

FCC PART 15 CLASS B  
EMI MEASUREMENT AND TEST REPORT  
For

WENZHOU MTLC ELECTRIC APPLIANCES CO., LTD.  
Tiancheng Industrial Zone, Yueqing, Zhejiang 325608, China

**FCC ID: ZZH-MWS**

April 24, 2012

This Report Concerns: Original Report	Equipment Type: Receptacle
Test Engineer:	Eric Li <i>Eric Li</i>
Report No.:	BST12040063Y-1ER-3
Receive EUT Date/Test Date:	April 18, 2012/ April 19-23, 2012
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## **1. GENERAL INFORMATION**

### **1.1. Report information**

1.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BST approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BST in any way guarantees the later performance of the product/equipment.

1.1.2.The sample/s mentioned in this report is/are supplied by Applicant, BST therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BST, unless the applicant has authorized BST in writing to do so.

Test Facility -

The test site used to collect the radiated data is located on the address of SinTek Laboratory Co.,Ltd.

(FCC Registered Test Site Number: 963441) on

No.7, Xinshidai Industrial, Guantian Village, Shiyan Town, Baoan District, Shenzhen, Guangdong 518108, China

The Test Site is constructed and calibrated to meet the FCC requirements.

### **1.2. Measurement Uncertainty**

Available upon request.

## 2. PRODUCT DESCRIPTION

### 2.1. EUT Description

Applicant : WENZHOU MTLC ELECTRIC APPLIANCES CO., LTD.  
 Address : Tiancheng Industrial Zone, Yueqing, Zhejiang 325608, China  
 Manufacturer : WENZHOU MTLC ELECTRIC APPLIANCES CO., LTD.  
 Address : Tiancheng Industrial Zone, Yueqing, Zhejiang 325608, China  
 EUT Description : Receptacle  
 Model Number : MWS  
 Frequency : 315MHz  
 Power Supply : AC 100-277V, 50/60Hz

### 2.2. Block Diagram of EUT Configuration

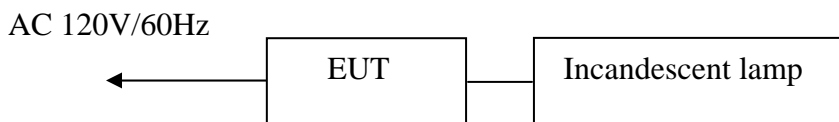


Figure 1 EUT Setup

### 2.3. Support Equipment List

Name	Model No	S/N	Manufacturer	Used “ ”
N/A	N/A	N/A	N/A	N/A

### 2.4. Test Conditions

Temperature: 20~25  
 Relative Humidity: 50~63 %

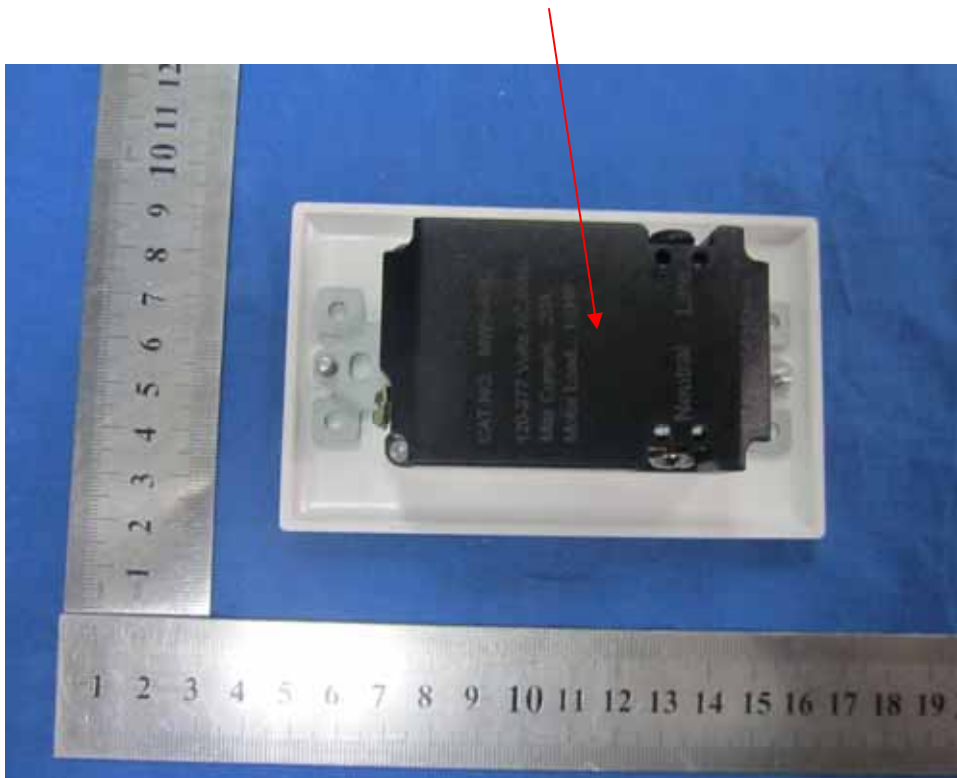
### 3. FCC ID LABEL

**FCC ID: ZZH-MWS**

**This device complies with Part 15 of the FCC Rules. Operation 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.**

#### Label Location on EUT

#### EUT View/ FCC ID Label Location



#### 4. TEST RESULTS SUMMARY

**Table 1 Test Results Summary**

Test Items	Test Results
Conducted disturbance	Pass
Radiated disturbance	Pass

Remark: "N/A" means "Not applicable."

Statement: All testing was performed using the test procedures found in ANSI C63.4-2003.

##### **Modifications**

No modification was made.

## 5. TEST EQUIPMENT USED

Equipment/Facilities	Manufacturer	Model #	Serial no.	Date of Cal.	Cal. Interval
Cable	Resenberger	N/A	NO.1	Mar 10 , 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Mar 10 , 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Mar 10 , 2012	1 Year
LISN	Rohde & Schwarz	ESH3-Z5	100305	Mar 10 , 2012	1 Year
50 Coaxial Switch	ANRITSU CORP	MP59B	6200283933	Mar 10 , 2012	1 Year
EMI Test Receiver	Rohde & Schwarz	ESP13	100180	Oct.11,2011	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSP40	100273	Sep.10,2011	1 Year
Spectrum Analyzer	Agilent	E4446A	US44300459	Sep.10,2011	1 Year
3m Semi-Anechoic Chamber	Albatross Projects	9m×6m×6m	N/A	Feb.20,2012	1 Year
Signal Generator	FLUKE	PM5418 - Y/C	LO747012	Feb.20,2012	1 Year
Signal Generator	FLUKE	PM5418TX	LO738007	Feb.20,2012	1 Year
Loop Antenna	SCHWARZBECK	FMZB1516	113	Jan.30,2012	1 Year
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4079	Sep.22,2011	1 Year
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-564	Sep.22,2011	1 Year
Ultra Broadband Antenna	Rohde & Schwarz	HL-562	100110	June.15,2011	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100196	Oct.11,2011	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100197	Oct.11,2011	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
Power Meter	Rohde & Schwarz	NRVD	100041	Feb.20,2012	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Feb.20,2012	1 Year
Coaxial Cable with N-connectors	SCHWARZBECK	AK9515H	95549	Sep.22,2011	1 Year
Radio Communication Test Set	Rohde & Schwarz	CMS 54	846621/024	Feb.20,2012	1 Year
Modulation Analyzer	Hewlett-Packard	8901B	2303A00362	Feb.20,2012	1 Year
Absorbing clamp	Rohde & Schwarz	MDS-21	N/A	Oct.11,2011	1 Year

## 6. CONDUCTED EMISSION TEST

### 6.1. Block Diagram of Test Setup

#### 6.1.1. Block Diagram of connection between the EUT and the simulators

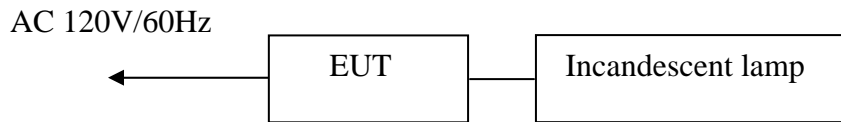
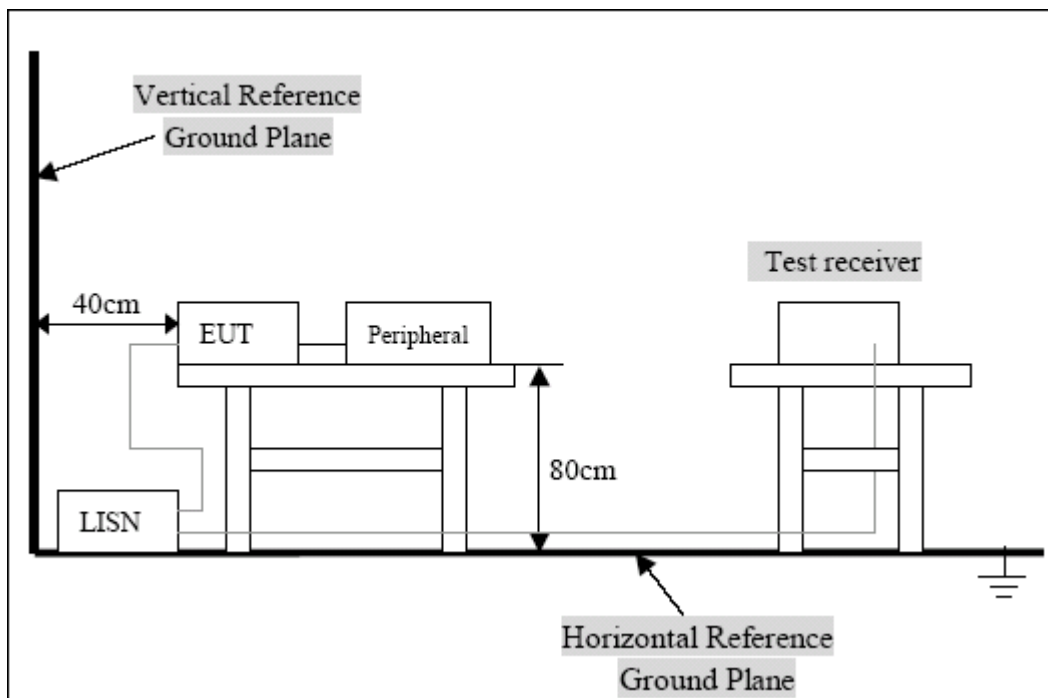


Figure 1 EUT Setup

#### 6.1.2. Test Setup Diagram



### 6.2. Test Standard

FCC Part 15 CLASS B

ANSI C63.4 2003



**6.3. Conducted Emission Limit(Class B)**

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

**6.4. EUT Configuration on Test**

The following equipments are installed on conducted emission test to meet FCC Part 15 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

**6.5. Operating Condition of EUT**

- 6.5.1. Setup the EUT and simulators as shown in Section 6.1.
- 6.5.2. Turn on the power of all equipments.
- 6.5.3. Let the EUT work in test mode (RX) and test it.

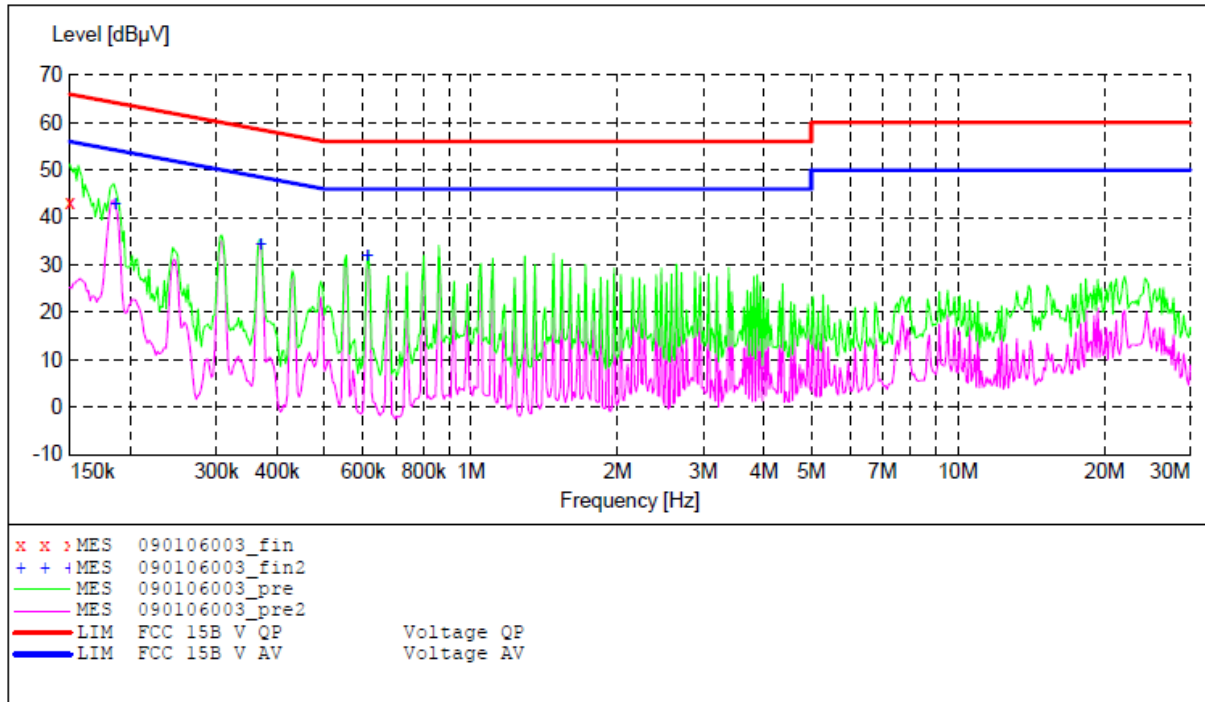
**6.6. Test Procedure**

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

**6.7. Test Result**

**Pass**

N Line



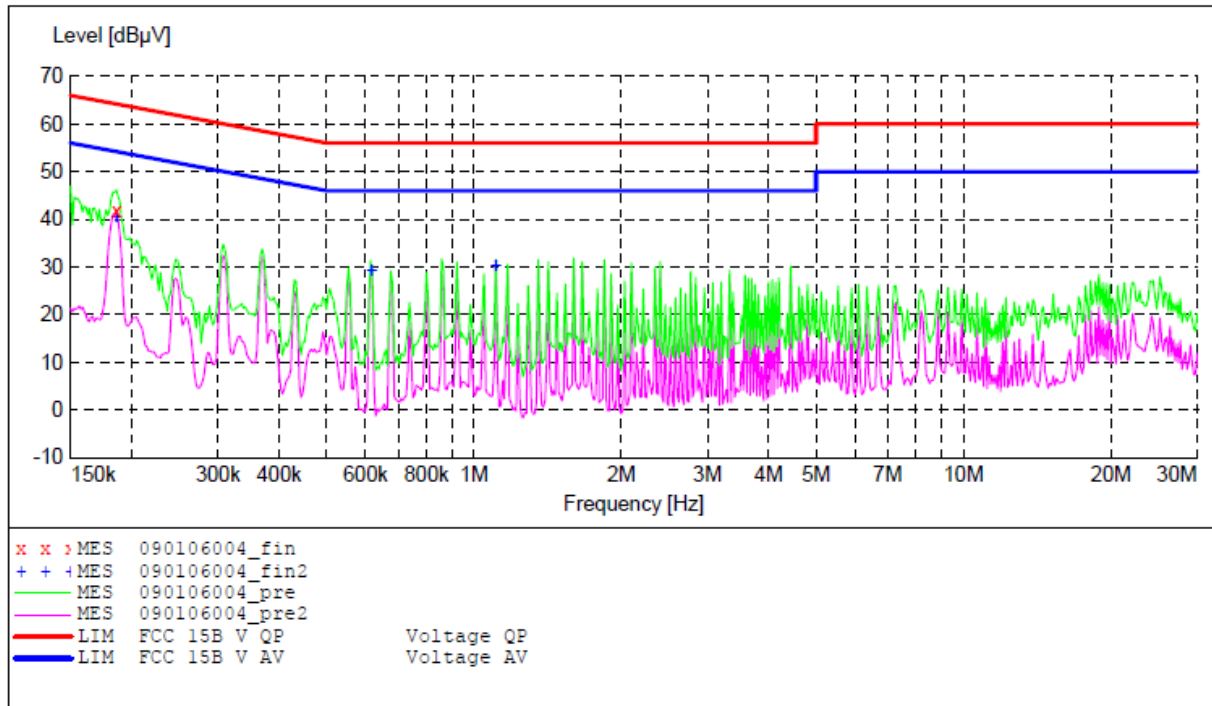
**MEASUREMENT RESULT: "090106003\_fin"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	43.10	11.0	66	22.9	QP	N	GND

**MEASUREMENT RESULT: "090106003\_fin2"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.186000	42.90	11.2	54	11.3	AV	N	GND
0.370500	34.50	11.8	49	14.0	AV	N	GND
0.613500	32.00	12.0	46	14.0	AV	N	GND

L Line



**MEASUREMENT RESULT: "090106004\_fin"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.186000	41.70	11.2	64	22.5	QP	L1	GND

**MEASUREMENT RESULT: "090106004\_fin2"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.186000	40.40	11.2	54	13.8	AV	L1	GND
0.618000	29.20	11.9	46	16.8	AV	L1	GND
1.108500	30.30	11.8	46	15.7	AV	L1	GND

## 7. RADIATED EMISSION MEASUREMENT

### 7.1. Block Diagram of EUT Configuration

7.1.1. Block Diagram of connection between the EUT and the simulators

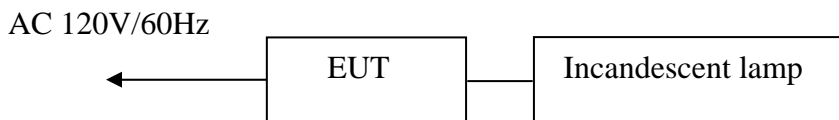
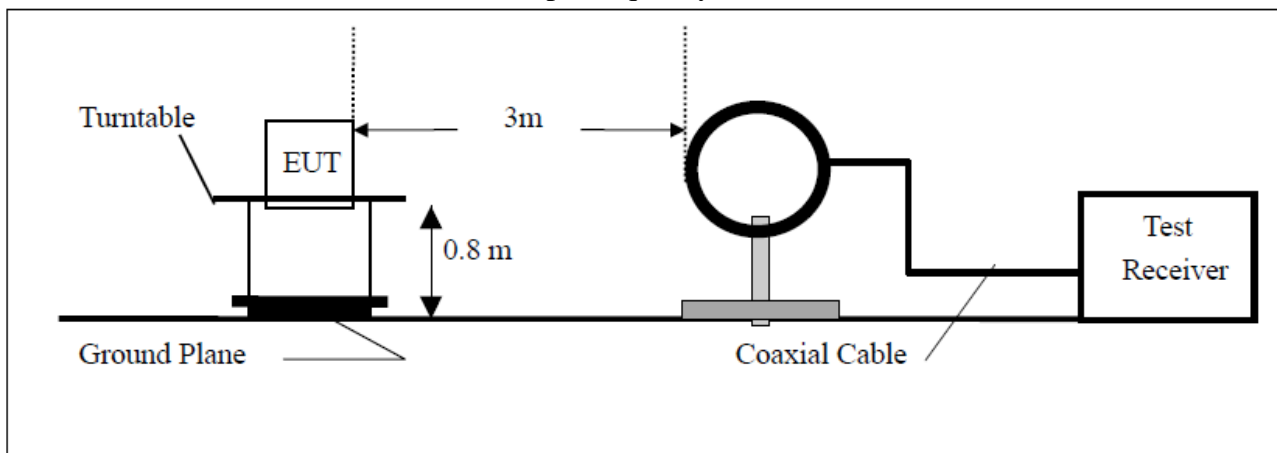


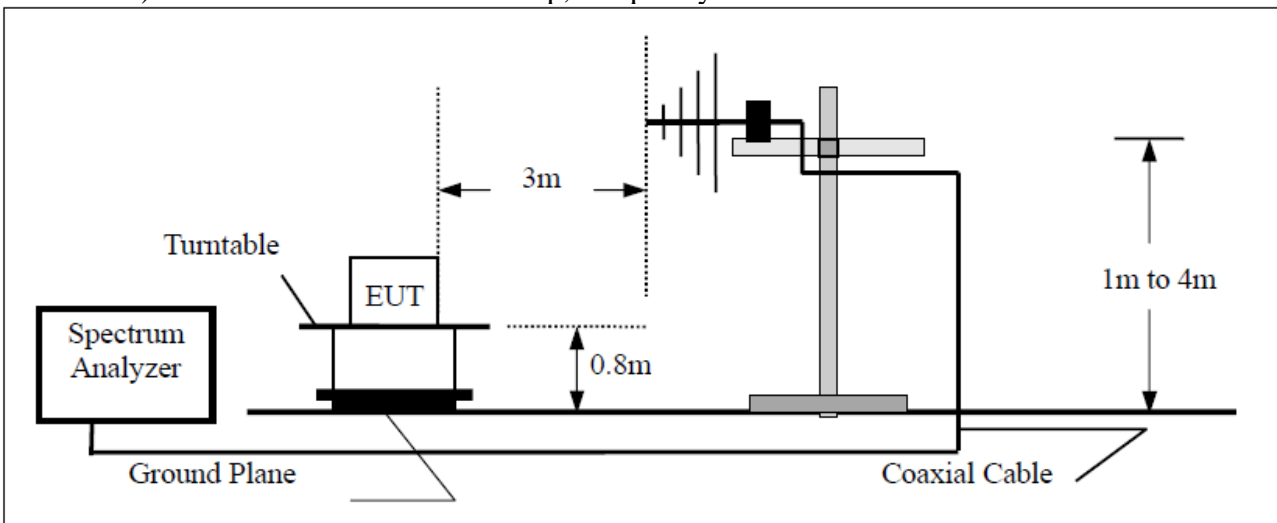
Figure 1 EUT Setup

7.1.2. Radiated Test Setup Diagram

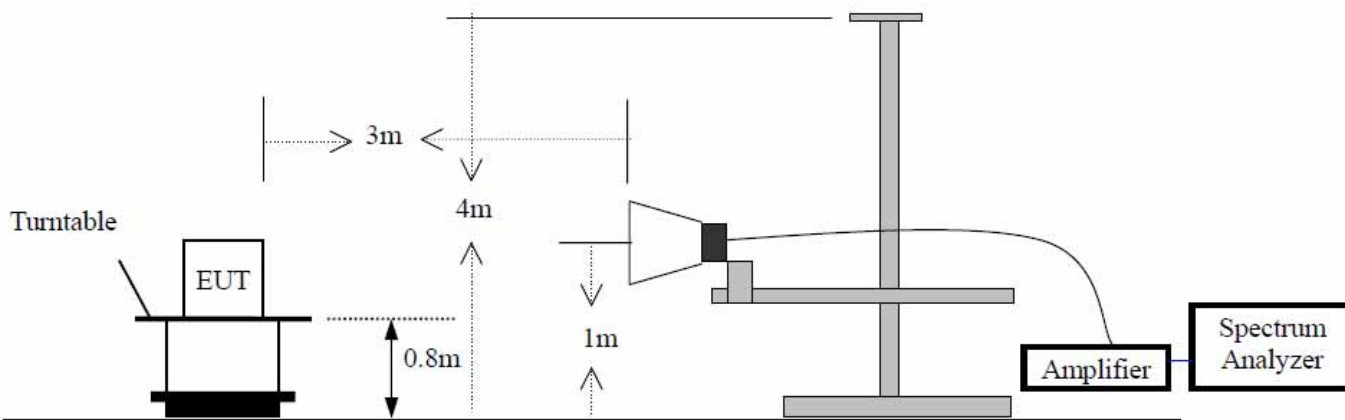
1) Radiated Emission Test Set-Up, Frequency Below 30MHz



2) Radiated Emission Test Set-Up, Frequency Below 1000MHz



3) Radiated Emission Test Set-Up, Frequency above 1000MHz



7.2. Test Standard

FCC Part 15 CLASS B  
ANSI C63.4 2003

7.3. Radiated Emission Limit(Class B)

Frequency (MHz)	Limit			The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	Measurement distance (m)	
0.009 - 0.490	2400/F(kHz)	/	300	
0.490 - 1.705	24000/F(kHz)	/	30	
1.705-30	30	29.5	30	
30 - 88	100	40	3	
88 - 216	150	43.5	3	
216 - 960	200	46	3	
Above 960	500	54	3	

- Note: (1) RF Voltage (dBuV)=20 log Voltage(uV)  
 (2) In the Above Table,the tighter limit applies at the band edges.  
 (3) Distaqnce refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### **7.4. EUT Configuration on Test**

The following equipment are installed on Radiated Emission Measurement to meet the Commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### **7.5. Operating Condition of EUT**

- 7.5.1. Setup the EUT as shown on Section 7.1
- 7.5.2. Turn on the power of all equipments.
- 7.5.3. Let the EUT work in test mode (RX) and measure it.

#### **7.6. Test Procedure**

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level.

Calibrated Loop antenna is used as receiving antenna for frequencies below 30MHz, Calibrated Bilog antenna is used as receiving antenna for frequencies between 30 MHz and 1 GHz, Calibrated Horn antenna is used as receiving antenna for frequencies above 1000MHz. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9kHz to 2GHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Peak detector and Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

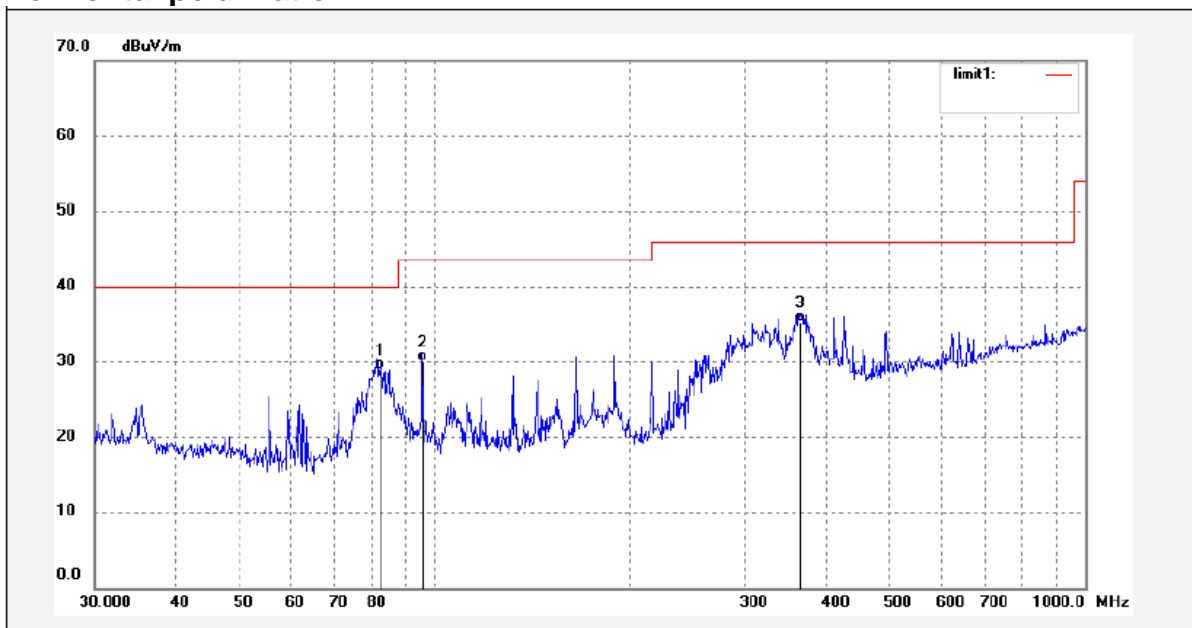
Through three orthogonal axes to determine which attitude and equipment arrangement produces the

#### **7.7. Test Result**

**PASS**

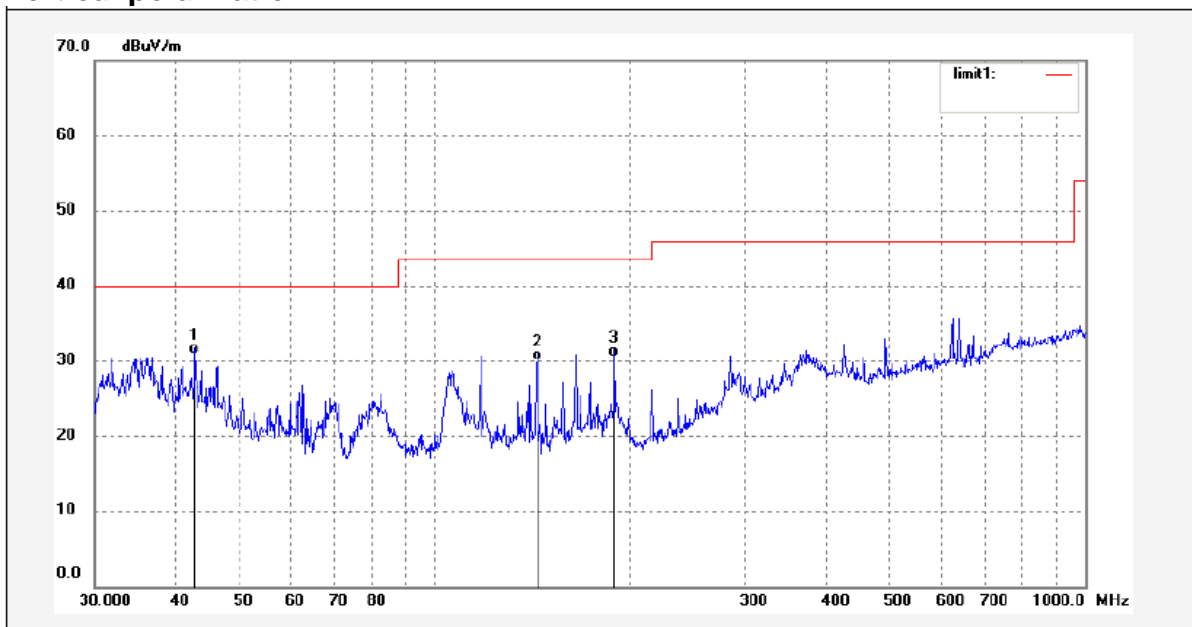
Below 1GHz

**Horizontal polarization**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	82.0739	15.51	13.49	29.00	40.00	-11.00	QP	
2	96.6483	16.03	14.06	30.09	43.50	-13.41	QP	
3	366.8025	13.83	21.49	35.32	46.00	-10.68	QP	

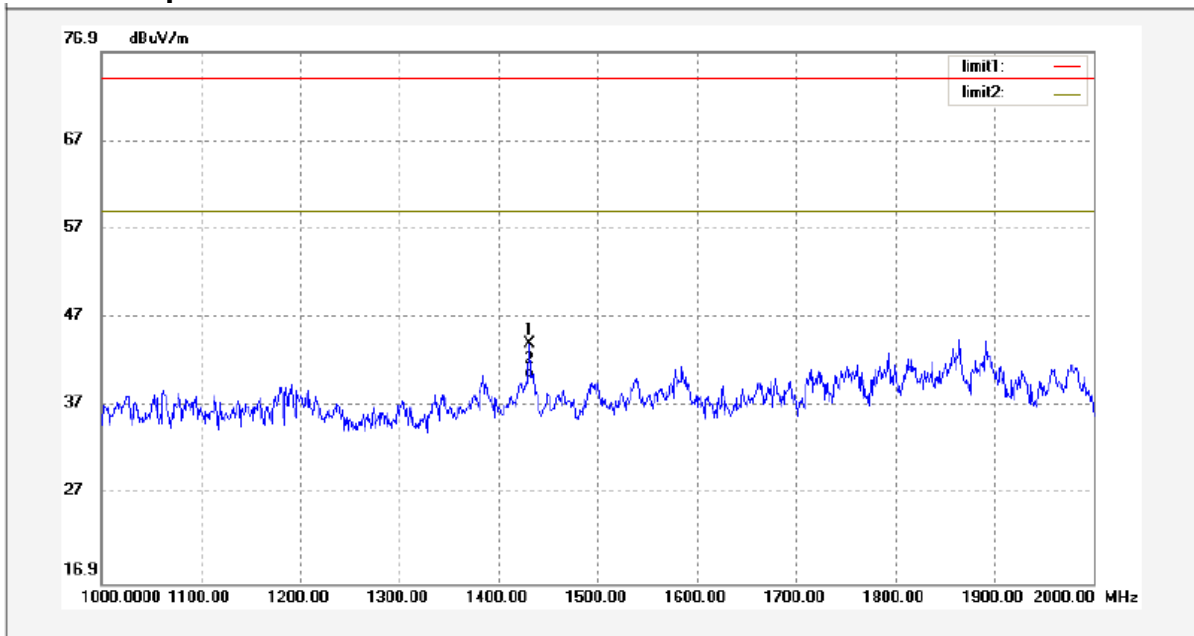
**Vertical polarization**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.0798	14.04	16.87	30.91	40.00	-9.09	QP	
2	144.7760	15.55	14.48	30.03	43.50	-13.47	QP	
3	190.1074	15.66	14.87	30.53	43.50	-12.97	QP	

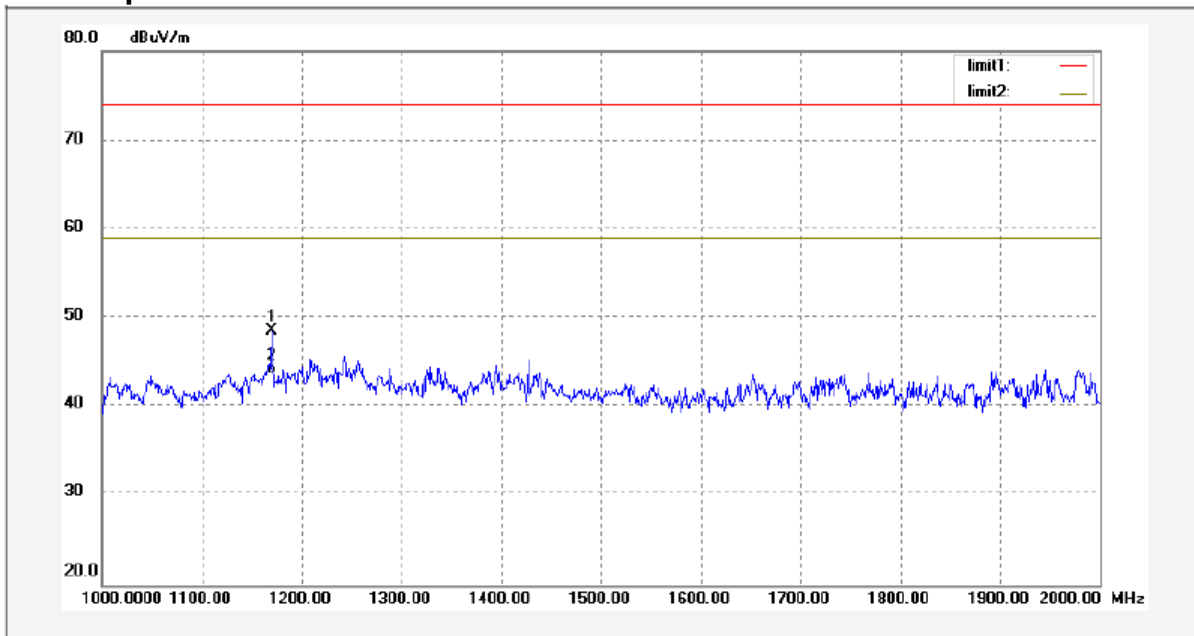
Above 1GHz

**Horizontal polarization**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1431.000	49.08	-5.05	44.03	74.00	-29.97	peak	
2	1431.000	45.08	-5.05	40.03	59.00	-18.97	AVG	

**Vertical polarization**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1170.000	54.35	-5.79	48.56	74.00	-25.44	peak	
2	1170.000	49.35	-5.79	43.56	59.00	-15.44	AVG	