

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT

FCC ID: 2BPYM-JT301A

Product: Door Sensor

Trade Mark: Jointech

Model No.: JT301A

Family Model: N/A

Report No.: S25043001002002

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Door Sensor
Trade Mark	Jointech
Model Name	JT301A
Family Model	N/A
Model Difference	N/A
FCC ID:	2BPYM-JT301A
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 12, 66
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	FPC Antenna
Antenna gain:	Band 2: -2dBi, Band 4: -0.26dBi, Band 5: -5 dBi, Band 12: -8.71dBi, B66:-0.26dBi
Adapter	N/A
Battery	DC 3.7V, 1300mAh, 4.81Wh
Power supply	DC 3.7V from battery or DC 5V from charge port
Extreme Vol. Limits:	DC 3.15V to DC 4.26V (Nominal DC 3.7V) (Note 1)
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage DC 4.26V and Low Voltage 3.15V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2BPYM-JT301A** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, ANSI C63.26:2015.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:

ShenZhen NTEK Testing Technology Co., Ltd.

No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB

1.5 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.6 WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has LTE Bands of: Band 2/4/5/12/66

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

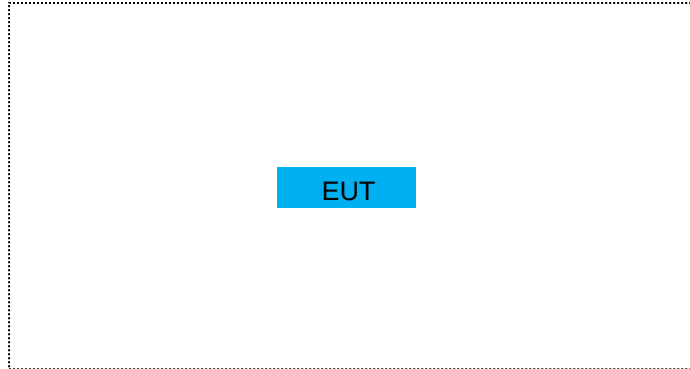
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Door Sensor	JT301A	FCC ID: 2BPYM-JT301A	EUT

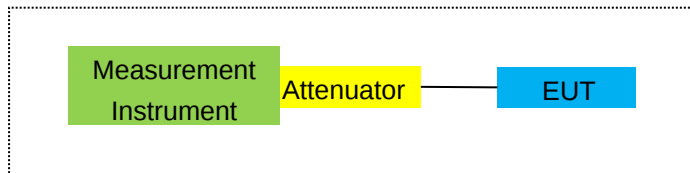
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

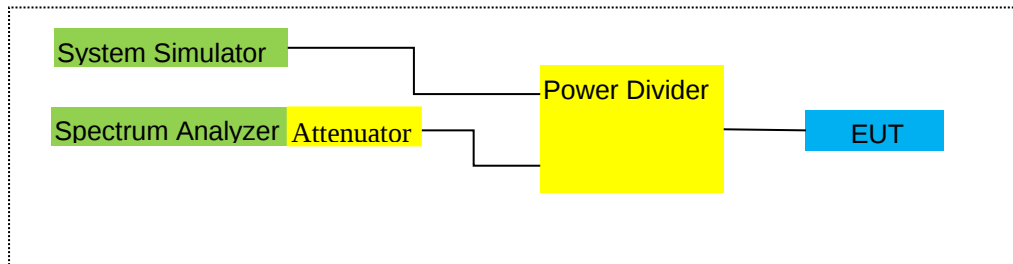
For Radiated Test Cases



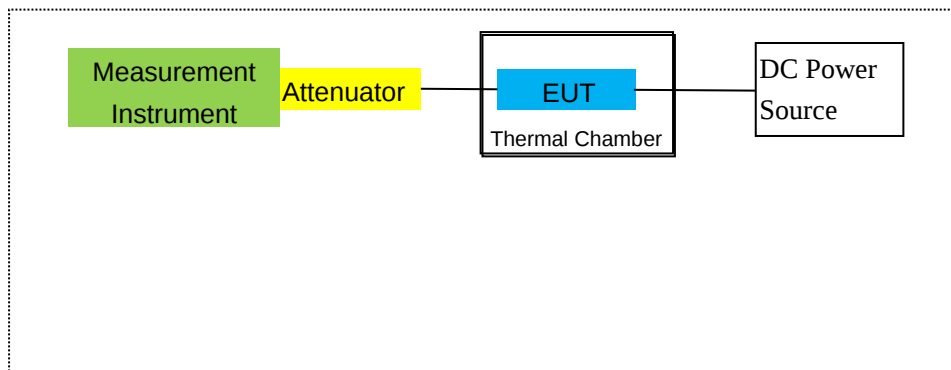
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.

3.TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2025.04.17	2026.04.16	1 year
2	Test Receiver	R&S	ESPI7	101318	2025.04.17	2026.04.16	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2025.04.17	2026.04.16	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2025.04.17	2026.04.16	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2025.04.17	2026.04.16	1 year
9	Power Meter	R&S	NRVS	100696	2025.04.17	2026.04.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2025.04.17	2026.04.16	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2025.04.17	2026.04.16	1 year
16	LISN	EMCO	3816/2	00042990	2025.04.17	2026.04.16	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2025.04.17	2026.04.16	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2025.04.17	2026.04.16	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2025.04.17	2026.04.16	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2025.04.17	2026.04.16	1 year
24	test receiver	R&S	ESCI	a0304218	2025.04.17	2026.04.16	1 year
25	Communication Tester	R&S	CMU200	A0304247	2025.04.17	2026.04.16	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2025.04.17	2026.04.16	1 year

27	DC Power Source	N/A	PS-6005D	20170402923	2023.05.06	2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2025.04.17	2026.04.16	1 year
29	Communication Tester	R&S	CMW500	148500	2025.05.06	2026.05.05	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".³

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

Band 2/4/5/12/66

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53,
FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

Set a marker to point the corresponding band edge frequency in each test case.

Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

Band 2/4/5/12/66

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53

LIMITS

1. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.
2. The Band 41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log (P)$ dB.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

MODES TESTED

Band 2/4/5/12/66

7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50

LIMITS:

- 22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
- 27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
- 27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
- 27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
- 27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.
- 90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

KDB 971168 v02r01 RF power output using broadband peak and average power meter method.

KDB 971168 D01 Power Meas License Digital Systems v02r01, "Measurement Guidance for Certification of Licensed Digital Transmitters"

MODES TESTED

Band 2/4/5/12/66

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average		
							(mW)		
1.4MHz Band QPSK	6/0	1850.7	16.54	3.76	8.90	21.68	147.114	Horizontal	Pass
		1880	15.25	3.91	8.90	20.24	105.691	Horizontal	Pass
		1909.3	15.52	3.93	8.90	20.49	112.040	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	14.07	3.77	8.90	19.20	83.114	Horizontal	Pass
		1880	14.89	3.91	8.90	19.88	97.348	Horizontal	Pass
		1908.5	16.64	3.94	8.90	21.60	144.614	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	16.44	3.77	8.90	21.57	143.645	Horizontal	Pass
		1880	16.45	3.91	8.90	21.44	139.343	Horizontal	Pass
		1907.5	16.98	3.94	8.90	21.94	156.330	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	17.55	3.79	8.90	22.66	184.407	Horizontal	Pass
		1880	18.00	3.95	8.90	22.95	197.425	Horizontal	Pass
		1905	15.48	3.97	8.90	20.41	110.004	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	15.65	3.79	8.90	20.76	119.211	Horizontal	Pass
		1880	16.89	3.95	8.90	21.84	152.769	Horizontal	Pass
		1902.5	15.25	3.97	8.90	20.18	104.211	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	17.01	3.81	8.90	22.10	161.996	Horizontal	Pass
		1880	15.54	3.96	8.90	20.48	111.600	Horizontal	Pass
		1900	17.20	4.00	8.90	22.10	162.211	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	15.90	3.76	8.90	21.04	127.020	Vertical	Pass
		1880	15.02	3.91	8.90	20.01	100.147	Vertical	Pass
		1909.3	16.64	3.93	8.90	21.61	144.973	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	16.50	3.77	8.90	21.63	145.695	Vertical	Pass
		1880	16.58	3.91	8.90	21.57	143.527	Vertical	Pass
		1908.5	15.43	3.94	8.90	20.39	109.457	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	15.86	3.77	8.90	20.99	125.515	Vertical	Pass
		1880	14.71	3.91	8.90	19.70	93.396	Vertical	Pass
		1907.5	16.83	3.94	8.90	21.79	150.908	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	14.63	3.79	8.90	19.74	94.256	Vertical	Pass
		1880	13.90	3.95	8.90	18.85	76.703	Vertical	Pass
		1905	14.30	3.97	8.90	19.23	83.718	Vertical	Pass

15.0MHz Band QPSK	75/0	1857.5	14.93	3.79	8.90	20.04	101.030	Vertical	Pass
		1880	16.14	3.95	8.90	21.09	128.559	Vertical	Pass
		1902.5	16.58	3.97	8.90	21.51	141.452	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	18.30	3.81	8.90	23.39	218.447	Vertical	Pass
		1880	16.51	3.96	8.90	21.45	139.695	Vertical	Pass
		1900	15.38	4.00	8.90	20.28	106.744	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	6/0	1850.7	14.60	3.76	8.90	20.55	113.381	Horizontal	Pass
		1880	15.75	3.91	8.90	20.07	101.522	Horizontal	Pass
		1909.3	15.45	3.93	8.90	20.93	123.797	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	15.29	3.77	8.90	18.35	68.460	Horizontal	Pass
		1880	14.95	3.91	8.90	20.57	114.039	Horizontal	Pass
		1908.5	14.55	3.94	8.90	19.01	79.601	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	15.14	3.77	8.90	21.18	131.239	Horizontal	Pass
		1880	15.50	3.91	8.90	19.94	98.597	Horizontal	Pass
		1907.5	14.00	3.94	8.90	18.42	69.474	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	15.35	3.79	8.90	20.50	112.145	Horizontal	Pass
		1880	14.05	3.95	8.90	19.69	93.213	Horizontal	Pass
		1905	15.36	3.97	8.90	21.02	126.456	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.68	3.79	8.90	20.28	106.659	Horizontal	Pass
		1880	15.77	3.95	8.90	19.10	81.267	Horizontal	Pass
		1902.5	15.65	3.97	8.90	21.65	146.237	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	13.84	3.81	8.90	18.65	73.279	Horizontal	Pass
		1880	16.17	3.96	8.90	20.16	103.749	Horizontal	Pass
		1900	14.55	4.00	8.90	19.06	80.484	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	14.61	3.76	8.90	20.49	112.000	Vertical	Pass
		1880	15.84	3.91	8.90	19.31	85.301	Vertical	Pass
		1909.3	15.13	3.93	8.90	19.53	89.819	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	13.77	3.77	8.90	19.40	87.161	Vertical	Pass
		1880	14.83	3.91	8.90	20.71	117.786	Vertical	Pass
		1908.5	14.56	3.94	8.90	19.26	84.302	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	13.76	3.77	8.90	21.92	155.665	Vertical	Pass
		1880	15.05	3.91	8.90	21.91	155.189	Vertical	Pass
		1907.5	15.69	3.94	8.90	19.70	93.397	Vertical	Pass

10.0MHz Band 16 QAM	50/0	1855	13.98	3.79	8.90	20.35	108.270	Vertical	Pass
		1880	15.57	3.95	8.90	20.72	118.079	Vertical	Pass
		1905	15.12	3.97	8.90	20.42	110.146	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.85	3.79	8.90	20.58	114.212	Vertical	Pass
		1880	14.87	3.95	8.90	21.21	131.994	Vertical	Pass
		1902.5	13.66	3.97	8.90	19.88	97.232	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	14.29	3.81	8.90	22.18	165.044	Vertical	Pass
		1880	14.90	3.96	8.90	22.08	161.266	Vertical	Pass
		1900	13.78	4.00	8.90	19.93	98.467	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	14.45	3.12	8.90	20.23	105.320	Horizontal	Pass
		1732.5	13.10	3.27	8.90	18.73	74.700	Horizontal	Pass
		1754.3	15.41	3.29	8.90	21.02	126.447	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	13.79	3.13	8.90	19.56	90.455	Horizontal	Pass
		1732.5	14.71	3.27	8.90	20.34	108.063	Horizontal	Pass
		1753.5	15.37	3.30	8.90	20.97	124.908	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	15.99	3.13	8.90	21.76	149.917	Horizontal	Pass
		1732.5	15.29	3.27	8.90	20.92	123.730	Horizontal	Pass
		1752.5	14.71	3.30	8.90	20.31	107.346	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	14.84	3.15	8.90	20.59	114.455	Horizontal	Pass
		1732.5	14.63	3.31	8.90	20.22	105.153	Horizontal	Pass
		1750	16.25	3.33	8.90	21.82	151.927	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	15.04	3.15	8.90	20.79	119.976	Horizontal	Pass
		1732.5	15.33	3.31	8.90	20.92	123.648	Horizontal	Pass
		1747.5	16.46	3.33	8.90	22.03	159.588	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.19	3.17	8.90	18.92	77.924	Horizontal	Pass
		1732.5	14.40	3.32	8.90	19.98	99.535	Horizontal	Pass
		1745	15.10	3.36	8.90	20.64	116.004	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	14.78	3.12	8.90	20.56	113.724	Vertical	Pass
		1732.5	15.07	3.27	8.90	20.70	117.377	Vertical	Pass
		1754.3	16.22	3.29	8.90	21.83	152.578	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	15.58	3.13	8.90	21.35	136.548	Vertical	Pass
		1732.5	16.04	3.27	8.90	21.67	147.027	Vertical	Pass
		1753.5	15.86	3.30	8.90	21.46	140.057	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	15.18	3.13	8.90	20.95	124.427	Vertical	Pass
		1732.5	15.44	3.27	8.90	21.07	127.866	Vertical	Pass
		1752.5	13.75	3.30	8.90	19.35	86.130	Vertical	Pass
10.0MHz Band	50/0	1715	12.76	3.15	8.90	18.51	70.967	Vertical	Pass
		1732.5	15.75	3.31	8.90	21.34	136.276	Vertical	Pass

QPSK		1750	14.89	3.33	8.90	20.46	111.135	Vertical	Pass
15.0MHz	75/0	1717.5	16.29	3.15	8.90	22.04	160.089	Vertical	Pass
Band		1732.5	16.45	3.31	8.90	22.04	159.919	Vertical	Pass
QPSK		1747.5	15.04	3.33	8.90	20.61	114.968	Vertical	Pass
20.0MHz	100/0	1720	16.13	3.17	8.90	21.86	153.625	Vertical	Pass
Band		1732.5	16.52	3.32	8.90	22.10	162.261	Vertical	Pass
QPSK		1745	14.67	3.36	8.90	20.21	104.999	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	14.78	3.12	8.90	20.56	113.672	Horizontal	Pass
		1732.5	15.25	3.27	8.90	20.88	122.365	Horizontal	Pass
		1754.3	15.16	3.29	8.90	20.77	119.468	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.89	3.13	8.90	19.66	92.374	Horizontal	Pass
		1732.5	15.10	3.27	8.90	20.73	118.245	Horizontal	Pass
		1753.5	16.37	3.30	8.90	21.97	157.295	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.54	3.13	8.90	19.31	85.348	Horizontal	Pass
		1732.5	13.18	3.27	8.90	18.81	76.053	Horizontal	Pass
		1752.5	14.36	3.30	8.90	19.96	99.080	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	15.43	3.15	8.90	21.18	131.358	Horizontal	Pass
		1732.5	13.29	3.31	8.90	18.88	77.315	Horizontal	Pass
		1750	13.21	3.33	8.90	18.78	75.574	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.21	3.15	8.90	19.96	99.142	Horizontal	Pass
		1732.5	16.15	3.31	8.90	21.74	149.313	Horizontal	Pass
		1747.5	14.68	3.33	8.90	20.25	105.808	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	14.23	3.17	8.90	19.96	99.157	Horizontal	Pass
		1732.5	15.39	3.32	8.90	20.97	124.904	Horizontal	Pass
		1745	16.30	3.36	8.90	21.84	152.615	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	16.51	3.12	8.90	22.29	169.260	Vertical	Pass
		1732.5	14.38	3.27	8.90	20.01	100.323	Vertical	Pass
		1754.3	14.57	3.29	8.90	20.18	104.272	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.35	3.13	8.90	20.12	102.913	Vertical	Pass
		1732.5	14.30	3.27	8.90	19.93	98.298	Vertical	Pass
		1753.5	15.68	3.30	8.90	21.28	134.232	Vertical	Pass
5.0MHz Band 16	25/0	1712.5	16.13	3.13	8.90	21.90	154.922	Vertical	Pass
		1732.5	15.30	3.27	8.90	20.93	123.881	Vertical	Pass

QAM		1752.5	13.84	3.30	8.90	19.44	87.894	Vertical	Pass
10.0MHz	50/0	1715	13.65	3.15	8.90	19.40	87.057	Vertical	Pass
Band 16		1732.5	14.34	3.31	8.90	19.93	98.494	Vertical	Pass
QAM		1750	16.75	3.33	8.90	22.32	170.724	Vertical	Pass
15.0MHz	75/0	1717.5	14.31	3.15	8.90	20.06	101.378	Vertical	Pass
Band 16		1732.5	14.62	3.31	8.90	20.21	104.992	Vertical	Pass
QAM		1747.5	14.94	3.33	8.90	20.51	112.456	Vertical	Pass
20.0MHz	100/0	1720	15.89	3.17	8.90	21.62	145.191	Vertical	Pass
Band 16		1732.5	17.00	3.32	8.90	22.58	181.002	Vertical	Pass
QAM		1745	14.94	3.36	8.90	20.48	111.578	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	21.25	2.01	5.30	2.15	22.39	173.234	Horizontal	Pass
		836.5	21.60	2.01	5.30	2.15	22.74	187.986	Horizontal	Pass
		848.3	20.08	2.02	5.70	2.15	21.61	144.779	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	21.56	2.01	5.30	2.15	22.70	186.403	Horizontal	Pass
		836.5	22.19	2.01	5.30	2.15	23.33	215.413	Horizontal	Pass
		847.5	21.50	2.02	5.70	2.15	23.03	201.099	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	20.56	2.01	5.30	2.15	21.70	147.808	Horizontal	Pass
		836.5	21.50	2.01	5.30	2.15	22.64	183.726	Horizontal	Pass
		846.5	21.75	2.02	5.70	2.15	23.28	213.005	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	21.20	2.01	5.30	2.15	22.34	171.390	Horizontal	Pass
		836.5	21.67	2.01	5.30	2.15	22.81	190.903	Horizontal	Pass
		844	20.13	2.02	5.70	2.15	21.66	146.700	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	22.70	2.01	5.30	2.15	23.84	242.167	Vertical	Pass
		836.5	22.41	2.01	5.30	2.15	23.55	226.485	Vertical	Pass
		848.3	20.96	2.02	5.70	2.15	22.49	177.278	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	22.07	2.01	5.30	2.15	23.21	209.219	Vertical	Pass
		836.5	21.82	2.01	5.30	2.15	22.96	197.698	Vertical	Pass
		847.5	19.34	2.02	5.70	2.15	20.87	122.166	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	20.18	2.01	5.30	2.15	21.32	135.435	Vertical	Pass
		836.5	21.66	2.01	5.30	2.15	22.80	190.461	Vertical	Pass
		846.5	20.30	2.02	5.70	2.15	21.83	152.387	Vertical	Pass
10.0MHz Band QPSK	50/0	829	19.60	2.01	5.30	2.15	20.74	118.468	Vertical	Pass
		836.5	23.62	2.01	5.30	2.15	24.76	299.426	Vertical	Pass
		844	20.92	2.02	5.70	2.15	22.45	175.826	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	824.7	20.20	2.01	5.30	2.15	21.34	136.206	Horizontal	Pass
		836.5	21.25	2.01	5.30	2.15	22.39	173.258	Horizontal	Pass
		848.3	19.73	2.02	5.70	2.15	21.26	133.734	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	20.68	2.01	5.30	2.15	21.82	151.934	Horizontal	Pass
		836.5	19.60	2.01	5.30	2.15	20.74	118.548	Horizontal	Pass
		847.5	20.00	2.02	5.70	2.15	21.53	142.312	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	20.37	2.01	5.30	2.15	21.51	141.539	Horizontal	Pass
		836.5	19.66	2.01	5.30	2.15	20.80	120.099	Horizontal	Pass
		846.5	20.06	2.02	5.70	2.15	21.59	144.254	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	19.23	2.01	5.30	2.15	20.37	108.821	Horizontal	Pass
		836.5	19.82	2.01	5.30	2.15	20.96	124.606	Horizontal	Pass
		844	20.22	2.02	5.70	2.15	21.75	149.507	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	21.78	2.01	5.30	2.15	22.92	195.873	Vertical	Pass
		836.5	20.93	2.01	5.30	2.15	22.07	161.054	Vertical	Pass
		848.3	20.53	2.02	5.70	2.15	22.06	160.524	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	19.10	2.01	5.30	2.15	20.24	105.580	Vertical	Pass
		836.5	20.58	2.01	5.30	2.15	21.72	148.703	Vertical	Pass
		847.5	19.29	2.02	5.70	2.15	20.82	120.774	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	20.12	2.01	5.30	2.15	21.26	133.571	Vertical	Pass
		836.5	18.55	2.01	5.30	2.15	19.69	93.042	Vertical	Pass
		846.5	20.75	2.02	5.70	2.15	22.28	168.992	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	19.41	2.01	5.30	2.15	20.55	113.620	Vertical	Pass
		836.5	22.53	2.01	5.30	2.15	23.67	232.839	Vertical	Pass
		844	22.09	2.02	5.70	2.15	23.62	230.375	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

ERP(dBm)=EIRP-2.15

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	18.17	1.91	5.60	2.15	19.71	93.581	Horizontal	Pass
		707.5	19.88	1.91	5.70	2.15	21.52	142.062	Horizontal	Pass
		715.3	16.47	1.93	5.80	2.15	18.19	65.921	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	17.16	1.91	5.60	2.15	18.70	74.106	Horizontal	Pass
		707.5	17.85	1.91	5.70	2.15	19.49	88.843	Horizontal	Pass
		714.5	18.65	1.93	5.80	2.15	20.37	108.924	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	18.35	1.91	5.60	2.15	19.89	97.521	Horizontal	Pass
		707.5	18.64	1.91	5.70	2.15	20.28	106.760	Horizontal	Pass
		713.5	18.00	1.92	5.80	2.15	19.73	93.993	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	18.58	1.91	5.60	2.15	20.12	102.754	Horizontal	Pass
		707.5	17.39	1.91	5.70	2.15	19.03	80.072	Horizontal	Pass
		711	15.64	1.92	5.80	2.15	17.37	54.627	Horizontal	Pass
1.4MHz Band QPSK	6/0	699.7	17.79	1.91	5.60	2.15	19.33	85.613	Vertical	Pass
		707.5	17.54	1.91	5.70	2.15	19.18	82.745	Vertical	Pass
		715.3	16.58	1.93	5.80	2.15	18.30	67.643	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	18.68	1.91	5.60	2.15	20.22	105.113	Vertical	Pass
		707.5	16.04	1.91	5.70	2.15	17.68	58.621	Vertical	Pass
		714.5	18.85	1.93	5.80	2.15	20.57	113.990	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	17.84	1.91	5.60	2.15	19.38	86.695	Vertical	Pass
		707.5	16.95	1.91	5.70	2.15	18.59	72.272	Vertical	Pass
		713.5	17.34	1.92	5.80	2.15	19.07	80.655	Vertical	Pass
10.0MHz Band QPSK	50/0	704	17.89	1.91	5.60	2.15	19.43	87.678	Vertical	Pass
		707.5	19.91	1.91	5.70	2.15	21.55	142.979	Vertical	Pass
		711	19.13	1.92	5.80	2.15	20.86	121.807	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	6/0	699.7	21.00	1.91	5.60	2.15	22.54	179.378	Horizontal	Pass
		707.5	21.00	1.91	5.70	2.15	22.64	183.785	Horizontal	Pass
		715.3	20.35	1.93	5.80	2.15	22.07	161.087	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	21.94	1.91	5.60	2.15	23.48	223.064	Horizontal	Pass
		707.5	19.54	1.91	5.70	2.15	21.18	131.125	Horizontal	Pass
		714.5	19.89	1.93	5.80	2.15	21.61	144.997	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	19.48	1.91	5.60	2.15	21.02	126.512	Horizontal	Pass
		707.5	21.65	1.91	5.70	2.15	23.29	213.523	Horizontal	Pass
		713.5	21.65	1.92	5.80	2.15	23.38	217.879	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	21.48	1.91	5.60	2.15	23.02	200.586	Horizontal	Pass
		707.5	20.11	1.91	5.70	2.15	21.75	149.752	Horizontal	Pass
		711	21.09	1.92	5.80	2.15	22.82	191.389	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	699.7	19.51	1.91	5.60	2.15	21.05	127.247	Vertical	Pass
		707.5	21.74	1.91	5.70	2.15	23.38	217.751	Vertical	Pass
		715.3	20.44	1.93	5.80	2.15	22.16	164.574	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	21.85	1.91	5.60	2.15	23.39	218.267	Vertical	Pass
		707.5	21.48	1.91	5.70	2.15	23.12	205.281	Vertical	Pass
		714.5	21.58	1.93	5.80	2.15	23.30	213.692	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	20.31	1.91	5.60	2.15	21.85	152.990	Vertical	Pass
		707.5	21.60	1.91	5.70	2.15	23.24	210.784	Vertical	Pass
		713.5	19.36	1.92	5.80	2.15	21.09	128.407	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	21.01	1.91	5.60	2.15	22.55	179.929	Vertical	Pass
		707.5	22.20	1.91	5.70	2.15	23.84	242.217	Vertical	Pass
		711	21.15	1.92	5.80	2.15	22.88	194.054	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

ERP(dBm)=EIRP-2.15

8.6 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	14.66	3.12	8.90	20.44	110.719	Horizontal	Pass
1745		13.51	3.27	8.90	19.14	82.066	Horizontal	Pass	
1779.3		17.02	3.29	8.90	22.63	183.239	Horizontal	Pass	
3.0MHz Band QPSK	15/0	1711.5	14.59	3.13	8.90	20.36	108.557	Horizontal	Pass
1745		15.28	3.27	8.90	20.91	123.255	Horizontal	Pass	
1778.5		14.03	3.30	8.90	19.63	91.903	Horizontal	Pass	
5.0MHz Band QPSK	25/0	1712.5	15.70	3.13	8.90	21.47	140.288	Horizontal	Pass
1745		16.26	3.27	8.90	21.89	154.442	Horizontal	Pass	
1777.5		14.12	3.30	8.90	19.72	93.763	Horizontal	Pass	
10.0MHz Band QPSK	50/0	1715	15.51	3.15	8.90	21.26	133.611	Horizontal	Pass
1745		15.53	3.31	8.90	21.12	129.405	Horizontal	Pass	
1775		16.32	3.33	8.90	21.89	154.493	Horizontal	Pass	
15.0MHz Band QPSK	75/0	1717.5	15.31	3.15	8.90	21.06	127.535	Horizontal	Pass
1745		16.32	3.31	8.90	21.91	155.263	Horizontal	Pass	
1772.5		16.95	3.33	8.90	22.52	178.469	Horizontal	Pass	
20.0MHz Band QPSK	100/0	1720	15.31	3.17	8.90	21.04	127.083	Horizontal	Pass
1745		16.26	3.32	8.90	21.84	152.868	Horizontal	Pass	
1770		15.70	3.36	8.90	21.24	133.071	Horizontal	Pass	
1.4MHz Band QPSK	6/0	1710.7	14.87	3.12	8.90	20.65	116.022	Vertical	Pass
1745		16.17	3.27	8.90	21.80	151.466	Vertical	Pass	
1779.3		16.19	3.29	8.90	21.80	151.437	Vertical	Pass	
3.0MHz Band QPSK	15/0	1711.5	15.91	3.13	8.90	21.68	147.294	Vertical	Pass
1745		16.26	3.27	8.90	21.89	154.644	Vertical	Pass	
1778.5		16.06	3.30	8.90	21.66	146.636	Vertical	Pass	
5.0MHz Band QPSK	25/0	1712.5	15.01	3.13	8.90	20.78	119.560	Vertical	Pass
1745		15.49	3.27	8.90	21.12	129.310	Vertical	Pass	
1777.5		14.20	3.30	8.90	19.80	95.433	Vertical	Pass	
10.0MHz Band QPSK	50/0	1715	12.58	3.15	8.90	18.33	68.035	Vertical	Pass
1745		16.00	3.31	8.90	21.59	144.304	Vertical	Pass	
1775		14.13	3.33	8.90	19.70	93.356	Vertical	Pass	
15.0MHz	75/0	1717.5	17.00	3.15	8.90	22.75	188.360	Vertical	Pass

Band QPSK		1745	17.11	3.31	8.90	22.70	186.233	Vertical	Pass
		1772.5	15.43	3.33	8.90	21.00	125.940	Vertical	Pass
20.0MHz	100/0	1720	17.63	3.17	8.90	23.36	216.769	Vertical	Pass
Band		1745	16.65	3.32	8.90	22.23	166.923	Vertical	Pass
QPSK		1770	14.09	3.36	8.90	19.63	91.796	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	16.48	3.12	8.9	22.26	168.313	Horizontal	Pass
		1745	16.75	3.27	8.9	22.38	172.933	Horizontal	Pass
		1779.3	17.18	3.29	8.9	22.79	190.234	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	16.28	3.13	8.9	22.05	160.368	Horizontal	Pass
		1745	16.75	3.27	8.9	22.38	173.133	Horizontal	Pass
		1778.5	16.75	3.3	8.9	22.35	171.769	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	16.40	3.13	8.9	22.17	164.781	Horizontal	Pass
		1745	14.40	3.27	8.9	20.03	100.697	Horizontal	Pass
		1777.5	15.61	3.3	8.9	21.21	132.234	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	16.05	3.15	8.9	21.80	151.518	Horizontal	Pass
		1745	15.28	3.31	8.9	20.87	122.119	Horizontal	Pass
		1775	15.04	3.33	8.9	20.61	115.193	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.34	3.15	8.9	20.09	101.983	Horizontal	Pass
		1745	15.76	3.31	8.9	21.35	136.394	Horizontal	Pass
		1772.5	16.63	3.33	8.9	22.20	165.786	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	16.04	3.17	8.9	21.77	150.398	Horizontal	Pass
		1745	16.39	3.32	8.9	21.97	157.549	Horizontal	Pass
		1770	15.39	3.36	8.9	20.93	123.932	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	16.33	3.12	8.9	22.11	162.710	Vertical	Pass
		1745	16.30	3.27	8.9	21.93	155.804	Vertical	Pass
		1779.3	16.16	3.29	8.9	21.77	150.171	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.17	3.13	8.9	20.94	124.072	Vertical	Pass
		1745	14.91	3.27	8.9	20.54	113.254	Vertical	Pass
		1778.5	16.90	3.3	8.9	22.50	177.774	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	16.98	3.13	8.9	22.75	188.566	Vertical	Pass
		1745	16.62	3.27	8.9	22.25	168.050	Vertical	Pass
		1777.5	14.80	3.3	8.9	20.40	109.642	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	14.65	3.15	8.9	20.40	109.726	Vertical	Pass
		1745	17.28	3.31	8.9	22.87	193.856	Vertical	Pass
		1775	16.64	3.33	8.9	22.21	166.342	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	15.17	3.15	8.9	20.92	123.724	Vertical	Pass
		1745	16.20	3.31	8.9	21.79	151.096	Vertical	Pass
		1772.5	15.21	3.33	8.9	20.78	119.760	Vertical	Pass

20.0MHz	100/0	1720	17.16	3.17	8.9	22.89	194.670	Vertical	Pass
Band 16		1745	17.18	3.32	8.9	22.76	188.839	Vertical	Pass
QAM		1770	17.28	3.36	8.9	22.82	191.560	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

LIMIT

§22.917 (e) and §24.238 and §90.691 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

LTE Band 2/4/5/12/66

RESULTS

PASS

9.1 LTE BAND 2

QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.8	-48.36	4.04	33.51	-18.89	-13	-5.89	Horizontal
3701.8	-50.72	4.04	33.51	-21.25	-13	-8.25	Vertical
5552.6	-46.25	5.24	35.84	-15.65	-13	-2.65	Vertical
5552.6	-48.65	5.24	35.84	-18.05	-13	-5.05	Horizontal
185.4	-39.54	1.43	16.02	-24.94	-13	-11.94	Vertical
453.9	-32.95	1.30	17.99	-16.26	-13	-3.26	Horizontal
Test Results for Mid Channel 1880MHz							
3760.1	-47.02	4.04	33.56	-17.50	-13	-4.50	Horizontal
3760.1	-51.27	4.04	33.56	-21.75	-13	-8.75	Vertical
5640.8	-48.84	5.24	35.91	-18.17	-13	-5.17	Vertical
5640.8	-49.60	5.24	35.91	-18.93	-13	-5.93	Horizontal
183.6	-34.72	1.62	16.97	-19.36	-13	-6.36	Vertical
290.3	-34.42	1.74	15.98	-20.19	-13	-7.19	Horizontal
Test Results for High Channel 1909.3MHz							
3819.1	-46.34	4.04	34.00	-16.38	-13	-3.38	Horizontal
3819.1	-46.00	4.04	34.00	-16.04	-13	-3.04	Vertical
5728.0	-49.73	5.24	36.04	-18.93	-13	-5.93	Vertical
5728.0	-47.28	5.24	36.04	-16.48	-13	-3.48	Horizontal
194.3	-39.91	1.42	17.29	-24.03	-13	-11.03	Vertical
342.9	-33.73	1.50	17.90	-17.32	-13	-4.32	Horizontal

QPSK EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.5	-45.60	4.07	33.54	-16.13	-13	-3.13	Horizontal
3720.5	-49.32	4.07	33.54	-19.85	-13	-6.85	Vertical
5580.2	-46.60	5.28	35.86	-16.02	-13	-3.02	Vertical
5580.2	-49.70	5.28	35.86	-19.12	-13	-6.12	Horizontal
208.6	-37.28	1.58	16.89	-21.96	-13	-8.96	Vertical
357.8	-41.60	1.76	17.26	-26.10	-13	-13.10	Horizontal
Test Results for Mid Channel 1880MHz							
3760.7	-46.15	4.04	33.56	-16.63	-13	-3.63	Horizontal
3760.7	-45.88	4.04	33.56	-16.36	-13	-3.36	Vertical
5640.9	-49.59	5.24	35.91	-18.92	-13	-5.92	Vertical
5640.9	-49.84	5.24	35.91	-19.17	-13	-6.17	Horizontal
200.7	-43.75	1.46	16.27	-28.95	-13	-15.95	Vertical
345.5	-38.78	1.59	15.15	-25.22	-13	-12.22	Horizontal
Test Results for High Channel 1900MHz							
3800.7	-48.59	4.04	34.00	-18.63	-13	-5.63	Horizontal
3800.7	-46.38	4.04	34.00	-16.42	-13	-3.42	Vertical
5700.6	-47.27	5.24	36.04	-16.47	-13	-3.47	Vertical
5700.6	-50.07	5.24	36.04	-19.27	-13	-6.27	Horizontal
212.9	-33.71	1.36	17.39	-17.68	-13	-4.68	Vertical
313.3	-40.32	1.66	15.39	-26.60	-13	-13.60	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

Over Limit= : P_{Mea}(dBm)-Limit(dBm)

Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.2 LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3422.3	-48.80	4.02	29.80	-23.02	-13	-10.02	Horizontal
3422.3	-46.81	4.02	29.80	-21.03	-13	-8.03	Vertical
5133.0	-49.99	5.24	35.84	-19.39	-13	-6.39	Vertical
5133.0	-49.62	5.24	35.84	-19.02	-13	-6.02	Horizontal
198.6	-40.23	1.68	16.04	-25.86	-13	-12.86	Vertical
454.6	-33.90	1.78	17.74	-17.94	-13	-4.94	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.9	-48.24	4.03	30.00	-22.27	-13	-9.27	Horizontal
3465.9	-42.75	4.03	30.00	-16.78	-13	-3.78	Vertical
5197.8	-46.69	5.25	35.86	-16.08	-13	-3.08	Vertical
5197.8	-47.34	5.25	35.86	-16.73	-13	-3.73	Horizontal
208.2	-40.73	1.72	17.69	-24.76	-13	-11.76	Vertical
346.5	-41.64	1.62	16.02	-27.23	-13	-14.23	Horizontal
Test Results for High Channel 1754.3MHz							
3508.7	-47.41	4.05	30.01	-21.45	-13	-8.45	Horizontal
3508.7	-45.86	4.05	30.01	-19.90	-13	-6.90	Vertical
5263.7	-48.49	5.26	35.86	-17.89	-13	-4.89	Vertical
5263.7	-48.40	5.26	35.86	-17.80	-13	-4.80	Horizontal
183.5	-31.63	1.80	16.69	-16.74	-13	-3.74	Vertical
332.4	-38.81	1.75	16.66	-23.90	-13	-10.90	Horizontal

QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.2	-47.74	4.02	29.80	-21.96	-13	-8.96	Horizontal
3440.2	-47.50	4.02	29.80	-21.72	-13	-8.72	Vertical
5160.7	-50.75	5.24	35.84	-20.15	-13	-7.15	Vertical
5160.7	-49.87	5.24	35.84	-19.27	-13	-6.27	Horizontal
183.1	-38.69	1.57	17.26	-23.00	-13	-10.00	Vertical
310.3	-34.25	1.78	16.35	-19.68	-13	-6.68	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.9	-48.29	4.03	30.00	-22.32	-13	-9.32	Horizontal
3465.9	-49.35	4.03	30.00	-23.38	-13	-10.38	Vertical
5197.9	-47.37	5.25	35.86	-16.76	-13	-3.76	Vertical
5197.9	-47.28	5.25	35.86	-16.67	-13	-3.67	Horizontal
209.0	-39.76	1.44	17.95	-23.26	-13	-10.26	Vertical
270.2	-32.03	1.65	16.09	-17.59	-13	-4.59	Horizontal
Test Results for High Channel 1745MHz							
3490.8	-43.95	2.91	27.68	-19.18	-13	-6.18	Horizontal
3490.8	-44.13	2.91	27.68	-19.36	-13	-6.36	Vertical
5235.5	-47.35	5.26	35.86	-16.75	-13	-3.75	Vertical
5235.5	-51.31	5.26	35.86	-20.71	-13	-7.71	Horizontal
185.1	-39.46	1.61	16.85	-24.21	-13	-11.21	Vertical
291.4	-38.74	1.61	15.19	-25.16	-13	-12.16	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

Over Limit= : P_{Mea}(dBm)-Limit(dBm)

Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.3 LTE BAND 5

QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.6	-46.28	2.78	27.50	-21.56	-13	-8.56	Horizontal
1649.6	-48.69	2.78	27.50	-23.97	-13	-10.97	Vertical
2474.5	-44.75	2.90	27.80	-19.85	-13	-6.85	Vertical
2474.5	-50.94	2.90	27.80	-26.04	-13	-13.04	Horizontal
179.4	-35.66	1.76	17.59	-19.83	-13	-6.83	Vertical
461.1	-38.84	1.63	15.87	-24.60	-13	-11.60	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.7	-45.27	2.80	27.48	-20.59	-13	-7.59	Horizontal
1673.7	-45.20	2.80	27.48	-20.52	-13	-7.52	Vertical
2509.7	-42.59	2.91	27.70	-17.80	-13	-4.80	Vertical
2509.7	-49.55	2.91	27.70	-24.76	-13	-11.76	Horizontal
213.4	-40.88	1.61	15.68	-26.81	-13	-13.81	Vertical
431.5	-35.46	1.59	17.52	-19.54	-13	-6.54	Horizontal
Test Results for High Channel 848.3MHz							
1697.5	-48.01	2.82	27.43	-23.40	-13	-10.40	Horizontal
1697.5	-49.95	2.82	27.43	-25.34	-13	-12.34	Vertical
2545.1	-42.40	2.92	27.74	-17.58	-13	-4.58	Vertical
2545.1	-49.92	2.92	27.74	-25.10	-13	-12.10	Horizontal
192.7	-34.05	1.69	16.67	-19.06	-13	-6.06	Vertical
366.7	-33.96	1.70	17.18	-18.47	-13	-5.47	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.9	-50.40	2.78	27.50	-25.68	-13	-12.68	Horizontal
1658.9	-41.12	2.78	27.50	-16.40	-13	-3.40	Vertical
2487.3	-52.12	2.90	27.80	-27.22	-13	-14.22	Vertical
2487.3	-48.03	2.90	27.80	-23.13	-13	-10.13	Horizontal
200.8	-42.18	1.71	15.57	-28.32	-13	-15.32	Vertical
364.3	-31.34	1.34	16.40	-16.29	-13	-3.29	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.1	-41.17	2.80	27.48	-16.49	-13	-3.49	Horizontal
1673.1	-41.95	2.80	27.48	-17.27	-13	-4.27	Vertical
2509.8	-50.21	2.91	27.70	-25.42	-13	-12.42	Vertical
2509.8	-46.36	2.91	27.70	-21.57	-13	-8.57	Horizontal
212.4	-31.49	1.44	17.04	-15.89	-13	-2.89	Vertical
343.7	-41.19	1.76	17.62	-25.34	-13	-12.34	Horizontal
Test Results for High Channel 844MHz							
1688.7	-45.93	2.82	27.43	-21.32	-13	-8.32	Horizontal
1688.7	-46.19	2.82	27.43	-21.58	-13	-8.58	Vertical
2532.8	-50.15	2.92	27.74	-25.33	-13	-12.33	Vertical
2532.8	-46.72	2.92	27.74	-21.90	-13	-8.90	Horizontal
205.9	-34.51	1.74	17.70	-18.55	-13	-5.55	Vertical
393.4	-34.33	1.41	17.46	-18.27	-13	-5.27	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.5 LTE BAND 12

QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.6	-41.77	2.60	27.20	-17.17	-13	-4.17	Horizontal
1399.6	-42.54	2.60	27.20	-17.94	-13	-4.94	Vertical
2099.5	-48.97	2.85	27.54	-24.28	-13	-11.28	Vertical
2099.5	-47.56	2.85	27.54	-22.87	-13	-9.87	Horizontal
212.4	-36.25	1.49	17.78	-19.96	-13	-6.96	Vertical
387.4	-39.83	1.36	17.33	-23.86	-13	-10.86	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.3	-44.15	2.61	27.28	-19.48	-13	-6.48	Horizontal
1415.3	-43.93	2.61	27.28	-19.26	-13	-6.26	Vertical
2123.1	-49.81	2.87	27.59	-25.09	-13	-12.09	Vertical
2123.1	-48.26	2.87	27.59	-23.54	-13	-10.54	Horizontal
207.6	-38.45	1.73	15.74	-24.44	-13	-11.44	Vertical
385.0	-32.56	1.62	15.79	-18.39	-13	-5.39	Horizontal
Test Results for High Channel 715.3MHz							
1430.7	-50.30	2.63	27.28	-25.65	-13	-12.65	Horizontal
1430.7	-46.58	2.63	27.28	-21.93	-13	-8.93	Vertical
2146.6	-43.09	2.88	27.60	-18.37	-13	-5.37	Vertical
2146.6	-46.61	2.88	27.60	-21.89	-13	-8.89	Horizontal
186.5	-32.92	1.61	18.00	-16.53	-13	-3.53	Vertical
281.0	-34.91	1.45	15.49	-20.87	-13	-7.87	Horizontal

QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.5	-51.34	2.61	27.26	-26.69	-13	-13.69	Horizontal
1408.5	-46.02	2.61	27.26	-21.37	-13	-8.37	Vertical
2112.4	-47.82	2.87	27.58	-23.11	-13	-10.11	Vertical
2112.4	-49.59	2.87	27.58	-24.88	-13	-11.88	Horizontal
197.9	-39.52	1.31	16.97	-23.86	-13	-10.86	Vertical
468.7	-42.16	1.65	16.70	-27.10	-13	-14.10	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.6	-43.86	2.61	27.28	-19.19	-13	-6.19	Horizontal
1415.6	-50.32	2.61	27.28	-25.65	-13	-12.65	Vertical
2123.3	-50.21	2.87	27.59	-25.49	-13	-12.49	Vertical
2123.3	-49.55	2.87	27.59	-24.83	-13	-11.83	Horizontal
176.0	-34.67	1.72	17.99	-18.40	-13	-5.40	Vertical
363.3	-39.23	1.73	17.94	-23.02	-13	-10.02	Horizontal
Test Results for High Channel 711MHz							
1422.5	-47.12	2.62	27.28	-22.46	-13	-9.46	Horizontal
1422.5	-42.21	2.62	27.28	-17.55	-13	-4.55	Vertical
2133.4	-51.79	2.87	27.60	-27.06	-13	-14.06	Vertical
2133.4	-47.93	2.87	27.60	-23.20	-13	-10.20	Horizontal
209.9	-35.25	1.58	15.93	-20.89	-13	-7.89	Vertical
361.9	-31.54	1.36	15.59	-17.30	-13	-4.30	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.6 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3422.2	-57.70	3.84	35.81	-25.73	-13	-12.73	Horizontal
3422.2	-60.51	3.84	35.81	-28.54	-13	-15.54	Vertical
5132.4	-61.03	5.18	36.85	-29.36	-13	-16.36	Vertical
5132.4	-60.39	5.18	36.85	-28.72	-13	-15.72	Horizontal
204.6	-47.51	1.56	17.97	-31.10	-13	-18.10	Vertical
306.2	-50.85	1.33	15.11	-37.07	-13	-24.07	Horizontal
Test Results for Mid Channel 1745MHz							
3490.4	-60.97	3.85	35.82	-29.00	-13	-16.00	Horizontal
3490.4	-60.72	3.85	35.82	-28.75	-13	-15.75	Vertical
5235.8	-58.81	5.21	36.85	-27.17	-13	-14.17	Vertical
5235.8	-60.86	5.21	36.85	-29.22	-13	-16.22	Horizontal
187.8	-47.17	1.77	16.17	-32.77	-13	-19.77	Vertical
391.0	-47.85	1.63	15.21	-34.27	-13	-21.27	Horizontal
Test Results for High Channel 1779.3MHz							
3559.2	-58.22	3.86	35.83	-26.25	-13	-13.25	Horizontal
3559.2	-57.93	3.86	35.83	-25.96	-13	-12.96	Vertical
5337.9	-57.13	5.24	36.87	-25.50	-13	-12.50	Vertical
5337.9	-59.23	5.24	36.87	-27.60	-13	-14.60	Horizontal
198.7	-45.15	1.58	17.56	-29.17	-13	-16.17	Vertical
269.2	-49.34	1.45	16.58	-34.21	-13	-21.21	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (20MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.7	-61.91	3.84	35.82	-29.93	-13	-16.93	Horizontal
3440.7	-61.94	3.84	35.82	-29.96	-13	-16.96	Vertical
5160.9	-58.91	5.18	36.86	-27.23	-13	-14.23	Vertical
5160.9	-62.05	5.18	36.86	-30.37	-13	-17.37	Horizontal
180.7	-49.88	1.56	15.76	-35.68	-13	-22.68	Vertical
323.6	-45.44	1.33	15.44	-31.32	-13	-18.32	Horizontal
Test Results for Mid Channel 1745MHz							
3490.6	-58.24	3.85	35.82	-26.27	-13	-13.27	Horizontal
3490.6	-60.81	3.85	35.82	-28.84	-13	-15.84	Vertical
5235.8	-61.98	5.21	36.85	-30.34	-13	-17.34	Vertical
5235.8	-56.88	5.21	36.85	-25.24	-13	-12.24	Horizontal
183.3	-44.90	1.77	16.84	-29.82	-13	-16.82	Vertical
252.6	-51.19	1.63	17.64	-35.18	-13	-22.18	Horizontal
Test Results for High Channel 1770MHz							
3540.4	-57.53	3.86	35.83	-25.56	-13	-12.56	Horizontal
3540.4	-59.98	3.86	35.83	-28.01	-13	-15.01	Vertical
5310.4	-58.95	5.24	36.88	-27.31	-13	-14.31	Vertical
5310.4	-58.15	5.24	36.88	-26.51	-13	-13.51	Horizontal
182.9	-46.03	1.58	16.84	-30.77	-13	-17.77	Vertical
310.9	-47.02	1.45	17.64	-30.83	-13	-17.83	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

Over Limit= : P_{Mea}(dBm)-Limit(dBm)

We test both H direction and V direction, recorded worst case direction.

Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = -30° to $+50^{\circ}\text{C}$

Voltage = low voltage, DC 3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

LTE Band 2/4/5/12/66

RESULTS

See the following pages.

10.1 LTE BAND 2

Band 2 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1880	14.3	0.007611	2.5
3.7	1880	10.5	0.005573	2.5
4.26	1880	13.1	0.006988	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	3.2	0.001710	2.5
Extreme (50C)	1880	15.1	0.008027	2.5
Extreme (40C)	1880	12.5	0.006635	2.5
Extreme (30C)	1880	15.5	0.008244	2.5
Extreme (10C)	1880	5.7	0.003043	2.5
Extreme (0C)	1880	4.4	0.002367	2.5
Extreme (-10C)	1880	9.9	0.005240	2.5
Extreme (-20C)	1880	9.4	0.004978	2.5
Extreme (-30C)	1880	15.6	0.008310	2.5

Band 2 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1880	5.6	0.002983	2.5
3.7	1880	10.8	0.005752	2.5
4.26	1880	3.6	0.001909	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	7.4	0.003942	2.5
Extreme (50C)	1880	11.1	0.005890	2.5
Extreme (40C)	1880	9.2	0.004919	2.5
Extreme (30C)	1880	12.5	0.006647	2.5
Extreme (10C)	1880	3.2	0.001722	2.5
Extreme (0C)	1880	8.9	0.004755	2.5
Extreme (-10C)	1880	12.6	0.006697	2.5
Extreme (-20C)	1880	6.8	0.003597	2.5
Extreme (-30C)	1880	12.1	0.006425	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.2 LTE BAND 4

Band 4 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1732.5	8.3	0.004806	2.5
3.7	1732.5	6.7	0.003856	2.5
4.26	1732.5	11.7	0.006778	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	14.2	0.008169	2.5
Extreme (50C)	1732.5	15.7	0.009036	2.5
Extreme (40C)	1732.5	3.4	0.001969	2.5
Extreme (30C)	1732.5	3.9	0.002225	2.5
Extreme (10C)	1732.5	4.8	0.002791	2.5
Extreme (0C)	1732.5	10.3	0.005930	2.5
Extreme (-10C)	1732.5	6.9	0.003965	2.5
Extreme (-20C)	1732.5	8.9	0.005150	2.5
Extreme (-30C)	1732.5	9.5	0.005458	2.5

Band 4 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1732.5	7.9	0.004541	2.5
3.7	1732.5	13.1	0.007565	2.5
4.26	1732.5	10.1	0.005825	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	4.7	0.002715	2.5
Extreme (50C)	1732.5	15.1	0.008718	2.5
Extreme (40C)	1732.5	15.9	0.009177	2.5
Extreme (30C)	1732.5	6.3	0.003627	2.5
Extreme (10C)	1732.5	10.9	0.006263	2.5
Extreme (0C)	1732.5	7.0	0.004053	2.5
Extreme (-10C)	1732.5	8.5	0.004894	2.5
Extreme (-20C)	1732.5	8.8	0.005089	2.5
Extreme (-30C)	1732.5	8.0	0.004592	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.3 LTE BAND 5

Band 5 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	836.5	7.7	0.009219	2.5
3.7	836.5	15.8	0.018886	2.5
4.26	836.5	9.6	0.011500	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	15.1	0.017999	2.5
Extreme (50C)	836.5	4.0	0.004796	2.5
Extreme (40C)	836.5	15.4	0.018422	2.5
Extreme (30C)	836.5	14.4	0.017220	2.5
Extreme (10C)	836.5	9.3	0.011119	2.5
Extreme (0C)	836.5	12.8	0.015333	2.5
Extreme (-10C)	836.5	6.4	0.007674	2.5
Extreme (-20C)	836.5	12.5	0.014963	2.5
Extreme (-30C)	836.5	4.7	0.005615	2.5

Band 5 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	836.5	15.1	0.018039	2.5
3.7	836.5	13.8	0.016530	2.5
4.26	836.5	10.8	0.012856	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	3.6	0.004359	2.5
Extreme (50C)	836.5	9.1	0.010909	2.5
Extreme (40C)	836.5	7.3	0.008696	2.5
Extreme (30C)	836.5	11.6	0.013882	2.5
Extreme (10C)	836.5	8.1	0.009722	2.5
Extreme (0C)	836.5	7.6	0.009085	2.5
Extreme (-10C)	836.5	13.5	0.016098	2.5
Extreme (-20C)	836.5	10.1	0.012130	2.5
Extreme (-30C)	836.5	10.0	0.011909	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.5 LTE BAND 12

Band 12 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	707.5	8.2	0.011533	2.5
3.7	707.5	4.6	0.006562	2.5
4.26	707.5	14.3	0.020202	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	13.1	0.018470	2.5
Extreme (50C)	707.5	4.3	0.006050	2.5
Extreme (40C)	707.5	8.4	0.011806	2.5
Extreme (30C)	707.5	5.3	0.007522	2.5
Extreme (10C)	707.5	7.7	0.010912	2.5
Extreme (0C)	707.5	8.9	0.012631	2.5
Extreme (-10C)	707.5	11.0	0.015571	2.5
Extreme (-20C)	707.5	7.4	0.010448	2.5
Extreme (-30C)	707.5	5.1	0.007162	2.5

Band 12 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	707.5	12.4	0.017472	2.5
3.7	707.5	10.1	0.014278	2.5
4.26	707.5	8.6	0.012224	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.3	0.011750	2.5
Extreme (50C)	707.5	12.6	0.017768	2.5
Extreme (40C)	707.5	12.6	0.017837	2.5
Extreme (30C)	707.5	5.2	0.007357	2.5
Extreme (10C)	707.5	9.8	0.013818	2.5
Extreme (0C)	707.5	5.3	0.007534	2.5
Extreme (-10C)	707.5	10.9	0.015372	2.5
Extreme (-20C)	707.5	9.9	0.014023	2.5
Extreme (-30C)	707.5	9.9	0.014018	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.6 LTE BAND 66

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1745	6.1	0.003500	2.5
3.7	1745	12.8	0.007318	2.5
4.26	1745	6.3	0.003605	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	9.8	0.005594	2.5
Extreme (50C)	1745	11.7	0.006718	2.5
Extreme (40C)	1745	8.8	0.005051	2.5
Extreme (30C)	1745	12.1	0.006931	2.5
Extreme (10C)	1745	6.0	0.003448	2.5
Extreme (0C)	1745	5.0	0.002861	2.5
Extreme (-10C)	1745	15.1	0.008639	2.5
Extreme (-20C)	1745	13.4	0.007701	2.5
Extreme (-30C)	1745	13.4	0.007655	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1745	15.0	0.008586	2.5
3.7	1745	13.8	0.007907	2.5
4.26	1745	14.7	0.008419	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	14.4	0.008230	2.5
Extreme (50C)	1745	4.1	0.002368	2.5
Extreme (40C)	1745	6.9	0.003977	2.5
Extreme (30C)	1745	14.9	0.008519	2.5
Extreme (10C)	1745	8.5	0.004865	2.5
Extreme (0C)	1745	14.2	0.008141	2.5
Extreme (-10C)	1745	9.7	0.005555	2.5
Extreme (-20C)	1745	8.2	0.004705	2.5
Extreme (-30C)	1745	12.2	0.007006	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

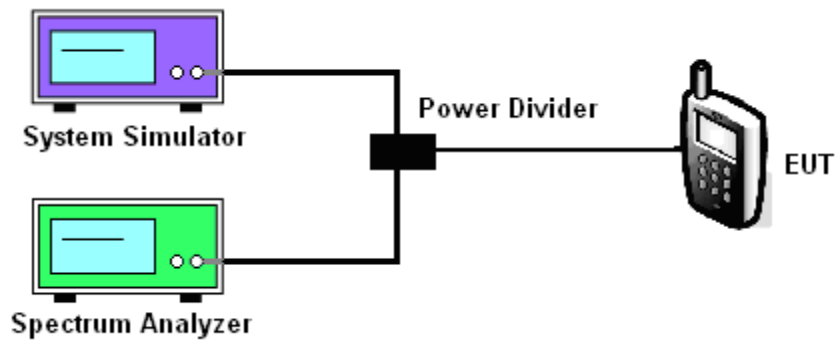
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For LTE operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



MODES TESTED

LTE Band 2/4/5/12/66

Test data reference attachment.

-----END OF REPORT-----