

# FCC Test Report

APPLICANT : ZTE CORPORATION  
EQUIPMENT : GSM/WCDMA/LTE Multi-Mode  
Digital Mobile Phone  
BRAND NAME : ZTE  
MODEL NAME : Z998  
FCC ID : Q78-Z998  
STANDARD : FCC 47 CFR FCC Part 15 Subpart B  
CLASSIFICATION : Certification

The product was received on Feb. 04, 2013 and completely tested on Mar. 07, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



## TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT ..... 4

1. GENERAL DESCRIPTION ..... 5

    1.1. Applicant..... 5

    1.2. Manufacturer ..... 5

    1.3. Feature of Equipment Under Test..... 5

    1.4. Product Specification of Equipment Under Test ..... 6

    1.5. Test Site ..... 7

    1.6. Applied Standards ..... 7

2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 8

    2.1. Test Mode ..... 8

    2.2. Connection Diagram of Test System ..... 11

    2.3. Support Unit used in test configuration and system..... 14

    2.4. Test Software ..... 15

3. TEST RESULT..... 16

    3.1. Test of AC Conducted Emission Measurement ..... 16

    3.2. Test of Radiated Emission Measurement ..... 23

4. LIST OF MEASURING EQUIPMENT ..... 29

5. UNCERTAINTY OF EVALUATION ..... 30

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS





### 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 8.86 dB at 5.840 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 3.01 dB at 30.000 MHz for Quasi-Peak

## 1. General Description

### 1.1. Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

### 1.2. Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

### 1.3. Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA/LTE Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z998
FCC ID	Q78-Z998
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/DC-HSDPA /LTE/WLAN11bgn/Bluetooth/Bluetooth v4.0 - LE
HW Version	w9bA
SW Version	Z998V1.0.0B04
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. Product Specification of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx Frequency</b>	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
<b>Rx Frequency Range</b>	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2: 1930.7 MHz ~ 1989.3 MHz LTE Band 4: 2110.7 MHz ~ 2154.3 MHz LTE Band 5: 869.7 MHz ~ 893.3 MHz LTE Band 17: 736.5 MHz ~ 743.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz GPS : 1.57542 GHz
<b>Antenna Type</b>	WWAN : PIFA Antenna LTE : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna
<b>Type of Modulation</b>	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM (Downlink Only) DC-HSDPA : BPSK (Uplink) LTE: QPSK / 16QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth BDR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK Bluetooth v4.0 - LE: GFSK GPS : BPSK

### 1.5. 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>
	03CH06-HY	722060/4086B-1

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.	
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC/IC Registration No.</b>
	CO01-KS	149928/4086E-1

### 1.6. 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

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

## 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 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)	☒	☒	☒
2.	Data application transferred mode (EUT with PC or notebook)	☒	☒	☒

**Abbreviations:**

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

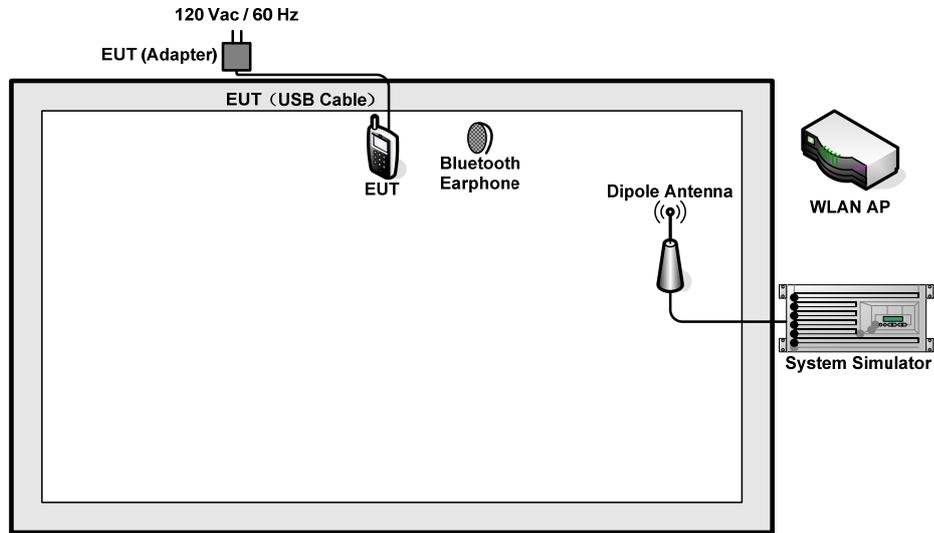
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	<p>Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 1&gt;</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + MPEG4&lt;Fig. 1&gt;</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx&lt;Fig. 2&gt;</p> <p>Mode 4: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 1&gt;</p> <p>Mode 5: LTE Band 2 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + MPEG4&lt;Fig. 3&gt;</p> <p>Mode 6: LTE Band 4 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx&lt;Fig. 4&gt;</p> <p>Mode 7: LTE Band 5 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 3&gt;</p> <p>Mode 8: LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with PC) + GPS Rx&lt;Fig. 5&gt;</p>
Radiated Emissions < 1GHz	1/2	<p>Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 1&gt;</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + MPEG4&lt;Fig. 1&gt;</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx&lt;Fig. 2&gt;</p> <p>Mode 4: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 1&gt;</p> <p>Mode 5: LTE Band 2 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + MPEG4&lt;Fig. 3&gt;</p> <p>Mode 6: LTE Band 4 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx&lt;Fig. 4&gt;</p> <p>Mode 7: LTE Band 5 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 3&gt;</p> <p>Mode 8: LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx&lt;Fig. 6&gt;</p>
Radiated Emissions ≥ 1GHz	1/2	<p>Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera&lt;Fig. 1&gt;</p> <p>Mode 2: LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx&lt;Fig. 6&gt;</p>



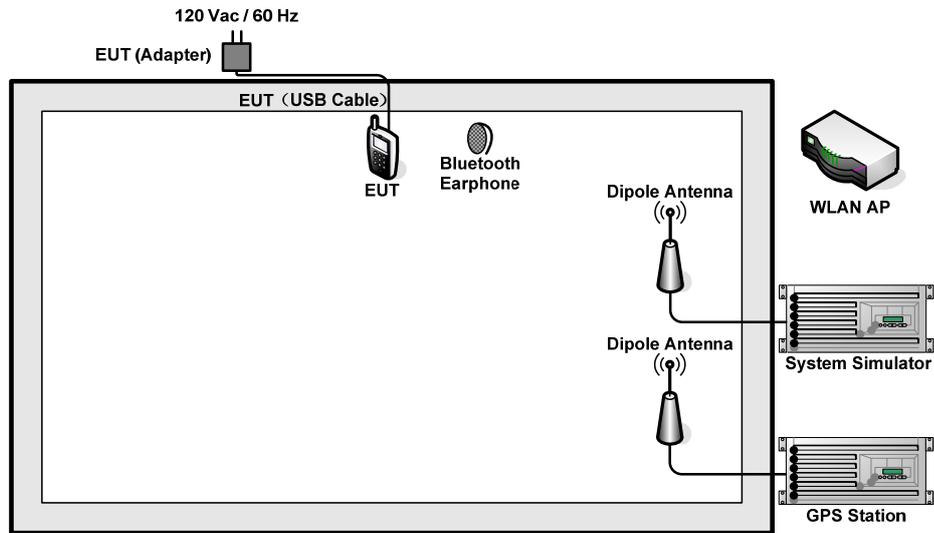
**Remark:**

1. The worst case of AC Conducted Emission is mode 3; the test data of this mode was reported.
2. The USB Link mode of AC Conducted Emission is mode 8; the test data of this mode was reported.
3. The worst case of Radiated Emissions is mode 1; the test data of this mode was reported.
4. The USB Link mode of Radiated Emissions is mode 8; the test data of this mode was reported.
5. Data Link with Notebook / PC means data application transferred mode between EUT and Notebook / PC.

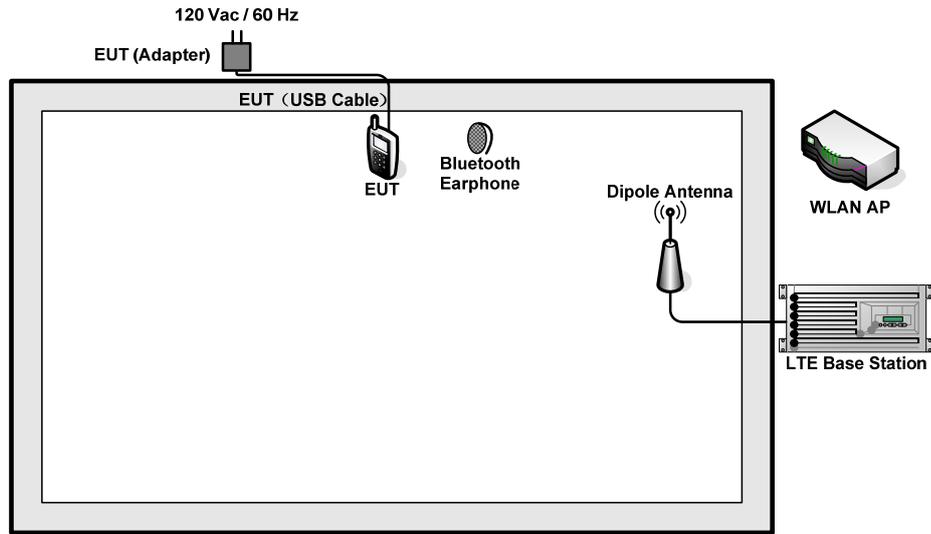
## 2.2. Connection Diagram of Test System



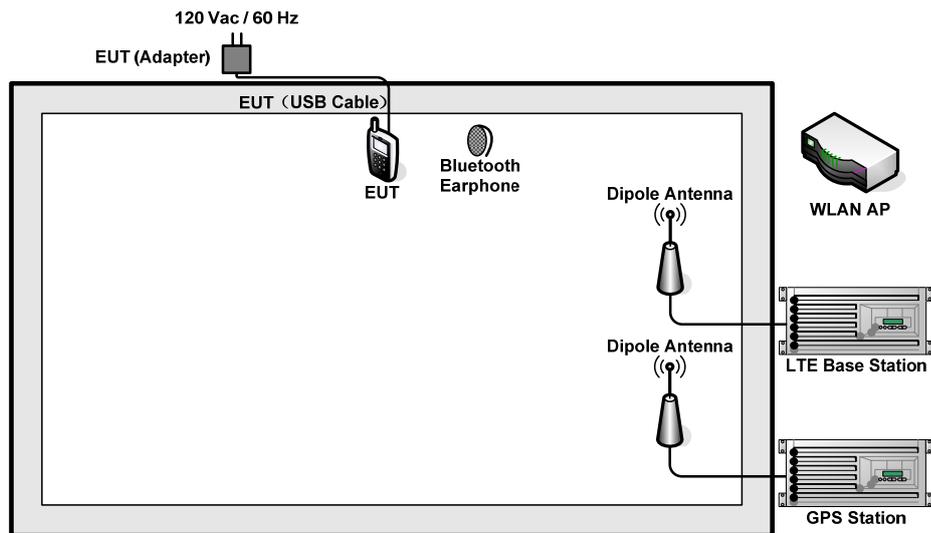
<Fig. 1>



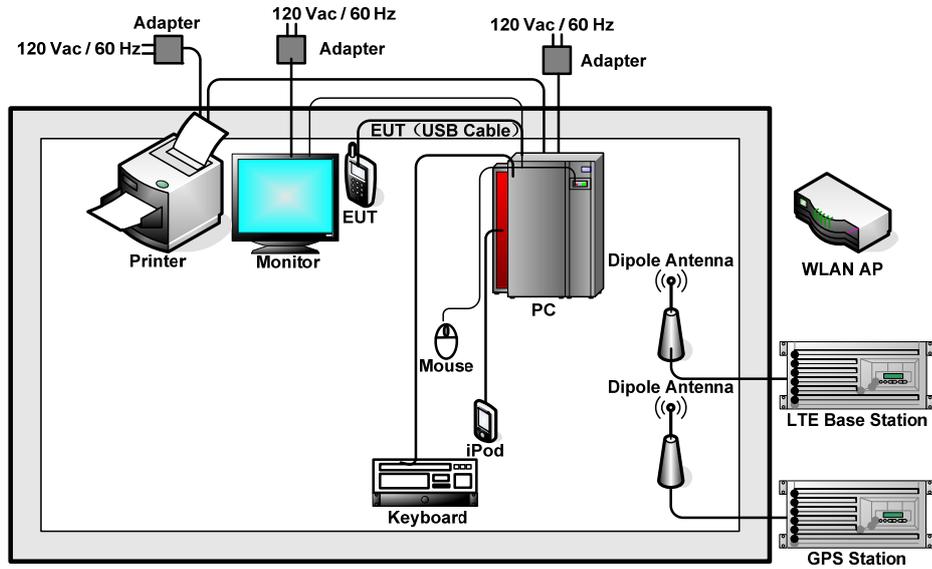
<Fig. 2>



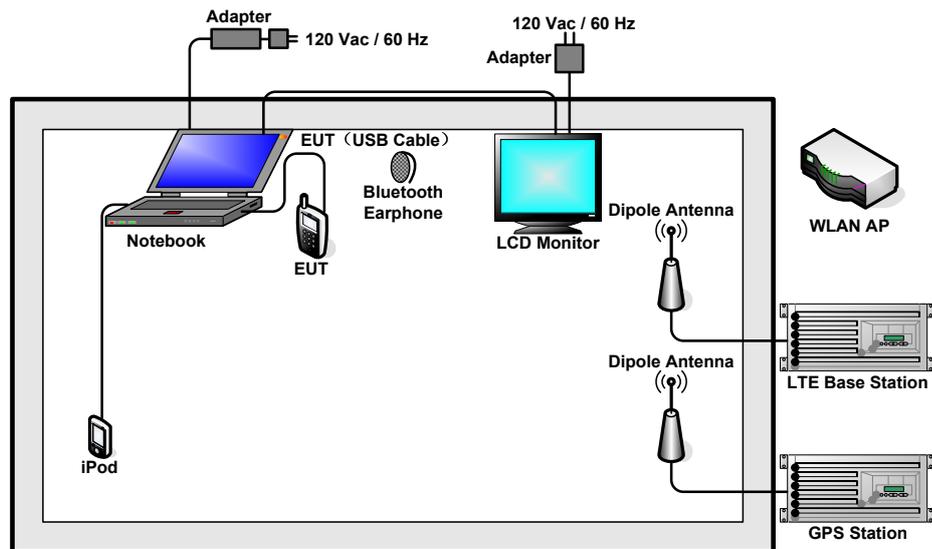
<Fig. 3>



<Fig. 4>



<Fig. 5>



<Fig. 6>

### 2.3. Support Unit used in test configuration and system

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.	LTE Base Station	Anritus	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
4.	GPS Station	ADIVIC	MP9000	N/A	N/A	Unshielded, 1.8 m
5.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8m
6.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
7.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
8.	PC	Dell	MT320	FCC DoC	N/A	Unshielded, 1.8 m
9.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
10.	SD Card	ScanDisk	16G class 4	FCC DoC	N/A	N/A
11.	Monitor	Dell	E1910Hc	FCC DoC	Shielded, 1.2 m	Unshielded, 1.8 m
12.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6m	Unshielded, 1.8m
13.	(USB) Keyboard	Dell	SK-8115	FCC DoC	Shielded, 1.8 m with core	N/A
14.	(USB) Mouse	Dell	N231	FCC DoC	Shielded, 1.8 m	N/A
15.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A
16.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	Unshielded, 1.0m	N/A
17.	Printer	HP	Laser Jet 1018	FCC DoC	Shielded, 1.8 m	Unshielded, 1.8 m
18.	iPod	Apple	A1199	FCC DoC	Shielded, 1.2 m	N/A
19.	iPod	Apple	A1285	FCC DoC	Shielded, 1.6m	N/A



## **2.4. Test Software**

The EUT was in GSM or WCDMA or LTE 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" under WIN7 installed in notebook or PC for files transfer with EUT via USB cable.
2. Turn on GPS function to make the EUT receive continuous signals from GPS station.
3. Execute "Windows Media 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.

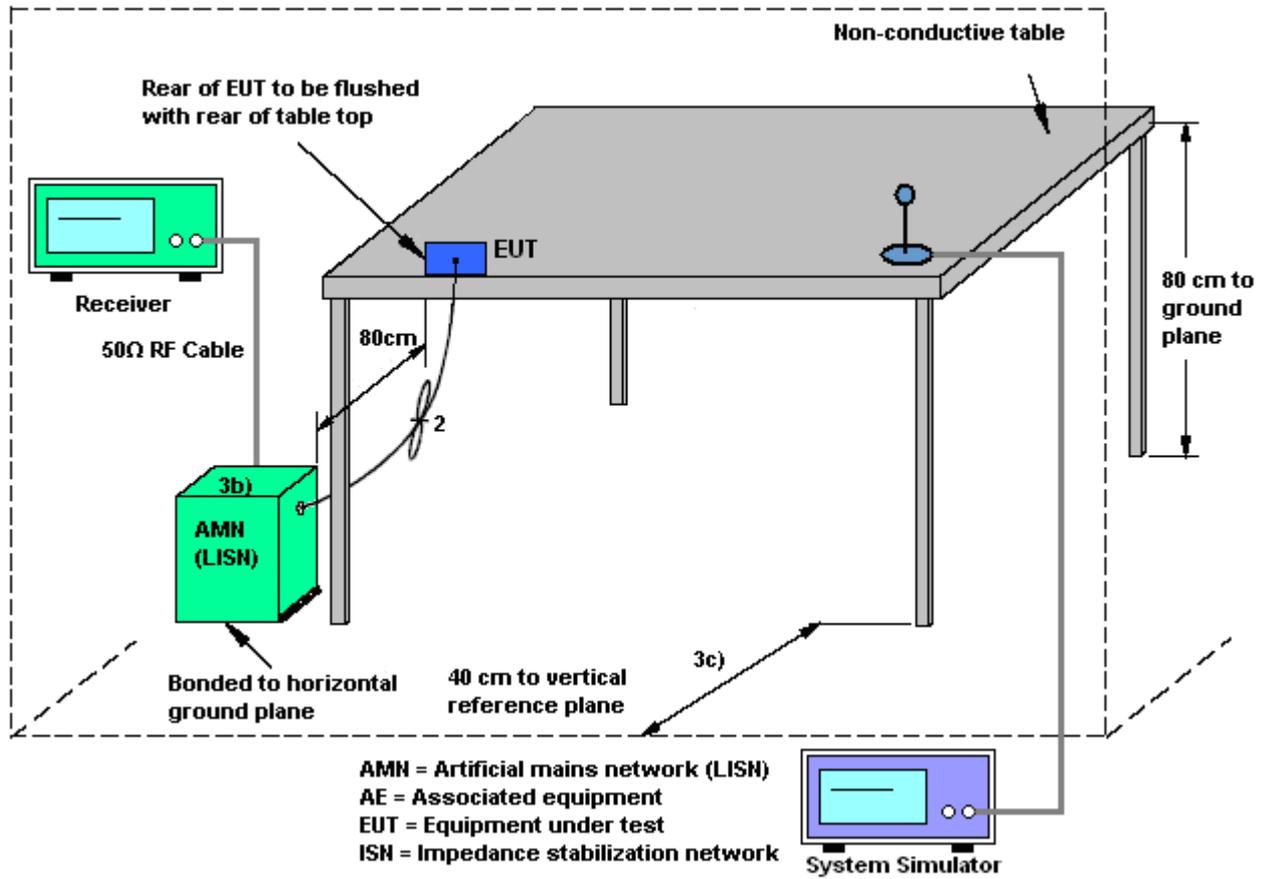
##### 3.1.2 Measuring Instruments

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.

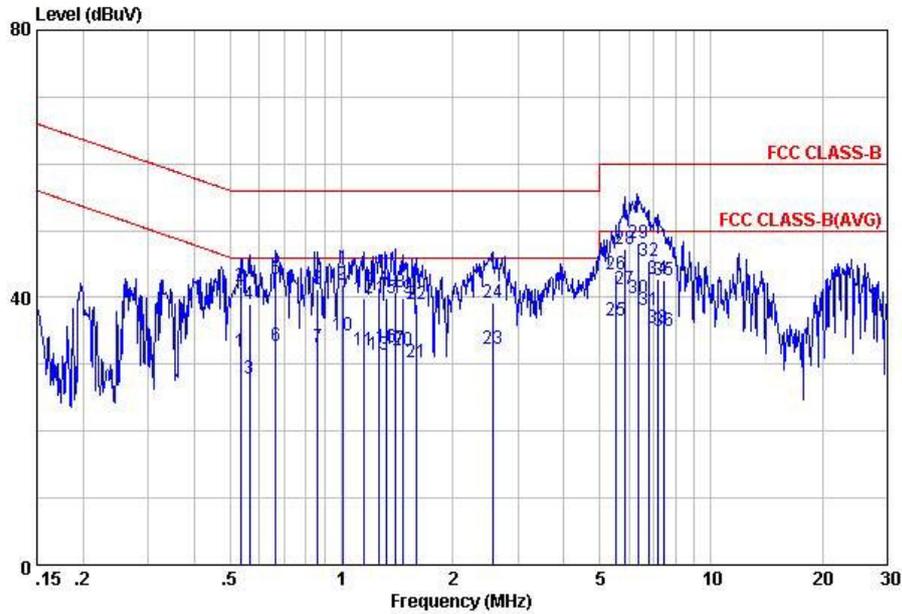
### 3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 3	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
 Condition: FCC CLASS-B LISN-L20130306 LINE  
 Project : (FC) 320406  
 mode : Mode 3

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.53	31.86	-14.14	46.00	21.40	0.20	10.26	Average
2	0.53	41.76	-14.24	56.00	31.30	0.20	10.26	QP
3	0.56	27.76	-18.24	46.00	17.30	0.20	10.26	Average
4	0.56	38.96	-17.04	56.00	28.50	0.20	10.26	QP
5	0.66	42.87	-13.13	56.00	32.40	0.20	10.27	QP
6	0.66	32.67	-13.33	46.00	22.20	0.20	10.27	Average
7	0.86	32.61	-13.39	46.00	22.19	0.14	10.28	Average
8	0.86	41.31	-14.69	56.00	30.89	0.14	10.28	QP
9	1.00	41.88	-14.12	56.00	31.50	0.10	10.28	QP
10	1.00	34.38	-11.62	46.00	24.00	0.10	10.28	Average
11	1.15	32.08	-13.92	46.00	21.70	0.10	10.28	Average
12	1.15	39.98	-16.02	56.00	29.60	0.10	10.28	QP
13	1.26	31.48	-14.52	46.00	21.10	0.10	10.28	Average
14	1.26	41.38	-14.62	56.00	31.00	0.10	10.28	QP
15	1.32	39.99	-16.01	56.00	29.60	0.10	10.29	QP
16	1.32	32.59	-13.41	46.00	22.20	0.10	10.29	Average
17	1.40	32.29	-13.71	46.00	21.90	0.10	10.29	Average
18	1.40	40.89	-15.11	56.00	30.50	0.10	10.29	QP
19	1.47	39.79	-16.21	56.00	29.40	0.10	10.29	QP
20	1.47	32.19	-13.81	46.00	21.80	0.10	10.29	Average
21	1.60	30.20	-15.80	46.00	19.80	0.10	10.30	Average
22	1.60	39.10	-16.90	56.00	28.70	0.10	10.30	QP

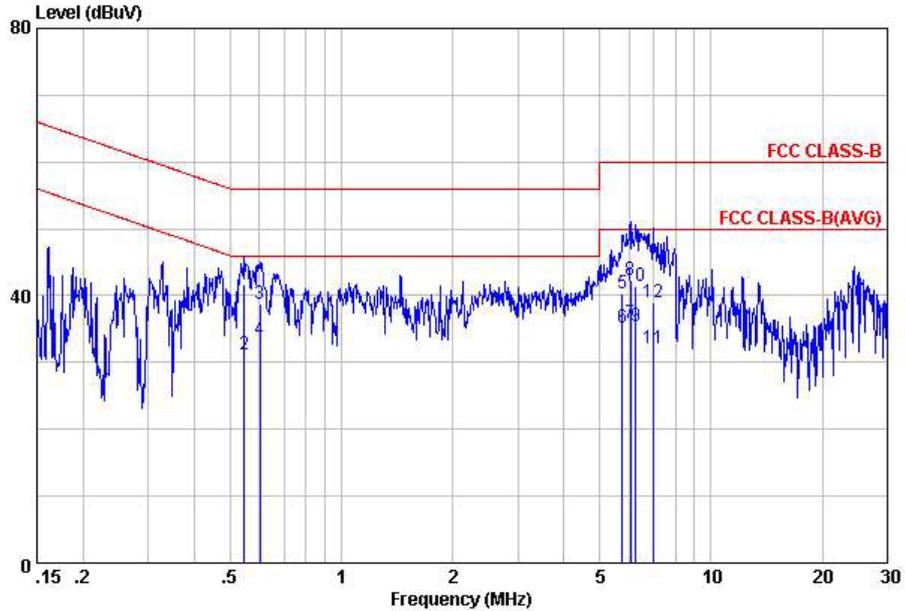


<b>Test Mode :</b>	Mode 3	<b>Temperature :</b>	19~20°C
<b>Test Engineer :</b>	Tom Wang	<b>Relative Humidity :</b>	39~40%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Line
<b>Function Type :</b>	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx		
<b>Remark :</b>	All emissions not reported here are more than 10 dB below the prescribed limit.		

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
23	2.57	32.33	-13.67	46.00	21.90	0.12	10.31	Average
24	2.57	39.33	-16.67	56.00	28.90	0.12	10.31	QP
25	5.51	36.64	-13.36	50.00	26.10	0.20	10.34	Average
26	5.51	43.54	-16.46	60.00	33.00	0.20	10.34	QP
27	5.84	41.14	-8.86	50.00	30.60	0.20	10.34	Average
28	5.84	47.14	-12.86	60.00	36.60	0.20	10.34	QP
29	6.35	48.15	-11.85	60.00	37.60	0.20	10.35	QP
30	6.35	39.95	-10.05	50.00	29.40	0.20	10.35	Average
31	6.77	38.15	-11.85	50.00	27.60	0.20	10.35	Average
32	6.77	45.35	-14.65	60.00	34.80	0.20	10.35	QP
33	7.21	35.45	-14.55	50.00	24.90	0.20	10.35	Average
34	7.21	42.85	-17.15	60.00	32.30	0.20	10.35	QP
35	7.49	42.55	-17.45	60.00	32.00	0.20	10.35	QP
36	7.49	34.95	-15.05	50.00	24.40	0.20	10.35	Average



Test Mode :	Mode 3	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

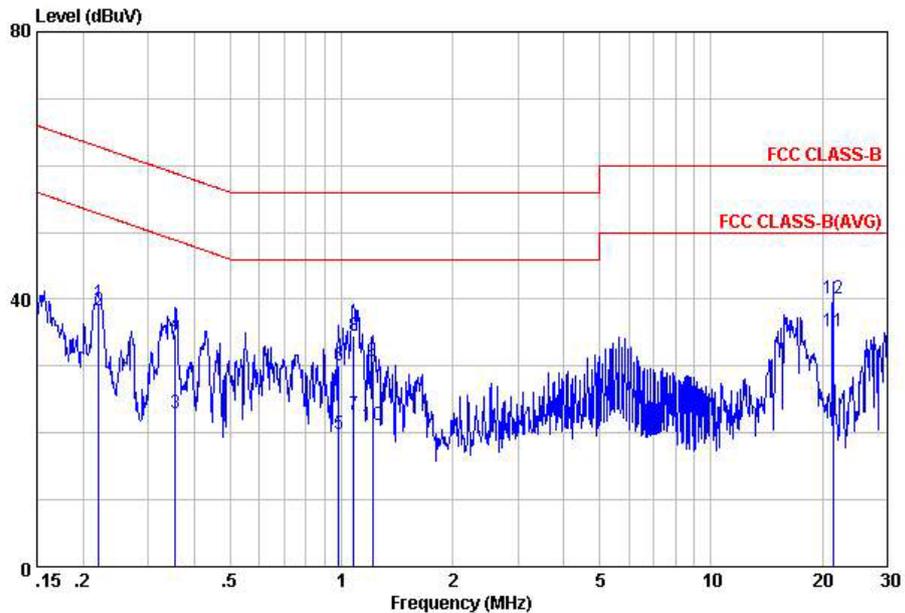


Site : C001-KS  
 Condition: FCC CLASS-B LISN-N20130306 NEUTRAL  
 Project : (FC) 320406  
 mode : Mode 3

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.55	41.64	-14.36	56.00	31.10	0.28	10.26	QP
2	0.55	31.24	-14.76	46.00	20.70	0.28	10.26	Average
3	0.60	38.80	-17.20	56.00	28.30	0.24	10.26	QP
4	0.60	33.40	-12.60	46.00	22.90	0.24	10.26	Average
5	5.74	40.44	-19.56	60.00	29.90	0.20	10.34	QP
6	5.74	35.24	-14.76	50.00	24.70	0.20	10.34	Average
7	6.06	35.84	-14.16	50.00	25.30	0.20	10.34	Average
8	6.06	42.34	-17.66	60.00	31.80	0.20	10.34	QP
9	6.25	35.34	-14.66	50.00	24.80	0.20	10.34	Average
10	6.25	41.44	-18.56	60.00	30.90	0.20	10.34	QP
11	6.95	32.15	-17.85	50.00	21.60	0.20	10.35	Average
12	6.95	38.95	-21.05	60.00	28.40	0.20	10.35	QP



Test Mode :	Mode 8	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with PC) + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

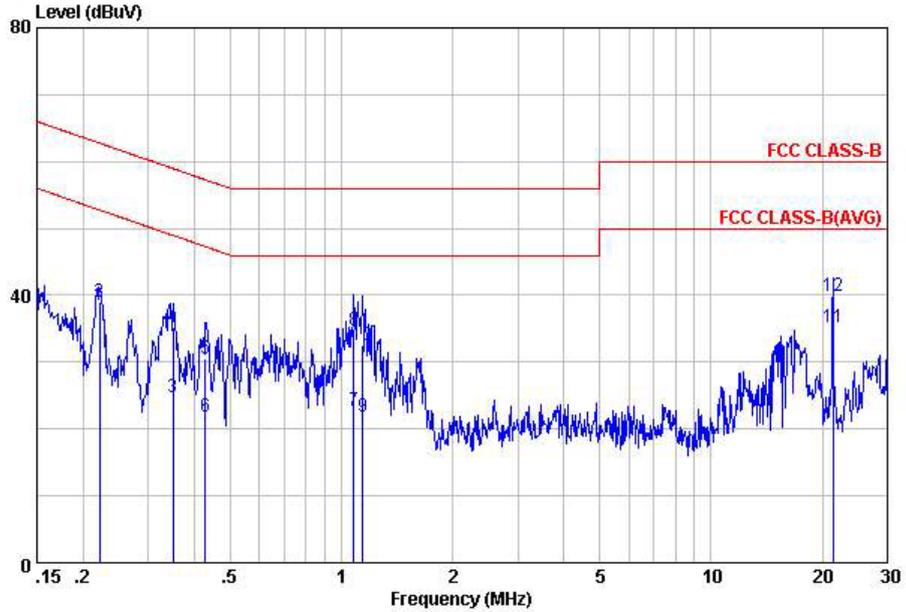


Site : C001-KS  
 Condition: FCC CLASS-B LISN-L20130306 LINE  
 Project : (FC) 320406  
 mode : Mode 8

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dBuV	dB	dBuV	dBuV	dB	dB	
1	0.22	39.35	-23.44	62.79	28.18	0.95	10.22	QP
2	0.22	38.35	-14.44	52.79	27.18	0.95	10.22	Average
3	0.36	22.87	-25.96	48.83	12.20	0.42	10.25	Average
4	0.36	34.87	-23.96	58.83	24.20	0.42	10.25	QP
5	0.98	19.88	-26.12	46.00	9.50	0.10	10.28	Average
6	0.98	29.98	-26.02	56.00	19.60	0.10	10.28	QP
7	1.08	22.78	-23.22	46.00	12.40	0.10	10.28	Average
8	1.08	34.58	-21.42	56.00	24.20	0.10	10.28	QP
9	1.22	30.68	-25.32	56.00	20.30	0.10	10.28	QP
10	1.22	21.08	-24.92	46.00	10.70	0.10	10.28	Average
11	21.37	35.20	-14.80	50.00	24.59	0.10	10.51	Average
12	21.37	40.10	-19.90	60.00	29.49	0.10	10.51	QP



Test Mode :	Mode 8	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with PC) + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
 Condition: FCC CLASS-B LISN-N20130306 NEUTRAL  
 Project : (FC) 320406  
 mode : Mode 8

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.22	38.65	-14.09	52.74	27.47	0.96	10.22	Average
2	0.22	39.05	-23.69	62.74	27.87	0.96	10.22	QP
3	0.35	24.77	-24.19	48.96	14.01	0.51	10.25	Average
4	0.35	35.17	-23.79	58.96	24.41	0.51	10.25	QP
5	0.43	30.57	-26.72	57.29	19.95	0.37	10.25	QP
6	0.43	21.77	-25.52	47.29	11.15	0.37	10.25	Average
7	1.08	22.79	-23.21	46.00	12.41	0.10	10.28	Average
8	1.08	34.69	-21.31	56.00	24.31	0.10	10.28	QP
9	1.14	21.89	-24.11	46.00	11.51	0.10	10.28	Average
10	1.14	32.59	-23.41	56.00	22.21	0.10	10.28	QP
11	21.37	35.18	-14.82	50.00	24.47	0.20	10.51	Average
12	21.37	39.98	-20.02	60.00	29.27	0.20	10.51	QP

## 3.2. Test of Radiated Emission Measurement

### 3.2.1. Limit of Radiated Emission

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

### 3.2.2. Measuring Instruments

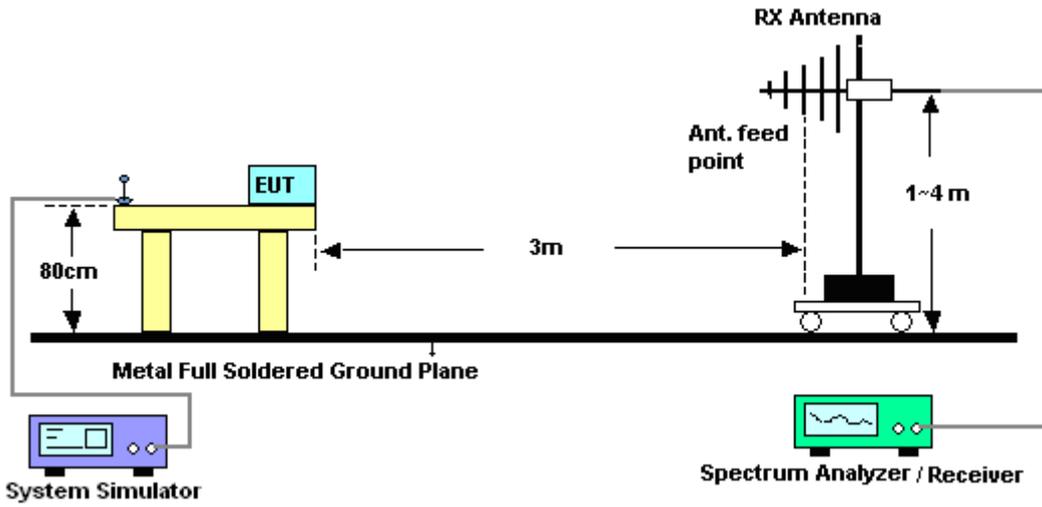
See list of measuring instruments of this test report.

### 3.2.3. Test Procedures

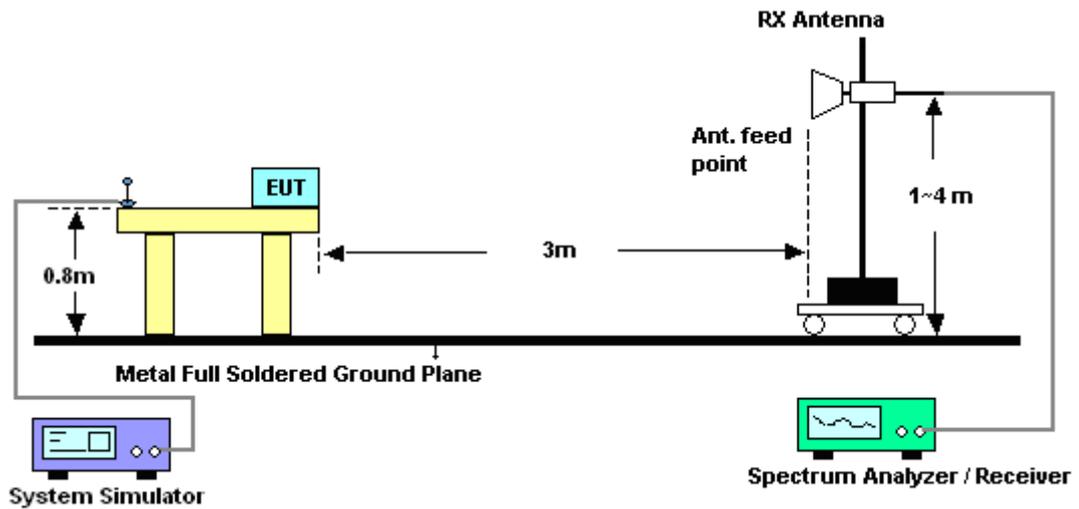
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between one to 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, peak values of EUT will be reported. Otherwise, the emission will be repeated by 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

For radiated emissions from 30MHz to 1GHz



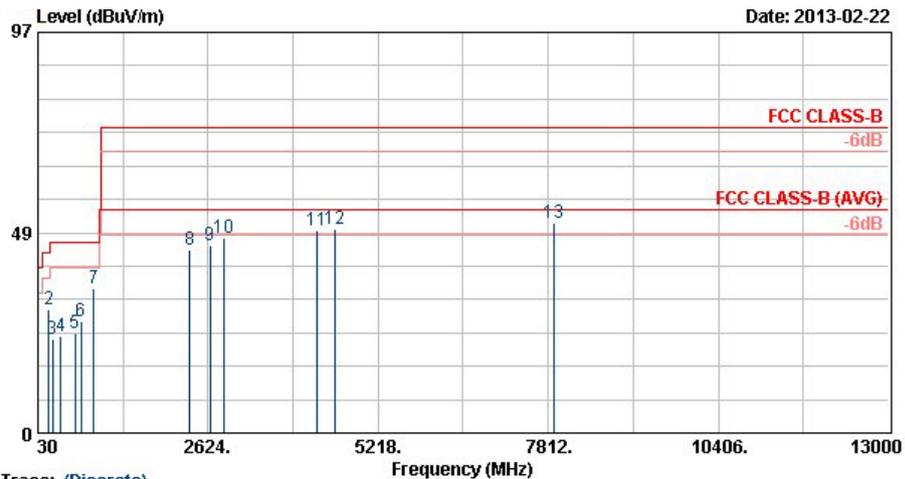
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 1	Temperature :	22~23°C
Test Engineer :	Timberland Lin	Relative Humidity :	43~44%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera		

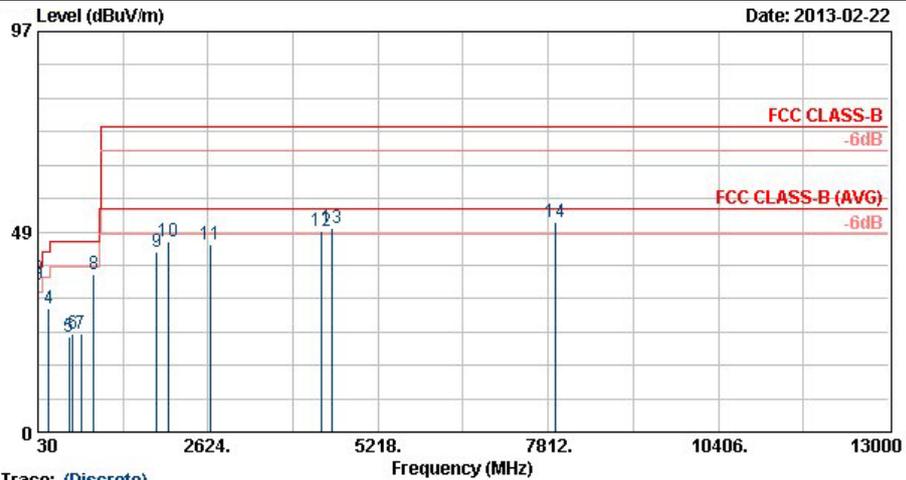


Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : FCC CLASS-B HF-ANT\_120601 HORIZONTAL  
 Power : 120Vac/60Hz  
 Mode : Model

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Ant Pos	Table Pos	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	dB	
1	30.00	21.55	-18.45	40.00	33.56	18.90	31.55	---	---	0.64	Peak
2	196.59	29.97	-13.53	43.50	50.84	9.18	31.58	100	117	1.52	Peak
3	255.99	22.65	-23.35	46.00	38.82	13.18	31.12	---	---	1.77	Peak
4	374.90	23.52	-22.48	46.00	37.66	14.85	31.11	---	---	2.12	Peak
5	595.40	24.20	-21.80	46.00	34.61	18.80	31.95	---	---	2.75	Peak
6	684.30	27.12	-18.88	46.00	36.99	18.95	31.68	---	---	2.86	Peak
7	881.40	35.00	-11.00	46.00	42.35	20.50	31.17	---	---	3.32	Peak
8	2342.00	44.48	-29.52	74.00	59.75	32.28	53.93	---	---	6.38	Peak
9	2652.00	45.47	-28.53	74.00	59.80	32.68	53.93	---	---	6.92	Peak
10	2876.00	47.33	-26.67	74.00	61.01	32.94	53.97	---	---	7.35	Peak
11	4292.00	49.04	-24.96	74.00	59.91	34.52	54.96	---	---	9.58	Peak
12	4548.00	49.30	-24.70	74.00	59.33	34.98	55.09	---	---	10.08	Peak
13	7892.00	50.83	-23.17	74.00	59.51	36.10	55.75	100	208	10.96	Peak



Test Mode :	Mode 1	Temperature :	22~23°C
Test Engineer :	Timberland Lin	Relative Humidity :	43~44%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera		



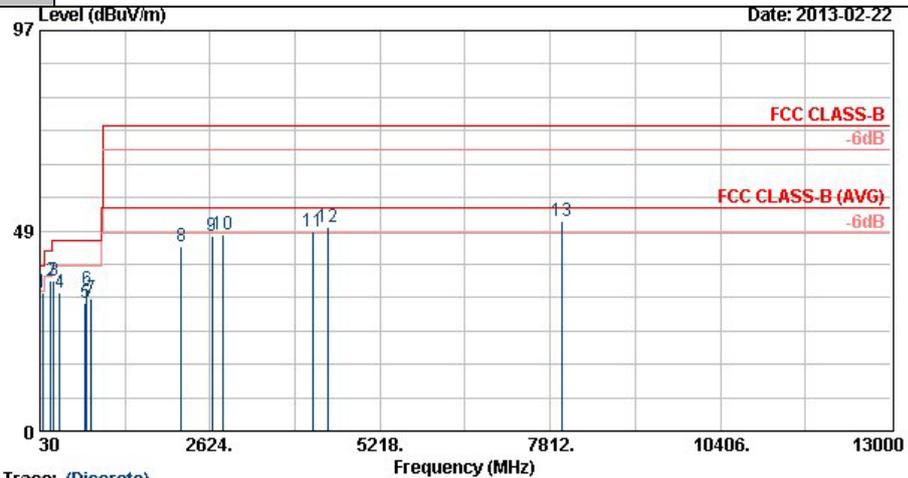
Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : FCC CLASS-B HF-ANT\_120801 VERTICAL  
 Power : 120Vac/60Hz

Mode : Model

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Ant Pos	Table Pos	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	dB	
1 @	30.00	42.05	2.05	40.00	54.06	18.90	31.55	100	360	0.64	Peak
2 !	30.00	36.99	-3.01	40.00	49.00	18.90	31.55	100	360	0.64	QP
3 !	36.48	35.57	-4.43	40.00	51.79	14.58	31.51	---	---	---	0.71 Peak
4	193.08	29.77	-13.73	43.50	50.58	9.06	31.37	---	---	---	1.50 Peak
5	504.40	23.06	-22.94	46.00	34.77	17.70	31.91	---	---	---	2.49 Peak
6	560.40	23.67	-22.33	46.00	33.35	18.99	31.26	---	---	---	2.59 Peak
7	691.30	23.70	-22.30	46.00	33.74	18.90	31.82	---	---	---	2.87 Peak
8	881.40	38.04	-7.96	46.00	45.40	20.50	31.17	---	---	---	3.32 Peak
9	1846.00	43.80	-30.20	74.00	61.66	30.60	53.97	---	---	---	5.51 Peak
10	2014.00	46.25	-27.75	74.00	62.52	31.82	54.00	---	---	---	5.90 Peak
11	2668.00	45.61	-28.39	74.00	59.87	32.70	53.93	---	---	---	6.97 Peak
12	4342.00	48.81	-25.19	74.00	59.46	34.64	54.97	---	---	---	9.68 Peak
13	4524.00	49.27	-24.73	74.00	59.24	34.99	55.03	---	---	---	10.07 Peak
14	7918.00	50.73	-23.27	74.00	59.39	36.10	55.73	100	222	10.97	Peak



Test Mode :	Mode 8	Temperature :	22~23°C
Test Engineer :	Timberland Lin	Relative Humidity :	43~44%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx		

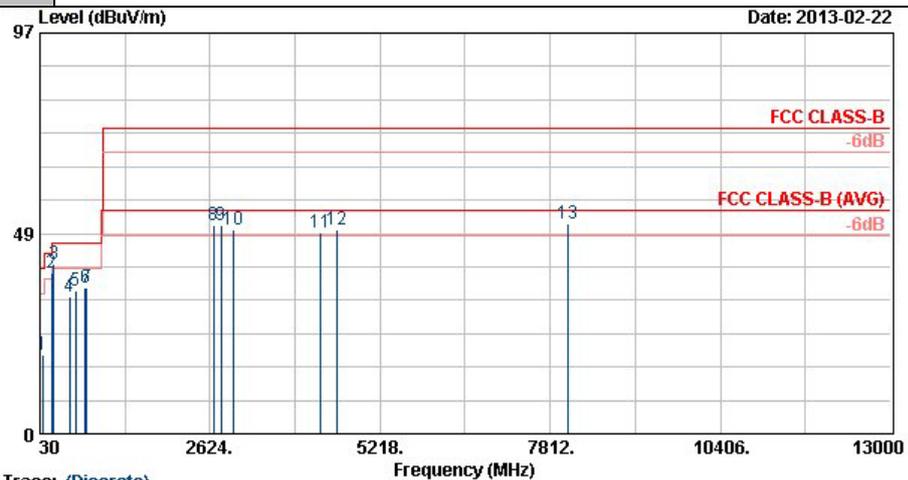


Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : FCC CLASS-B HF-ANT\_120801 HORIZONTAL  
 Power : From System  
 Mode : Mode8

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Ant Pos	Table Pos	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	dB	
1	66.99	33.38	-6.62	40.00	57.46	6.42	31.42	135	29	0.92	Peak
2	197.94	36.44	-7.06	43.50	57.32	9.22	31.63	---	---	1.53	Peak
3	239.79	36.48	-9.52	46.00	54.57	11.30	31.08	---	---	1.69	Peak
4	336.40	33.49	-12.51	46.00	48.72	13.73	30.96	---	---	2.00	Peak
5	719.30	31.19	-14.81	46.00	40.58	19.20	31.54	---	---	2.95	Peak
6	740.00	34.11	-11.89	46.00	42.54	19.60	31.05	---	---	3.02	Peak
7	815.90	32.25	-13.75	46.00	40.73	19.96	31.55	---	---	3.11	Peak
8	2190.00	44.60	-29.40	74.00	60.32	32.07	53.96	---	---	6.18	Peak
9	2652.00	47.33	-26.67	74.00	61.66	32.68	53.93	---	---	6.92	Peak
10	2820.00	47.62	-26.38	74.00	61.44	32.88	53.96	---	---	7.26	Peak
11	4204.00	48.43	-25.57	74.00	59.68	34.28	54.94	---	---	9.41	Peak
12	4412.00	49.58	-24.42	74.00	59.92	34.80	54.98	---	---	9.84	Peak
13	7998.00	50.98	-23.02	74.00	59.59	36.10	55.70	100	127	10.99	Peak



Test Mode :	Mode 8	Temperature :	22~23°C
Test Engineer :	Timberland Lin	Relative Humidity :	43~44%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 17 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx		



Trace: (Discrete)  
 Site : 03CH06-HV  
 Condition : FCC CLASS-B HF-ANT\_120801 VERTICAL  
 Power : From System  
 Mode : Mode8

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Ant Pos	Table Pos	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	cm	deg	dB	
1	66.99	19.21	-20.79	40.00	43.29	6.42	---	---	0.92	Peak
2 @	211.44	38.95	-4.55	43.50	59.44	9.10	100	269	1.58	Peak
3 !	239.79	41.26	-4.74	46.00	59.34	11.30	---	---	1.69	Peak
4	479.90	33.05	-12.95	46.00	44.20	17.40	---	---	2.30	Peak
5	575.80	34.49	-11.51	46.00	44.44	18.96	---	---	2.66	Peak
6	719.30	35.49	-10.51	46.00	44.88	19.20	---	---	2.95	Peak
7	740.00	35.38	-10.62	46.00	43.81	19.60	---	---	3.02	Peak
8	2678.00	50.62	-23.38	74.00	64.87	32.72	---	---	6.97	Peak
9	2788.00	50.37	-23.63	74.00	64.32	32.84	---	---	7.16	Peak
10	2972.00	49.25	-24.75	74.00	62.64	33.06	---	---	7.54	Peak
11	4302.00	48.51	-25.49	74.00	59.32	34.52	---	---	9.63	Peak
12	4566.00	49.34	-24.66	74.00	59.41	34.97	---	---	10.08	Peak
13	8076.00	50.92	-23.08	74.00	59.63	36.11	100	121	10.95	Peak

## 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Mar. 07, 2013	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	Mar. 07, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	Mar. 07, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	N/A	Nov. 15, 2012	Mar. 07, 2013	Nov. 14, 2013	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	Mar. 07, 2013	Dec. 28, 2013	Conduction (CO01-KS)
GPS Station	ADIVIC	MP9000	MP9000-111 046	N/A	N/A	Mar. 07, 2013	N/A	Conduction (CO01-KS)
LTE Base Station	Anritsu	MT8820C	6201074235	LTE_FDD full band	Dec. 29, 2012	Mar. 07, 2013	Dec. 28, 2013	Conduction (CO01-KS)
Spectrum Analyzer	R&S	FSP30	101352	9kHz~30GHz	Nov. 07, 2012	Feb. 22, 2013	Nov. 06, 2013	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz~1000MHz	May 04, 2012	Feb. 22, 2013	May 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz~2GHz	Oct. 06, 2012	Feb. 22, 2013	Oct. 05, 2013	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Feb. 22, 2013	Jul. 31, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz~40GHz	Sep. 28, 2012	Feb. 22, 2013	Sep. 27, 2013	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz~26.5GHz	Apr. 13, 2012	Feb. 22, 2013	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz~1GHz	Apr. 11, 2012	Feb. 22, 2013	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC05184 5	SN980048	1GHz~18GHz	Jul. 21, 2012	Feb. 22, 2013	Jul. 20, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz~30MHz	Jul. 03, 2012	Feb. 22, 2013	Jul. 02, 2013	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	Feb. 22, 2013	Oct. 20, 2013	Radiation (03CH06-HY)
GPS Station	Pendulum	GSG-54	N/A	N/A	N/A	Feb. 22, 2013	N/A	Radiation (03CH06-HY)
LTE Base Station	R&S	CMW500	123471	70MHz~3.3GHz	May 29, 2012	Feb. 22, 2013	May 28, 2013	Radiation (03CH06-HY)

## 5. Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.26
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP320406 as below.