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Technical Compliance Statement

No. ACS-E14009

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	X464UNV
	X464UNV (C)
	MultiSync X464UNV

Test Standards :

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 ≤ 16A per phase)	
EN 61000-3-3: 2013	Electromagnetic compatibility(EMC) Part 3 :Limits Section 3 : Limits of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 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: 2013 信華科技 (深圳) 有限公司	Conducted Susceptibility
	IEC 61000-4-8: 2009 Audix Technology	Magnetic field immunity
	IEC 61000-4-11: 2004 EMC 部門 報告	Dips/ Voltage Interruption Variation

Stamp only for EMC Dept. Report

Signature: David Jin

David Jin

Manager

Date : Jan.11, 2014



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	X464UNV
	X464UNV (C)
	MultiSync X464UNV

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-E14009
Date of Test : Dec.16~31, 2013
Date of Report : Jan.11, 2014

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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	X464UNV
	X464UNV (C)
	MultiSync X464UNV

(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: 2013
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: 2013, 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 : Dec.16~ 31, 2013 Report of date: Jan.11, 2014

Prepared by : Aimee Xiang Reviewed by : Jack Zhong
Aimee Xiang / Assistant 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: David Jin

David Jin / 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 26.80dB at 12.988MHz	
Conducted disturbance at telecommunication port	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 14.20dB at 26.5581MHz	
Radiated disturbance (30-1000MHz)	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 14.10dB at 146.400MHz	
Radiated disturbance (1-6GHz)	EN 55022: 2010+AC: 2011	PASS	Meets Class A Minimum passing margin is 16.93dB at 1259.660MHz	
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: 2013	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	A & B
Surge (Input a.c. power port)	IEC 61000-4-5: 2005	PASS	B	A & B
Surge(Telecommunication port)		PASS	B	A & B
Radio-frequency,Continuous conducted disturbance	IEC 61000-4-6: 2013	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	X464UNV
	X464UNV (C)
	MultiSync X464UNV

Above all models difference are in sales marketing.

Test Model Number : X464UNV

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: LTI460HN09

Power Cord : Unshielded, Detachable, 1.8m / 1.5m(3 pins)

Display Cable : Shielded, Detachable, 1.8m / 1.5m

LAN Cable : Shielded, Detachable, 2.0m

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

Date of Test : Dec.16~31, 2013

Date of Receipt : Dec.15, 2013

Sample Type : Prototype production

N/A is an abbreviation for Not Applicable.

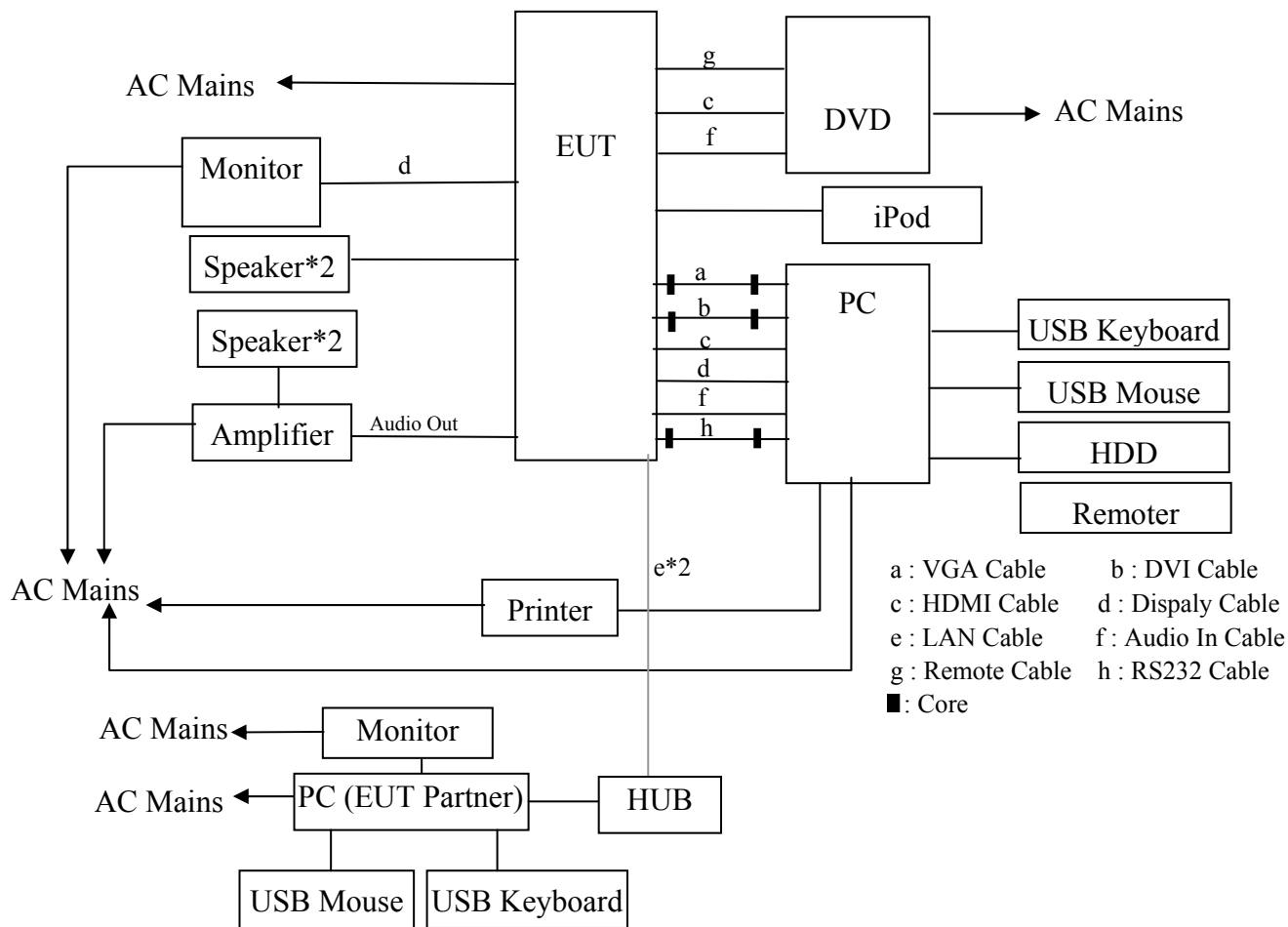
2.2. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type
1.	Personal Computer	Test PC A	ACER	Veriton M6610	N/A	☒ FCC DoC ☒ BSMI ID:R33142
		Power Cord: Unshielded, Detachable, 1.8m / 1.5m VGA Cable: Shielded, Undetachable, 1.8m / 1.5m(with two cores) DVI Cable: Shielded, Undetachable, 1.8m / 1.5m(with two cores) HDMI Cable: Shielded, Undetachable, 1.8m / 1.5m Audio Cable: Shielded, Undetachable, 1.8m / 1.5m RS232 Cable: Shielded, Undetachable, 3.0m(with two cores)				
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, Detachable, 1.8m Power Cord: Unshielded, Detachable, 1.8m Power Adapter: HP, M/N: 0957-2119, BSMI ID: R33030, DC Cable: Unshielded, Detachable, 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, Detachable, 1.8m Audio Cable: Shielded, Detachable, 1.8m Remote Cable: Shielded, Detachable, 1.8m Power Cord: Unshielded, Detachable , 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-LM07R	DELL	3008WFPt	CN-0RW915-716 18-846-397L	☒ FCC DoC ☒ BSMI ID: R3A002
		Power Cord: Unshielded, Detachable, 1.8m				
10.	iPod	ACS-EMC-IPS1	APPLE	A1271	4H012AUKA78	☒ FCC DoC ☒ BSMI ID: R33057
		Data Cable: Shielded, Detachable, 1.0m				

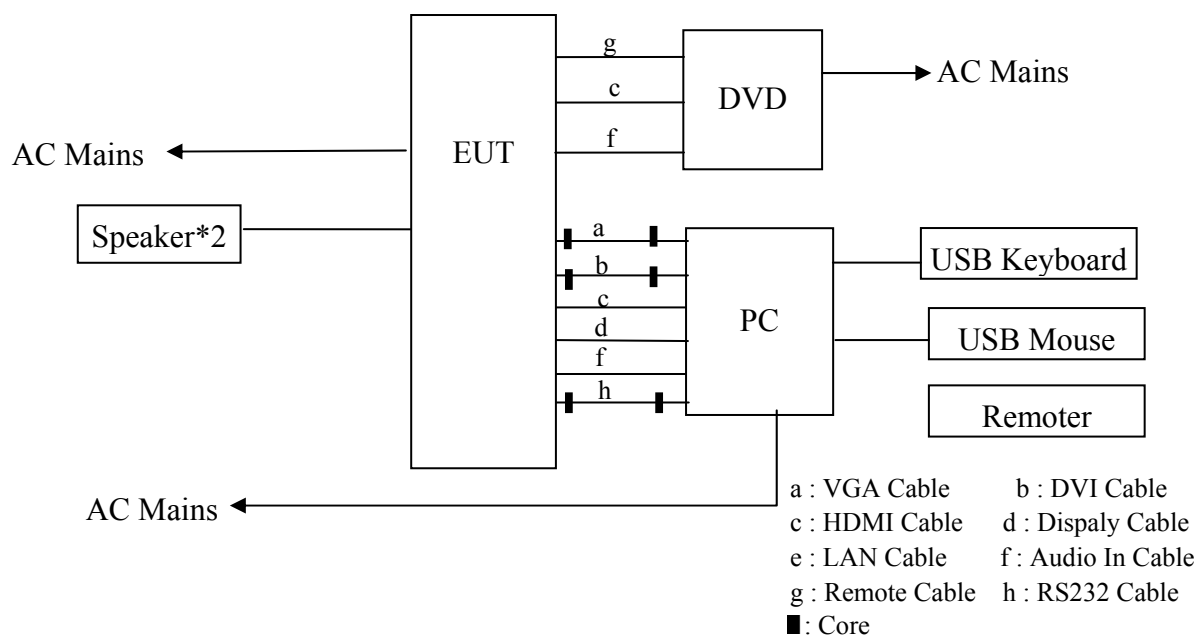
【PC system which transmitting 】

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)

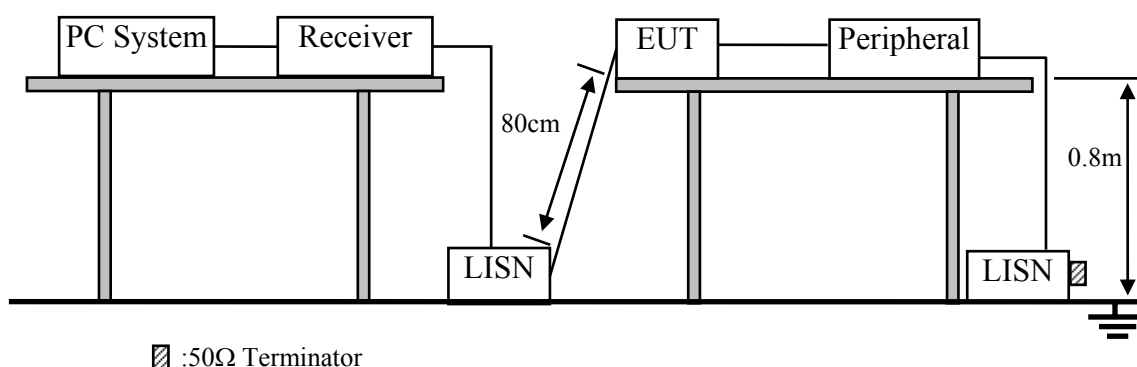
Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 2 Conduction	3.06 dB
Uncertainty for ISN test in No. 2 Conduction	3.84 dB
Uncertainty for Radiation Emission test in 10m chamber (Distance: 10m)	3.40dB (30~200MHz, Polarize: H)
	3.42dB (30~200MHz, Polarize: V)
	3.68dB (200M~1GHz, Polarize: H)
	3.59dB (200M~1GHz, Polarize: V)
Uncertainty for Radiation Emission test in 10m chamber (1GHz-18GHz)	4.97dB (Distance: 3m Polarize: V)
	4.99dB (Distance: 3m Polarize: H)
Uncertainty for SVSWR in 10m Chamber	3.46dB (Distance: 3m Polarize: V)
	3.49dB (Distance: 3m Polarize: H)
Uncertainty for Flicker test	5.18%
Uncertainty for Harmonic test	9.4%
Uncertainty for C/S Test	1.36dB (Using CDN test)
	3.20dB (Using EM clamp test)
Uncertainty for R/S Test	1.73dB (80MHz~200MHz)
	1.76dB(200MHz~1000MHz)
Uncertainty for test site temperature and humidity	0.6°C
	3%
Pressure	1kPa

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, 13	1 Year
2	L.I.S.N.#1	Rohde & Schwarz	ENV4200	100041	May.08, 13	1 Year
3	L.I.S.N.#2	Kyoritsu	KNW-407	8-1628-5	May.08, 13	1 Year
4	Terminator	Hubersuhner	50Ω	No. 1	May.08, 13	1 Year
5	Terminator	Hubersuhner	50Ω	No. 2	May.08, 13	1 Year
6	RF Cable	Fujikura	3D-2W	No.2	May.08, 13	1 Year
7	Coaxial Switch	Anritsu	MP59B	6200298346	May.08, 13	1 Year
8	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	May.08, 13	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 : X464UNV

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 ESHS20) 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 & 9~13) to read Q.P values, all the test results are listed in next pages.

EUT: LCD Monitor	Model No. : X464UNV
Test Date: Dec.26, 2013	Temperature: 22.3℃
Humidity: 51%	Pressure: 101.2kPa

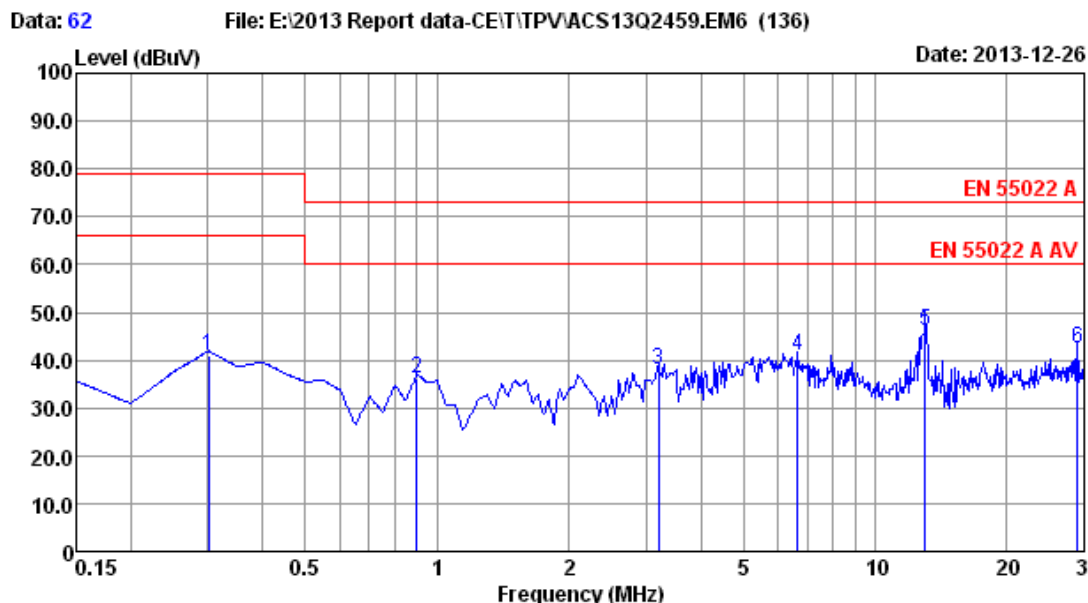
The EUT was pre-tested under following test modes, and selected test mode 3 was the worst cases to issue report.

No.	Test Mode	Cable	Input Port	Resolution & Frequency
1.	PC Mode	1.8m	Display	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.			DVI	640*480/60Hz
8.				1280*1024/75Hz
9.				1920*1080/60Hz
10.			HDMI	1920*1080/60Hz
11.			Display Panel is Vertical	1080*1920/60Hz
12.		1.5m	Display	1080*1920/60Hz
13.	DVD Mode	1.8m	HDMI 1080P	

(※ Worst test mode)

Test result is presented in the report as below

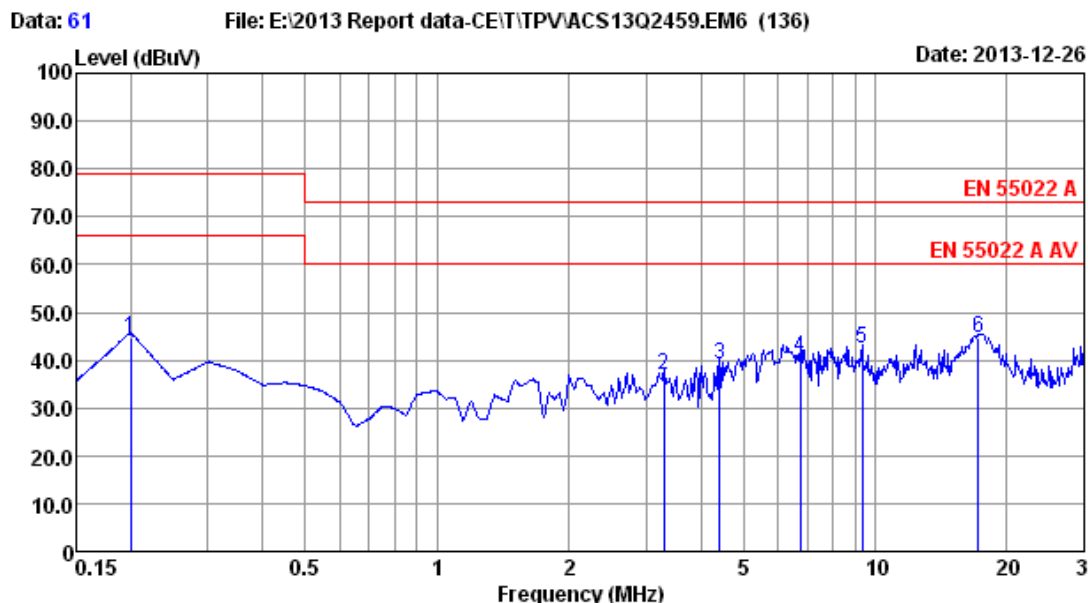
No.	Test Mode	Cable	Input Port	Resolution & Frequency
1.	Running “H” Pattern And 1KHz Playing	1.8m	Display	1920*1080/60Hz



Site no :2# CE Data No :62
 Dis./Lisn :13 ENV4200 L1 LISN phase:LINE
 Limit :EN 55022 A Pre :101.2kPa
 Env./Ins. :22.3°C/51% Engineer :Dota-YAO
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 Display:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.30028	9.93	9.96	21.03	40.92	79.00	38.08	QP
2	0.89917	9.97	9.97	16.16	36.10	73.00	36.90	QP
3	3.207	10.03	10.00	17.96	37.99	73.00	35.01	QP
4	6.662	10.06	10.05	20.69	40.80	73.00	32.20	QP
5	12.988	10.08	10.11	26.01	46.20	73.00	26.80	QP
6	28.908	10.13	10.26	22.08	42.47	73.00	30.53	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 :61
 Dis./Lisn :13 ENV4200 N LISN phase:NEUTRAL
 Limit :EN 55022 A Pre :101.2kPa
 Env./Ins. :22.3°C/51% Engineer :Dota-YAO
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 Display:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.19969	9.81	9.96	25.03	44.80	79.00	34.20	QP
2	3.293	9.87	10.00	17.09	36.96	73.00	36.04	QP
3	4.407	9.89	10.02	19.32	39.23	73.00	33.77	QP
4	6.746	9.91	10.05	20.50	40.46	73.00	32.54	QP
5	9.352	9.99	10.08	22.22	42.29	73.00	30.71	QP
6	17.199	10.05	10.15	24.33	44.53	73.00	28.47	QP

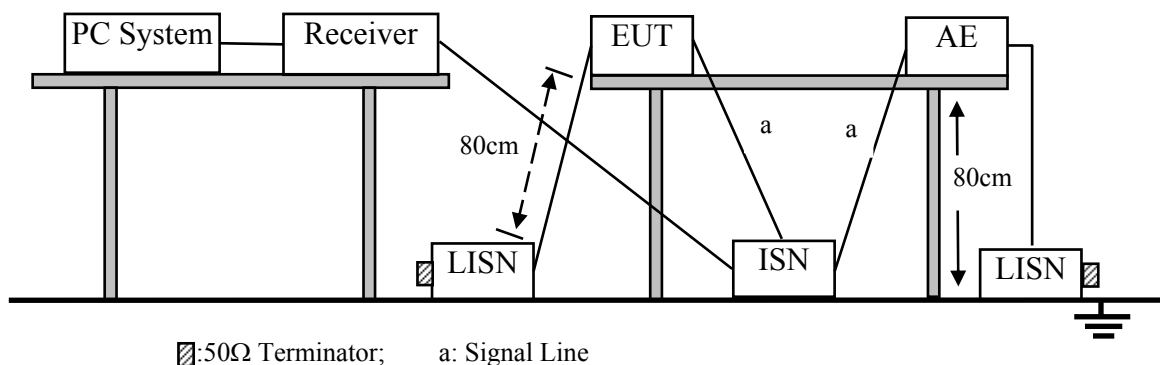
Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when useing a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

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, 13	1 Year
2	L.I.S.N. #1	Rohde & Schwarz	ENV4200	100041	May.08, 13	1 Year
3	L.I.S.N. #2	Kyoritsu	KNW-407	8-1628-5	May.08, 13	1 Year
4	Terminator	EMCO	50Ω	No. 1	May.08, 13	1 Year
5	Terminator	EMCO	50Ω	No. 2	May.08, 13	1 Year
6	RF Cable	Fujikura	3D-2W	No. 2	May.08, 13	1 Year
7	Current Probe	Rohde & Schwarz	EZ-17	833335/009	Nov.22, 13	1 Year
8	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20534	Oct.31, 13	1 Year
9	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20535	Oct.31, 13	1 Year
10	Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20412	May.08, 13	1 Year
11	Coaxial Switch	Anritsu	MP59B	6200298346	May.08, 13	1 Year
12	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	May.08, 13	1 Year
13	I.S.N.	TESEQ	ISN T800	30858	Oct.31, 13	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	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	97~87	84~74
500kHz ~ 30MHz	87	74

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. the 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 ESHS20) 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 and average values, all the test results are listed in next pages.

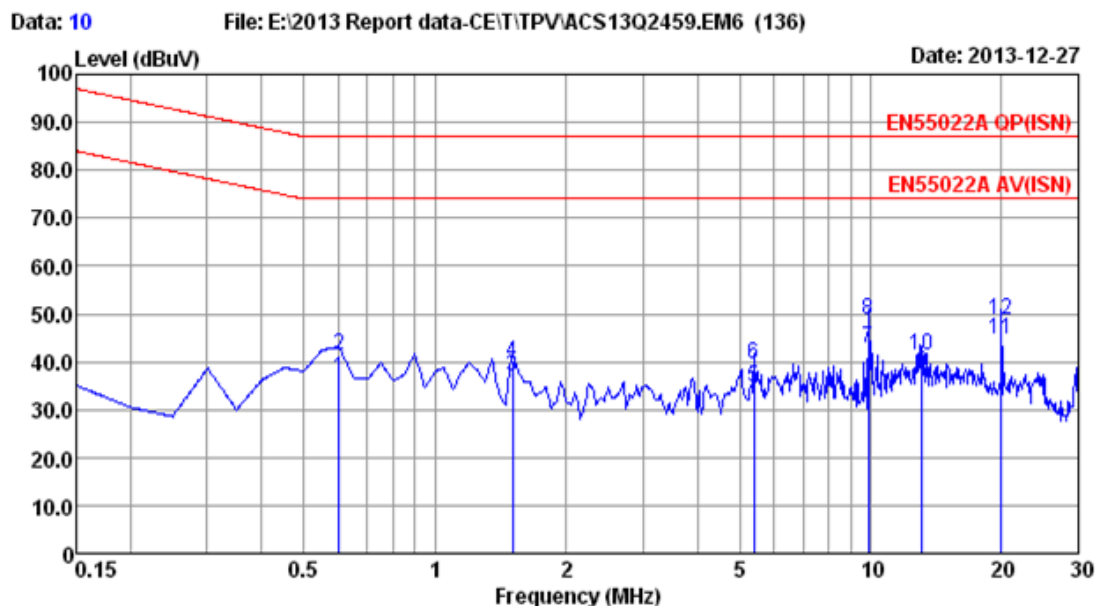
EUT: LCD Monitor Model No. : X464UNV

Test Date: Dec.27, 2013 Temperature: 22.3℃

Humidity: 51% Pressure: 101.2kPa

The details of test modes are as follows :

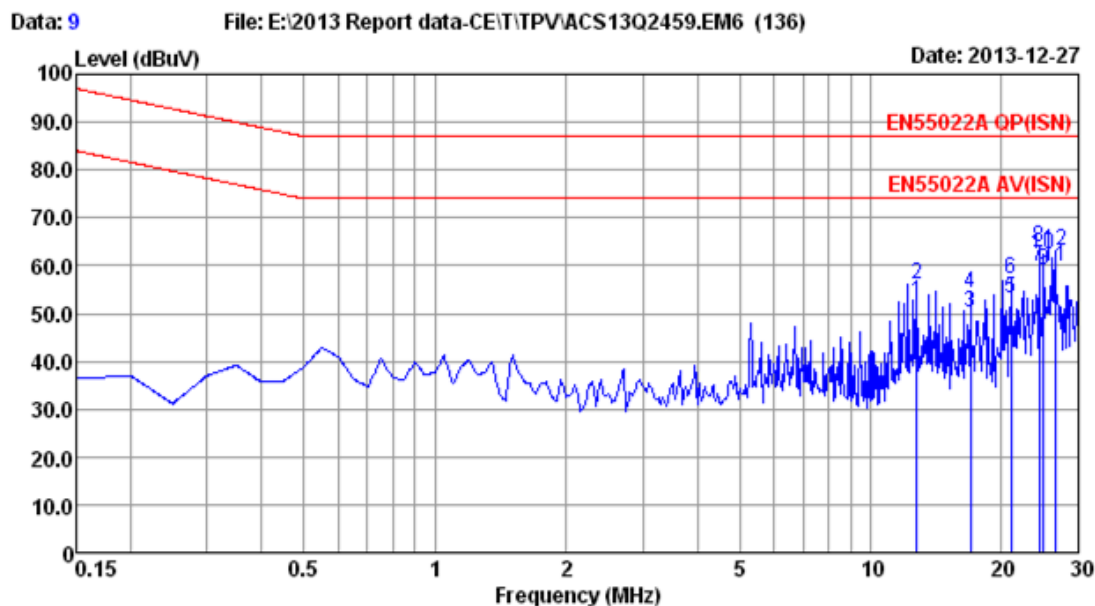
No.	Test Mode
1.	LAN1 ISN 10Mbps
2.	LAN1 ISN 100Mbps
3.	LAN2 ISN 10Mbps
4.	LAN2 ISN 100Mbps



Site no :2# CE Data No :10
 Dis./Lisn :2013 ISN T800 CAT5 LISN phase:
 Limit :EN55022A QP(ISN) Pre :101.2kPa
 Env./Ins. :22.3°C/51% Engineer :Dota-YAO
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :LAN1 ISN:10Mbps

No	Freq (MHz)	ISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.6011	9.93	9.96	16.69	36.58	74.00	37.42	Average
2	0.6011	9.93	9.96	21.31	41.20	87.00	45.80	QP
3	1.5033	9.78	9.98	17.28	37.04	74.00	36.96	Average
4	1.5033	9.78	9.98	20.06	39.82	87.00	47.18	QP
5	5.3900	9.67	10.03	15.03	34.73	74.00	39.27	Average
6	5.3900	9.67	10.03	19.96	39.66	87.00	47.34	QP
7	9.8606	9.64	10.09	23.23	42.96	74.00	31.04	Average
8	9.8606	9.64	10.09	29.08	48.81	87.00	38.19	QP
9	13.1269	9.65	10.12	17.83	37.60	74.00	36.40	Average
10	13.1269	9.65	10.12	21.51	41.28	87.00	45.72	QP
11	19.9500	9.73	10.18	24.57	44.48	74.00	29.52	Average
12	19.9500	9.73	10.18	28.85	48.76	87.00	38.24	QP

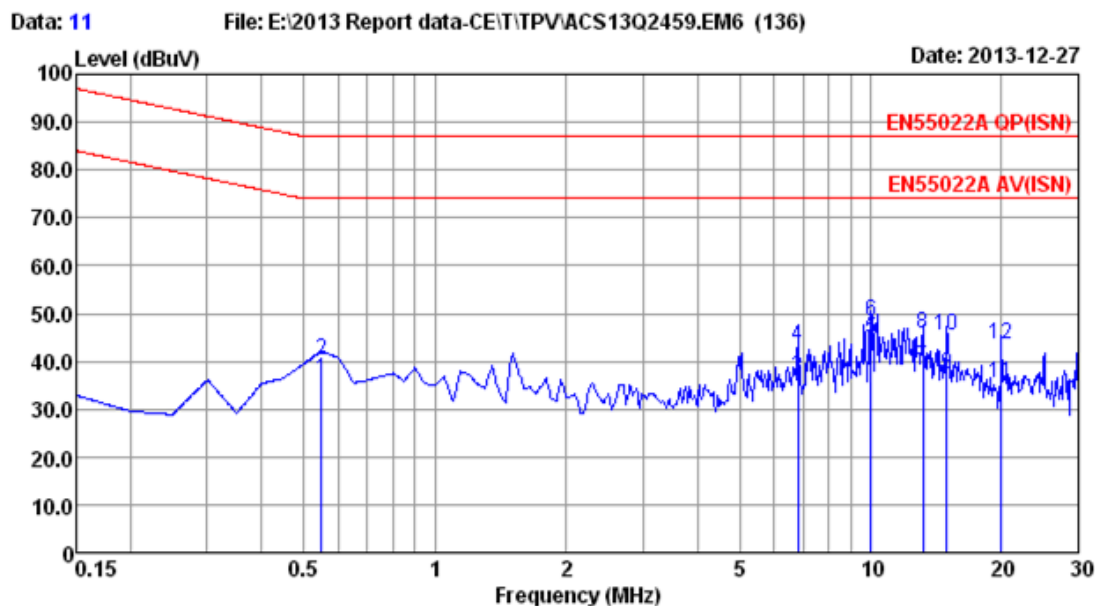
Remarks: 1.Emission Level=ISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :2# CE Data No :9
 Dis./Lisn :2013 ISN T800 CAT5 LISN phase:
 Limit :EN55022A QP (ISN) Pre :101.2kPa
 Env./Ins. :22.3°C/51% Engineer :Dota-YAO
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :LAN1 ISN:100Mbps

No	Freq (MHz)	ISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	12.7837	9.65	10.11	32.74	52.50	74.00	21.50	Average
2	12.7837	9.65	10.11	36.43	56.19	87.00	30.81	QP
3	16.9282	9.68	10.15	30.23	50.06	74.00	23.94	Average
4	16.9282	9.68	10.15	34.34	54.17	87.00	32.83	QP
5	21.0355	9.75	10.19	33.26	53.20	74.00	20.80	Average
6	21.0355	9.75	10.19	37.30	57.24	87.00	29.76	QP
7	24.3995	9.84	10.22	39.55	59.61	74.00	14.39	Average
8	24.3995	9.84	10.22	43.63	63.69	87.00	23.31	QP
9	24.9221	9.85	10.22	39.06	59.13	74.00	14.87	Average
10	24.9221	9.85	10.22	42.16	62.23	87.00	24.77	QP
11	26.5581	9.89	10.24	39.61	59.74	74.00	14.26	Average
12	26.5581	9.89	10.24	43.10	63.23	87.00	23.77	QP

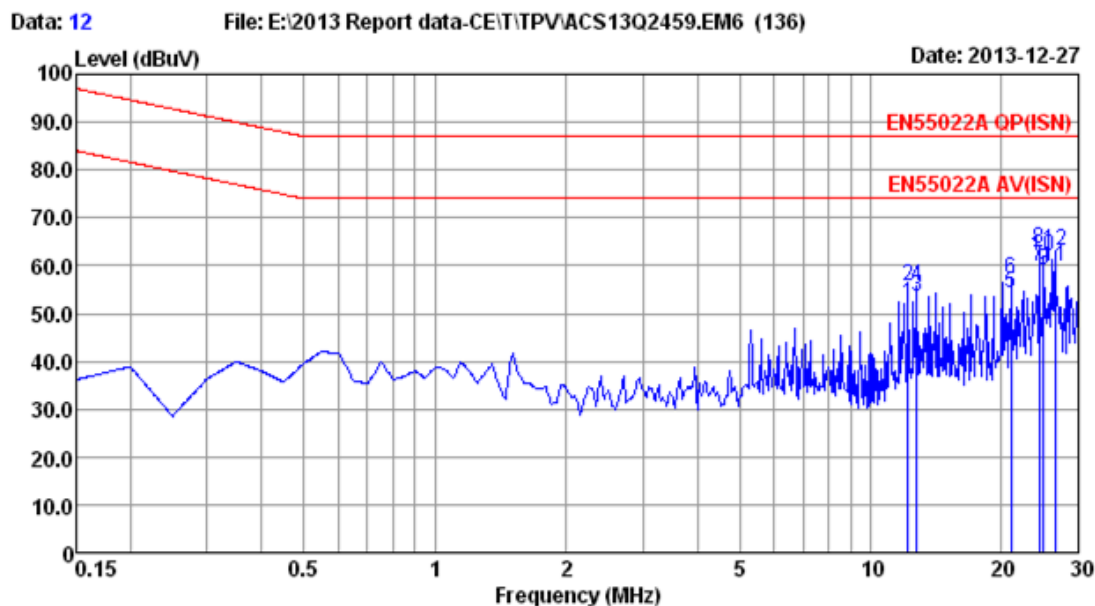
Remarks: 1.Emission Level=ISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :2# CE Data No :11
 Dis./Lisn :2013 ISN T800 CAT5 LISN phase:
 Limit :EN55022A QP (ISN) Pre :101.2kPa
 Env./Ins. :22.3°C/51% Engineer :Dota-YAO
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :LAN2 ISN:10Mbps

No	Freq (MHz)	ISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.5493	9.94	9.96	16.32	36.22	74.00	37.78	Average
2	0.5493	9.94	9.96	20.34	40.24	87.00	46.76	QP
3	6.8051	9.66	10.05	16.69	36.40	74.00	37.60	Average
4	6.8051	9.66	10.05	23.37	43.08	87.00	43.92	QP
5	10.0186	9.64	10.09	25.03	44.76	74.00	29.24	Average
6	10.0186	9.64	10.09	28.69	48.42	87.00	38.58	QP
7	13.1966	9.65	10.12	18.86	38.63	74.00	35.37	Average
8	13.1966	9.65	10.12	25.80	45.57	87.00	41.43	QP
9	14.9860	9.65	10.13	17.65	37.43	74.00	36.57	Average
10	14.9860	9.65	10.13	25.46	45.24	87.00	41.76	QP
11	19.9500	9.73	10.18	15.63	35.54	74.00	38.46	Average
12	19.9500	9.73	10.18	23.52	43.43	87.00	43.57	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	:12
Dis./Lisn	:2013 ISN T800 CAT5	LISN phase:	
Limit	:EN55022A QP (ISN)	Pre	:101.2kPa
Env./Ins.	:22.3°C/51%	Engineer	:Dota-YAO
EUT	:LCD Monitor M/N:X464UNV		
Power Rating	:AC 230V/50Hz		
Test Mode	:LAN2 ISN:100Mbps		

No	Freq (MHz)	ISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	12.1884	9.64	10.11	32.23	51.98	74.00	22.02	Average
2	12.1884	9.64	10.11	36.01	55.76	87.00	31.24	QP
3	12.7837	9.65	10.11	33.69	53.45	74.00	20.55	Average
4	12.7837	9.65	10.11	35.78	55.54	87.00	31.46	QP
5	21.0355	9.75	10.19	34.47	54.41	74.00	19.59	Average
6	21.0355	9.75	10.19	37.18	57.12	87.00	29.88	QP
7	24.3995	9.84	10.22	39.64	59.70	74.00	14.30	Average
8	24.3995	9.84	10.22	43.50	63.56	87.00	23.44	QP
9	24.9221	9.85	10.22	39.08	59.15	74.00	14.85	Average
10	24.9221	9.85	10.22	41.90	61.97	87.00	25.03	QP
11	26.5581	9.89	10.24	39.67	59.80	74.00	14.20	Average
12	26.5581	9.89	10.24	42.98	63.11	87.00	23.89	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)

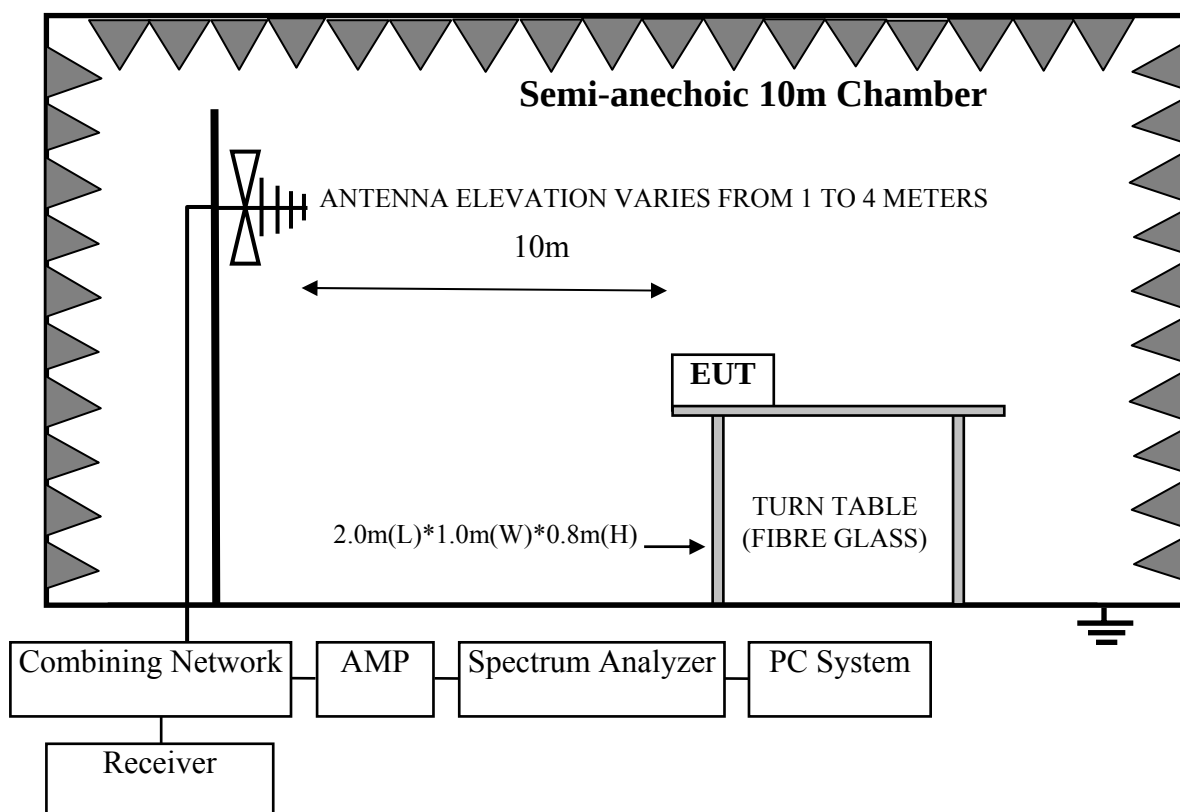
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	10m Chamber	AUDIX	N/A	N/A	Nov.25,13	1 Year
2	EMC Analyzer	Agilent	E7405A	MY42000131	Oct.31, 13	1 Year
3	EMC Analyzer	Agilent	E7405A	MY45116588	Oct.31, 13	1 Year
4	Test Receiver	Rohde & Schwarz	ESCI	100843	Nov.08, 13	1 Year
5	Amplifier	Agilent	8447D	2944A10684	May.08, 13	1 Year
6	Amplifier	Agilent	8447D	2944A11140	May.08, 13	1 Year
7	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-493	Mar.14, 13	1 Year
8	Trilog-Broadband Antenna	TESEQ	CBL6112D	25237	May.30, 13	1 Year
9	RF Cable	MIYAZAKI	CFD400-NL	10m Chamber No.1	May.08, 13	1 Year
10	RF Cable	MIYAZAKI	CFD400-NL	10m Chamber No.2	May.08, 13	1 Year
11	Coaxial Switch	Anritsu	MP59B	M73989	May.08, 13	1 Year
12	Coaxial Switch	Anritsu	MP59B	6200766905	May.08, 13	1 Year
13	Coaxial Switch	Anritsu	MP59B	6200313662	May.08, 13	1 Year

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

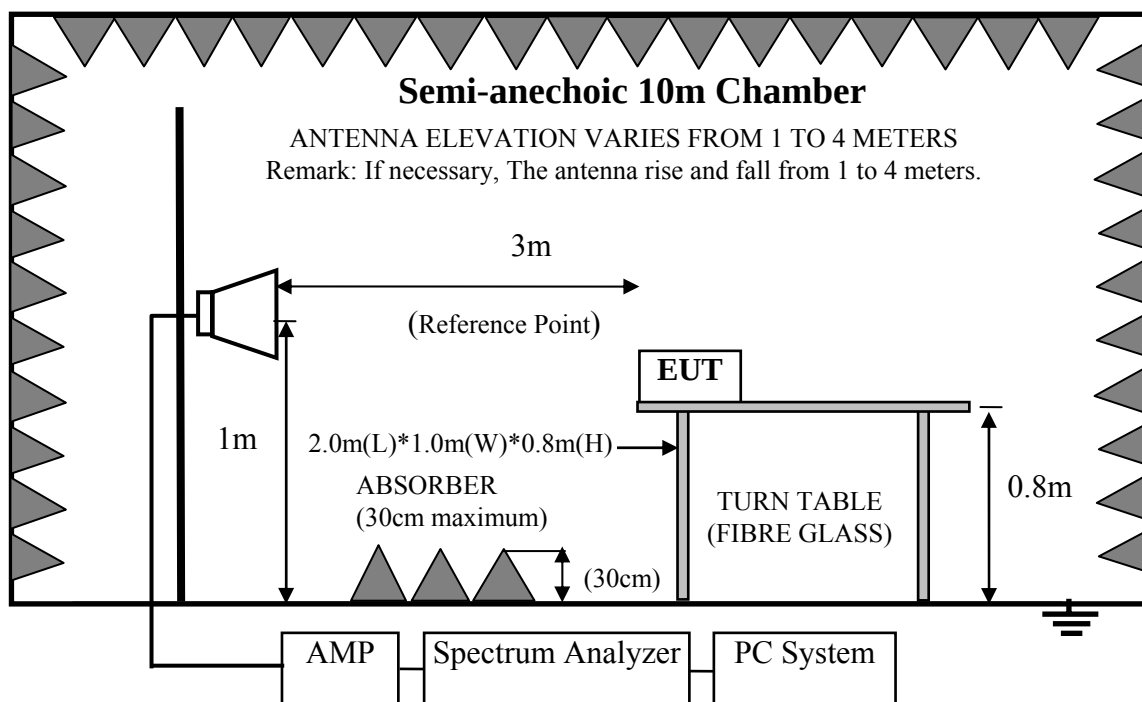
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMC Analyzer	Agilent	E7405A	MY45116588	Oct.31, 13	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	Aug.27, 13	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 13	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 13	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	28616/2	May.08, 13	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 EMC Analyzer E7405A 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. : X464UNV

The EUT with the following test modes were tested and selected (mode 3 & 6 & 9 ~13) to read Q.P values, all the test results are listed in next pages.

Test Date: Dec.24, 2013 Temperature: 24.7℃

Humidity: 47% Pressure: 101.1kPa

The EUT was pre-tested under following test modes, and selected test mode 3 was the worst cases to issue report.

No.	Test Mode	Cable	Input Port	Resolution & Frequency
1.	PC Mode	1.8m	VGA	640*480/60Hz
2.				1280*1024/75Hz
3.※				1920*1080/60Hz
4.			DVI	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.		1.5m	VGA	1920*1080/60Hz
13.	DVD Mode	1.8m	HDMI 1080P	

(※ Worst test mode)

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: Dec.26, 2013 Temperature: 26.7℃

Humidity: 49% Pressure: 101.3kPa

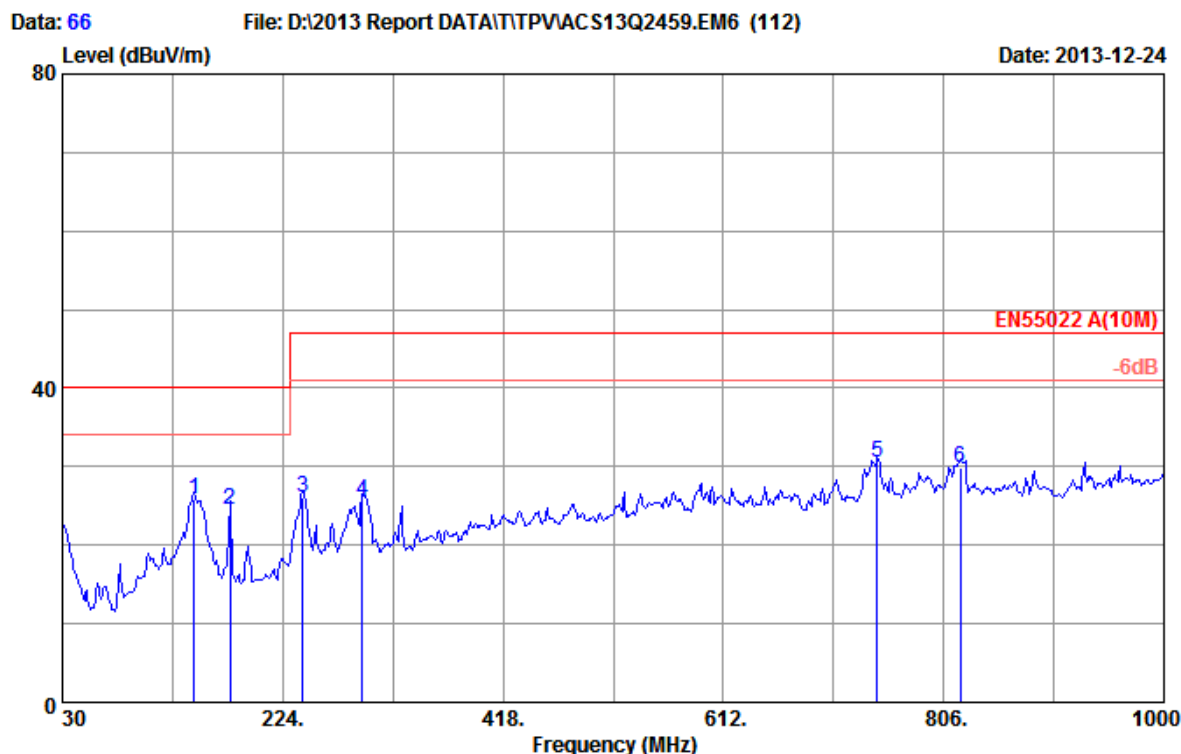
The EUT was pre-tested under following test modes, and selected test mode 1 was the worst cases to issue report.

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

(※ Worst test mode)

Test result is presented in the report as below

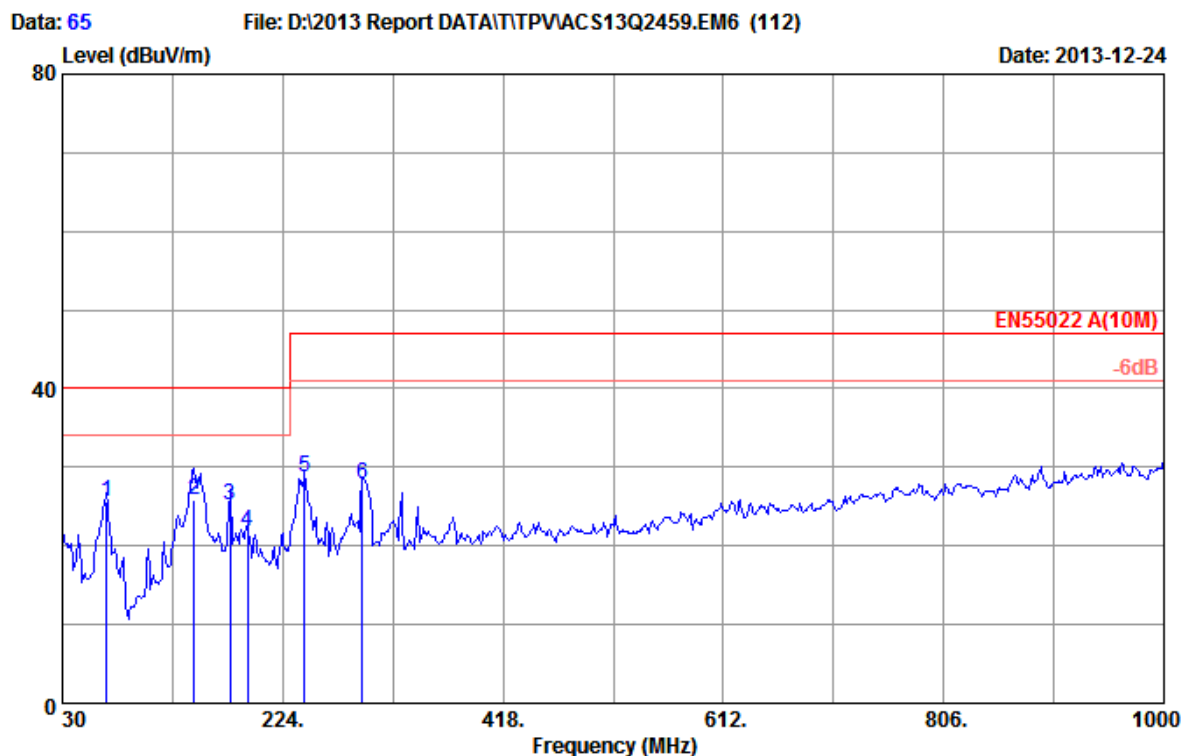
No.	Input Port	Resolution & Frequency
1.	DVI	1920*1080/60Hz



Site no :10m Chamber Data No :66
 Dis./Ant. :2013 25237 10M Ant.pol :HORIZONTAL
 Limit :EN55022 A(10M) Pre :101.1kPa
 Env./Ins. :24.7°C/47% Engineer :ANDY
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running 'H' Pattern And 1kHz Playing
 VGA:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	146.400	10.68	4.19	10.95	25.82	40.00	14.18	QP
2	177.440	9.33	4.31	10.90	24.54	40.00	15.46	QP
3	241.460	11.55	4.57	9.94	26.06	47.00	20.94	QP
4	293.840	13.10	4.78	7.64	25.52	47.00	21.48	QP
5	747.800	19.70	5.77	5.02	30.49	47.00	16.51	QP
6	820.550	20.10	5.93	3.85	29.88	47.00	17.12	QP

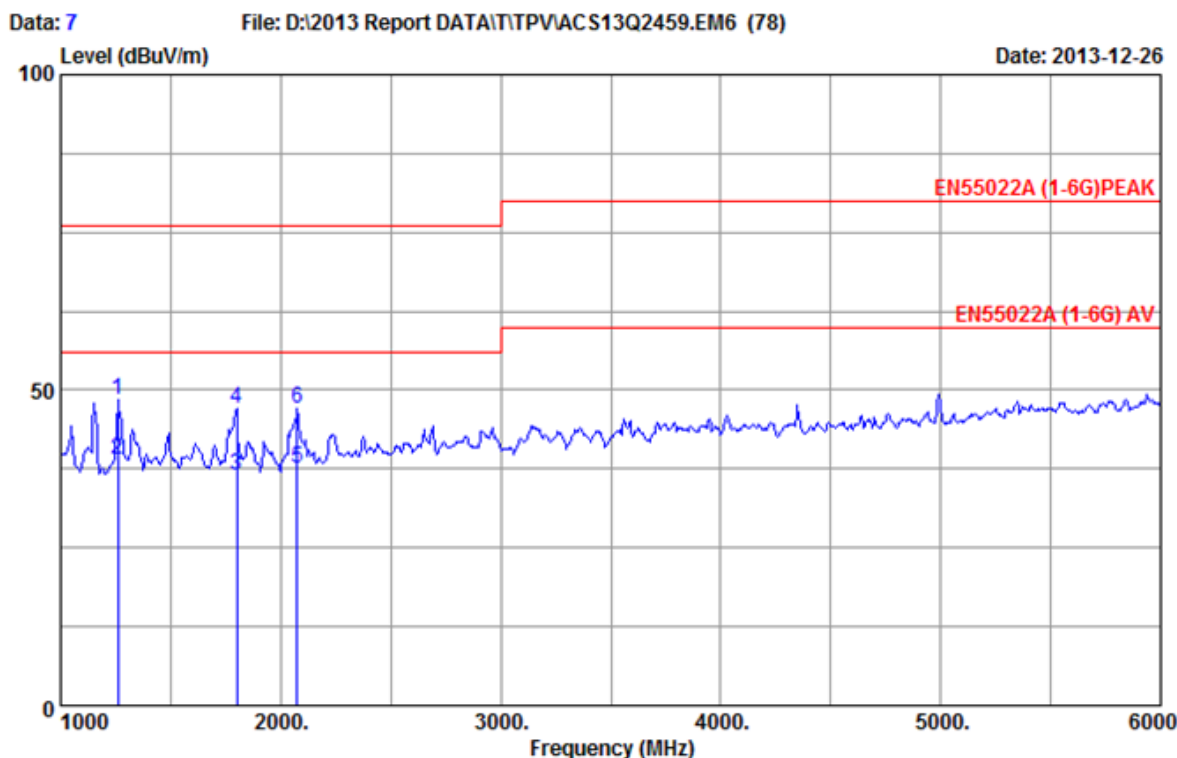
Remarks: 1.Emission Level=Antenna Factor+Cable Loss+Reading.
 2.The emission Levels that are 20db below the official limit are not reported
 3. The worst emission was detected at 146.400 MHz with corrected signal level of 25.82 dBuV/m (Limit is 40.00dBuV/m) when the antenna was at horizontal polarization 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 Chamber Data No :65
 Dis./Ant. :2013 9168-493 Ant.pol :VERTICAL
 Limit :EN55022 A(10M) Pre :101.1kPa
 Env./Ins. :24.7°C/47% Engineer :ANDY
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running 'H' Pattern And 1kHz Playing
 VGA:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	68.800	11.94	3.88	9.82	25.64	40.00	14.36	QP
2	146.400	13.20	4.19	8.51	25.90	40.00	14.10	QP
3	177.440	12.06	4.31	8.75	25.12	40.00	14.88	QP
4	192.960	10.25	4.37	7.16	21.78	40.00	18.22	QP
5	243.400	11.47	4.57	12.62	28.66	47.00	18.34	QP
6	293.840	13.18	4.78	9.79	27.75	47.00	19.25	QP

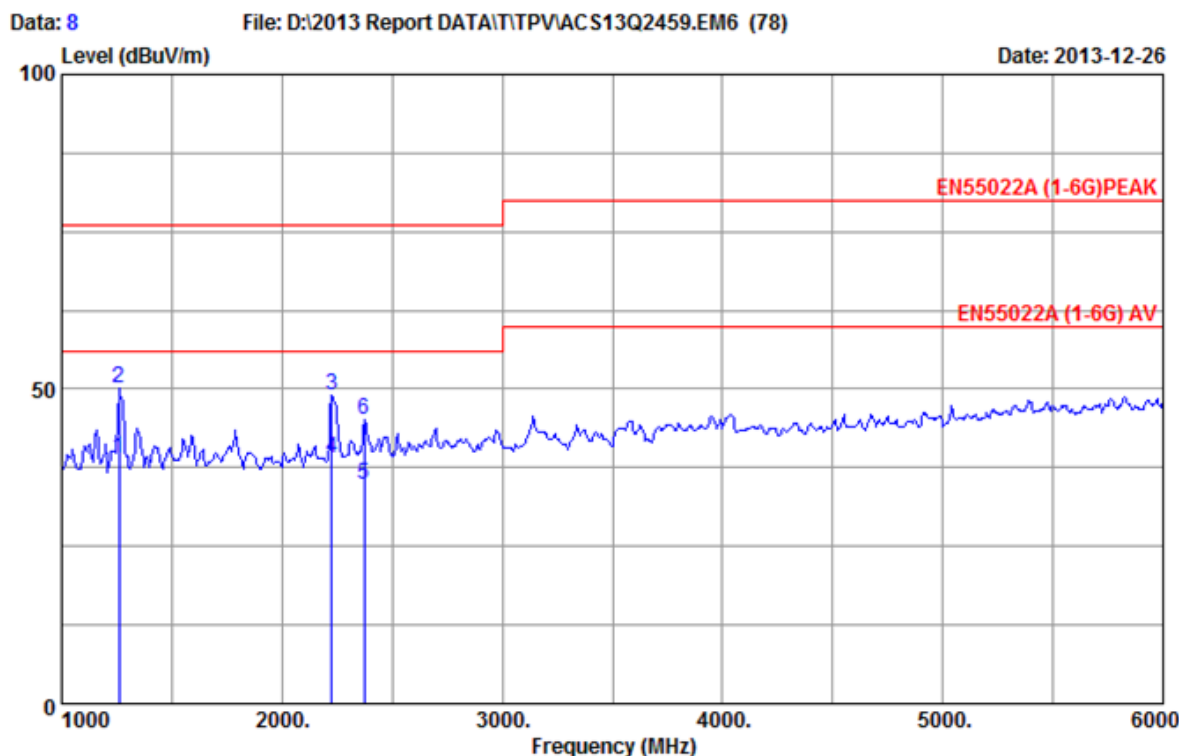
Remarks: 1.Emission Level=Antenna Factor+Cable Loss+Reading.
 2.The emission Levels that are 20db below the official limit are not reported
 3. The worst emission was detected at 146.400 MHz with corrected signal level of 25.90 dBuV/m (Limit is 40.00dBuV/m) when the antenna was at vertical polarization 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 :7
 Dis./Ant. :3m 2013 3115 (4877) Ant.pol :HORIZONTAL
 Limit :EN55022A (1-6G) PEAK Pre :101.3kPa
 Env./Ins. :26.7°C/49% Engineer :Even_Deng
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 DVI:1920*1080@60Hz
 Line:1.8m

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	1260.610	24.55	1.66	35.91	58.25	48.55	76.00	27.45	Peak
2	1261.470	24.55	1.66	35.91	48.70	39.00	56.00	17.00	Average
3	1799.230	25.90	2.20	35.10	43.36	36.36	56.00	19.64	Average
4	1800.850	25.90	2.20	35.10	53.96	46.96	76.00	29.04	Peak
5	2074.980	26.31	2.49	34.79	43.66	37.67	56.00	18.33	Average
6	2075.270	26.31	2.49	34.79	53.03	47.04	76.00	28.96	Peak

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 :8
 Dis./Ant. :3m 2013 3115 (4877) Ant.pol :VERTICAL
 Limit :EN55022A (1-6G) PEAK Pre :101.3kPa
 Env./Ins. :26.7°C/49% Engineer :Even_Deng
 EUT :LCD Monitor M/N:X464UNV
 Power Rating :AC 230V/50Hz
 Test Mode :Running "H" Pattern And 1KHz Playing
 DVI:1920*1080@60Hz
 Line:1.8m

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	1259.660	24.54	1.66	35.91	48.78	39.07	56.00	16.93	Average
2	1260.230	24.55	1.66	35.91	59.71	50.01	76.00	25.99	Peak
3	2225.670	26.73	2.62	34.77	54.52	49.10	76.00	26.90	Peak
4	2226.540	26.73	2.62	34.77	44.30	38.88	56.00	17.12	Average
5	2374.850	27.15	2.75	34.74	39.54	34.70	56.00	21.30	Average
6	2375.160	27.15	2.75	34.74	49.90	45.06	76.00	30.94	Peak

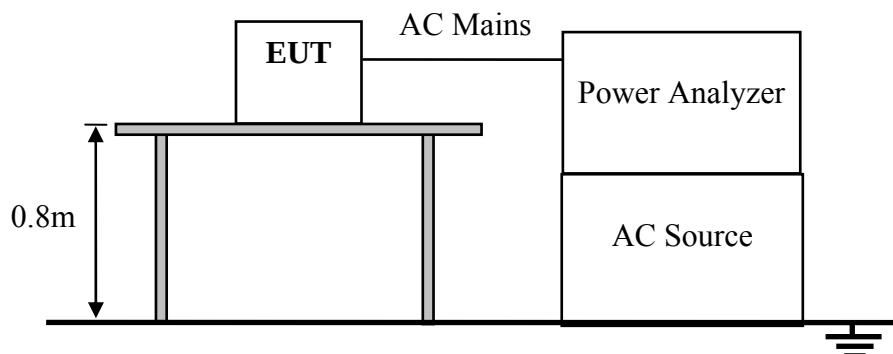
Remarks: 1.Emission Level=Antenna Factor+Cable Loss+Reading+AMP factor.
 2.The emission Levels that are 20db below the official limit are not reported

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, 13	1 Year
2.	Compliance Test System	California Instruments	PACS-1	72627	Oct.31, 13	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.

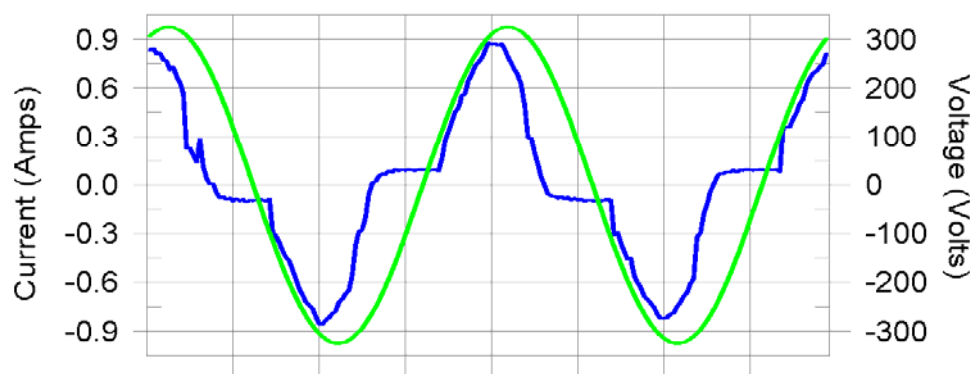
The EUT was tested and all the test results are listed in next pages.

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

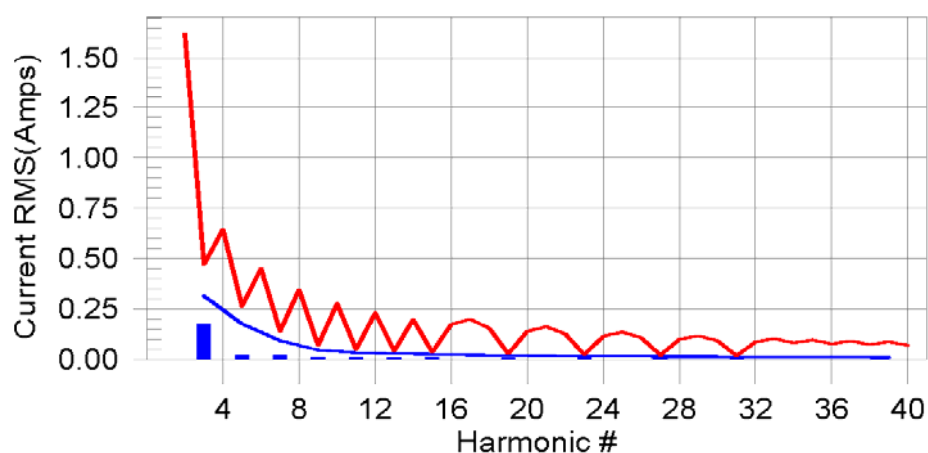
EUT: LCD Monitor M/N:X464UNV
 Test category: Class-D per Ed. 3.2 (2009) (European limits)
 Test date: 2013-12-16 Start time: 15:49:38 End time: 15:52:29
 Test duration (min): 2.5 Data file name: H-000024.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line European Limits



Test result: Pass Worst harmonic was #23 with 61.92% of the limit.

Current Test Result Summary (Run time)

EUT: LCD Monitor M/N:X464UNV Tested by: Sun
 Test category: Class-D per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2013-12-16 Start time: 15:49:38 End time: 15:52:29
 Test duration (min): 2.5 Data file name: H-000024.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal
 THCA: 0.17 I-THD(%): 40.20 POHC(A): 0.013 POHC Limit(A): 0.040
 Highest parameter values during test:
 V_RMS (Volts): 230.04 Frequency(Hz): 50.00
 I_Peak (Amps): 0.911 I_RMS (Amps): 0.474
 I_Fund (Amps): 0.439 Crest Factor: 1.925
 Power (Watts): 92.3 Power Factor: 0.850

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.171	0.314	54.4	0.172	0.471	36.47	Pass
4	0.000						
5	0.019	0.175	10.8	0.019	0.263	7.36	Pass
6	0.000						
7	0.019	0.092	20.9	0.020	0.139	14.25	Pass
8	0.000						
9	0.009	0.046	20.5	0.010	0.069	14.26	Pass
10	0.000						
11	0.009	0.032	28.3	0.009	0.048	19.54	Pass
12	0.000						
13	0.005	0.028	18.7	0.006	0.041	13.72	Pass
14	0.000						
15	0.012	0.024	49.1	0.012	0.036	34.19	Pass
16	0.000						
17	0.001	0.021	3.9	0.000	0.199	0.00	Pass
18	0.000						
19	0.008	0.019	44.9	0.009	0.028	31.11	Pass
20	0.000						
21	0.003	0.017	19.4	0.000	0.161	0.00	Pass
22	0.000						
23	0.010	0.015	61.9	0.010	0.023	42.50	Pass
24	0.000						
25	0.001	0.014	9.0	0.000	0.135	0.00	Pass
26	0.000						
27	0.007	0.013	49.3	0.007	0.020	34.46	Pass
28	0.000						
29	0.002	0.012	14.1	0.000	0.116	0.00	Pass
30	0.000						
31	0.006	0.011	49.8	0.006	0.017	35.22	Pass
32	0.000						
33	0.001	0.011	9.9	0.000	0.102	0.00	Pass
34	0.000						
35	0.004	0.010	43.7	0.000	0.096	0.00	Pass
36	0.000						
37	0.001	0.010	13.1	0.000	0.091	0.00	Pass
38	0.000						
39	0.004	0.009	42.4	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:X464UNV **Tested by:** Sun
Test category: Class-D per Ed. 3.2 (2009) (European limits) **Test Margin:** 100
Test date: 2013-12-16 **Start time:** 15:49:38 **End time:** 15:52:29
Test duration (min): 2.5 **Data file name:** H-000024.cts_data
Comment: Running "H" Pattern And 1kHz Playing
Customer: TPV

Test Result: Pass **Source qualification:** Normal

Highest parameter values during test:

Voltage (Vrms): 230.04	Frequency(Hz): 50.00
I_Peak (Amps): 0.911	I_RMS (Amps): 0.474
I_Fund (Amps): 0.439	Crest Factor: 1.925
Power (Watts): 92.3	Power Factor: 0.850

Harm#	Harmonics	V-rms	Limit V-rms	% of Limit	Status
2		0.085	0.460	18.43	OK
3		0.463	2.070	22.36	OK
4		0.062	0.460	13.42	OK
5		0.036	0.920	3.91	OK
6		0.028	0.460	6.04	OK
7		0.038	0.690	5.51	OK
8		0.014	0.460	3.03	OK
9		0.017	0.460	3.75	OK
10		0.013	0.460	2.90	OK
11		0.012	0.230	5.21	OK
12		0.013	0.230	5.52	OK
13		0.009	0.230	3.83	OK
14		0.006	0.230	2.56	OK
15		0.016	0.230	7.16	OK
16		0.010	0.230	4.56	OK
17		0.008	0.230	3.59	OK
18		0.009	0.230	3.98	OK
19		0.011	0.230	4.71	OK
20		0.007	0.230	2.95	OK
21		0.010	0.230	4.36	OK
22		0.004	0.230	1.85	OK
23		0.012	0.230	5.25	OK
24		0.004	0.230	1.76	OK
25		0.005	0.230	2.17	OK
26		0.003	0.230	1.23	OK
27		0.012	0.230	5.10	OK
28		0.003	0.230	1.30	OK
29		0.005	0.230	2.22	OK
30		0.004	0.230	1.63	OK
31		0.008	0.230	3.60	OK
32		0.003	0.230	1.33	OK
33		0.004	0.230	1.65	OK
34		0.004	0.230	1.53	OK
35		0.008	0.230	3.31	OK
36		0.003	0.230	1.18	OK
37		0.005	0.230	1.97	OK
38		0.003	0.230	1.33	OK
39		0.009	0.230	4.04	OK
40		0.003	0.230	1.35	OK

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

EUT: LCD Monitor M/N:X464UNV

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

Test date: 2013-12-16

Test duration (min): 2.5

Comment: DVD Playing

Customer: TPV

Tested by: Sun

Test Margin: 100

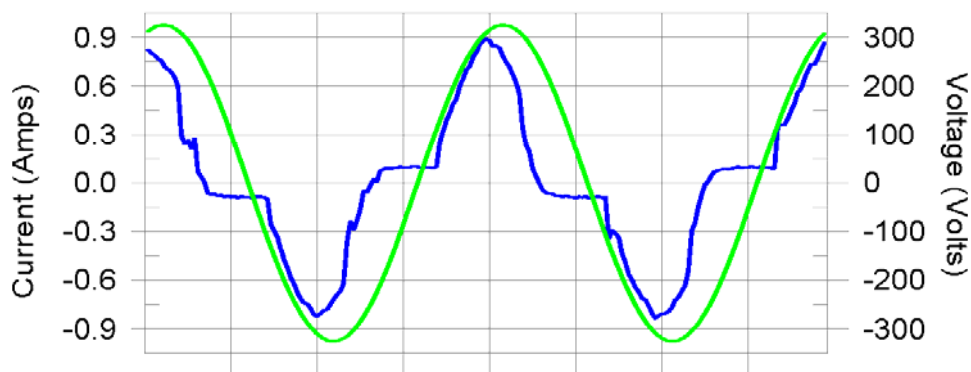
End time: 16:09:44

Start time: 16:06:53

Data file name: H-000026.cts_data

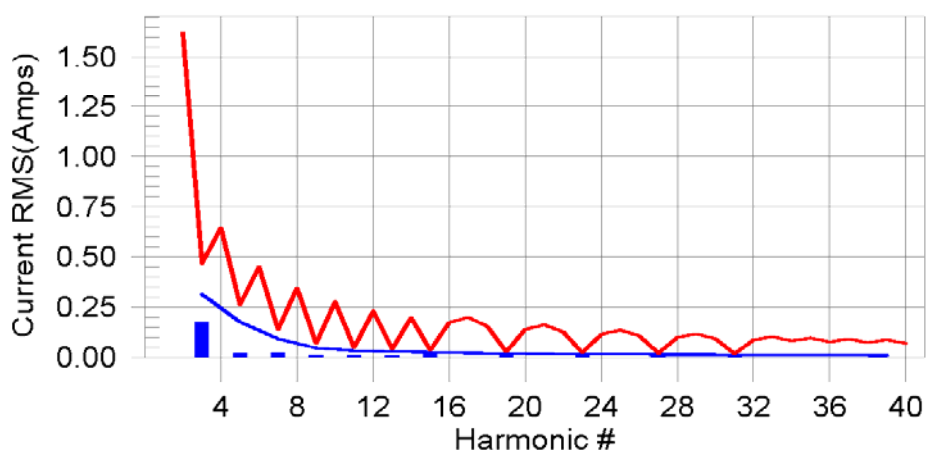
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line

European Limits



Test result: Pass Worst harmonic was #23 with 63.05% of the limit.

Current Test Result Summary (Run time)

EUT: LCD Monitor M/N:X464UNV Tested by: Sun
 Test category: Class-D per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2013-12-16 Start time: 16:06:53 End time: 16:09:44
 Test duration (min): 2.5 Data file name: H-000026.cts_data
 Comment: DVD Playing
 Customer: TPV

Test Result: Pass Source qualification: Normal
 THCA: 0.18 I-THD(%): 40.65 POHC(A): 0.013 POHC Limit(A): 0.040
 Highest parameter values during test:
 V_RMS (Volts): 230.05 Frequency(Hz): 50.00
 I_Peak (Amps): 0.905 I_RMS (Amps): 0.474
 I_Fund (Amps): 0.438 Crest Factor: 1.919
 Power (Watts): 92.1 Power Factor: 0.849

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.172	0.313	54.8	0.173	0.468	36.95	Pass
4	0.000						
5	0.019	0.175	10.7	0.019	0.261	7.30	Pass
6	0.000						
7	0.020	0.092	21.8	0.022	0.138	16.03	Pass
8	0.000						
9	0.009	0.046	18.9	0.009	0.069	13.46	Pass
10	0.000						
11	0.010	0.032	31.0	0.011	0.048	23.68	Pass
12	0.000						
13	0.005	0.028	19.3	0.006	0.041	14.13	Pass
14	0.000						
15	0.013	0.024	52.3	0.014	0.035	39.35	Pass
16	0.000						
17	0.001	0.021	4.0	0.000	0.199	0.00	Pass
18	0.000						
19	0.009	0.019	47.8	0.010	0.028	34.23	Pass
20	0.000						
21	0.003	0.017	20.1	0.000	0.161	0.00	Pass
22	0.000						
23	0.010	0.015	63.0	0.010	0.023	44.79	Pass
24	0.000						
25	0.001	0.014	8.4	0.000	0.135	0.00	Pass
26	0.000						
27	0.007	0.013	51.6	0.007	0.020	36.56	Pass
28	0.000						
29	0.002	0.012	12.8	0.000	0.116	0.00	Pass
30	0.000						
31	0.006	0.011	51.1	0.006	0.017	37.06	Pass
32	0.000						
33	0.001	0.011	8.8	0.000	0.102	0.00	Pass
34	0.000						
35	0.004	0.010	44.3	0.000	0.096	0.00	Pass
36	0.000						
37	0.001	0.010	11.5	0.000	0.091	0.00	Pass
38	0.000						
39	0.004	0.009	43.2	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:X464UNV **Tested by:** Sun
Test category: Class-D per Ed. 3.2 (2009) (European limits) **Test Margin:** 100
Test date: 2013-12-16 **Start time:** 16:06:53 **End time:** 16:09:44
Test duration (min): 2.5 **Data file name:** H-000026.cts_data
Comment: DVD Playing
Customer: TPV

Test Result: Pass **Source qualification:** Normal

Highest parameter values during test:

Voltage (Vrms): 230.05	Frequency(Hz): 50.00
I_Peak (Amps): 0.905	I_RMS (Amps): 0.474
I_Fund (Amps): 0.438	Crest Factor: 1.919
Power (Watts): 92.1	Power Factor: 0.849

Harm#	Harmonics	V-rms	Limit V-rms	% of Limit	Status
2		0.089	0.460	19.35	OK
3		0.460	2.070	22.24	OK
4		0.060	0.460	13.02	OK
5		0.036	0.920	3.90	OK
6		0.028	0.460	5.98	OK
7		0.036	0.690	5.25	OK
8		0.013	0.460	2.85	OK
9		0.016	0.460	3.54	OK
10		0.013	0.460	2.78	OK
11		0.012	0.230	5.15	OK
12		0.012	0.230	5.38	OK
13		0.008	0.230	3.41	OK
14		0.006	0.230	2.58	OK
15		0.017	0.230	7.38	OK
16		0.010	0.230	4.29	OK
17		0.007	0.230	3.15	OK
18		0.009	0.230	3.91	OK
19		0.012	0.230	5.24	OK
20		0.006	0.230	2.68	OK
21		0.009	0.230	3.90	OK
22		0.004	0.230	1.94	OK
23		0.012	0.230	5.36	OK
24		0.005	0.230	2.06	OK
25		0.004	0.230	1.88	OK
26		0.003	0.230	1.29	OK
27		0.012	0.230	5.18	OK
28		0.004	0.230	1.54	OK
29		0.005	0.230	2.18	OK
30		0.003	0.230	1.37	OK
31		0.008	0.230	3.65	OK
32		0.003	0.230	1.28	OK
33		0.004	0.230	1.72	OK
34		0.003	0.230	1.48	OK
35		0.008	0.230	3.58	OK
36		0.003	0.230	1.26	OK
37		0.005	0.230	2.10	OK
38		0.003	0.230	1.47	OK
39		0.010	0.230	4.28	OK
40		0.004	0.230	1.56	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: 2013

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:X464UNV
 Test category: All parameters (European limits)
 Test date: 2013-12-16 Start time: 15:37:13
 Test duration (min): 10 Data file name: F-000023.cts_data
 Comment: Running "H" Pattern And 1kHz Playing
 Customer: TPV

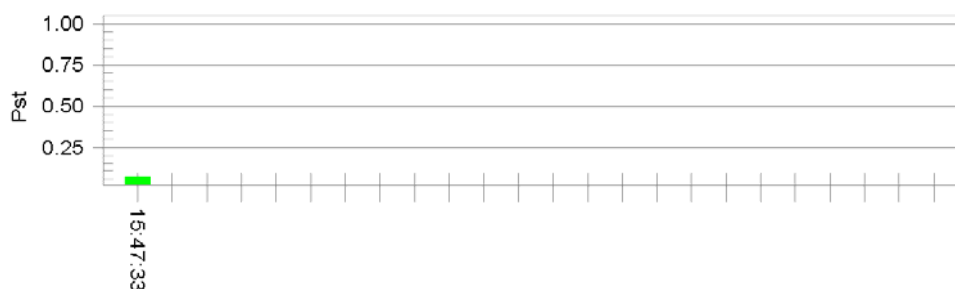
Tested by: Sun
 Test Margin: 100
 End time: 15:47:34

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):	229.83		
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

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

EUT: LCD Monitor M/N:X464UNV
 Test category: All parameters (European limits)
 Test date: 2013-12-16
 Test duration (min): 10
 Comment: DVD Playing
 Customer: TPV

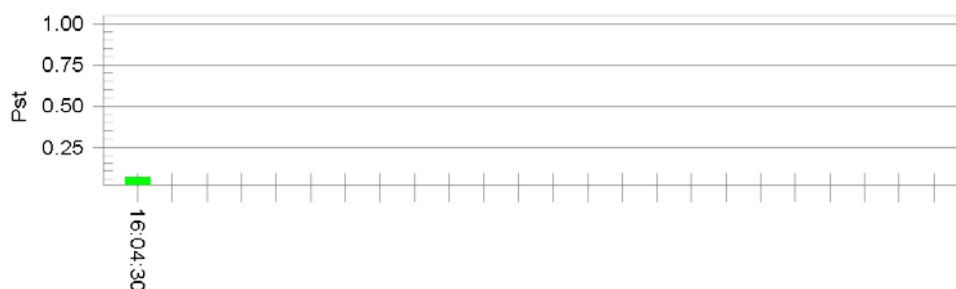
Tested by: Sun
 Test Margin: 100
 Start time: 15:54:10
 End time: 16:04:32
 Data file name: F-000025.cts_data

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):	229.86		
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

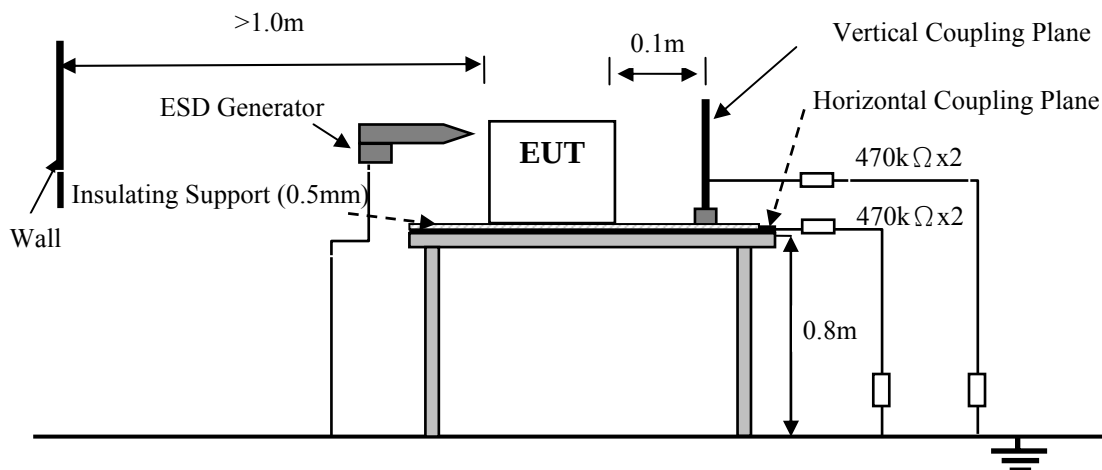
Failures which are not self-recovered after removal of the external disturbance, but which can be recovered to normal operation by reset or reboot are permissible.

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.03,13	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	: Dec.19, 2013
EUT	: LCD Monitor	Temperature	: 23.5±0.6℃
M/N	: X464UNV	Humidity	: 45±3%
Test Voltage	: AC 230V/50Hz	Test Mode	: Same as Section 3.6
Test Engineer	: Sun	Pressure	: 100.9±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 25 times and negative 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	1,2,8,10	B	A	Pass
± 4	Contact	1,2,8,10	B	B	Pass
± 2	Air	3,4,5,6,7,8,9,11	B	A	Pass
± 4	Air	3,4,5,6,7,8,9,11	B	A	Pass
± 8	Air	3,4,5,6,7,8,9,11	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>	Metal / Screws	<u>9</u>	Display / HDMI Port
<u>2</u>	LAN Port	<u>10</u>	RS232 Port
<u>3</u>	Screen	<u>11</u>	Speaker Port
<u>4</u>	Buttons	<u>12</u>	
<u>5</u>	AC IN Port	<u>13</u>	
<u>6</u>	Audio IN Port	<u>14</u>	
<u>7</u>	Headphone Port	<u>15</u>	
<u>8</u>	DVI / VGA Port	<u>16</u>	

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 test.

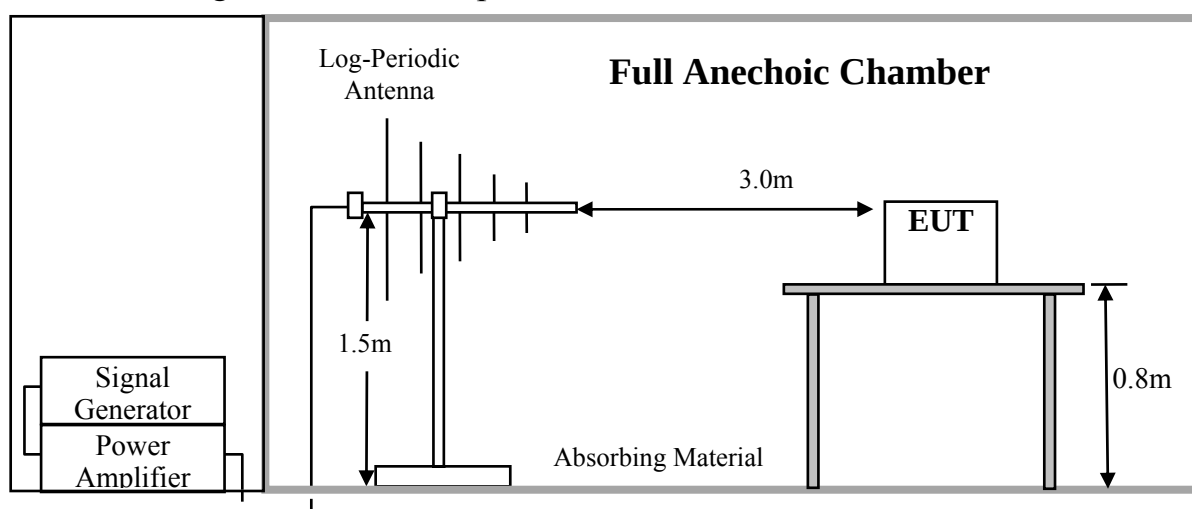
Discharge was considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

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. 13	1 Year
2.	Signal Generator	Agilent	N5181A	MY49061013	Nov.05, 13	1 Year
3.	Amplifier	A&R	100W/1000M1	17028	NCR	NCR
4.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 13	1 Year
5.	Power Sensor	Anritsu	MA2491A	032516	May.08, 13	1 Year
6.	Log-periodic Antenna	A&R	AT1080	16512	NCR	NCR
NCR: No Calibration required (Calibrated with system)						

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.

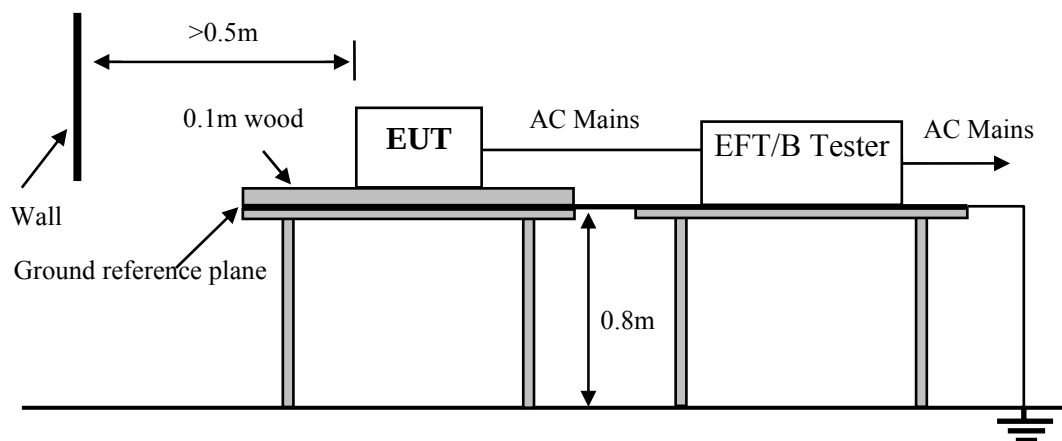
Applicant : TPV Electronics (FuJian) Co., Ltd. EUT : LCD Monitor M/N : X464UNV Test Voltage : AC 230V/50Hz Test Engineer : Roj Required Performance : A	Test Date : Dec.31, 2013 Temperature : 23±0.6℃ Humidity : 47±3% Pressure : 100.5±1KPa Test Mode : Same as Section 3.6 Actual Performance : A																																				
Modulation: ☒ AM ☐ Pulse ☐ none 1 kHz 80%																																					
Frequency Rang :80 MHz -1000MHz																																					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <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> <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> </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, 13	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 : X464UNV Test Voltage : AC 230V/50Hz Test Engineer : Sun Required Performance : B	Test Date : Dec.19, 2013 Temperature : 23.3±0.6°C Humidity : 45±3% Test Mode : Same as Section 3.6 Pressure : 100.9±1KPa Actual Performance : A&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	A	A	Pass
	1kV	B	B	B	Pass
N	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
PE	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
L N	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
L PE	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
N PE	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
L N PE	0.5kV	B	A	A	Pass
	1kV	B	B	B	Pass
Signal Line	0.5kV	B	B	B	Pass

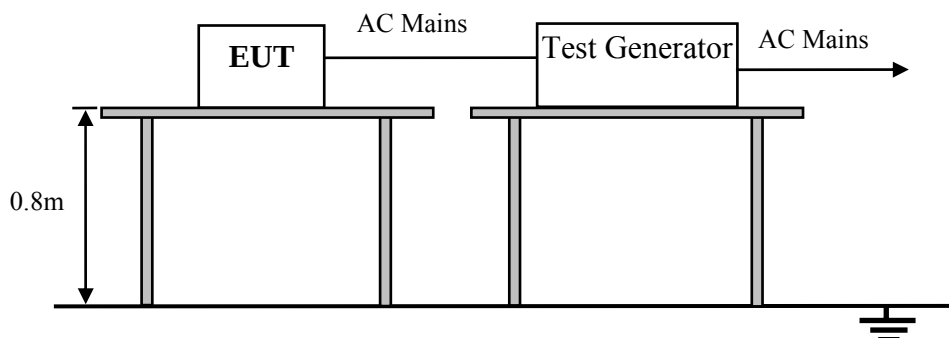
Remark: When Testing "B" Means the monitor will twinkle during test, recover to normal when stop test.

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, 13	1 Year
2	CDN	EMC PARTNER	CDN-UTP8	CDN-UTP8-1508	Aug.12, 13	1 Year
3	CDN	EMC PARTNER	CDN2000-06-25	CDN2000-06-25 0111	Aug.12, 13	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.

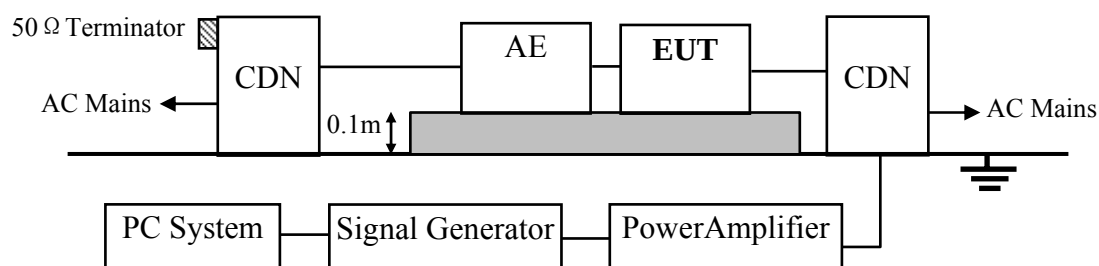
Applicant : TPV Electronics (FuJian) Co., Ltd. EUT : LCD Monitor M/N : X464UNV Power Supply : AC 230V/50Hz Test Engineer : Sun Required Performance : B	Test Date : Dec.19, 2013 Temperature : $23.3 \pm 0.6^{\circ}\text{C}$ Humidity : $44 \pm 3\%$ Test Mode : Same as Section 3.6 Pressure : $100.9 \pm 1\text{KPa}$ 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	B	B				Pass
	90°	B	A	A	B	B	B				Pass
	180°	B	A	A	B	B	B				Pass
	270°	B	A	A	B	B	B				Pass
L-PE	0°	B	A	A	B	A	A	B	B	B	Pass
	90°	B	A	A	B	A	A	B	B	B	Pass
	180°	B	A	A	B	A	A	B	B	B	Pass
	270°	B	A	A	B	A	A	B	B	B	Pass
N-PE	0°	B	A	A	B	A	A	B	B	B	Pass
	90°	B	A	A	B	A	A	B	B	B	Pass
	180°	B	A	A	B	A	A	B	B	B	Pass
	270°	B	A	A	B	A	A	B	B	B	Pass
Signal Line					C	C	C				Pass
Remark: When Testing “B” Means the monitor will twinkle during test, recover to normal when stop test. “C” means the network interrupt, but it will recovery by normal.											

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.05,13	1 Year
2.	Amplifier	AR	25A250A	19152	NCR	NCR
3.	Power meter	HP	436A	2016A07891	May.08, 13	1 Year
4.	Power sensor	Agilent	8482B	MY41090514	Nov.26, 13	1 Year
5.	CDN	FCC	FCC-801-M3-25	107	May.08, 13	1 Year
6.	CDN	FCC	FCC-801-M3-25	07045	May.08, 13	1 Year
7.	PC	N/A	N/A	N/A	N/A	N/A
8.	Attenuator	Weinschel	40-6-34	LJ092	May.08, 13	1 Year
9.	EM Injection Clamp	FCC	F-203I-23mm	403	May.08, 13	1 Year
10.	RF Cable	MICABLE	A04-07-07-2M	09111340	NCR	NCR
11.	RF Cable	STORM	MFR-57500	90-195-2MTR	NCR	NCR
NCR: No Calibration required (Calibrated with system)						

13.2. Block Diagram of Test Setup



13.3. Test Standard

EN 55024: 2010 (IEC 61000-4-6: 2013)

(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. EUT : LCD Monitor M/N : X464UNV Power Supply : AC 230V/50Hz Test Engineer : Roj Required Performance : A	Test Date : Dec.31, 2013 Temperature : 22.5±0.6℃ Humidity : 46±3% Test Mode : Same as Section 3.6 Pressure : 100.6±1KPa 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

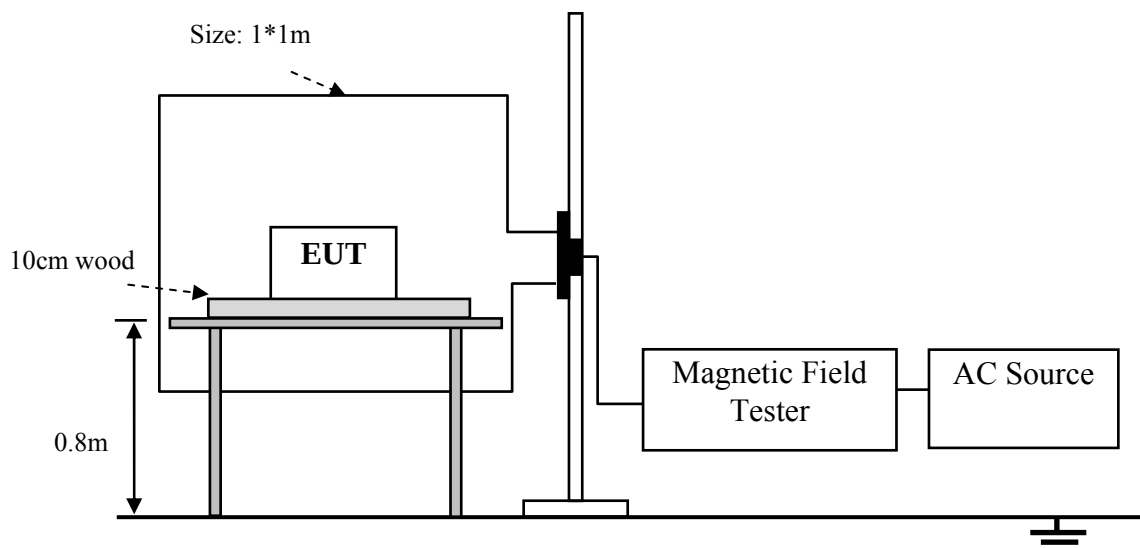
Remark:

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, 13	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.

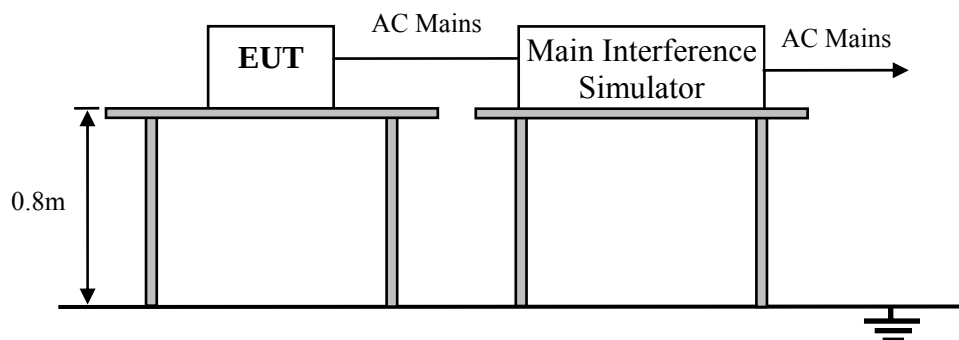
Applicant	:	TPV Electronics (FuJian) Co., Ltd.	Test Date	:	Dec.31, 2013
EUT	:	LCD Monitor	Temperature	:	23±0.6℃
M/N	:	X464UNV	Humidity	:	42±3%
Test Voltage	:	AC 230V/50Hz	Test Mode	:	Same as Section 3.6
Test Engineer	:	Roj	Pressure	:	100.6±1KPa
Required Performance	:	A	Actual Performance	:	A
Test Level	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:					

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, 13	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 : Dec.31, 2013		
EUT : LCD Monitor				Temperature : 23±0.6℃		
M/N : X464UNV				Humidity : 44±3%		
Power Supply : AC 100V/50Hz ; AC 230V/50Hz				Test Mode : Same as Section 3.6		
Test Engineer : Roj				Pressure : 101.2±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 test.						

16. PHOTOGRAPHS

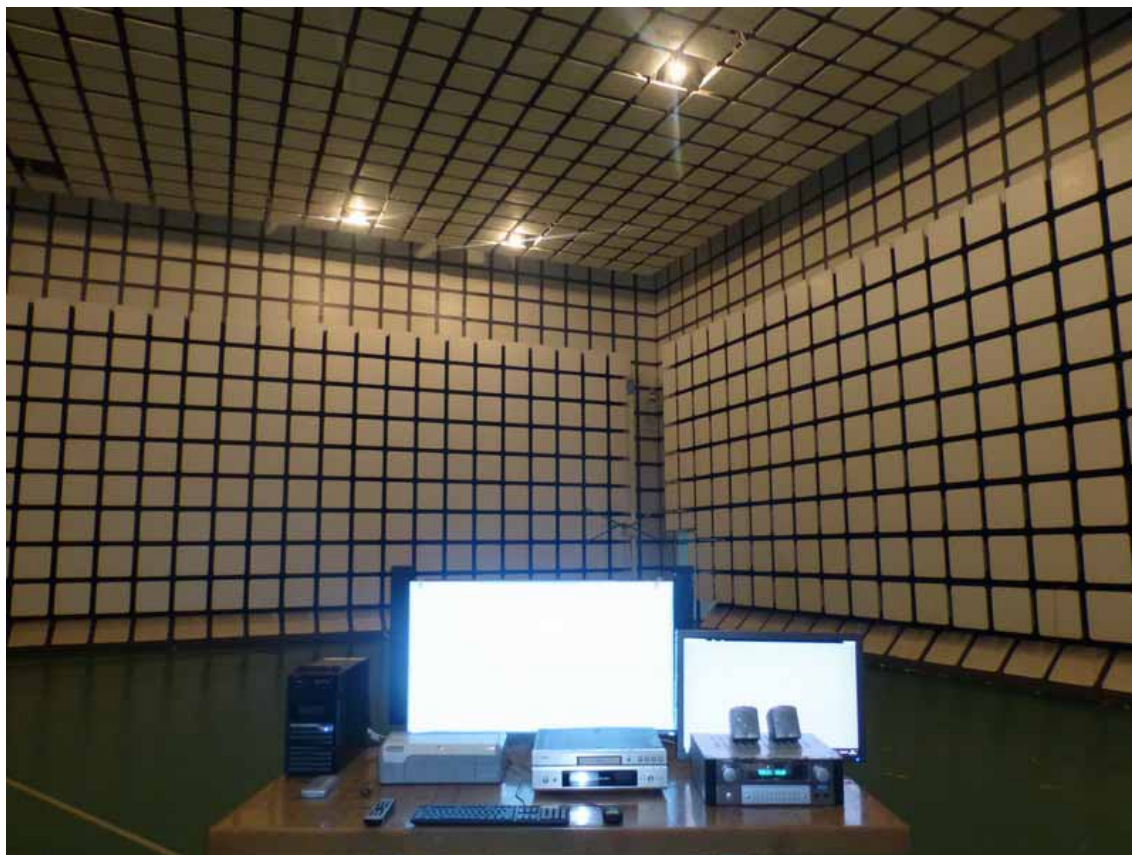
16.1. Photos of Power Line Conducted Emission Test



16.2. Photos of Conducted Disturbance at Telecommunication Ports Test



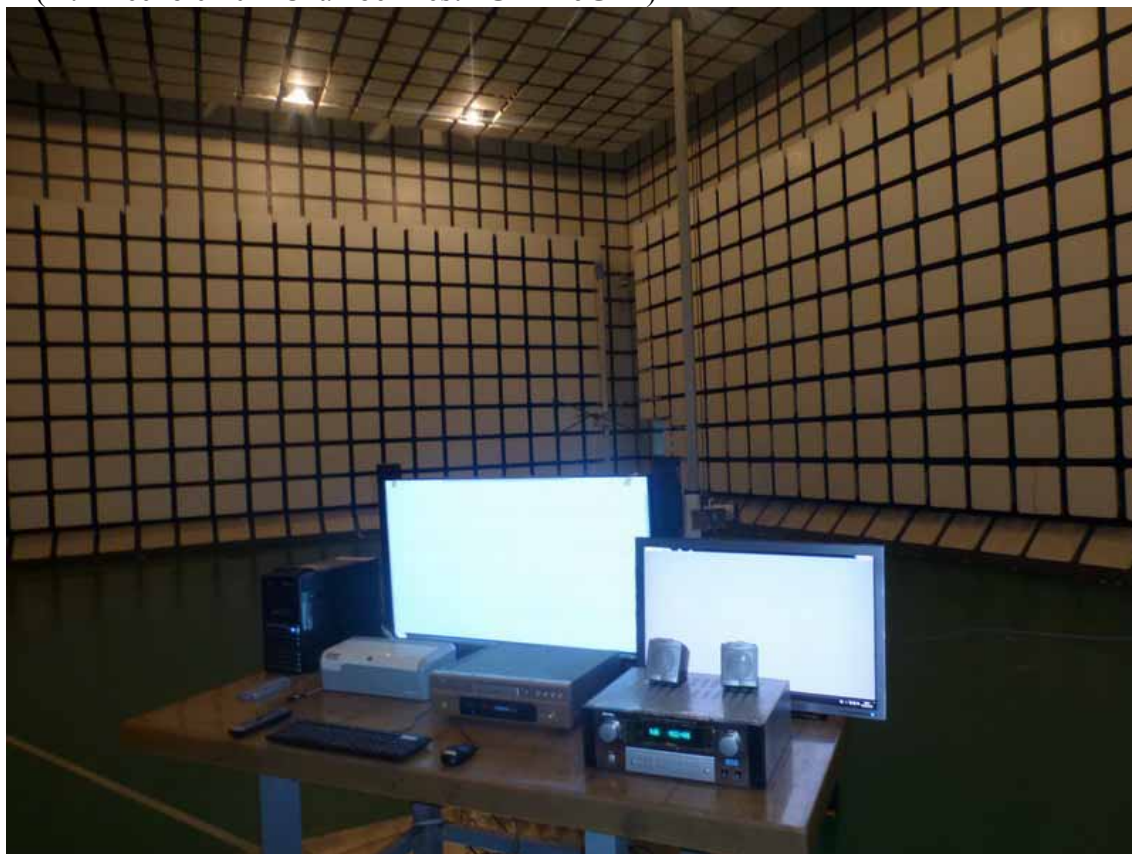
16.3.Photos of Radiated Emission Test (In Anechoic Chamber)



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



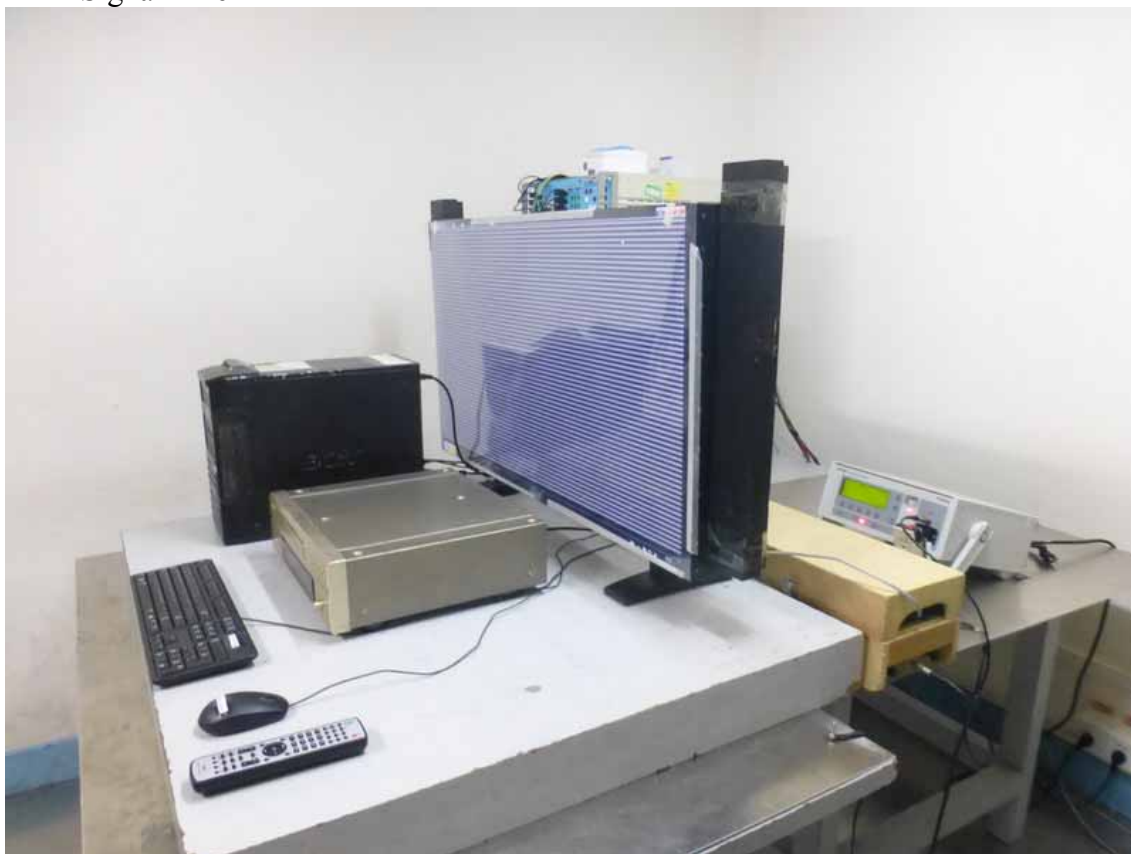
16.6.Photo of RF Strength Susceptibility Test



16.7.Photo of Electrical Fast Transient/Burst Immunity Test



Signal Line



16.8.Photo of Surge Test



Signal Line



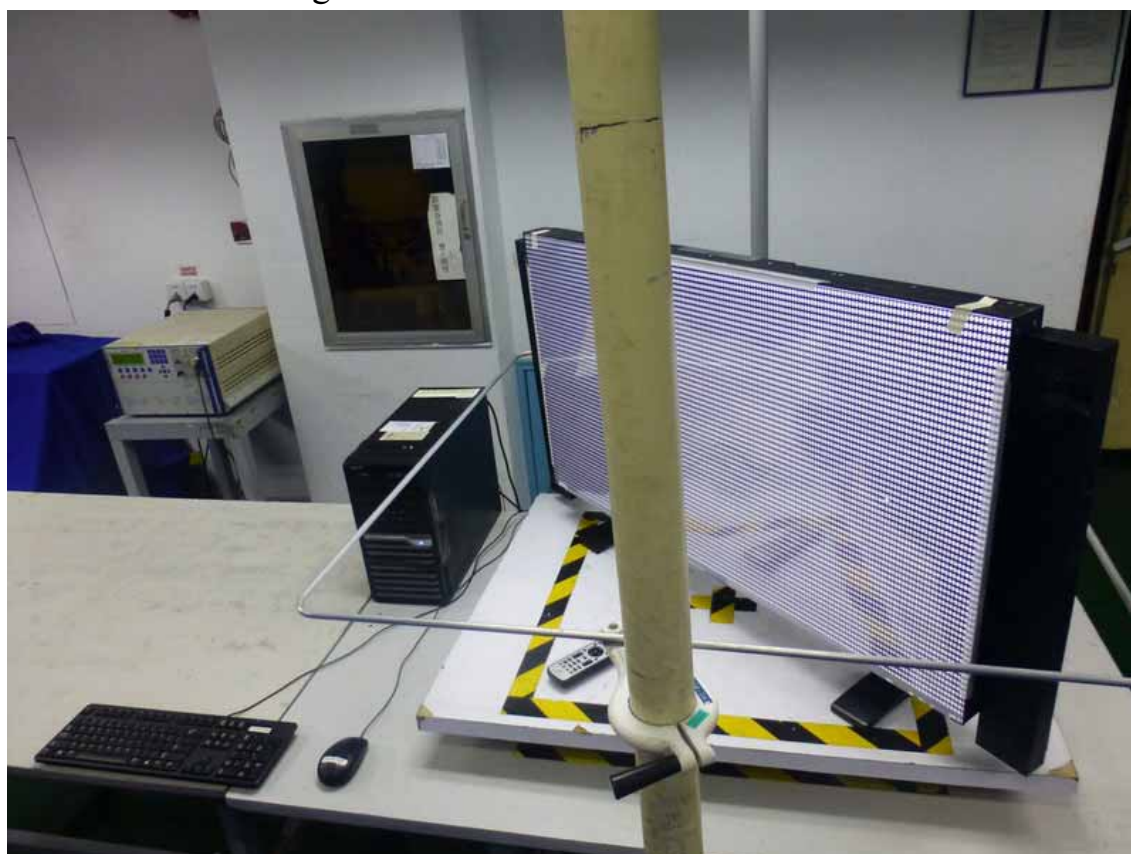
16.9. Photo of Injected Currents Susceptibility Test



Signal Line



16.10. Photo of Magnetic Field Test



16.11. Photo of Voltage Dips and interruptions test

