

Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No. : 06-IST-0291

Date of Issue : July 11, 2006

Model(s) : EFL-0632X

Kind of Product : Gaming LCD Monitor

FCC ID : RY8EFL0632X

Applicant : Effinet Systems, Inc.

Address : #801 KICOX Venture Center, 188-5, Guro-dong Guro-gu,
Seoul, Korea

Manufacturer : Effinet Systems, Inc.

Address : 92, Chogok-ri, Nam-myun, Kimcheon-city, Kyungbuk, Korea

Test Result

☒ Positive

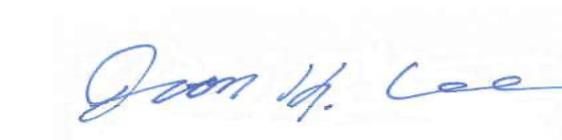
☐ Negative

Reviewed By

Approved By



S.J.CHO / EMC Group Manager



J.H.LEE / Chief

Comment (s)

- Investigations requested : Measurement to the relevant clauses of FCC rules and regulations Part 15 Subpart B - Unintentional Radiators, Class B.
- The test report with appendix consists of 18 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 2003.



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■ Test Conditions and Data - Emissions

◆ Conducted Emissions	0.15MHz - 30MHz	Applicable	
Test Conditions / Data and Plots			10-12
◆ Radiated Emissions	30MHz - 1GHz	Applicable	
Test Conditions / Data and Plots			13-15

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Note:

INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (**FCC Filing Lab.**)

80, Jeil-Ri, Yangji-Myun, Yongin-City

Kyonggi-Do, 449-860, Korea

TEL : +82 31 333 9018

FAX : +82 31 333 9019

ENVIRONMENTAL CONDITIONS

Temperature 25 °C

Humidity 48 %

Atmospheric pressure 1015 mbar

POWER SUPPLY SYSTEM USED

Power supply system AC 120Vac, 60Hz

(Refer to the product information)

PRODUCT INFORMATION

The Equipment Under Test(EUT) is Gaming LCD Monitor Effinet System, Inc.

(FCC ID : RY8EFL0632X)

Panel :	Size	6.3" Diagonal
	Active Display Area	129.02 x 96.77 mm
	Type No.	NEC, NL10276BC12
	Number of Pixels	1024 (H) x 768 (V)
	Pixel Pitch	0.126 mm x 0.126 mm
	Panel Dimension	(WHD) 178.8 x 126.8 x 12.0 mm
Scanning Frequency	Horizontal	30 ~ 60KHz
	Vertical	50 ~ 75Hz
Resolution	Prime	1024 x 768 @ 60 Hz
Input Signal	RGB (Video/Sync)	RGB Analog (0.7Vp-p, 75ohms) / H/V Separate(TTL)
Power	Input	AC100~240V, 50/60Hz, 1A
	Output	DC12V, 3.33A, 40W MAX
	LSE0107A1240(Li Shin International Enterprise Corp.)	

- EMC suppression device is not used during the test.
- Please refer to user's manual.

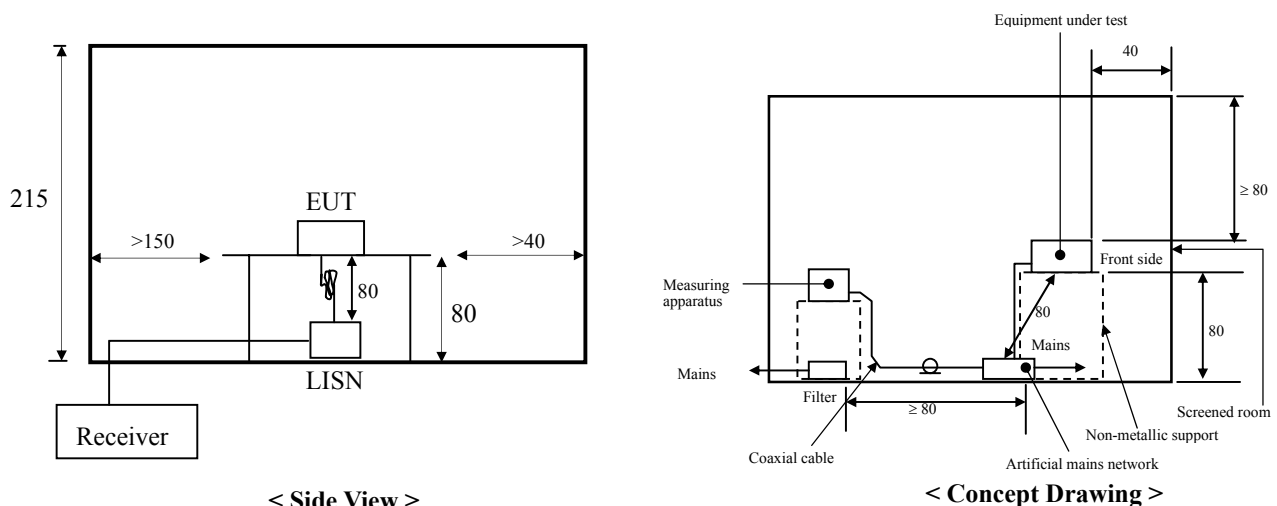
DESCRIPTIONS OF TEST

Conducted Emissions:

The measurement were performed over the frequency range of 0.15MHz to 30MHz using a ESH2-Z5 LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" & "Average" within a bandwidth of 9KHz.

-Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1m X 1.5m wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The ESCS30 and ESH2-Z5 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80cm from the LISN and powered from the ESH2-Z5 LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the ESH2-Z5 LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the ESCS30 receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.15 to 30MHz. The bandwidth of the receiver was set to 10kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



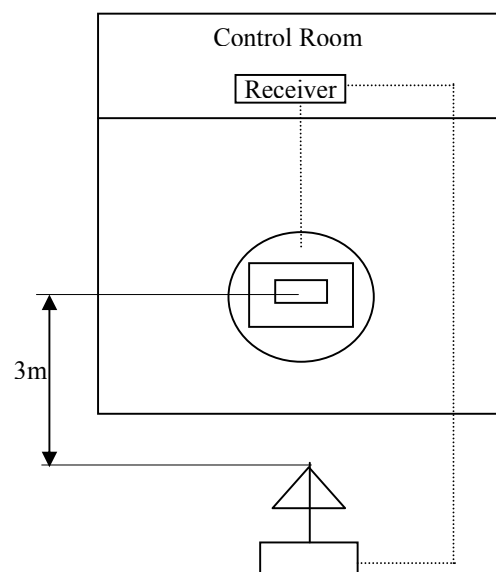
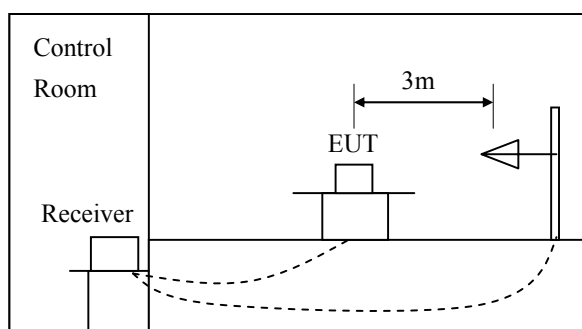
DESCRIPTION OF TEST

Radiated Emissions:

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120KHz.

-Procedure of Test

Preliminary measurements were made at 3 meter using bi-log antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 1000MHz using bi-log antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.



Measurement Uncertainty Calculations

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

Contribution (Conducted Emissions)	Probability Distribution	Uncertainty (±dB)
		0.15-30MHz
Receiver Specification	Rectangular	1.5
LISN Coupling Specification	Rectangular	1.5
Cable and Input Attenuator Calibration	Normal (k=2)	0.5
Mismatch to Reciver	U-Shaped	-0.8 / +0.7
System Repeatability	Normal (k=1)	0.2
Combined Standard Uncertainty	Normal (k=2)	-1.85 / +1.71
Expanded Uncertainty U	Normal (k=2)	-3.7 / +3.42

$$U_{c,minus} = -1.85, U_{c,plus} = 1.71$$

$$U = -3.70 / +3.42 \text{ (} k=2, 95.45\% \text{ confidence level)}$$

Contribution (Radiated Emissions)	Probability Distribution	Uncertainties(±dB)
		3 m
Antenna		
Factor	Normal (k=2)	0.9968
Frequency Interpolation	Rectangular	0.1039
Height Variation	Rectangular	-2.6 / +1.5
Directivity Difference	Rectangular	-1.0 / +0
Phase Center Location	Rectangular	1.0
Cable Loss	Normal (k=2)	0.5
Receiver		
Voltage Accuracy	Normal (k=2)	2.0
Pulse Response	Rectangular	1.5
Absolute Repetition Rate	Rectangular	1.5
Mismatch to Receiver		
Γ_{antenna} = 0.33	U-Shaped	-1.0 / +0.9
Γ_{receiver} = 0.33		
System Repeatability	Std Deviation	0.5
Combined Standard Uncertainty	Normal	-2.6048 / 2.2775
Expanded Uncertainty U	Normal (k=2)	-5.21 / +4.55

$$U_{c,minus} = -2.6048, U_{c,plus} = 2.2775$$

$$U = -5.21 / +4.55 \text{ (} k=2, 95.45\% \text{ confidence level)}$$

Equipment Under Test

EUT Type :

- ☒ Table-Top. ☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation - mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby Mode
☒ Operational Condition : Scrolling "H" pattern on the screen
 ☒ 1024 x 768, 75Hz
 ☒ 800 x 600, 75Hz
 ☒ 640 x 480, 75Hz

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

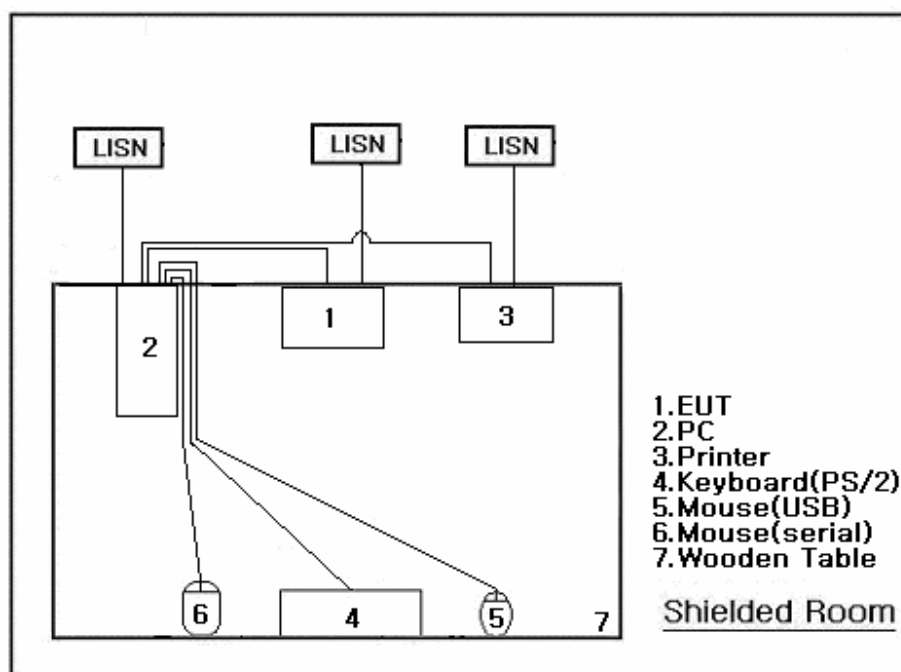
Equipment	Type	Brand	Serial No.	FCC Compliance Info.
PC	dx6120 MT	HP	CNG52000QL	DOC
Keyboard(PS/2)	SK-1688	HP	N/A	DOC
Mouse(USB)	M-UV69	HP	N/A	DOC
Mouse(Serial)	M-M28	Logitech	N/A	DZL210365
Printer	A0302380	Northern Telecom	2633S60168	DSI6XU2225C-L

Connecting Interface Cables :

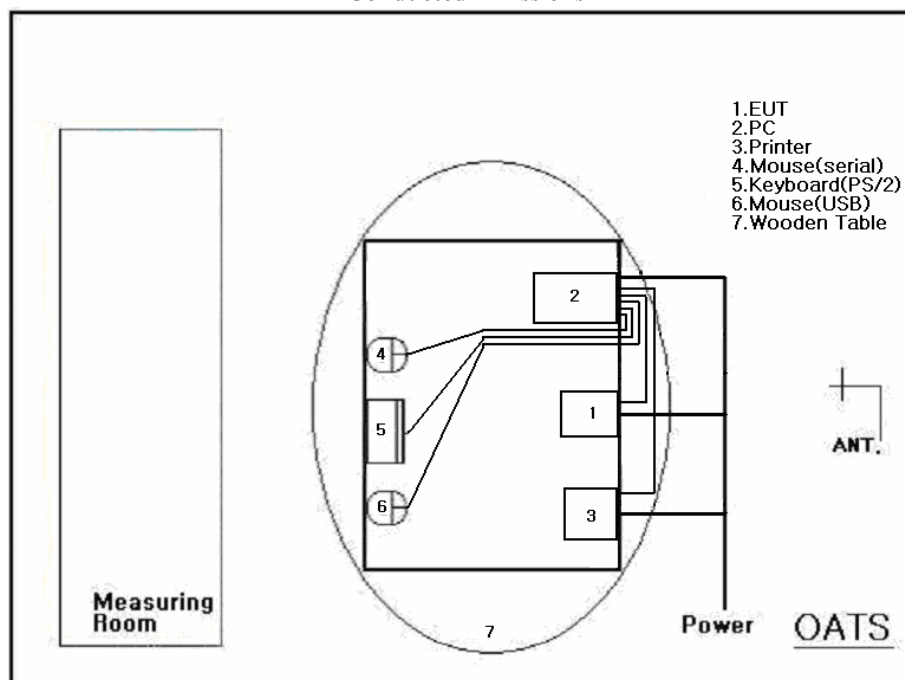
- Unshielded AC power cable (with one ferrite core) : 1.8 m
- Shielded monitor's signal cable (with two ferrite core) : 1.8 m
- Shielded Printer's signal cable (without ferrite core) : 1.8 m
- Unshielded Mouse(serial) signal cable (without ferrite core) : 1.6 m

Note :

Test Set-Up



Conducted Emissions



Radiated Emissions

TEST CONDITIONS AND DATA

Conducted Emissions

[Applicable]

◆ Test Equipment Used

Model Name	Description	Manufacture	Calibration Date	Serial Number
ESCS30	Test Receiver	Rohde & Schwarz	Jan. 12, 2006	828985/023
ESH2-Z5	LISN	Rohde & Schwarz	Aug. 12, 2005	861714/012
ESH3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 12, 2005	357.8810.52

◆ Test Accessories Used

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

◆ Test Program Scrolling "H" pattern.

◆ Test Date July 05, 2006

◆ Test Area Conducted room.

Note : The equipment used is calibrated in regular for every year.

Conducted Emissions

Live Phase

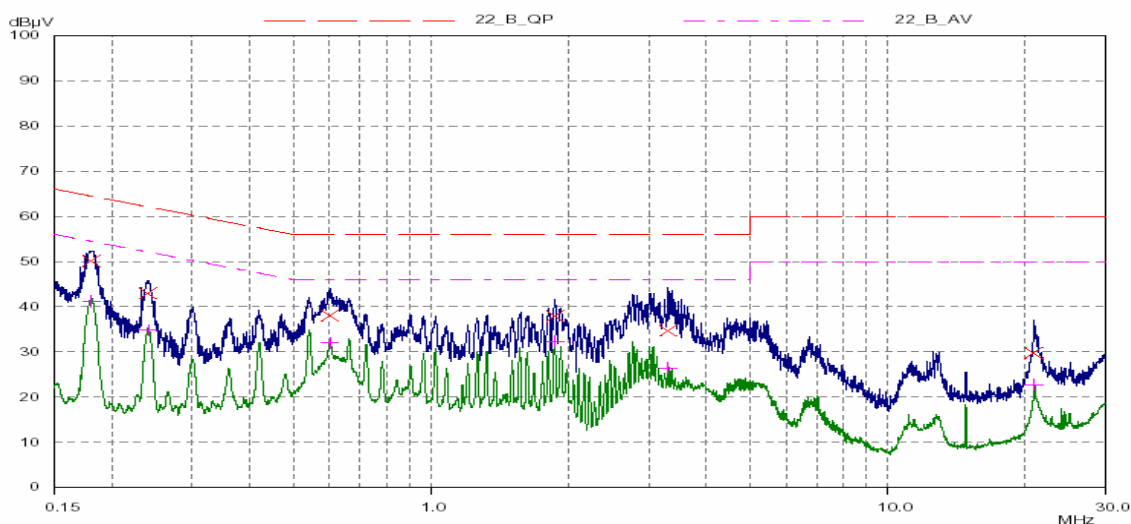
ISTCo.,Ltd.

Conducted Emission

EUT: EFL-0632X
Manuf: EFFINET
Op Cond: LIVE
Operator: S.J.OH
Test Spec: 120Vac 60Hz
Comment: LIVE
Result File: PK : BLUE AV : GREEN
L.dat : New Measurement

Scan Settings			(1. Range) Frequencies		Step	IF BW	Detector	Receiver Settings		
Start	150kHz	Stop	30MHz		0.2%	9kHz	PK+AV	M-Time	20msec	Atten
								Preamp	OFF	OpRge
										60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss [dB]	Cable Loss [dB μ V]	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.180	50.1	41.2	64.5	54.5	0.3	0.2	50.6	41.7	13.8	12.8
0.240	43.0	34.8	62.1	52.1	0.3	0.3	43.6	35.4	18.5	16.7
0.601	38.1	31.9	56.0	46.0	0.2	0.6	38.9	32.7	17.2	13.3
1.871	37.9	32.3	56.0	46.0	0.3	0.7	38.9	33.2	17.1	12.8
3.313	34.7	26.5	56.0	46.0	0.3	0.7	35.7	27.5	20.3	18.5
20.946	29.8	22.7	60.0	50.0	0.7	1.0	31.5	24.4	28.5	25.6

Note :

Conducted Emissions

Neutral Phase

ISTCo.,Ltd.

Conducted Emission

EUT: EFL-0632X
Manuf: EFFINET
Op Cond: Schrolling 'H' Patterns
Operator: S.J.OH
Test Spec: 120Vac 60Hz
Comment: NEUTRAL
PK : BLUE AV : GREEN
n.dat : New Measurement

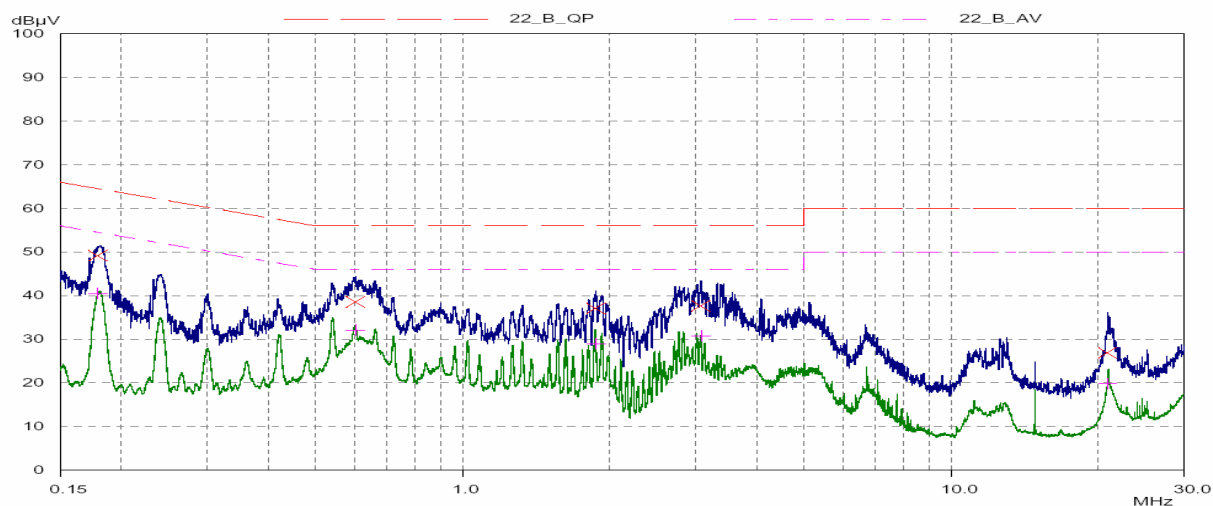
Result File:

Scan Settings

Frequencies		Step	IF BW	Detector	Receiver Settings		Preamplifier	OpRge
Start	Stop				M-Time	Atten		
150kHz	30MHz	0.2%	9kHz	PK+AV	20msec	Auto	OFF	60dB

Final Measurement:

Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss [dB]	Cable Loss [dB μ V]	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.172	49.2	40.5	64.9	54.9	0.3	0.2	49.7	41.0	15.1	13.8
0.631	39.5	32.1	56.0	46.0	0.2	0.6	40.3	32.9	15.7	13.1
1.875	37.1	29.0	56.0	46.0	0.3	0.7	38.0	30.0	18.0	16.0
3.077	37.6	30.8	56.0	46.0	0.3	0.7	38.6	31.8	17.4	14.2
20.904	26.9	19.8	60.0	50.0	0.7	1.0	28.6	21.5	31.4	28.5

Note :

Radiated Emissions

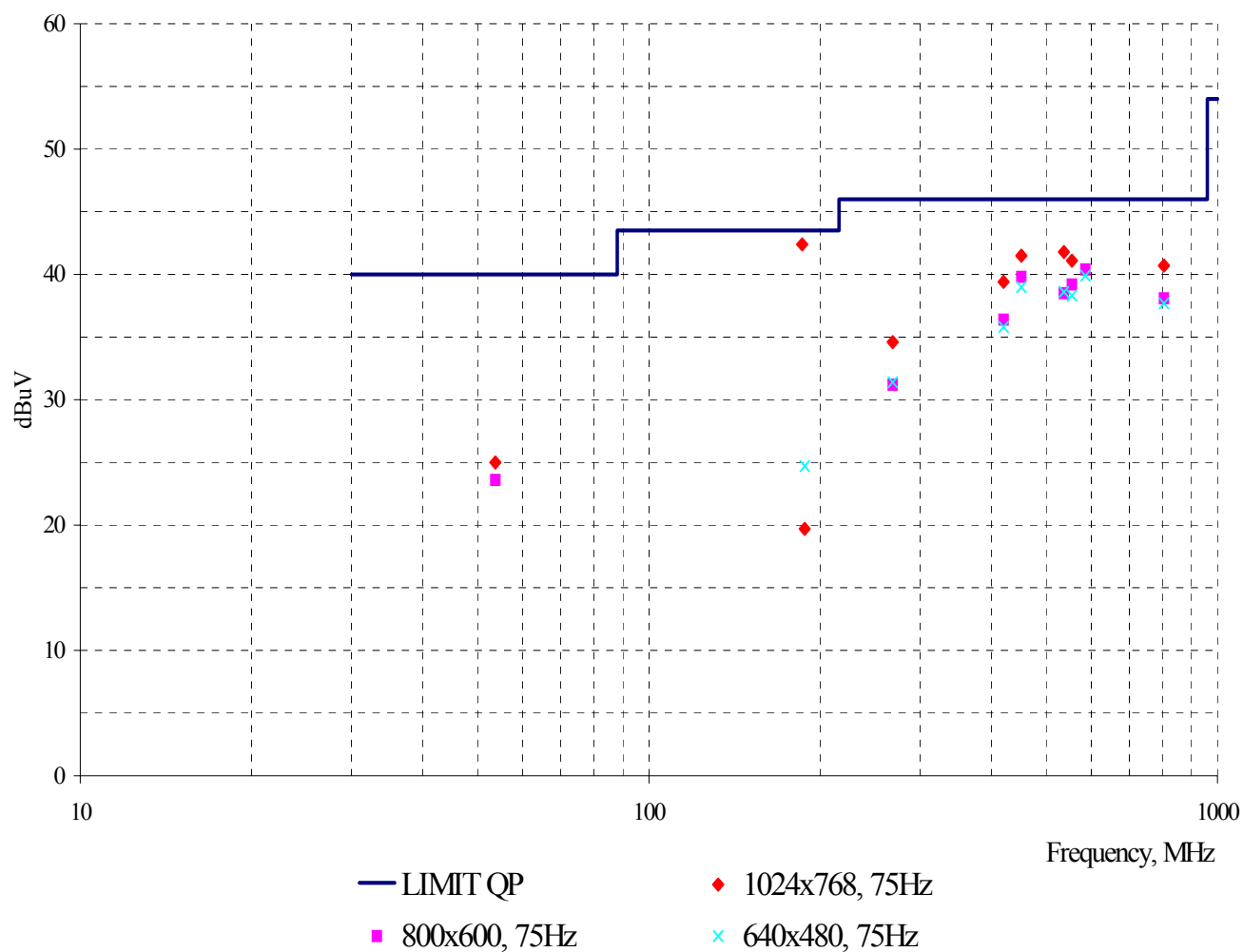
(Disturbance Radiation)

[Applicable]

	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB/m]	Cable Loss [dB]	Polar. [H/V]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1024 x 768, 75Hz	53.7	12.1	11.8	1.1	H	25.0	40.0	15.0
	187.9	7.1	9.5	3.1	H	19.7	43.5	23.8
	268.5	19.1	11.5	4.0	V	34.6	46.0	11.4
	420.6	18.8	15.3	5.3	V	39.4	46.0	6.6
	451.9	19.1	16.8	5.6	V	41.5	46.0	4.5
	536.9	20.1	15.5	6.2	V	41.8	46.0	4.2
	554.8	16.7	17.9	6.5	V	41.1	46.0	4.9
	586.1	17.4	18.4	6.6	V	42.4	46.0	3.6
	805.4	10.4	21.4	8.9	H	40.7	46.0	5.3
800 x 600, 75Hz	53.7	10.7	11.8	1.1	H	23.6	40.0	16.4
	268.5	15.7	11.5	4.0	V	31.2	46.0	14.8
	420.6	15.8	15.3	5.3	V	36.4	46.0	9.6
	451.9	17.4	16.8	5.6	V	39.8	46.0	6.2
	536.9	16.8	15.5	6.2	V	38.5	46.0	7.5
	554.8	14.8	17.9	6.5	V	39.2	46.0	6.8
	586.1	15.4	18.4	6.6	V	40.4	46.0	5.6
	805.4	7.8	21.4	8.9	H	38.1	46.0	7.9
640 x 480, 75Hz	187.9	12.1	9.5	3.1	H	24.7	43.5	18.8
	268.5	15.9	11.5	4.0	V	31.4	46.0	14.6
	420.6	15.2	15.3	5.3	V	35.8	46.0	10.2
	451.9	16.6	16.8	5.6	V	39.0	46.0	7.0
	536.9	16.9	15.5	6.2	V	38.6	46.0	7.4
	554.8	13.9	17.9	6.5	V	38.3	46.0	7.7
	586.1	14.9	18.4	6.6	V	39.9	46.0	6.1
	805.4	7.4	21.4	8.9	H	37.7	46.0	8.3

Note:..

MEASUREMENT OF DISTURBANCE RADIATION



Appendix A. The Photos of Test Setup



Conducted Emissions (Front View)

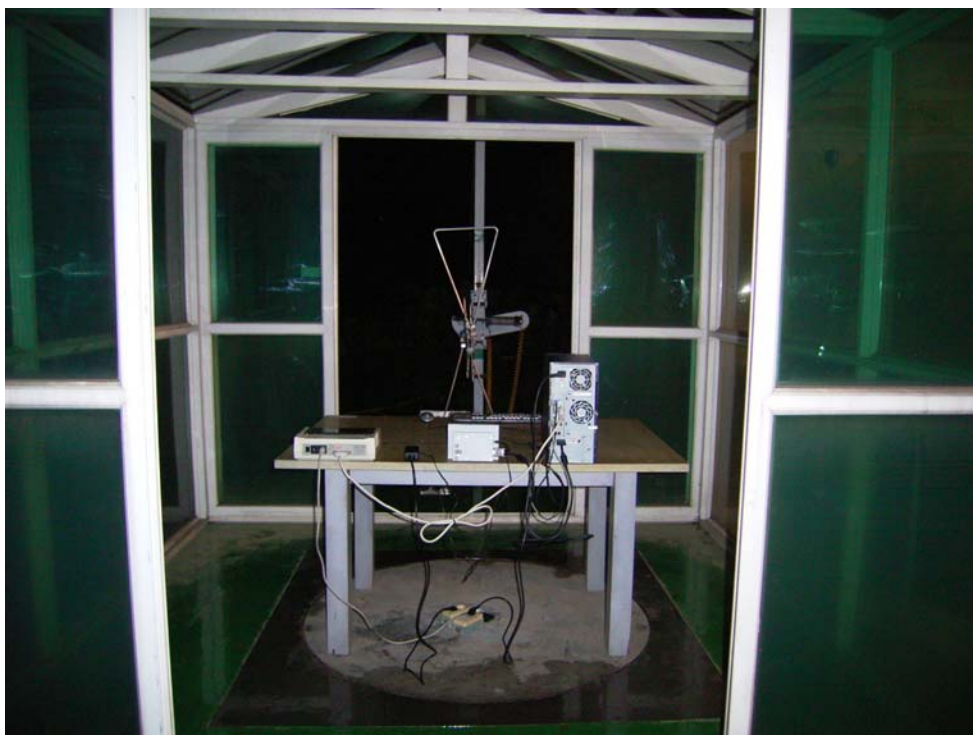


Conducted Emissions (Rear View)

Appendix A. The Photos of Test Setup



Radiated Emissions (Front View)



Radiated Emissions (Rear View)

Appendix B. The Photos of Equipment Under Test



Front View



Rear View

Appendix B. The Photos of Equipment Under Test



Adaptor



Adaptor Label

Appendix B. The Photos of Equipment Under Test



Signal Cable