

# FCC Test Report

**APPLICANT** : Motorola Mobility, Inc.  
**EQUIPMENT** : Mobile Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : XT615  
**MARKETING NAME** : XT615  
**GPPD NUMBER** : 3192  
**FCC ID** : IHDP56MM6  
**STANDARD** : FCC 47 CFR FCC Part 15 Subpart B  
**CLASSIFICATION** : Certification

The product was received on Jan. 18, 2012 and completely tested on Jan. 20, 2012. 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.**

SPORTON INTERNATIONAL INC.

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FCC ID : IHDP56MM6

Page Number : 1 of 25

Report Issued Date : Jan. 31, 2012

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### 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 5.00 dB at 1.974 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 3.44 dB at 39.990 MHz for Peak



## **1. General Description**

### **1.1. Applicant**

**Motorola Mobility, Inc.**

8F., No. 9, Songgao Rd., Taipei 110, Taiwan, R.O.C.

### **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	XT615
Marketing Name	XT615
FCC ID	IHDP56MM6
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	PR3
SW Version	V1_470
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: 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	Production Unit

**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	03CH05-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	T&E	GS-50	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	Sony Ericsson	MW600	PY70DA2029	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:**

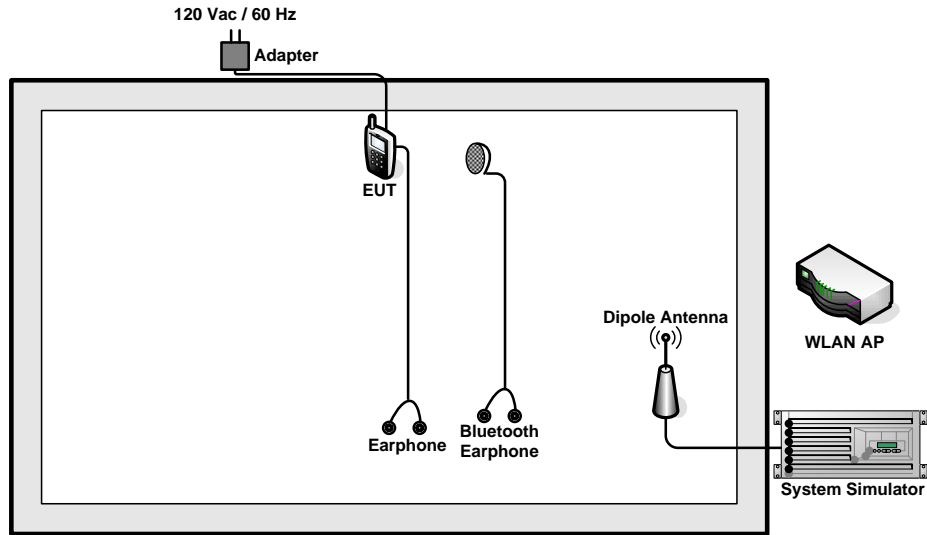
- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

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

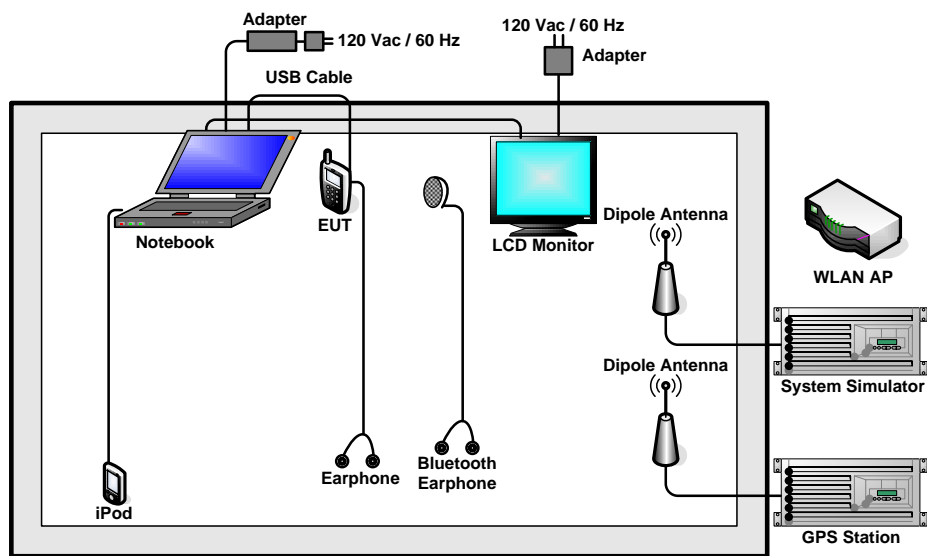
**Remark:** For signal above 1GHz, the worst case was test item 2.

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	<p>Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + Camera + USB Cable (Charging from Adapter) &lt;Fig. 1&gt;</p> <p>Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter) &lt;Fig. 1&gt;</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + Battery + USB Cable (Data Link with Notebook) &lt;Fig. 2&gt;</p>
Radiated Emissions < 1GHz	1/2	<p>Mode 1: GSM1900 Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + Camera + USB Cable (Charging from Adapter) &lt;Fig. 1&gt;</p> <p>Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter) &lt;Fig. 1&gt;</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + Battery + USB Cable (Data Link with Notebook) &lt;Fig. 2&gt;</p>
Radiated Emissions ≥ 1GHz	2	<p>Mode 1: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + Battery + USB Cable (Data Link with Notebook) &lt;Fig. 2&gt;</p>
<p><b>Remark:</b></p> <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. Data 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.

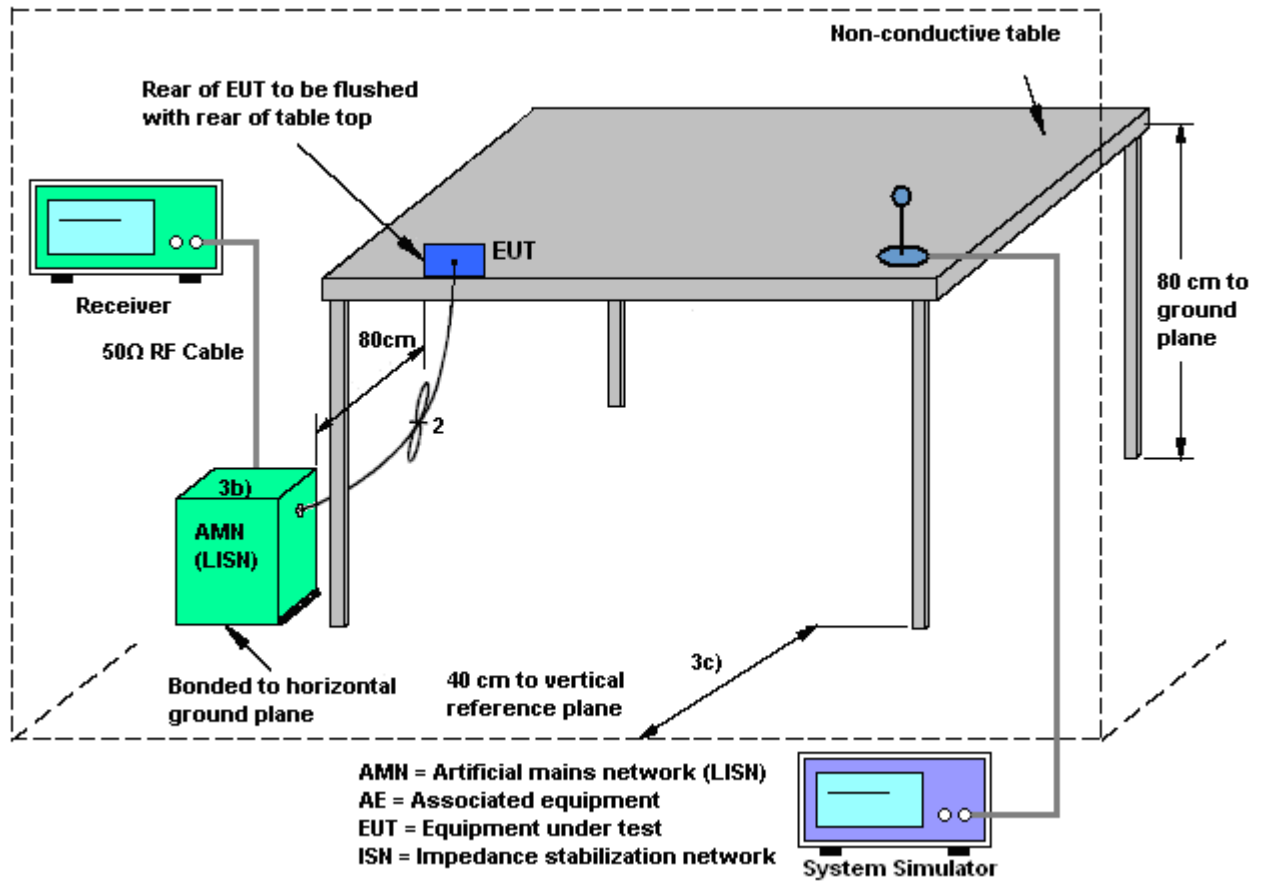
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedure

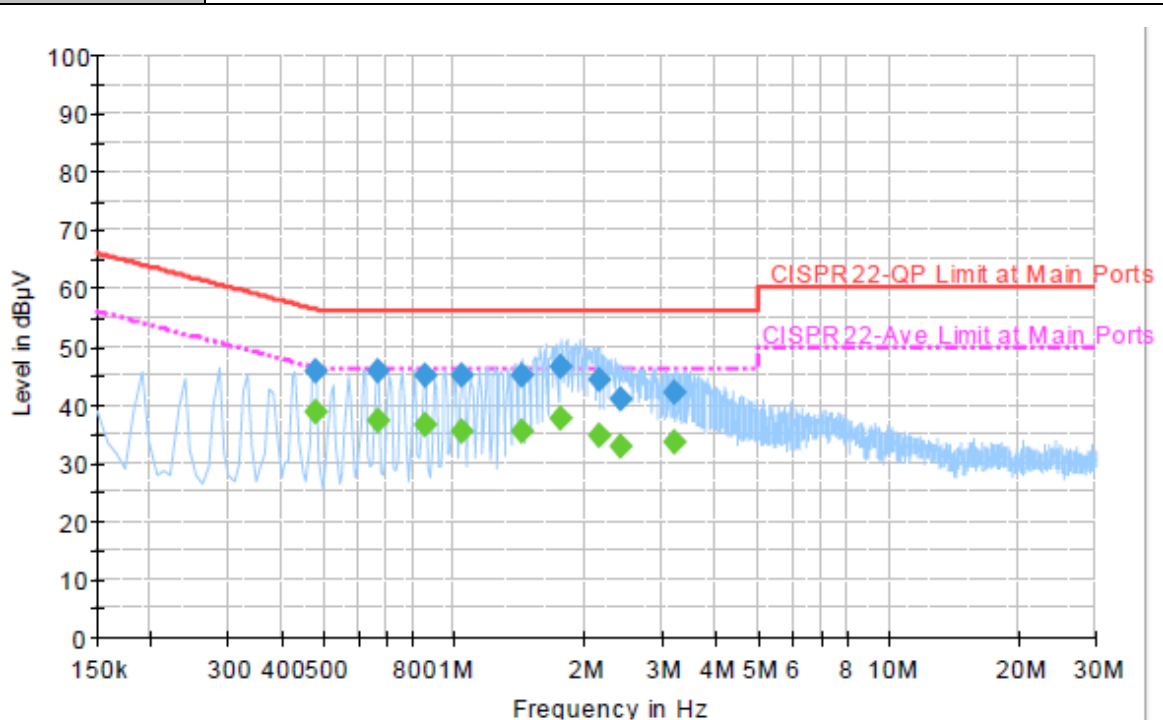
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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.

### 3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

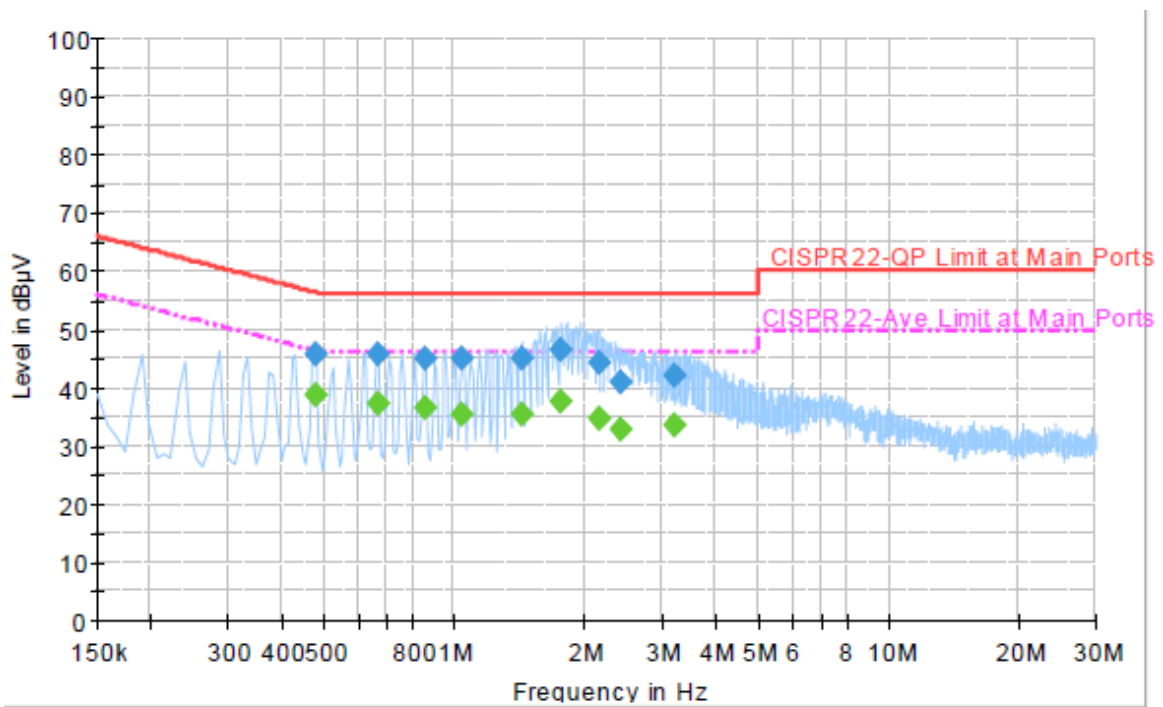
Test Mode :	Mode 2	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported 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)
0.478000	45.7	Off	L1	19.4	10.7	56.4
0.670000	45.7	Off	L1	19.4	10.3	56.0
0.854000	45.0	Off	L1	19.5	11.0	56.0
1.046000	45.2	Off	L1	19.4	10.8	56.0
1.430000	45.1	Off	L1	19.4	10.9	56.0
1.766000	46.4	Off	L1	19.4	9.6	56.0
2.150000	44.4	Off	L1	19.4	11.6	56.0
2.406000	41.0	Off	L1	19.5	15.0	56.0
3.214000	42.2	Off	L1	19.5	13.8	56.0

Test Mode :	Mode 2	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

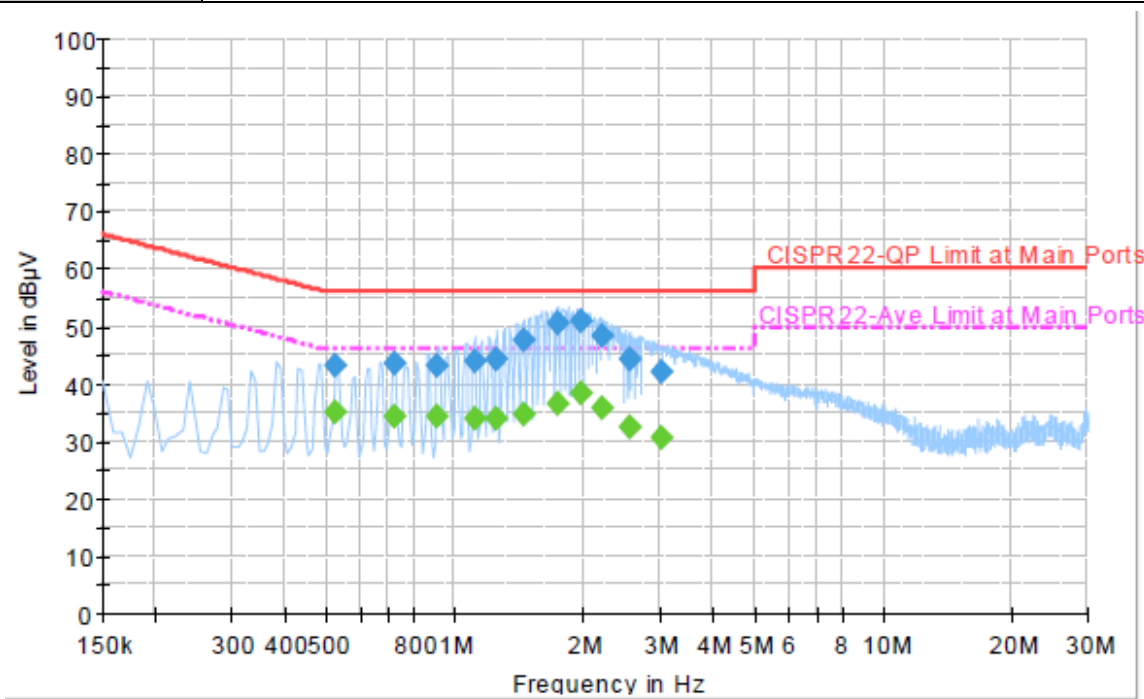


**Final Result 2**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.478000	38.9	Off	L1	19.4	7.5	46.4
0.670000	37.1	Off	L1	19.4	8.9	46.0
0.854000	36.7	Off	L1	19.5	9.3	46.0
1.046000	35.3	Off	L1	19.4	10.7	46.0
1.430000	35.6	Off	L1	19.4	10.4	46.0
1.766000	37.6	Off	L1	19.4	8.4	46.0
2.150000	34.6	Off	L1	19.4	11.4	46.0
2.406000	32.9	Off	L1	19.5	13.1	46.0
3.214000	33.5	Off	L1	19.5	12.5	46.0



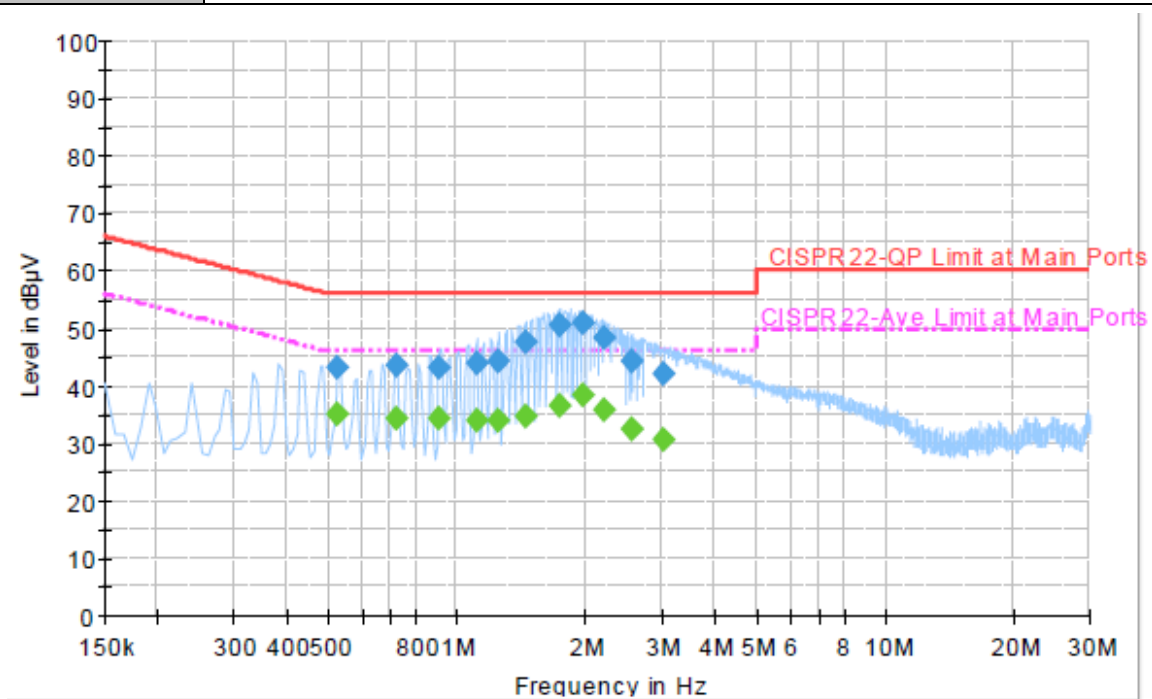
Test Mode :	Mode 2	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported 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)
0.526000	43.2	Off	N	19.3	12.8	56.0
0.726000	43.6	Off	N	19.4	12.4	56.0
0.910000	43.1	Off	N	19.4	12.9	56.0
1.110000	43.8	Off	N	19.4	12.2	56.0
1.246000	44.3	Off	N	19.5	11.7	56.0
1.446000	47.6	Off	N	19.4	8.4	56.0
1.734000	50.4	Off	N	19.5	5.6	56.0
1.974000	51.0	Off	N	19.5	5.0	56.0
2.206000	48.2	Off	N	19.5	7.8	56.0
2.550000	44.3	Off	N	19.5	11.7	56.0
3.030000	42.2	Off	N	19.5	13.8	56.0

Test Mode :	Mode 2	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + Earphone + Battery + MPEG4 + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



**Final Result 2**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.526000	34.9	Off	N	19.3	11.1	46.0
0.726000	34.5	Off	N	19.4	11.5	46.0
0.910000	34.5	Off	N	19.4	11.5	46.0
1.110000	34.0	Off	N	19.4	12.0	46.0
1.246000	33.8	Off	N	19.5	12.2	46.0
1.446000	34.5	Off	N	19.4	11.5	46.0
1.734000	36.5	Off	N	19.5	9.5	46.0
1.974000	38.3	Off	N	19.5	7.7	46.0
2.206000	35.9	Off	N	19.5	10.1	46.0
2.550000	32.6	Off	N	19.5	13.4	46.0
3.030000	30.6	Off	N	19.5	15.4	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

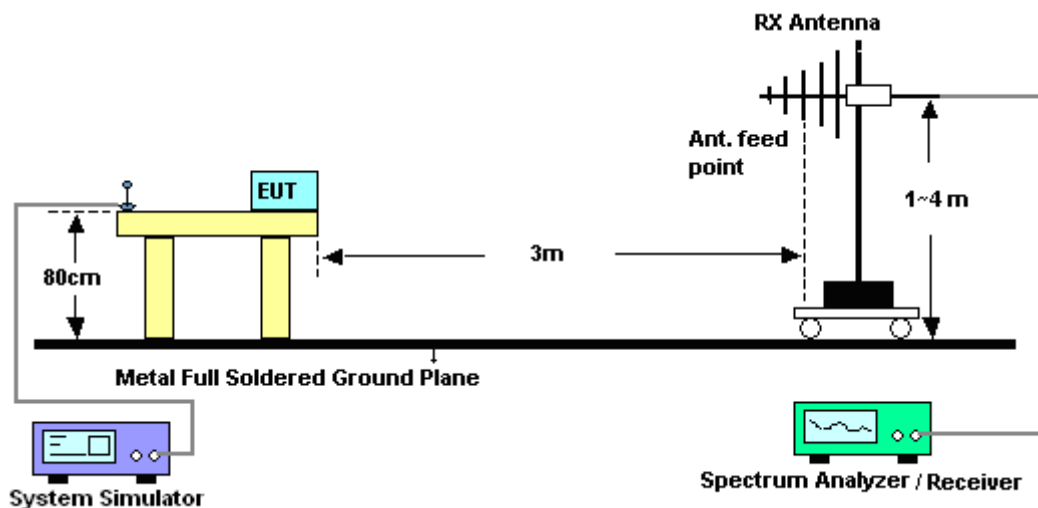
### 3.2.2. Measuring Instruments

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 Results of Radiated Emissions (9 kHz ~ 30 MHz)

Test Engineer :	Gavin Wu	Temperature :	19~20°C
		Relative Humidity :	43~44%

<Part15C>

Frequency	Measurement Distance	Field Strength	Antenna Factor	Distance Factor	Limit Distance	Field Strength at Limit Distance (30m)	Limit (30m)	Remark
(MHz)	(m)	(dBuV/m)	(dB/m)	(dB/decade)	(m)	(dBuV/m)	(dBuV/m)	-
0.03277	3	-1.70	20.10	40	30	-41.70	29.54	Bluetooth
0.03277	3	-4.08	20.10	40	30	-44.08	29.54	WLAN

Note:

- The low frequency 32.768KHz was performed under Part15C, and the result was 20dB lower than the limit line.
- In accordance with 15.33 (a): For each frequency at which a measurement is made at only one distance, the square of an inverse linear distance extrapolation factor (40 dB/decade) is applied.  
 Distance extrapolation factor =  $40 \log(\text{specific distance} / \text{test distance})$  (dB);  
 Limit line = specific limits (dBuV) + distance extrapolation factor.
- The field strength measured is direct conversion of all parameters (antenna factor and distance extrapolation factor) and loaded into the spectrum.
- For example 1:  
 Field Strength at 3m=10 (dBuV/m)  
 Field Strength at 30m=10- 40\*log(30m/3m)=-30 (dBuV/m)  
 For example 2:  
 Field Strength at 10m=10 (dBuV/m)  
 Field Strength at 30m=10- 40\*log(30m/10m)=-9.08 (dBuV/m)

<Part15B>

Frequency	Measurement Distance	Field Strength	Antenna Factor	Distance Factor	Limit Distance	Field Strength at Limit Distance (30m)	Limit (30m)	Remark
(MHz)	(m)	(dBuV/m)	(dB/m)	(dB/decade)	(m)	(dBuV/m)	(dBuV/m)	-
-	-	-	-	-	-	-	-	-

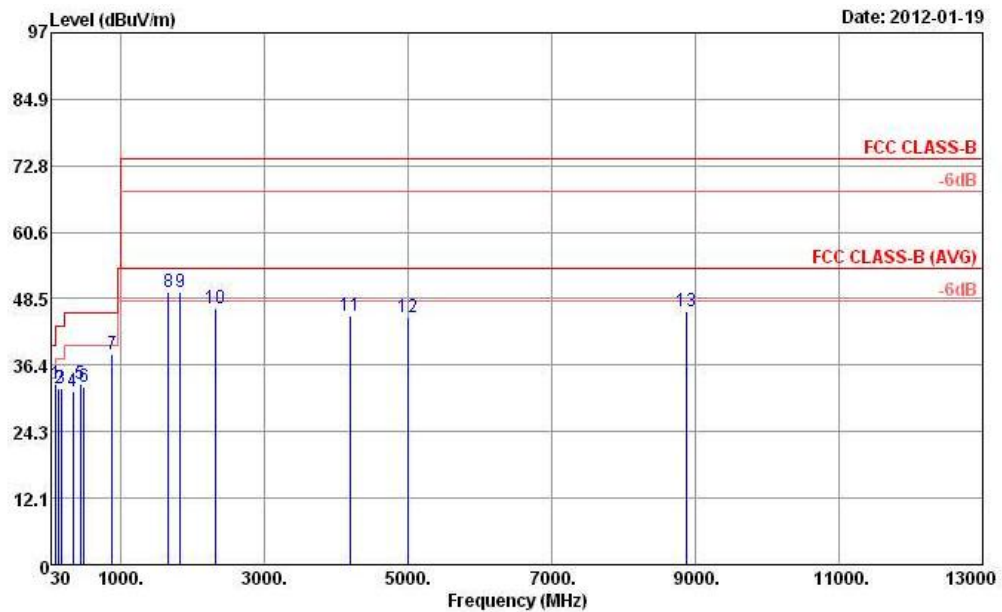
Note:

The low frequency, which started from 32.768KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.2.6. Test Result of Radiated Emission

Test Mode :	Mode 3	Temperature :	21~22°C
Test Engineer :	David Ke	Relative Humidity :	42~43%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + Battery + USB Cable (Data Link with Notebook)		
Remark :	#7 is system simulator signal which can be ignored.		



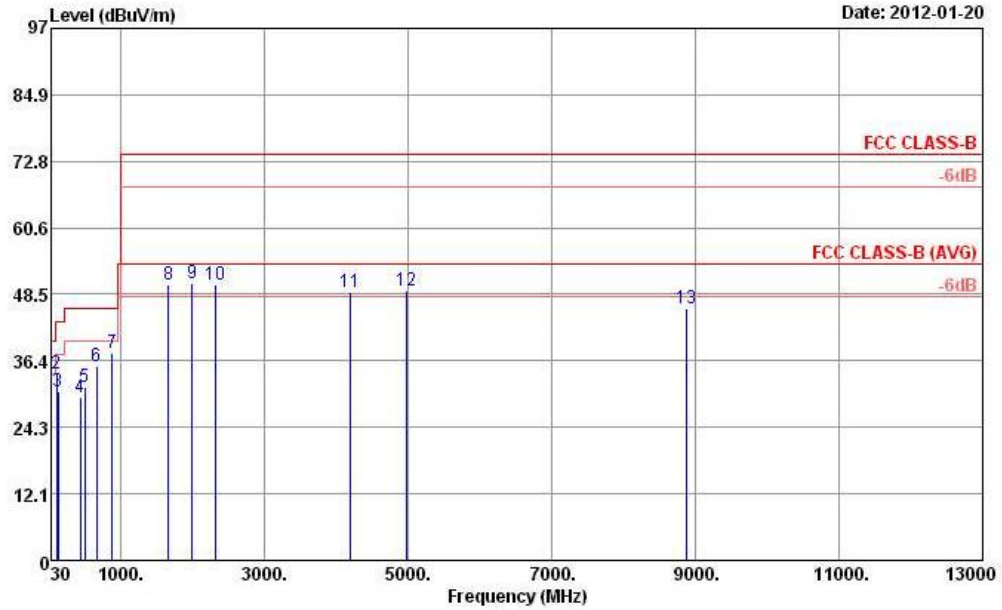
Site : 03CH05-HY  
 Condition : FCC CLASS-B 3m HF\_ANT\_110810 HORIZONTAL  
 Power : From System

Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	93.99	32.97	-10.53	43.50	54.33	9.10	1.08	31.54	100	50 Peak
2	133.68	32.18	-11.32	43.50	51.06	11.40	1.24	31.52	---	---
3	166.35	32.21	-11.29	43.50	52.52	9.86	1.36	31.53	---	---
4	332.20	31.58	-14.42	46.00	47.14	13.88	1.86	31.30	---	---
5	442.10	33.09	-12.91	46.00	45.16	16.96	2.12	31.15	---	---
6	491.80	32.51	-13.49	46.00	43.45	17.94	2.21	31.09	---	---
7	881.40	38.49			42.90	23.10	2.98	30.49	---	---
8	1660.00	49.85	-24.15	74.00	74.70	29.37	3.81	58.03	100	37 Peak
9	1826.00	49.79	-24.21	74.00	73.09	30.53	4.04	57.87	---	---
10	2324.00	46.83	-27.17	74.00	68.08	31.96	4.53	57.74	---	---
11	4186.00	45.31	-28.69	74.00	65.11	33.52	6.13	59.45	---	---
12	4990.00	45.09	-28.91	74.00	62.83	33.80	6.58	58.12	---	---
13	8870.00	46.30	-27.70	74.00	57.21	36.02	9.44	56.37	---	---



Test Mode :	Mode 3	Temperature :	21~22°C
Test Engineer :	David Ke	Relative Humidity :	42~43%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + GPS Rx + Earphone + Battery + USB Cable (Data Link with Notebook)		
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH05-HY  
 Condition : FCC CLASS-B 3m HF\_ANT\_110810 VERTICAL  
 Power : From System

Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 !	39.99	36.56	-3.44	40.00	54.02	13.30	0.75	31.51	100	73 Peak
2	103.71	34.04	-9.46	43.50	53.95	10.54	1.11	31.56	---	---
3	125.85	30.78	-12.72	43.50	49.36	11.72	1.22	31.52	---	---
4	442.10	29.72	-16.28	46.00	41.79	16.96	2.12	31.15	---	---
5	498.10	31.53	-14.47	46.00	42.32	18.06	2.23	31.08	---	---
6	664.00	35.43	-10.57	46.00	43.33	20.25	2.61	30.76	---	---
7	881.40	37.83			42.24	23.10	2.98	30.49	---	---
8	1660.00	50.36	-23.64	74.00	75.21	29.37	3.81	58.03	---	---
9	1996.00	50.52	-23.48	74.00	72.19	31.70	4.34	57.71	100	59 Peak
10	2324.00	50.30	-23.70	74.00	71.55	31.96	4.53	57.74	---	---
11	4186.00	48.86	-25.14	74.00	68.66	33.52	6.13	59.45	---	---
12	4980.00	49.25	-24.75	74.00	67.02	33.80	6.58	58.15	---	---
13	8886.00	45.89	-28.11	74.00	56.77	36.03	9.44	56.35	---	---



### 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Jan. 20, 2012	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz~30MHz	Dec. 09, 2011	Jan. 20, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz~30MHz	Dec. 06, 2011	Jan. 20, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jan. 20, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz~30GHz	Nov. 03, 2011	Jan. 19, 2012~Jan. 20, 2012	Nov. 02, 2012	Radiation (03CH05-HY)
COM-POWER	Double Ridge Horn	AH-118	701030	1GHz~18GHz	N/A	Jan. 19, 2012~Jan. 20, 2012	N/A	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz~1GHz	Oct. 22, 2011	Jan. 19, 2012~Jan. 20, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	Jan. 19, 2012~Jan. 20, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m~4 m	N/A	Jan. 19, 2012~Jan. 20, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 04, 2011	Jan. 19, 2012~Jan. 20, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
COM-POWER	COM-POWER	PA-103	161075	1KHz~1GHz	Mar. 29, 2011	Jan. 19, 2012~Jan. 20, 2012	Mar. 28, 2012	Radiation (03CH05-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz~18GHz	Jul. 19, 2011	Jan. 19, 2012~Jan. 20, 2012	Jul. 18, 2012	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 21, 2011	Jan. 19, 2012~Jan. 20, 2012	Feb. 20, 2012	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz~26.5GHz	Apr. 14, 2011	Jan. 19, 2012~Jan. 20, 2012	Apr. 13, 2012	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	Jan. 19, 2012~Jan. 20, 2012	Oct. 20, 2012	-
GPS Station	T&E	GS-50	N/A	N/A	N/A	Jan. 19, 2012~Jan. 20, 2012	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>				