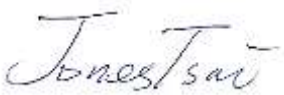
FCC RF Test Report

APPLICANT	**: BlackBerry Limited**
EQUIPMENT	**: Smartphone**
BRAND NAME	**: BlackBerry**
MODEL NAME	**: RHE151LW**
MARKETING NAME	**: SQC100-2**
FCC ID	**: L6ARHE150LW**
STANDARD	**: 47 CFR Part 2, 22(H), 24(E), 27**
CLASSIFICATION	**: PCS Licensed Transmitter Held to Ear (PCE)**

The product was received on Jul. 15, 2014 and testing was completed on Oct. 04, 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

SPORTON INTERNATIONAL INC.
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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG471524B	Rev. 01	Initial issue of report	Nov. 11, 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-132 (5.4) RSS-133 (6.4) RSS-139 (6.4) RSS-199 (4.4)	Conducted Output Power	Reporting Only	PASS	-
-	§24.232(d)	RSS-130(4.4) RSS-132 (5.4) RSS-133 (6.4) RSS-139 (6.4)	Peak-to-Average Ratio	<13 dB	Not Performed	Please refer to Sporton Report No. : FG471420B
3.2	§22.913(a)(2)	RSS-132(5.4) SRSP-503(5.1.3)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(b)(10) §27.50(c)(10) §27.50(c)(9)	N/A	Effective Radiated Power (Band 17)	ERP < 3 Watt		
	N/A	RSS-130(4.4)	Equivalent Isotropic Radiated Power (Band 17)	EIRP < 5 Watt		
	§24.232(c) §27.50(h)(2)	RSS-133 (6.4) SRSP-510(5.1.2) RSS-199 (4.4)	Equivalent Isotropic Radiated Power (Band 2) (Band 7)	EIRP < 2Watt		
	§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 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	RSS-GEN(4.9) RSS-132 (5.5) RSS-133 (6.5.1) RSS-130(4.6) RSS-139 (6.5)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 10.40 dB at 10002.000 MHz
	§2.1053 §27.53(m)(4)	RSS-GEN(4.9) RSS-199 (4.5)	Radiated Spurious Emission (Band 7)	< $55+10\log_{10}$(P[Watts])	PASS	
-	§2.1049 §22.917(b) §24.238(b) §27.53(h)(3) §27.53(m)(6)	RSS-GEN(4.6.1) RSS-132 (3.1) RSS-133 (3.1) RSS-139 (3.1) RSS-199 (4.2)	Occupied Bandwidth	Reporting Only	Not Performed	Please refer to Sporton Report No. : FG471420B

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
-	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)(4)	RSS-GEN(4.9) RSS-132 (5.5) RSS-133 (6.5.1) RSS-130(4.6) RSS-139 (6.5) RSS-199 (4.5)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 17) (Band 7)	< 43+10log10(P[Watt])	Not Performed	Please refer to Sporton Report No. : FG471420B
-	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	RSS-GEN(4.9) RSS-132 (5.5) RSS-133 (6.5.1) RSS-130(4.6) RSS-139 (6.5)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log10(P[Watts])	Not Performed	Please refer to Sporton Report No. : FG471420B
	§2.1051 §27.53(m)(4)	RSS-GEN(4.9) RSS-199 (4.5)	Conducted Spurious Emission (Band 7)	< 55+10log10(P[Watts])	Not Performed	Please refer to Sporton Report No. : FG471420B
-	§2.1055 §22.355	RSS-GEN(4.7) RSS-132(5.3)	Frequency Stability Temperature & Voltage	< 2.5 ppm	Not Performed	Please refer to Sporton Report No. : FG471420B
	§2.1055 §24.235 §27.54	RSS-GEN(4.7) RSS-133(6.3) RSS-130(4.3) RSS-139 (6.3) RSS-199 (4.3)		within authorized band		

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	RHE151LW
Marketing Name	SQC100-2
FCC ID	L6ARHE150LW
IMEI Code	004401139984195
EUT supports Radios application	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	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 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	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 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz LTE Band 17 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 23.95 dBm LTE Band 4 : 23.20 dBm LTE Band 5 : 23.24 dBm LTE Band 7 : 23.93 dBm LTE Band 17 : 23.35 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 Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	BW	Maximum ERP/EIRP
Part 22	LTE Band 5	QPSK	1.4 MHz	0.080 W
Part 24	LTE Band 2	QPSK	15 MHz	0.198 W
Part 27	LTE Band 4	QPSK	10MHz	0.275 W
Part 27	LTE Band 17	QPSK	5MHz	0.052 W
Part 27	LTE Band 7	QPSK	15MHz	0.196 W

1.7 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

1.8 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01
- 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

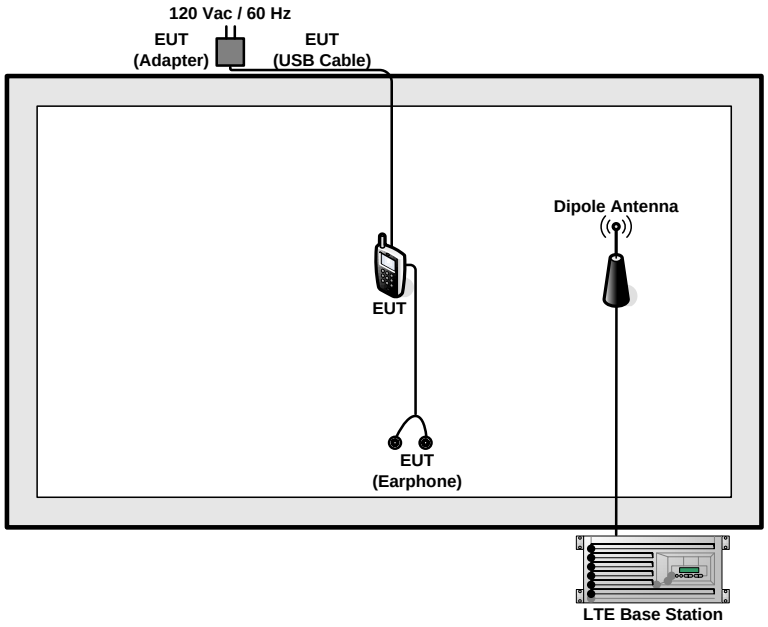
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 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	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	7	-	-	v	v	v	v	v	v	v	v	v	v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v	v	v	v
E.R.P./ E.I.R.P.	2					v		v		v			v	v	v
	4				v			v		v			v	v	v
	5	v				-	-	v		v			v	v	v
	7	-	-			v		v		v			v	v	v
	17	-	-	v		-	-	v		v			v	v	v
Radiated Spurious Emission	2	v	v	v	v	v	v	v		v			v	v	v
	4	v	v	v	v	v	v	v		v			v	v	v
	5	v	v	v	v	-	-	v		v			v	v	v
	7	-	-	v	v	v	v	v		v			v	v	v
	17	-	-	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. For E.R.P/E.I.R.P. measurement, the widest bandwidth of each band is chosen for testing due to highest conducted power. Besides, the lowest bandwidth of each band is also measured for reporting only. 4. 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. 5. All modes and data rates and positions were investigated, and found that EUT without 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.

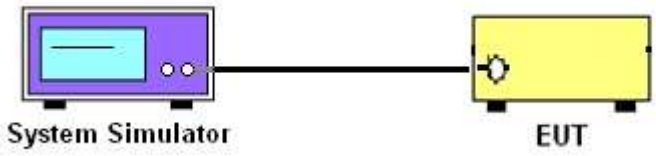
3.1.2 Measuring Instruments

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 5 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				**20450**	**20525**	**20600**
Frequency (MHz)				**829**	**836.5**	**844**
10	QPSK	1	0	23.00	23.10	**23.24**
10	QPSK	1	24	22.96	23.06	23.17
10	QPSK	1	49	22.97	23.03	23.17
10	QPSK	25	0	21.92	22.00	22.06
10	QPSK	25	12	21.82	21.93	22.05
10	QPSK	25	24	21.89	21.98	22.10
10	QPSK	50	0	21.83	21.89	21.98
10	16QAM	1	0	22.00	22.03	22.18
10	16QAM	1	24	21.95	22.05	22.17
10	16QAM	1	49	21.99	22.07	22.17
10	16QAM	25	0	20.85	20.92	20.99
10	16QAM	25	12	20.85	20.90	21.06
10	16QAM	25	24	20.83	20.90	21.12
10	16QAM	50	0	20.79	20.82	20.95
Channel				**20425**	**20525**	**20625**
Frequency (MHz)				**826.5**	**836.5**	**846.5**
5	QPSK	1	0	22.96	23.01	23.19
5	QPSK	1	12	22.95	23.04	23.21
5	QPSK	1	24	22.94	23.10	23.19
5	QPSK	12	0	21.96	22.06	22.25
5	QPSK	12	6	21.86	22.08	22.21
5	QPSK	12	11	21.95	22.03	22.22
5	QPSK	25	0	21.80	21.97	22.17
5	16QAM	1	0	22.00	21.98	22.15
5	16QAM	1	12	21.99	22.05	22.25
5	16QAM	1	24	21.92	22.04	22.22
5	16QAM	12	0	20.94	21.07	21.17
5	16QAM	12	6	20.93	21.09	21.23
5	16QAM	12	11	21.02	21.04	21.23
5	16QAM	25	0	20.82	20.96	21.09

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**20415**	**20525**	**20635**
Frequency (MHz)				**825.5**	**836.5**	**847.5**
3	QPSK	1	0	22.99	23.00	22.99
3	QPSK	1	7	22.96	22.97	22.91
3	QPSK	1	14	22.88	22.92	22.87
3	QPSK	8	0	22.93	22.88	22.92
3	QPSK	8	4	22.94	22.96	22.93
3	QPSK	8	7	22.94	22.95	22.97
3	QPSK	15	0	21.92	21.99	21.98
3	16QAM	1	0	21.95	21.95	21.95
3	16QAM	1	7	21.87	21.89	21.89
3	16QAM	1	14	21.83	21.82	21.87
3	16QAM	8	0	21.89	21.98	21.94
3	16QAM	8	4	21.70	21.74	21.79
3	16QAM	8	7	21.94	21.91	21.93
3	16QAM	15	0	20.98	21.03	20.97
Channel				**20407**	**20525**	**20643**
Frequency (MHz)				**824.7**	**836.5**	**848.3**
1.4	QPSK	1	0	23.02	23.10	23.18
1.4	QPSK	1	2	22.98	23.13	23.22
1.4	QPSK	1	5	22.97	23.07	23.23
1.4	QPSK	3	0	22.98	23.13	23.17
1.4	QPSK	3	1	23.01	23.08	23.20
1.4	QPSK	3	2	23.01	23.12	23.23
1.4	QPSK	6	0	22.02	22.15	22.24
1.4	16QAM	1	0	22.00	22.05	22.23
1.4	16QAM	1	2	21.95	22.05	22.19
1.4	16QAM	1	5	21.88	22.11	22.19
1.4	16QAM	3	0	21.99	22.16	22.20
1.4	16QAM	3	1	21.80	22.10	22.23
1.4	16QAM	3	2	21.99	22.13	22.26
1.4	16QAM	6	0	21.03	21.12	21.26

<LTE Band 2 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				**18700**	**18900**	**19100**
Frequency (MHz)				**1860**	**1880**	**1900**
20	QPSK	1	0	23.28	**23.95**	23.92
20	QPSK	1	49	23.31	23.81	23.74
20	QPSK	1	99	23.43	23.87	23.45
20	QPSK	50	0	22.11	22.59	22.75
20	QPSK	50	24	22.12	22.57	22.63
20	QPSK	50	49	22.18	22.61	22.46
20	QPSK	100	0	22.19	22.64	22.68
20	16QAM	1	0	22.21	22.65	22.95
20	16QAM	1	49	22.29	22.84	22.71
20	16QAM	1	99	22.48	22.93	22.43
20	16QAM	50	0	21.14	21.56	21.76
20	16QAM	50	24	21.20	21.53	21.71
20	16QAM	50	49	21.24	21.66	21.57
20	16QAM	100	0	21.23	21.66	21.68
Channel				**18675**	**18900**	**19125**
Frequency (MHz)				**1857.5**	**1880**	**1902.5**
15	QPSK	1	0	23.28	23.66	23.86
15	QPSK	1	37	23.24	23.81	23.72
15	QPSK	1	74	23.41	23.94	23.46
15	QPSK	36	0	22.04	22.70	22.70
15	QPSK	36	18	22.10	22.63	22.58
15	QPSK	36	37	22.23	22.73	22.49
15	QPSK	75	0	22.08	22.61	22.52
15	16QAM	1	0	22.22	22.67	22.78
15	16QAM	1	37	22.25	22.81	22.71
15	16QAM	1	74	22.39	22.91	22.47
15	16QAM	36	0	21.12	21.60	21.80
15	16QAM	36	18	21.18	21.67	21.63
15	16QAM	36	37	21.30	21.71	21.56
15	16QAM	75	0	21.13	21.62	21.54

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**18650**	**18900**	**19150**
Frequency (MHz)				**1855**	**1880**	**1905**
10	QPSK	1	0	23.23	23.81	23.71
10	QPSK	1	24	23.15	23.82	23.68
10	QPSK	1	49	23.27	23.90	23.49
10	QPSK	25	0	22.18	22.78	22.70
10	QPSK	25	12	22.18	22.79	22.66
10	QPSK	25	24	22.12	22.77	22.49
10	QPSK	50	0	22.11	22.58	22.49
10	16QAM	1	0	22.19	22.84	22.69
10	16QAM	1	24	22.16	22.81	22.69
10	16QAM	1	49	22.19	22.89	22.40
10	16QAM	25	0	21.30	21.70	21.73
10	16QAM	25	12	21.13	21.73	21.64
10	16QAM	25	24	21.11	21.75	21.55
10	16QAM	50	0	21.13	21.63	21.56
Channel				**18625**	**18900**	**19175**
Frequency (MHz)				**1852.5**	**1880**	**1907.5**
5	QPSK	1	0	23.19	23.76	23.67
5	QPSK	1	12	23.27	23.78	23.58
5	QPSK	1	24	23.12	23.82	23.48
5	QPSK	12	0	22.31	22.87	22.69
5	QPSK	12	6	22.26	22.87	22.61
5	QPSK	12	11	22.29	22.90	22.54
5	QPSK	25	0	22.22	22.73	22.47
5	16QAM	1	0	22.18	22.82	22.64
5	16QAM	1	12	22.25	22.86	22.57
5	16QAM	1	24	22.13	22.89	22.41
5	16QAM	12	0	21.34	21.87	21.75
5	16QAM	12	6	21.41	21.83	21.68
5	16QAM	12	11	21.36	21.87	21.66
5	16QAM	25	0	21.27	21.70	21.62

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**18615**	**18900**	**19185**
Frequency (MHz)				**1851.5**	**1880**	**1908.5**
3	QPSK	1	0	23.18	23.79	23.58
3	QPSK	1	7	23.28	23.82	23.53
3	QPSK	1	14	23.25	23.81	23.46
3	QPSK	8	0	22.29	22.86	22.62
3	QPSK	8	4	22.31	22.84	22.58
3	QPSK	8	7	22.34	22.85	22.51
3	QPSK	15	0	22.30	22.80	22.50
3	16QAM	1	0	22.14	22.77	22.57
3	16QAM	1	7	22.20	22.78	22.50
3	16QAM	1	14	22.15	22.80	22.41
3	16QAM	8	0	21.25	21.76	21.61
3	16QAM	8	4	21.29	21.76	21.54
3	16QAM	8	7	21.29	21.74	21.54
3	16QAM	15	0	21.29	21.81	21.59
Channel				**18607**	**18900**	**19193**
Frequency (MHz)				**1850.7**	**1880**	**1909.3**
1.4	QPSK	1	0	23.24	23.80	23.52
1.4	QPSK	1	2	23.25	23.85	23.50
1.4	QPSK	1	5	23.28	23.84	23.42
1.4	QPSK	3	0	23.27	23.85	23.52
1.4	QPSK	3	1	23.24	23.83	23.51
1.4	QPSK	3	2	23.26	23.80	23.50
1.4	QPSK	6	0	22.33	22.85	22.52
1.4	16QAM	1	0	22.17	22.84	22.51
1.4	16QAM	1	2	22.18	22.83	22.47
1.4	16QAM	1	5	22.20	22.86	22.43
1.4	16QAM	3	0	22.27	22.92	22.54
1.4	16QAM	3	1	22.23	22.93	22.55
1.4	16QAM	3	2	22.28	22.92	22.53
1.4	16QAM	6	0	21.33	21.94	21.63

<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	**23.20**	23.07	23.06
20	QPSK	1	49	23.00	23.00	23.02
20	QPSK	1	99	23.01	22.97	22.94
20	QPSK	50	0	21.93	21.92	21.90
20	QPSK	50	24	21.88	21.84	21.91
20	QPSK	50	49	21.84	21.77	21.83
20	QPSK	100	0	21.91	21.92	21.87
20	16QAM	1	0	22.14	22.12	22.13
20	16QAM	1	49	22.05	22.05	22.09
20	16QAM	1	99	21.98	22.01	21.99
20	16QAM	50	0	20.88	20.87	20.86
20	16QAM	50	24	20.88	20.80	20.89
20	16QAM	50	49	20.82	20.74	20.81
20	16QAM	100	0	20.85	20.90	20.87
Channel				**20025**	**20175**	**20325**
Frequency (MHz)				**1717.5**	**1732.5**	**1747.5**
15	QPSK	1	0	23.16	23.07	23.09
15	QPSK	1	37	23.07	23.03	23.04
15	QPSK	1	74	22.97	22.96	23.00
15	QPSK	36	0	21.96	22.01	21.95
15	QPSK	36	18	21.99	21.91	21.90
15	QPSK	36	37	21.99	21.86	21.83
15	QPSK	75	0	21.91	21.84	21.83
15	16QAM	1	0	22.20	22.07	22.08
15	16QAM	1	37	22.11	22.07	22.11
15	16QAM	1	74	22.01	21.97	21.97
15	16QAM	36	0	20.96	20.92	20.94
15	16QAM	36	18	20.97	20.87	20.91
15	16QAM	36	37	20.94	20.86	20.85
15	16QAM	75	0	20.87	20.81	20.82

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	23.15	23.07	23.03
10	QPSK	1	24	23.08	22.99	23.10
10	QPSK	1	49	22.99	23.01	22.98
10	QPSK	25	0	21.98	22.04	21.98
10	QPSK	25	12	22.01	21.99	22.05
10	QPSK	25	24	22.04	21.94	21.96
10	QPSK	50	0	21.87	21.82	21.82
10	16QAM	1	0	22.11	22.10	22.07
10	16QAM	1	24	22.16	22.07	22.11
10	16QAM	1	49	22.01	21.98	21.99
10	16QAM	25	0	20.99	20.96	20.95
10	16QAM	25	12	20.94	20.93	21.03
10	16QAM	25	24	20.97	20.93	20.93
10	16QAM	50	0	20.83	20.80	20.85
Channel				**19975**	**20175**	**20375**
Frequency (MHz)				**1712.5**	**1732.5**	**1752.5**
5	QPSK	1	0	23.14	23.03	23.16
5	QPSK	1	12	23.09	23.07	23.13
5	QPSK	1	24	23.12	23.00	23.05
5	QPSK	12	0	22.19	22.10	22.16
5	QPSK	12	6	22.09	22.08	22.16
5	QPSK	12	11	22.08	22.04	22.08
5	QPSK	25	0	22.02	21.93	22.01
5	16QAM	1	0	22.16	22.08	22.20
5	16QAM	1	12	22.15	22.11	22.11
5	16QAM	1	24	22.13	22.04	22.08
5	16QAM	12	0	21.20	21.13	21.12
5	16QAM	12	6	21.19	21.08	21.13
5	16QAM	12	11	21.12	21.13	21.05
5	16QAM	25	0	21.05	20.93	21.02

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	23.14	23.05	23.10
3	QPSK	1	7	23.13	23.05	23.03
3	QPSK	1	14	23.10	23.02	23.04
3	QPSK	8	0	22.24	22.14	22.17
3	QPSK	8	4	22.18	22.07	22.07
3	QPSK	8	7	22.17	22.07	22.09
3	QPSK	15	0	22.10	22.10	22.02
3	16QAM	1	0	22.18	22.09	22.08
3	16QAM	1	7	22.13	22.05	22.01
3	16QAM	1	14	22.07	22.05	22.08
3	16QAM	8	0	21.18	21.05	21.09
3	16QAM	8	4	21.13	21.02	21.03
3	16QAM	8	7	21.13	21.01	21.01
3	16QAM	15	0	21.16	21.04	21.04
Channel				**19957**	**20175**	**20393**
Frequency (MHz)				**1710.7**	**1732.5**	**1754.3**
1.4	QPSK	1	0	23.14	23.03	23.07
1.4	QPSK	1	2	23.15	23.12	23.08
1.4	QPSK	1	5	23.15	23.09	23.11
1.4	QPSK	3	0	23.13	23.04	23.08
1.4	QPSK	3	1	23.17	23.11	23.08
1.4	QPSK	3	2	23.17	23.09	23.07
1.4	QPSK	6	0	22.21	22.09	22.13
1.4	16QAM	1	0	22.18	22.09	22.05
1.4	16QAM	1	2	22.14	22.08	22.08
1.4	16QAM	1	5	22.13	22.07	22.05
1.4	16QAM	3	0	22.23	22.14	22.13
1.4	16QAM	3	1	22.25	22.14	22.11
1.4	16QAM	3	2	22.24	22.14	22.18
1.4	16QAM	6	0	21.25	21.18	21.20

<LTE Band 7 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				**20850**	**21100**	**21350**
Frequency (MHz)				**2510**	**2535**	**2560**
20	QPSK	1	0	23.50	23.41	23.92
20	QPSK	1	49	23.38	23.47	23.47
20	QPSK	1	99	23.10	23.54	23.30
20	QPSK	50	0	22.54	22.35	22.51
20	QPSK	50	24	22.48	22.30	22.40
20	QPSK	50	49	22.23	22.29	22.45
20	QPSK	100	0	22.18	22.27	22.57
20	16QAM	1	0	22.20	22.39	22.43
20	16QAM	1	49	22.39	22.48	22.47
20	16QAM	1	99	22.55	22.55	22.50
20	16QAM	50	0	21.29	21.30	21.85
20	16QAM	50	24	21.50	21.24	21.90
20	16QAM	50	49	21.30	21.28	21.87
20	16QAM	100	0	21.15	21.25	21.82
Channel				**20825**	**21100**	**21375**
Frequency (MHz)				**2507.5**	**2535**	**2562.5**
15	QPSK	1	0	23.14	23.42	23.51
15	QPSK	1	37	23.37	23.49	23.58
15	QPSK	1	74	23.54	23.47	23.80
15	QPSK	36	0	22.26	22.34	22.46
15	QPSK	36	18	22.19	22.33	22.42
15	QPSK	36	37	22.30	22.37	22.79
15	QPSK	75	0	22.20	22.29	22.54
15	16QAM	1	0	22.13	22.42	22.48
15	16QAM	1	37	22.35	22.44	22.52
15	16QAM	1	74	22.40	22.48	22.93
15	16QAM	36	0	21.21	21.29	21.41
15	16QAM	36	18	21.18	21.26	21.41
15	16QAM	36	37	21.26	21.30	21.77
15	16QAM	75	0	21.14	21.23	21.40

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**20800**	**21100**	**21400**
Frequency (MHz)				**2505**	**2535**	**2565**
10	QPSK	1	0	23.10	23.38	23.40
10	QPSK	1	24	23.36	23.44	23.78
10	QPSK	1	49	23.40	23.44	23.86
10	QPSK	25	0	22.17	22.41	22.47
10	QPSK	25	12	22.30	22.38	22.74
10	QPSK	25	24	22.29	22.39	22.84
10	QPSK	50	0	22.16	22.23	22.57
10	16QAM	1	0	22.15	22.38	22.39
10	16QAM	1	24	22.35	22.45	22.80
10	16QAM	1	49	22.37	22.44	22.70
10	16QAM	25	0	21.09	21.32	21.43
10	16QAM	25	12	21.23	21.30	21.62
10	16QAM	25	24	21.23	21.34	21.76
10	16QAM	50	0	21.15	21.19	21.59
Channel				**20775**	**21100**	**21425**
Frequency (MHz)				**2502.5**	**2535**	**2567.5**
5	QPSK	1	0	23.16	23.44	23.71
5	QPSK	1	12	23.31	23.47	**23.93**
5	QPSK	1	24	23.32	23.45	23.90
5	QPSK	12	0	22.30	22.54	22.91
5	QPSK	12	6	22.23	22.53	22.97
5	QPSK	12	11	22.44	22.51	22.88
5	QPSK	25	0	22.17	22.36	22.83
5	16QAM	1	0	22.11	22.42	22.73
5	16QAM	1	12	22.22	22.43	22.87
5	16QAM	1	24	22.35	22.43	22.93
5	16QAM	12	0	21.32	21.46	21.90
5	16QAM	12	6	21.21	21.46	21.87
5	16QAM	12	11	21.36	21.49	21.89
5	16QAM	25	0	21.14	21.36	21.82

<LTE Band 17 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				**23780**	**23790**	**23800**
Frequency (MHz)				**709**	**710**	**711**
10	QPSK	1	0	23.06	**23.35**	23.10
10	QPSK	1	24	23.16	23.28	23.25
10	QPSK	1	49	23.28	23.25	23.28
10	QPSK	25	0	22.09	22.15	22.08
10	QPSK	25	12	22.12	22.11	22.16
10	QPSK	25	24	22.24	22.21	22.19
10	QPSK	50	0	22.04	22.03	22.11
10	16QAM	1	0	22.06	22.08	22.09
10	16QAM	1	24	22.16	22.15	22.25
10	16QAM	1	49	22.16	22.26	22.20
10	16QAM	25	0	21.08	21.09	21.00
10	16QAM	25	12	21.01	21.08	21.12
10	16QAM	25	24	21.08	21.17	21.08
10	16QAM	50	0	20.96	20.94	21.00
Channel				**23755**	**23790**	**23825**
Frequency (MHz)				**706.5**	**710**	**713.5**
5	QPSK	1	0	23.12	23.16	23.18
5	QPSK	1	12	23.14	23.19	23.33
5	QPSK	1	24	23.22	23.32	23.27
5	QPSK	12	0	22.21	22.18	22.31
5	QPSK	12	6	22.12	22.25	22.32
5	QPSK	12	11	22.28	22.22	22.26
5	QPSK	25	0	22.22	22.18	22.17
5	16QAM	1	0	22.07	22.18	22.17
5	16QAM	1	12	22.15	22.17	22.27
5	16QAM	1	24	22.20	22.27	22.21
5	16QAM	12	0	21.13	21.19	21.23
5	16QAM	12	6	21.18	21.22	21.31
5	16QAM	12	11	21.25	21.22	21.29
5	16QAM	25	0	21.12	21.07	21.09

Note: maximum average power for LTE.

3.2 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

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 v02r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watts with LTE band 17.

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 v02r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 7 and 1 watt with LTE band 4.

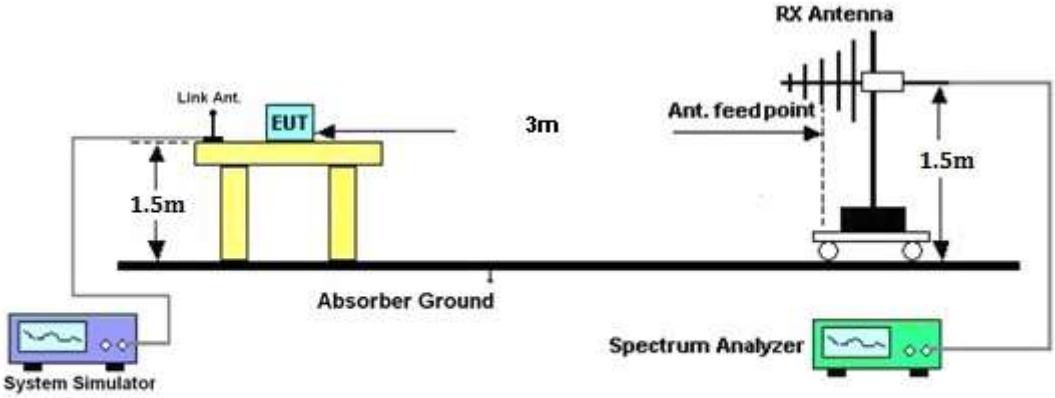
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r01 Section 5.2.1. and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
3. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.2.5 Test Result of ERP/EIRP

LTE Band 2 / 15MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	22.97	0.198	21.97	0.157
Middle		1	0	22.94	0.197	21.99	0.158
Highest		1	0	22.94	0.197	21.94	0.156
Limit	EIRP < 2W			Result		PASS	

LTE Band 5 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	18.69	0.074	9.82	0.010
Middle		1	0	18.82	0.076	9.42	0.009
Highest		1	0	19.05	0.080	9.15	0.008
Limit	EIRP < 7W			Result		PASS	

LTE Band 17 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	17.15	0.052	6.22	0.004
Middle		1	0	17.16	0.052	8.29	0.007
Highest		1	0	17.16	0.052	8.15	0.007
Limit	EIRP < 3W			Result		PASS	

LTE Band 4 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	24.35	0.272	22.37	0.173
Middle		1	0	24.34	0.272	22.77	0.189
Highest		1	0	24.39	0.275	22.71	0.187
Limit	EIRP < 1W			Result		PASS	

LTE Band 7 / 15MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	22.78	0.190	22.92	0.196
Middle		1	0	22.49	0.178	22.61	0.182
Highest		1	0	22.12	0.163	22.48	0.177
Limit	EIRP < 2W			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 Band 7
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 55 + 10 log (P) dB.

For LTE Band,17
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

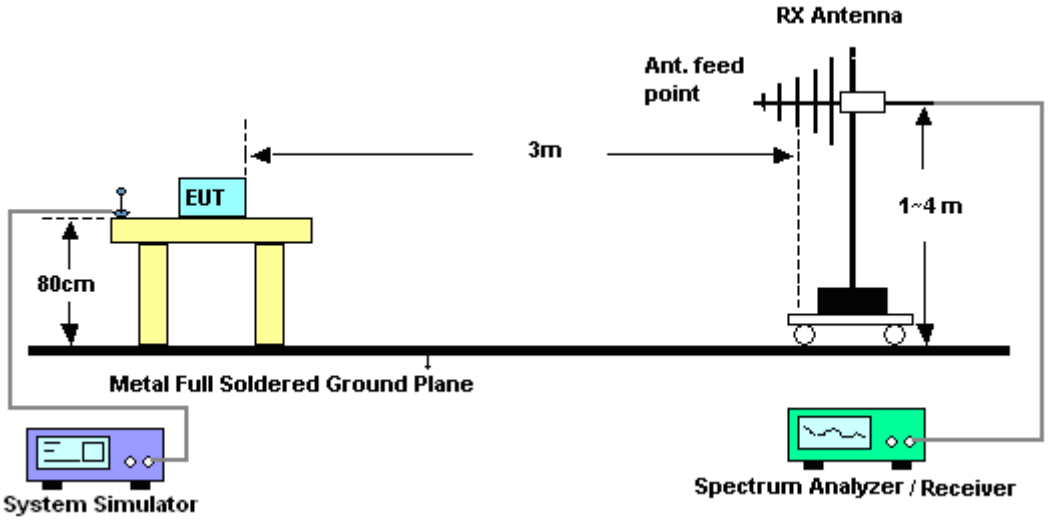
The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

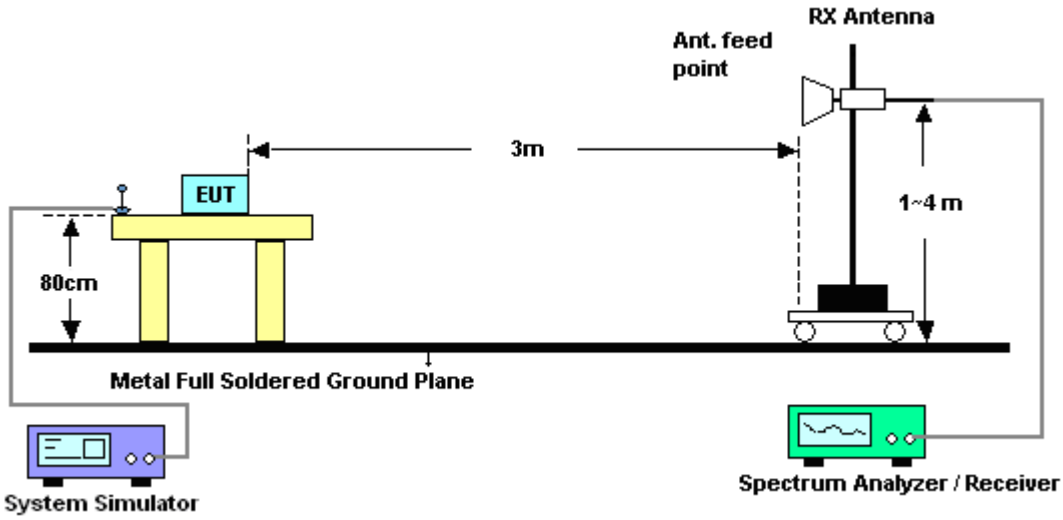
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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.
    For Band 7
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
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 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1648	-45.74	-13	-32.74	-57.23	-47.5	0.98	4.89	H	Pass
2472	-50.72	-13	-37.72	-66.51	-52.6	1.28	5.32	H	Pass
3296	-51.29	-13	-38.29	-67.88	-54.7	1.54	7.10	H	Pass

Band :	LTE Band 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1648	-43.74	-13	-30.74	-57.67	-45.5	0.98	4.89	V	Pass
2472	-51.42	-13	-38.42	-67.01	-53.3	1.28	5.32	V	Pass
3296	-49.69	-13	-36.69	-67.11	-53.1	1.54	7.10	V	Pass

<Middle Channel>

Band :	LTE Band 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1672	-50.12	-13	-37.12	-61.78	-51.8	0.99	4.82	H	Pass
2505	-49.94	-13	-36.94	-65.51	-51.9	1.29	5.40	H	Pass
3340	-51.51	-13	-38.51	-67.79	-55.1	1.55	7.30	H	Pass

Band :	LTE Band 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1672	-47.22	-13	-34.22	-60.86	-48.9	0.99	4.82	V	Pass
2505	-50.34	-13	-37.34	-66.56	-52.3	1.29	5.40	V	Pass
3340	-49.21	-13	-36.21	-67.17	-52.8	1.55	7.30	V	Pass

<High Channel>

Band :	LTE Band 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1688	-44.07	-13	-31.07	-55.43	-45.7	1.00	4.77	H	Pass
2538	-51.22	-13	-38.22	-67.05	-53.2	1.30	5.43	H	Pass
3384	-51.03	-13	-38.03	-67.63	-54.8	1.57	7.49	H	Pass

Band :	LTE Band 5	**Temperature :**	23~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1692	-40.98	-13	-27.98	-54.88	-42.6	1.00	4.76	V	Pass
2538	-50.72	-13	-37.72	-66.73	-52.7	1.30	5.43	V	Pass
3384	-49.43	-13	-36.43	-67.47	-53.2	1.57	7.49	V	Pass

<Low Channel>

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
3700	-45.55	-13	-32.55	-63.15	-52.12	1.67	8.24	H	Pass
5550	-46.55	-13	-33.55	-69.06	-53.62	2.65	9.72	H	Pass
7400	-33.85	-13	-20.85	-63.17	-42.99	2.46	11.60	H	Pass

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
3700	-46.60	-13	-33.60	-65.36	-53.17	1.67	8.24	V	Pass
5550	-47.11	-13	-34.11	-69.55	-54.18	2.65	9.72	V	Pass
7400	-34.17	-13	-21.17	-63.02	-43.31	2.46	11.60	V	Pass

<Middle Channel>

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
3749	-46.65	-13	-33.65	-64.61	-53.27	1.68	8.30	H	Pass
5625	-44.38	-13	-31.38	-67.58	-51.43	2.70	9.75	H	Pass
7500	-33.92	-13	-20.92	-63.98	-43.29	2.43	11.80	H	Pass

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
3749	-46.69	-13	-33.69	-65.62	-53.31	1.68	8.30	V	Pass
5625	-45.44	-13	-32.44	-68.3	-52.49	2.70	9.75	V	Pass
7500	-32.90	-13	-19.90	-62.78	-42.27	2.43	11.80	V	Pass

<High Channel>

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
3798	-41.70	-13	-28.70	-60	-46.21	1.70	8.36	H	Pass
5700	-44.93	-13	-31.93	-68.28	-49.82	2.74	9.78	H	Pass
7600	-37.97	-13	-24.97	-66.62	-45.28	2.40	11.86	H	Pass

Band :	LTE Band 2	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
3798	-43.70	-13	-30.70	-62.53	-48.21	1.70	8.36	V	Pass
5700	-45.48	-13	-32.48	-68.39	-50.37	2.74	9.78	V	Pass
7600	-36.93	-13	-23.93	-65.24	-44.24	2.40	11.86	V	Pass

<Low Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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	-50.45	-13	-37.45	-66.77	-56.52	1.58	7.65	H	Pass
5130	-47.00	-13	-34.00	-67.37	-54.29	2.41	9.70	H	Pass
6840	-39.25	-13	-26.25	-67.45	-47.22	2.64	10.61	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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	-49.09	-13	-36.09	-66.92	-55.16	1.58	7.65	V	Pass
5130	-44.90	-13	-31.90	-65.74	-52.19	2.41	9.70	V	Pass
6840	-39.53	-13	-26.53	-66.99	-47.5	2.64	10.61	V	Pass

<Middle Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
3462	-50.71	-13	-37.71	-67.75	-56.95	1.59	7.83	H	Pass
5195	-44.26	-13	-31.26	-65.8	-51.51	2.45	9.70	H	Pass
6927	-38.07	-13	-25.07	-66.73	-46.17	2.61	10.71	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
3462	-49.87	-13	-36.87	-67.84	-56.11	1.59	7.83	V	Pass
5195	-42.83	-13	-29.83	-63.64	-50.08	2.45	9.70	V	Pass
6927	-38.75	-13	-25.75	-66.71	-46.85	2.61	10.71	V	Pass

<High Channel>

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
3504	-50.75	-13	-37.75	-67.51	-57.15	1.61	8.00	H	Pass
5260	-46.10	-13	-33.10	-67.58	-53.31	2.49	9.70	H	Pass
7014	-40.00	-13	-27.00	-69.01	-48.24	2.59	10.83	H	Pass

Band :	LTE Band 4	**Temperature :**	23~25°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
3504	-49.00	-13	-36.00	-66.95	-55.4	1.61	8.00	V	Pass
5260	-42.07	-13	-29.07	-63.82	-49.28	2.49	9.70	V	Pass
7014	-40.90	-13	-27.90	-68.25	-49.14	2.59	10.83	V	Pass

<Low Channel>

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
4998	-45.14	-25	-20.14	-65.43	-52.5	2.34	9.70	H	Pass
7500	-37.73	-25	-12.73	-67.83	-47.1	2.43	11.80	H	Pass
10002	-37.70	-25	-12.70	-69.08	-47.2	2.70	12.20	H	Pass

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
4998	-48.24	-25	-23.24	-68.61	-55.6	2.34	9.70	V	Pass
7500	-36.43	-25	-11.43	-66.14	-45.8	2.43	11.80	V	Pass
10002	-35.40	-25	-10.40	-65.98	-44.9	2.70	12.20	V	Pass

<Middle Channel>

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
5064	-46.77	-25	-21.77	-67.47	-54.1	2.37	9.70	H	Pass
7598	-38.64	-25	-13.64	-67.78	-48.1	2.40	11.86	H	Pass
10130	-41.54	-25	-16.54	-73.01	-51.1	2.70	12.25	H	Pass

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
5064	-47.17	-25	-22.17	-67.93	-54.5	2.37	9.70	V	Pass
7598	-39.44	-25	-14.44	-68.64	-48.9	2.40	11.86	V	Pass
10130	-41.24	-25	-16.24	-71.73	-50.8	2.70	12.25	V	Pass

<High Channel>

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
5130	-47.01	-25	-22.01	-68.12	-54.3	2.41	9.70	H	Pass
7695	-42.55	-25	-17.55	-71.15	-52.1	2.37	11.92	H	Pass
10260	-36.29	-25	-11.29	-68.33	-45.9	2.69	12.30	H	Pass

Band :	LTE Band 7	**Temperature :**	23~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
5130	-48.81	-25	-23.81	-69.7	-56.1	2.41	9.70	V	Pass
7698	-36.75	-25	-11.75	-65.41	-46.3	2.37	11.92	V	Pass
10260	-38.59	-25	-13.59	-69.16	-48.2	2.69	12.30	V	Pass

<Low Channel>

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1408	-54.49	-13	-41.49	-62.93	-56.20	0.87	4.73	H	Pass
2112	-54.98	-13	-41.98	-66.04	-55.90	1.17	4.24	H	Pass
2816	-53.19	-13	-40.19	-66.84	-55.30	1.39	5.65	H	Pass

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1408	-53.59	-13	-40.59	-64.18	-55.30	0.87	4.73	V	Pass
2112	-52.78	-13	-39.78	-65.91	-53.70	1.17	4.24	V	Pass
2816	-51.89	-13	-38.89	-67.14	-54.00	1.39	5.65	V	Pass

<Middle Channel>

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1408	-54.19	-13	-41.19	-63.00	-55.90	0.87	4.73	H	Pass
2115	-54.88	-13	-41.88	-66.18	-55.80	1.17	4.25	H	Pass
2820	-54.09	-13	-41.09	-67.51	-56.20	1.39	5.66	H	Pass

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1408	-54.29	-13	-41.29	-64.82	-56.00	0.87	4.73	V	Pass
2115	-52.38	-13	-39.38	-65.60	-53.30	1.17	4.25	V	Pass
2820	-52.09	-13	-39.09	-66.93	-54.20	1.39	5.66	V	Pass

<High Channel>

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic 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
1416	-56.05	-13	-43.05	-64.36	-57.80	0.87	4.78	H	Pass
2118	-54.97	-13	-41.97	-66.32	-55.90	1.17	4.25	H	Pass
2824	-52.18	-13	-39.18	-65.84	-54.30	1.39	5.66	H	Pass

Band :	LTE Band 17	**Temperature :**	23~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	46~48%
Test Engineer :	Ken Wu and Derreck Chen	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic 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
1416	-54.75	-13	-41.75	-65.38	-56.50	0.87	4.78	V	Pass
2118	-51.17	-13	-38.17	-64.21	-52.10	1.17	4.25	V	Pass
2824	-51.68	-13	-38.68	-66.78	-53.80	1.39	5.66	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	Oct. 02, 2014	Jan. 06, 2015	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	101749	10Hz ~ 30GHz	Feb. 10, 2014	Oct. 03, 2014~ Oct. 04, 2014	Feb. 09, 2015	Radiation (03CH07-HY
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 10, 2013	Oct. 03, 2014~ Oct. 04, 2014	Oct. 09, 2014	Radiation (03CH07-HY
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 19, 2014	Oct. 03, 2014~ Oct. 04, 2014	Aug.18, 2015	Radiation (03CH07-HY
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz	Mar. 17, 2014	Oct. 03, 2014~ Oct. 04, 2014	Mar. 16, 2015	Radiation (03CH07-HY
Preamplifier	Agilent	8449B	3008A02362	1 GHz~26.5 GHz	Nov. 29, 2013	Oct. 03, 2014~ Oct. 04, 2014	Nov. 28, 2014	Radiation (03CH07-HY
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Oct. 03, 2014~ Oct. 04, 2014	N/A	Radiation (03CH07-HY
Antenna Mast	ChainTek	M-400-0	114/8000604 /L	N/A	N/A	Oct. 03, 2014~ Oct. 04, 2014	N/A	Radiation (03CH07-HY
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 02, 2014	Oct. 03, 2014~ Oct. 04, 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**