FCC DOC TEST REPORT

Declaration **o**f **C**onformity

According to

47 CFR, Part 2, Part 15, CISPR PUB. 22,
Canada ICES-003 Issue 5

Applicant	:	TPV Electronics (Fujian) Co., Ltd.
Address	:	Shangzheng, Yuanhong Road, Fuqing City, Fujian Province, P.R.China
Equipment	:	LCD Monitor
Model No.	:	238LM00001, I2470***

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of ***Cerpass Technology Corp.*** the test report shall not be reproduced except in full.

Contents

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Equipment	:	LCD Monitor
Model No.	:	238LM00001, I2470***

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2009** and the energy emitted by this equipment was ***passed*** **CISPR PUB. 22 FCC Part 15, Canada ICES-003 Issue 5** in both radiated and conducted emission class B limits.
Testing was carried out on Jun. 27, 2013 at **Cerpass Technology Corp**.

Signature

Hill Chen
EMC/RF B.U. Assistant Manager

History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description

1. Summary of Test Procedure and Test Result

Test Item	Normative References	Test Result	Remarks
Conducted Emission (Mains Ports)	FCC 47 CFR Part 15 Subpart B ANSI C63.4-2009 ICES-003 Issue 5	PASS	Meets Class B Limit Minimum passing margin(AVG) is -14.58 dB at 0.498 MHz
Radiated Emission	FCC 47 CFR Part 15 Subpart B ANSI C63.4-2009 ICES-003 Issue 5	PASS	Meets Class B Limit Minimum passing margin(QP) is -5.32 dB at 125.390 MHz

2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

LCD Monitor	Model No：	238LM00001, I2470*** (The "*" could be any alphanumeric character including blank for marketing differentiation.)
Power Cable	Non-Shielding, 1.5m & 1.8m	
Please refer to the user's manual.		

2.2. Test Manner

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included PC, Keyboard, Mouse, Printer, iPod Nano, Earphone, DVD Player and EUT for EMI test.
c. An executive program, “BURNIN.EXE” under WIN 7, which generates a complete line of continuously repeating “H” pattern was used as the test software.
   The program was executed as follows:
   1. Turn on the power of all equipment.
   2. The PC reads the test program from the hard disk drive and runs it.
   3. The PC sends “H” messages to the EUT, and the EUT displays “H” patterns on the screen.
   4. The PC sends “H” messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
   5. The PC sends “H“ messages to the printer, then the printer prints them on the paper.
   6. Repeat the steps from 2 to 5.
d. An executive program, “BURNIN.EXE” was executed to play 1 kHz signals.
e. An executive program, “BURNIN.EXE” was executed to read and write data from iPod Nano.
f. The test modes of EMI test as follow:
   Test Mode 1. Full system (VGA mode 1920*1080@60Hz) for horizontal
   Test Mode 2. Full system (VGA mode 1280*1024@75Hz) for horizontal
   Test Mode 3. Full system (VGA mode 640*480@60Hz) for horizontal
   Test Mode 4. Full system (VGA mode 1920*1080@60Hz) for vertical
   Test Mode 5. Full system (Display mode 1920*1080@60Hz) for horizontal
   Test Mode 6. Full system (Display mode 1280*1024@75Hz) for horizontal
   Test Mode 7. Full system (Display mode 640*480@60Hz) for horizontal
   Test Mode 8. Full system (Display mode 1920*1080@60Hz) for vertical
   Test Mode 9. Full system (DVI mode 1920*1080@60Hz) for horizontal
   Test Mode 10. Full system (DVI mode 1280*1024@75Hz) for horizontal
   Test Mode 11. Full system (DVI mode 640*480@60Hz) for horizontal
   Test Mode 12. Full system (DVI mode 1920*1080@60Hz) for vertical
   Test Mode 13. Full system (HDMI mode 1920*1080@60Hz) for horizontal
   Test Mode 14. Full system (HDMI mode 1280*1024@75Hz) for horizontal
   Test Mode 15. Full system (HDMI mode 640*480@60Hz) for horizontal
   Test Mode 16. Full system (HDMI mode 1920*1080@60Hz) for vertical
   Test Mode 17. DVD 1080P Mode
   For conduction test, “Test Mode 1” generate the worst cases, it was reported as final results.
   For radiation (30MHz ~ 1GHz) test, “Test Mode 13” generate the worst cases, it was reported as final results.
   For radiation (1GHz ~ 15GHz) test, “Test Mode 9” generate the worst cases, it was reported as final results.

2.3. Description of Test System

Device	Manufacturer	Model No.	Description
PC	DELL	XPS 8500	Power Cable, Non-Shielded, 1.8m
Keyboard	DELL	SK-8175	Data Cable, USB Shielding 1.85m
Mouse	DELL	MOC5UO	Data Cable, USB Shielding 1.85m
Printer	HP	D2660	Power Cable, Non-Shielded 1.8m Data Cable, USB Shielding 1.6m
iPod Nano*3	Apple	A1320	Data Cable, USB Shielding 1.0m
Earphone	MIC	MIC-4	Data Cable, Audio Unshielding 1.35m
DVD Player	SONY	DVP-NS718HP	Power Cable, Non-Shielded 1.8m

Use Cable:

Cable	Quantity	Description
VGA	1	Shielding, 1.8m & 1.5m, with two ferrite cores bonded
DVI	1	Shielding, 1.8m & 1.5m, with two ferrite cores bonded
HDMI	1	Shielding, 1.8m & 1.5m
Display	1	Shielding, 1.8m & 1.5m
Audio	1	Unshielding, 1.8m & 1.5m
USB 3.0	1	Shielding, 1.8m

2.4. General Information of Test

Test Site :	Cerpass Technology Corp. 2F-11, No. 3, Yuan Qu St., (Nankang Software Park), Taipei, Taiwan 115, R.O.C.
Test Site Location (OATS2-SD) :	No.68-1, Shihbachongsi, Shihding Township, Taipei City 223, Taiwan, R.O.C.
FCC Registration Number :	TW1049, TW1061, 488071, 390316
IC Registration Number :	4934B-1, 4934D-1
VCCI Registration Number :	T-1173 for Telecommunication Test C-4139 for Conducted emission test R-3428 for Radiated emission test G-97 for radiated disturbance above 1GHz
Frequency Range Investigated :	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 15,000 MHz
Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.
Laboratory Accreditation	TAF Testing Laboratory 1439 NVLAP LAB CODE: 200954-0

2.5. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	3.25 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	3.93 dB
	1,000 MHz ~ 15,000 MHz	Vertical / Horizontal	5.18 dB

3. Test of Conducted Emission

3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

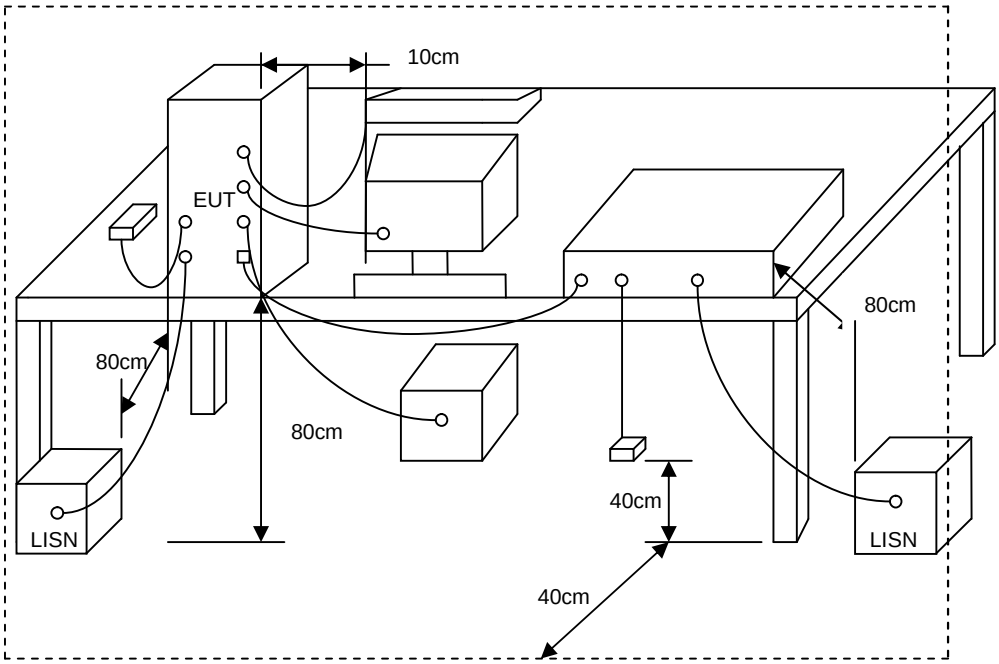
Conducted Emission Limits:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

3.2. Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.3. Typical test Setup

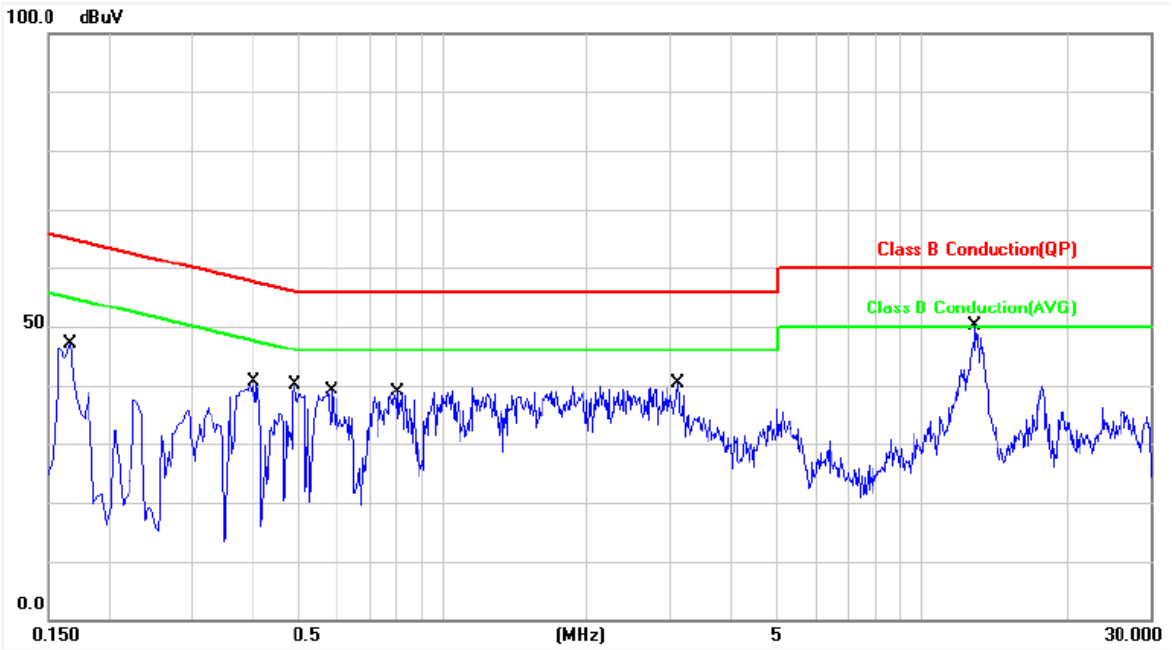


3.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI	100821	2012/12/24	2013/12/23
LISN	Schwarzbeck	NSLK 8127	8127-516	2013/03/08	2014/03/07
LISN	Schwarzbeck	NSLK 8127	8127-568	2012/08/22	2013/08/21
Attenuator	HAMEG	HZ560	------	2013/03/07	2014/03/06

3.5. Test Result and Data

Power	:	AC 120V	Pol/Phase	:	LINE
Test Mode 1	:	Full system (VGA mode 1920*1080@60Hz) for horizontal	Temperature	:	23 °C
Test Date	:	Jun. 25, 2013	Humidity	:	52 %
Model No.	:	238LM00001	Atmospheric Pressure	:	1015 pha

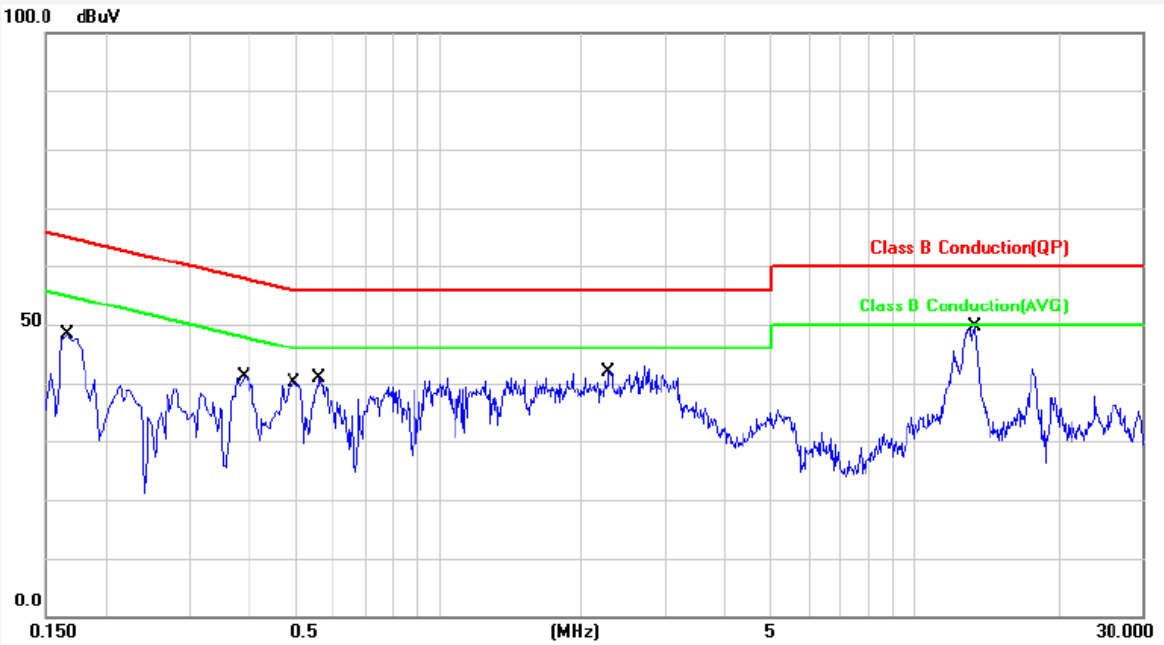


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1660	10.45	35.26	45.71	65.15	-19.44	QP	P
2	0.1660	10.45	26.92	37.37	55.15	-17.78	AVG	P
3	0.4020	10.32	27.21	37.53	57.81	-20.28	QP	P
4	0.4020	10.32	15.94	26.26	47.81	-21.55	AVG	P
5	0.4900	10.31	26.77	37.08	56.17	-19.09	QP	P
6	0.4900	10.31	19.80	30.11	46.17	-16.06	AVG	P
7	0.5860	10.31	24.59	34.90	56.00	-21.10	QP	P
8	0.5860	10.31	13.03	23.34	46.00	-22.66	AVG	P
9	0.8059	10.33	24.81	35.14	56.00	-20.86	QP	P
10	0.8059	10.33	16.06	26.39	46.00	-19.61	AVG	P
11	3.0980	10.51	23.71	34.22	56.00	-21.78	QP	P
12	3.0980	10.51	17.27	27.78	46.00	-18.22	AVG	P
13	12.9260	11.08	32.92	44.00	60.00	-16.00	QP	P
14	12.9260	11.08	23.64	34.72	50.00	-15.28	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	NEUTRAL
Test Mode 1	:	Full system (VGA mode 1920*1080@60Hz) for horizontal	Temperature	:	23 °C
Test Date	:	Jun. 25, 2013	Humidity	:	52 %
Model No.	:	238LM00001	Atmospheric Pressure	:	1015 pha



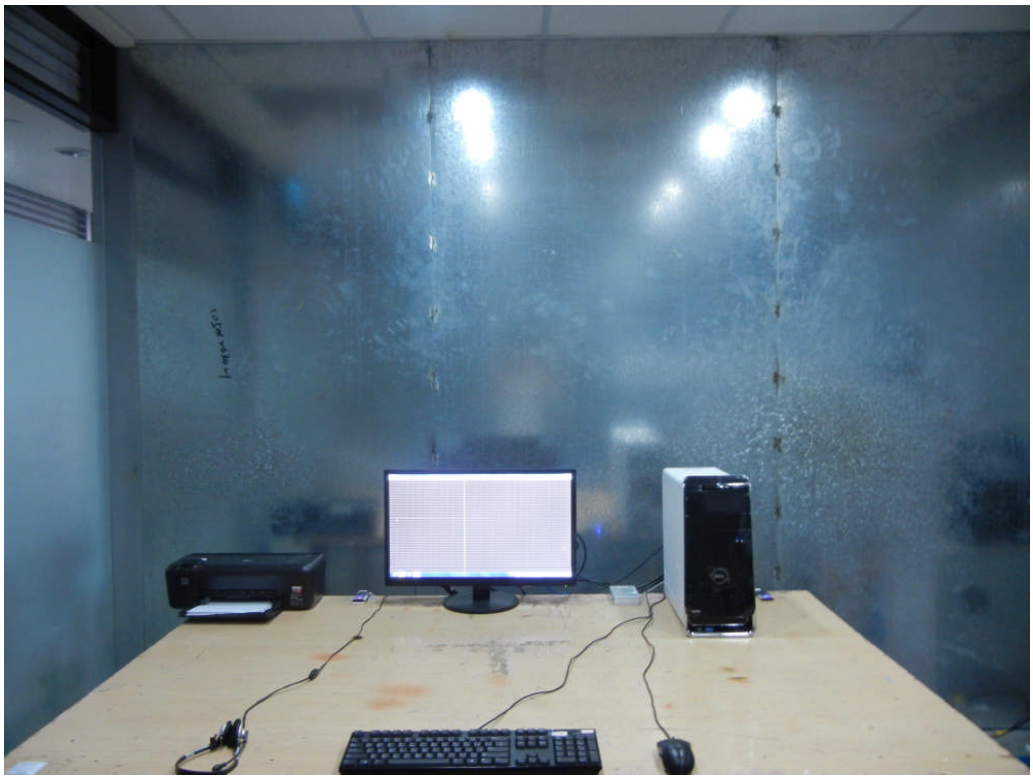
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1660	10.45	35.09	45.54	65.15	-19.61	QP	P
2	0.1660	10.45	26.98	37.43	55.15	-17.72	AVG	P
3	0.3899	10.33	27.97	38.30	58.06	-19.76	QP	P
4	0.3899	10.33	22.40	32.73	48.06	-15.33	AVG	P
5	0.4980	10.32	27.05	37.37	56.03	-18.66	QP	P
6	0.4980	10.32	21.13	31.45	46.03	-14.58	AVG	P
7	0.5620	10.31	26.46	36.77	56.00	-19.23	QP	P
8	0.5620	10.31	18.56	28.87	46.00	-17.13	AVG	P
9	2.2820	10.42	24.66	35.08	56.00	-20.92	QP	P
10	2.2820	10.42	19.02	29.44	46.00	-16.56	AVG	P
11	13.3420	11.06	31.92	42.98	60.00	-17.02	QP	P
12	13.3420	11.06	22.66	33.72	50.00	-16.28	AVG	P

Note: Level = Reading + Factor
Margin = Level – Limit

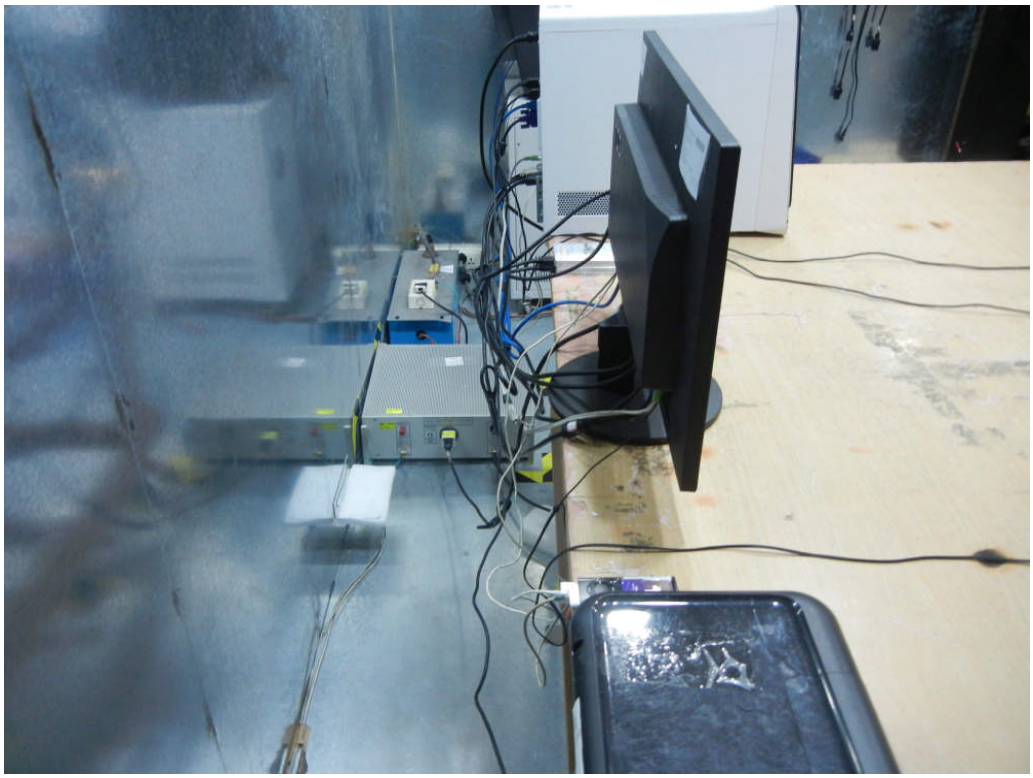
Test engineer: Ken

3.6. Test Photographs

Front View



Rear View



4. Test of Radiated Emission

4.1. Test Limit

Radiated emissions from 30 MHz to 15,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-2009. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 3.2. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

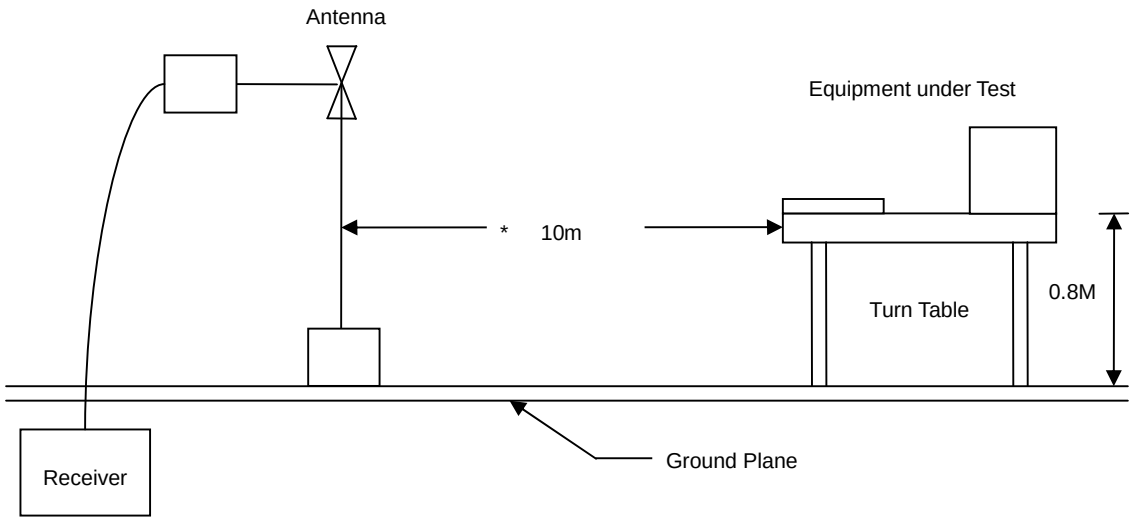
Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

4.2. Test Procedures

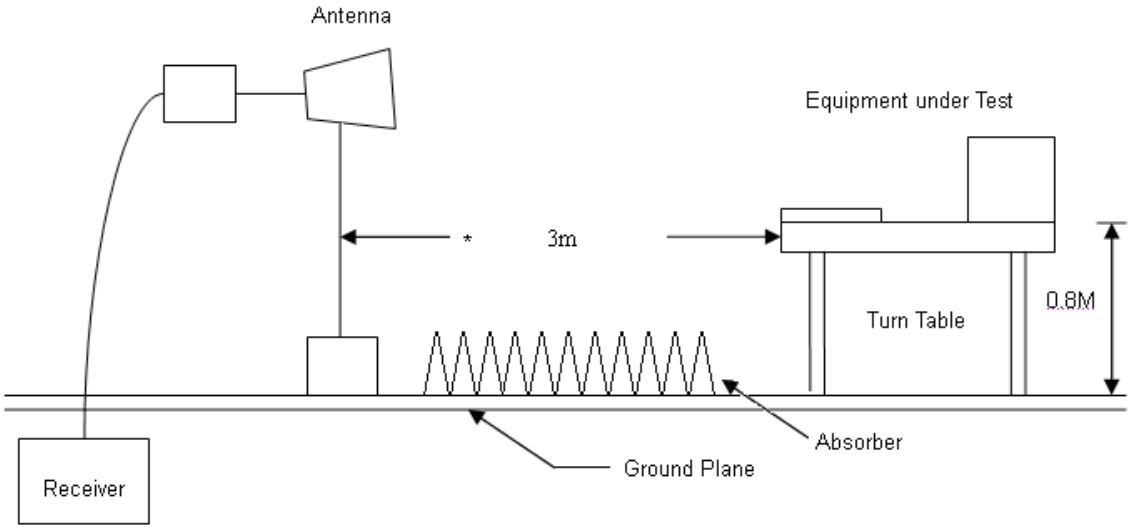
a. The EUT was placed on a Rota table top 0.8 meter above ground.
b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

4.3. Typical test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup

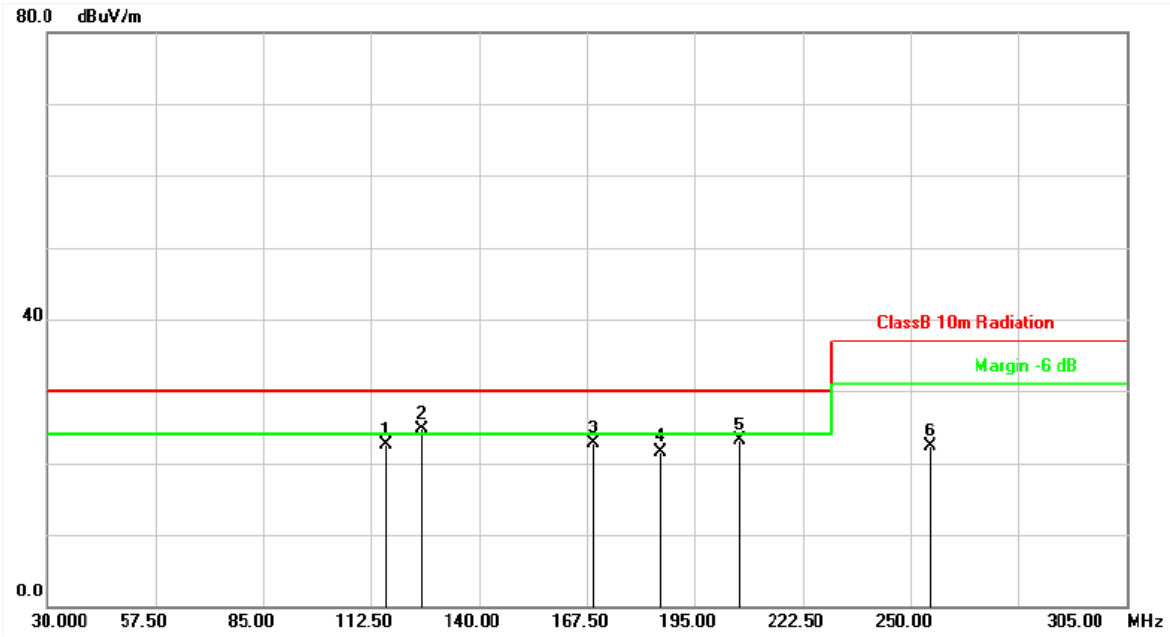


4.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Amplifier	Agilent	8447D	2944A10531	2012/10/17	2013/10/16
Bilog Antenna	Schaffner	CBL6112B	2840	2013/03/27	2014/03/26
Spectrum Analyzer	R&S	FSP 3	100800	2013/03/14	2014/03/13
EMI Receiver	Schaffner	SCR3501	437	2013/03/15	2014/03/14
SPECTRUM ANALYZER	R&S	FSP40	100219	2012/09/13	2013/09/12
HORN ANTENNA	EMCO	3115	31601	2012/09/13	2013/09/12
PREAMPLIFIER	EMC	EMC012635	980029	2012/09/12	2013/09/11

4.5. Test Result and Data (30MHz ~ 1GHz)

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 13	:	Full system (HDMI mode 1920*1080@60Hz) for horizontal	Temperature	:	22 °C
Test Date	:	Jun. 27, 2013	Humidity	:	70 %
Model No.	:	238LM00001	Atmospheric Pressure	:	983 pha

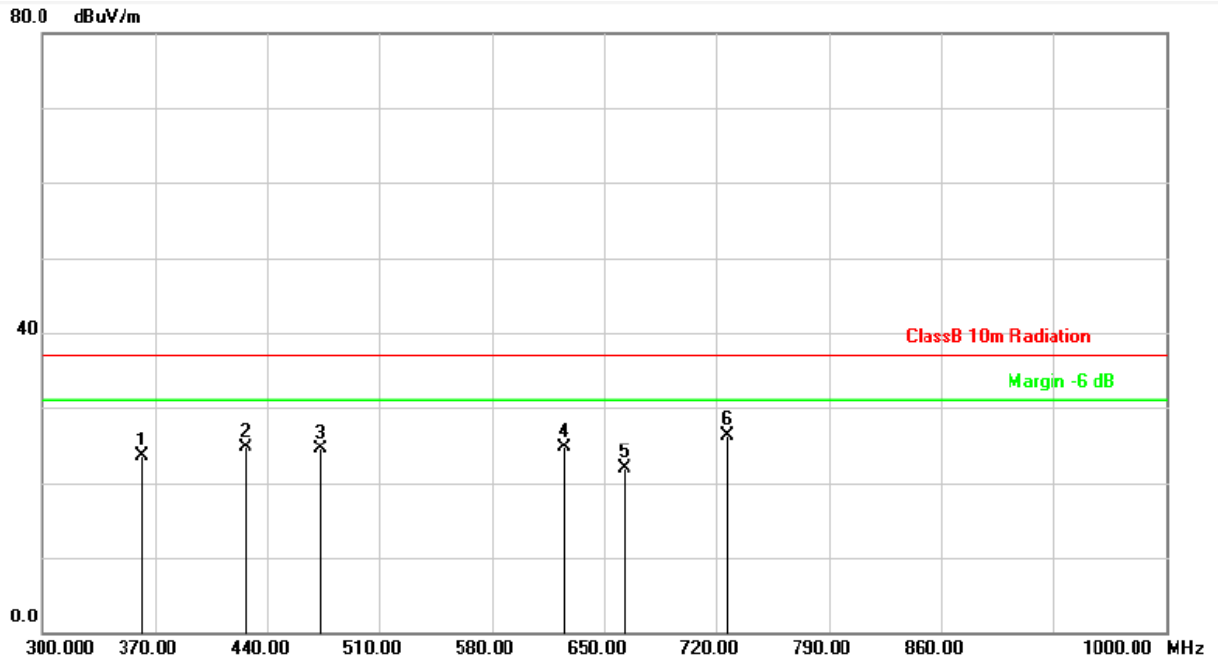


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	116.2600	-14.12	36.61	22.49	30.00	-7.51	QP	100	235	P
2	125.3900	-14.08	38.76	24.68	30.00	-5.32	QP	400	0	P
3	169.2600	-15.97	38.65	22.68	30.00	-7.32	QP	400	0	P
4	186.3500	-16.33	37.92	21.59	30.00	-8.41	QP	100	200	P
5	206.5700	-15.85	39.00	23.15	30.00	-6.85	QP	100	0	P
6	254.9800	-11.78	34.14	22.36	37.00	-14.64	QP	100	214	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 13	:	Full system (HDMI mode 1920*1080@60Hz) for horizontal	Temperature	:	22 °C
Test Date	:	Jun. 27, 2013	Humidity	:	70 %
Model No.	:	238LM00001	Atmospheric Pressure	:	983 pha

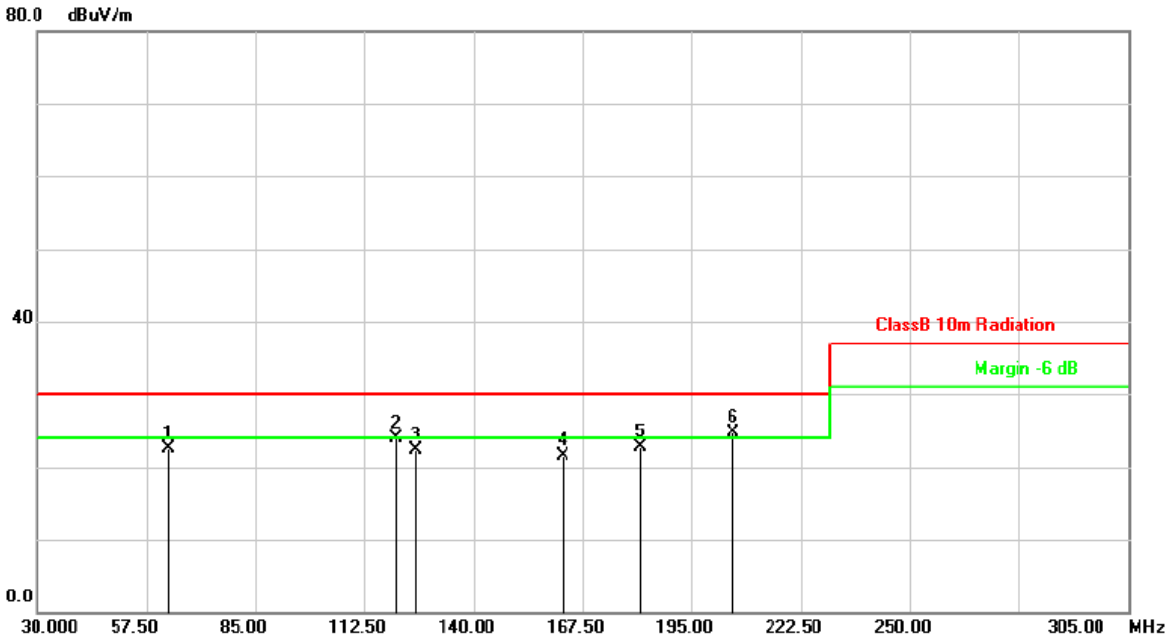


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	362.1500	-9.34	32.92	23.58	37.00	-13.42	QP	100	0	P
2	426.5900	-7.82	32.47	24.65	37.00	-12.35	QP	100	214	P
3	472.6800	-6.94	31.53	24.59	37.00	-12.41	QP	100	0	P
4	625.1800	-4.08	28.76	24.68	37.00	-12.32	QP	100	125	P
5	662.5900	-3.67	25.65	21.98	37.00	-15.02	QP	100	0	P
6	726.5400	-2.80	29.15	26.35	37.00	-10.65	QP	100	0	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 13	:	Full system (HDMI mode 1920*1080@60Hz) for horizontal	Temperature	:	22 °C
Test Date	:	Jun. 27, 2013	Humidity	:	70 %
Model No.	:	238LM00001	Atmospheric Pressure	:	983 pha

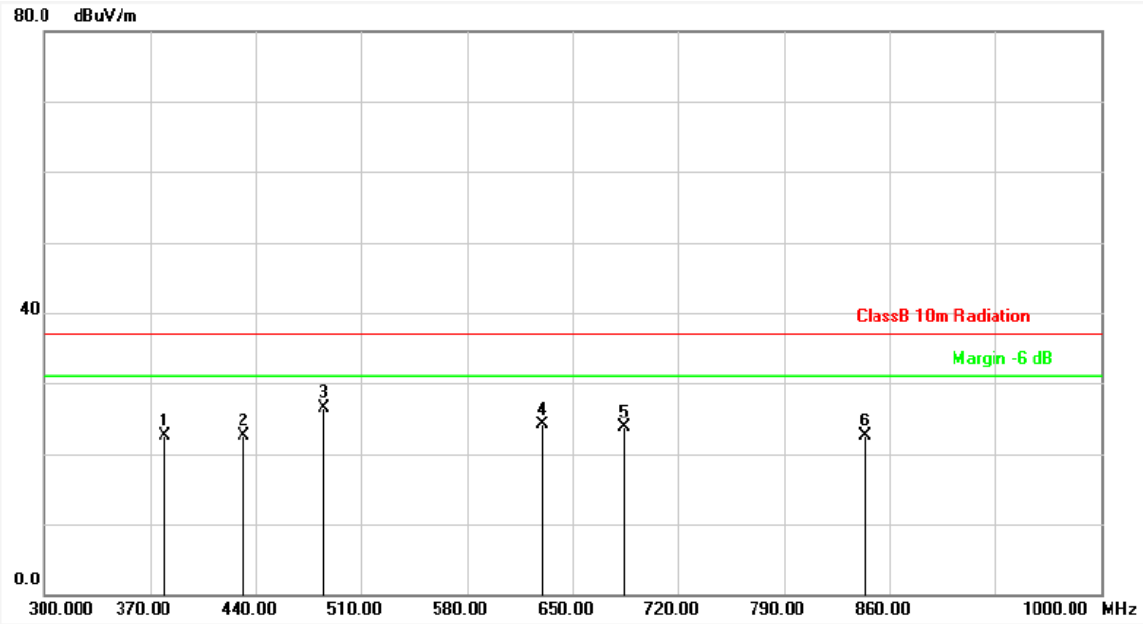


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	63.2400	-20.73	43.20	22.47	30.00	-7.53	QP	400	0	P
2	120.2500	-13.19	37.04	23.85	30.00	-6.15	QP	100	241	P
3	125.4800	-13.27	35.56	22.29	30.00	-7.71	QP	400	0	P
4	162.5700	-15.29	36.77	21.48	30.00	-8.52	QP	400	0	P
5	182.0300	-15.49	38.17	22.68	30.00	-7.32	QP	400	0	P
6	205.2899	-15.39	40.07	24.68	30.00	-5.32	QP	400	0	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 13	:	Full system (HDMI mode 1920*1080@60Hz) for horizontal	Temperature	:	22 °C
Test Date	:	Jun. 27, 2013	Humidity	:	70 %
Model No.	:	238LM00001	Atmospheric Pressure	:	983 pha



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	379.5799	-8.09	30.56	22.47	37.00	-14.53	QP	100	0	P
2	432.2600	-7.15	29.72	22.57	37.00	-14.43	QP	100	0	P
3	485.3600	-5.89	32.48	26.59	37.00	-10.41	QP	100	0	P
4	630.2600	-2.76	26.94	24.18	37.00	-12.82	QP	100	0	P
5	684.2900	-3.63	27.31	23.68	37.00	-13.32	QP	300	254	P
6	843.6500	-1.74	24.22	22.48	37.00	-14.52	QP	100	0	P

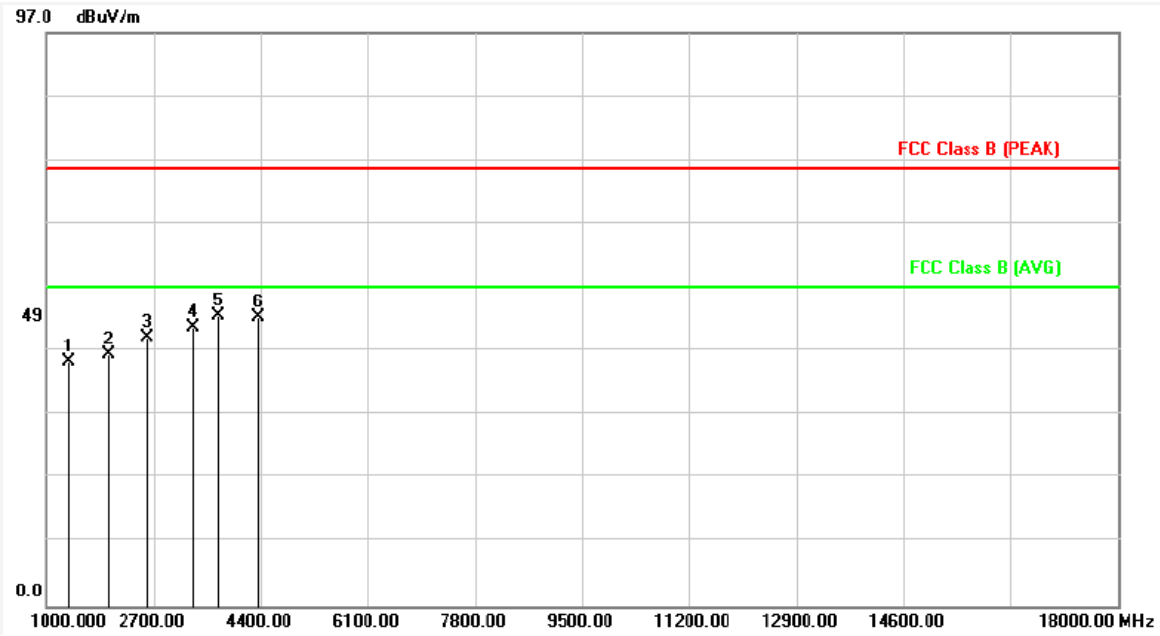
Note: Level = Reading + Factor

Margin = Level – Limit

Test engineer: Charlie

4.6. Test Result and Data (1GHz ~ 15GHz)

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode 9	:	Full system (DVI mode 1920*1080@60Hz) for horizontal	Temperature	:	23 °C
Test Date	:	Jun. 27, 2013	Humidity	:	45 %
Model No.	:	238LM00001	Atmospheric Pressure	:	1013 pha

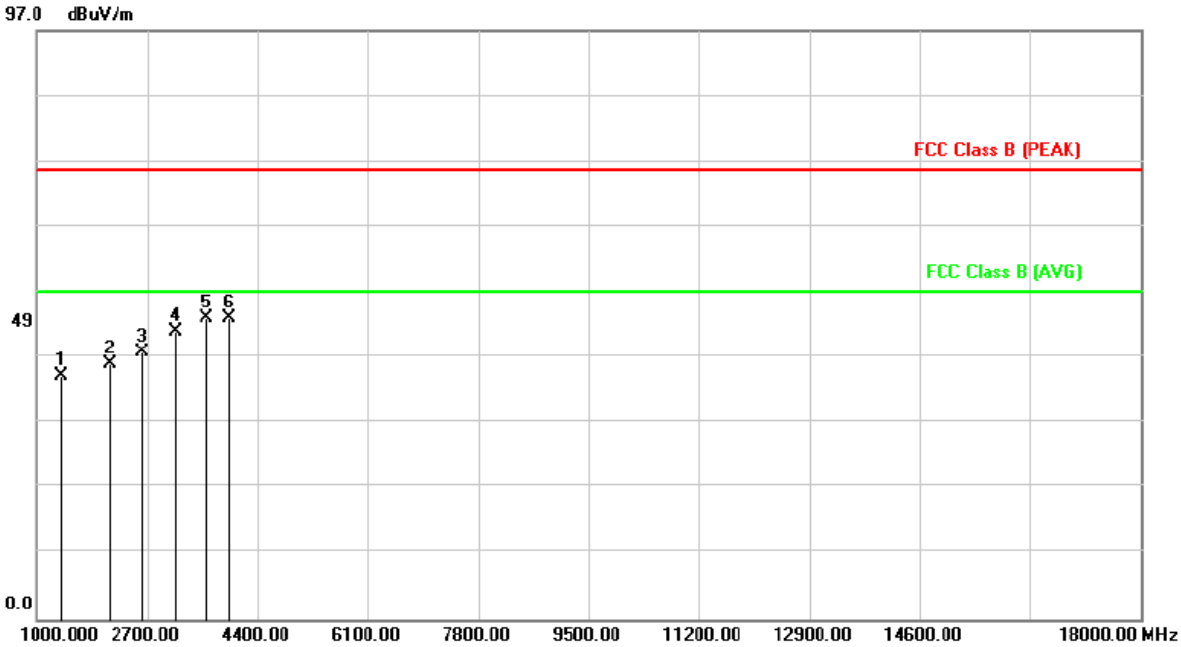


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	1340.000	-6.99	48.45	41.46	74.00	-32.54	peak	400	0	P
2	1986.000	-2.96	45.60	42.64	74.00	-31.36	peak	400	0	P
3	2598.000	-0.53	46.01	45.48	74.00	-28.52	peak	400	0	P
4	3329.000	2.60	44.55	47.15	74.00	-26.85	peak	400	0	P
5	3737.000	4.18	44.84	49.02	74.00	-24.98	peak	400	0	P
6	4366.000	5.78	42.99	48.77	74.00	-25.23	peak	400	0	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 120V	Pol/Phase	:	HORIZONTAL
Test Mode 9	:	Full system (DVI mode 1920*1080@60Hz) for horizontal	Temperature	:	23 °C
Test Date	:	Jun. 27, 2013	Humidity	:	45 %
Model No.	:	238LM00001	Atmospheric Pressure	:	1013 pha



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (◦)	P/F
1	1374.000	-6.79	46.93	40.14	74.00	-33.86	peak	100	0	P
2	2122.000	-2.42	44.60	42.18	74.00	-31.82	peak	100	0	P
3	2615.000	-0.45	44.58	44.13	74.00	-29.87	peak	100	0	P
4	3142.000	1.94	45.56	47.50	74.00	-26.50	peak	100	0	P
5	3618.000	3.69	45.80	49.49	74.00	-24.51	peak	100	0	P
6	3958.000	5.11	44.38	49.49	74.00	-24.51	peak	100	0	P

Note: Level = Reading + Factor

Margin = Level – Limit

Test engineer: Charlie

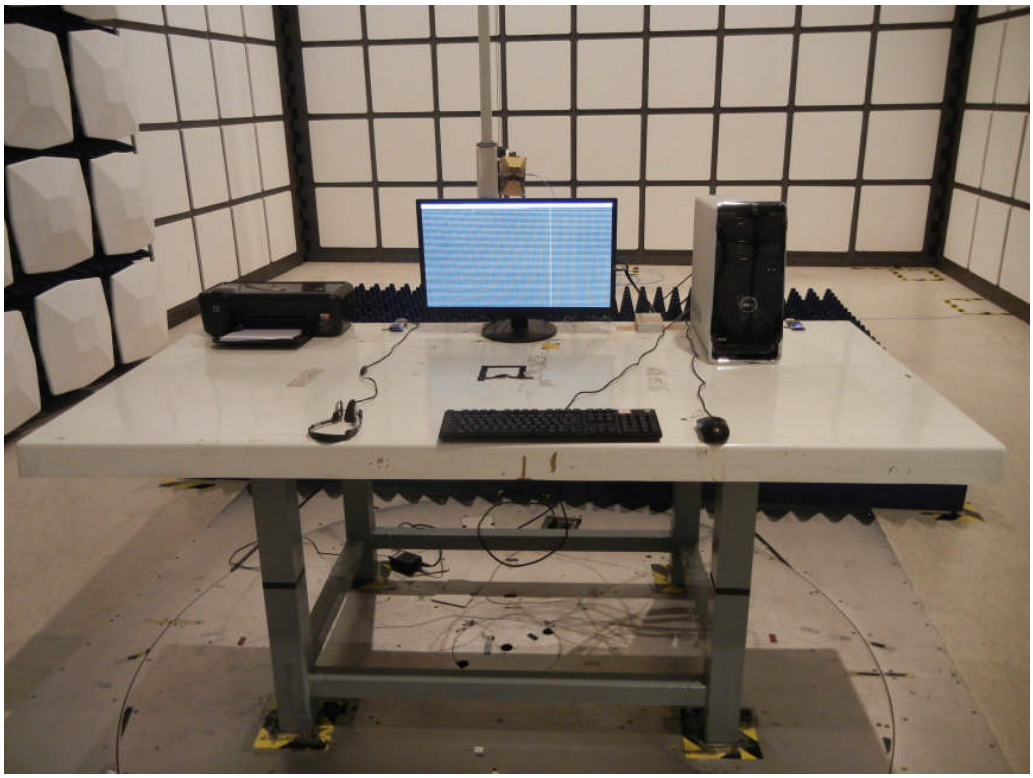
4.7. Test Photographs (30MHz~1GHz)

Front View

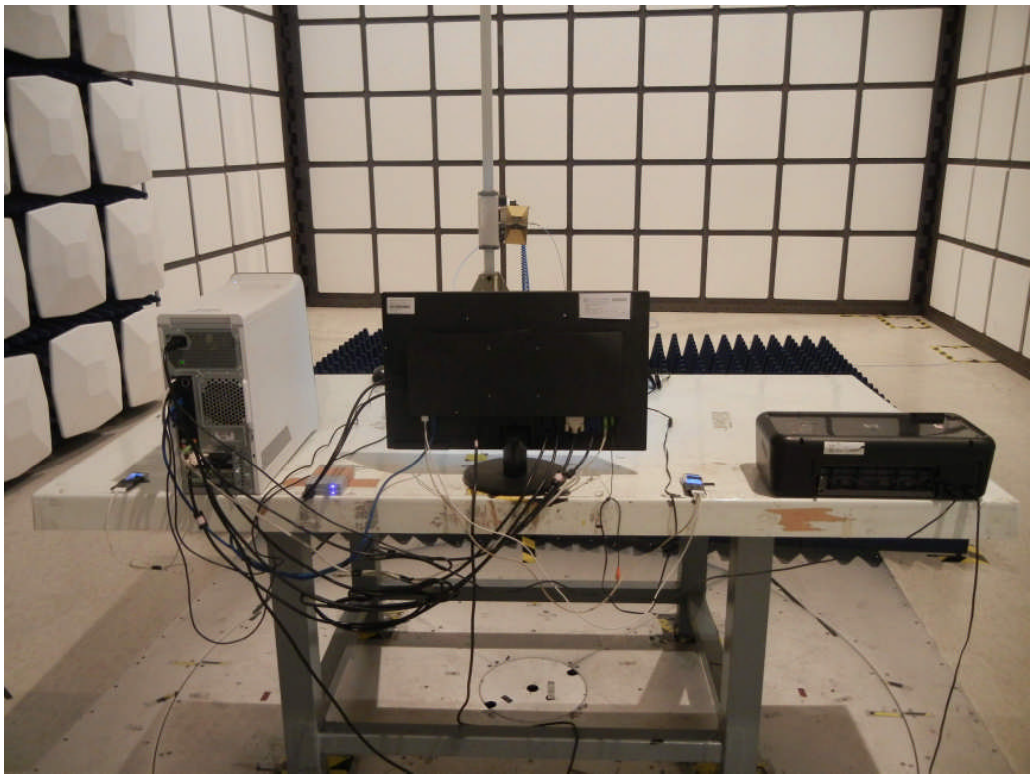
Rear View

4.8. Test Photographs (1GHz~15GHz)

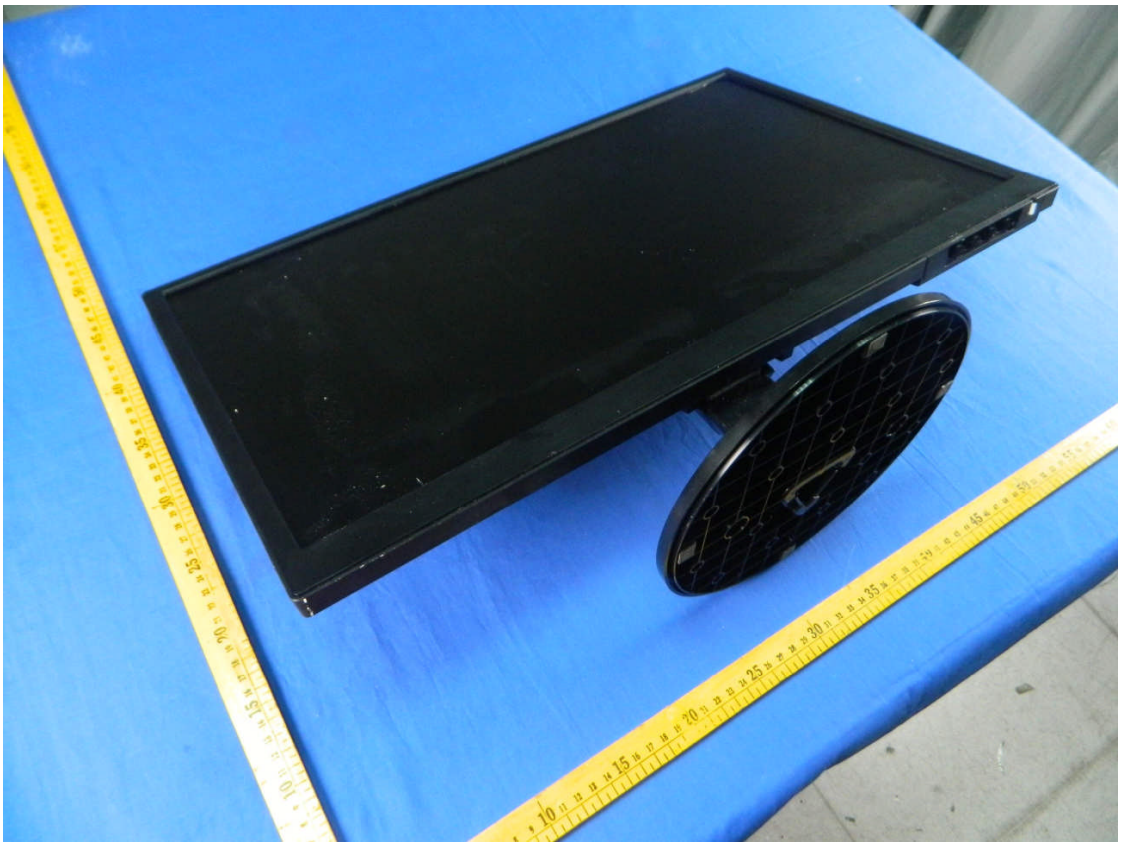
Front View

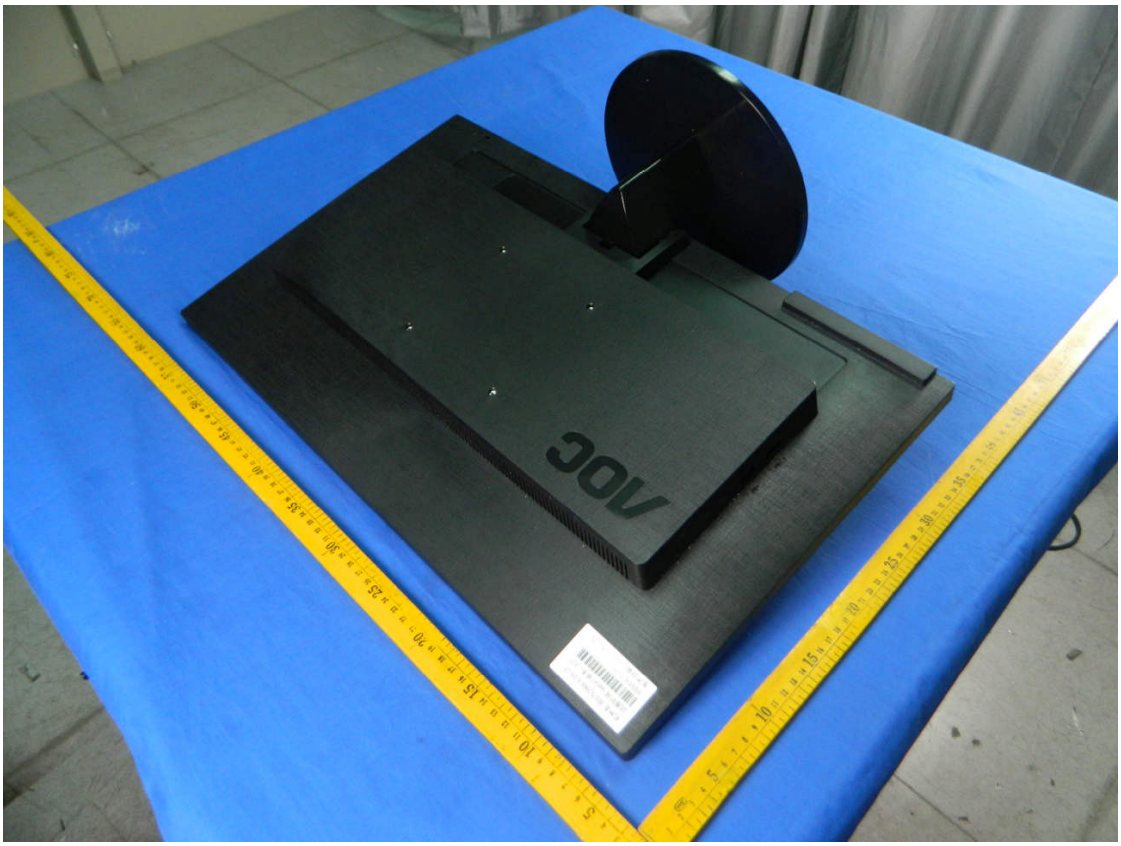


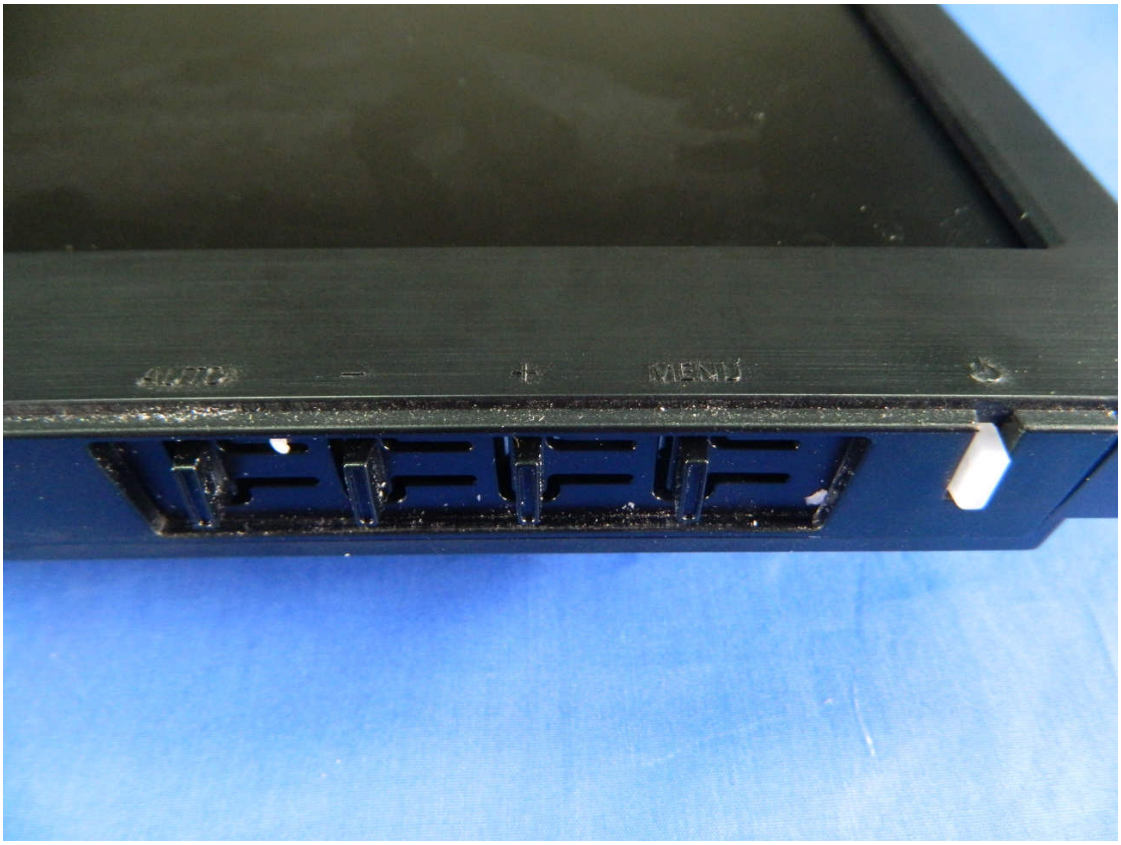
Rear View



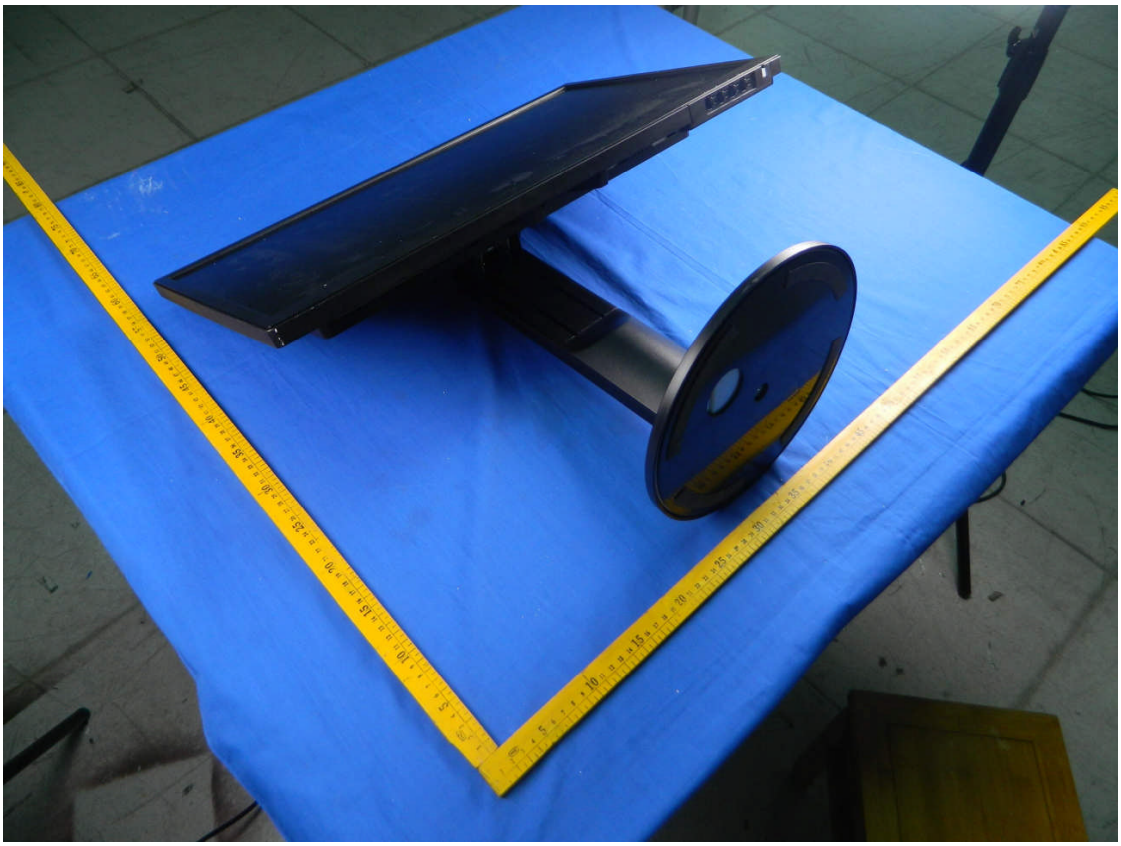
5. Photographs of EUT

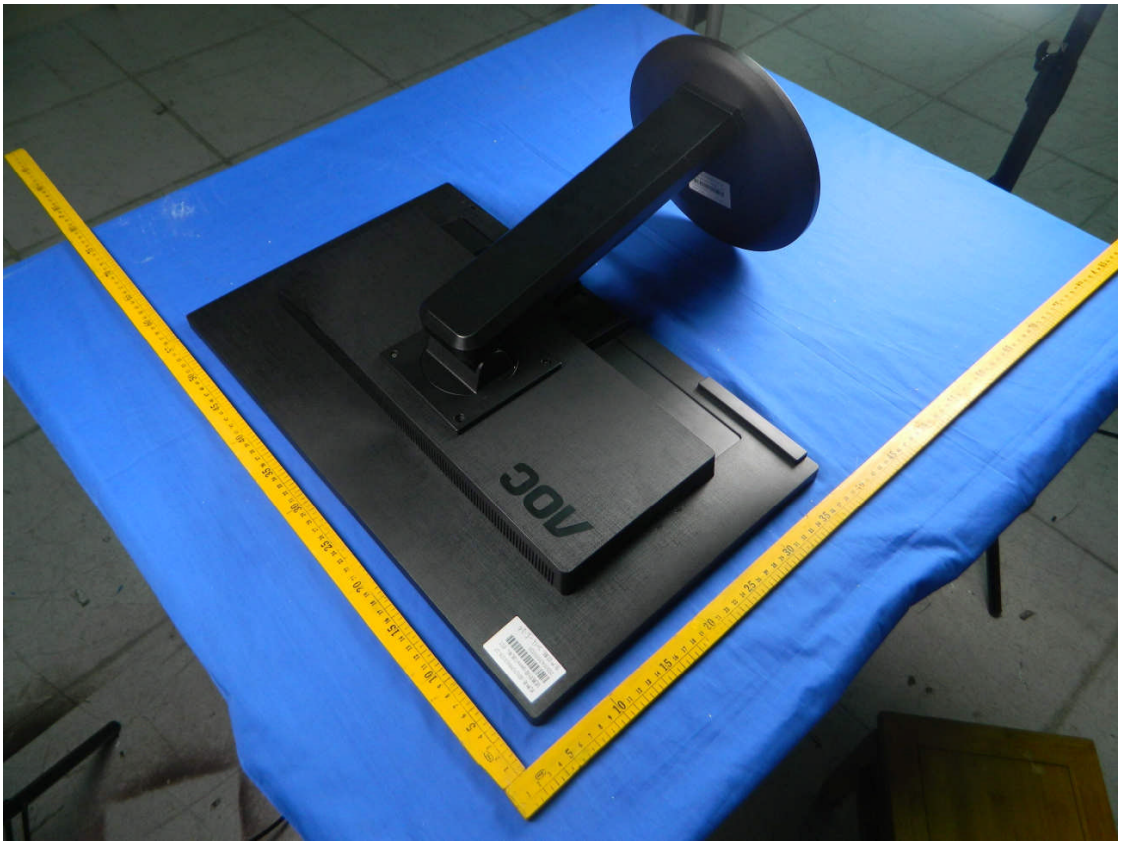





MENU


AOC




AOC