FCC Test Report

APPLICANT	:	BlackBerry Limited
EQUIPMENT	:	Smartphone
BRAND NAME	:	BlackBerry
MODEL NAME	:	RHF141LW
MARKETING NAME	:	SQC100-3
FCC ID	:	L6ARHF140LW
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION	:	Certification

The product was received on Jul. 15, 2014 and testing was completed on Nov. 06, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2009 and has been in 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.

Louis Wu

Reviewed by: Louis Wu / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC471526	Rev. 01	Initial issue of report	Nov. 24, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	ICES003 Section 6.1	AC Conducted Emission	< 15.107 limits < ICES003 6.1 limits	PASS	Under limit 2.00 dB at 0.182 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 1.69 dB at 60.880 MHz for Quasi-Peak

1. General Description

1.1. Applicant

BlackBerry Limited
2300 University Street East, Waterloo, ON., CAN, N2K1A0

1.2. Manufacturer

FIH Mobile Limited
No.4, Mingsheng St.,Tu-Cheng Dist., New Taipei City 23679, Taiwan

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	BlackBerry
Model Name	RHF141LW
Marketing Name	SQC100-3
FCC ID	L6ARHF140LW
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth v4.0 EDR/LE
HW Version	PVT 2
SW Version	BlackBerry 10.3.1.565/566
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 subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	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 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz ; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz WPC / PMA : 100 kHz ~ 205 kHz
Rx Frequency	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 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz ; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz WPC / PMA : 100 kHz ~ 205 kHz GPS : 1.57542 GHz NFC : 13.56 MHz
Antenna Type	WWAN : Coupling type (LDS) LTE : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna NFC : Loop Antenna WPC / PMA : Loop Antenna

Product Specification subjective to this standard	
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) LTE: QPSK / 16QAM CDMA2000 : QPSK CDMA2000 1xEV-DO : 8PSK 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : π /4-DQPSK Bluetooth (3Mbps) : 8-DPSK GPS : BPSK NFC: ASK WPC / PMA : ASK

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st 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	
Test Site No.	**Sporton Site No.**	
	CO05-HY	03CH06-HY

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C. TEL: +886-2-2603-5367 / +886-2-2601-1640 FAX: +886-2-2601-1695
Test Site No.	**Sporton Site No.**
	OS02-LK

1.7. Applicable 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 C63.4-2009

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 C63.4-2009 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)	☒	☒	Note 1
2.	Charging Mode (EUT with WPC charger)	☒	☒	☒
3.	Charging Mode (EUT with PMA charger)	☒	☒	Note 1
4.	Data application transferred mode (EUT with notebook)	☒	☒	Note 1

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.

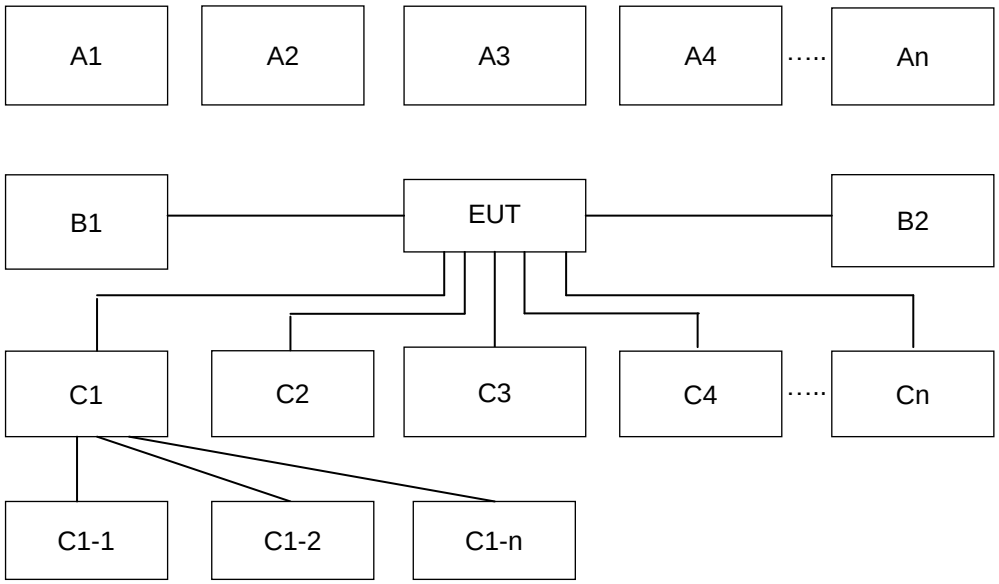
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2/3/4	Mode 1 : GSM850 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + NFC On + Earphone 1 + USB Cable1 (Charging from Adapter 1) Mode 2 : WCDMA Band V Idle + WLAN (5GHz) Idle + Bluetooth Idle + MPEG4 + Earphone 2 + USB Cable 2 (Charging from Adapter 2) Mode 3 : LTE Band 4 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + Camera + Earphone 3 + USB Cable 1 (Charging from Adapter 1) Mode 4 : WCDMA Band II Idle + WLAN (5GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 1 + USB Cable 2 (Data Link with Notebook) Mode 5 : GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + WPC Charger Mode 6 : GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + PMA Charger Mode 7 : WCDMA Band II Idle + WLAN (5GHz) Idle + Bluetooth Idle + FM Rx + Earphone 1 + USB Cable 2 (Data Link with Notebook)

Test Items	EUT Configure Mode	Function Type
Radiated Emissions < 1GHz	1/2/3/4	Mode 1 : GSM850 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + NFC On + Earphone 1 + USB Cable1 (Charging from Adapter 1) Mode 2 : WCDMA Band V Idle + WLAN (5GHz) Idle + Bluetooth Idle + MPEG4 + Earphone 2 + USB Cable 2 (Charging from Adapter 2) Mode 3 : LTE Band 4 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + Camera + Earphone 3 + USB Cable 1 (Charging from Adapter 1) Mode 4 : WCDMA Band II Idle + WLAN (5GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 1 + USB Cable 2 (Data Link with Notebook) Mode 5 : GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter) Mode 6 : GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + PMA Charging + GPS Rx + Earphone 1 + PMA Charger (Charging from Adapter) Mode 7 : WCDMA Band II Idle + WLAN (5GHz) Idle + Bluetooth Idle + FM Rx + Earphone 1 + USB Cable 2 (Data Link with Notebook)
Radiated Emissions ≥ 1GHz	1	Mode 1 : GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)

Remark:

1. The worst case of AC is mode 6; only the test data of this mode was reported.
2. The worst case of RE < 1G is mode 5; only the test data of this mode was reported.
3. Data Link with Notebook means data application transferred mode between EUT and Notebook.

2.2. Connection Diagram of Test System



Conduction Test Setup									
No.	**Wireless Station**	**Connection Type**	**Test Mode**						
			1	**2**	**3**	**4**	**5**	**6**	**7**
A1	BT Earphone	Bluetooth	X	X	X	X	X	X	X
A2	System Simulator	GSM/UMTS/CDMA/ WCDMA/LTE	X	X	X	X	X	X	X
A3	GPS Station	GPS				X	X	X	
A4	AP router	WiFi	X	X	X	X	X	X	X
A5	NFC Card	NFC	X						
A6	WPC Charger	WPC					X		
A7	PMA Charger	PMA						X	
No.	**Power Source**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	AC : 120V/60Hz	AC Power Cable	X	X	X				
No.	**Setup Peripherals**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	Earphone	Earphone jack	X	X	X	X	X	X	X
C2	SD card	SD I/O interface without cable	X	X	X	X	X	X	X
C3	Notebook	Adapter jack B1				X			X
C3-1	AP	RJ45 cable to C3				X			X
C3-2	IPod	USB cable jack to C3				X			X

Radiation Test Setup									
No.	Wireless Station	Connection Type	Test Mode						
			1	2	3	4	5	6	7
A1	BT Earphone	Bluetooth	X	X	X	X	X	X	X
A2	System Simulator	GSM/UMTS/CDMA/ WCDMA/LTE	X	X	X	X	X	X	X
A3	GPS Station	GPS				X	X	X	
A4	AP router	WiFi	X	X	X	X	X	X	X
A5	Notebook	WiFi	X	X	X	X	X	X	X
A6	WPC Charging	WPC					X		
A7	PMA Charging	PMA						X	
No.	**Power Source**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	AC : 120V/60Hz	AC Power Cable	X	X	X				
No.	**Setup Peripherals**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	Notebook	USB cable				X			X
C1-1	IPod	USB Cable to C1				X			X
C1-2	WLAN AP	RJ-45 Cable to C1				X			X
C2	Earphone	Earphone jack	X	X	X	X	X	X	X
C3	SD card	SD I/O interface without cable	X	X	X	X	X	X	X

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	System Simulator	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
4.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
5.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
7.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
8.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
9.	WPC Charger	LG	WCP-700	BEJWCP700	N/A	Unshielded, 1.5 m
10.	PMA Charger	DURACELL	POWERMAT	FCC DoC	N/A	Unshielded, 1.5 m
11.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
12.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.4. EUT Operation Test Setup

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. Data application is transferred between Laptop and EUT via USB cable.
2. Execute "GPS Test" to make the EUT receive continuous signals from GPS station.
3. Execute "Windows Media Player" to play MPEG4 files.
4. Turn on FM RX function.
5. The EUT is charging from the WPC or PMA charger through wireless charging function.

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.

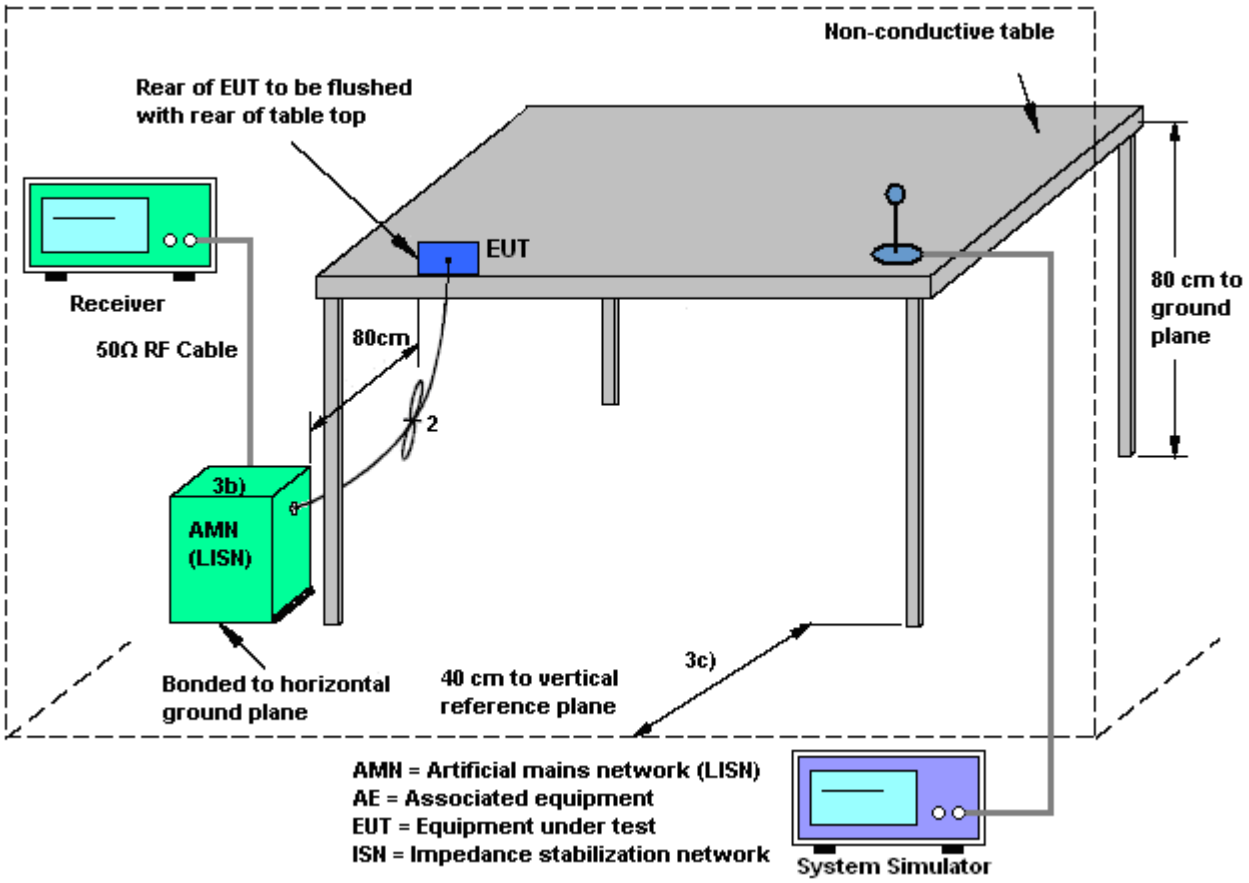
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

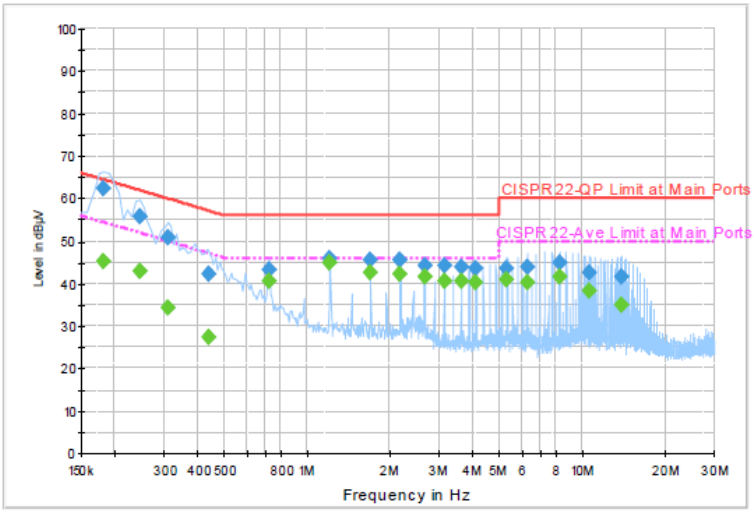
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

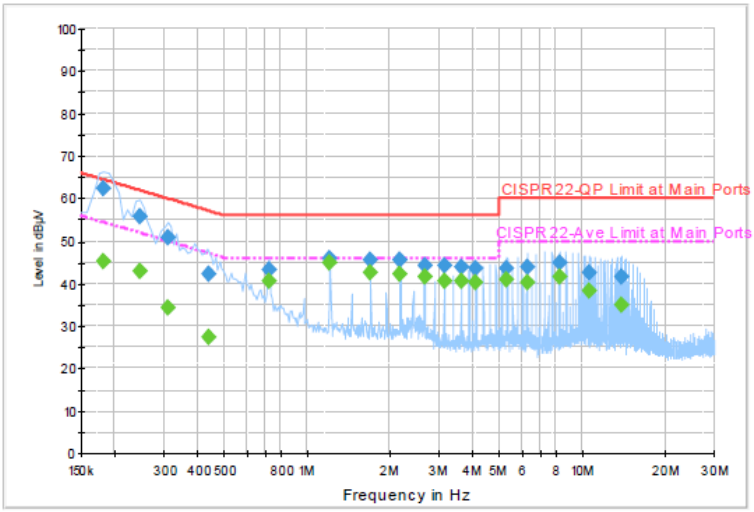
Test Mode :	Mode 6	**Temperature :**	21~23℃
Test Engineer :	Cosmo Xu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + WPC Charger		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	62.4	Off	L1	19.4	2.0	64.4
0.246000	55.6	Off	L1	19.5	6.3	61.9
0.310000	50.7	Off	L1	19.5	9.3	60.0
0.438000	42.1	Off	L1	19.5	15.0	57.1
0.726000	43.4	Off	L1	19.5	12.6	56.0
1.206000	45.8	Off	L1	19.5	10.2	56.0
1.686000	45.4	Off	L1	19.5	10.6	56.0
2.166000	45.4	Off	L1	19.3	10.6	56.0
2.654000	44.2	Off	L1	19.5	11.8	56.0
3.134000	44.3	Off	L1	19.6	11.7	56.0
3.614000	44.0	Off	L1	19.6	12.0	56.0
4.094000	43.4	Off	L1	19.6	12.6	56.0
5.302000	43.6	Off	L1	19.6	16.4	60.0
6.262000	43.9	Off	L1	19.6	16.1	60.0
8.198000	44.8	Off	L1	19.7	15.2	60.0
10.598000	42.7	Off	L1	19.7	17.3	60.0
13.750000	41.7	Off	L1	19.8	18.3	60.0

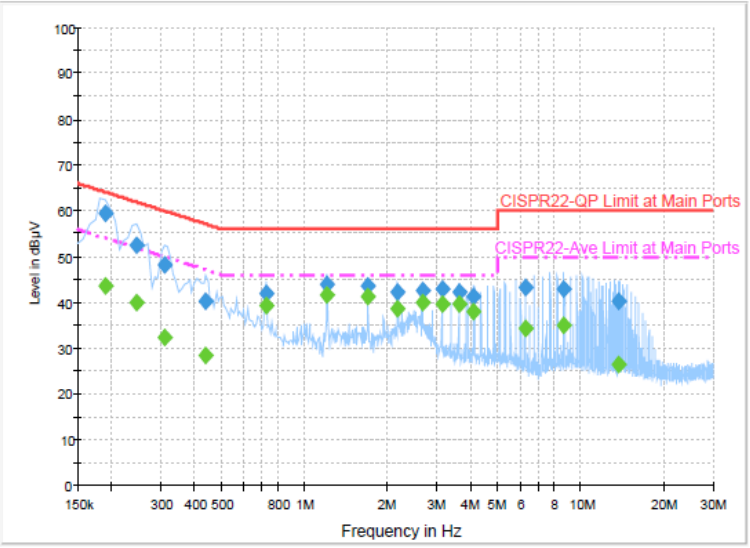
Test Mode :	Mode 6	Temperature :	21~23℃
Test Engineer :	Cosmo Xu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + WPC Charger		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	45.3	Off	L1	19.4	9.1	54.4
0.246000	43.0	Off	L1	19.5	8.9	51.9
0.310000	34.4	Off	L1	19.5	15.6	50.0
0.438000	27.3	Off	L1	19.5	19.8	47.1
0.726000	40.6	Off	L1	19.5	5.4	46.0
1.206000	44.8	Off	L1	19.5	1.2	46.0
1.686000	42.7	Off	L1	19.5	3.3	46.0
2.166000	42.3	Off	L1	19.3	3.7	46.0
2.654000	41.4	Off	L1	19.5	4.6	46.0
3.134000	40.7	Off	L1	19.6	5.3	46.0
3.614000	40.5	Off	L1	19.6	5.5	46.0
4.094000	40.1	Off	L1	19.6	5.9	46.0
5.302000	41.0	Off	L1	19.6	9.0	50.0
6.262000	40.3	Off	L1	19.6	9.7	50.0
8.198000	41.5	Off	L1	19.7	8.5	50.0
10.598000	38.1	Off	L1	19.7	11.9	50.0
13.750000	35.1	Off	L1	19.8	14.9	50.0

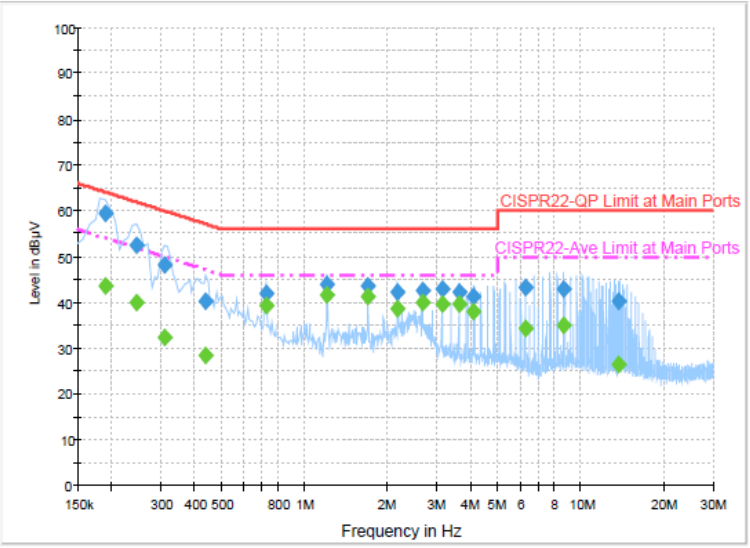
Test Mode :	Mode 6	Temperature :	21~23℃
Test Engineer :	Cosmo Xu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + WPC Charger		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	59.3	Off	N	19.5	4.7	64.0
0.246000	52.3	Off	N	19.5	9.6	61.9
0.310000	48.1	Off	N	19.5	11.9	60.0
0.438000	40.1	Off	N	19.5	17.0	57.1
0.726000	42.0	Off	N	19.5	14.0	56.0
1.206000	44.1	Off	N	19.5	11.9	56.0
1.686000	43.7	Off	N	19.5	12.3	56.0
2.166000	42.2	Off	N	19.3	13.8	56.0
2.654000	42.5	Off	N	19.5	13.5	56.0
3.134000	42.9	Off	N	19.6	13.1	56.0
3.614000	42.2	Off	N	19.6	13.8	56.0
4.094000	41.2	Off	N	19.6	14.8	56.0
6.270000	43.1	Off	N	19.6	16.9	60.0
8.678000	43.1	Off	N	19.7	16.9	60.0
13.734000	40.3	Off	N	19.8	19.7	60.0

Test Mode :	Mode 6	Temperature :	21~23℃
Test Engineer :	Cosmo Xu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + WLAN (2.4GHz) Idle + Bluetooth Idle + GPS Rx + Earphone 2 + WPC Charger		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	43.6	Off	N	19.5	10.4	54.0
0.246000	39.9	Off	N	19.5	12.0	51.9
0.310000	32.2	Off	N	19.5	17.8	50.0
0.438000	28.3	Off	N	19.5	18.8	47.1
0.726000	39.4	Off	N	19.5	6.6	46.0
1.206000	41.6	Off	N	19.5	4.4	46.0
1.686000	41.3	Off	N	19.5	4.7	46.0
2.166000	38.8	Off	N	19.3	7.2	46.0
2.654000	40.0	Off	N	19.5	6.0	46.0
3.134000	39.5	Off	N	19.6	6.5	46.0
3.614000	39.6	Off	N	19.6	6.4	46.0
4.094000	38.0	Off	N	19.6	8.0	46.0
6.270000	34.2	Off	N	19.6	15.8	50.0
8.678000	35.1	Off	N	19.7	14.9	50.0
13.734000	26.4	Off	N	19.8	23.6	50.0

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)
Above 960	500	3

Note: Measurement below 1GHz follows the CISPR 22 limit line as below：

15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement”

Frequency (MHz)	Field Strength (dBuV/meter)	Measurement Distance (meters)
30 – 230	30	10
230 – 1000	37	10

3.2.2. Measuring Instruments

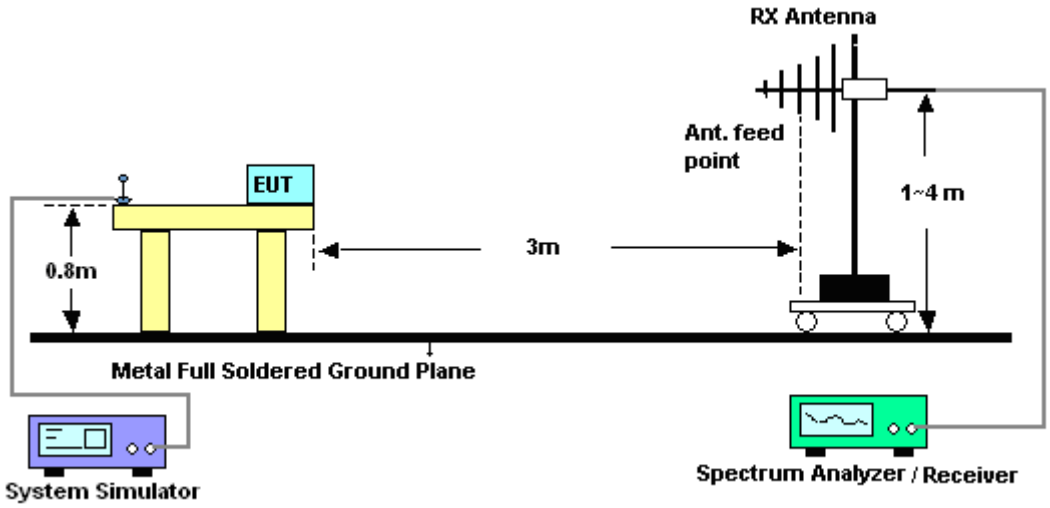
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

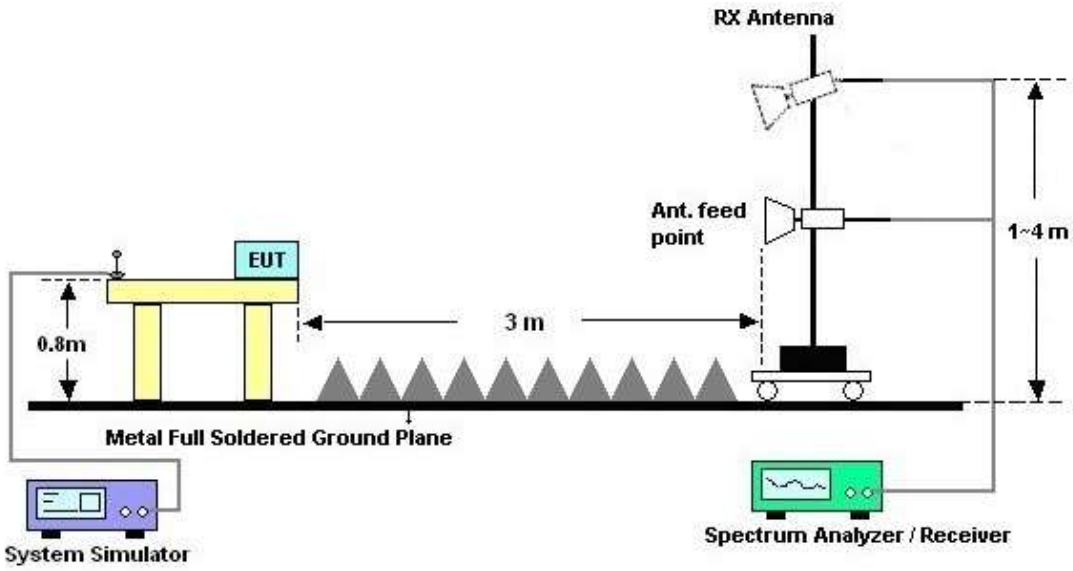
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one 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 (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
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 (dBμV/m) = 20 log Emission level (μV/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

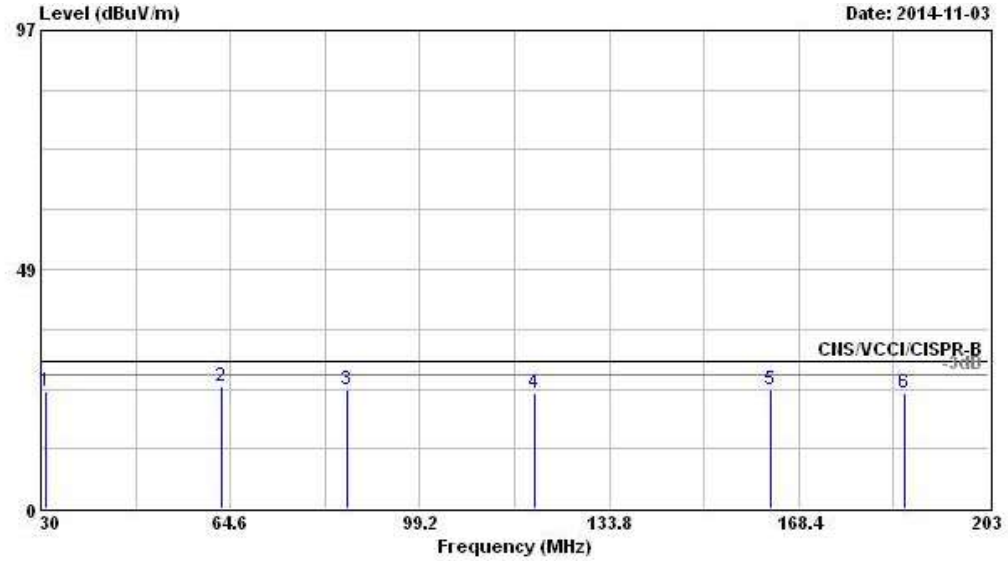


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

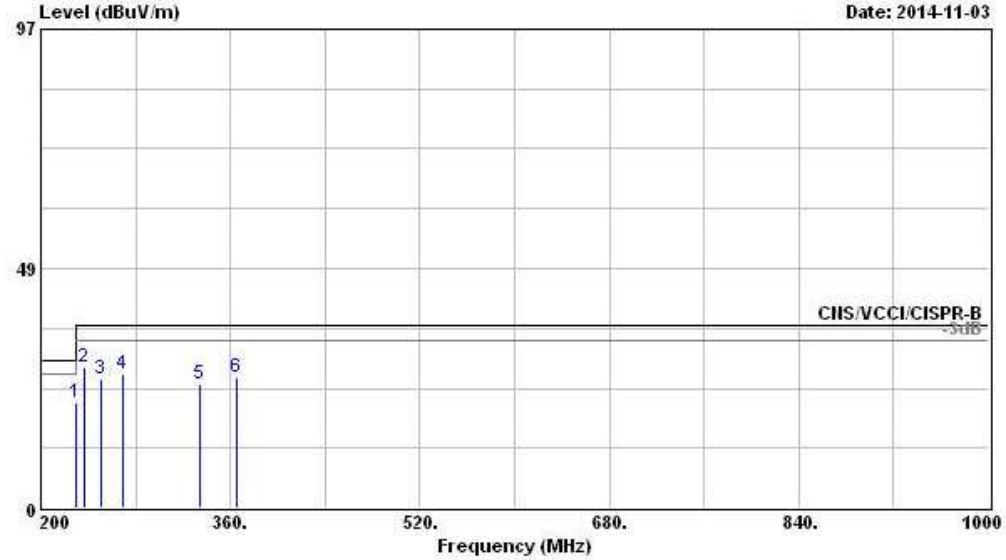
Test Mode :	Mode 5	Temperature :	21~23°C
Test Engineer :	Luke Chang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		



Site : OS02-LK
Condition : CNS/VCCI/CISPR-B 10m 6112D2444 / 20140510 HORIZONTAL
Project : 471526
Power : From WPC
Mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Table Pos	Ant Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm	
1 @	31.040	23.66	-6.34	30.00	28.82	18.03	0.85	24.04	---	---	Peak
2 @	62.870	24.66	-5.34	30.00	40.73	6.39	1.18	23.64	269	400	Peak
3 @	86.050	24.03	-5.97	30.00	37.98	8.29	1.32	23.56	---	---	Peak
4 @	120.130	23.53	-6.47	30.00	33.36	12.12	1.55	23.50	---	---	Peak
5 @	163.380	24.14	-5.86	30.00	35.87	9.95	1.76	23.44	---	---	Peak
6 @	187.780	23.37	-6.63	30.00	35.92	8.96	1.90	23.41	---	---	Peak

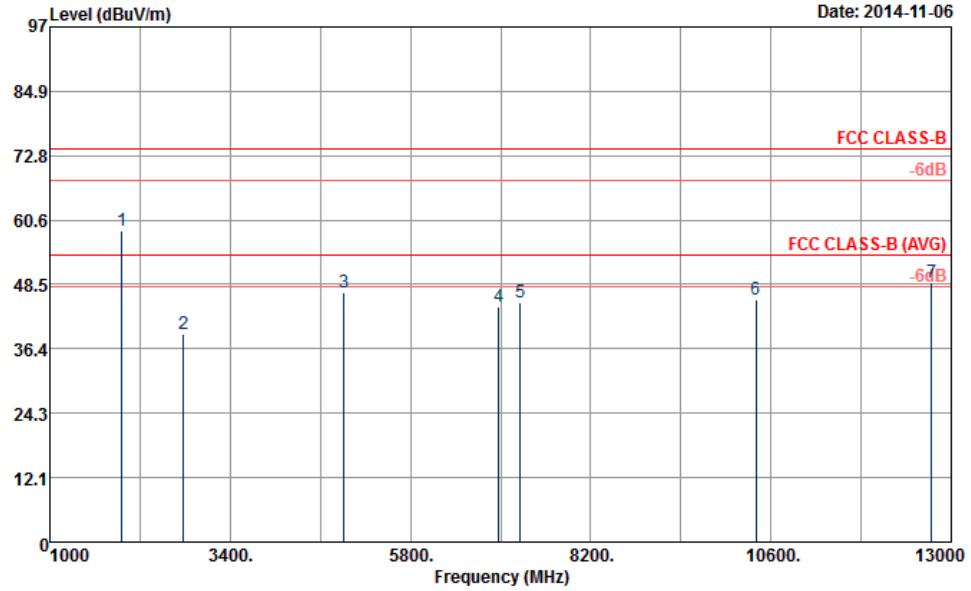
Test Mode :	Mode 5	Temperature :	21~23°C
Test Engineer :	Luke Chang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		



Site : OS02-LK
Condition : CNS/VCCI/CISPR-B 10m 6112D2444 / 20140510 HORIZONTAL
Project : 471526
Power : From WPC
Mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Table Pos	Ant Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm	
1 @	229.600	21.21	-8.79	30.00	32.25	10.24	2.07	23.35	---	---	Peak
2 @	236.800	28.61	-8.39	37.00	38.73	11.11	2.11	23.34	---	---	Peak
3 @	250.400	26.04	-10.96	37.00	34.64	12.54	2.18	23.32	---	---	Peak
4 @	268.800	27.12	-9.88	37.00	35.14	12.99	2.28	23.29	---	---	Peak
5 @	334.400	25.07	-11.93	37.00	31.79	14.02	2.49	23.23	---	---	Peak
6 @	365.600	26.62	-10.38	37.00	32.29	14.88	2.67	23.22	---	---	Peak

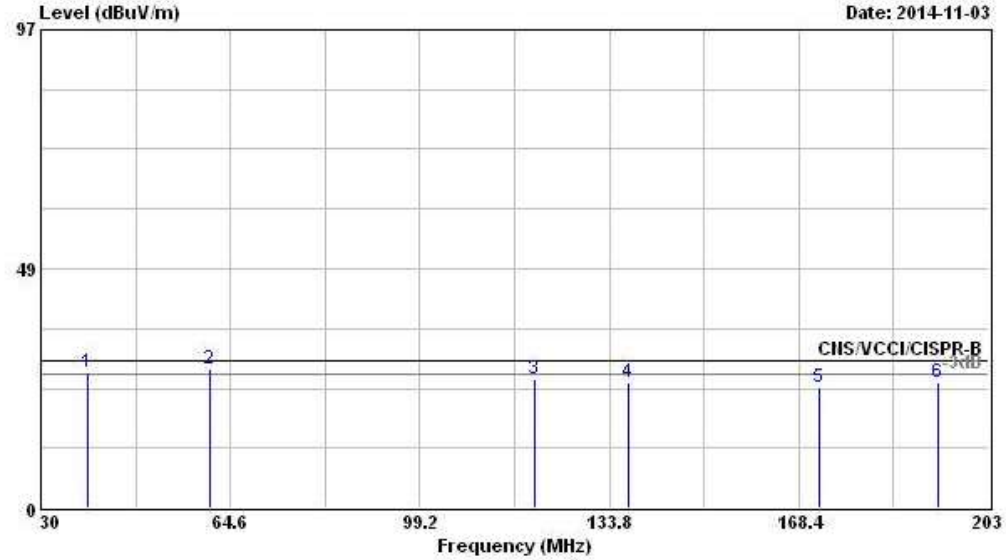
Test Mode :	Mode 5	**Temperature :**	21~23°C
Test Engineer :	Luke Chang	**Relative Humidity :**	46~48%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		
Remark :	#1 is system simulator signal which can be ignored.		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT_583_140731 HORIZONTAL
Project : 471526
Power : From WPC
Mode : Mode 5

	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	1958.00	58.53			82.29	31.33	5.40	60.49	---	---	Peak
2	2776.00	39.16	-34.84	74.00	60.92	32.43	6.58	60.77	---	---	Peak
3	4918.00	47.09	-26.91	74.00	64.33	34.43	8.94	60.61	---	---	Peak
4	6980.00	44.33	-29.67	74.00	57.78	35.80	11.15	60.40	---	---	Peak
5	7260.00	45.18	-28.82	74.00	58.02	35.75	11.91	60.50	---	---	Peak
6	10400.00	45.65	-28.35	74.00	55.98	37.32	12.99	60.64	---	---	Peak
7	12738.00	48.88	-25.12	74.00	53.69	39.39	15.79	59.99	121	27	Peak

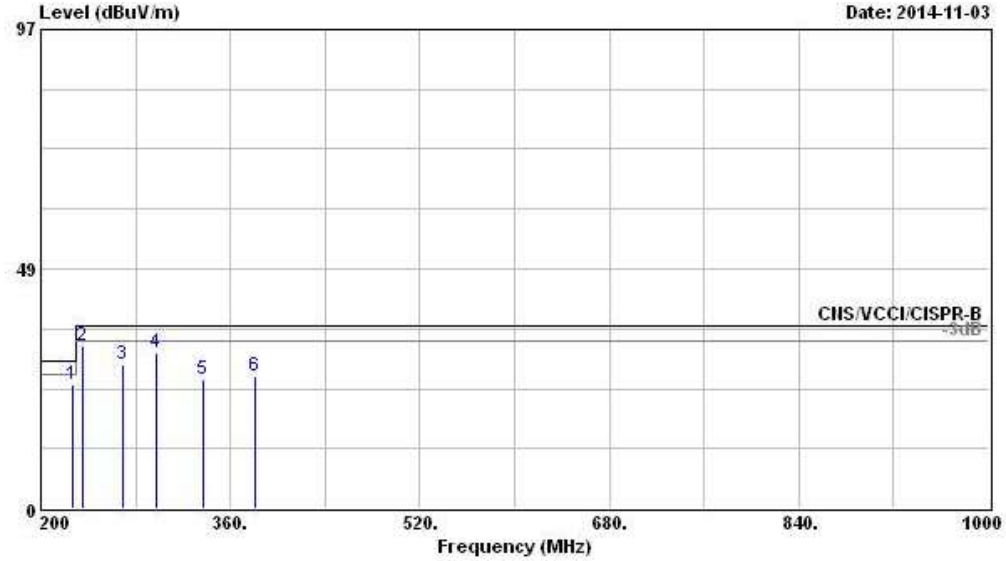
Test Mode :	Mode 5	Temperature :	21~23°C
Test Engineer :	Luke Chang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		



Site : OS02-LK
Condition : CNS/VCCI/CISPR-B 10m 6112D2444 / 20140510 VERTICAL
Project : 471526
Power : From WPC
Mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Table Pos	Ant Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm	
1 @	38.420	27.44	-2.56	30.00	36.20	14.16	0.95	23.87	350	100	QP
2 @	60.880	28.31	-1.69	30.00	44.21	6.60	1.15	23.65	175	100	QP
3 @	120.130	26.05	-3.95	30.00	35.88	12.12	1.55	23.50	---	---	Peak
4 @	137.260	25.57	-4.43	30.00	35.94	11.41	1.70	23.48	---	---	Peak
5 @	172.210	24.55	-5.45	30.00	36.64	9.53	1.81	23.43	---	---	Peak
6 @	193.830	25.52	-4.48	30.00	37.92	9.08	1.92	23.40	---	---	Peak

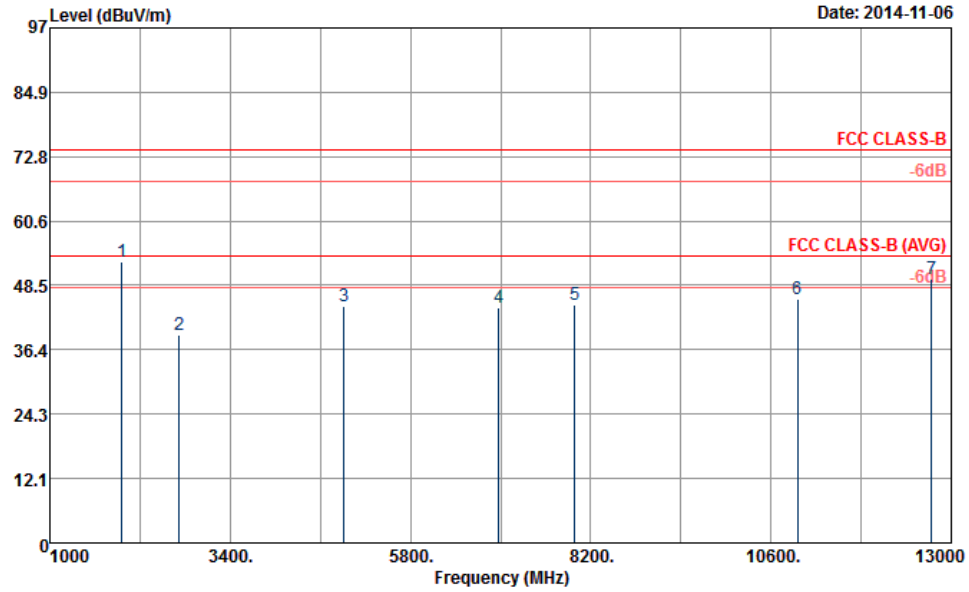
Test Mode :	Mode 5	Temperature :	21~23°C
Test Engineer :	Luke Chang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		



Site : OS02-LK
Condition : CNS/VCCI/CISPR-B 10m 6112D2444 / 20140510 VERTICAL
Project : 471526
Power : From WPC
Mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Table Pos	Ant Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	deg	cm	
1 @	227.200	25.16	-4.84	30.00	36.47	9.98	2.06	23.35	---	---	Peak
2 @	236.000	32.84	-4.16	37.00	43.08	10.99	2.11	23.34	---	---	Peak
3 @	268.800	29.10	-7.90	37.00	37.12	12.99	2.28	23.29	---	---	Peak
4 @	297.600	31.68	-5.32	37.00	39.35	13.29	2.29	23.25	---	---	Peak
5 @	336.800	26.18	-10.82	37.00	32.86	14.05	2.50	23.23	---	---	Peak
6 @	380.800	26.82	-10.18	37.00	32.10	15.17	2.76	23.21	---	---	Peak

Test Mode :	Mode 5	Temperature :	21~23°C
Test Engineer :	Luke Chang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM1900 Idle + WLAN (5GHz) Idle + Bluetooth Idle + WPC Charging + GPS Rx + Earphone 2 + WPC Charger (Charging from Adapter)		
Remark :	#1 is system simulator signal which can be ignored.		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT_583_140731 VERTICAL
Project : 471526
Power : From WPC
Mode : Mode 5

	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	1960.00	52.98			76.74	31.33	5.40	60.49	---	---	Peak
2	2722.00	39.11	-34.89	74.00	60.93	32.35	6.55	60.72	---	---	Peak
3	4918.00	44.61	-29.39	74.00	61.85	34.43	8.94	60.61	---	---	Peak
4	6980.00	44.22	-29.78	74.00	57.67	35.80	11.15	60.40	---	---	Peak
5	7984.00	44.87	-29.13	74.00	56.79	35.80	12.01	59.73	---	---	Peak
6	10954.00	45.86	-28.14	74.00	53.66	37.68	13.72	59.20	---	---	Peak
7	12736.00	49.62	-24.38	74.00	54.43	39.39	15.79	59.99	107	221	Peak

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Oct. 28, 2014~ Oct. 29, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Oct. 28, 2014~ Oct. 29, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Oct. 28, 2014~ Oct. 29, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Oct. 28, 2014~ Oct. 29, 2014	N/A	Conduction (CO05-HY)
Amplifier	HP	87405A	3950M00135	0.1MHz ~ 3GHz	Jul. 09, 2014	Nov. 03, 2014	Jul. 08, 2015	Radiation (OS02-LK)
Spectrum Analyzer	R&S	FSP 7	100642	9 kHz ~ 7 GHz	Mar. 06, 2014	Nov. 03, 2014	Mar. 05, 2015	Radiation (OS02-LK)
Test Receiver	R&S	ESCS 30	838251/004	9 kHz ~ 2.75 GHz	May 28, 2014	Nov. 03, 2014	May 27, 2015	Radiation (OS02-LK)
Bilog Antenna	CHASE	CBL6112D	2444	30 MHz ~ 2 GHz	May 10, 2014	Nov. 03, 2014	May 09, 2015	Radiation (OS02-LK)
Turn Table	EMCO	2080	9711-1090	0 ~ 360 degree	N/A	Nov. 03, 2014	N/A	Radiation (OS02-LK)
Antenna Mast	EMCO	2075	9711-2114	1 m ~ 4 m	N/A	Nov. 03, 2014	N/A	Radiation (OS02-LK)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Nov. 06, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Nov. 06, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2014	Nov. 06, 2014	May 05, 2015	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~ 2GHz	Sep. 27, 2014	Nov. 06, 2014	Sep. 26, 2015	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Jul. 24, 2014	Nov. 06, 2014	Jul. 23, 2015	Radiation (03CH06-HY)
Amplifier	SONOMA	310N	186713	9kHz ~ 1GHz	Apr. 16, 2014	Nov. 06, 2014	Apr. 15, 2015	Radiation (03CH06-HY)
Preamplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 17, 2014	Nov. 06, 2014	Jul. 16, 2015	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Nov. 06, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Nov. 06, 2014	N/A	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**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.50**