ECMG Worldwide Certification Solutions
ECMG Worldwide Certification Solution, Inc.
www.ecmg-global.com

FCC Test Report

On Model Name: LCD Monitor

Model Number: W22*S**

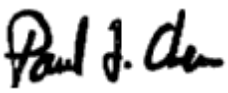
FCC ID Number: WNEW22XSX

Prepared for

SHENZHEN KTC COMPUTER TECHNOLOGY CO., LTD.

According to FCC Part 15 Subpart B,Class B

Test Report #:	SHE-0904-10191-FCC
Prepared by:	May Wang
Reviewed by:	Jawen Yin
QC Manager:	Paul Chen

Test Report Released by:  May 21, 2009

Paul Chen Date

Test Location

Tests performed at ECMG Worldwide Certification Solution Inc. (China) in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location:	*Shenzhen Academy of Metrology and Quality Inspection.* *Bldg. of Metrology & Quality Inspection, Longzhu Road, Shenzhen, Guangdong, China.*
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FCC Registration Number:	*274801*
CNAS Registration Nunber:	*L0579*

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The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

Test Sample	*: LCD MONITOR*
Model Number	*: W22*S**
Model Tested	*: W2209S5*
Date Tested	*: May 12, 2009*
Applicant	*: SHENZHEN KTC COMPUTER TECHNOLOGY CO.,LTD*
	Northern Wuhe Road，Gangtou, Buji, Longgang, Shenzhen, China
Telephone	*: +86-755-33615330*
Fax	*: +86-755-33615329*

EUT Description

SHENZHEN KTC COMPUTER TECHNOLOGY CO.,LTD model tested W2209S5 (referred to as the EUT in this report) is a LCD MONITOR.

The EUT's features are given as follow:

Monitor type: *TFT LCD*

Max. resolution : *1360*768@60Hz*

Power supply: *100V-240Vac, 60/50Hz*

Max.consumption: *48W*

The EUT is a LCD Monitor which input/output ports as follows:

(1) One VGA Port: *Connected with PC (unshided,with 2ferrite cores)*

(2) One DVI Port: *Connected with PC (unshided, with 2 ferrite cores)*

(3) One AC In Port: *Connected with Power(unshided, withoutferrite cores)*

(4) one audio Port: *Optional*

Note :

The above EUT information was declared by manufacturer and for more detailed features description, please refer to manufacture's specification or user's manual.

Derive of EUT

*W22*S**(1st*=05-20，mean's for the year of design and develop ；2nd*=1-99 or Blank，mean's the different enclosure；3rd*=-D or Blank，-D mean's have DVI input）100-240VAC 50/60Hz 1.0A.*

They are similar products except for model name and shape of enclosure, Such as they have the same function circuit and PCB, they are named differently only for marketing purpose.

The worst model W2209S5 is used for all testing.

Test Mode of EUT

*Let the EUT worked in test mode (Running "H" Pattern 640*480@60Hz / Running "H" Pattern 1024*768@60Hz/ Running "H" Pattern 1360*768@60Hz) and measured it.*

*The EUT's Max. resolution bandwidth is 1360*768@60Hz at VGA &DVI mode, the highest frequency which the EUT operates is between 108-500MHz, so the Upper frequency of radiated emission measurement range is up to 2GHz,other resolution bandwidth that operates frenquency is below 108MHz, so the Upper frequency of radiated emission measurement range is up to 1GHz.*

Test Summary

The Electromagnetic Compatibility requirements on model W2209S5 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

Emission Tests				
Specifications	***Description***	***Test Results***	***Test Point***	***Remark***
FCC Part 15.107 Class B per ANSI C63.4 2003	*Conducted Emission*	*Passed*	*AC Input Port*	*Attachment 1*
FCC Part 15.109 Class B per ANSI C63.4 2003	*Radiated Emission*	*Passed*	*Enclosure*	*Attachment 2*

Test Mode Justification

This device complies with Part 15 of the FCC rules. Operations is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Equipment Modification

Any modifications installed previous to testing by SHENZHEN KTC COMPUTER TECHNOLOGY CO.,LTD will be incorporated in each production model sold or leased in United States.

There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.

EUT Sample Photos

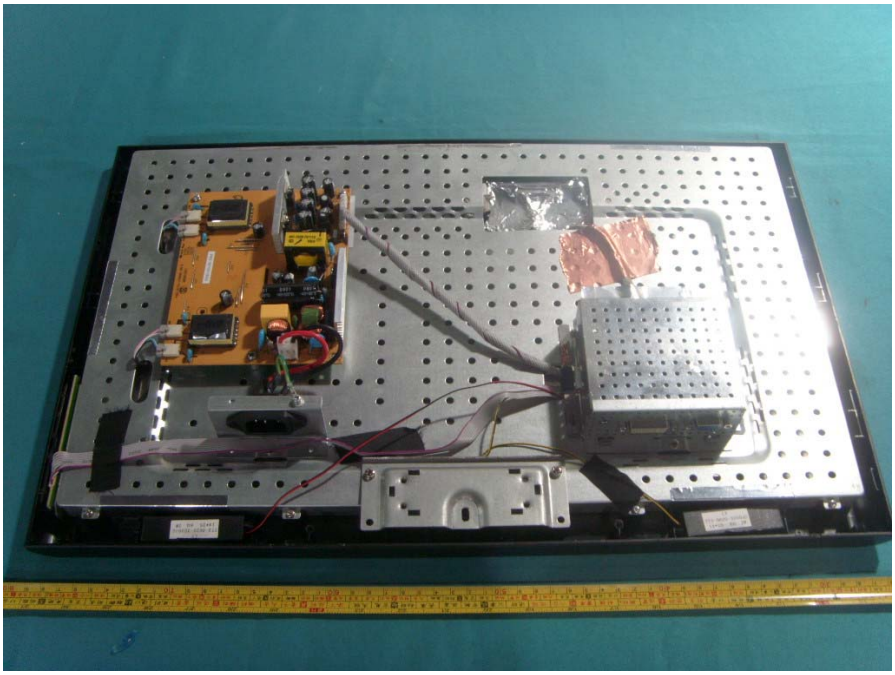
Front View

Rear View

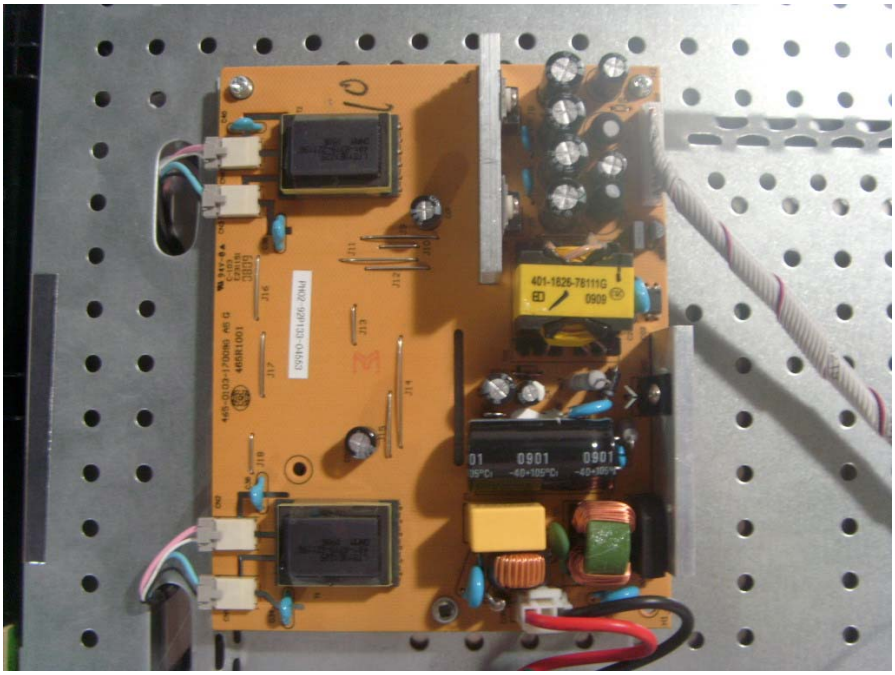
Side View#1

Side View#2

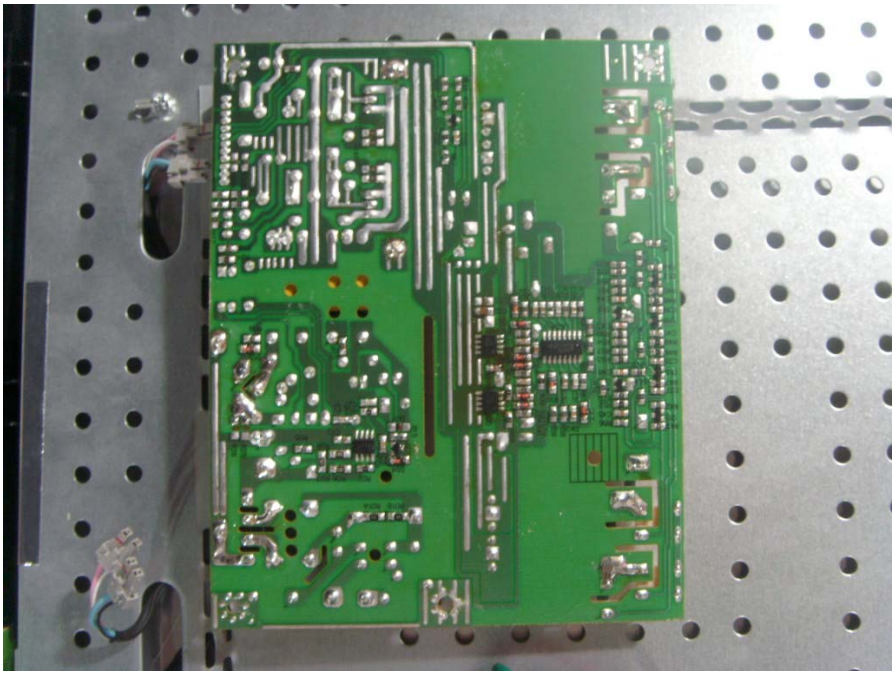
I/O Ports View



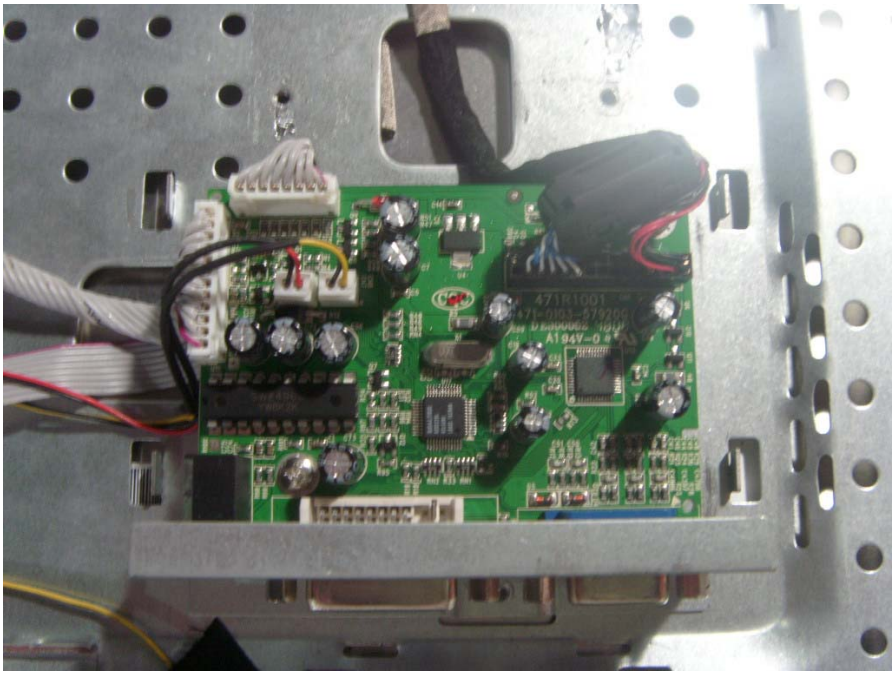
Uncovered View



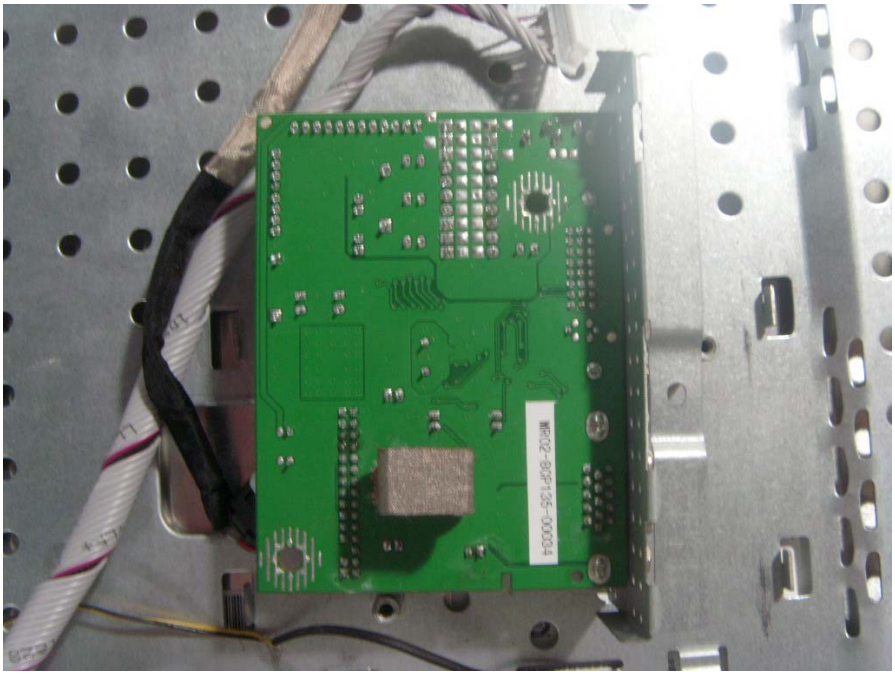
Power Board-Front View



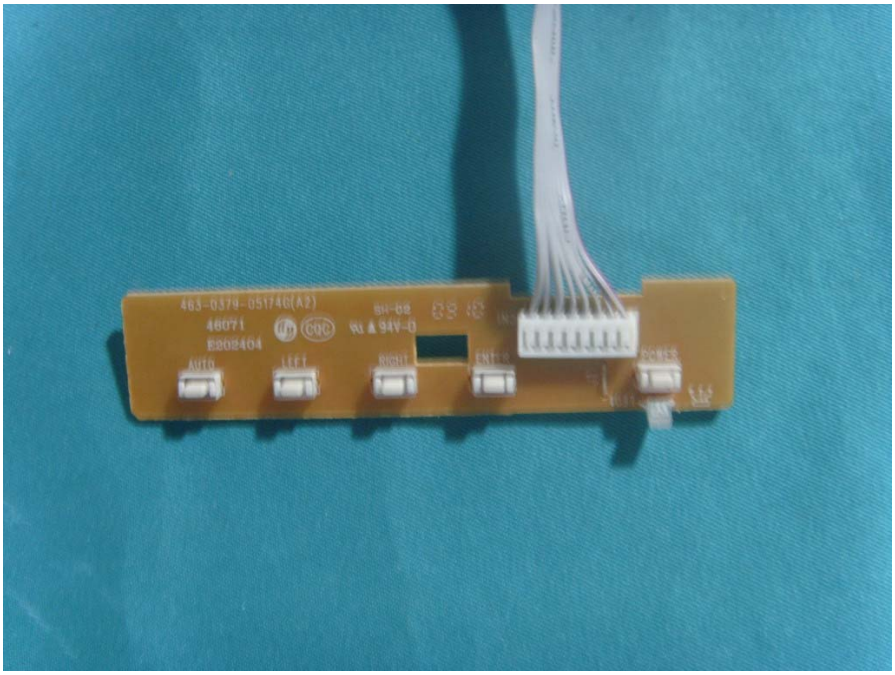
Power Board-Rear View



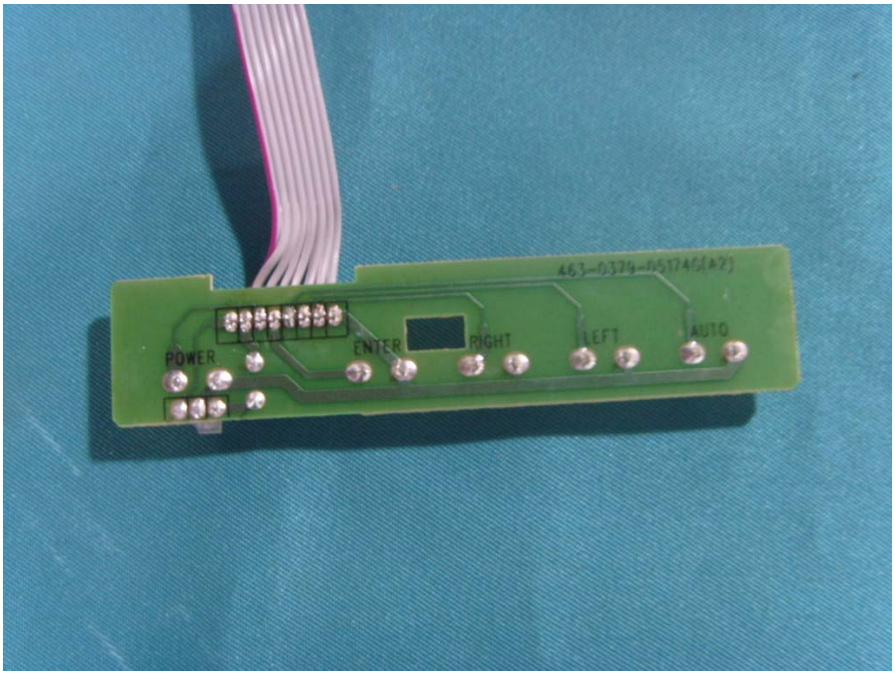
Main Board-Front View



Main Board-Rear View



Key-board- Front View



Key-board- Rear View

LCD Screen-Front View

LCD Screen-Rear View

Lable View

AC Power View

DVI Cable View

VGA Cable View

Test System Details

EUT	
Model Number:	W22*S**
Model Tested:	W2209S5
Description:	LCD Monitor
Manufacture:	SHENZHEN KTC COMPUTER TECHNOLOGY CO., LTD

Support Equipment

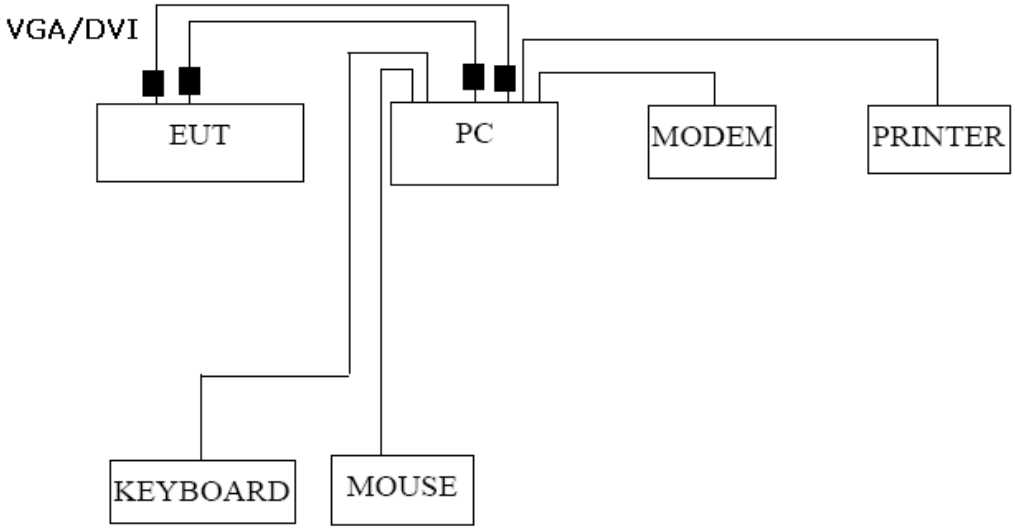
Description	Model Number	Serial Number	Manufacturer
Host PC	Think Centre M57e	N/A	Lenovo
Printer	K30141	N/A	Canon
Modem	TM-EC5658V	03402406009	TP-Link
Keyboard	KU-0225	0683207	Lenovo
Mouse	MO28UOL	44AC107	Lenovo

Cable Description

Description	From	To	Length (Meters)	Shielded (Y/N)	Ferrite (Y/N)
AC Power Cable	EUT	Plug	1.2	N	N
VGA Cable	EUT	Host PC	1.5	N	Y
DVI Cable	EUT	Host PC	1.5	N	Y
PC Power Cable	PC Host	Plug	1.6	N	Y
Keyboard Cable	Keyboard	Host PC	1.6	N	Y
Mouse Cable	Mouse	Host PC	1.6	N	Y
Printer Cable	Printer	Host PC	1.2	N	Y
Modem Cable	Modem	Host PC	1.2	N	Y

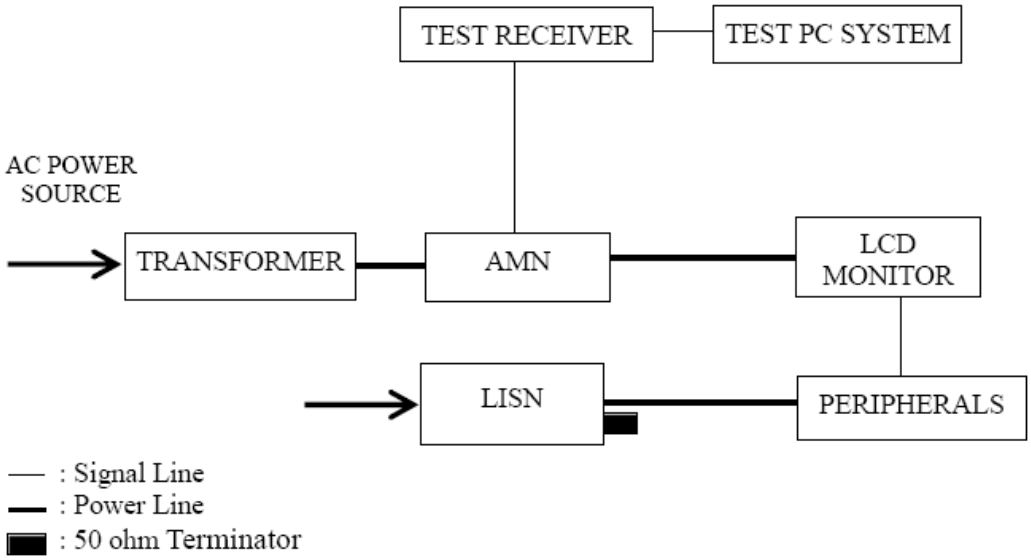
Note : The "EUT" indicates "LCD MONITOR".

Configuration of Tested System

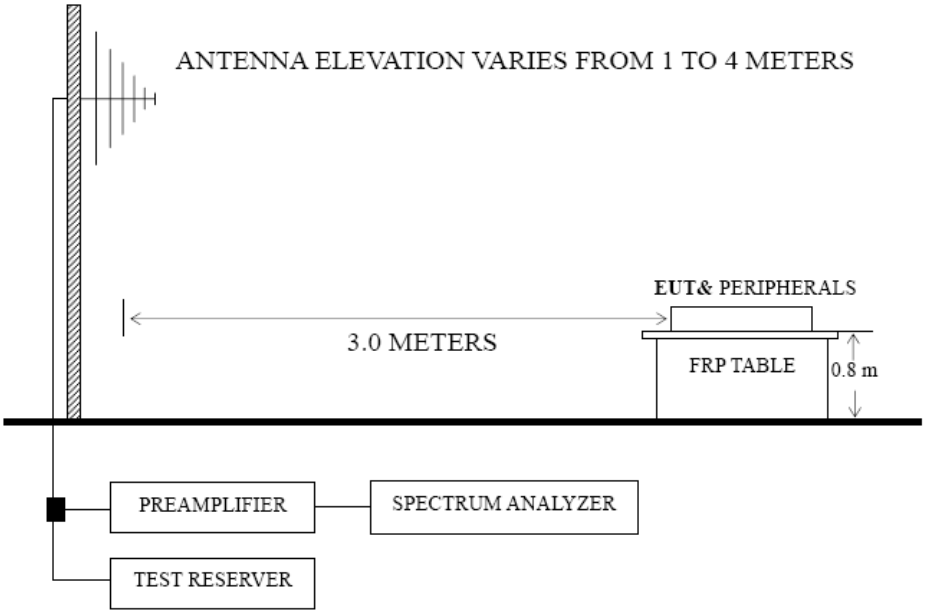


■ : Ferrite core

Block Diagram of Test Connection

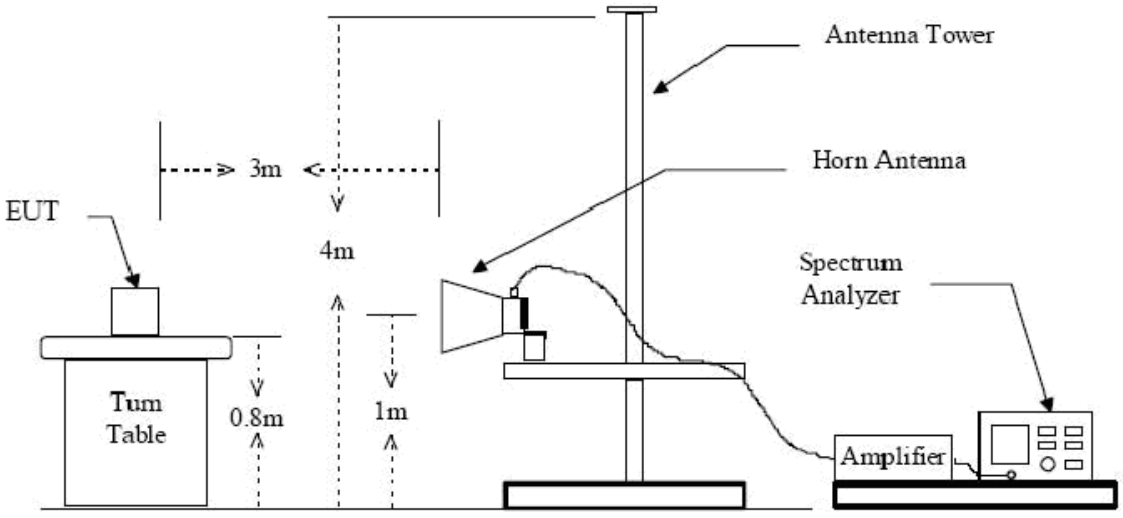


Conducted Emission Test Set up



■ : 50 ohm Coaxial Switch

Radiated Emission Test Set up(below 1GHz)



Radiated Emission Test Set up(Above 1GHz)

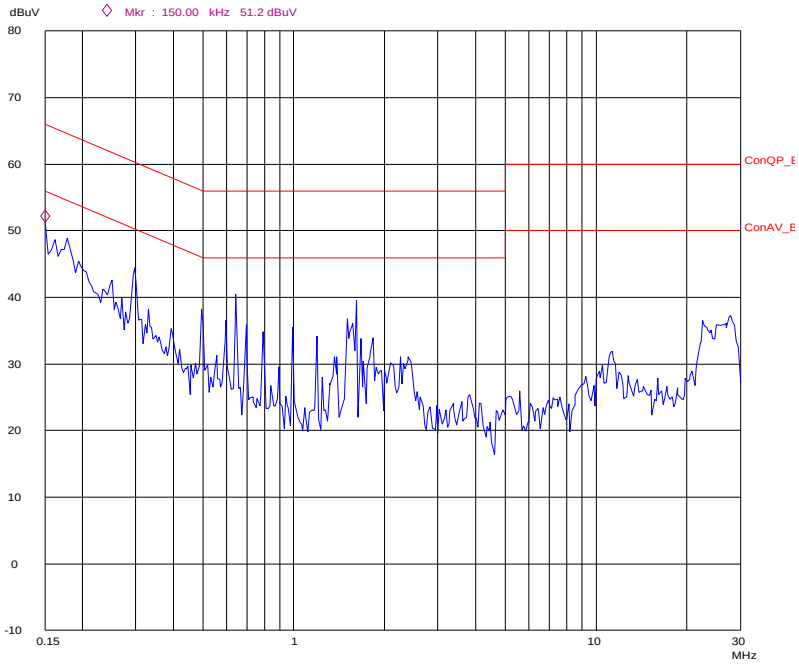
ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	SHENZHEN KTC COMPUTER TECHNOLOGY CO.,LTD	**TEST STANDERD:**	FCC Part 15: 2008, Class B
MODEL NUMBERS:	W22*S**	**PRODUCT:**	LCD MONITOR
EUT MODEL:	W2209S5	**EUT DESIGNATION:**	Information Technology Equipment
TEMPERATURE:	23°C	**HUMIDITY:**	47%RH
ATM PRESSURE:	101.0kPa	**GROUNDING:**	Through AC Power Cable
TESTED BY:	May Wang	**DATE OF TEST:**	May 12, 2009
TEST REFERENCE:	ANSI C63.4: 2003		
TEST PROCEDURE:	The EUT was set up acCableing to the guideline of ANSI C63.4: 2003 for conducted emissions. The measurement was using a AMN on each line and an EMI receiver peak scan was made at the frequency measurement range.The six highest significant peaks were then marked, and these signals were then quasi-peaked and averaged. The frequency range investigated was from 150KHz to 30MHz.		
TESTED RANGE:	150kHz to 30MHz		
TEST VOLTAGE:	120VAC / 60Hz		
RESULTS:	The EUT meets the requirements of test reference for Conducted Emissions. The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB		

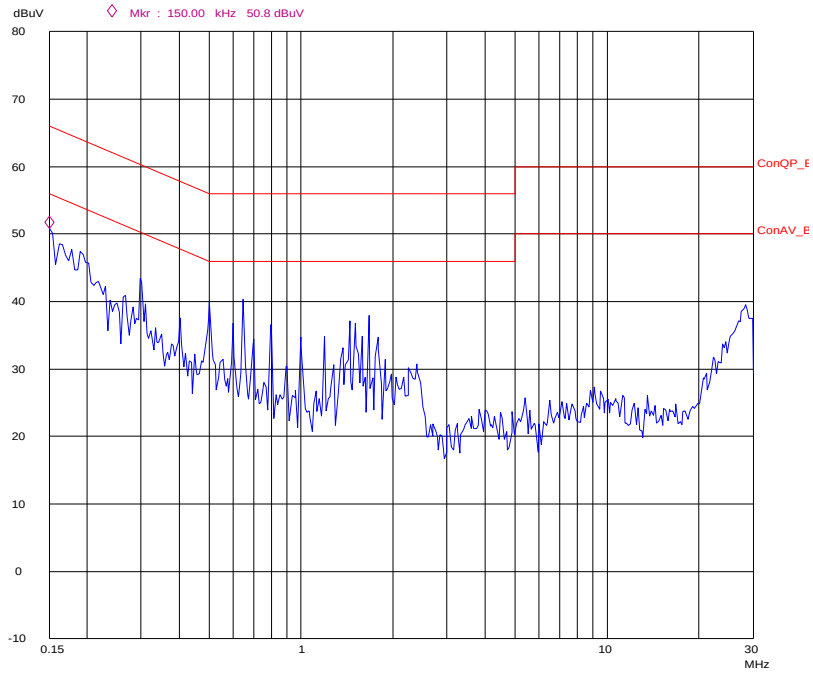
15.107 Conducted Limit:

Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

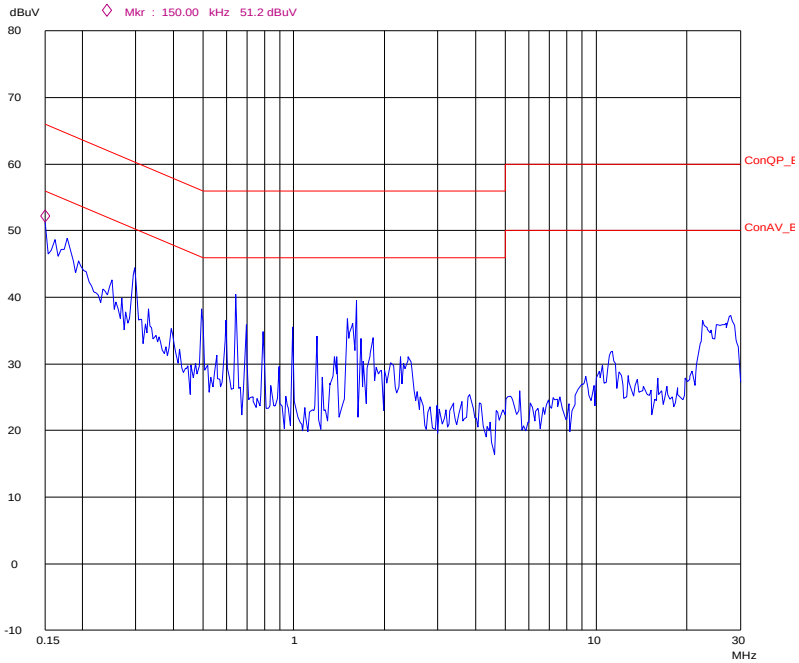
Frequency of Emission (MHz)	***Conducted Limit (dBuV)***	
	Quasi-Peak	***Average***
0.15-0.5	*66 to 56**	*56 to 46**
0.5-5	*56*	*46*
5-30	*60*	*50*
1) The lower limit shall apply at the transition frequencies. *2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz*		



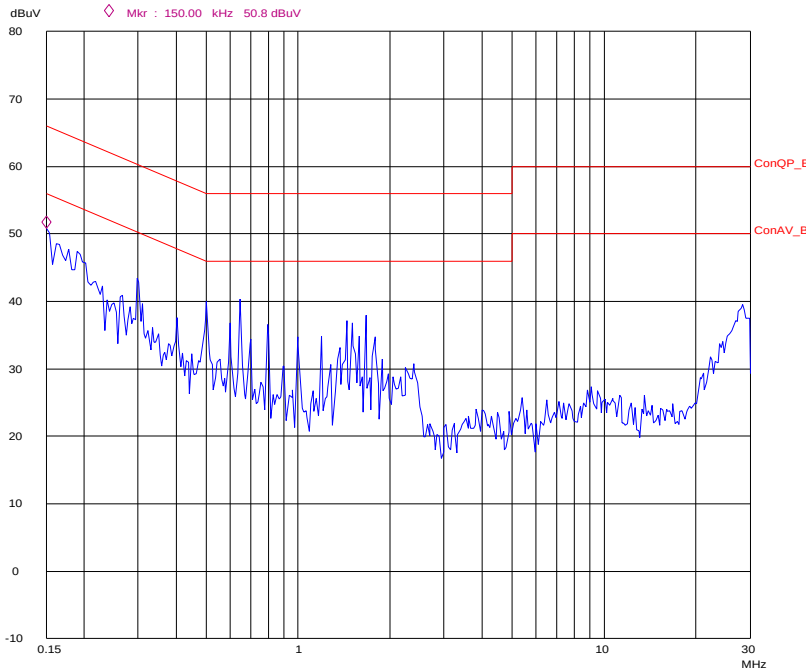
Line L Conducted Emission Graph(VGA Mode 640*480@60Hz)



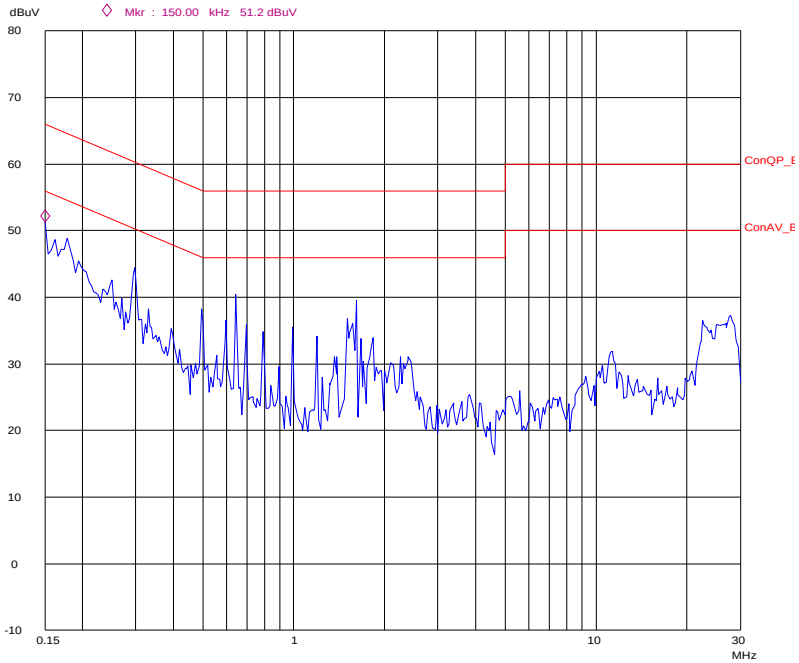
Line N Conducted Emission Graph(VGA Mode 640*480@60Hz)



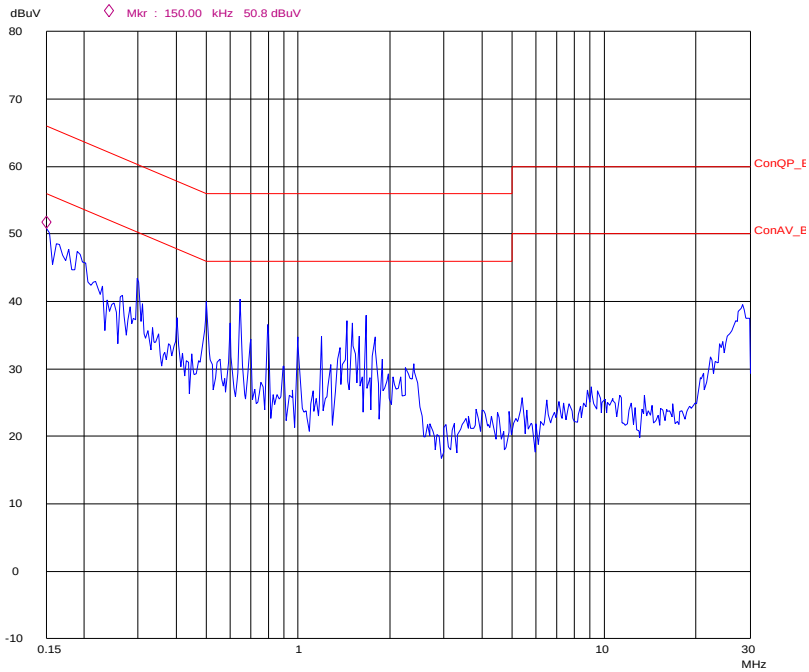
Line L Conducted Emission Graph(DVI Mode 640*480@60Hz)



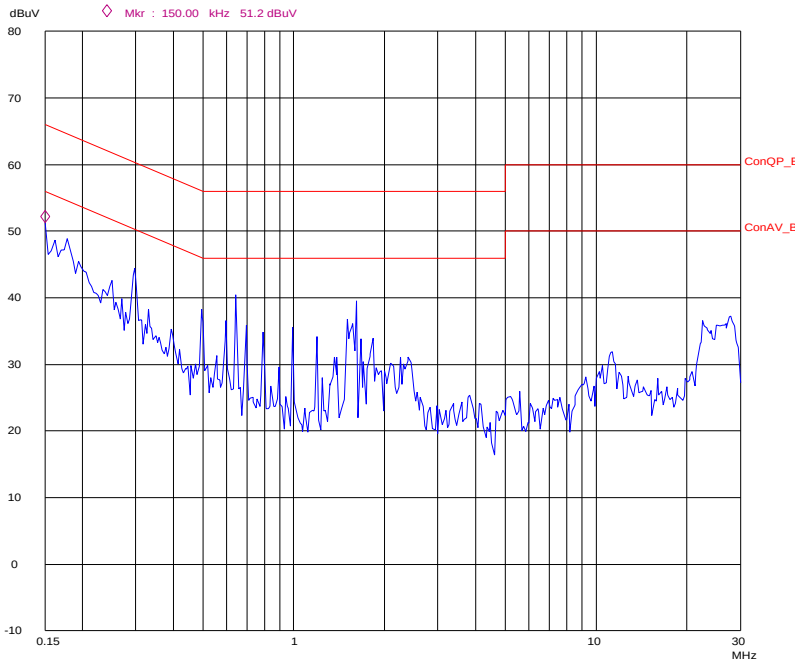
Line N Conducted Emission Graph(DVI Mode 640*480@60Hz)



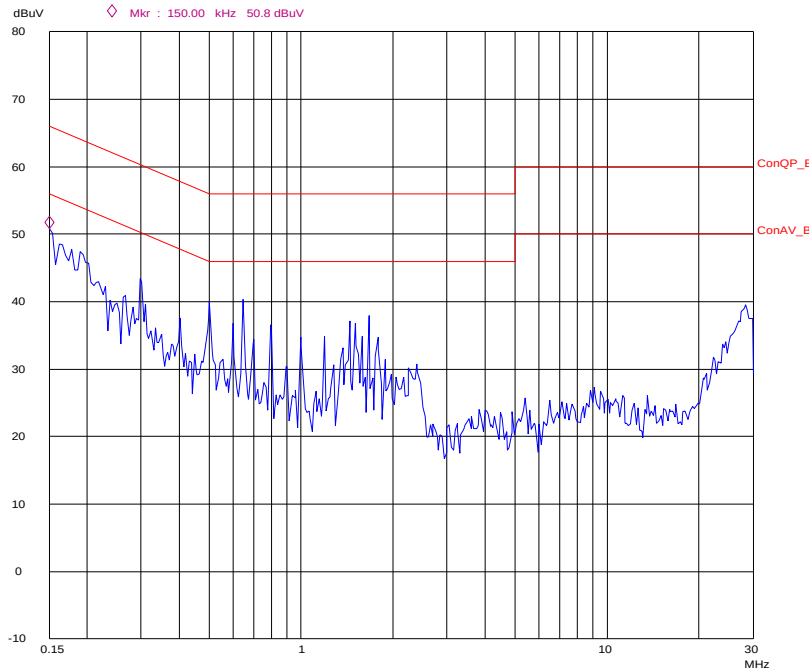
Line L Conducted Emission Graph(VGA Mode 1024*768@60Hz)



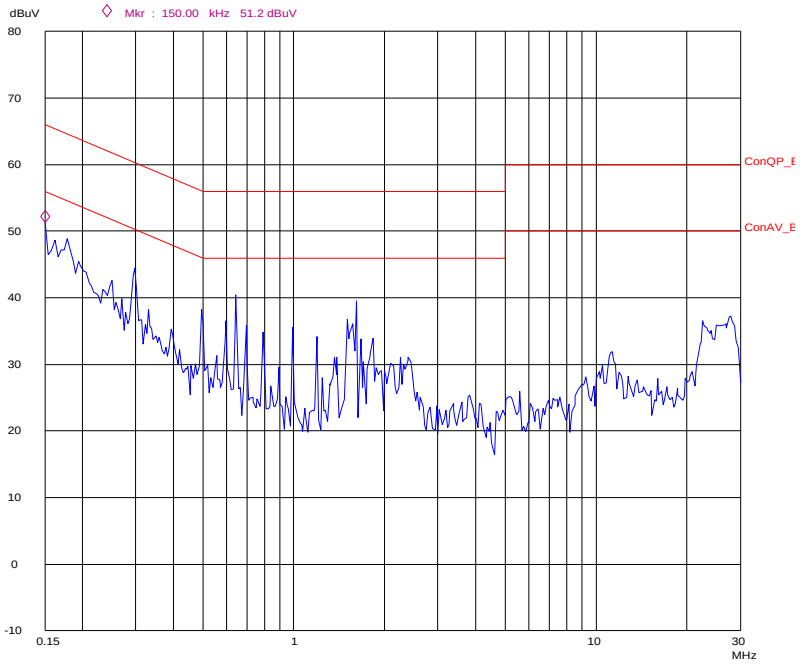
Line N Conducted Emission Graph(VGA Mode 1024*768@60Hz)



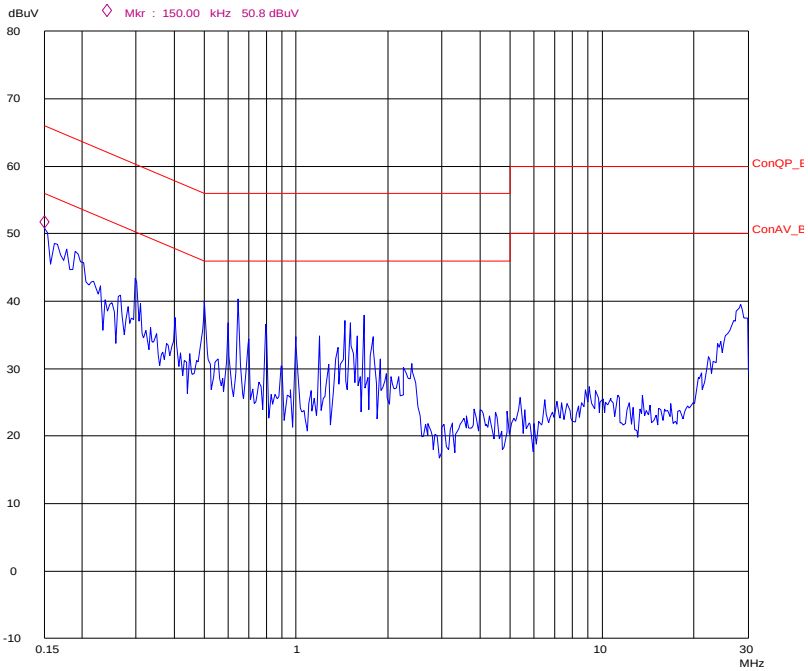
Line L Conducted Emission Graph(DVI Mode 1024*768@60Hz)



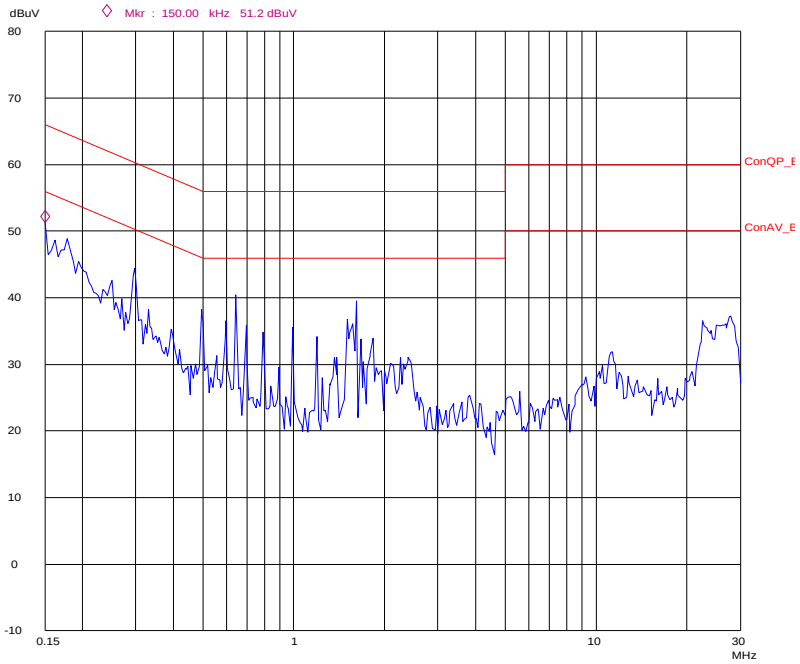
Line N Conducted Emission Graph(DVI Mode 1024*768@60Hz)



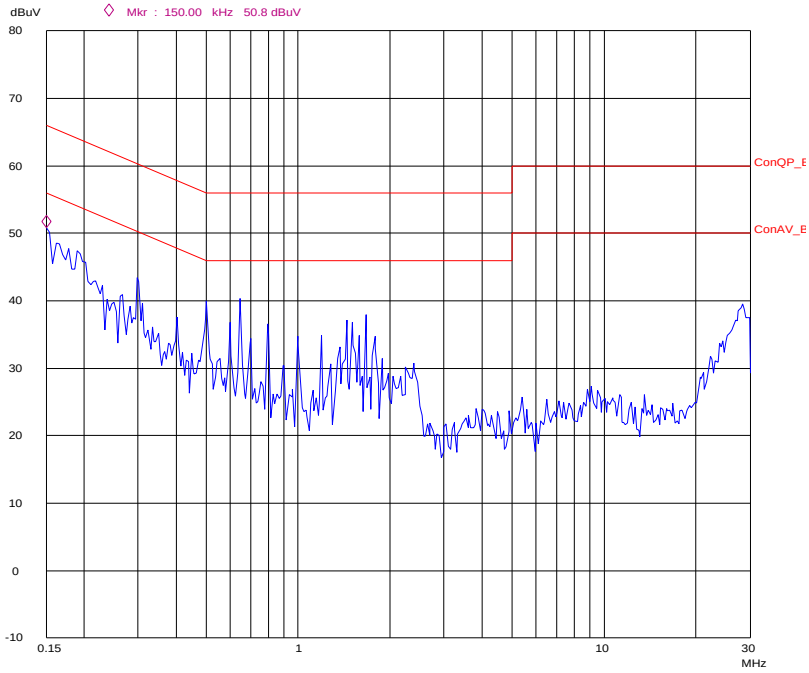
Line L Conducted Emission Graph(VGA Mode 1360*768@60Hz)



Line N Conducted Emission Graph(VGA Mode 1360*768@60Hz)



Line L Conducted Emission Graph(DVI Mode 1360*768@60Hz)



Line N Conducted Emission Graph(DVI Mode 1360*768@60Hz)

Test Data :

Line	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AV Level (dBuV)	Limits AV (dBuV)	Margin QP (dB)
VGA Mode(640*480@60Hz)								
L	0.150	43.7	66	-22.3	0.150	29.8	56	-26.2
L	0.644	40.3	56	-15.7	0.644	40.2	46	-5.8
L	1.615	30.0	56	-26.0	1.615	10.0	46	-36.0
N	0.150	44.2	66	-21.8	0.150	32.3	56	-23.7
N	0.500	34.8	56	-21.2	0.500	33.7	46	-12.3
N	0.648	38.4	56	-17.6	0.648	38.1	46	-7.9
DVI Mode(640*480@60Hz)								
L	0.150	45.2	66	-20.8	0.150	27.3	56	-28.7
L	0.644	43.2	56	-12.8	0.644	39.8	46	-6.2
L	1.615	28.9	56	-27.1	1.615	10.5	46	-35.5
N	0.150	43.5	66	-22.5	0.150	33.5	56	-22.5
N	0.500	36.4	56	-19.6	0.500	38.7	46	-7.3
N	0.648	34.6	56	-21.4	0.648	37.8	46	-8.2
VGA Mode(1024*768@60Hz)								
L	0.157	43.5	66	-22.5	0.157	27.8	56	-28.2
L	0.644	42.6	56	-13.4	0.644	37.8	46	-8.2
L	1.618	27.9	56	-28.1	1.618	10.3	46	-35.7
N	0.150	44.8	66	-21.2	0.150	32.6	56	-23.4
N	0.510	35.6	56	-20.4	0.510	36.8	46	-9.2
N	0.648	36.8	56	-19.2	0.648	38.7	46	-7.3
DVI Mode(1024*768@60Hz)								
L	0.150	45.8	66	-20.2	0.150	25.8	56	-30.2
L	0.654	46.2	56	-9.8	0.654	35.4	46	-10.6
L	1.615	28.5	56	-27.5	1.615	10.5	46	-35.5

Continue on to next page…

N	0.157	43.5	66	-22.5	0.157	36.5	56	-19.5
N	0.500	36.5	56	-19.5	0.500	37.6	46	-8.4
N	0.658	37.6	56	-18.4	0.658	35.7	46	-10.3
VGA Mode(1360*768@60Hz)								
L	0.155	47.8	66	-18.2	0.155	25.4	56	-30.6
L	0.644	46.8	56	-9.2	0.644	35.8	46	-10.2
L	1.625	26.8	56	-29.2	1.625	11.5	46	-34.5
N	0.150	41.5	66	-24.5	0.150	36.5	56	-19.5
N	0.502	35.5	56	-20.5	0.502	37.6	46	-8.4
N	0.648	39.5	56	-16.5	0.648	37.5	46	-8.5
DVI Mode(1360*768@60Hz)								
L	0.159	42.3	66	-23.7	0.159	30.4	56	-25.6
L	0.644	47.6	56	-8.4	0.644	32.8	46	-13.2
L	1.614	25.3	56	-30.7	1.614	12.5	46	-33.5
N	0.150	45.2	66	-20.8	0.150	38.7	56	-17.3
N	0.500	38.5	56	-17.5	0.500	35.2	46	-10.8
N	0.640	40.5	56	-15.5	0.640	37.5	46	-8.5

1) All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.

2) "QP" means "Quasi-Peak" values, "AV" means "Average" values.

Test Equipment List :

Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Interval
EMI test receiver	ESCS30	R&S	830245/009	01/22/2009	01/21/2010
AMN	ESH2-Z5	R&S	100002	01/22/2009	01/21/2010
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: _____ ***REVIEWED BY:*** _____

ENGINEER ***SENIOR ENGINEER***

Conducted Emission Test Set-up

ATTACHMENT 2 - RADIATED EMISSION TEST RESULTS

CLIENT:	SHENZHEN KTC COMPUTER TECHNOLOGY CO.,LTD	**TEST STANDERD:**	FCC Part 15, Class B
MODEL NUMBERS:	W22*S**	**PRODUCT:**	LCD MONITOR
EUT MODEL:	W2209S5	**EUT DESIGNATION:**	Information Technology Equipment
TEMPERATURE:	23°C	**HUMIDITY:**	47%RH
ATM PRESSURE:	101.0kPa	**GROUNDING:**	Through AC Power Cable
TESTED BY:	May Wang	**DATE OF TEST:**	May 12, 2009
TEST REFERENCE:	ANSI C63.4: 2003		
TEST PROCEDURE:	The EUT was set up acCableing to the guidelines of ANSI C63.4: 2003 for radiated emissions. An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber. Signal discrimination was then performed and the significant peaks marked. These values were then quasi-peak in the frequency range of 30 MHz to 1GHz at an Anechoic chamber, the bandwidth of Test Receiver was set at 120KHz. the measurement are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz. The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor are given as follows: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain		
TESTED RANGE:	30MHz to 2,000MHz		
TEST VOLTAGE:	120VAC / 60Hz		
RESULTS:	The EUT meets the requirements of test reference for Radiated Emission on Horizontcal polarization by -4.1dB at 720.087MHz. the worst mode is 1024*768@60Hz at DVI mode. The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB		

15.109 Limits of Radiated Emission :

The field strength of radiated emissions at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	*Field Strength (μV/m)*	*Field Strength (dBμV/m)*
30 - 88	*100*	*40.0*
88 -216	*150*	*43.5*
216 - 960	*200*	*46.0*
Above 960	*500*	*54.0*

1) Emission Level dB (μ V/m) = 20 log Emission Level (μ V/m)

2) The tighter limit applies at the band edges.

3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Test Data :

Below 1GHz:

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, QP [dB]	3 Meters Limits [dBµV/m]
VGA Mode (640*480@60Hz)				
223.979	V	36.2	-9.8	46.0
480.060	V	39.4	-6.6	46.0
720.101	V	38.6	-7.4	46.0
191.343	H	36.3	-7.2	43.5
480.982	H	40.7	-5.3	46.0
720.080	H	41.5	-4.5	46.0
DVI Mode(640*480@60Hz)				
223.979	V	38.5	-7.5	46.0
498.060	V	36.7	-9.3	46.0
720.101	V	36.9	-9.1	46.0
191.343	H	35.7	-7.8	43.5
487.982	H	41.6	-4.4	46.0
720.082	H	39.8	-6.2	46.0
VGA Mode (1024*768@60Hz)				
218.979	V	39.7	-6.3	46.0
402.060	V	37.5	-8.5	46.0
722.101	V	39.4	-6.6	46.0
187.343	H	36.9	-6.6	43.5
464.970	H	40.6	-5.4	46.0
751.080	H	37.2	-8.8	46.0
DVI Mode (1024*768@60Hz)				
203.979	V	33.9	-12.1	46.0
440.060	V	38.7	-7.3	46.0
720.101	V	39.4	-6.6	46.0

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214.658	H	37.4	-6.1	43.5
480.982	H	39.7	-6.3	46.0
720.087	H	41.9	-4.1	46.0
VGA Mode (1360*768@60Hz)				
223.979	V	34.6	-11.4	46.0
480.060	V	36.9	-9.1	46.0
725.101	V	37.5	-8.5	46.0
191.343	H	34.9	-8.6	43.5
480.940	H	39.8	-6.2	46.0
720.084	H	40.2	-5.8	46.0
DVI Mode (1360*768@60Hz)				
223.979	V	37.2	-8.8	46.0
495.265	V	32.5	-13.5	46.0
720.101	V	39.4	-6.6	46.0
200.191	H	35.2	-8.3	43.5
480.982	H	40.4	-5.6	46.0
726.546	H	36.9	-9.1	46.0

1) The limits shown are based on Quasi-peak value detector below or equal to 1GHz , the bandwidth of Test Receiver was set at 120 kHz below 1GHz.

2) The frequency range from 1GHz to 2GHz was checked for 1360*768@60Hz at VGA&DVI mode, 30 MHz to 1000MHz was checked for all test modes.

3) The emission levels that are 20dB below the official limit are not reported.

Above 1GHz :

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, QP [dB]	3 Meters Limits [dBµV/m]	Remark
*VGA Mode (1360*768@60Hz)*					
1102.010	H	42.3	-11.7	54	AV
1404.525	H	43.0	-11.0	54	
1621.585	H	46.0	-8.0	54	
1102.010	V	43.5	-10.5	54	
1404.525	V	44.4	-9.6	54	
1621.585	V	44.3	-9.7	54	
1102.010	H	45.9	-28.1	74	PK
1404.525	H	55.8	-18.2	74	
1621.585	H	53.5	-20.5	74	
1102.010	V	51.2	-22.8	74	
1404.525	V	56.0	-18.0	74	
1621.585	V	57.2	-16.8	74	

1) The limits shown are based on peak value and average value detector above 1GHz, the bandwidth of test receiver was set at 1MHz above 1GHz.

2) The frequency range from 1GHz to 2GHz was checked for 1360*768@60Hz at VGA&DVI mode, 30 MHz to 1000MHz was checked for all test mode.

3) The emission levels that are 20dB below the official limit are not reported.

Above 1GHz :

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, QP [dB]	3 Meters Limits [dBµV/m]	Remark
*DVI Mode (1360*768@60Hz)*					
1102.010	H	42.5	-11.5	54	AV
1404.525	H	43.0	-11.0	54	
1621.585	H	46.0	-7.0	54	
1102.010	V	43.5	-10.5	54	
1404.525	V	48.4	-5.6	54	
1621.585	V	44.3	-9.7	54	
1102.010	H	45.9	-28.1	74	PK
1404.525	H	55.8	-18.2	74	
1621.585	H	53.5	-20.5	74	
1102.010	V	51.2	-22.8	74	
1404.525	V	56.0	-18.0	74	
1621.585	V	57.2	-16.8	74	

1) The limits shown are based on peak value and average value detector above 1GHz, the bandwidth of test receiver was set at 1MHz above 1GHz.

2) The frequency range from 1GHz to 2GHz was checked for 1360*768@60Hz at VGA&DVI mode, 30 MHz to 1000MHz was checked for all test mode.

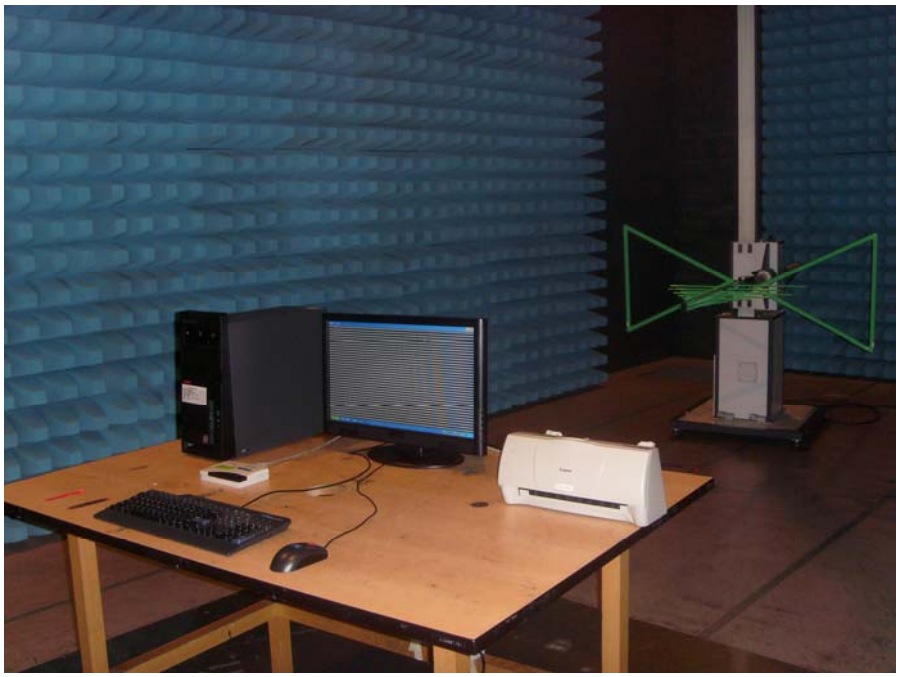
3) The emission levels that are 20dB below the official limit are not reported.

Test Equipment List :

Test Equipment	Model No.	Manufacturer	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	ESI26	R&S	838736/013	2009/01/25	2010/01/24
Bilog Antenna	CBL6112B	Chase	2591	2009/01/25	2010/01/24
Horn Antenna	HF906	R&S	SB4343	2009/01/25	2010/01/24
3m SEMI-ANECHOIC CHAMBER	9X6X6	Albatross projects	---	2009/03/21	2010/03/20
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: _____ ***REVIEWED BY:*** _____

ENGINEER ***SENIOR ENGINEER***



Radiated Emission Test Set-up (below 1GHz)

Radiated Emission Test Set-up (above 1GHz)