

# FCC Test Report

APPLICANT : Motorola Mobility, Inc.  
EQUIPMENT : Mobile Phone  
BRAND NAME : MOTOROLA  
MODEL NAME : XT611  
GPPD NUMBER : 3195  
FCC ID : IHDP56MM1  
STANDARD : FCC 47 CFR FCC Part 15 Subpart B  
CLASSIFICATION : Certification

The product was received on Sep. 30, 2011 and completely tested on Nov. 28, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



## TABLE OF CONTENTS

REVISION HISTORY .....	3
SUMMARY OF TEST RESULT .....	4
<b>1. GENERAL DESCRIPTION .....</b>	<b>5</b>
1.1. Applicant.....	5
1.2. Manufacturer .....	5
1.3. Feature of Equipment Under Test.....	6
1.4. Test Site .....	7
1.5. Applied Standards .....	7
1.6. Ancillary Equipment List.....	7
<b>2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST .....</b>	<b>8</b>
2.1. Test Mode .....	8
2.2. Connection Diagram of Test System .....	10
2.3. Test Software .....	11
<b>3. TEST RESULT .....</b>	<b>12</b>
3.1. Test of AC Conducted Emission Measurement .....	12
3.2. Test of Radiated Emission Measurement .....	18
<b>4. LIST OF MEASURING EQUIPMENT .....</b>	<b>22</b>
<b>5. UNCERTAINTY OF EVALUATION .....</b>	<b>23</b>





### SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	7.2.4	AC Conducted Emission	< 15.107 limits < RSS-Gen table 2 limits	PASS	Under limit 4.20 dB at 1.902 MHz
3.2	15.109	7.2.3.2	Radiated Emission	< 15.109 limits or < RSS-Gen table 1 limits (Section 6)	PASS	Under limit 9.05 dB at 663.300 MHz



## **1. General Description**

### **1.1. Applicant**

**Motorola Mobility, Inc.**

600 N. US Highway 45 Libertyville, IL 60048-1286 U.S.A.

### **1.2. Manufacturer**

**Chi Mei Communication Systems, Inc.**

No. 4, Mingsheng Street, Tucheng District, New Taipei City, 23678, Taiwan

### 1.3. Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile Phone
Brand Name	MOTOROLA
Model Name	XT611
FCC ID	IHDP56MM1
Tx Frequency Range	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz WLAN : 2400 MHz ~ 2483.5 MHz
Rx Frequency Range	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz WLAN : 2400 MHz ~ 2483.5 MHz GPS : 1.57542 GHz
Antenna Type	WWAN : Fixed Internal Antenna WLAN/Bluetooth : PIFA Antenna
HW Version	V2.1
SW Version	4_410_9000
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK 802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) GPS : BPSK
EUT Stage	Identical Prototype

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4. Test Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	CO05-HY	03CH06-HY	722060/4086B-1

## 1.5. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2003
- IC RSS-Gen Issue 3

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 1.6. Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
5.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

## 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The EUT uses a USB interface and microprocessor operating 800MHz which is the maximum frequency used.

The following tables are showing the test modes as the worst cases and recorded in this report.

Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Charging Mode (EUT with adapter)	☒	☒	Note 1
2.	Data application transferred mode (EUT with notebook)	☒	☒	☒

**Abbreviations:**

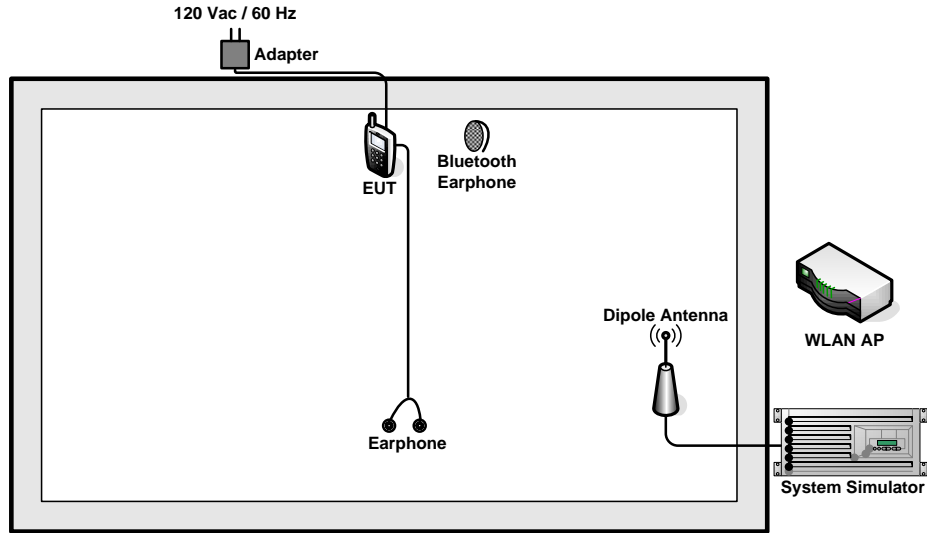
- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

**Note 1:** Testing for this mode is not required or not the worst case.

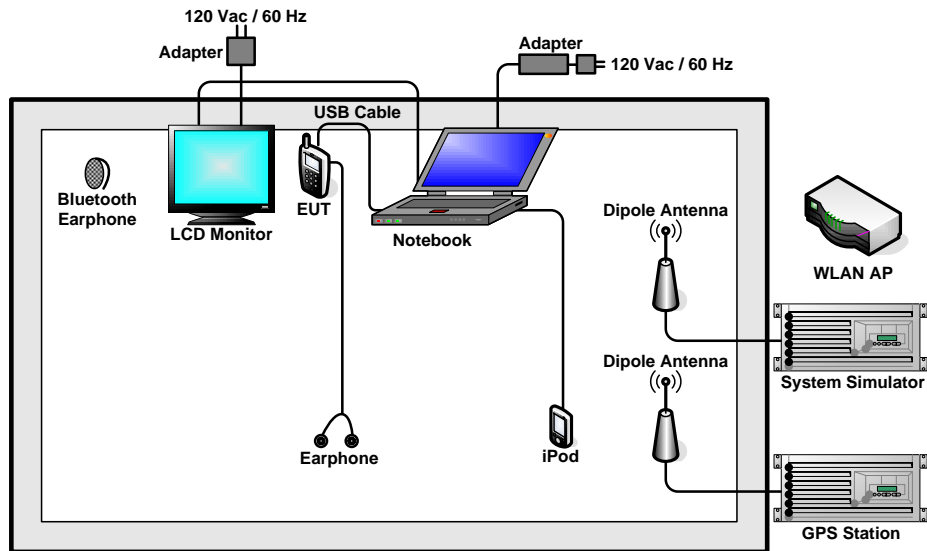
**Remark:** For signal above 1GHZ, the worst case was test item 2.

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + Earphone + MPEG4 + USB Cable (Charging from Adapter) + Battery <Fig. 1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Earphone + Camera + USB Cable (Charging from Adapter) + Battery <Fig. 1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + USB Cable (Data Link with Notebook) + Battery <Fig. 2>
Radiated Emissions < 1GHz	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + Earphone + MPEG4 + USB Cable (Charging from Adapter) + Battery <Fig. 1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Earphone + Camera + USB Cable (Charging from Adapter) + Battery <Fig. 1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + USB Cable (Data Link with Notebook) + Battery <Fig. 2>
Radiated Emissions ≥ 1GHz	2	Mode 1: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + USB Cable (Data Link with Notebook) + Battery <Fig. 2>
<b>Remark:</b> <ol style="list-style-type: none"> <li>1. The worst case of AC is mode 2; only the test data of this mode was reported.</li> <li>2. The worst case of RE &lt; 1G is mode 3; only the test data of this mode was reported.</li> <li>3. Link with Notebook means data application transferred mode between EUT and Notebook.</li> </ol>		

## 2.2. Connection Diagram of Test System



<Fig. 1>



<Fig. 2>



## **2.3. Test Software**

The EUT was in GSM or WCDMA idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Execute the program, "Winthrax", installed in notebook for active sync files transfer with EUT via USB cable.
2. Execute "GPS Test" to make the EUT receive signals from GPS station continuously.
3. Execute "Video Player" to play MPEG4 files.
4. Turn on camera to capture images.

### 3. Test Result

#### 3.1. Test of AC Conducted Emission Measurement

##### 3.1.1 Limits of AC Conducted Emission

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.

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

\*Decreases with the logarithm of the frequency.

##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

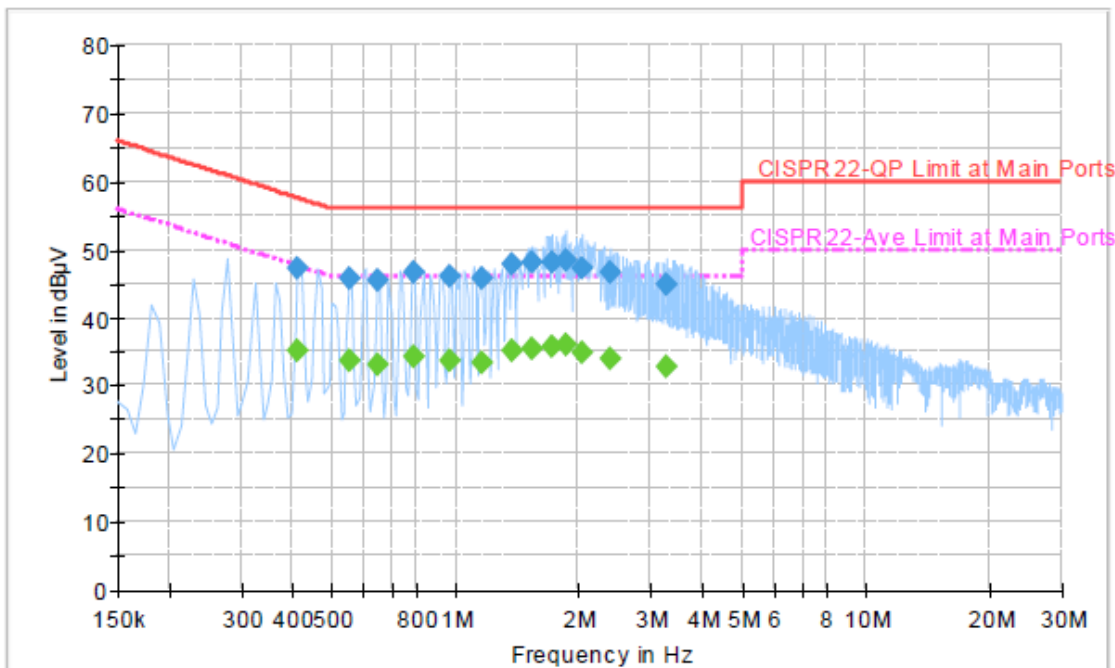
##### 3.1.3 Test Procedure

1. 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.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.



### 3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Aslen Chiu	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN Idle + Earphone + Camera + USB Cable (Charging from Adapter) + Battery		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



#### Final Result 1

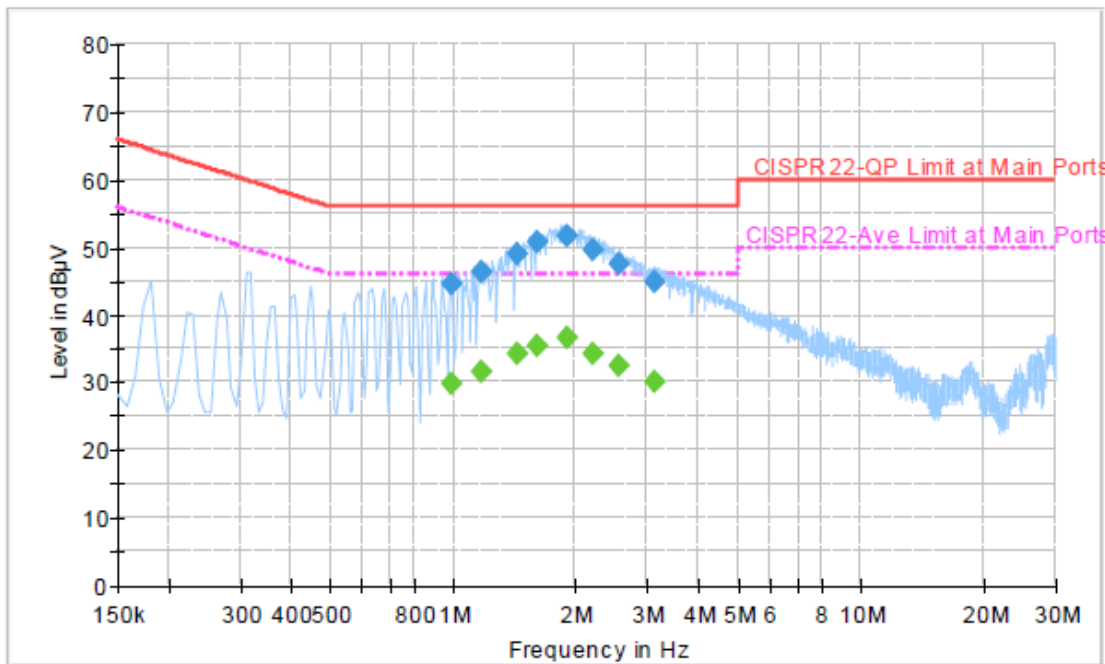
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.414000	47.3	Off	L1	19.5	10.3	57.6
0.550000	45.8	Off	L1	19.4	10.2	56.0
0.646000	45.4	Off	L1	19.4	10.6	56.0
0.790000	46.5	Off	L1	19.4	9.5	56.0
0.974000	46.1	Off	L1	19.4	9.9	56.0
1.158000	45.9	Off	L1	19.4	10.1	56.0
1.382000	47.7	Off	L1	19.4	8.3	56.0
1.718000	48.2	Off	L1	19.4	7.8	56.0
1.862000	48.3	Off	L1	19.4	7.7	56.0
2.038000	47.2	Off	L1	19.4	8.8	56.0
2.374000	46.6	Off	L1	19.5	9.4	56.0
3.270000	45.0	Off	L1	19.5	11.0	56.0



Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	35.1	Off	L1	19.5	12.5	47.6
0.550000	33.6	Off	L1	19.4	12.4	46.0
0.646000	33.0	Off	L1	19.4	13.0	46.0
0.790000	34.1	Off	L1	19.4	11.9	46.0
0.974000	33.8	Off	L1	19.4	12.2	46.0
1.158000	33.5	Off	L1	19.4	12.5	46.0
1.382000	35.0	Off	L1	19.4	11.0	46.0
1.718000	35.8	Off	L1	19.4	10.2	46.0
1.862000	36.0	Off	L1	19.4	10.0	46.0
2.038000	34.8	Off	L1	19.4	11.2	46.0
2.374000	34.0	Off	L1	19.5	12.0	46.0
3.270000	32.7	Off	L1	19.5	13.3	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Aslen Chiu	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN Idle + Earphone + Camera + USB Cable (Charging from Adapter) + Battery		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.990000	44.7	Off	N	19.5	11.3	56.0
1.174000	46.2	Off	N	19.5	9.8	56.0
1.438000	49.1	Off	N	19.5	6.9	56.0
1.614000	50.7	Off	N	19.5	5.3	56.0
1.902000	51.8	Off	N	19.5	4.2	56.0
2.214000	49.5	Off	N	19.5	6.5	56.0
2.550000	47.5	Off	N	19.5	8.5	56.0
3.126000	44.8	Off	N	19.5	11.2	56.0



Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.990000	29.9	Off	N	19.5	16.1	46.0
1.174000	31.6	Off	N	19.5	14.4	46.0
1.438000	34.2	Off	N	19.5	11.8	46.0
1.614000	35.3	Off	N	19.5	10.7	46.0
1.902000	36.6	Off	N	19.5	9.4	46.0
2.214000	34.1	Off	N	19.5	11.9	46.0
2.550000	32.6	Off	N	19.5	13.4	46.0
3.126000	30.2	Off	N	19.5	15.8	46.0



### 3.2. Test of Radiated Emission Measurement

#### 3.2.1. Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

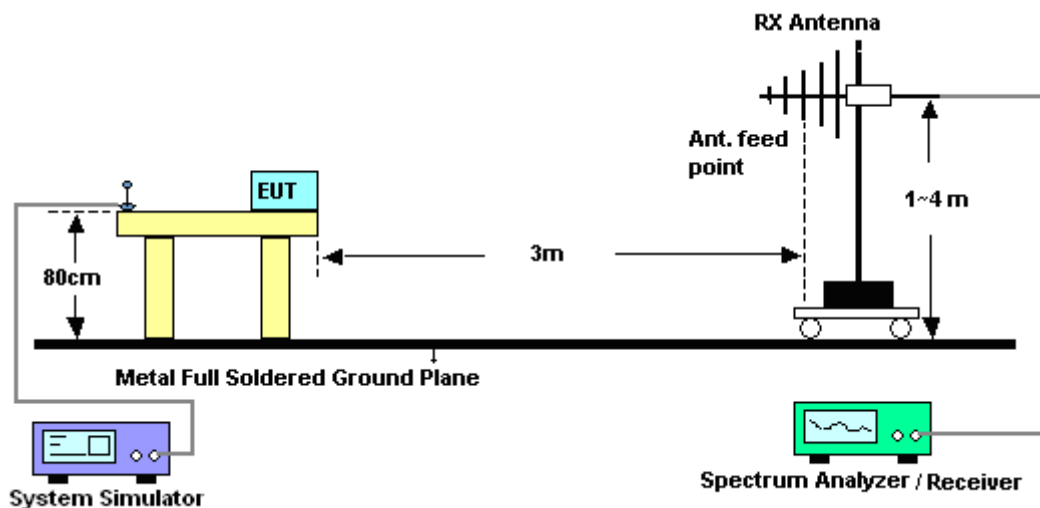
#### 3.2.2. Measuring Instruments

See list of measuring instruments of this test report.

**3.2.3. Test Procedures**

1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. 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 turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported
8. Emission level (dBuV/m) = 20 log Emission level (uV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

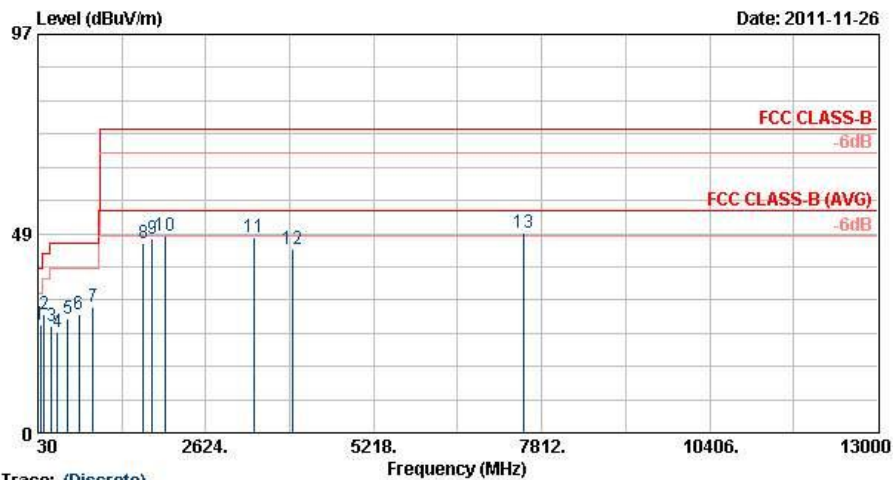
**3.2.4. Test Setup of Radiated Emission**





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 3	Temperature :	23~25°C
Test Engineer :	Eric Shih	Relative Humidity :	49~51%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + USB Cable (Data Link with Notebook) + Battery		
Remark :	#7 is system simulator signal which can be ignored.		

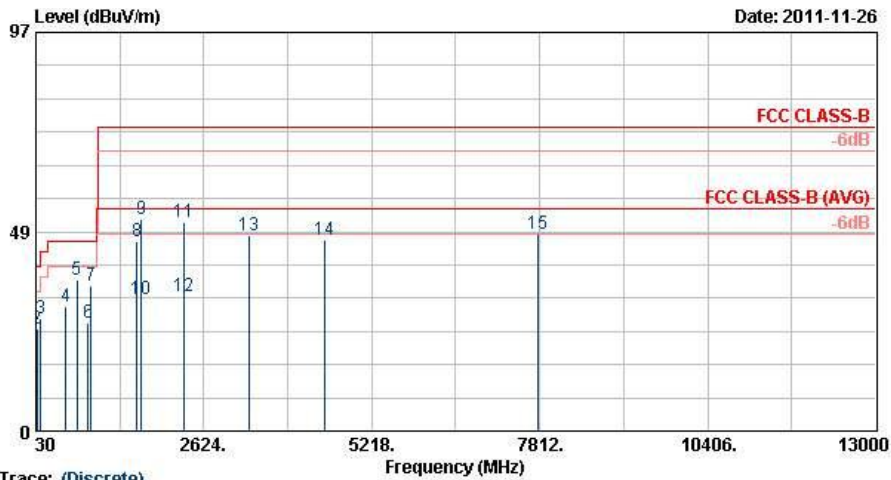


Trace: (Discrete)  
 Site : 03CR06-RY  
 Condition : FCC CLASS-B HF-ANT\_110802 HORIZONTAL  
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	75.63	26.32	-13.68	40.00	50.50	6.65	0.87	31.69	103	47	Peak
2	129.63	28.82	-14.68	43.50	47.33	11.80	1.39	31.70	---	---	Peak
3	239.79	26.03	-19.97	46.00	44.15	11.30	2.24	31.65	---	---	Peak
4	332.90	24.66	-21.34	46.00	40.13	13.75	2.36	31.58	---	---	Peak
5	498.80	27.88	-18.12	46.00	39.14	17.60	2.92	31.78	---	---	Peak
6	663.30	28.80	-17.20	46.00	38.17	19.16	3.45	31.98	---	---	Peak
7	881.40	30.57	-15.43	46.00	37.88	20.61	3.81	31.72	---	---	Peak
8	1660.00	46.07	-27.93	74.00	66.76	29.03	4.39	54.12	---	---	Peak
9	1796.00	47.32	-26.68	74.00	66.88	30.02	4.58	54.17	---	---	Peak
10	1990.00	47.93	-26.07	74.00	65.90	31.38	4.89	54.24	---	---	Peak
11	3372.00	47.47	-26.53	74.00	62.97	32.65	6.55	54.70	---	---	Peak
12	3974.00	44.71	-29.29	74.00	59.46	33.09	7.32	55.16	---	---	Peak
13	7542.00	48.61	-25.39	74.00	58.01	35.51	11.31	56.21	102	95	Peak



Test Mode :	Mode 3	Temperature :	23~25°C
Test Engineer :	Eric Shih	Relative Humidity :	49~51%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + USB Cable (Data Link with Notebook) + Battery		
Remark :	#6 is mobile station signal which can be ignored. #7 is system simulator signal which can be ignored.		



Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B HF-ANT\_110802 VERTICAL  
 Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	29.65	-10.35	40.00	42.17	18.80	0.40	31.72	---	---	Peak
2	48.09	24.83	-15.17	40.00	47.04	8.87	0.63	31.71	---	---	Peak
3	101.28	27.28	-16.22	43.50	46.66	11.28	1.02	31.68	---	---	Peak
4	498.80	30.24	-15.76	46.00	41.50	17.60	2.92	31.78	---	---	Peak
5 @	663.30	36.95	-9.05	46.00	46.32	19.16	3.45	31.98	104	53	Peak
6	831.30	26.23			34.21	20.21	3.73	31.93	---	---	Peak
7	881.40	35.19			42.49	20.61	3.81	31.72	---	---	Peak
8	1588.00	46.12	-27.88	74.00	67.44	28.54	4.24	54.09	---	---	Peak
9	1660.00	51.44	-22.56	74.00	72.14	29.03	4.39	54.12	100	172	Peak
10	1660.00	32.20	-21.80	54.00	52.89	29.03	4.39	54.12	100	172	Average
11	2326.00	50.75	-23.25	74.00	67.95	31.83	5.31	54.34	100	330	Peak
12	2326.00	32.79	-21.21	54.00	49.99	31.83	5.31	54.34	100	330	Average
13	3318.00	47.74	-26.26	74.00	63.29	32.62	6.49	54.67	---	---	Peak
14	4500.00	46.41	-27.59	74.00	59.72	34.60	7.76	55.67	---	---	Peak
15	7788.00	47.90	-26.10	74.00	57.53	35.56	10.88	56.08	---	---	Peak



### 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receive	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Nov. 24, 2011 ~ Nov. 28, 2011	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Nov. 24, 2011 ~ Nov. 28, 2011	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 24, 2011 ~ Nov. 28, 2011	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Nov. 24, 2011 ~ Nov. 28, 2011	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 27, 2011	Nov. 26, 2011	Oct. 26, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000M Hz	May 10, 2011	Nov. 26, 2011	May 09, 2012	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 22, 2011	Nov. 26, 2011	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 01, 2011	Nov. 26, 2011	Jul. 31, 2012	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 21, 2011	Nov. 26, 2011	Oct. 20, 2012	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 14, 2011	Nov. 26, 2011	Apr. 13, 2012	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 14, 2011	Nov. 26, 2011	Apr. 13, 2012	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	114256	N/A	Feb. 15, 2011	Nov. 24, 2011~ Nov. 28, 2011	Feb. 14, 2012	-
GPS Station	Pendulum	GSG-54	N/A	N/A	N/A	Nov. 24, 2011~ Nov. 28, 2011	N/A	-

## 5. Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		



**Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)**

Contribution	Uncertainty of $X_i$		$u(X_i)$	$C_i$	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	$\pm 0.10$	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	$\pm 1.70$	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	$\pm 0.50$	Normal (k=2)	0.25	1	0.25
Receiver Correction	$\pm 2.00$	Rectangular	1.15	1	1.15
Antenna Factor Directional	$\pm 1.50$	Rectangular	0.87	1	0.87
Site Imperfection	$\pm 2.80$	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				