Variant FCC RF Test Report

APPLICANT	:	BlackBerry Limited
EQUIPMENT	:	Smartphone
BRAND NAME	:	BlackBerry
MODEL NAME	:	RHF142LW
MARKETING NAME	:	SQC100-5
FCC ID	:	L6ARHF140LW
STANDARD	:	47 CFR Part 2, 27
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original test report. The product was received on Aug. 21, 2014 and testing was completed on Dec. 14, 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 / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be 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.

Reviewed by: Joseph Lin / Supervisor

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
FG471526-02B	Rev. 01	This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number FG471526B as appendix B.	Dec. 29, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-Gen(4.8) RSS-130(4.4) RSS-139 (6.4)	Conducted Output Power	Reporting Only	PASS	-
3.2	§27.50(b)(10)	N/A	Effective Radiated Power (Band 13)	ERP < 3 Watt	PASS	-
	§27.50(d)(4)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
3.3	§2.1053 §27.53(c)(2) §27.53(f) §27.53(h)	RSS-GEN(4.9) RSS-130(4.6) RSS-139 (6.5)	Radiated Spurious Emission (Band 4) (Band 13)	< $43+10\log_{10}(P[Watts])$	PASS	Under limit 10.76 dB at 1559.000 MHz

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	RHF142LW
Marketing Name	SQC100-5
FCC ID	L6ARHF140LW
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC/WPC/PMA WLAN 11b/g/n (HT20) WLAN 11a/n (HT20/HT40) Bluetooth v4.0 EDR/LE
HW Version	PVT 2
SW Version	BlackBerry 10.3.1.1031 Radio 1032 /SR 10.3.1.663
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	LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz
Rx Frequency	LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz
Bandwidth	LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 13 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 4 : 23.10 dBm LTE Band 13 : 23.37 dBm
Antenna Type	PIFA Antenna
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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

1.6 Testing 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.**	
	TH02-HY	03CH07-HY

1.7 Applicable Standards

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

- 47 CFR Part 2, 27
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02
- KDB 648474 D03 Handset Wireless Chargers Battery Covers v01r02

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

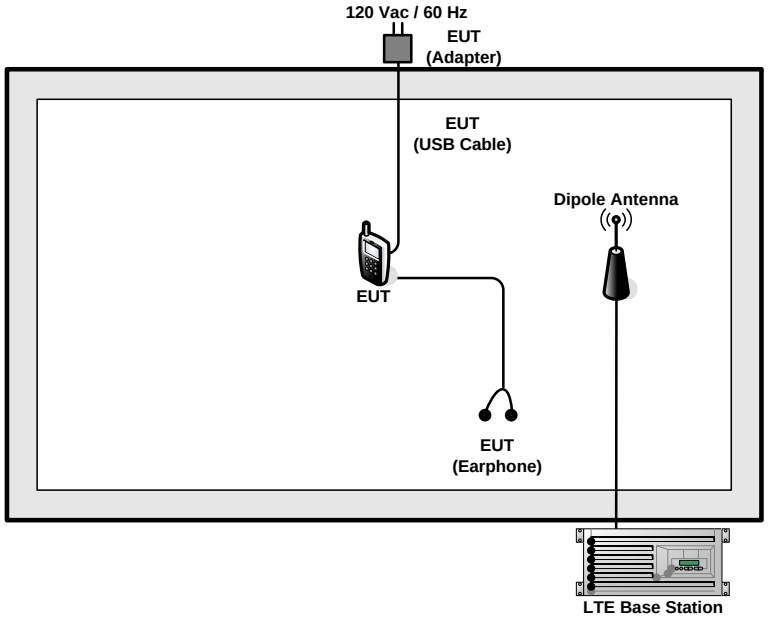
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v	v	v	v
Radiated Spurious Emission	4	v	v	v	v	v	v	v		v			v	v	v
	13	-	-	v	v	-	-	v		v			v	v	v
Note	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. All modes and data rates and positions were investigated, and found that EUT with the wireless power charger as the worst case test configuration.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

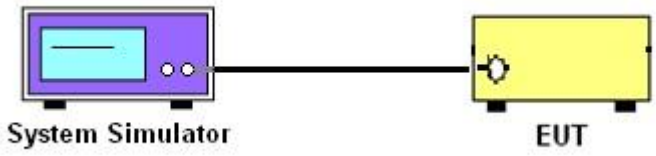
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

<LTE Band 4 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20050	20175	20300
Frequency (MHz)				1720	1732.5	1745
20	QPSK	1	0	23.08	22.91	**23.10**
20	QPSK	1	49	22.61	22.81	22.88
20	QPSK	1	99	22.56	22.72	22.73
20	QPSK	50	0	21.71	21.84	21.99
20	QPSK	50	24	21.63	21.87	21.89
20	QPSK	50	49	21.69	21.86	21.94
20	QPSK	100	0	21.73	21.82	22.08
20	16QAM	1	0	21.96	21.97	22.09
20	16QAM	1	49	21.64	21.82	21.88
20	16QAM	1	99	21.58	21.90	21.74
20	16QAM	50	0	20.79	20.85	21.01
20	16QAM	50	24	20.76	20.82	21.18
20	16QAM	50	49	20.66	20.90	21.04
20	16QAM	100	0	20.71	20.80	21.06
Channel				20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	**23.06**	22.82	23.02
15	QPSK	1	37	22.79	22.69	23.01
15	QPSK	1	74	22.58	22.73	22.70
15	QPSK	36	0	21.79	21.79	22.26
15	QPSK	36	18	21.80	21.85	22.09
15	QPSK	36	37	21.61	21.87	22.02
15	QPSK	75	0	21.72	21.76	21.92
15	16QAM	1	0	21.98	21.85	22.12
15	16QAM	1	37	21.79	21.89	22.01
15	16QAM	1	74	21.70	21.80	21.76
15	16QAM	36	0	20.87	20.74	21.16
15	16QAM	36	18	20.89	20.84	21.06
15	16QAM	36	37	20.74	20.88	21.10
15	16QAM	75	0	20.65	20.86	21.04

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20000	20175	20350
Frequency (MHz)				1715	1732.5	1750
10	QPSK	1	0	22.93	22.81	**23.05**
10	QPSK	1	24	22.84	22.72	23.01
10	QPSK	1	49	22.69	22.72	22.72
10	QPSK	25	0	21.90	21.92	22.06
10	QPSK	25	12	21.92	21.78	22.13
10	QPSK	25	24	21.86	21.89	21.91
10	QPSK	50	0	21.71	21.89	21.98
10	16QAM	1	0	22.00	21.93	22.11
10	16QAM	1	24	21.90	21.80	22.06
10	16QAM	1	49	21.66	21.82	21.72
10	16QAM	25	0	20.87	20.90	21.05
10	16QAM	25	12	20.93	20.76	21.03
10	16QAM	25	24	20.88	20.82	20.90
10	16QAM	50	0	20.82	20.86	21.02
Channel				19975	20175	20375
Frequency (MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	22.89	22.81	**22.99**
5	QPSK	1	12	22.90	22.75	22.85
5	QPSK	1	24	22.93	22.79	22.71
5	QPSK	12	0	21.90	21.86	22.07
5	QPSK	12	6	21.86	21.91	21.92
5	QPSK	12	11	21.78	21.91	21.83
5	QPSK	25	0	21.80	21.84	21.93
5	16QAM	1	0	22.02	21.82	22.04
5	16QAM	1	12	21.85	21.87	21.91
5	16QAM	1	24	21.96	21.78	21.75
5	16QAM	12	0	20.91	20.85	21.04
5	16QAM	12	6	20.90	20.84	21.01
5	16QAM	12	11	20.88	20.87	20.94
5	16QAM	25	0	20.98	20.86	21.01

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**19965**	**20175**	**20385**
Frequency (MHz)				**1711.5**	**1732.5**	**1753.5**
3	QPSK	1	0	22.91	22.80	**22.92**
3	QPSK	1	7	22.81	22.84	22.79
3	QPSK	1	14	22.90	22.83	22.77
3	QPSK	8	0	21.99	21.87	21.98
3	QPSK	8	4	21.88	21.83	21.87
3	QPSK	8	7	21.94	21.83	21.82
3	QPSK	15	0	21.95	21.83	21.88
3	16QAM	1	0	21.89	21.88	21.90
3	16QAM	1	7	21.88	21.90	21.87
3	16QAM	1	14	21.82	21.82	21.66
3	16QAM	8	0	20.94	20.75	20.89
3	16QAM	8	4	20.90	20.83	20.81
3	16QAM	8	7	20.80	20.77	20.88
3	16QAM	15	0	20.91	20.93	20.96
Channel				**19957**	**20175**	**20393**
Frequency (MHz)				**1710.7**	**1732.5**	**1754.3**
1.4	QPSK	1	0	22.92	22.79	22.81
1.4	QPSK	1	2	22.92	22.74	22.83
1.4	QPSK	1	5	22.93	22.75	22.77
1.4	QPSK	3	0	22.91	22.83	22.81
1.4	QPSK	3	1	22.95	22.79	22.82
1.4	QPSK	3	2	**22.96**	22.84	22.68
1.4	QPSK	6	0	22.04	21.90	21.91
1.4	16QAM	1	0	22.05	21.85	21.93
1.4	16QAM	1	2	22.01	21.83	21.79
1.4	16QAM	1	5	21.95	21.76	21.78
1.4	16QAM	3	0	21.94	21.93	21.93
1.4	16QAM	3	1	21.97	21.84	21.80
1.4	16QAM	3	2	21.97	21.80	21.89
1.4	16QAM	6	0	21.02	20.92	20.91

<LTE Band 13 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset		Power (dBm) Middle Ch. / Freq.	
Channel					23230	
Frequency (MHz)					782	
10	QPSK	1	0		**23.37**	
10	QPSK	1	24		23.22	
10	QPSK	1	49		23.35	
10	QPSK	25	0		22.72	
10	QPSK	25	12		22.65	
10	QPSK	25	24		22.69	
10	QPSK	50	0		22.51	
10	16QAM	1	0		22.83	
10	16QAM	1	24		22.67	
10	16QAM	1	49		22.76	
10	16QAM	25	0		21.78	
10	16QAM	25	12		21.63	
10	16QAM	25	24		21.75	
10	16QAM	50	0		21.52	
Channel				23205	23230	23255
Frequency (MHz)				779.5	782	784.5
5	QPSK	1	0	23.14	**23.28**	23.21
5	QPSK	1	12	23.02	23.07	22.97
5	QPSK	1	24	23.21	23.24	23.12
5	QPSK	12	0	22.53	22.57	22.52
5	QPSK	12	6	22.43	22.44	22.45
5	QPSK	12	11	22.50	22.61	22.63
5	QPSK	25	0	22.23	22.34	22.32
5	16QAM	1	0	22.54	22.58	22.64
5	16QAM	1	12	22.37	22.44	22.56
5	16QAM	1	24	22.59	22.56	22.35
5	16QAM	12	0	21.66	21.65	21.60
5	16QAM	12	6	21.40	21.48	21.44
5	16QAM	12	11	21.47	21.63	21.62
5	16QAM	25	0	21.37	21.44	21.43

3.2 Effective Radiated Power and Effective Isotropic Radiated Power

3.2.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average ERP 3 watts with LTE band 13.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 1 watt with LTE band 4.

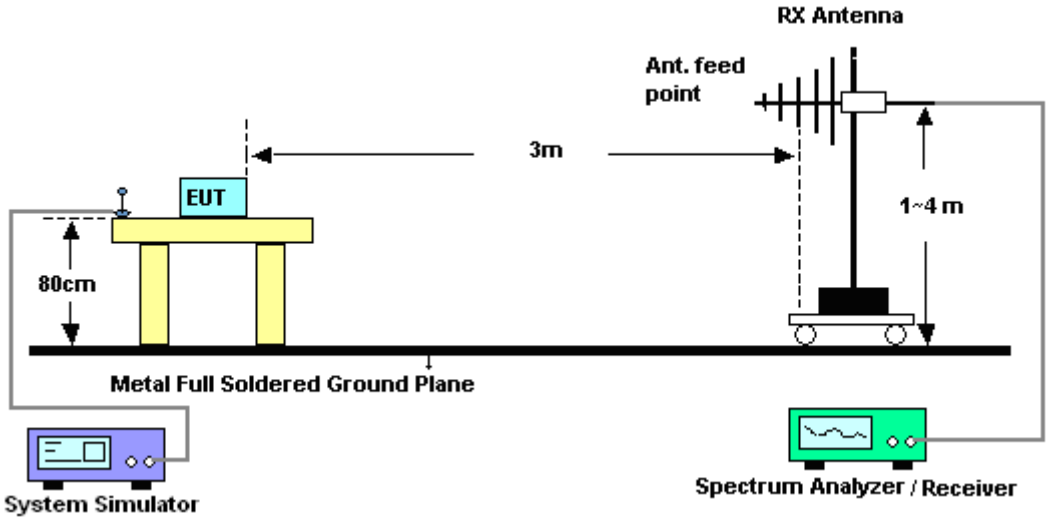
3.2.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GSM/GPRS/EDGE) and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector.
3. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15.

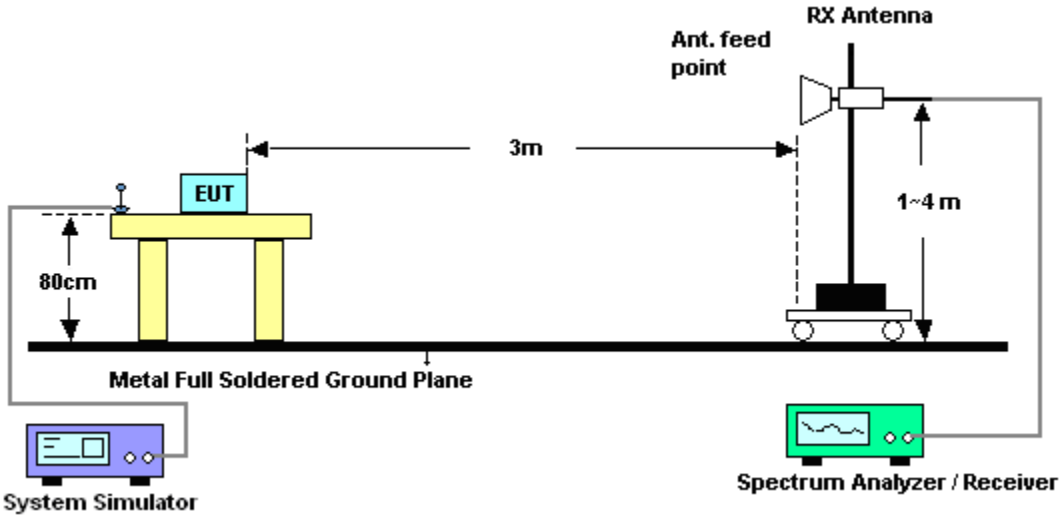
	LTE					
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1MHz	1MHz	1MHz
Detector	RMS	RMS	RMS	RMS	RMS	RMS
Trace	Average	Average	Average	Average	Average	Average
Average Type	Power	Power	Power	Power	Power	Power
Sweep Count	100	100	100	100	100	100

3.2.3 Test Setup

For Effective Radiated Power



For Equivalent Isotropic Radiated Power



LTE Band 4 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	21.59	0.14	21.72	0.15
Middle		1	0	22.25	0.17	22.20	0.17
Highest		1	0	22.23	0.17	21.97	0.16
Limit	EIRP < 1W			Result		PASS	

LTE Band 13 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	18.28	0.07	9.24	0.01
Middle		1	0	17.53	0.06	8.39	0.01
Highest		1	0	17.56	0.06	8.72	0.01
Limit	ERP < 3W			Result		PASS	

3.3 Radiated Spurious Emission Measurement

3.3.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.3.2 Measuring Instruments

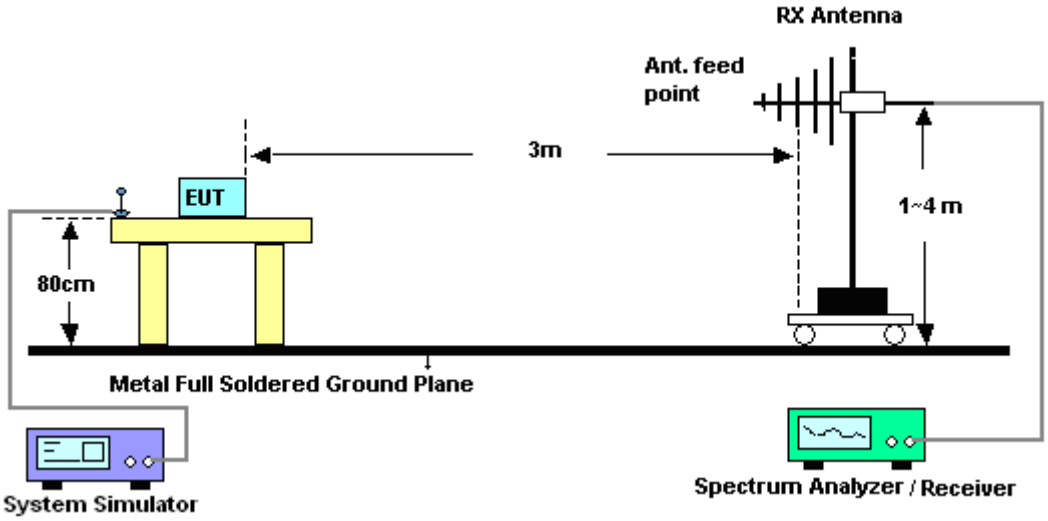
The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

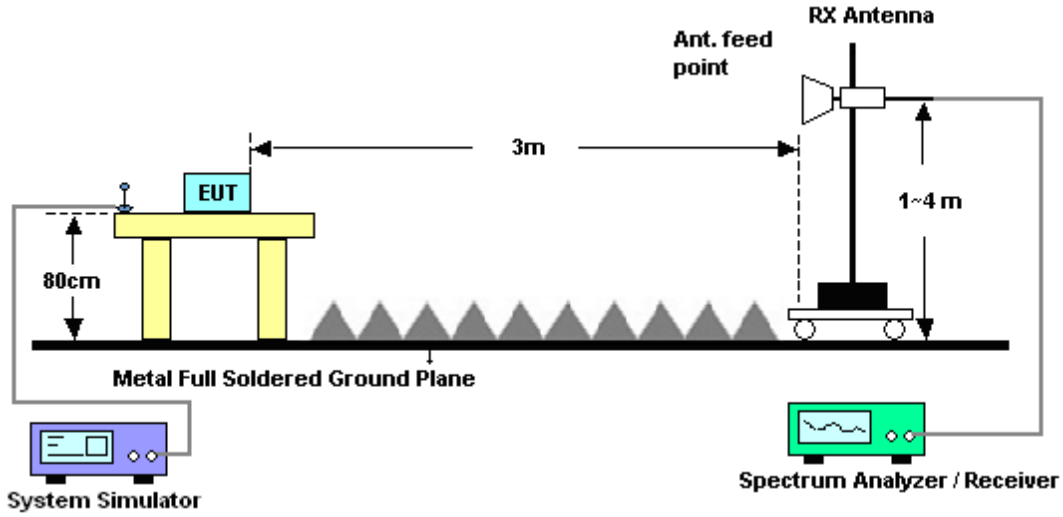
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.3.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.3.5 Test Result of Field Strength of Spurious Radiated

<Low Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-44.69	-13	-31.69	-63.49	-50.76	1.58	7.65	H	Pass
5135	-51.67	-13	-38.67	-75.4	-58.96	2.41	9.70	H	Pass
6840	-50.25	-13	-37.25	-76.11	-58.22	2.64	10.61	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-46.11	-13	-33.11	-63.23	-52.18	1.58	7.65	V	Pass
5135	-53.30	-13	-40.30	-76.39	-60.59	2.41	9.70	V	Pass
6840	-46.31	-13	-33.31	-71.09	-54.28	2.64	10.61	V	Pass

<Middle Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3448	-47.21	-13	-34.21	-66.29	-53.39	1.59	7.77	H	Pass
5175	-54.02	-13	-41.02	-77.48	-61.28	2.44	9.70	H	Pass
6900	-51.17	-13	-38.17	-76.3	-59.23	2.62	10.68	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3448	-45.40	-13	-32.40	-62.85	-51.58	1.59	7.77	V	Pass
5175	-53.82	-13	-40.82	-76.22	-61.08	2.44	9.70	V	Pass
6900	-47.19	-13	-34.19	-72.05	-55.25	2.62	10.68	V	Pass

<High Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3480	-45.74	-13	-32.74	-64.46	-52.05	1.60	7.91	H	Pass
5220	-53.15	-13	-40.15	-76.52	-60.39	2.46	9.70	H	Pass
6960	-49.37	-13	-36.37	-74.68	-57.52	2.60	10.75	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3480	-46.24	-13	-33.24	-63.79	-52.55	1.60	7.91	V	Pass
5220	-52.45	-13	-39.45	-75.01	-59.69	2.46	9.70	V	Pass
6960	-48.16	-13	-35.16	-72.48	-56.31	2.60	10.75	V	Pass

<Low Channel>

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1552	-54.98	-13	-41.98	-65.86	-57.05	0.94	5.15	H	Pass
2331	-59.74	-13	-46.74	-75.92	-61.25	1.24	4.89	H	Pass
3108	-57.75	-13	-44.75	-76.47	-60.39	1.48	6.28	H	Pass

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1554	-54.33	-13.00	-41.33	-64.31	-56.39	0.94	5.15	V	Pass
2331	-61.07	-13	-48.07	-75.73	-62.58	1.24	4.89	V	Pass
3108	-59.39	-13	-46.39	-76.56	-62.03	1.48	6.28	V	Pass

<Middle Channel>

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1560	-54.97	-42.15	-12.82	-66.01	-57.01	0.94	5.13	H	Pass
2338	-59.72	-13	-46.72	-75.78	-61.24	1.24	4.91	H	Pass
3118	-58.18	-13	-45.18	-76.73	-60.86	1.48	6.32	H	Pass

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1559	-52.91	-42.15	-10.76	-62.94	-54.96	0.94	5.13	V	Pass
2338.5	-61.76	-13	-48.76	-75.91	-63.28	1.24	4.91	V	Pass
3118	-59.38	-13	-46.38	-76.63	-62.06	1.48	6.32	V	Pass

<High Channel>

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1560	-58.28	-42.15	-16.13	-69.28	-60.32	0.94	5.13	H	Pass
2346	-59.53	-13	-46.53	-75.89	-61.08	1.24	4.94	H	Pass
3128	-58.26	-13	-45.26	-76.78	-60.99	1.49	6.36	H	Pass

Band :	LTE Band 13	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Stan Hsieh, Eric Shih, Derreck Chen, and Ken Wu	**Polarization :**	Vertical
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1560	-56.97	-42.15	-14.82	-66.86	-59.01	0.94	5.13	V	Pass
2346	-61.08	-13	-48.08	-75.75	-62.63	1.24	4.94	V	Pass
3128	-59.82	-13	-46.82	-76.82	-62.55	1.49	6.36	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201026480	30MHz~2.7GHz SISO	Jan. 07, 2014	Nov. 22, 2014	Jan. 06, 2015	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	101749	10Hz ~ 30GHz	Feb. 10, 2014	Dec. 14, 2014	Feb. 09, 2015	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Sep. 27, 2014	Dec. 14, 2014	Sep. 26, 2015	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 19, 2014	Dec. 14, 2014	Aug. 18, 2015	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz	Mar. 17, 2014	Dec. 14, 2014	Mar. 16, 2015	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1 GHz~26.5 GHz	Oct. 21, 2014	Dec. 14, 2014	Oct. 20, 2015	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Dec. 14, 2014	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	M-400-0	114/8000604 /L	N/A	N/A	Dec. 14, 2014	N/A	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Oct. 02, 2014	Dec. 14, 2014	Oct. 01, 2015	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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

Appendix B. Original Report

Please refer to Sporton report number FG471526B as below.