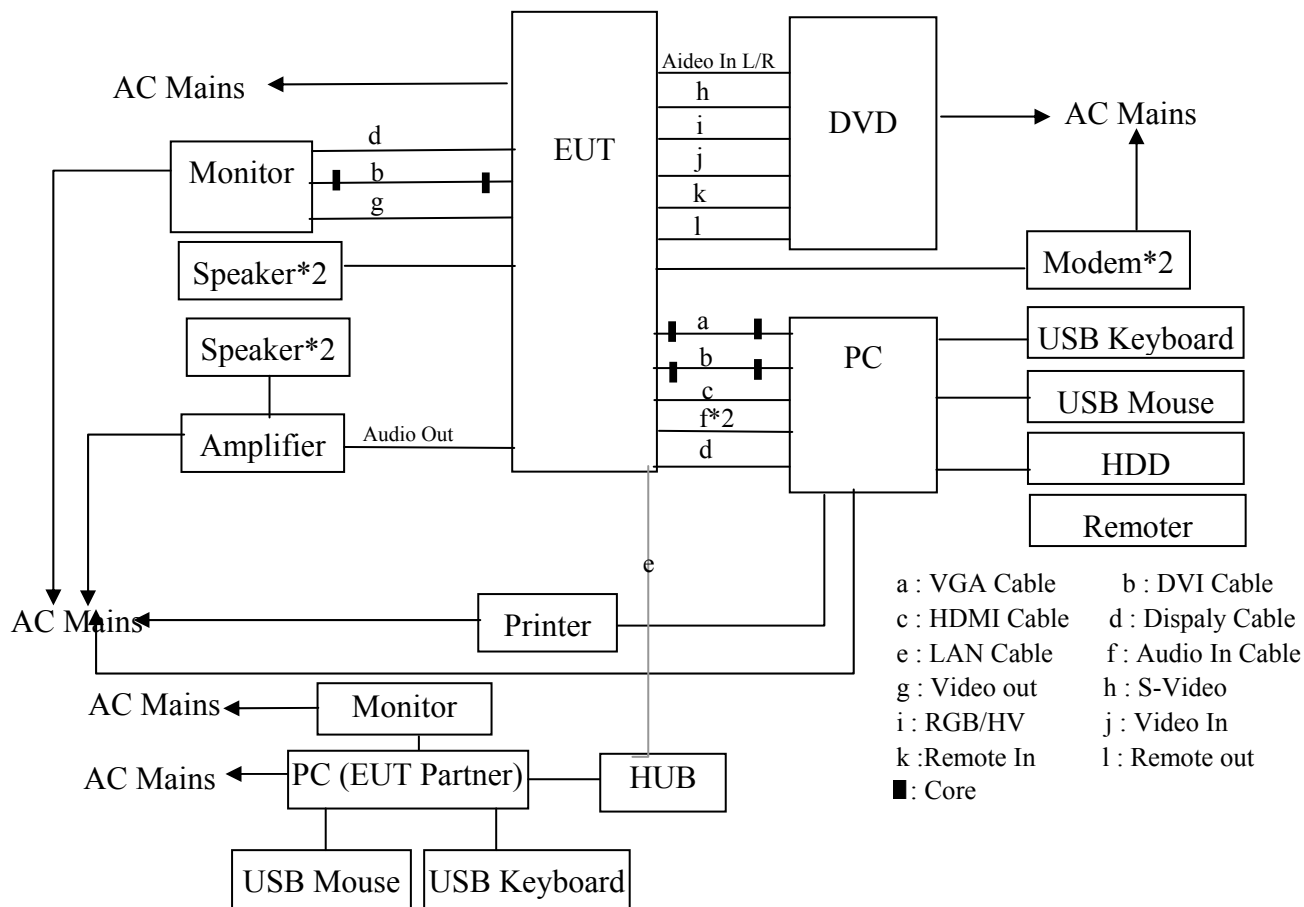
2.2. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type
1.	Personal Computer	Test PC M	DELL	Studio 540	224XK2X	☒ FCC DoC ☒ BSMI ID:R33002
		Power Cord: Unshielded, Detachable, 1.8m Display Card: HD3450 (DVI+VGA+HDMI)				
2.	USB Keyboard	ACS-EMC- K03R	DELL	SK-8115	CN-ODJ313-7161 6-711-04WJ	☒ FCC DoC ☒ BSMI ID: T3A002
		Power Cord: shielded, Undetachable, 2.0m				
3.	USB Mouse	ACS-EMC-M03R	DELL	M0C5UO	512023253	☒ FCC DoC ☒ BSMI ID: R41108
		Power Cord: shielded, Undetachable, 1.8m				
4.	Printer	ACS-EMC-PT04	HP	C9079A	N/A	☒ FCC DoC ☒ BSMI ID: R33001
		USB Cable: Shielded, Detachabled, 1.8m Power Cord: Unshielded, Detachabled, 1.8m Power Adapter: HP, M/N: 0957-2119, BSMI ID: R33030, DC Cable: Unshielded, Detachabled, 1.5m				
5.	HDD	ACS-EMC-HDD01	Terasys	F12-UF	A0100215-53900 31	☒ FCC DoC ☒ BSMI ID: 4912A022
		USB Cable: Shielded, Detachable, 1.8m				
6.	DVD Player	ACS-EMC-DVD01	DENON	DVD-3910	4098400342E	☐ FCC ID ☐ BSMI ID
		Data Cable: Shielded, Detachabled, 1.8m Power Cord: Unshielded, Detachabled , 1.8m				
7.	Power Amplifier	ACS-EMC-AMP01	SANGU	AV-805	N/A	☐ FCC ID ☐ BSMI ID
		Data Cable: Unshielded, Undetachable 1.2m				
8.	Speaker	Manufacturer: Shark M/N: HTW-615 External Speaker: 8Ω,15W				
9.	Monitor	ACS-EMC-LM06R	DELL	2407WFPb	CN-0YY528-466 33-764-1Y8S	☒ FCC DoC ☒ BSMI ID: R43002
		Power Cord: Unshielded, Detachable, 1.8m VGA Cable: Shielded, Detachable, 2.0m (with two cores) DVI Cable: Shielded, Detachable, 2.0m (with two cores)				
10.	Modem	ACS-EMC-MD01	ACEEX	1414	980013578	☒ FCC ID: IFAXDM1414 ☐ BSMI ID
		Data Cable: Shielded, Detachabled, 1.5m Power Adapter: TGL, MDE130100TH, DC Cable: Unshielded, Detachabled, 1.6m (with one core)				
11.	Modem	ACS-EMC-MD02	ACEEX	1414	980013578	☒ FCC ID: IFAXDM1414 ☐ BSMI ID
		Data Cable: Shielded, Detachabled, 1.5m Power Adapter: TGL, MDE130100TH, DC Cable: Unshielded, Detachabled, 1.6m (with one core)				

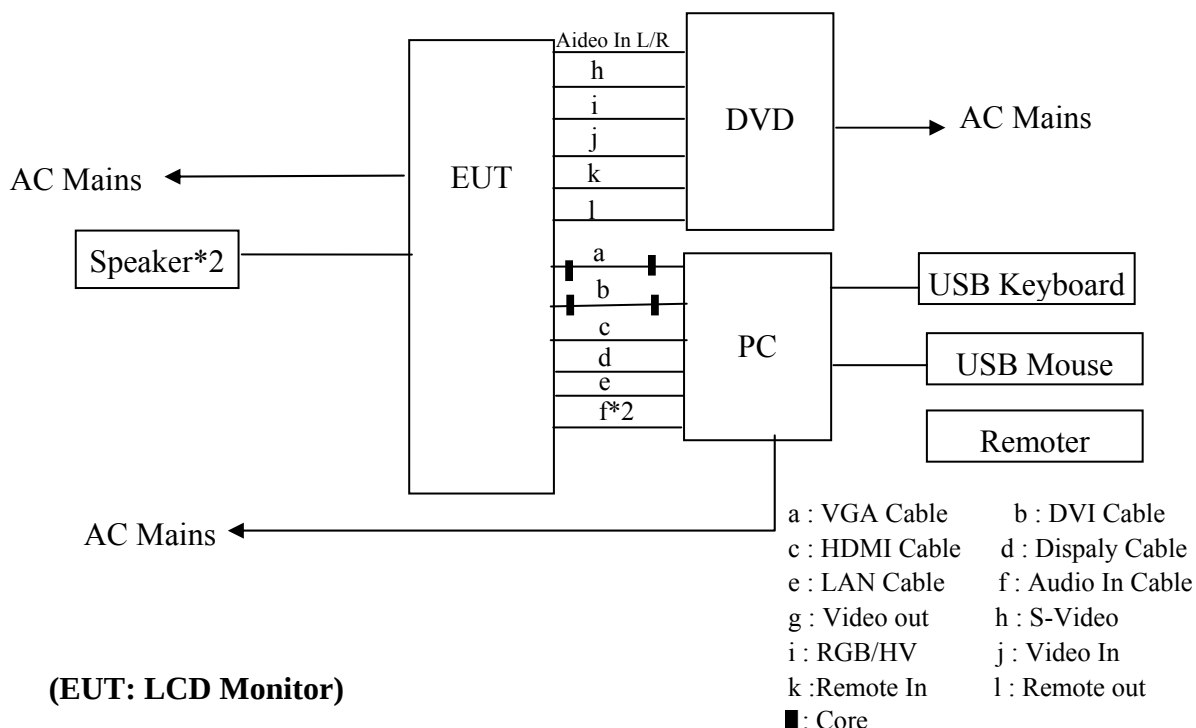
【PC system which transmitting 】

No.	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type
1.	Personal Computer	Test PC N	DELL	Studio 540	J14XK2X	☒ FCC DoC ☒ BSMI ID:R33002
		Power Cord: Unshielded, Detachable, 1.8m LAN Cable: Unshielded, Detachable, 10m Display Card: HD3650 (DVI+Display+HDMI)				
2.	USB Keyboard	ACS-EMC- K02R	DELL	SK-8115	CN-ORH656-658 90-686-007J	☒ FCC DoC ☒ BSMI ID: T3A002
		Power Cord: shielded, Undetachable, 2.0m				
3.	USB Mouse	ACS-EMC-M02R	DELL	M056UO	512024264	☒ FCC DoC ☒ BSMI ID: R41108
		Power Cord: shielded, Undetachable, 1.8m				
4.	Monitor	ACS-EMC-LM04R	DELL	1907FPt	CN-009759-71618 -6AP-ACPP	☒ FCC DoC ☒ BSMI ID: R3A002
		Power Cord: Unshielded, Detachable, 1.8m VGA Cable: Shielded, Detachable, 2.0m				
5.	HUB	ACS-EMC-DL01	D-Link	DGS-1008D	B2C6468500621	☒ FCC DoC ☐ BSMI ID
		Data Cable: Shielded, Detachabled, 1.8m Adapter: M/N: RL48-07V51000, DC Cable: Unshielded, Detachabled , 1.0m				

2.3. Block Diagram of connection between EUT and simulators For EMI Tests



For EMS Tests



(EUT: LCD Monitor)

2.4. Test Facility

Site Description

Name of Firm	: Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China
3m Anechoic Chamber	: Certificated by FCC, USA Registration Number: 90454 Valid Date: Feb.22, 2015
3m & 10m Anechoic Chamber	: Certificated by FCC, USA Registration Number: 794232 Valid Date: Oct.31, 2015
EMC Lab.	: Certificated by DAkkS, Germany Registration No: D-PL-12151-01-01 Valid Date: Feb.01, 2014
	Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2014

2.5. Measurement Uncertainty

(95% confidence levels, k=2)

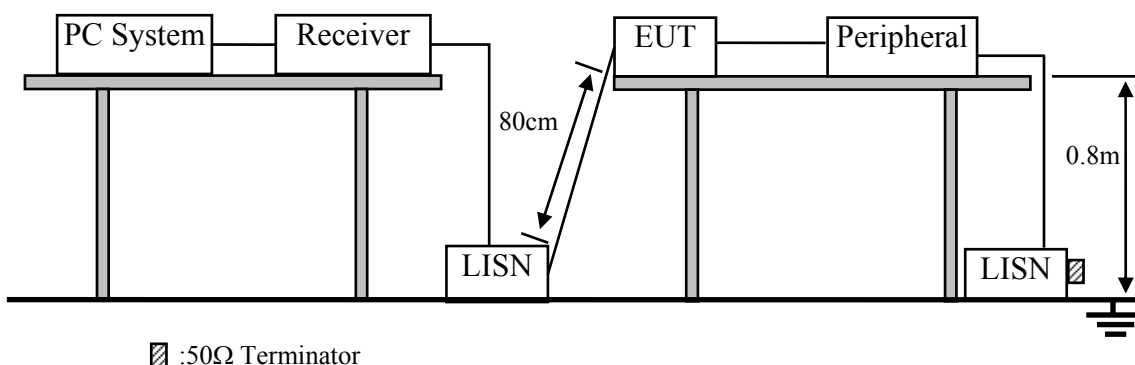
Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 2 Conduction	3.2 dB
Uncertainty for Radiation Emission test in 10m chamber (Distance: 10m)	2.8dB (30~200MHz, Polarize: H)
	3.0dB (30~200MHz, Polarize: V)
	3.2dB (200M~1GHz, Polarize: H)
	3.2dB (200M~1GHz, Polarize: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz-18GHz)	3.1dB (Distance: 3m Polarize: V)
	3.7dB (Distance: 3m Polarize: H)
Uncertainty for SVSWR in 10m Chamber	2.4 dB (Distance: 3m Polarize: V)
	2.4 dB (Distance: 3m Polarize: H)
Uncertainty for Flicker test	0.06%
Uncertainty for Harmonic test	1.8%
Uncertainty for C/S Test	1.36dB (Using CDN test)
	3.20 (Using EM clamp test)
Uncertainty for R/S Test	1.64dB (80MHz~200MHz)
	1.66dB(200MHz~1000MHz)
Uncertainty for test site temperature and humidity	0.6°C
	3%

3. CONDUCTED DISTURBANCE AT MAINS TERMINALS TEST

3.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	May.08, 12	1 Year
2	L.I.S.N.#1	Rohde & Schwarz	ENV4200	100041	May.08, 12	1 Year
3	L.I.S.N.#2	Kyoritsu	KNW-407	8-1628-5	May.08, 12	1 Year
4	Terminator	Hubersuhner	50Ω	No. 1	May.08, 12	1 Year
5	Terminator	Hubersuhner	50Ω	No. 2	May.08, 12	1 Year
6	RF Cable	Fujikura	3D-2W	No.2	May.08, 12	1 Year
7	Coaxial Switch	Anritsu	MP59B	6200298346	May.08, 12	1 Year
8	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	May.08, 12	1 Year

3.2. Block Diagram of Test Setup



3.3. Test Standard

EN 55022: 2010+AC: 2011, Class A

3.4. Power Line Conducted Disturbance at Mains Terminals Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	79	66
500kHz ~ 30MHz	73	60

Notes: 1. Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.5. EUT Configuration on Test

The following equipments are installed on Conducted Emission Test to meet EN 55022 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5.1. LCD Monitor (EUT)

Model Number : X462UNV

Serial Number : N/A

3.5.2. Support Equipment : As Tested Supporting System Detail, in Section 2.2.

3.6. Operating Condition of EUT

- 3.6.1. Setup the EUT and simulator as shown as Section 3.2.
- 3.6.2. Turned on the power of all equipment.
- 3.6.3. PC system ran the Self-test program “EMC TEST. exe” by windows XP and sent “H” Character to LCD Monitor (EUT) through DVI / VGA / HDMI / Display card, the Screen of EUT displayed and filled with “H” pattern
- 3.6.4. The PC system was running the program “1kHz signal playing” and sending sound to EUT.
- 3.6.5. DVD Mode: The DVD player played DVD Disk and sent “DVD 1kHz Signal Playing” image to the LCD Monitor (EUT).
- 3.6.6. The other peripheral devices were driven and operated in turn during all testing.

3.7. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55022 Class A on conducted Disturbance test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. The test results are reported and test results for Conducted Disturbance Test on Section 3.8.

3.8. Conducted Disturbance at Mains Terminals Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

The EUT with the following test modes were tested and selected (mode 3 & 6 & 9~15) to read Q.P values, all the test results are listed in next pages.

EUT: LCD Monitor

Model No. : X462UNV

Test Date: Apr. 18, 2013

Temperature: 23.5℃

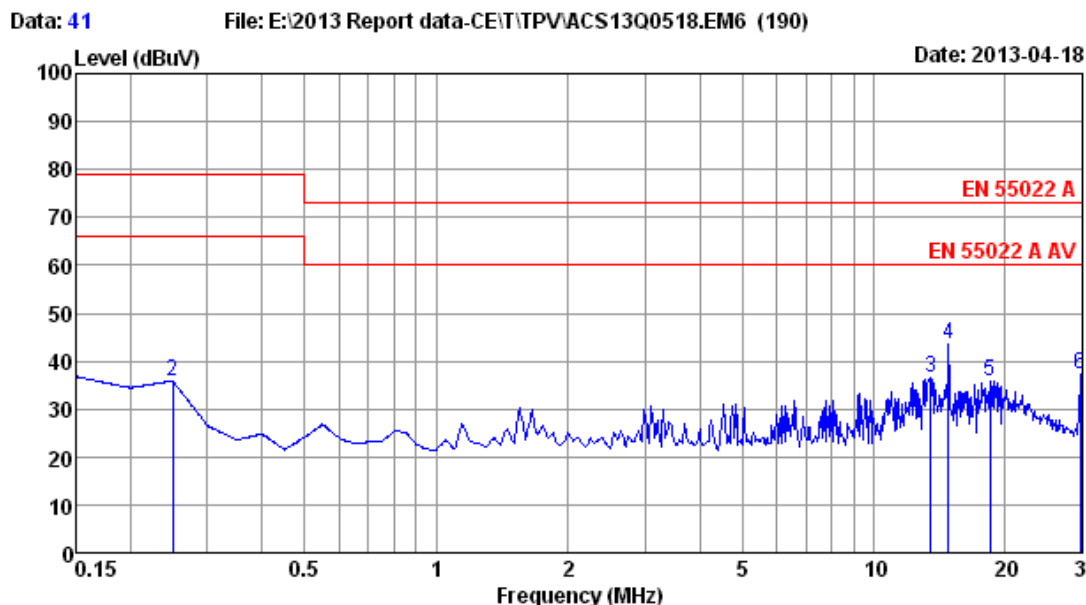
Humidity: 65%

The EUT was pre-tested under following test modes, and test mode 6 was the worst cases for final test.

No.	Test Mode	Input Port	Resolution & Frequency
1.	PC Mode	DVI	640*480/60Hz
2.			1280*1024/75Hz
3.			1920*1080/60Hz
4.		VGA	640*480/60Hz
5.			1280*1024/75Hz
6.✖			1920*1080/60Hz
7.		Display	640*480/60Hz
8.			1280*1024/75Hz
9.			1920*1080/60Hz
10.		HDMI	1920*1080/60Hz
11.		VGA Panel is Vertical	1080*1920/60Hz
12.	DVD Mode	Video In	
13.		HDMI 1080P	
14.		RGB / HV	
15.		S-Video	

Test result is presented in the report as below

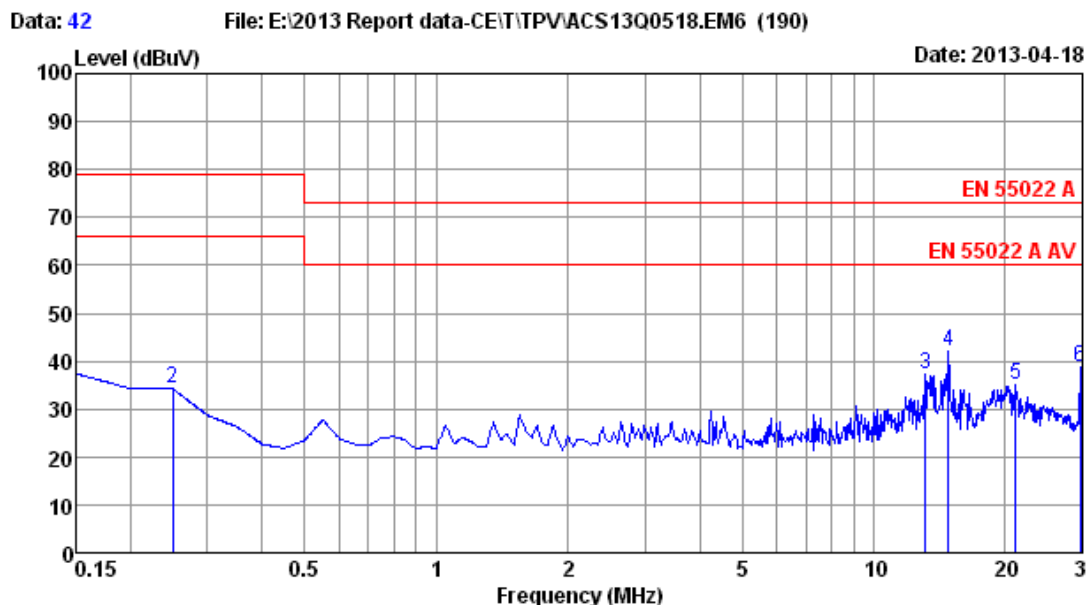
No.	Test Mode	Input Port	Resolution & Frequency
1.	Running “H” Pattern And 1KHz Playing	VGA	1920*1080/60Hz



Site no :2# CE Data No :41
 Dis./Lish :12 ENV4200 L1 LISN phase:LINE
 Limit :EN 55022 A
 Env./Ins. :23.5°C/65% Engineer :Nick_Huang
 EUT :LCD Monitor M/N:X462UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 VGA:1920*1080@60Hz

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.1500	9.95	9.93	16.88	36.76	79.00	42.24	QP
2	0.2495	9.87	9.94	16.10	35.91	79.00	43.09	QP
3	13.4793	9.95	10.00	16.65	36.60	73.00	36.40	QP
4	14.8281	9.99	10.01	23.69	43.69	73.00	29.31	QP
5	18.4258	9.99	10.04	15.90	35.93	73.00	37.07	QP
6	29.6838	10.03	10.17	17.07	37.27	73.00	35.73	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when useing a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :2# CE Data No :42
 Dis./Lisn :12 ENV4200 N LISN phase:NEUTRAL
 Limit :EN 55022 A
 Env./Ins. :23.5°C/65% Engineer :Nick_Huang
 EUT :LCD Monitor M/N:X462UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 VGA:1920*1080@60Hz

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.1500	9.95	9.93	17.52	37.40	79.00	41.60	QP
2	0.2495	9.87	9.94	14.47	34.28	79.00	44.72	QP
3	13.1269	9.94	10.00	17.14	37.08	73.00	35.92	QP
4	14.8281	9.99	10.01	22.23	42.23	73.00	30.77	QP
5	21.1472	9.99	10.07	14.89	34.95	73.00	38.05	QP
6	29.6838	10.03	10.17	18.71	38.91	73.00	34.09	QP

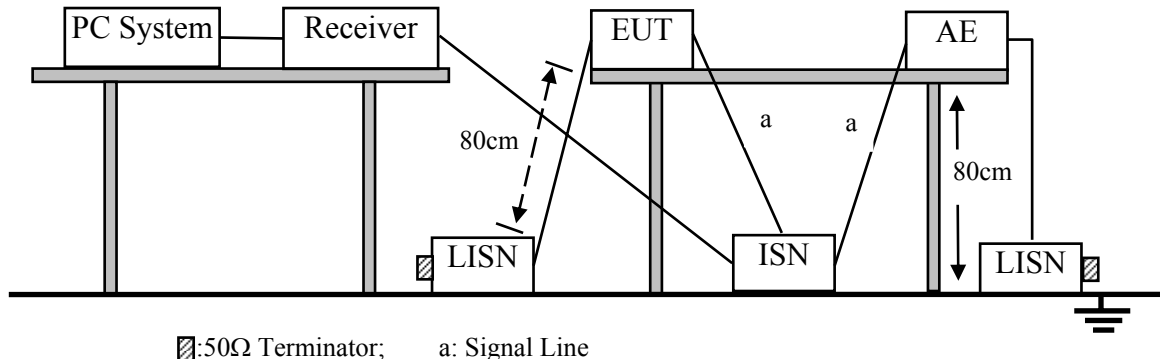
Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when useing a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. CONDUCTED DISTURBANCE AT TELECOMMUNICATION PORTS TEST

4.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	May.08, 12	1 Year
2	L.I.S.N.	Rohde & Schwarz	ENV4200	100041	May.08, 12	1 Year
3	L.I.S.N.	Kyoritsu	KNW-407	8-1628-5	May.08, 12	1 Year
4	Terminator	EMCO	50Ω	No. 1	May.08, 12	1 Year
5	Terminator	EMCO	50Ω	No. 2	May.08, 12	1 Year
6	RF Cable	Fujikura	3D-2W	No. 2	May.08, 12	1 Year
7	Current Probe	Rohde & Schwarz	EZ-17	833335/009	Nov.05,12	1 Year
8	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20534	Oct.31,12	1 Year
9	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20535	Oct.31,12	1 Year
10	Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20412	May.08, 12	1 Year
11	Coaxial Switch	Anritsu	MP59B	6200298346	May.08, 12	1 Year
12	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	May.08, 12	1 Year

4.2. Block Diagram of Test Setup



4.3. Test Standard

EN 55022: 2010+AC: 2011

4.4. Conducted Disturbance at Telecommunication Ports Limit

Frequency	Maximum RF Line Voltage		Maximum RF Line Current	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)	Quasi-Peak Level dB(μA)	Average Level dB(μA)
150kHz ~ 500kHz	97~87	84~74	53-43	40-30
500kHz ~ 30MHz	87	74	43	30

Notes: 1. Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

4.5. EUT Configuration on Test

The following equipments are installed on Conducted Emission Test to meet EN 55022 Class A requirement and operating in a manner that tends to maximize its emission characteristics in a normal application. The configuration of EUT and its simulators were the same as those used in conducted test. Please refer to Section 3.5.

4.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 4.2.

4.7. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55022: 2010+AC: 2011 on Conducted Disturbance test. And connected to the telecommunication ports through ISN. Both sides of telecommunication line are investigated to find out the maximum conducted emission according to EN 55022 regulations during conducted disturbance test.

The bandwidth of the test receiver (R& S Test Receiver ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 4.8.

4.8. Conducted Disturbance at Telecommunication Ports Test Results

PASS.

The EUT with the following test modes were tested and to read Q.P values, all the test results are listed in next pages.

EUT: LCD Monitor

Model No. : X462UNV

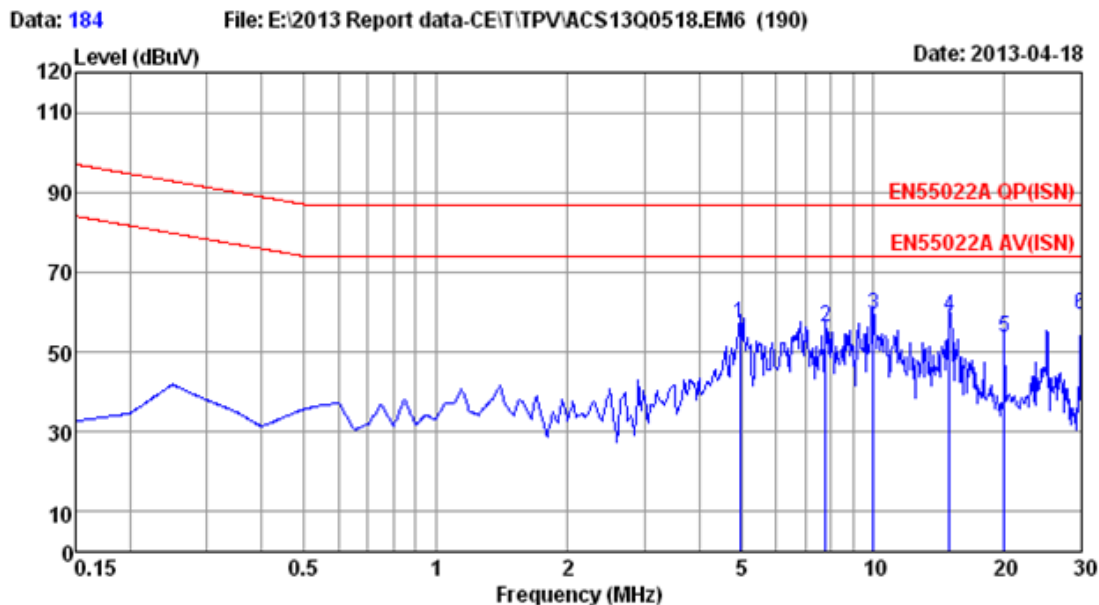
Test Date: Apr. 18, 2013

Temperature: 23.5°C

Humidity: 65%

The details of test modes are as follows :

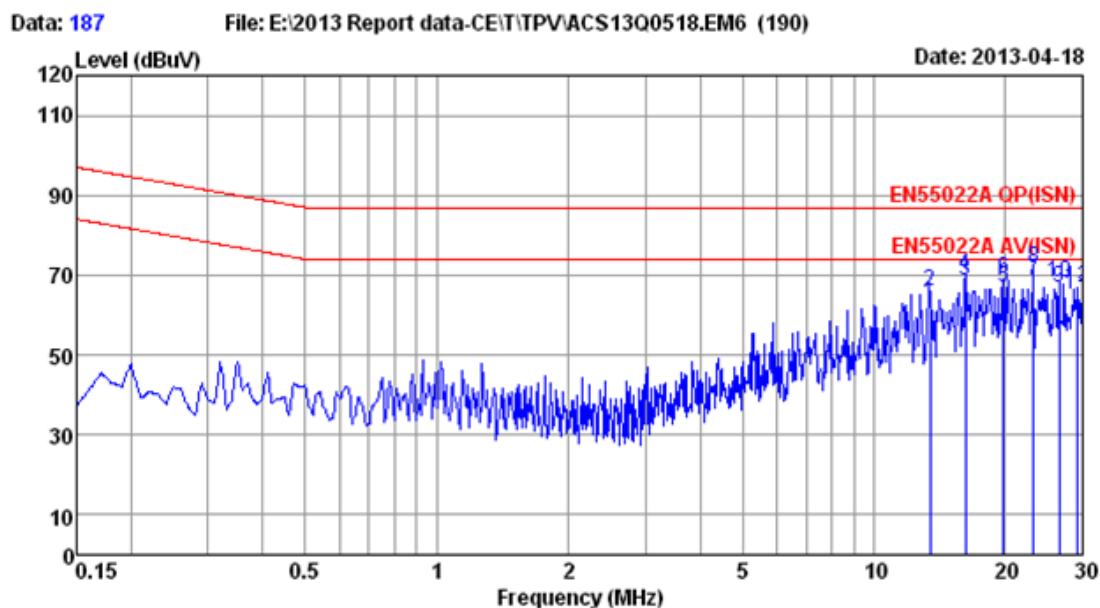
No.	Test Mode
1.	LAN 10Mbps
2.	LAN 100Mbps



Site no :2# CE Data No :184
Dis./Lisn :2012 ISN T800 CAT5 LISN phase:
Limit :EN55022A QP (ISN)
Env./Ins. :23.5°C/65% Engineer :Nick_Huang
EUT :LCD Monitor M/N:X462UNV
Power Rating :AC 230V/50Hz
Test Mode :Running "H" Pattern And 1KHz Playing
ISN:10Mbps

No	Freq (MHz)	ISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	4.952	9.66	9.95	37.64	57.25	87.00	29.75	QP
2	7.810	9.64	9.96	36.58	56.18	87.00	30.82	QP
3	10.019	9.63	9.98	39.75	59.36	87.00	27.64	QP
4	14.986	9.64	10.01	39.03	58.68	87.00	28.32	QP
5	19.950	9.96	10.06	33.56	53.58	87.00	33.42	QP
6	30.000	9.96	10.17	39.41	59.54	87.00	27.46	QP

Remarks: 1.Emission Level=ISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



Site no :2# CE Data No :187
 Dis./Lisn :2012 ISN T800 CAT5 LISN phase:
 Limit :EN55022A QP (ISN)
 Env./Ins. :23.5°C/65% Engineer :Nick_Huang
 EUT :LCD Monitor M/N:X462UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 ISN:100Mbps

No	Freq (MHz)	ISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	13.408	9.64	10.00	43.03	62.67	74.00	11.33	Average
2	13.408	9.64	10.00	46.51	66.15	87.00	20.85	QP
3	16.226	9.72	10.02	48.89	68.63	74.00	5.37	Average
4	16.226	9.72	10.02	50.33	70.07	87.00	16.93	QP
5	19.740	9.94	10.06	47.05	67.05	74.00	6.95	Average
6	19.740	9.94	10.06	48.86	68.86	87.00	18.14	QP
7	23.140	9.88	10.10	48.68	68.66	74.00	5.34	Average
8	23.140	9.88	10.10	51.60	71.58	87.00	15.42	QP
9	26.558	9.88	10.14	46.78	66.80	74.00	7.20	Average
10	26.558	9.88	10.14	48.32	68.34	87.00	18.66	QP
11	29.216	9.94	10.16	45.08	65.18	74.00	8.82	Average
12	29.216	9.94	10.16	46.57	66.67	87.00	20.33	QP

Remarks: 1.Emission Level=ISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

5. RADIATED DISTURBANCE TEST

5.1. Test Equipments

5.1.1. For frequency range 30MHz~1000MHz (At Anechoic Chamber)

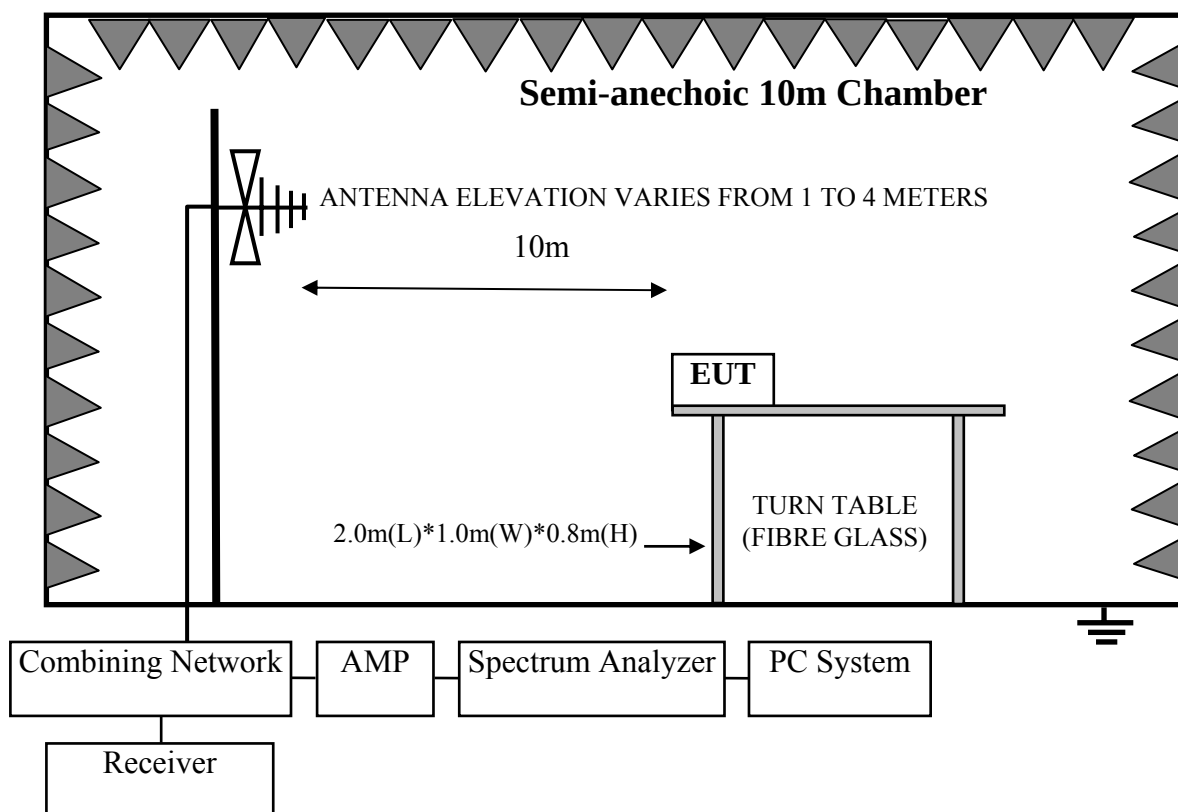
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	10m Chamber	AUDIX	N/A	N/A	Nov.25,12	1 Year
2	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year
3	Test Receiver	Rohde & Schwarz	ESCI	100843	Oct.31, 12	1 Year
4	Amplifier	Agilent	8447D	2944A10684	May.08, 12	1 Year
5	Bilog Antenna	Schaffner	CBL6112D	25237	Aug.29, 11	2 Year
6	RF Cable	MIYAZAKI	CFD400-NL	10m Chamber No.1	May.08, 12	1 Year
7	Coaxial Switch	Anritsu	MP59B	M73989	May.08, 12	1 Year
8	Coaxial Switch	Anritsu	MP59B	6200766905	May.08, 12	1 Year

5.1.2. For frequency range 1GHz~6GHz (At Anechoic Chamber)

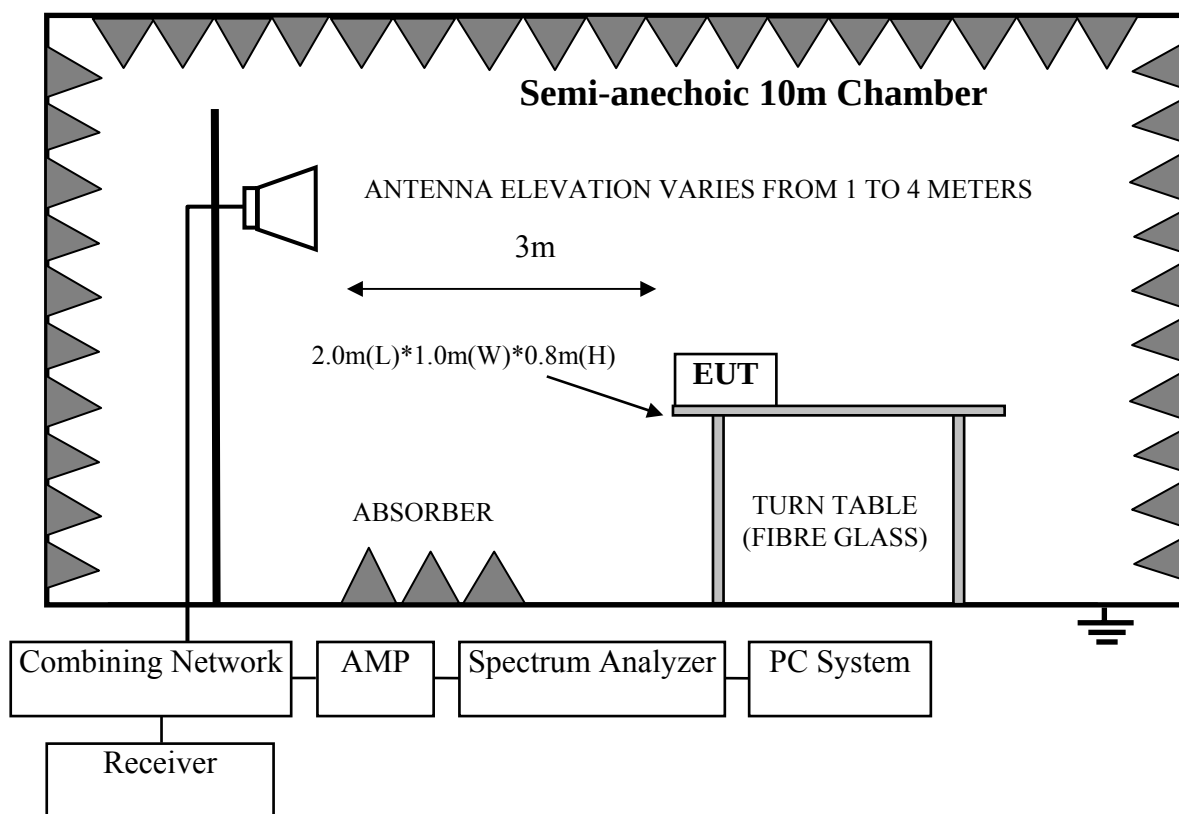
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year
2	Horn Antenna	EMCO	3115	9510-4580	June.05, 12	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 12	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77980/6	May.08, 12	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 12	1 Year

5.2. Block Diagram of Test Setup

5.2.1. In Anechoic Chamber Test Setup Diagram for 30MHz~1000MHz



5.2.2. In Anechoic (10m) Chamber Test Setup Diagram for 1-6GHz



5.3. Test Standard

EN 55022: 2010+AC: 2011, Class A

5.4. Radiated Disturbance Limit

All emanations from a Class A computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	10	40
230 ~ 1000	10	47
1000~3000	3	76(Peak) 56(Average)
3000~6000	3	80(Peak) 60(Average)

Note: (1) Emission level = Antenna Factor + Cable Loss + Reading
Emission level = Antenna Factor - Amp Factor + Cable Loss + Reading (above 1000MHz)

(2) The lower limit shall apply at the transition frequencies.

(3) Distance refers to the distance in meters between the test instrument antenna and the closed point of any part of the E.U.T..

5.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

5.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 5.2.

5.7. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m & 10m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all the interface cables were changed according to EN 55022 Class A on Radiated Disturbance test.

The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCI) is 120 kHz.

The resolution bandwidth of the Agilent Spectrum Analyzer N9030A was set at 1MHz. (For above 1GHz)

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values.

The frequency range from 1GHz to 6GHz was checked and all final readings of measurement were with Peak and Average detector, measurement distance was 3m at semi-anechoic chamber. The portion of the test volume that was obstructed by absorber placed on the floor (30cm maximum).

Finally, selected operating situations at Anechoic Chamber measurement, all the test results are listed in section 5.8.

5.8. Radiated Disturbance Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

EUT: LCD Monitor Model No. : X462UNV

The EUT with the following test modes were tested and selected (mode 3 & 6 & 9 ~15) to read Q.P values, all the test results are listed in next pages.

Test Date: Apr. 23, 2013 Temperature: 24℃ Humidity: 56%

The EUT was pre-tested under following test modes, and test mode 6 was the worst cases for final test.

No.	Test Mode	Input Port	Resolution & Frequency
1.	PC Mode	DVI	640*480/60Hz
2.			1280*1024/75Hz
3.			1920*1080/60Hz
4.		VGA	640*480/60Hz
5.			1280*1024/75Hz
6. ✖			1920*1080/60Hz
7.		Display	640*480/60Hz
8.			1280*1024/75Hz
9.			1920*1080/60Hz
10.		HDMI	1920*1080/60Hz
11.		VGA Panel is Vertical	1080*1920/60Hz
12.	DVD Mode	Video In	
13.		HDMI 1080P	
14.		RGB / HV	
15.		S-Video	

Test result is presented in the report as below

No	Test Mode	Input Port	Resolution & Frequency
1.	Running “H” Pattern And 1KHz Playing	VGA	1920*1080/60Hz

For frequency range 1GHz~6GHz

The EUT with below test mode were measured within Anechoic Chamber and the test results listed in next pages

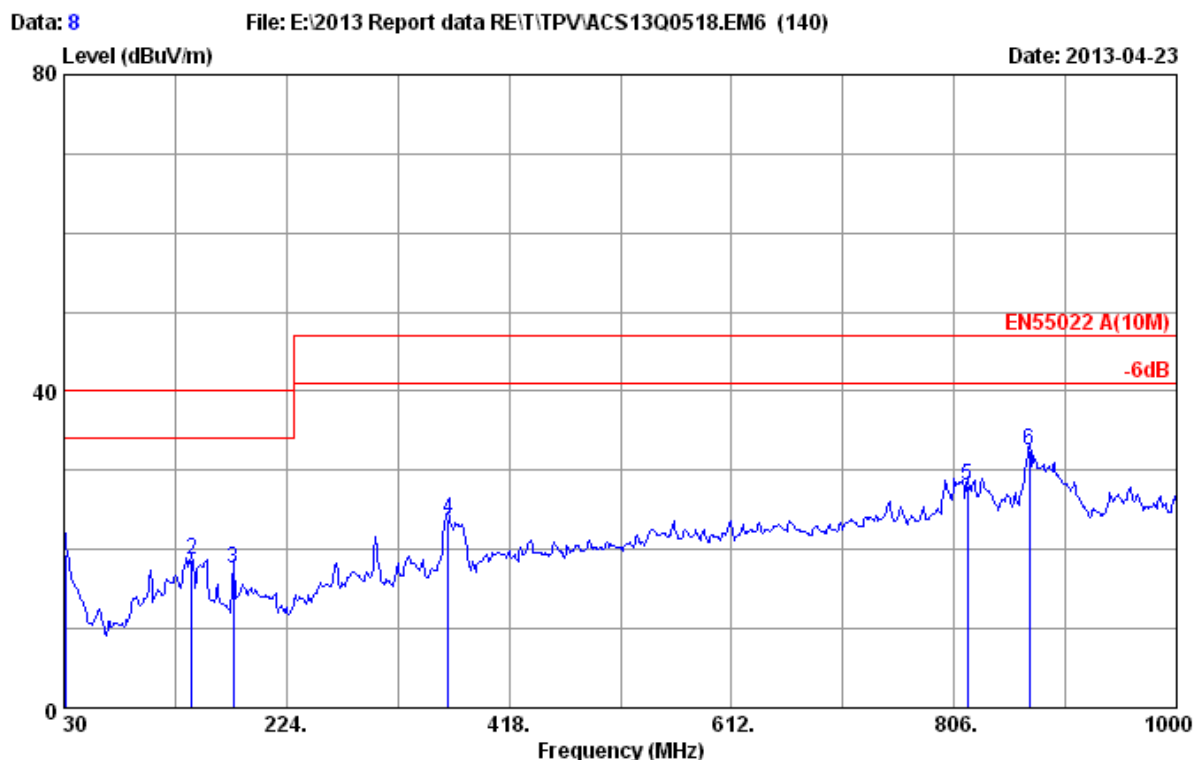
Test Date: Apr. 24, 2013 Temperature: 24℃ Humidity: 56%

The EUT was pre-tested under following test modes, and test mode 2 was the worst cases for final test.

No.	Input Port	Resolution & Frequency
1.	DVI	1920*1080/60Hz
2.	VGA	1920*1080/60Hz
3.	Display	1920*1080/60Hz
4.	HDMI	1920*1080/60Hz
5.	VGA Panel is Vertical	1080*1920/60Hz

Test result is presented in the report as below

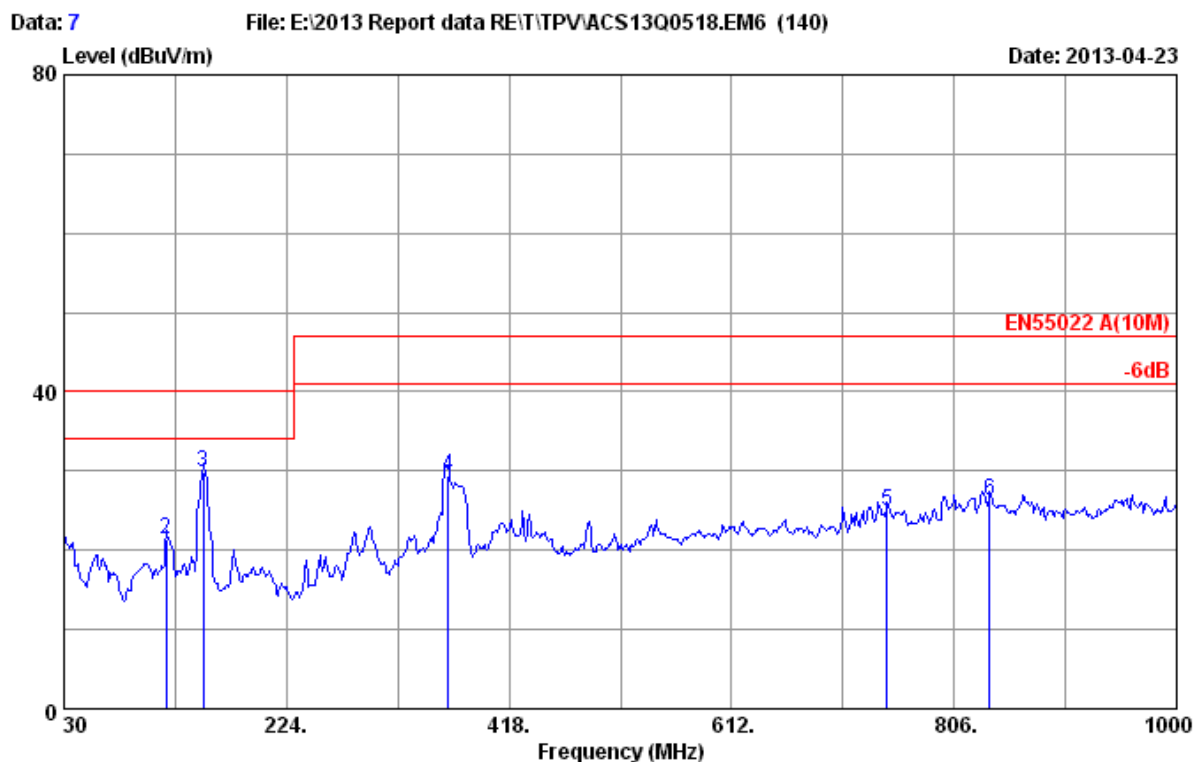
No.	Input Port	Resolution & Frequency
1.	VGA	1920*1080/60Hz



Site no :10M Data No :8
 Dis./Lisn :10m 11 CBL6112D 25237 Ant.pol :HORIZONTAL
 Limit :EN55022 A(10M)
 Env./Ins. :24°C/56% Engineer :Libra
 EUT :LCD Monitor M/N:X462UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 VGA:1920*1080@60Hz

No	Freq (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	31.940	18.50	0.53	0.35	19.38	40.00	20.62	QP
2	141.550	11.80	1.06	5.78	18.64	40.00	21.36	QP
3	177.440	10.00	1.15	6.48	17.63	40.00	22.37	QP
4	364.650	14.80	1.68	7.29	23.77	47.00	23.23	QP
5	817.640	20.40	2.93	4.81	28.14	47.00	18.86	QP
6	871.960	20.96	3.03	8.46	32.45	47.00	14.55	QP

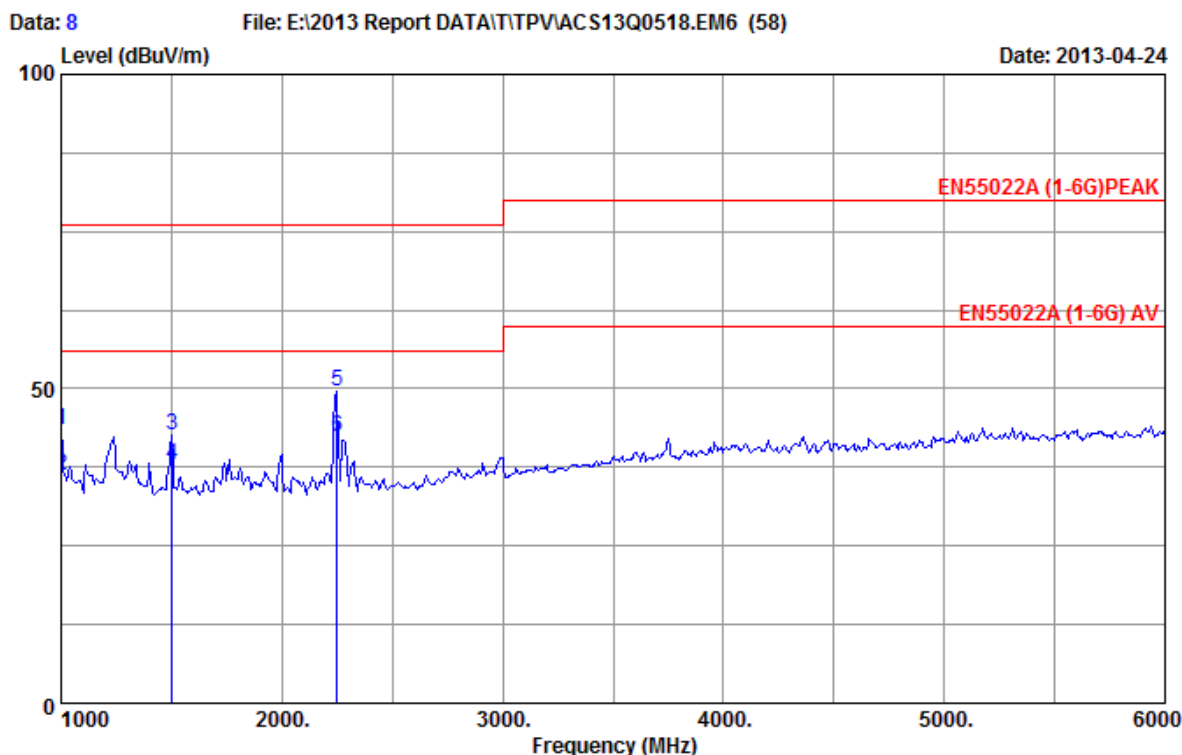
Remarks: 1.Emission Level=Antenna Factor+Cable Loss+Reading.
 2.The emission Levels that are 20db below the official limit are not reported
 3. The worst emission was detected at 871.960MHz with corrected signal level of 323.45dBμV/m (Limit is 47.00dBμV/m) when the antenna was at horizontal polarization and at 2.3m high and the turn table was at 152°.
 4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.



Site no :10M Data No :7
 Dis./Lisn :10m 11 CBL6112D 25237 Ant.pol :VERTICAL
 Limit :EN55022 A(10M)
 Env./Ins. :24°C/56% Engineer :Libra
 EUT :LCD Monitor M/N:X462UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 VGA:1920*1080@60Hz

No	Freq (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.000	19.60	0.53	0.83	20.96	40.00	19.04	QP
2	119.240	13.10	1.01	7.31	21.42	40.00	18.58	QP
3	151.250	11.10	1.08	17.76	29.94	40.00	10.06	QP
4	364.650	14.80	1.68	13.03	29.51	47.00	17.49	QP
5	747.800	19.64	2.76	2.66	25.06	47.00	21.94	QP
6	837.040	20.38	2.96	3.01	26.35	47.00	20.65	QP

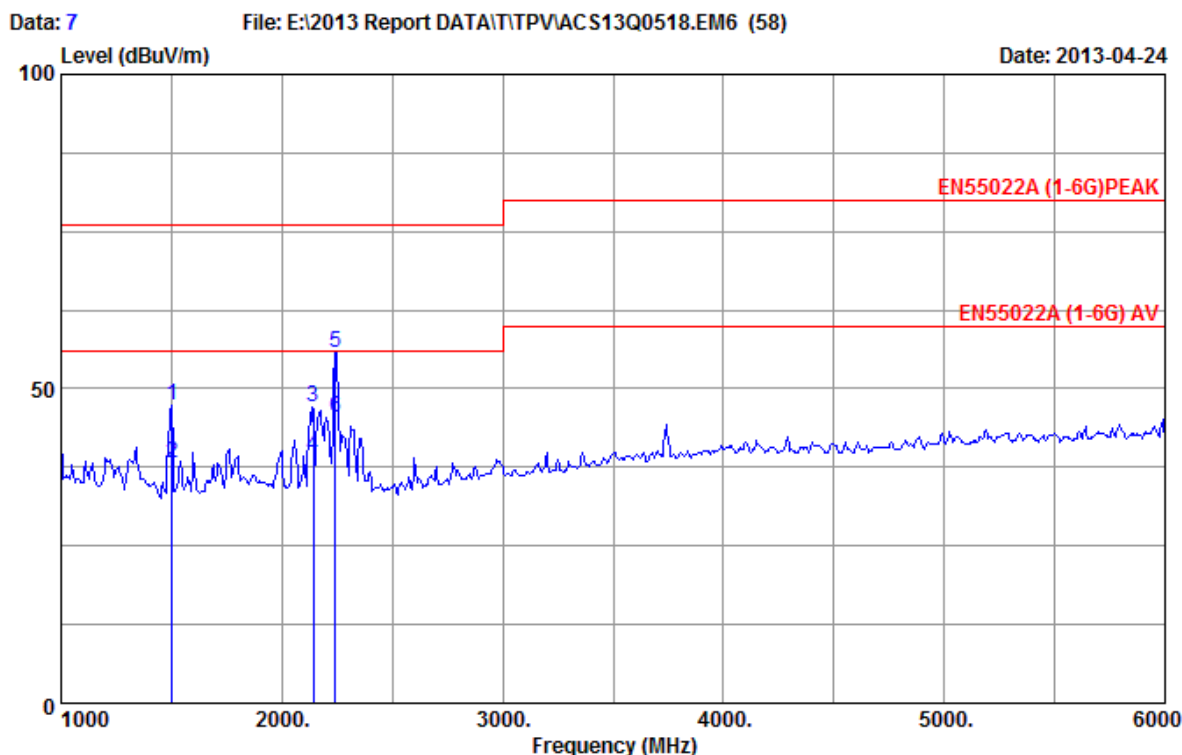
Remarks: 1.Emission Level=Antenna Factor+Cable Loss+Reading.
 2.The emission Levels that are 20db below the official limit are not reported
 3. The worst emission was detected at 151.250MHz with corrected signal level of 29.94dB μ V/m (Limit is 40.00dB μ V/m) when the antenna was at vertical polarization and at 1.2m high and the turn table was at 315°.
 4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.



Site no. : 10m Chamber Data no. : 8
 Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : HORIZONTAL
 Limit : EN55022A (1-6G) PEAK
 Env. / Ins. : 24°C/56% Engineer : Even_Deng
 EUT : LCD Monitor M/N:X462UNV
 Power Rating : AC 230V/50Hz
 Test Mode : Running 'H' Pattern And 1kHz Playing
 VGA:1920*1080@60Hz

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1001.036	23.10	0.95	36.50	56.03	43.58	76.00	32.42	Peak
2	1001.564	23.10	0.95	36.50	48.63	36.18	56.00	19.82	Average
3	1501.822	24.10	1.02	35.95	53.37	42.54	76.00	33.46	Peak
4	1501.824	24.10	1.02	35.95	48.63	37.80	56.00	18.20	Average
5	2251.522	23.95	1.23	35.28	59.60	49.50	76.00	26.50	Peak
6	2251.912	23.95	1.23	35.28	52.36	42.26	56.00	13.74	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.



Site no. : 10m Chamber Data no. : 7
 Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
 Limit : EN55022A (1-6G) PEAK
 Env. / Ins. : 24°C/56% Engineer : Even_Deng
 EUT : LCD Monitor M/N:X462UNV
 Power Rating : AC 230V/50Hz
 Test Mode : Running 'H' Pattern And 1kHz Playing
 VGA:1920*1080@60Hz

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1500.911	24.10	1.02	35.95	58.19	47.36	76.00	28.64	Peak
2	1501.512	24.10	1.02	35.95	48.96	38.13	56.00	17.87	Average
3	2140.932	24.06	1.18	35.33	57.09	47.00	76.00	29.00	Peak
4	2141.821	24.06	1.18	35.33	49.27	39.18	56.00	16.82	Average
5	2240.255	23.96	1.22	35.28	65.86	55.76	76.00	20.24	Peak
6	2241.633	23.96	1.22	35.28	55.64	45.54	56.00	10.46	Average

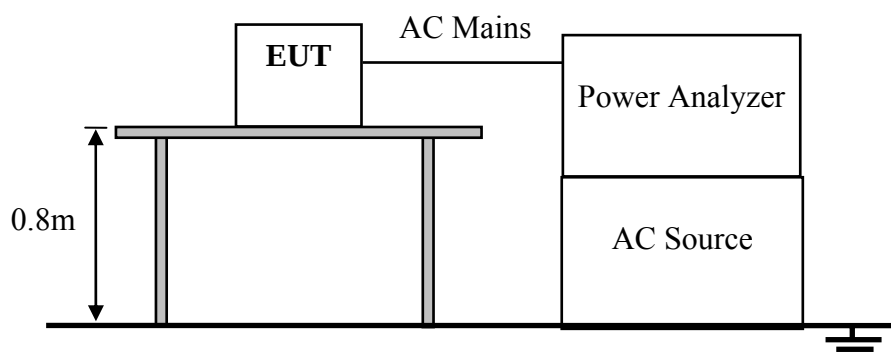
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.

6. HARMONIC CURRENT TEST

6.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Compliance Test System	California Instruments	5001ix	58481	Oct.31, 12	1 Year
2.	Compliance Test System	California Instruments	PACS-1	72627	Oct.31, 12	1 Year

6.2. Block Diagram of Test Setup



6.3. Test Standard

EN 61000-3-2: 2006+A1: 2009+A2: 2009; Class D

6.4. Limits of Harmonic Current

Limits for Class D Equipment		
Harmonic order (n)	Maximum permissible harmonic current per watt (mA/W)	Maximum permissible harmonic current (A)
3	3.4	0.23
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15≤n≤39 (odd harmonic only)	3.85/n	0.15×15/n

Remark: if the EUT Power level is below 75 Watts and therefore has no defined limits.

6.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

6.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 6.2.

6.7. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

6.8. Test Results

PASS.

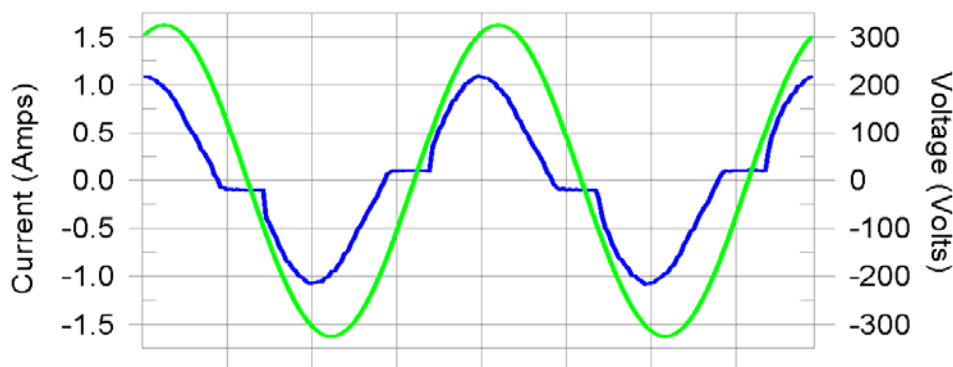
The EUT was tested and all the test results are listed in next pages.

Harmonics – Class-D per Ed. 3.2 (2009)(Run time)

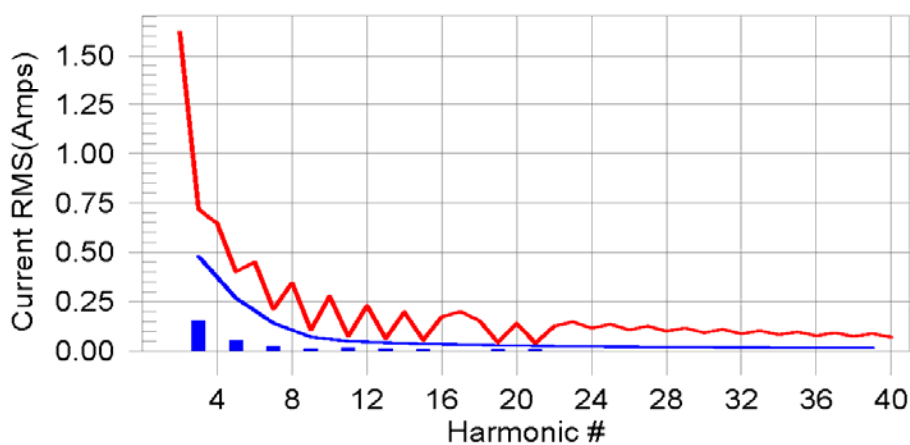
EUT: LCD Monitor M/N:X462UNV
 Test category: Class-D per Ed. 3.2 (2009) (European limits)
 Test date: 2013-4-10 Start time: 14:01:16 End time: 14:04:07
 Test duration (min): 2.5 Data file name: H-000132.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line European Limits



Test result: Pass Worst harmonic was #3 with 31.90% of the limit.

Current Test Result Summary (Run time)

EUT: LCD Monitor M/N:X462UNV
 Test category: Class-D per Ed. 3.2 (2009) (European limits)
 Test date: 2013-4-10 Start time: 14:01:16 End time: 14:04:07
 Test duration (min): 2.5 Data file name: H-000132.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal
 THCA: 0.16 I-THD(%): 25.85 POHC(A): 0.005 POHC Limit(A): 0.060
 Highest parameter values during test:
 V_RMS (Volts): 230.03 Frequency(Hz): 50.00
 I_Peak (Amps): 1.127 I_RMS (Amps): 0.663
 I_Fund (Amps): 0.642 Crest Factor: 1.701
 Power (Watts): 140.6 Power Factor: 0.922

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.152	0.478	31.9	0.154	0.717	21.42	Pass
4	0.000						
5	0.051	0.267	19.2	0.052	0.401	12.93	Pass
6	0.000						
7	0.024	0.141	17.4	0.025	0.211	11.80	Pass
8	0.000						
9	0.009	0.070	12.3	0.009	0.105	8.42	Pass
10	0.000						
11	0.015	0.049	29.6	0.015	0.074	20.00	Pass
12	0.000						
13	0.011	0.042	25.0	0.011	0.062	17.06	Pass
14	0.000						
15	0.007	0.037	18.4	0.007	0.054	12.61	Pass
16	0.000						
17	0.003	0.032	10.1	0.000	0.199	0.00	Pass
18	0.000						
19	0.006	0.029	20.0	0.006	0.043	13.51	Pass
20	0.000						
21	0.005	0.026	20.5	0.005	0.039	13.88	Pass
22	0.000						
23	0.004	0.023	17.1	0.000	0.147	0.00	Pass
24	0.000						
25	0.003	0.022	13.4	0.000	0.135	0.00	Pass
26	0.000						
27	0.004	0.020	19.6	0.000	0.125	0.00	Pass
28	0.000						
29	0.004	0.019	21.3	0.000	0.116	0.00	Pass
30	0.000						
31	0.003	0.017	17.9	0.000	0.109	0.00	Pass
32	0.000						
33	0.003	0.016	16.8	0.000	0.102	0.00	Pass
34	0.000						
35	0.003	0.015	19.0	0.000	0.096	0.00	Pass
36	0.000						
37	0.003	0.015	20.1	0.000	0.091	0.00	Pass
38	0.000						
39	0.002	0.014	15.0	0.000	0.087	0.00	Pass
40	0.000						

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

Voltage Source Verification Data (Run time)

EUT: LCD Monitor M/N:X462UNV Tested by: Victory
 Test category: Class-D per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2013-4-10 Start time: 14:01:16 End time: 14:04:07
 Test duration (min): 2.5 Data file name: H-000132.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.03	Frequency(Hz): 50.00
I _{Peak} (Amps): 1.127	I _{RMS} (Amps): 0.663
I _{Fund} (Amps): 0.642	Crest Factor: 1.701
Power (Watts): 140.6	Power Factor: 0.922

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.086	0.460	18.73	OK
3	0.469	2.070	22.68	OK
4	0.052	0.460	11.30	OK
5	0.051	0.920	5.55	OK
6	0.025	0.460	5.41	OK
7	0.044	0.690	6.35	OK
8	0.015	0.460	3.23	OK
9	0.020	0.460	4.37	OK
10	0.014	0.460	3.02	OK
11	0.015	0.230	6.67	OK
12	0.010	0.230	4.33	OK
13	0.011	0.230	4.57	OK
14	0.007	0.230	3.00	OK
15	0.014	0.230	6.18	OK
16	0.011	0.230	4.75	OK
17	0.010	0.230	4.29	OK
18	0.008	0.230	3.54	OK
19	0.009	0.230	3.87	OK
20	0.006	0.230	2.68	OK
21	0.007	0.230	2.97	OK
22	0.005	0.230	2.04	OK
23	0.007	0.230	3.05	OK
24	0.003	0.230	1.49	OK
25	0.005	0.230	2.06	OK
26	0.002	0.230	0.99	OK
27	0.007	0.230	3.07	OK
28	0.003	0.230	1.09	OK
29	0.008	0.230	3.64	OK
30	0.002	0.230	1.05	OK
31	0.004	0.230	1.83	OK
32	0.002	0.230	0.97	OK
33	0.006	0.230	2.60	OK
34	0.002	0.230	1.04	OK
35	0.005	0.230	2.13	OK
36	0.002	0.230	0.81	OK
37	0.006	0.230	2.67	OK
38	0.002	0.230	0.75	OK
39	0.005	0.230	2.28	OK
40	0.002	0.230	1.03	OK

Harmonics – Class-D per Ed. 3.2 (2009)(Run time)

EUT: LCD Monitot M/N:X462UNV

Tested by: Victory

Test category: Class-D per Ed. 3.2 (2009) (European limits)

Test Margin: 100

Test date: 2013-4-11

Start time: 9:32:18

End time: 9:35:09

Test duration (min): 2.5

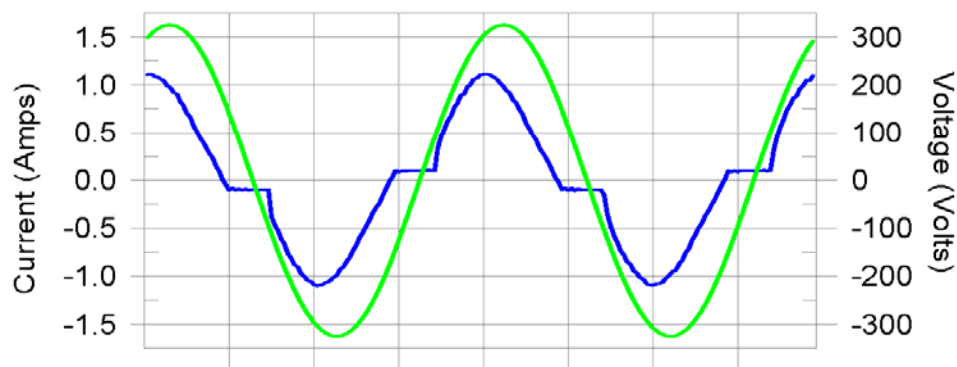
Data file name: H-000143.cts_data

Comment: DVD Playing

Customer: TPV

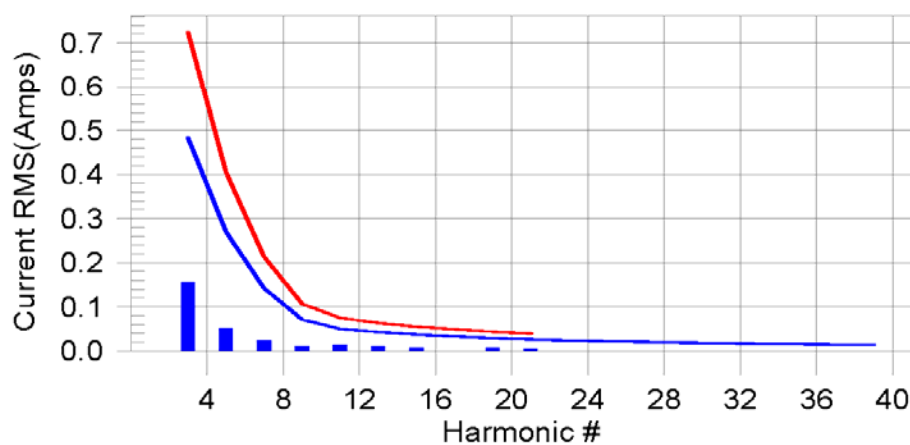
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line

European Limits



Test result: Pass Worst harmonic was #3 with 32.11% of the limit.

Current Test Result Summary (Run time)

EUT: LCD Monitot M/N:X462UNV Tested by: Victory
Test category: Class-D per Ed. 3.2 (2009) (European limits) Test Margin: 100
Test date: 2013-4-11 Start time: 9:32:18 End time: 9:35:09
Test duration (min): 2.5 Data file name: H-000143.cts_data
Comment: DVD Playing
Customer: TPV

Test Result: Pass Source qualification: Normal
THC(A): 0.17 I-THD(%): 25.94 POHC(A): 0.005 POHC Limit(A): 0.061
Highest parameter values during test:
V_RMS (Volts): 230.02 Frequency(Hz): 50.00
I_Peak (Amps): 1.149 I_RMS (Amps): 0.672
I_Fund (Amps): 0.650 Crest Factor: 1.712
Power (Watts): 142.3 Power Factor: 0.922

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.155	0.484	32.1	0.157	0.725	21.59	Pass
4	0.000						
5	0.051	0.270	19.0	0.052	0.405	12.73	Pass
6	0.000						
7	0.024	0.142	16.7	0.024	0.213	11.31	Pass
8	0.000						
9	0.010	0.071	13.6	0.010	0.107	9.40	Pass
10	0.000						
11	0.014	0.050	28.2	0.014	0.075	19.13	Pass
12	0.000						
13	0.011	0.043	26.0	0.011	0.063	17.80	Pass
14	0.000						
15	0.007	0.037	18.4	0.007	0.055	12.62	Pass
16	0.000						
17	0.004	0.033	10.7	0.000	0.000	0.00	Pass
18	0.000						
19	0.006	0.029	19.4	0.006	0.043	13.12	Pass
20	0.000						
21	0.005	0.026	20.7	0.005	0.039	14.04	Pass
22	0.000						
23	0.004	0.024	16.6	0.000	0.000	0.00	Pass
24	0.000						
25	0.003	0.022	12.7	0.000	0.000	0.00	Pass
26	0.000						
27	0.004	0.020	19.3	0.000	0.000	0.00	Pass
28	0.000						
29	0.004	0.019	20.2	0.000	0.000	0.00	Pass
30	0.000						
31	0.003	0.018	19.2	0.000	0.000	0.00	Pass
32	0.000						
33	0.003	0.017	15.9	0.000	0.000	0.00	Pass
34	0.000						
35	0.003	0.016	19.6	0.000	0.000	0.00	Pass
36	0.000						
37	0.003	0.015	20.4	0.000	0.000	0.00	Pass
38	0.000						
39	0.002	0.014	16.0	0.000	0.000	0.00	Pass
40	0.000						

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

Voltage Source Verification Data (Run time)

EUT: LCD Monitot M/N:X462UNV Tested by: Victory
 Test category: Class-D per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2013-4-11 Start time: 9:32:18 End time: 9:35:09
 Test duration (min): 2.5 Data file name: H-000143.cts_data
 Comment: DVD Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.02	Frequency(Hz): 50.00
I _{Peak} (Amps): 1.149	I _{RMS} (Amps): 0.672
I _{Fund} (Amps): 0.650	Crest Factor: 1.712
Power (Watts): 142.3	Power Factor: 0.922

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.087	0.460	18.96	OK
3	0.463	2.070	22.37	OK
4	0.051	0.460	11.06	OK
5	0.050	0.920	5.43	OK
6	0.024	0.460	5.13	OK
7	0.043	0.690	6.21	OK
8	0.012	0.460	2.67	OK
9	0.018	0.460	3.97	OK
10	0.014	0.460	3.12	OK
11	0.015	0.230	6.38	OK
12	0.012	0.230	5.15	OK
13	0.012	0.230	5.04	OK
14	0.008	0.230	3.31	OK
15	0.015	0.230	6.69	OK
16	0.011	0.230	4.71	OK
17	0.010	0.230	4.23	OK
18	0.009	0.230	3.79	OK
19	0.009	0.230	4.03	OK
20	0.006	0.230	2.73	OK
21	0.007	0.230	2.88	OK
22	0.005	0.230	2.08	OK
23	0.007	0.230	3.11	OK
24	0.005	0.230	2.06	OK
25	0.005	0.230	2.28	OK
26	0.004	0.230	1.83	OK
27	0.007	0.230	3.14	OK
28	0.005	0.230	1.99	OK
29	0.008	0.230	3.59	OK
30	0.004	0.230	1.58	OK
31	0.006	0.230	2.41	OK
32	0.003	0.230	1.41	OK
33	0.006	0.230	2.66	OK
34	0.003	0.230	1.30	OK
35	0.005	0.230	2.37	OK
36	0.003	0.230	1.09	OK
37	0.007	0.230	2.84	OK
38	0.003	0.230	1.17	OK
39	0.006	0.230	2.46	OK
40	0.003	0.230	1.27	OK

7. VOLTAGE FLUCTUATIONS & FLICKER TEST

7.1. Test Equipment

Same as Section 6.1.

7.2. Block Diagram of Test Setup

Same as Section 6.2.

7.3. Test Standard

EN 61000-3-3: 2008

7.4. Limits of Voltage Fluctuation and Flick

Test Item	Limit	Note
P_{st}	1.0	P_{st} means Short-term flicker indicator
P_{lt}	0.65	P_{lt} means long-term flicker indicator
T_{dt}	500ms	T_{dt} means maximum time that dt exceeds 3.3%
$d_{max}(\%)$	4%	d_{max} means maximum relative voltage change.
$d_c(\%)$	3.3%	d_c means relative steady-state voltage change.

7.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

7.6. Operating Condition of EUT

Same as Section 6.6.

7.7. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions. During the flick measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

7.8. Test Results

PASS.

Please refer to the following page.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: LCD Monitor M/N:X462UNV
 Test category: All parameters (European limits)
 Test date: 2013-4-10 Start time: 13:48:09
 Test duration (min): 10 Data file name: F-000131.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

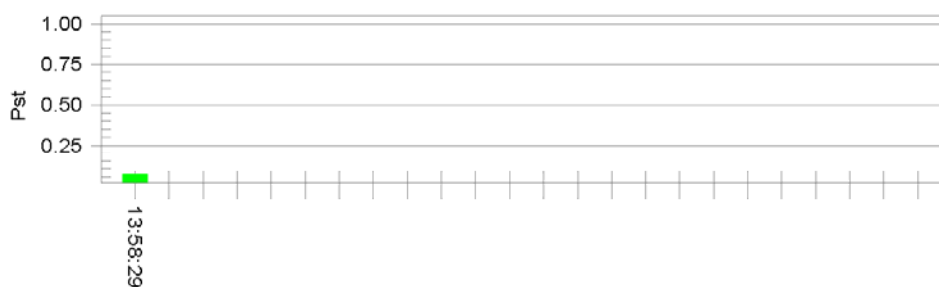
Tested by: Victory
 Test Margin: 100
 End time: 13:58:30

Test Result: Pass

Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.74		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: LCD Monitor M/N:X462UNV
 Test category: All parameters (European limits)
 Test date: 2013-4-11
 Test duration (min): 10
 Comment: DVD Playing
 Customer: TPV

Tested by: Victory
 Test Margin: 100
 Start time: 9:39:08
 End time: 9:49:29
 Data file name: F-000144.cts_data

Test Result: Pass

Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.83		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

8. IMMUNITY PERFORMANCE CRITERIA

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

Performance criterion A

When seen from the normal viewing distance, the EUT shall operate with no change beyond the manufacturer's specification, in flicker, colour, focus and jitter (except for the power frequency magnetic field test).

Power frequency magnetic field test

For CRT monitors, the following also applies:

The jitter shall be measured using a measuring microscope as specified in 6.6.14 of ISO 9241-3.

The jitter (in mm) shall not exceed the value $\frac{(\text{character height in mm} + 0,3) \times 2,5}{33,3}$ when the monitor is

immersed in a continuous magnetic field of 1A/m (r.m.s.) at one of the power frequencies of 50Hz.

Alternatively, a field of 50A/m may be applied, and a transparent graduated mask used to assess the jitter. In that case, the jitter shall not exceed 50 times the value in the above formula.

NOTE-This test level is used to simplify the measurement of jitter. Lesser values of the test level may be used if non-linearity is experienced, due to, for example, saturation of screening material.

The EUT shall be tested in two positions, both perpendicular to the magnetic field.

Performance criterion B

Screen disturbances during the application of the test are permissible.

Performance criterion C

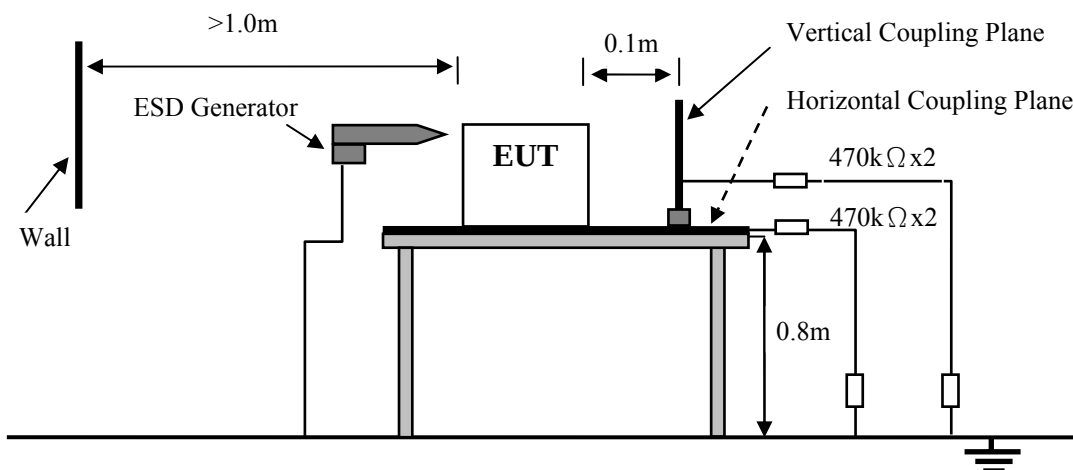
Failures which are not self-recovered after removal of the external disturbance, but which can be recovered to normal operation by reset or reboot are permissible.

9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	EM Test	Dito	V0503100053	Dec.03,12	1 Year

9.2. Block Diagram of Test Setup



9.3. Test Standard

EN 55024: 2010 (IEC 61000-4-2: 2008)

(Severity Level 1 & 2 & 3 for Air Discharge at ± 2 kV & ± 4 kV & ± 8 kV,
Severity Level 1 & 2 for Contact Discharge at ± 2 kV & ± 4 kV)

9.4. Severity Levels and Performance Criterion

Severity Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)	Performance criterion
1.	2	2	B
2.	4	4	
3.	6	8	
4.	8	15	
X	Special	Special	

9.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

9.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 9.2.

9.7. Test Procedure

9.7.1. Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

9.7.2. Contact Discharge:

All the procedure was same as Section 9.7.1. except that the generator was re-triggered for a new single discharge and repeated 50 times for each pre-selected test point. The tip of the discharge electrode was touching the EUT before the discharge switch was operated.

9.7.3. Indirect discharge for horizontal coupling plane:

At least 20 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

9.7.4. Indirect discharge for vertical coupling plane:

At least 20 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Electrostatic Discharge Test Results

Audix Technology (Shenzhen) Co., Ltd.

Applicant	: TPV Electronics (FuJian) Co., Ltd.	Test Date	: Apr. 10, 2013
EUT	: LCD Monitor	Temperature	: 20±0.6℃
M/N	: X462UNV	Humidity	: 41±3%
Test Voltage	: AC 230V/50Hz	Test Mode	: Same as Section 3.6
Test Engineer	: Victory	Pressure	: 100.8±1KPa
Required Performance	: B	Actual Performance	: A & B

Air Discharge: ±2kV ±4kV ±8kV # For Air Discharge each Point Positive 10 times and negative 10 times discharge.

Contact Discharge: ±2kV ±4kV # For Contact Discharge each point positive 10 & 25 times and negative 10 & 25 times discharge

For the time interval between successive single discharges an initial value of one second.

Discharge Voltage (kV)	Type of discharge	Dischargeable Points	Performance		Result (Pass/Fail)
			Required	Observati	
±2	Contact	2,4,5,7,9,14,15,16	B	A	Pass
±4	Contact	2,4,5,7,9,14,15,16	B	B	Pass
±2	Air	1,3, 6, 8, 10,11,12,13,16	B	A	Pass
±4	Air	1,3, 6, 8, 10,11,12,13,16	B	A	Pass
±8	Air	1,3, 6, 8, 10,11,12,13,16	B	B	Pass
±2	HCP-Bottom	Edge of the HCP	B	A	Pass
±2	VCP-Front	Center of the VCP	B	A	Pass
±2	VCP-Left	Center of the VCP	B	A	Pass
±2	VCP-Back	Center of the VCP	B	A	Pass
±2	VCP-Right	Center of the VCP	B	A	Pass
±4	HCP-Bottom	Edge of the HCP	B	A	Pass
±4	VCP-Front	Center of the VCP	B	A	Pass
±4	VCP-Left	Center of the VCP	B	A	Pass
±4	VCP-Back	Center of the VCP	B	A	Pass
±4	VCP-Right	Center of the VCP	B	A	Pass

Discharge Points Description

<u>1</u>	Speakers Port	<u>9</u>	RS232C Port
<u>2</u>	Video In /Out Port	<u>10</u>	LCD Screen
<u>3</u>	HDMI In Port	<u>11</u>	AC Port
<u>4</u>	VGA Port	<u>12</u>	Buttons
<u>5</u>	DVI Port	<u>13</u>	Slots
<u>6</u>	Display Port	<u>14</u>	Screens
<u>7</u>	LAN Port	<u>15</u>	Metal
<u>8</u>	Remote In / Out Port	<u>16</u>	Audio In/ Out

Remark: After discharge to the ungrounded part of EUT, it needs the bleeder resistor to remove the charge prior to next ESD pulse.

When Testing "B" Means the monitor will twinkle during test, recover to normal when stop.

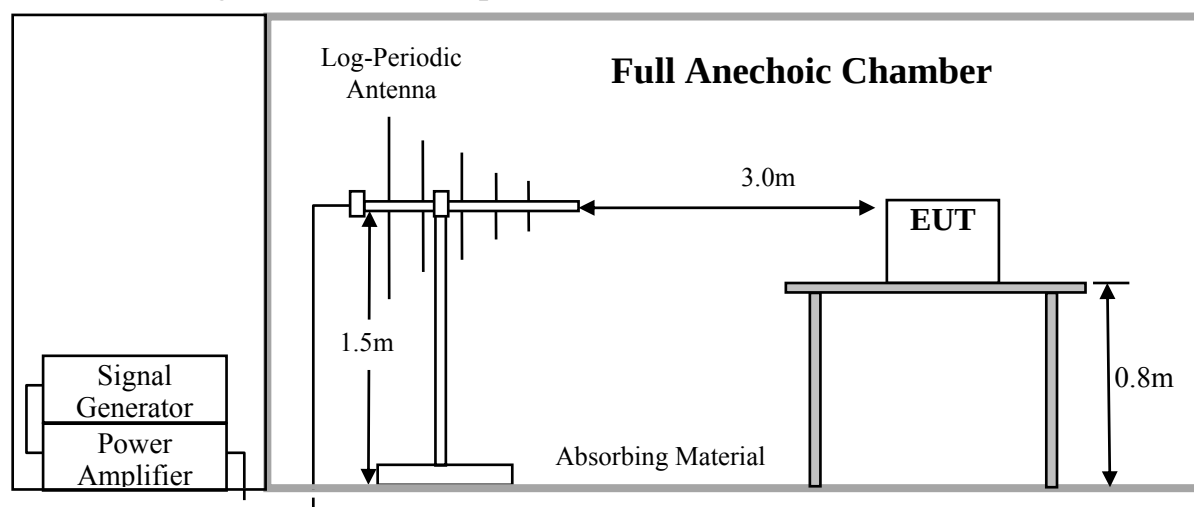
Discharge was considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	2#Chamber	AUDIX	N/A	N/A	Apr.20.12	1Year
2.	Signal Generator	Agilent	N5181A	MY49061013	Nov.05,12	1Year
3.	Amplifier	A&R	100W/1000M1	17028	NCR	NCR
4.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 12	1Year
5.	Power Sensor	Anritsu	MA2491A	032516	May.08, 12	1Year
6.	Log-periodic Antenna	A&R	AT1080	16512	NCR	NCR

10.2. Block Diagram of Test Setup



10.3. Test Standard

EN 55024: 2010 (IEC 61000-4-3: 2010)

(Severity Level: 2 at 3V / m)

10.4. Test Severity Level and Performance Criterion

Severity Level	Test Field Strength V/m	Performance Criteria
1.	1	A
2.	3	
3.	10	
X.	Special	

10.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

10.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 10.2.

10.7. Test Procedure

Testing was performed in a Fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80 cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system. The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 1GHz at a level of 3 V/m. The dwell time was set at 3 s. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.

All the scanning conditions are as follows:

Test conditions	
Frequency	80MHz-1GHz
Frequency increments step	1% of momentary used
Test level	3V/m (unmodulated)
Dwell time	3s
Test signal	80% amplitude modulated by 1kHz sinusoidal audio signal

10.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

RF Field Strength Susceptibility Test Results

Audix Technology (Shenzhen) Co., Ltd.

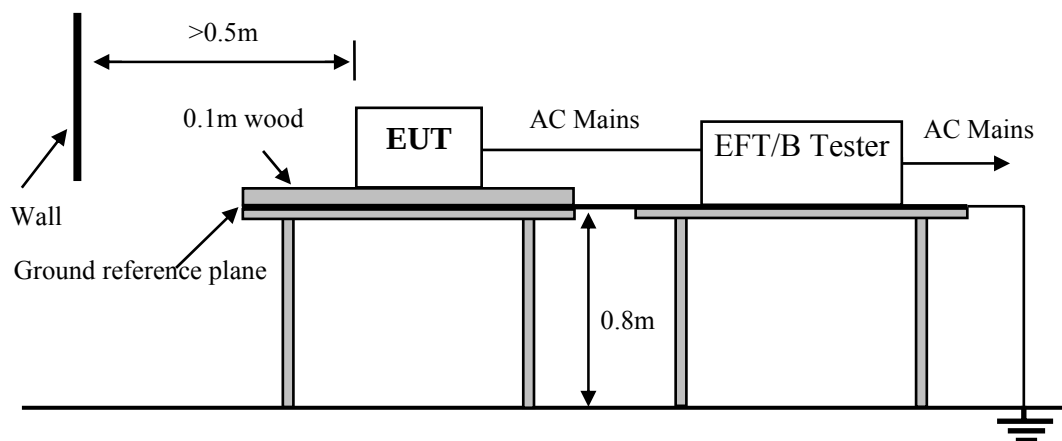
Applicant : TPV Electronics (FuJian) Co., Ltd. EUT : LCD Monitor M/N : X462UNV Test Voltage : AC 230V/50Hz Test Engineer : Donjon Required Performance : A	Test Date : Apr. 14, 2013 Temperature : 24±0.6℃ Humidity : 53±3% Pressure : 101.5±1KPa Test Mode : Same as Section 3.6 Actual Performance : A																																				
Modulation: ☒ AM ☐ Pulse ☐ none 1 kHz 80%																																					
Frequency Rang :80 MHz -1000MHz																																					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="2">Horizontal</th> <th colspan="2">Vertical</th> <th>Result</th> </tr> <tr> <th></th> <th>Required</th> <th>Observation</th> <th>Required</th> <th>Observation</th> <th>(Pass / Fail)</th> </tr> </thead> <tbody> <tr> <td>Front</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>Pass</td> </tr> <tr> <td>Right</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>Pass</td> </tr> <tr> <td>Rear</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>Pass</td> </tr> <tr> <td>Left</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>Pass</td> </tr> </tbody> </table>		Horizontal		Vertical		Result		Required	Observation	Required	Observation	(Pass / Fail)	Front	A	A	A	A	Pass	Right	A	A	A	A	Pass	Rear	A	A	A	A	Pass	Left	A	A	A	A	Pass
	Horizontal		Vertical		Result																																
	Required	Observation	Required	Observation	(Pass / Fail)																																
Front	A	A	A	A	Pass																																
Right	A	A	A	A	Pass																																
Rear	A	A	A	A	Pass																																
Left	A	A	A	A	Pass																																
Remark:																																					

11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

11.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Burst Tester	TESEQ	NSG3025	28017	May.08, 12	1 Year

11.2. Block Diagram of Test Setup



11.3. Test Standard

EN 55024: 2010 (IEC 61000-4-4: 2012)
(Severity Level 2 at 1kV)

11.4. Severity Levels and Performance Criterion

Open Circuit Output Test Voltage $\pm 10\%$			
Severity Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines	Performance criterion
1.	0.5 kV	0.25 kV	B
2.	1 kV	0.5 kV	
3.	2 kV	1 kV	
4.	4 kV	2 kV	
X	Special	Special	

11.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

11.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 11.2.

11.7. Test Procedure

The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support $0.1\text{m} \pm 0.01\text{m}$ thick. The ground reference plane was $1\text{m} \times 1\text{m}$ metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

11.7.1. For input and AC power ports:

The EUT was connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage were applied during compliance test and the duration of the test can't less than 1min.

11.7.2. For signal lines and control lines ports:

Ports which are intended to be connected to telecommunication networks (e.g. public switched telecommunication networks, integrated services digital networks, local area networks and similar networks.)

11.7.3. For DC input and DC output power ports:

It's unnecessary to test.

11.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Electrical Fast Transient/Burst Test Results

Audix Technology (Shenzhen) Co., Ltd.

Applicant : TPV Electronics (FuJian) Co., Ltd. EUT : LCD Monitor M/N : X462UNV Test Voltage : AC 230V/50Hz Test Engineer : Victory Required Performance : B	Test Date : Apr. 10, 2013 Temperature : 20±0.6℃ Humidity : 41±3% Test Mode : Same as Section 3.6 Pressure : 100.8±1KPa Actual Performance : B				
Repetition Frequency : <u>5 kHz / 100 kHz</u> Burst Duration : <u>15ms</u> Burst Period: <u>300ms</u>					
Inject Time(s): <u>120s</u> Inject Method: <u>Direct</u> Inject Line: ☒ AC Mains ☐ DC Supply ☒ Signal					
Line	Test Voltage	Performance			Result
		Required	Observation(+)	Observation(-)	(Pass/Fail)
L	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
N	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
PE	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
L N	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
L PE	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
N PE	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
L N PE	0.5kV	B	B	B	Pass
	1kV	B	B	B	Pass
Signal Line	0.5kV	B	B	B	Pass

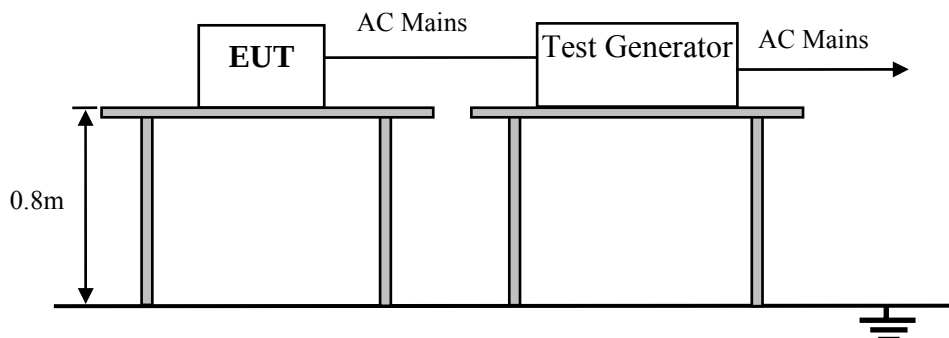
Remark: When Testing "B" Means the monitor will twinkle during test, recover to normal when stop.

12. SURGE TEST

12.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Transient Test System	EMC PARTNER	TRANSIENT 2000	TRA2006 F-S-T-D-R -1500	Aug.12,12	1 Year
2	CDN	EMC PARTNER	CDN-UTP8	CDN-UTP8-1508	Aug.12,12	1 Year
3	CDN	EMC PARTNER	CDN2000-06-25	CDN2000-06-25 0111	Aug.12,12	1 Year

12.2. Block Diagram of Test Setup



12.3. Test Standard

EN 55024: 2010 (IEC 61000-4-5: 2005)

(Severity Level: Line to Line was Level 2 at 1kV; Line to ground level 3 at 2kV)

12.4. Severity Levels and Performance Criterion

Severity Level	Open-Circuit Test Voltage kV	Performance criterion
1	0.5	B
2	1.0	
3	2.0	
4	4.0	
*	Special	

12.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

12.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 12.2

12.7. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 12.2.
- 2) For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Surge Immunity Test Results

Audix Technology (Shenzhen) Co., Ltd.

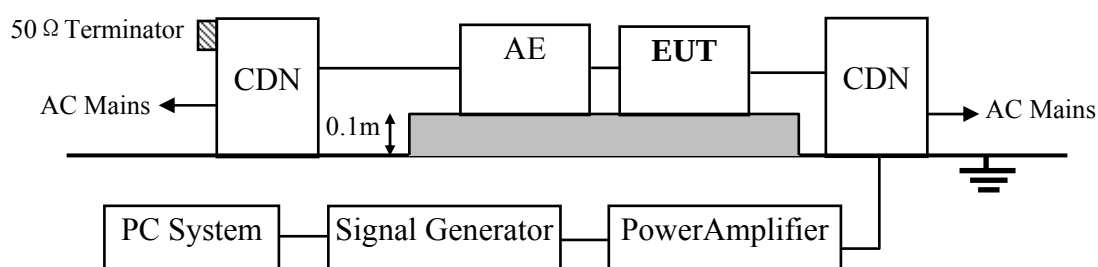
Applicant : TPV Electronics (FuJian) Co., Ltd. EUT : LCD Monitor M/N : X462UNV Power Supply : AC 230V/50Hz Test Engineer : Victory Required Performance : B	Test Date : Apr. 10, 2013 Temperature : $20 \pm 0.6^{\circ}\text{C}$ Humidity : $41 \pm 3\%$ Test Mode : Same as Section 3.6 Pressure : $100.8 \pm 1\text{KPa}$ Actual Performance : A&B										
No.of pluse: 5 Interval:60 Seconds											
Line : ☒ AC Mains ☐ DC Supply ☒ Signal											
Location	Volt	500V			1kV			2kV			Result (Pass/Fail)
	Phase	Performance			Performance			Performance			
		Required	+	-	Required	+	-	Required	+	-	
L-N	0°	B	A	A	B	A	A				Pass
	90°	B	A	A	B	A	A				Pass
	180°	B	A	A	B	A	A				Pass
	270°	B	A	A	B	A	A				Pass
L-PE	0°	B	A	A	B	A	A	B	A	A	Pass
	90°	B	A	A	B	A	A	B	A	A	Pass
	180°	B	A	A	B	A	A	B	A	A	Pass
	270°	B	A	A	B	A	A	B	A	A	Pass
N-PE	0°	B	A	A	B	A	A	B	A	A	Pass
	90°	B	A	A	B	A	A	B	A	A	Pass
	180°	B	A	A	B	A	A	B	A	A	Pass
	270°	B	A	A	B	A	A	B	A	A	Pass
Signal Line		B	B	B	B	B	B				Pass
Remark: When Testing "B" Means the monitor data transmission delay when test.											

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY49061013	Nov.05,12	1 Year
2.	Amplifier	AR	25A250A	19152	NCR	NCR
3.	Power meter	HP	436A	2016A07891	May.08, 12	1 Year
4.	Power sensor	Agilent	8482B	MY41090514	Nov.26, 12	1 Year
5.	CDN	FCC	FCC-801-M3-25	107	May.08, 12	1 Year
6.	CDN	FCC	FCC-801-M3-25	07045	May.08, 12	1 Year
7.	PC	N/A	N/A	N/A	N/A	N/A
8.	Attenuator	Weinschel	40-6-34	LJ092	May.08, 12	1 Year
9.	EM Injection Clamp	FCC	F-203I-23mm	403	May.08, 12	1 Year
10.	RF Cable	MICABLE	A04-07-07-2M	09111340	NCR	NCR
11.	RF Cable	STORM	MFR-57500	90-195-2MTR	NCR	NCR

13.2. Block Diagram of Test Setup



13.3. Test Standard

EN 55024: 2010 (IEC 61000-4-6: 2008)

(Severity Level 2 at 3V (r.m.s.) and frequency is from 0.15MHz to 80MHz)

13.4. Severity Levels and Performance Criterion

Severity Level	Voltage Level (e.m.f.) V	Performance criterion
1	1	A
2	3	
3	10	
X	Special	

13.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

13.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 13.2.

13.7. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 13.2.
- 2) Let the EUT work in test mode and test it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 10 and 30 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Injected Currents Susceptibility Test Results

Audix Technology (Shenzhen) Co., Ltd.

Applicant	: TPV Electronics (FuJian) Co., Ltd.	Test Date	: Apr. 14, 2013
EUT	: LCD Monitor	Temperature	: 24±0.6°C
M/N	: X462UNV	Humidity	: 53±3%
Power Supply	: AC 230V/50Hz	Test Mode	: Same as Section 3.6
Test Engineer	: Donjon	Pressure	: 101.5±1KPa
Required Performance	: A	Actual Performance	: A

Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Required	Observation	Result (Pass / Fail)
0.15 ~ 20	AC Mains	3V	A	A	PASS
20 ~ 80	AC Mains	3V	A	A	PASS
0.15 ~ 20	Lan line	3V	A	A	PASS
20 ~ 80	Lan line	3V	A	A	PASS

Modulation Signal: 1kHz 80% AM

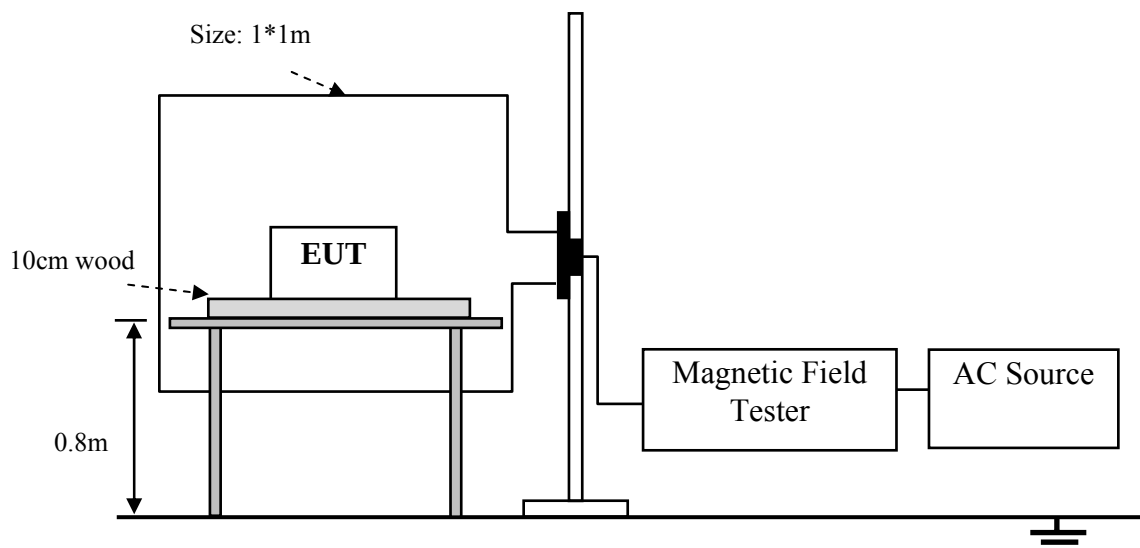
Remark:

14. MAGNETIC FIELD IMMUNITY TEST

14.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HEAFELY	MATM00.1	083858-10	May.08, 12	1 Year

14.2. Block Diagram of Test Setup



14.3. Test Standard

EN 55024: 2010 (IEC 61000-4-8: 2009)

(Severity Level 1 at 1A/m)

14.4. Severity Levels and Performance Criterion

Severity Level	Magnetic Field Strength A/m	Performance criterion
1.	1	A
2.	3	
3.	10	
4.	30	
5.	100	
X.	Special	

14.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

14.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 14.2.

14.7. Test Procedure

The EUT was subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 14.2. The induction coil was then rotated by 90° in order to expose the EUT to the test field with different orientations.

14.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Magnetic Field Immunity Test Results

Audix Technology (Shenzhen) Co., Ltd.

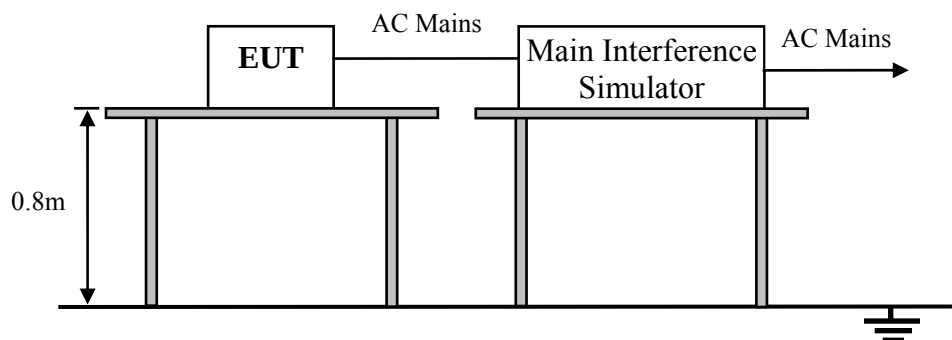
Applicant	:	TPV Electronics (FuJian) Co., Ltd.	Test Date	:	Apr. 14, 2013
EUT	:	LCD Monitor	Temperature	:	24±0.6℃
M/N	:	X462UNV	Humidity	:	53±3%
Test Voltage	:	AC 230V/50Hz	Test Mode	:	Same as Section 3.6
Test Engineer	:	Donjon	Pressure	:	101.5±1KPa
Required Performance	:	A	Actual Performance	:	A
Test Level	Testing Duration	Coil Orientation	Required	Observation	Result (Pass/Fail)
1A/m	5 min / coil	X	A	A	PASS
1A/m	5 min / coil	Y	A	A	PASS
1A/m	5 min / coil	Z	A	A	PASS
Remark: No function loss.					

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

15.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Main Interference Simulator	HAEFELY	PLINE 1610	083690-05	May.08, 12	1 Year

15.2. Block Diagram of Test Setup



15.3. Test Standard

EN 55024: 2010 (IEC 61000-4-11: 2004)

15.4. Severity Levels and Performance Criterion

Test Level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Duration (in period)	Performance Criterion
0	100	250	C
0	100	0.5	B
70	30	25	C

15.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

15.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 15.2.

15.7. Test Procedure

- 1) The EUT and test generator were setup as shown on Section 15.2.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

15.8. Test Results

PASS.

The EUT was tested and all the test results are listed in next page.

Voltage Dips And Interruptions Test Results

Audix Technology (Shenzhen) Co., Ltd.

Applicant : TPV Electronics (FuJian) Co., Ltd.				Test Date : Apr. 14, 2013		
EUT : LCD Monitor				Temperature : 23±0.6℃		
M/N : X462UNV				Humidity : 54±3%		
Power Supply : AC 100V/50Hz ; AC 230V/50Hz				Test Mode : Same as Section 3.6		
Test Engineer : Donjon				Pressure : 101.5±1KPa		
Required Performance : B & C				Actual Performance : A & B		
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Phase Angle	Required	Observation	Result (Pass / Fail)
0	100	0.5P	0° -360°	B	A	PASS
70	30	25P	0° -360°	C	A	PASS
0	100	250P	0° -360°	C	B	PASS
Note 1: U _T is the rated voltage for the equipment.						
Note 2: The frequency of the test voltage shall be within ±2% of the rated frequency, the output voltage shall be within ±5% of the rated voltage.						
Remark: When Testing “B” Means display screen flicker recover to normal when stop.						

16. PHOTOGRAPHS

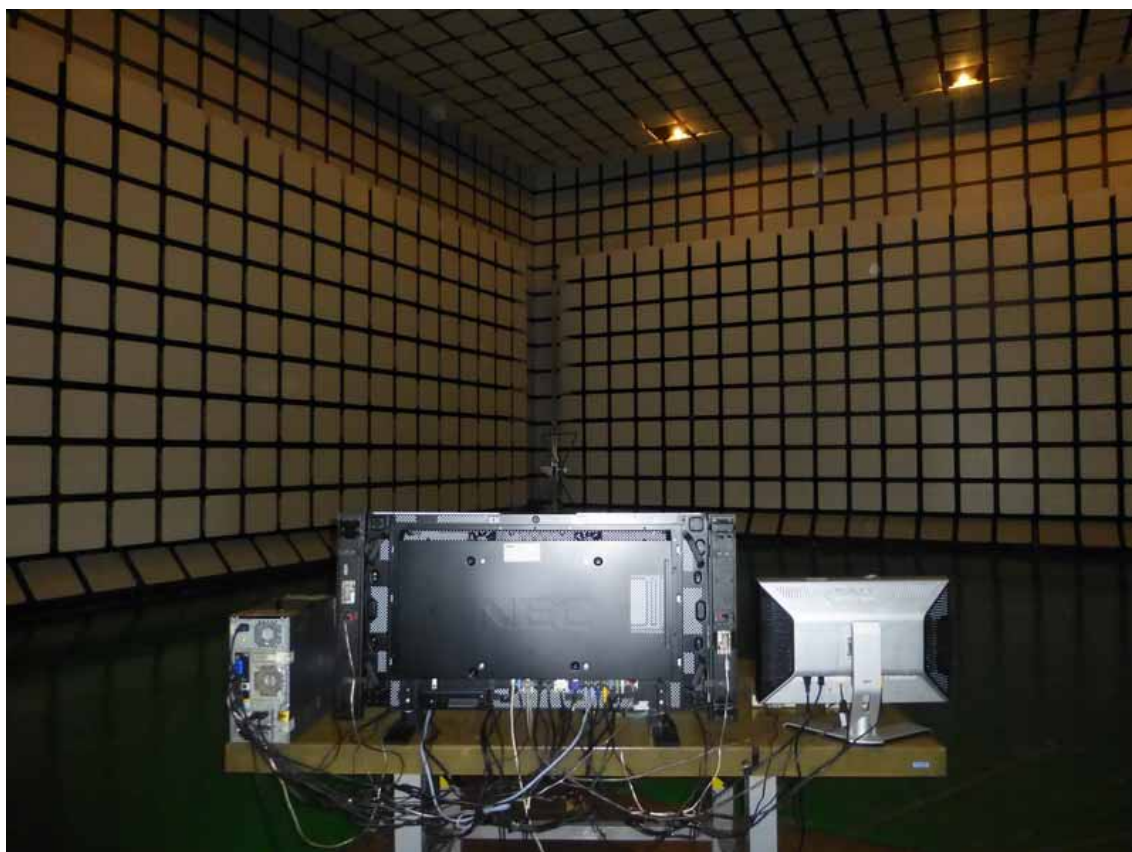
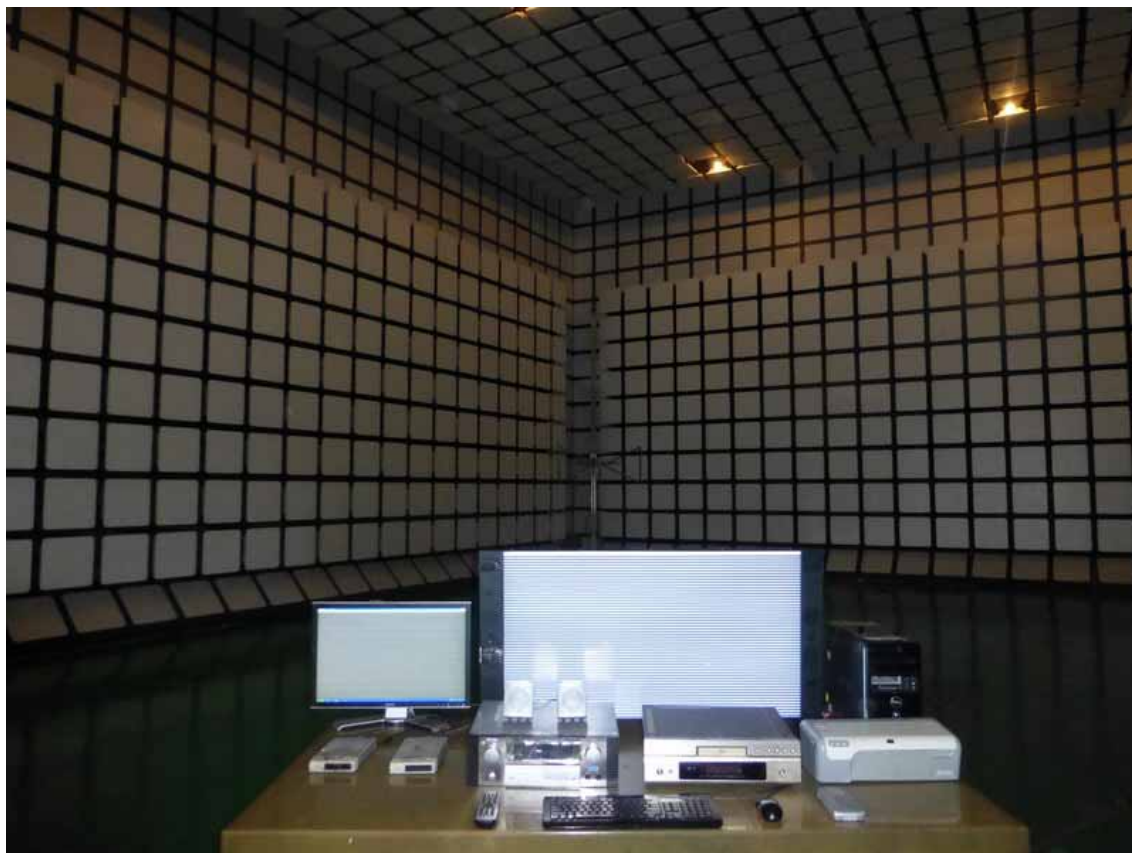
16.1. Photos of Power Line Conducted Emission Test



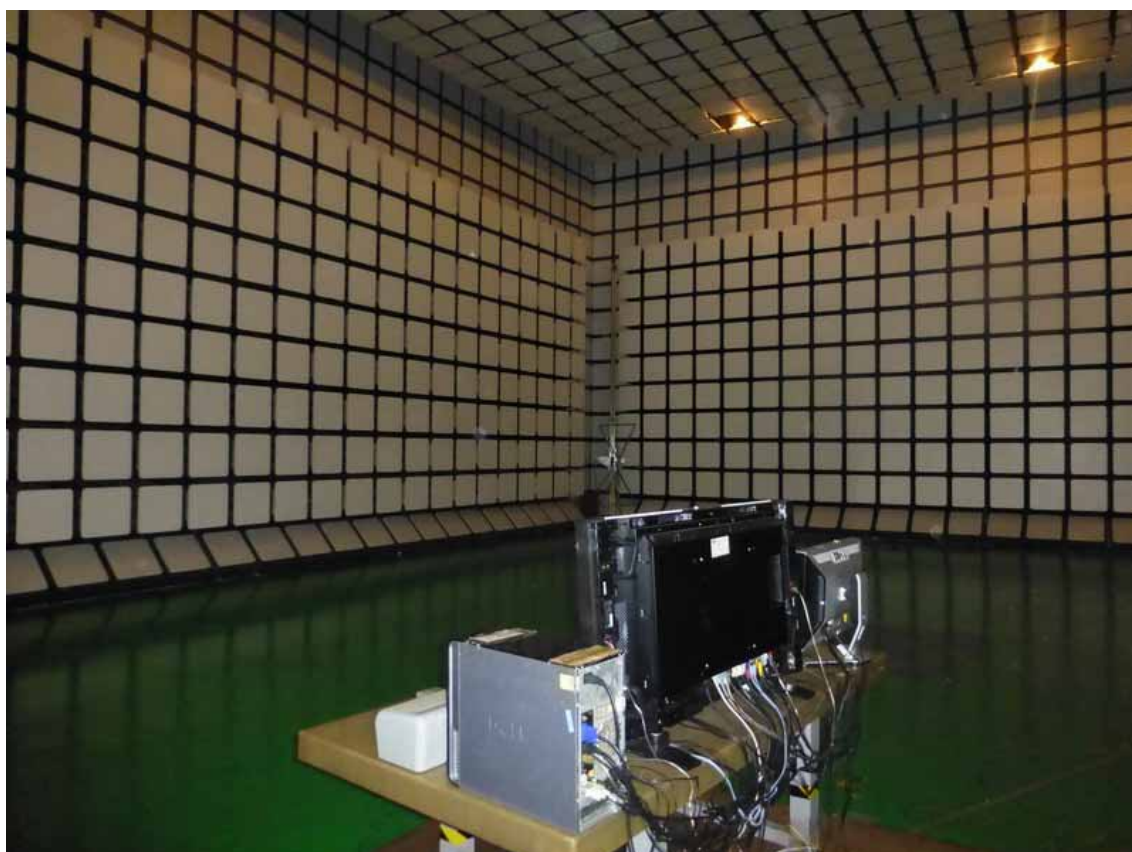
16.2. Photos of Conducted Disturbance at Telecommunication Ports Test



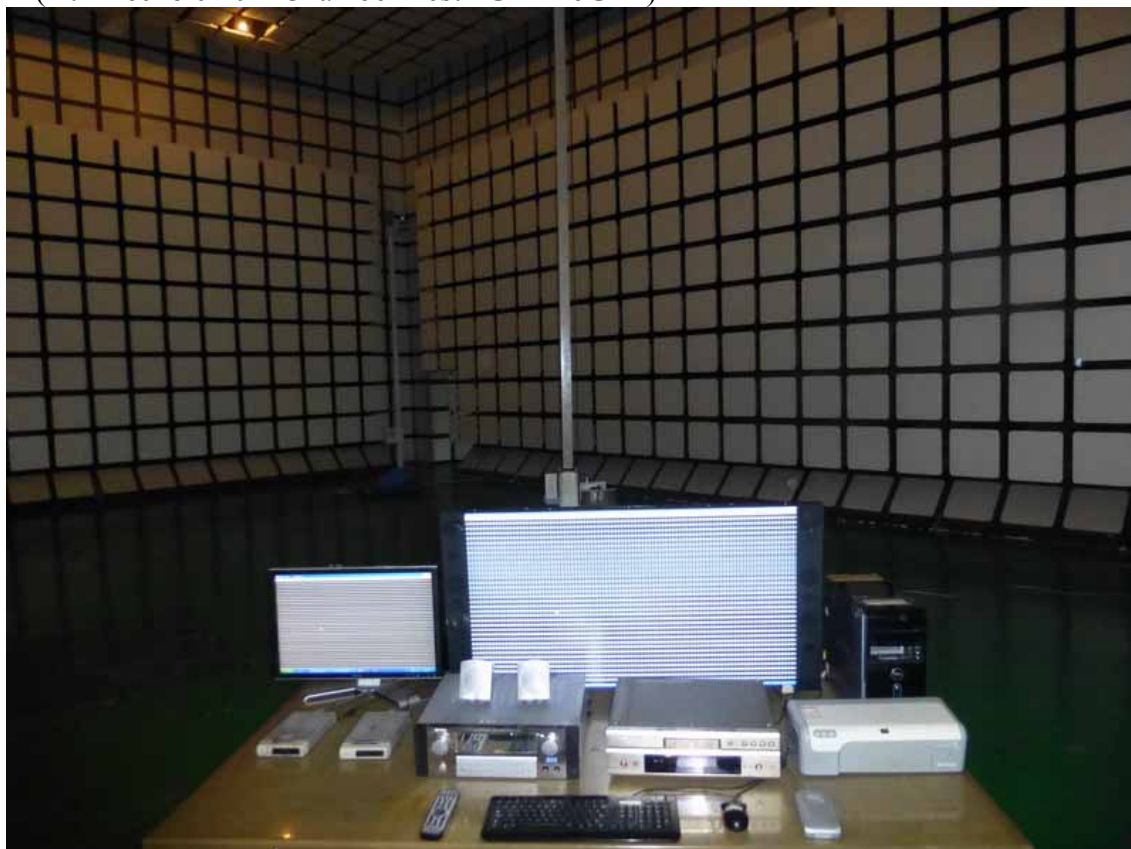
16.3.Photos of Radiated Emission Test (In Anechoic Chamber)



The Worst Resolution: Horizontal Panel, VGA: 1920*1080@60Hz



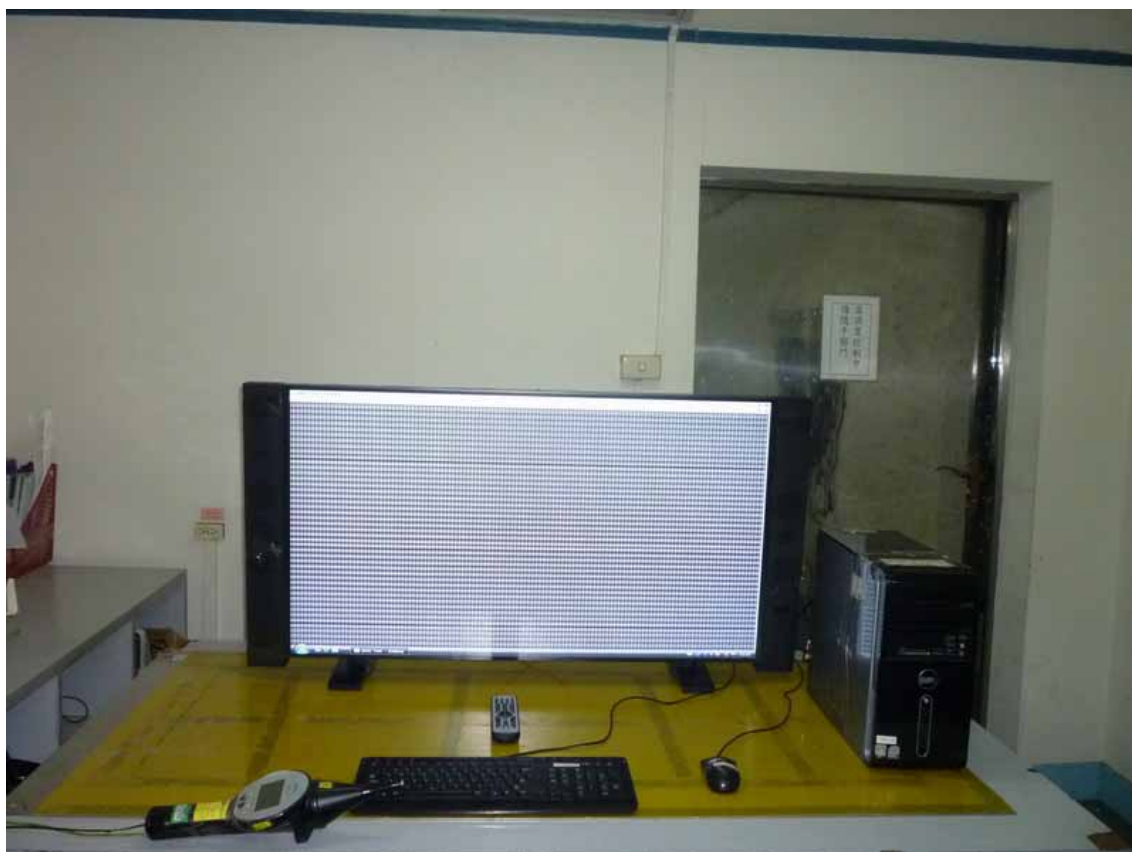
(At Anechoic 10m Chamber Test 1GHz –6GHz)



16.4. Photo of Harmonic / Flicker Test



16.5. Photos of Electrostatic Discharge Immunity Test



16.6. Photo of RF Strength Susceptibility Test



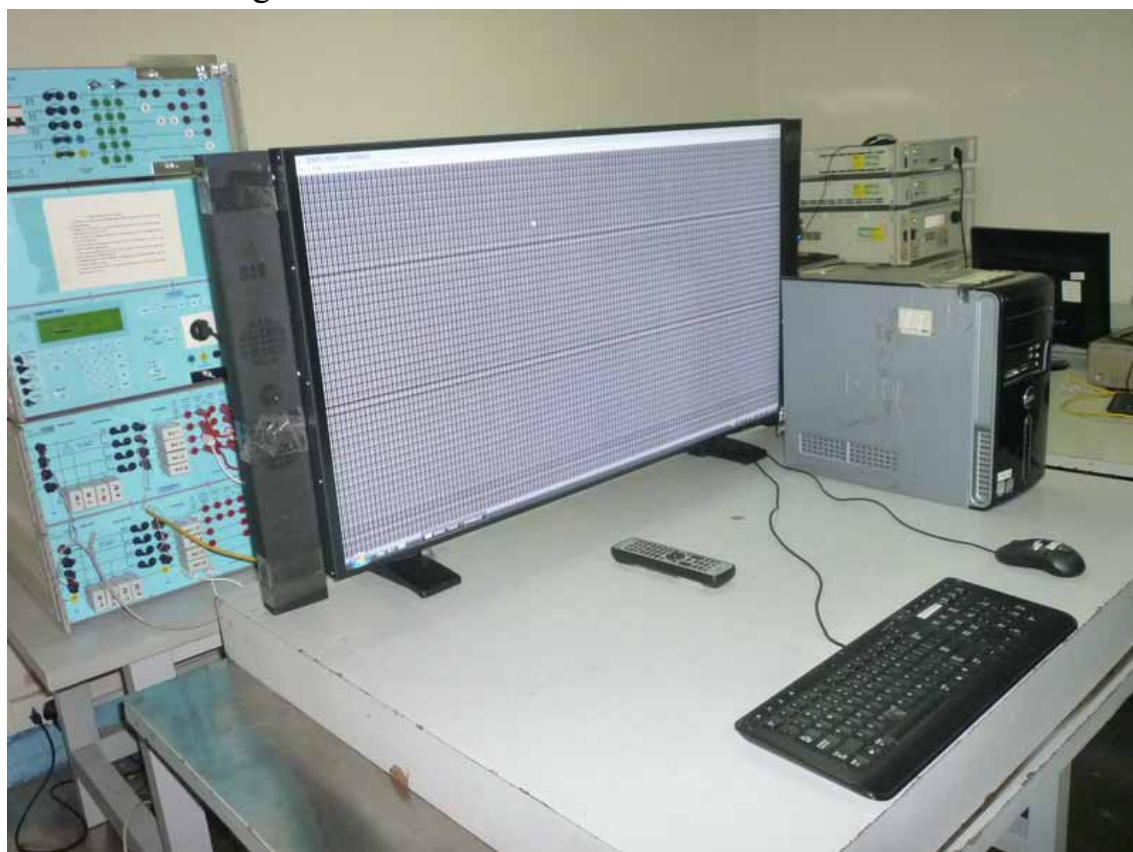
16.7. Photo of Electrical Fast Transient/Burst Immunity Test



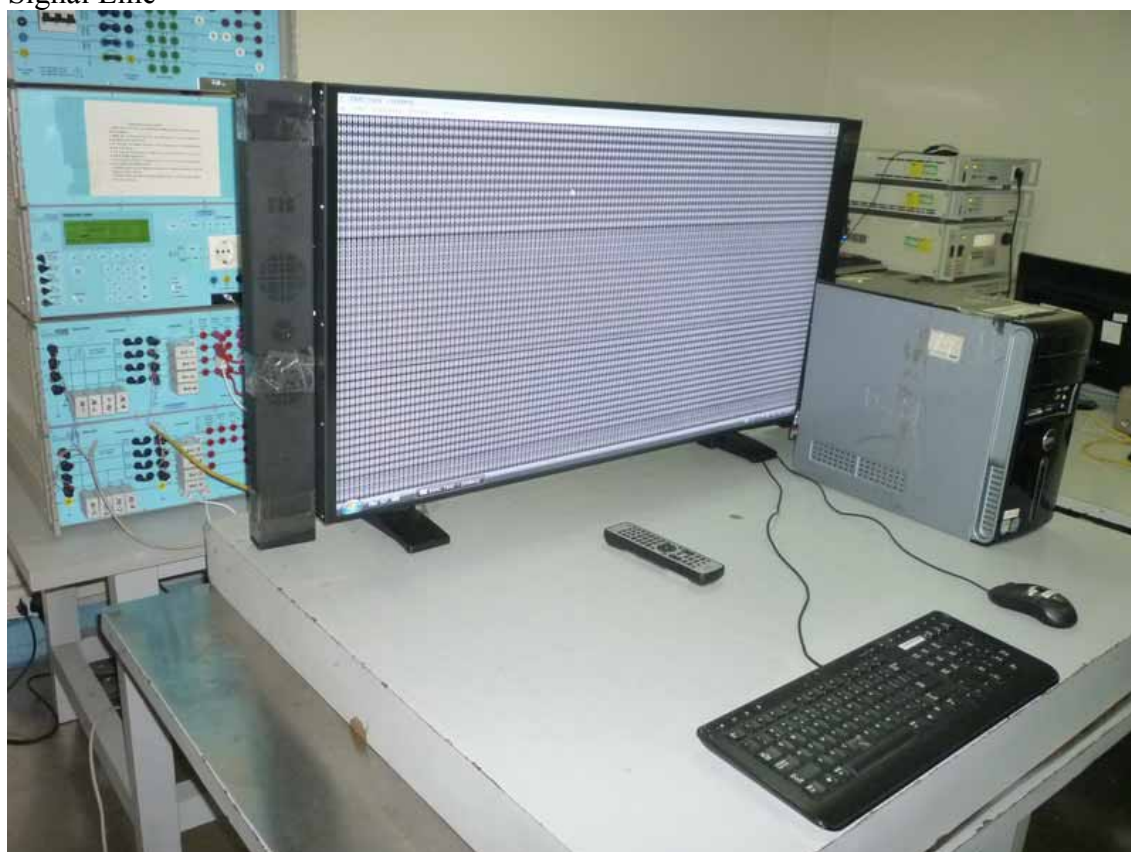
Signal Line



16.8.Photo of Surge Test



Signal Line



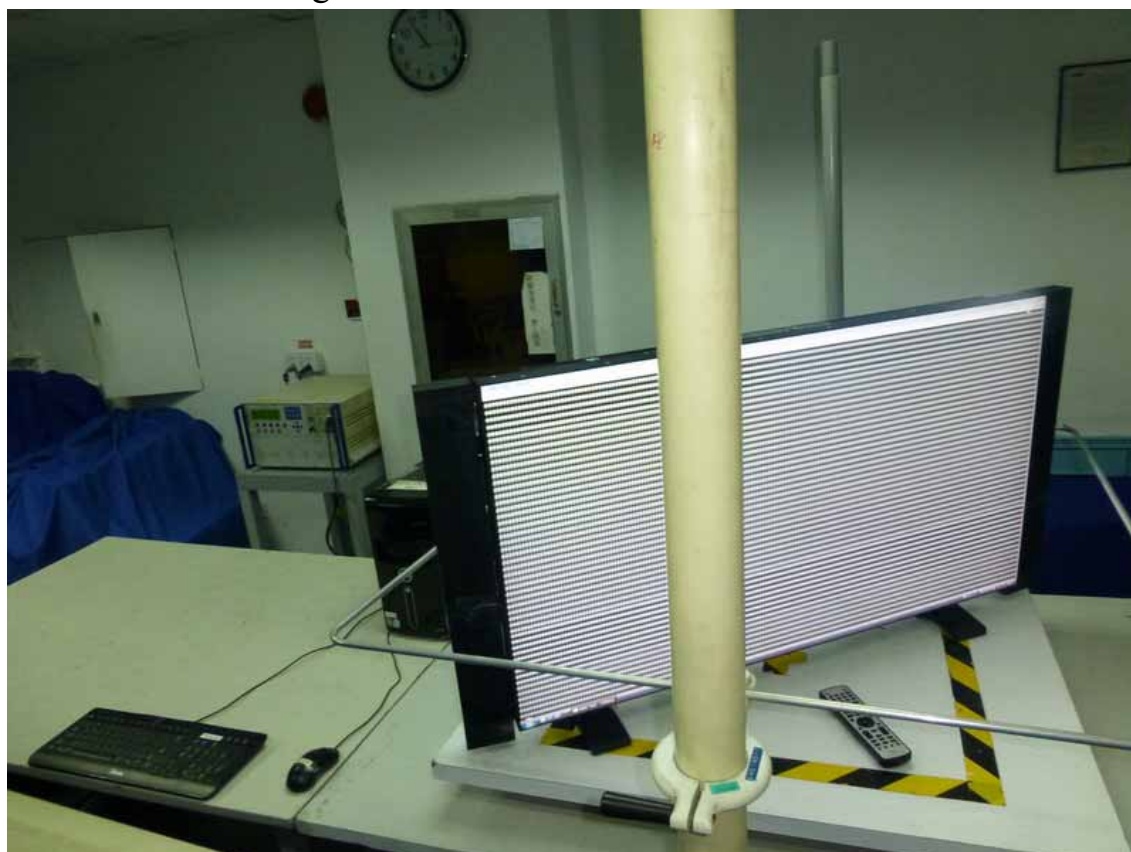
16.9. Photo of Injected Currents Susceptibility Test



Signal Line



16.10. Photo of Magnetic Field Test



16.11. Photo of Voltage Dips and interruptions test

