FCC Test Report

APPLICANT	:	Cellon Communications Technology Co., Ltd.
EQUIPMENT	:	GSM850/900/1800/1900 UMTS850/1900 GPRS、EDGE、BT mobile phone
BRAND NAME	:	enspire, Claro, Ring; D-mobile
MODEL NAME	:	C3021, A1028, 1028CA, 1028EN, 1028EC, DM3021K
FCC ID	:	T38PCD3031
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION	:	Certification

The product was received on Apr. 12, 2013 and completely tested on May 29, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory 2353

SPORTON INTERNATIONAL (SHENZHEN) INC.
No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC341202	Rev. 01	Initial issue of report	Jun. 28, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 6.11 dB at 22.420 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.32 dB at 59.100 MHz

1. General Description

1.1. Applicant

Cellon Communications Technology Co., Ltd.
11f, Skyworth C Buuilding, Gaoxin S.Ave.1., Hi-Tech Industrial Park, Nanshan.Shenzhen

1.2. Manufacturer

Cellon Communications Technology Co., Ltd.
11f, Skyworth C Buuilding, Gaoxin S.Ave.1., Hi-Tech Industrial Park, Nanshan.Shenzhen

1.3. Feature of Equipment Under Test

Product Feature	
Equipment	GSM850/900/1800/1900 UMTS850/1900 GPRS、EDGE、BT mobile phone
Brand Name	enspire, Claro, Ring; D-mobile
Model Name	C3021, A1028, 1028CA, 1028EN, 1028EC, DM3021K
FCC ID	T38PCD3031
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/Bluetooth
HW Version	V1.0
SW Version	V1.0
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The different brand names and model names are identical on hardware. The only difference is the label of different branding for different customer.

1.4. Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency Range	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 Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency Range	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 Bluetooth: 2402 MHz ~ 2480 MHz FM: 88 MHz ~ 108 MHz
Antenna Type	WWAN : Fixed Internal Antenna Bluetooth : PIFA Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK (Downlink Only) WCDMA: QPSK (Uplink) Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK FM

1.5. Test Site

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO01-SZ	03CH01-SZ	831040/4086F-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.	Operating Mode (EUT with earphone)	Note 1	☒	Note 1
2.	Charging Mode (EUT with adapter)	☒	☒	Note 1
3.	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.

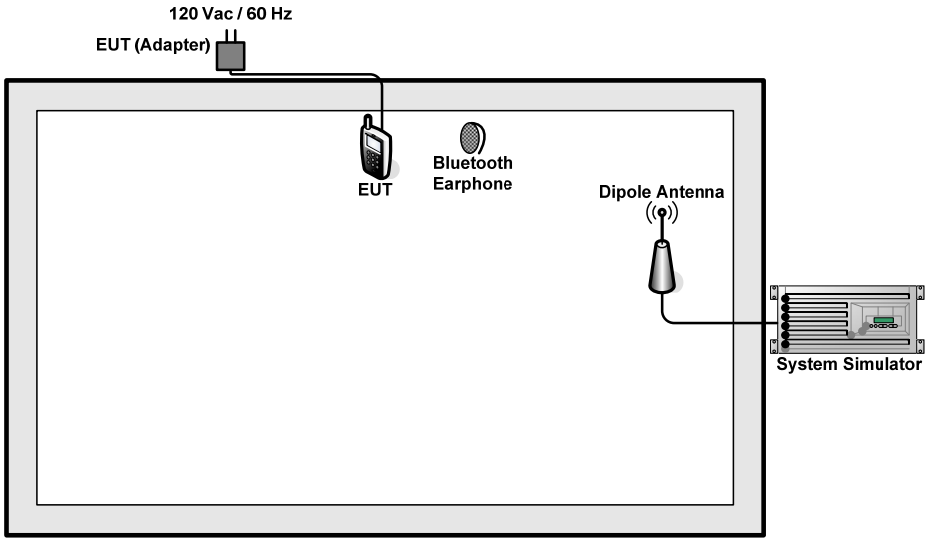
Remark: For signal above 1GHz, the worst case was test item 3.

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	2/3	Mode 1: GSM 850 Idle + Bluetooth Idle + Adapter + Camera <Fig. 1> Mode 2: GSM 1900 Idle + Bluetooth Idle + Adapter + MP3 <Fig. 1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + Adapter + FM Rx <Fig. 2> Mode 4: WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC) <Fig. 4>
Radiated Emissions < 1GHz	1/2/3	Mode 1: GSM 850 Idle + Bluetooth Idle + Adapter + Camera <Fig. 1> Mode 2: GSM 1900 Idle + Bluetooth Idle + Earphone + FM Rx <Fig. 3> Mode 3: WCDMA Band V Idle + Bluetooth Idle + Adapter + MP3 <Fig. 1> Mode 4: WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC) <Fig. 4>
Radiated Emissions ≥ 1GHz	3	Mode 1: WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC) <Fig. 4>

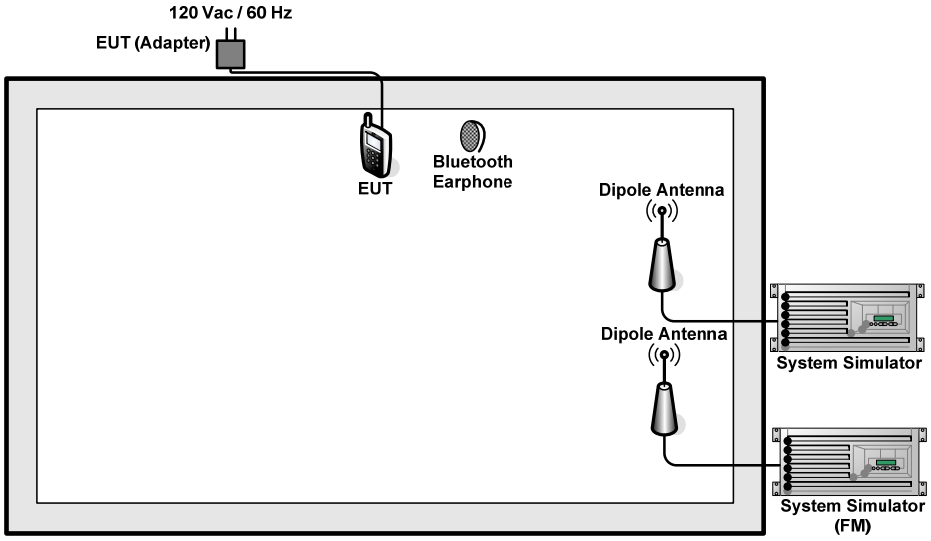
Remark:

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

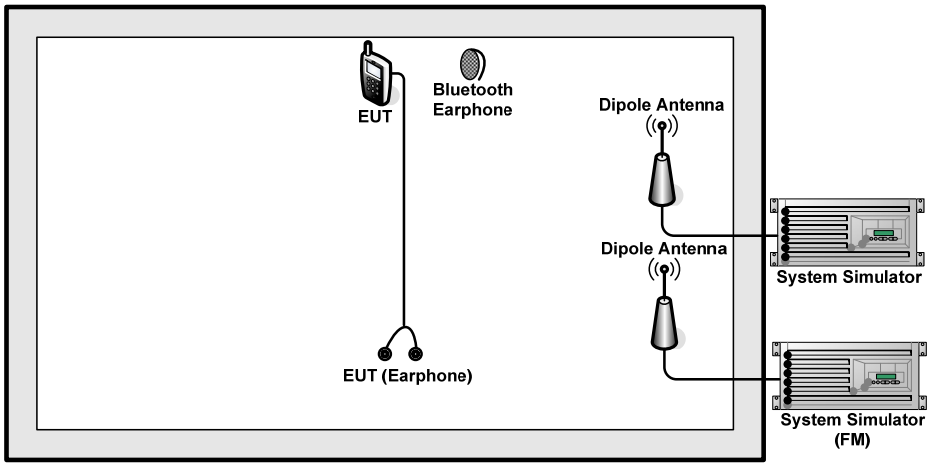
2.2. Connection Diagram of Test System



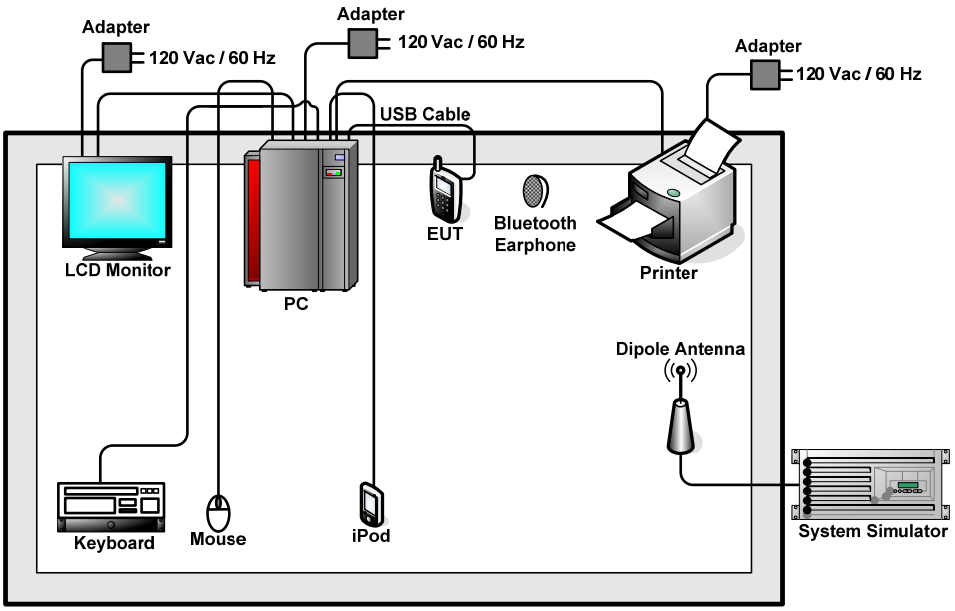
<Fig. 1>



<Fig. 2>


EUT
Bluetooth Earphone
Dipole Antenna
Dipole Antenna
System Simulator
EUT (Earphone)
System Simulator (FM)

<Fig. 3>


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
USB Cable
LCD Monitor
PC
EUT
Bluetooth Earphone
Printer
Dipole Antenna
Keyboard
Mouse
iPod
System Simulator

<Fig. 4>

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	Agilent	E5515C	N/A	N/A	Unshielded, 1.8 m
2.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
3.	PC	DELL	OPTIPLEX 390	FCC DoC	N/A	Unshielded, 1.8 m
4.	Monitor	DELL	IN1940MWB	FCC DoC	Shielded, 1.2 m	Unshielded, 1.8 m
5.	Mouse	DELL	MS111-L	FCC DoC	Shielded, 1.5 m	N/A
6.	Keyboard	DELL	KB212-B	FCC DoC	Shielded, 1.5 m	N/A
7.	Printer	HP	Laser Jet 1018	FCC DoC	Shielded, 1.8 m	Unshielded, 1.8 m
8.	Printer	SAMSUNG	ML-1610	N/A	Shielded, 1.8 m	Unshielded, 1.8 m
9.	Bluetooth Earphone	Nokia	BH-108	N/A	N/A	N/A
10.	iPod	Apple	MC525 ZP/A	FCC DoC	Shielded, 1.0 m	N/A

2.4. 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, and the following programs installed in the EUT were programmed during the test.

1. Execute the program, "Winthrax" under WIN7 installed in PC for files transfer with EUT via USB cable.
2. Turn on FM function to make the EUT receive continuous signals from system simulator (FM).
3. Execute "Music Player" to play MP3 file.
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.

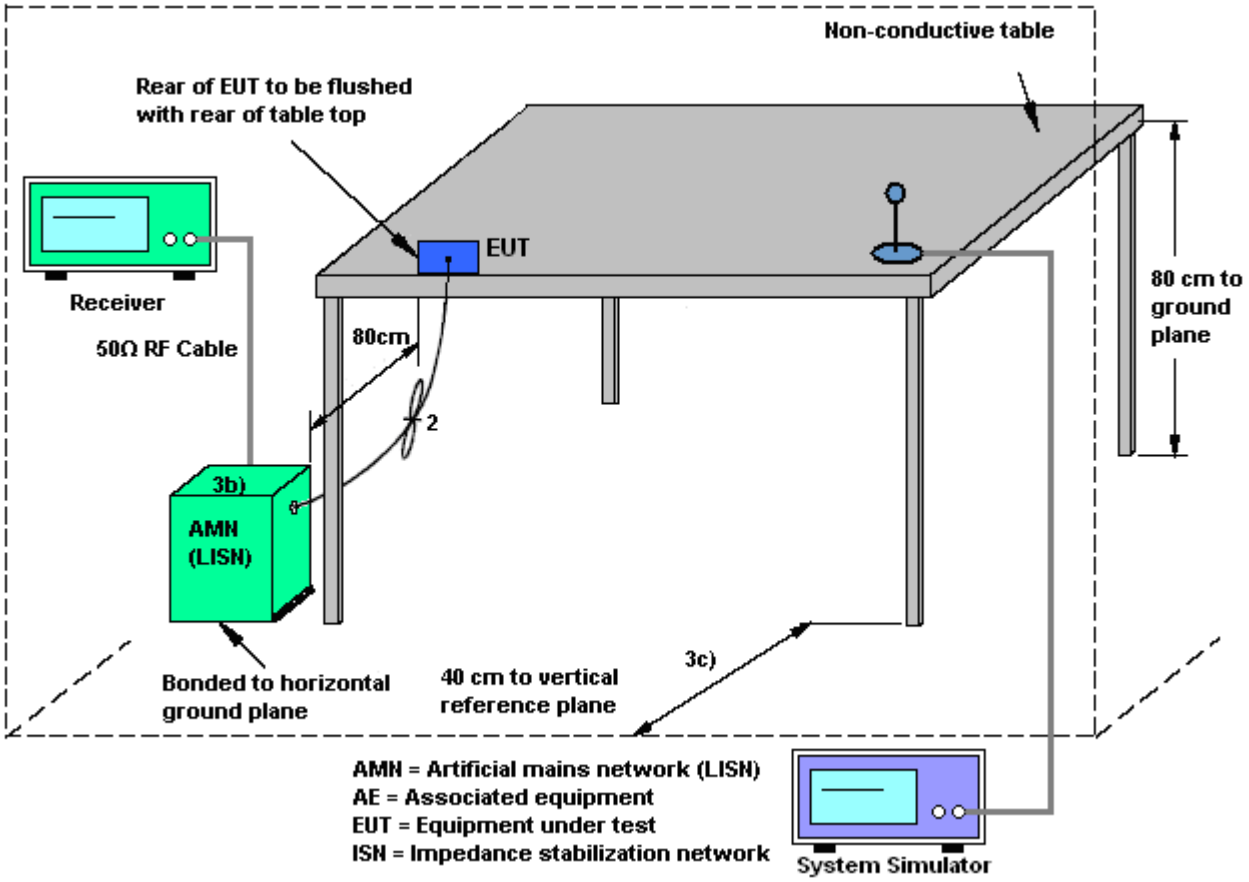
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

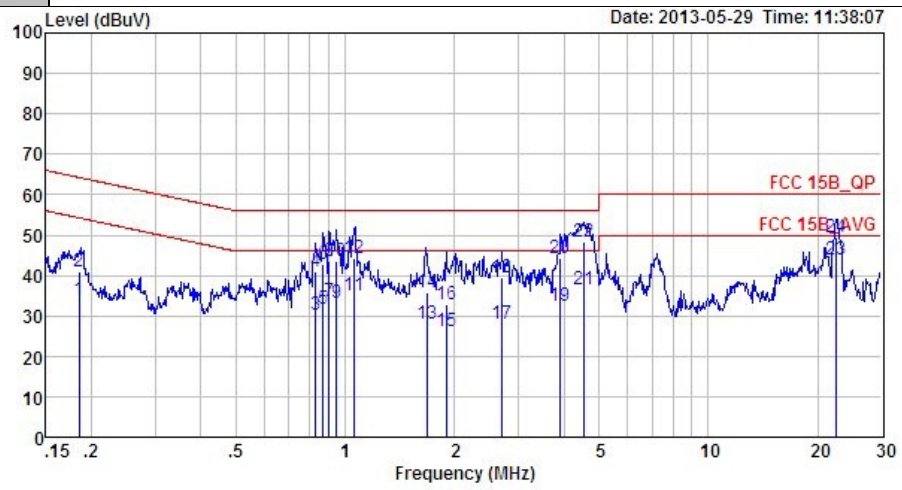
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

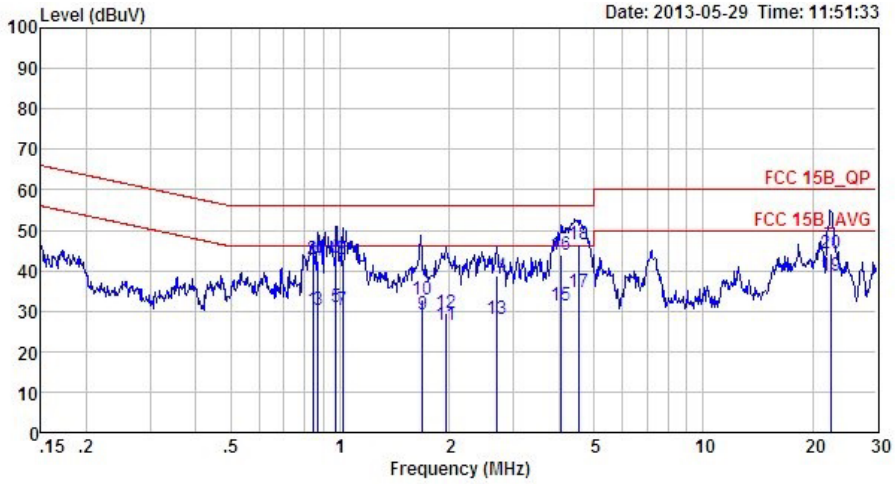
Test Mode :	Mode 4	**Temperature :**	24~25℃
Test Engineer :	Leo Liao	**Relative Humidity :**	48~49%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15B_QP LISN_L_2000601 LINE
Project : (FC) 341202
Mode : mode4

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.19	33.78	-20.46	54.24	23.70	0.03	10.05	Average
2		0.19	40.98	-23.26	64.24	30.90	0.03	10.05	QP
3		0.83	30.25	-15.75	46.00	20.12	0.02	10.11	Average
4		0.83	40.88	-15.12	56.00	30.75	0.02	10.11	QP
5		0.87	31.63	-14.37	46.00	21.50	0.02	10.11	Average
6		0.87	42.93	-13.07	56.00	32.80	0.02	10.11	QP
7		0.90	33.63	-12.37	46.00	23.49	0.03	10.11	Average
8		0.90	43.37	-12.63	56.00	33.23	0.03	10.11	QP
9		0.95	33.34	-12.66	46.00	23.20	0.03	10.11	Average
10		0.95	43.64	-12.36	56.00	33.50	0.03	10.11	QP
11		1.06	35.14	-10.86	46.00	24.99	0.03	10.12	Average
12		1.06	44.24	-11.76	56.00	34.09	0.03	10.12	QP
13		1.69	28.07	-17.93	46.00	17.91	0.03	10.13	Average
14		1.69	35.77	-20.23	56.00	25.61	0.03	10.13	QP
15		1.90	26.06	-19.94	46.00	15.88	0.03	10.15	Average
16		1.90	32.76	-23.24	56.00	22.58	0.03	10.15	QP
17		2.71	27.92	-18.08	46.00	17.70	0.04	10.18	Average
18		2.71	39.62	-16.38	56.00	29.40	0.04	10.18	QP
19		3.92	32.50	-13.50	46.00	22.25	0.06	10.19	Average
20		3.92	44.12	-11.88	56.00	33.87	0.06	10.19	QP
21		4.55	36.56	-9.44	46.00	26.31	0.06	10.19	Average
22		4.55	48.26	-7.74	56.00	38.01	0.06	10.19	QP
23	*	22.42	43.89	-6.11	50.00	33.00	0.43	10.46	Average
24		22.42	49.29	-10.71	60.00	38.40	0.43	10.46	QP

Test Mode :	Mode 4	Temperature :	24~25℃
Test Engineer :	Leo Liao	Relative Humidity :	48~49%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15B_QP LISN_N_2000601 NEUTRAL
Project : (FC) 341202
Mode : mode4

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.84	30.13	-15.87	46.00	20.00	0.02	10.11	Average
2		0.84	42.93	-13.07	56.00	32.80	0.02	10.11	QP
3		0.87	30.23	-15.77	46.00	20.10	0.02	10.11	Average
4		0.87	42.59	-13.41	56.00	32.46	0.02	10.11	QP
5		0.97	30.83	-15.17	46.00	20.70	0.02	10.11	Average
6		0.97	43.13	-12.87	56.00	33.00	0.02	10.11	QP
7		1.02	30.34	-15.66	46.00	20.21	0.02	10.11	Average
8		1.02	42.99	-13.01	56.00	32.86	0.02	10.11	QP
9		1.69	29.16	-16.84	46.00	19.00	0.03	10.13	Average
10		1.69	32.66	-23.34	56.00	22.50	0.03	10.13	QP
11		1.95	26.53	-19.47	46.00	16.35	0.03	10.15	Average
12		1.95	29.38	-26.62	56.00	19.20	0.03	10.15	QP
13		2.71	28.02	-17.98	46.00	17.80	0.04	10.18	Average
14		2.71	38.92	-17.08	56.00	28.70	0.04	10.18	QP
15		4.07	31.26	-14.74	46.00	21.01	0.06	10.19	Average
16		4.07	43.74	-12.26	56.00	33.49	0.06	10.19	QP
17		4.55	34.66	-11.34	46.00	24.40	0.07	10.19	Average
18	*	4.55	46.36	-9.64	56.00	36.10	0.07	10.19	QP
19		22.42	38.90	-11.10	50.00	27.80	0.64	10.46	Average
20		22.42	44.10	-15.90	60.00	33.00	0.64	10.46	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

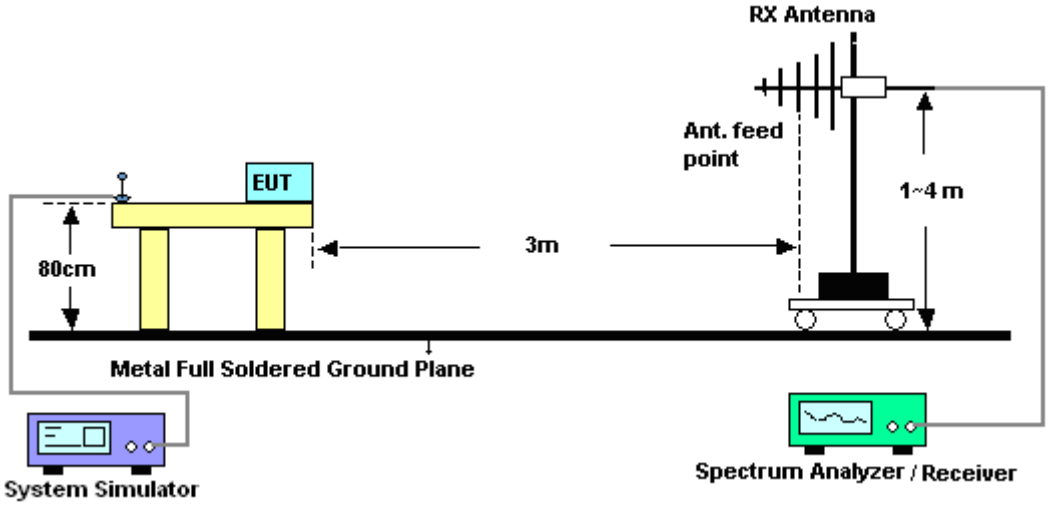
See list of measuring instruments of this test report.

3.2.3. Test Procedures

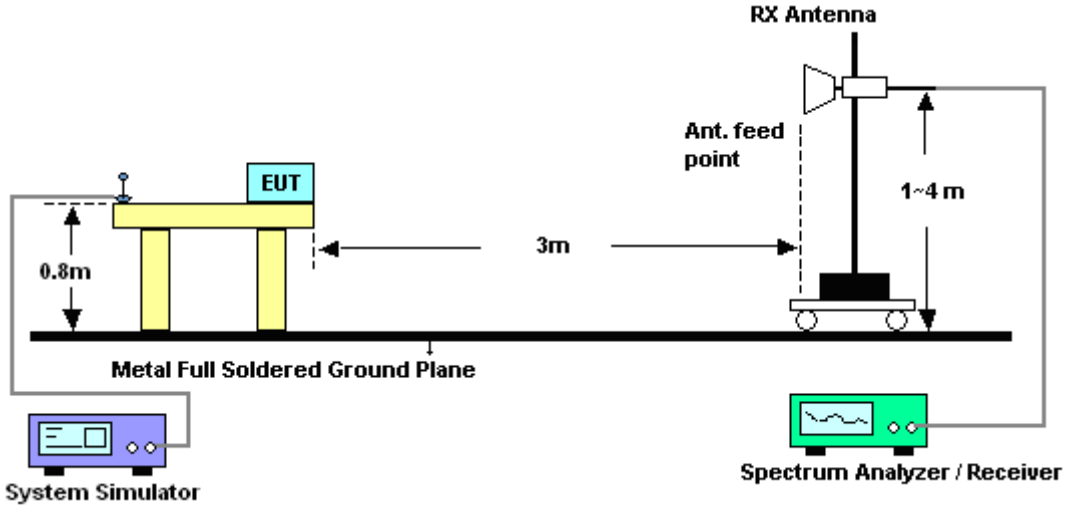
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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

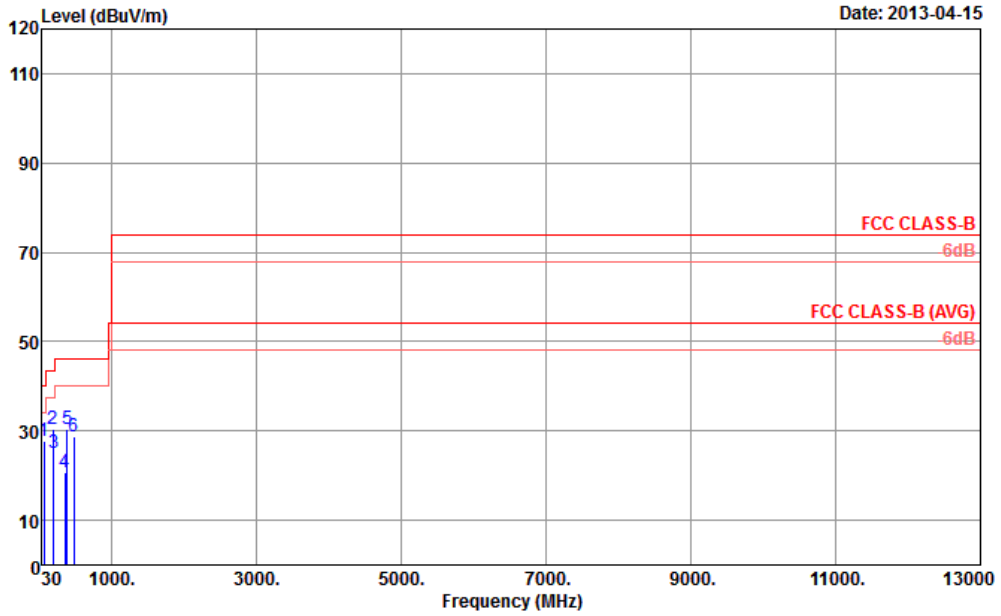


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

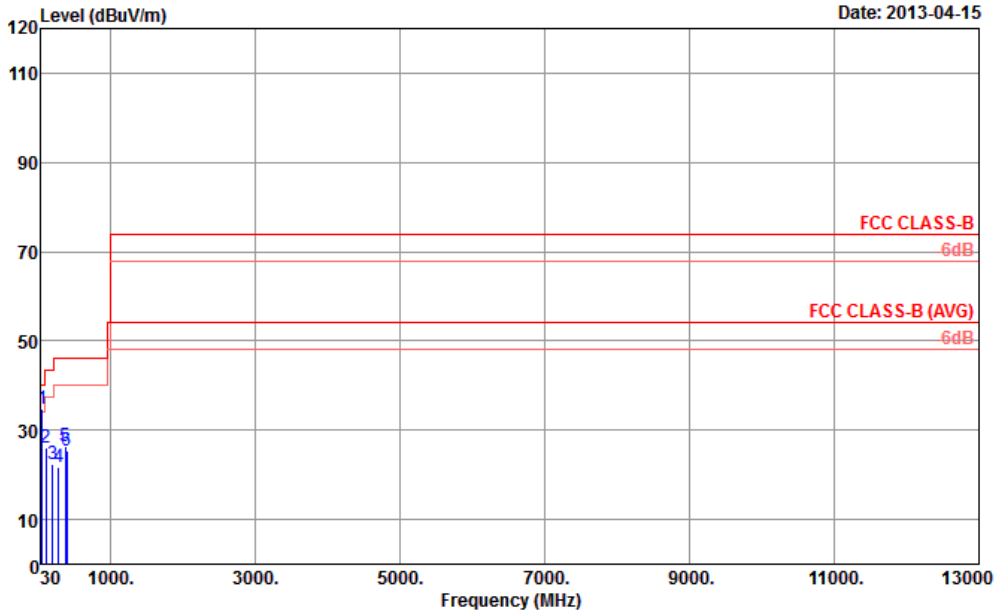
Test Mode :	Mode 4	Temperature :	24~25°C
Test Engineer :	Robin Luo	Relative Humidity :	54~55%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC)		



Site : 03CH01-SZ
Condition : FCC CLASS-B 3m LF ANT-H 121202 HORIZONTAL
Project : (FC)341202
Mode : Mode 4

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 P	67.83	27.83	-12.17	40.00	51.77	5.65	0.97	30.56	100	117	Peak
2	191.99	30.35	-13.15	43.50	49.65	9.67	1.39	30.36	---	---	Peak
3	201.69	25.16	-18.34	43.50	44.85	9.17	1.47	30.33	---	---	Peak
4	359.80	20.76	-25.24	46.00	33.69	15.02	1.85	29.80	---	---	Peak
5	385.02	30.40	-15.60	46.00	42.15	16.08	1.89	29.72	---	---	Peak
6	480.08	28.87	-17.13	46.00	38.99	17.20	2.08	29.40	---	---	Peak

Test Mode :	Mode 4	Temperature :	24~25℃
Test Engineer :	Robin Luo	Relative Humidity :	54~55%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band II Idle + Bluetooth Idle + USB Cable(Data Link with PC)		



Site : 03CH01-SZ
Condition : FCC CLASS-B 3m LF ANT-V 121202 VERTICAL
Project : (FC)341202
Mode : Mode 4

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 P	59.10	34.68	-5.32	40.00	58.78	5.60	0.83	30.53	100	165	Peak
2	105.66	25.92	-17.58	43.50	43.59	11.80	1.18	30.65	---	---	Peak
3	195.87	22.23	-21.27	43.50	41.96	9.20	1.42	30.35	---	---	Peak
4	283.17	21.77	-24.23	46.00	36.94	13.20	1.69	30.06	---	---	Peak
5	373.38	26.32	-19.68	46.00	38.37	15.84	1.87	29.76	---	---	Peak
6	392.78	25.56	-20.44	46.00	37.09	16.26	1.90	29.69	---	---	Peak

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
ESCIO TEST Receiver	R&S	1142.800 7.03	100724	9kHz~3GHz	Mar. 28, 2013	May 29, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 28, 2013	May 29, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 28, 2013	May 29, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	N/A	Nov. 20, 2012	May 29, 2013	Nov. 19, 2013	Conduction (CO01-SZ)
AC Filter	ETS-LINDGREN	LRE-2030/PEN 256260	00093783	N/A	N/A	May 29, 2013	N/A	Conduction (CO01-SZ)
AC Filter	ETS-LINDGREN	LRE-2030/PEN 256260	00097973	N/A	N/A	May 29, 2013	N/A	Conduction (CO01-SZ)
EMI Test Receiver	R&S	ESCI	100724	9kHz~3GHz	Mar. 28, 2013	Apr. 15, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP30	101362	9kHz~30GHz	Oct. 11, 2012	Apr. 15, 2013	Oct. 10, 2013	Radiation (03CH01-SZ)
Double Ridge Horn Amtenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 12, 2012	Apr. 15, 2013	Oct. 11, 2013	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30MHz~2GHz	Nov. 03, 2012	Apr. 15, 2013	Nov. 02, 2013	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3GHz Gain 30dB	Mar. 28, 2013	Apr. 15, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 28, 2013	Apr. 15, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF -Horn	Schwarzbeck	BBHA9170	BBHA9170249	14GHz~40GHz	Nov. 23, 2012	Apr. 15, 2013	Nov. 22, 2013	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100321	9KHz~30MHZ	Oct. 22, 2012	Apr. 15, 2013	Oct. 21, 2013	Radiation (03CH01-SZ)

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**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**

Appendix A. Photographs of EUT

Please refer to Sporton report number EP341202 as below.