

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

FCC ID: 2AOWK-3112

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ3112

Family Model: Armor X12, Armor X12 Pro, Armor X12 Lite,
Armor X12 Plus, Armor X12S, Armor X12P,
Armor X12T, Armor X12E

Report No.: S23060904201006

Issue Date: Aug 02, 2023

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Gotron Electronic CO.,LTD.

Address..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China

Manufacturer's Name..... : Shenzhen Gotron Electronic CO.,LTD.

Address..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China

Product name..... : Mobile Phone

Model and/or type reference .. : GQ3112

Trade Mark..... : ulefone

Family Model..... : Armor X12, Armor X12 Pro, Armor X12 Lite, Armor X12 Plus, Armor X12S, Armor X12P, Armor X12T, Armor X12E

Test Sample Number..... S230609042001

Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27

Test procedure : ANSI C63.26:2015
ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

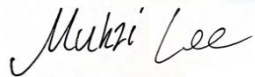
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Date of Test

Date (s) of performance of tests..... Jun 09, 2023 ~ Aug 02, 2023

Date of Issue Aug 02, 2023

Test Result..... **Pass**

Testing Engineer : 
(Mukzi Lee)

Authorized Signatory : 
(Alex Li)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	ulefone
Model Name	GQ3112
Family Model	Armor X12, Armor X12 Pro, Armor X12 Lite, Armor X12 Plus, Armor X12S, Armor X12P, Armor X12T, Armor X12E
Model Difference	All the model are the same circuit and RF module, except the model names.
FCC ID:	2AOWK-3112
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,17 LTE TDD Band 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 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE TDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM Card:	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 2: -3 dBi, Band 4: -4.63dBi, Band 5: -4.44dBi, Band 7: -3.32dBi, Band 12: -5.24 dBi, Band 17: -5.24 dBi, Band 66: -3.91 dBi
Adapter	Adapter 1# Model: HJ-0502000W2-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V $\overline{\text{---}}$ 2000mA Adapter 2# Model: HJ-0501000E1-US Input: 100-240V~50/60Hz 0.2A Output: 5.0V $\overline{\text{---}}$ 1.0A 5.0W
Battery	DC 3.87V, 4860mAh, 18.81Wh

Power supply	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.29 to DC 4.45V (Nominal DC 3.87V) (Note 1)
HW Version	P1T_01
SW Version	N/A
** Note1: The High Voltage DC 4.45V and Low Voltage 3.29V 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: 2AOWK-3112** filing to comply with the FCC Part 22H&24E&27&90S.

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.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street

Bao'an District, Shenzhen 518126 P.R. 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-1,

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 2/4/5/7/12/17/66

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	Mobile Phone	GQ3112	FCC ID: 2AOWK-3112	EUT

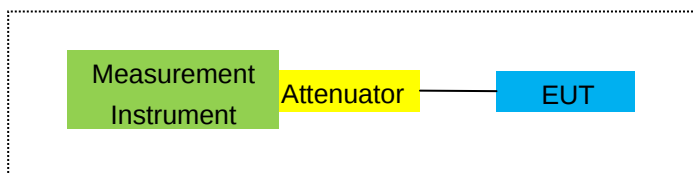
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

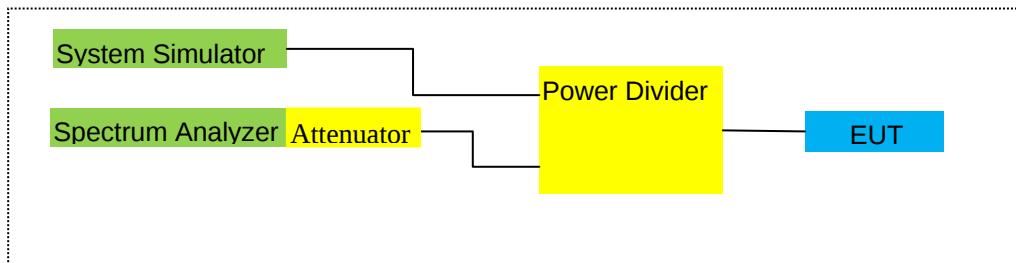
For Radiated Test Cases



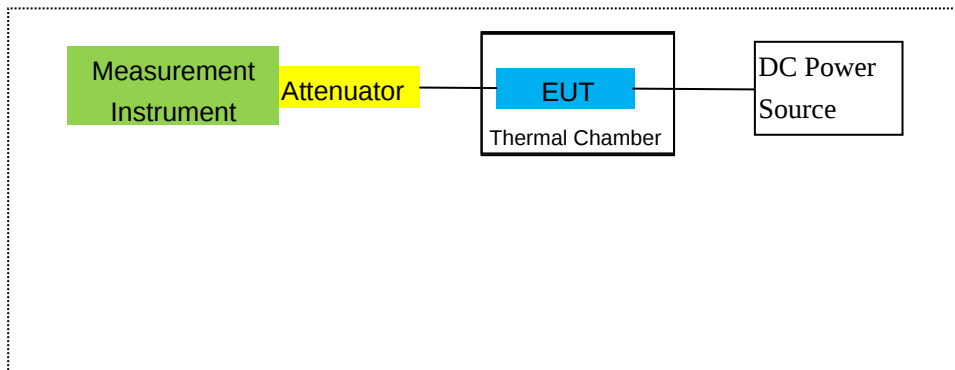
For Conducted Output Power



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	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16	2024.03.15	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2023.05.06	2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2025.03.30	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2023.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.11.04	2023.11.05	1 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.05.29	2024.05.28	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	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	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	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
23	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	1 year
24	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27	2024.03.26	1 year

26	DC Power Source	N/A	PS-6005D	2017040292 3	2023.05.06	2026.05.05	3 year
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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.

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 2/4/5/7/12/17/66

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, and §90.691

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 2/4/5/7/12/17/66

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 and §90.691

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 7/41 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 2/4/5/7/12/17/66
- ☐

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 and §90.635

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 2/4/5/7/12/17/66

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-7.03	3.76	28.24	17.45	55.590	Horizontal	Pass
		1880	-6.82	3.91	28.22	17.49	56.105	Horizontal	Pass
		1909.3	-6.70	3.93	28.20	17.57	57.148	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-6.90	3.77	28.23	17.56	57.016	Horizontal	Pass
		1880	-6.78	3.91	28.24	17.55	56.885	Horizontal	Pass
		1908.5	-6.80	3.94	28.25	17.51	56.364	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-7.04	3.77	28.31	17.50	56.234	Horizontal	Pass
		1880	-6.84	3.91	28.22	17.47	55.847	Horizontal	Pass
		1907.5	-6.84	3.94	28.20	17.42	55.208	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-7.05	3.79	28.33	17.49	56.105	Horizontal	Pass
		1880	-6.70	3.95	28.22	17.57	57.148	Horizontal	Pass
		1905	-6.71	3.97	28.19	17.51	56.364	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-7.10	3.79	28.34	17.45	55.590	Horizontal	Pass
		1880	-6.81	3.95	28.22	17.46	55.719	Horizontal	Pass
		1902.5	-6.66	3.97	28.18	17.55	56.885	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-7.02	3.81	28.35	17.52	56.494	Horizontal	Pass
		1880	-6.71	3.96	28.22	17.55	56.885	Horizontal	Pass
		1900	-6.57	4.00	28.16	17.59	57.412	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-6.97	3.76	28.24	17.51	56.364	Vertical	Pass
		1880	-6.72	3.91	28.22	17.59	57.412	Vertical	Pass
		1909.3	-6.69	3.93	28.20	17.58	57.280	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-6.89	3.77	28.23	17.57	57.148	Vertical	Pass
		1880	-6.80	3.91	28.24	17.53	56.624	Vertical	Pass
		1908.5	-6.82	3.94	28.25	17.49	56.105	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-7.06	3.77	28.31	17.48	55.976	Vertical	Pass
		1880	-6.73	3.91	28.22	17.58	57.280	Vertical	Pass
		1907.5	-6.80	3.94	28.20	17.46	55.719	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-7.04	3.79	28.33	17.50	56.234	Vertical	Pass
		1880	-6.68	3.95	28.22	17.59	57.412	Vertical	Pass
		1905	-6.63	3.97	28.19	17.59	57.412	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-7.01	3.79	28.34	17.54	56.754	Vertical	Pass
Band		1880	-6.73	3.95	28.22	17.54	56.754	Vertical	Pass
QPSK		1902.5	-6.64	3.97	28.18	17.57	57.148	Vertical	Pass
20.0MHz	1/#Mid	1860	-6.92	3.81	28.35	17.62	57.810	Vertical	Pass
Band		1880	-6.63	3.96	28.22	17.63	57.943	Vertical	Pass
QPSK		1900	-6.52	4.00	28.16	17.64	58.076	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-7.93	3.76	28.24	16.55	45.186	Horizontal	Pass
		1880	-7.83	3.91	28.22	16.48	44.463	Horizontal	Pass
		1909.3	-7.76	3.93	28.20	16.51	44.771	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-7.87	3.77	28.23	16.59	45.604	Horizontal	Pass
		1880	-7.81	3.91	28.24	16.52	44.875	Horizontal	Pass
		1908.5	-7.78	3.94	28.25	16.53	44.978	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-7.99	3.77	28.31	16.55	45.186	Horizontal	Pass
		1880	-7.85	3.91	28.22	16.46	44.259	Horizontal	Pass
		1907.5	-7.67	3.94	28.20	16.59	45.604	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-7.99	3.79	28.33	16.55	45.186	Horizontal	Pass
		1880	-7.67	3.95	28.22	16.60	45.709	Horizontal	Pass
		1905	-7.67	3.97	28.19	16.55	45.186	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-8.07	3.79	28.34	16.48	44.463	Horizontal	Pass
		1880	-7.76	3.95	28.22	16.51	44.771	Horizontal	Pass
		1902.5	-7.63	3.97	28.18	16.58	45.499	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-8.01	3.81	28.35	16.53	44.978	Horizontal	Pass
		1880	-7.70	3.96	28.22	16.56	45.290	Horizontal	Pass
		1900	-7.72	4.00	28.16	16.44	44.055	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-7.95	3.76	28.24	16.53	44.978	Vertical	Pass
		1880	-7.78	3.91	28.22	16.53	44.978	Vertical	Pass
		1909.3	-7.78	3.93	28.20	16.49	44.566	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-8.02	3.77	28.23	16.44	44.055	Vertical	Pass
		1880	-7.85	3.91	28.24	16.48	44.463	Vertical	Pass
		1908.5	-7.79	3.94	28.25	16.52	44.875	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-8.05	3.77	28.31	16.49	44.566	Vertical	Pass

Band 16 QAM		1880	-7.81	3.91	28.22	16.50	44.668	Vertical	Pass
		1907.5	-7.67	3.94	28.20	16.59	45.604	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-7.97	3.79	28.33	16.57	45.394	Vertical	Pass
		1880	-7.70	3.95	28.22	16.57	45.394	Vertical	Pass
		1905	-7.65	3.97	28.19	16.57	45.394	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-8.03	3.79	28.34	16.52	44.875	Vertical	Pass
		1880	-7.81	3.95	28.22	16.46	44.259	Vertical	Pass
		1902.5	-7.61	3.97	28.18	16.60	45.709	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-7.92	3.81	28.35	16.62	45.920	Vertical	Pass
		1880	-7.64	3.96	28.22	16.62	45.920	Vertical	Pass
		1900	-7.55	4.00	28.16	16.61	45.814	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	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-8.77	3.12	27.58	15.69	37.068	Horizontal	Pass
		1732.5	-8.69	3.27	27.61	15.65	36.728	Horizontal	Pass
		1754.3	-8.57	3.29	27.63	15.77	37.757	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-8.75	3.13	27.61	15.73	37.411	Horizontal	Pass
		1732.5	-8.69	3.27	27.61	15.65	36.728	Horizontal	Pass
		1753.5	-8.71	3.30	27.62	15.61	36.392	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-8.82	3.13	27.63	15.68	36.983	Horizontal	Pass
		1732.5	-8.69	3.27	27.61	15.65	36.728	Horizontal	Pass
		1752.5	-8.66	3.30	27.60	15.64	36.644	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-8.81	3.15	27.64	15.68	36.983	Horizontal	Pass
		1732.5	-8.57	3.31	27.61	15.73	37.411	Horizontal	Pass
		1750	-8.61	3.33	27.59	15.65	36.728	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-8.80	3.15	27.65	15.70	37.154	Horizontal	Pass
		1732.5	-8.64	3.31	27.61	15.66	36.813	Horizontal	Pass
		1747.5	-8.61	3.33	27.57	15.63	36.559	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-8.87	3.17	27.66	15.62	36.475	Horizontal	Pass
		1732.5	-8.65	3.32	27.61	15.64	36.644	Horizontal	Pass
		1745	-8.56	3.36	27.56	15.64	36.644	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-8.72	3.12	27.58	15.74	37.497	Vertical	Pass
		1732.5	-8.61	3.27	27.61	15.73	37.411	Vertical	Pass
		1754.3	-8.68	3.29	27.63	15.66	36.813	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-8.75	3.13	27.61	15.73	37.411	Vertical	Pass
		1732.5	-8.63	3.27	27.61	15.71	37.239	Vertical	Pass
		1753.5	-8.66	3.30	27.62	15.66	36.813	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-8.87	3.13	27.63	15.63	36.559	Vertical	Pass
		1732.5	-8.63	3.27	27.61	15.71	37.239	Vertical	Pass
		1752.5	-8.55	3.30	27.60	15.75	37.584	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-8.77	3.15	27.64	15.72	37.325	Vertical	Pass
		1732.5	-8.56	3.31	27.61	15.74	37.497	Vertical	Pass
		1750	-8.59	3.33	27.59	15.67	36.898	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-8.80	3.15	27.65	15.70	37.154	Vertical	Pass
		1732.5	-8.60	3.31	27.61	15.70	37.154	Vertical	Pass
		1747.5	-8.58	3.33	27.57	15.66	36.813	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-8.69	3.17	27.66	15.80	38.019	Vertical	Pass
		1732.5	-8.51	3.32	27.61	15.78	37.844	Vertical	Pass
		1745	-8.38	3.36	27.56	15.82	38.194	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-9.43	3.12	27.58	15.03	31.842	Horizontal	Pass
		1732.5	-9.23	3.27	27.61	15.11	32.434	Horizontal	Pass
		1754.3	-9.30	3.29	27.63	15.04	31.915	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-9.40	3.13	27.61	15.08	32.211	Horizontal	Pass
		1732.5	-9.19	3.27	27.61	15.15	32.734	Horizontal	Pass
		1753.5	-9.25	3.30	27.62	15.07	32.137	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-9.35	3.13	27.63	15.15	32.734	Horizontal	Pass
		1732.5	-9.25	3.27	27.61	15.09	32.285	Horizontal	Pass
		1752.5	-9.28	3.30	27.60	15.02	31.769	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-9.35	3.15	27.64	15.14	32.659	Horizontal	Pass
		1732.5	-9.19	3.31	27.61	15.11	32.434	Horizontal	Pass
		1750	-9.10	3.33	27.59	15.16	32.810	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-9.37	3.15	27.65	15.13	32.584	Horizontal	Pass
		1732.5	-9.20	3.31	27.61	15.10	32.359	Horizontal	Pass
		1747.5	-9.08	3.33	27.57	15.16	32.810	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-9.45	3.17	27.66	15.04	31.915	Horizontal	Pass
		1732.5	-9.12	3.32	27.61	15.17	32.885	Horizontal	Pass
		1745	-9.05	3.36	27.56	15.15	32.734	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-9.29	3.12	27.58	15.17	32.885	Vertical	Pass
		1732.5	-9.20	3.27	27.61	15.14	32.659	Vertical	Pass
		1754.3	-9.27	3.29	27.63	15.07	32.137	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-9.40	3.13	27.61	15.08	32.211	Vertical	Pass
		1732.5	-9.32	3.27	27.61	15.02	31.769	Vertical	Pass
		1753.5	-9.23	3.30	27.62	15.09	32.285	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-9.41	3.13	27.63	15.09	32.285	Vertical	Pass

Band 16		1732.5	-9.19	3.27	27.61	15.15	32.734	Vertical	Pass
QAM		1752.5	-9.23	3.30	27.60	15.07	32.137	Vertical	Pass
10.0MHz	1/#Mid	1715	-9.39	3.15	27.64	15.10	32.359	Vertical	Pass
Band 16		1732.5	-9.14	3.31	27.61	15.16	32.810	Vertical	Pass
QAM		1750	-9.22	3.33	27.59	15.04	31.915	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-9.48	3.15	27.65	15.02	31.769	Vertical	Pass
Band 16		1732.5	-9.21	3.31	27.61	15.09	32.285	Vertical	Pass
QAM		1747.5	-9.13	3.33	27.57	15.11	32.434	Vertical	Pass
20.0MHz	1/#Mid	1720	-9.28	3.17	27.66	15.21	33.189	Vertical	Pass
Band 16		1732.5	-9.09	3.32	27.61	15.20	33.113	Vertical	Pass
QAM		1745	-8.98	3.36	27.56	15.22	33.266	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							Conclusi on
			SG	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	824.7	1.26	2.01	19.68	2.15	16.78	47.643	Horizontal	Pass
		836.5	1.15	2.01	19.77	2.15	16.76	47.424	Horizontal	Pass
		848.3	1.11	2.02	19.82	2.15	16.76	47.424	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	1.21	2.01	19.70	2.15	16.75	47.315	Horizontal	Pass
		836.5	1.23	2.01	19.77	2.15	16.84	48.306	Horizontal	Pass
		847.5	1.11	2.02	19.81	2.15	16.75	47.315	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	1.21	2.01	19.71	2.15	16.76	47.424	Horizontal	Pass
		836.5	1.17	2.01	19.77	2.15	16.78	47.643	Horizontal	Pass
		846.5	1.09	2.02	19.79	2.15	16.71	46.881	Horizontal	Pass
10.0MH z Band QPSK	1/#Mid	829	1.20	2.01	19.73	2.15	16.77	47.534	Horizontal	Pass
		836.5	1.14	2.01	19.77	2.15	16.75	47.315	Horizontal	Pass
		844	1.09	2.02	19.78	2.15	16.70	46.774	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	1.29	2.01	19.68	2.15	16.81	47.973	Vertical	Pass
		836.5	1.22	2.01	19.77	2.15	16.83	48.195	Vertical	Pass
		848.3	1.15	2.02	19.82	2.15	16.80	47.863	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	1.22	2.01	19.70	2.15	16.76	47.424	Vertical	Pass
		836.5	1.17	2.01	19.77	2.15	16.78	47.643	Vertical	Pass
		847.5	1.18	2.02	19.81	2.15	16.82	48.084	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	1.22	2.01	19.71	2.15	16.77	47.534	Vertical	Pass
		836.5	1.24	2.01	19.77	2.15	16.85	48.417	Vertical	Pass
		846.5	1.23	2.02	19.79	2.15	16.85	48.417	Vertical	Pass
10.0MH z Band QPSK	1/#Mid	829	1.33	2.01	19.73	2.15	16.90	48.978	Vertical	Pass
		836.5	1.25	2.01	19.77	2.15	16.86	48.529	Vertical	Pass
		844	1.28	2.02	19.78	2.15	16.89	48.865	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclu sion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	824.7	0.44	2.01	19.68	2.15	15.96	39.446	Horizontal	Pass
		836.5	0.26	2.01	19.77	2.15	15.87	38.637	Horizontal	Pass
		848.3	0.28	2.02	19.82	2.15	15.93	39.174	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	0.40	2.01	19.70	2.15	15.94	39.264	Horizontal	Pass
		836.5	0.34	2.01	19.77	2.15	15.95	39.355	Horizontal	Pass
		847.5	0.22	2.02	19.81	2.15	15.86	38.548	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	0.38	2.01	19.71	2.15	15.93	39.174	Horizontal	Pass
		836.5	0.31	2.01	19.77	2.15	15.92	39.084	Horizontal	Pass
		846.5	0.26	2.02	19.79	2.15	15.88	38.726	Horizontal	Pass
10.0MH z Band 16 QAM	1/#Mid	829	0.34	2.01	19.73	2.15	15.91	38.994	Horizontal	Pass
		836.5	0.20	2.01	19.77	2.15	15.81	38.107	Horizontal	Pass
		844	0.30	2.02	19.78	2.15	15.91	38.994	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	0.35	2.01	19.68	2.15	15.87	38.637	Vertical	Pass
		836.5	0.33	2.01	19.77	2.15	15.94	39.264	Vertical	Pass
		848.3	0.31	2.02	19.82	2.15	15.96	39.446	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	0.34	2.01	19.70	2.15	15.88	38.726	Vertical	Pass
		836.5	0.31	2.01	19.77	2.15	15.92	39.084	Vertical	Pass
		847.5	0.19	2.02	19.81	2.15	15.83	38.282	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	0.33	2.01	19.71	2.15	15.88	38.726	Vertical	Pass
		836.5	0.19	2.01	19.77	2.15	15.80	38.019	Vertical	Pass
		846.5	0.26	2.02	19.79	2.15	15.88	38.726	Vertical	Pass
10.0MH z Band 16 QAM	1/#Mid	829	0.41	2.01	19.73	2.15	15.98	39.628	Vertical	Pass
		836.5	0.36	2.01	19.77	2.15	15.97	39.537	Vertical	Pass
		844	0.39	2.02	19.78	2.15	16.00	39.811	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)

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-5.66	4.54	27.75	17.55	56.885	Horizontal	Pass
		2535	-5.57	4.69	27.72	17.46	55.719	Horizontal	Pass
		2567.5	-5.47	4.71	27.71	17.53	56.624	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-5.73	4.55	27.76	17.48	55.976	Horizontal	Pass
		2535	-5.60	4.69	27.72	17.43	55.335	Horizontal	Pass
		2565	-5.52	4.72	27.70	17.46	55.719	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-5.73	4.55	27.77	17.49	56.105	Horizontal	Pass
		2535	-5.55	4.69	27.72	17.48	55.976	Horizontal	Pass
		2562.5	-5.52	4.72	27.69	17.45	55.590	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-5.64	4.57	27.78	17.57	57.148	Horizontal	Pass
		2535	-5.52	4.73	27.72	17.47	55.847	Horizontal	Pass
		2560	-5.42	4.75	27.68	17.51	56.364	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-5.69	4.54	27.75	17.52	56.494	Vertical	Pass
		2535	-5.54	4.69	27.72	17.49	56.105	Vertical	Pass
		2567.5	-5.56	4.71	27.71	17.44	55.463	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-5.71	4.55	27.76	17.50	56.234	Vertical	Pass
		2535	-5.47	4.69	27.72	17.56	57.016	Vertical	Pass
		2565	-5.46	4.72	27.70	17.52	56.494	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-5.67	4.55	27.77	17.55	56.885	Vertical	Pass
		2535	-5.61	4.69	27.72	17.42	55.208	Vertical	Pass
		2562.5	-5.46	4.72	27.69	17.51	56.364	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-5.59	4.57	27.78	17.62	57.810	Vertical	Pass
		2535	-5.39	4.73	27.72	17.60	57.544	Vertical	Pass
		2560	-5.31	4.75	27.68	17.62	57.810	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-6.40	4.54	27.75	16.81	47.973	Horizontal	Pass
		2535	-6.23	4.69	27.72	16.80	47.863	Horizontal	Pass
		2567.5	-6.18	4.71	27.71	16.82	48.084	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-6.33	4.55	27.76	16.88	48.753	Horizontal	Pass
		2535	-6.17	4.69	27.72	16.86	48.529	Horizontal	Pass
		2565	-6.17	4.72	27.70	16.81	47.973	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-6.47	4.55	27.77	16.75	47.315	Horizontal	Pass
		2535	-6.32	4.69	27.72	16.71	46.881	Horizontal	Pass
		2562.5	-6.13	4.72	27.69	16.84	48.306	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-6.42	4.57	27.78	16.79	47.753	Horizontal	Pass
		2535	-6.14	4.73	27.72	16.85	48.417	Horizontal	Pass
		2560	-6.20	4.75	27.68	16.73	47.098	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-6.35	4.54	27.75	16.86	48.529	Vertical	Pass
		2535	-6.24	4.69	27.72	16.79	47.753	Vertical	Pass
		2567.5	-6.14	4.71	27.71	16.86	48.529	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-6.35	4.55	27.76	16.86	48.529	Vertical	Pass
		2535	-6.18	4.69	27.72	16.85	48.417	Vertical	Pass
		2565	-6.25	4.72	27.70	16.73	47.098	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-6.52	4.55	27.77	16.70	46.774	Vertical	Pass
		2535	-6.32	4.69	27.72	16.71	46.881	Vertical	Pass
		2562.5	-6.13	4.72	27.69	16.84	48.306	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-6.28	4.57	27.78	16.93	49.317	Vertical	Pass
		2535	-6.08	4.73	27.72	16.91	49.091	Vertical	Pass
		2560	-6.02	4.75	27.68	16.91	49.091	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusi on
			SG	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			Level							
			(dBm)			(dB)	Average	Average		
						(dBm)	(mW)			
1.4MH z Band QPSK	1/#Mid	699.7	0.26	1.91	19.21	2.15	15.41	34.754	Vertical	Pass
		707.5	0.23	1.91	19.26	2.15	15.43	34.914	Vertical	Pass
		715.3	0.19	1.93	19.34	2.15	15.45	35.075	Vertical	Pass
3.0MH z Band QPSK	1/#Mid	700.5	0.34	1.91	19.21	2.15	15.49	35.400	Vertical	Pass
		707.5	0.32	1.91	19.26	2.15	15.52	35.645	Vertical	Pass
		714.5	0.30	1.93	19.34	2.15	15.56	35.975	Vertical	Pass
5.0MH z Band QPSK	1/#Mid	701.5	0.28	1.91	19.23	2.15	15.45	35.075	Vertical	Pass
		707.5	0.36	1.91	19.26	2.15	15.56	35.975	Vertical	Pass
		713.5	0.25	1.92	19.33	2.15	15.51	35.563	Vertical	Pass
10.0Hz Band QPSK	1/#Mid	704	0.19	1.91	19.25	2.15	15.38	34.514	Vertical	Pass
		707.5	0.35	1.91	19.26	2.15	15.55	35.892	Vertical	Pass
		711	0.25	1.92	19.32	2.15	15.50	35.481	Vertical	Pass
1.4MH z Band QPSK	1/#Mid	699.7	0.27	1.91	19.21	2.15	15.42	34.834	Horizontal	Pass
		707.5	0.30	1.91	19.26	2.15	15.50	35.481	Horizontal	Pass
		715.3	0.28	1.93	19.34	2.15	15.54	35.810	Horizontal	Pass
3.0MH z Band QPSK	1/#Mid	700.5	0.38	1.91	19.21	2.15	15.53	35.727	Horizontal	Pass
		707.5	0.23	1.91	19.26	2.15	15.43	34.914	Horizontal	Pass
		714.5	0.27	1.93	19.34	2.15	15.53	35.727	Horizontal	Pass
5.0MH z Band QPSK	1/#Mid	701.5	0.36	1.91	19.23	2.15	15.53	35.727	Horizontal	Pass
		707.5	0.28	1.91	19.26	2.15	15.48	35.318	Horizontal	Pass
		713.5	0.14	1.92	19.33	2.15	15.40	34.674	Horizontal	Pass
10.0Hz Band QPSK	1/#Mid	704	0.39	1.91	19.25	2.15	15.58	36.141	Horizontal	Pass
		707.5	0.38	1.91	19.26	2.15	15.58	36.141	Horizontal	Pass
		711	0.34	1.92	19.32	2.15	15.59	36.224	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz	1/#Mid	699.7	-0.96	1.91	19.21	2.15	14.19	26.242	Vertical	Pass
Band 16		707.5	-1.03	1.91	19.26	2.15	14.17	26.122	Vertical	Pass
QAM		715.3	-1.12	1.93	19.34	2.15	14.14	25.942	Vertical	Pass
3.0MHz	1/#Mid	700.5	-0.92	1.91	19.21	2.15	14.23	26.485	Vertical	Pass
Band 16		707.5	-1.06	1.91	19.26	2.15	14.14	25.942	Vertical	Pass
QAM		714.5	-1.07	1.93	19.34	2.15	14.19	26.242	Vertical	Pass
5.0MHz	1/#Mid	701.5	-0.96	1.91	19.23	2.15	14.21	26.363	Vertical	Pass
Band 16		707.5	-1.00	1.91	19.26	2.15	14.20	26.303	Vertical	Pass
QAM		713.5	-1.03	1.92	19.33	2.15	14.23	26.485	Vertical	Pass
10.0MHz	1/#Mid	704	-1.08	1.91	19.25	2.15	14.11	25.763	Vertical	Pass
Band 16		707.5	-1.13	1.91	19.26	2.15	14.07	25.527	Vertical	Pass
QAM		711	-1.09	1.92	19.32	2.15	14.16	26.062	Vertical	Pass
1.4MHz	1/#Mid	699.7	-1.01	1.91	19.21	2.15	14.14	25.942	Horizontal	Pass
Band 16		707.5	-1.05	1.91	19.26	2.15	14.15	26.002	Horizontal	Pass
QAM		715.3	-1.11	1.93	19.34	2.15	14.15	26.002	Horizontal	Pass
3.0MHz	1/#Mid	700.5	-0.98	1.91	19.21	2.15	14.17	26.122	Horizontal	Pass
Band 16		707.5	-1.05	1.91	19.26	2.15	14.15	26.002	Horizontal	Pass
QAM		714.5	-1.01	1.93	19.34	2.15	14.25	26.607	Horizontal	Pass
5.0MHz	1/#Mid	701.5	-0.92	1.91	19.23	2.15	14.25	26.607	Horizontal	Pass
Band 16		707.5	-1.10	1.91	19.26	2.15	14.10	25.704	Horizontal	Pass
QAM		713.5	-1.10	1.92	19.33	2.15	14.16	26.062	Horizontal	Pass
10.0MHz	1/#Mid	704	-0.92	1.91	19.25	2.15	14.27	26.730	Horizontal	Pass
Band 16		707.5	-0.89	1.91	19.26	2.15	14.31	26.977	Horizontal	Pass
QAM		711	-0.98	1.92	19.32	2.15	14.27	26.730	Horizontal	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)

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor	Correction	Max. ERP	Max. ERP	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	706.5	-0.16	1.91	19.23	2.15	15.01	31.696	Vertical	Pass
		710	-0.05	1.91	19.26	2.15	15.15	32.734	Vertical	Pass
		713.5	-0.22	1.92	19.33	2.15	15.04	31.915	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	-0.08	1.91	19.25	2.15	15.11	32.434	Vertical	Pass
		710	-0.08	1.91	19.26	2.15	15.12	32.509	Vertical	Pass
		711	-0.24	1.92	19.32	2.15	15.01	31.696	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	-0.11	1.91	19.23	2.15	15.06	32.063	Horizontal	Pass
		710	-0.04	1.91	19.26	2.15	15.16	32.810	Horizontal	Pass
		713.5	-0.21	1.92	19.33	2.15	15.05	31.989	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	-0.01	1.91	19.25	2.15	15.18	32.961	Horizontal	Pass
		710	-0.04	1.91	19.26	2.15	15.16	32.810	Horizontal	Pass
		711	-0.06	1.92	19.32	2.15	15.19	33.037	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor	Correction	Max. ERP	Max. ERP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	706.5	-0.49	1.91	19.23	2.15	14.68	29.376	Vertical	Pass
		710	-0.56	1.91	19.26	2.15	14.64	29.107	Vertical	Pass
		713.5	-0.55	1.92	19.33	2.15	14.71	29.580	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	-0.52	1.91	19.25	2.15	14.67	29.309	Vertical	Pass
		710	-0.60	1.91	19.26	2.15	14.60	28.840	Vertical	Pass
		711	-0.52	1.92	19.32	2.15	14.73	29.717	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	-0.56	1.91	19.23	2.15	14.61	28.907	Horizontal	Pass
		710	-0.47	1.91	19.26	2.15	14.73	29.717	Horizontal	Pass
		713.5	-0.57	1.92	19.33	2.15	14.69	29.444	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	-0.41	1.91	19.25	2.15	14.78	30.061	Horizontal	Pass
		710	-0.42	1.91	19.26	2.15	14.78	30.061	Horizontal	Pass
		711	-0.49	1.92	19.32	2.15	14.76	29.923	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.8 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-8.07	3.76	28.24	16.41	43.752	Horizontal	Pass
		1745	-7.94	3.91	28.22	16.37	43.351	Horizontal	Pass
		1779.3	-7.86	3.93	28.2	16.41	43.752	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-8.11	3.77	28.23	16.35	43.152	Horizontal	Pass
		1745	-7.84	3.91	28.24	16.49	44.566	Horizontal	Pass
		1778.5	-7.92	3.94	28.25	16.39	43.551	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-8.06	3.77	28.31	16.48	44.463	Horizontal	Pass
		1745	-7.94	3.91	28.22	16.37	43.351	Horizontal	Pass
		1777.5	-7.94	3.94	28.2	16.32	42.855	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-8.11	3.79	28.33	16.43	43.954	Horizontal	Pass
		1745	-7.80	3.95	28.22	16.47	44.361	Horizontal	Pass
		1775	-7.78	3.97	28.19	16.44	44.055	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-8.12	3.79	28.34	16.43	43.954	Horizontal	Pass
		1745	-7.89	3.95	28.22	16.38	43.451	Horizontal	Pass
		1772.5	-7.86	3.97	28.18	16.35	43.152	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-8.07	3.81	28.35	16.47	44.361	Horizontal	Pass
		1745	-7.83	3.96	28.22	16.43	43.954	Horizontal	Pass
		1770	-7.81	4	28.16	16.35	43.152	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-8.06	3.76	28.24	16.42	43.853	Vertical	Pass
		1745	-7.93	3.91	28.22	16.38	43.451	Vertical	Pass
		1779.3	-7.84	3.93	28.2	16.43	43.954	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-8.05	3.77	28.23	16.41	43.752	Vertical	Pass
		1745	-7.99	3.91	28.24	16.34	43.053	Vertical	Pass
		1778.5	-7.94	3.94	28.25	16.37	43.351	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-8.10	3.77	28.31	16.44	44.055	Vertical	Pass
		1745	-8.00	3.91	28.22	16.31	42.756	Vertical	Pass
		1777.5	-7.91	3.94	28.2	16.35	43.152	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-8.06	3.79	28.34	16.49	44.566	Vertical	Pass
		1745	-7.86	3.95	28.22	16.41	43.752	Vertical	Pass

QPSK		1775	-7.81	3.97	28.18	16.40	43.652	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-8.07	3.81	28.35	16.47	44.361	Vertical	Pass
Band		1745	-7.82	3.96	28.22	16.44	44.055	Vertical	Pass
QPSK		1772.5	-7.77	4	28.16	16.39	43.551	Vertical	Pass
20.0MHz	1/#Mid	1720	-8.03	3.79	28.34	16.52	44.875	Vertical	Pass
Band		1745	-7.75	3.95	28.22	16.52	44.875	Vertical	Pass
QPSK		1770	-7.67	3.97	28.18	16.54	45.082	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz	1/#Mid	1710.7	-8.11	3.76	28.24	16.37	43.351	Horizontal	Pass
Band 16		1745	-7.84	3.91	28.22	16.47	44.361	Horizontal	Pass
QAM		1779.3	-7.88	3.93	28.2	16.39	43.551	Horizontal	Pass
3.0MHz	1/#Mid	1711.5	-8.12	3.77	28.23	16.34	43.053	Horizontal	Pass
Band 16		1745	-7.88	3.91	28.24	16.45	44.157	Horizontal	Pass
QAM		1778.5	-7.96	3.94	28.25	16.35	43.152	Horizontal	Pass
5.0MHz	1/#Mid	1712.5	-8.05	3.77	28.31	16.49	44.566	Horizontal	Pass
Band 16		1745	-7.92	3.91	28.22	16.39	43.551	Horizontal	Pass
QAM		1777.5	-7.83	3.94	28.2	16.43	43.954	Horizontal	Pass
10.0MHz	1/#Mid	1715	-8.14	3.79	28.33	16.40	43.652	Horizontal	Pass
Band 16		1745	-7.87	3.95	28.22	16.40	43.652	Horizontal	Pass
QAM		1775	-7.75	3.97	28.19	16.47	44.361	Horizontal	Pass
15.0MHz	1/#Mid	1717.5	-8.20	3.79	28.34	16.35	43.152	Horizontal	Pass
Band 16		1745	-7.90	3.95	28.22	16.37	43.351	Horizontal	Pass
QAM		1772.5	-7.79	3.97	28.18	16.42	43.853	Horizontal	Pass
20.0MHz	1/#Mid	1720	-8.19	3.81	28.35	16.35	43.152	Horizontal	Pass
Band 16		1745	-7.91	3.96	28.22	16.35	43.152	Horizontal	Pass
QAM		1770	-7.82	4	28.16	16.34	43.053	Horizontal	Pass
1.4MHz	1/#Mid	1710.7	-8.10	3.76	28.24	16.38	43.451	Vertical	Pass
Band 16		1745	-7.94	3.91	28.22	16.37	43.351	Vertical	Pass
QAM		1779.3	-7.82	3.93	28.2	16.45	44.157	Vertical	Pass
3.0MHz	1/#Mid	1711.5	-8.03	3.77	28.23	16.43	43.954	Vertical	Pass
Band 16		1745	-7.98	3.91	28.24	16.35	43.152	Vertical	Pass
QAM		1778.5	-7.85	3.94	28.25	16.46	44.259	Vertical	Pass

5.0MHz	1/#Mid	1712.5	-8.07	3.77	28.31	16.47	44.361	Vertical	Pass
Band 16		1745	-7.99	3.91	28.22	16.32	42.855	Vertical	Pass
QAM		1777.5	-7.85	3.94	28.2	16.41	43.752	Vertical	Pass
10.0MHz	1/#Mid	1715	-8.18	3.79	28.34	16.37	43.351	Vertical	Pass
Band 16		1745	-7.92	3.95	28.22	16.35	43.152	Vertical	Pass
QAM		1775	-7.78	3.97	28.18	16.43	43.954	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-8.15	3.81	28.35	16.39	43.551	Vertical	Pass
Band 16		1745	-7.86	3.96	28.22	16.40	43.652	Vertical	Pass
QAM		1772.5	-7.70	4	28.16	16.46	44.259	Vertical	Pass
20.0MHz	1/#Mid	1720	-8.05	3.79	28.34	16.50	44.668	Vertical	Pass
Band 16		1745	-7.77	3.95	28.22	16.50	44.668	Vertical	Pass
QAM		1770	-7.72	3.97	28.18	16.49	44.566	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 2/4/5/7/12/17/66

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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-44.06	4.04	33.51	-14.59	-13	-1.59	Horizontal
3701.4	-48.66	4.04	33.51	-19.19	-13	-6.19	Vertical
5552.1	-44.01	5.24	35.84	-13.41	-13	-0.41	Vertical
5552.1	-50.52	5.24	35.84	-19.92	-13	-6.92	Horizontal
180.1	-36.79	1.43	16.02	-22.20	-13	-9.20	Vertical
422.8	-34.76	1.30	17.99	-18.07	-13	-5.07	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-45.46	4.04	33.56	-15.94	-13	-2.94	Horizontal
3760.0	-47.75	4.04	33.56	-18.23	-13	-5.23	Vertical
5640.0	-47.58	5.24	35.91	-16.91	-13	-3.91	Vertical
5640.0	-49.30	5.24	35.91	-18.63	-13	-5.63	Horizontal
190.9	-44.37	1.62	16.97	-29.02	-13	-16.02	Vertical
385.2	-38.99	1.74	15.98	-24.76	-13	-11.76	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-48.54	4.04	34.00	-18.58	-13	-5.58	Horizontal
3818.6	-47.33	4.04	34.00	-17.37	-13	-4.37	Vertical
5727.9	-49.43	5.24	36.04	-18.63	-13	-5.63	Vertical
5727.9	-49.58	5.24	36.04	-18.78	-13	-5.78	Horizontal
209.2	-39.18	1.42	17.29	-23.31	-13	-10.31	Vertical
334.8	-42.63	1.50	17.90	-26.22	-13	-13.22	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-48.25	4.07	33.54	-18.78	-13	-5.78	Horizontal
3720.0	-53.23	4.07	33.54	-23.76	-13	-10.76	Vertical
5580.0	-49.94	5.28	35.86	-19.36	-13	-6.36	Vertical
5580.0	-50.19	5.28	35.86	-19.61	-13	-6.61	Horizontal
183.9	-42.90	1.58	16.89	-27.58	-13	-14.58	Vertical
420.8	-38.35	1.76	17.26	-22.85	-13	-9.85	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.96	4.04	33.56	-22.44	-13	-9.44	Horizontal
3760.0	-52.15	4.04	33.56	-22.63	-13	-9.63	Vertical
5640.0	-49.36	5.24	35.91	-18.69	-13	-5.69	Vertical
5640.0	-49.03	5.24	35.91	-18.36	-13	-5.36	Horizontal
188.3	-44.30	1.46	16.27	-29.49	-13	-16.49	Vertical
310.6	-38.56	1.59	15.15	-25.00	-13	-12.00	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-51.20	4.04	34.00	-21.24	-13	-8.24	Horizontal
3800.0	-50.93	4.04	34.00	-20.97	-13	-7.97	Vertical
5700.0	-50.97	5.24	36.04	-20.17	-13	-7.17	Vertical
5700.0	-52.42	5.24	36.04	-21.62	-13	-8.62	Horizontal
185.4	-37.00	1.36	17.39	-20.96	-13	-7.96	Vertical
377.5	-39.34	1.66	15.39	-25.61	-13	-12.61	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.11	4.02	29.80	-21.33	-13	-8.33	Horizontal
3421.4	-49.44	4.02	29.80	-23.66	-13	-10.66	Vertical
5132.1	-53.97	5.24	35.84	-23.37	-13	-10.37	Vertical
5132.1	-50.93	5.24	35.84	-20.33	-13	-7.33	Horizontal
211.1	-43.06	1.68	16.04	-28.70	-13	-15.70	Vertical
299.7	-38.31	1.78	17.74	-22.35	-13	-9.35	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.60	4.03	30.00	-22.63	-13	-9.63	Horizontal
3465.0	-45.59	4.03	30.00	-19.62	-13	-6.62	Vertical
5197.5	-44.59	5.25	35.86	-13.98	-13	-0.98	Vertical
5197.5	-53.86	5.25	35.86	-23.25	-13	-10.25	Horizontal
195.6	-44.16	1.72	17.69	-28.19	-13	-15.19	Vertical
402.5	-43.16	1.62	16.02	-28.75	-13	-15.75	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-47.60	4.05	30.01	-21.64	-13	-8.64	Horizontal
3508.6	-45.50	4.05	30.01	-19.54	-13	-6.54	Vertical
5262.9	-47.98	5.26	35.86	-17.38	-13	-4.38	Vertical
5262.9	-51.76	5.26	35.86	-21.16	-13	-8.16	Horizontal
200.9	-34.92	1.80	16.69	-20.03	-13	-7.03	Vertical
255.7	-41.03	1.75	16.66	-26.13	-13	-13.13	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-47.71	4.02	29.80	-21.93	-13	-8.93	Horizontal
3440.0	-51.13	4.02	29.80	-25.35	-13	-12.35	Vertical
5160.0	-47.11	5.24	35.84	-16.51	-13	-3.51	Vertical
5160.0	-49.75	5.24	35.84	-19.15	-13	-6.15	Horizontal
200.1	-42.02	1.57	17.26	-26.33	-13	-13.33	Vertical
376.3	-37.85	1.78	16.35	-23.28	-13	-10.28	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.12	4.03	30.00	-23.15	-13	-10.15	Horizontal
3465.0	-46.73	4.03	30.00	-20.76	-13	-7.76	Vertical
5197.5	-46.97	5.25	35.86	-16.36	-13	-3.36	Vertical
5197.5	-51.21	5.25	35.86	-20.60	-13	-7.60	Horizontal
203.7	-41.56	1.44	17.95	-25.05	-13	-12.05	Vertical
372.3	-35.03	1.65	16.09	-20.59	-13	-7.59	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.07	4.05	27.68	-29.44	-13	-16.44	Horizontal
3490.0	-48.86	4.05	27.68	-25.23	-13	-12.23	Vertical
5235.0	-52.22	5.26	35.86	-21.62	-13	-8.62	Vertical
5235.0	-53.81	5.26	35.86	-23.21	-13	-10.21	Horizontal
208.9	-43.09	1.61	16.85	-27.85	-13	-14.85	Vertical
267.0	-44.01	1.61	15.19	-30.43	-13	-17.43	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-47.78	2.78	27.50	-23.06	-13	-10.06	Horizontal
1649.4	-46.50	2.78	27.50	-21.78	-13	-8.78	Vertical
2474.1	-48.64	2.90	27.80	-23.74	-13	-10.74	Vertical
2474.1	-50.43	2.90	27.80	-25.53	-13	-12.53	Horizontal
187.6	-36.36	1.76	17.59	-20.53	-13	-7.53	Vertical
285.7	-39.87	1.63	15.87	-25.63	-13	-12.63	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-46.49	2.80	27.48	-21.81	-13	-8.81	Horizontal
1673.0	-48.53	2.80	27.48	-23.85	-13	-10.85	Vertical
2509.5	-52.35	2.91	27.70	-27.56	-13	-14.56	Vertical
2509.5	-49.12	2.91	27.70	-24.33	-13	-11.33	Horizontal
187.8	-35.52	1.61	15.68	-21.45	-13	-8.45	Vertical
351.1	-44.22	1.59	17.52	-28.30	-13	-15.30	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-44.15	2.82	27.43	-19.54	-13	-6.54	Horizontal
1696.6	-48.63	2.82	27.43	-24.02	-13	-11.02	Vertical
2544.9	-45.29	2.92	27.74	-20.47	-13	-7.47	Vertical
2544.9	-51.81	2.92	27.74	-26.99	-13	-13.99	Horizontal
211.9	-34.22	1.69	16.67	-19.23	-13	-6.23	Vertical
432.1	-35.23	1.70	17.18	-19.75	-13	-6.75	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-51.72	2.78	27.50	-27.00	-13	-14.00	Horizontal
1658.0	-52.66	2.78	27.50	-27.94	-13	-14.94	Vertical
2487.0	-53.62	2.90	27.80	-28.72	-13	-15.72	Vertical
2487.0	-49.28	2.90	27.80	-24.38	-13	-11.38	Horizontal
178.7	-37.13	1.71	15.57	-23.27	-13	-10.27	Vertical
287.0	-34.60	1.34	16.40	-19.54	-13	-6.54	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.48	2.80	27.48	-24.80	-13	-11.80	Horizontal
1673.0	-52.56	2.80	27.48	-27.88	-13	-14.88	Vertical
2509.5	-49.34	2.91	27.70	-24.55	-13	-11.55	Vertical
2509.5	-53.28	2.91	27.70	-28.49	-13	-15.49	Horizontal
186.5	-41.14	1.44	17.04	-25.54	-13	-12.54	Vertical
402.3	-37.34	1.76	17.62	-21.48	-13	-8.48	Horizontal
Test Results for High Channel 844MHz							
1688.0	-45.56	2.82	27.43	-20.95	-13	-7.95	Horizontal
1688.0	-52.82	2.82	27.43	-28.21	-13	-15.21	Vertical
2532.0	-50.97	2.92	27.74	-26.15	-13	-13.15	Vertical
2532.0	-50.58	2.92	27.74	-25.76	-13	-12.76	Horizontal
203.5	-40.57	1.74	17.70	-24.61	-13	-11.61	Vertical
360.5	-40.33	1.41	17.46	-24.27	-13	-11.27	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.

9.4 LTE BAND 7

QPSK EIRP POWER FOR LTE BAND 7 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-59.08	5.23	35.81	-28.50	-25	-3.50	Horizontal
5005.0	-63.32	5.23	35.81	-32.74	-25	-7.74	Vertical
7507.5	-60.42	5.67	36.85	-29.24	-25	-4.24	Vertical
7507.5	-61.83	5.67	36.85	-30.65	-25	-5.65	Horizontal
185.5	-50.41	1.73	17.97	-34.17	-25	-9.17	Vertical
297.6	-53.87	1.38	15.11	-40.14	-25	-15.14	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.93	5.23	35.82	-34.34	-25	-9.34	Horizontal
5070.0	-64.79	5.23	35.82	-34.20	-25	-9.20	Vertical
7605.0	-63.59	5.67	36.85	-32.41	-25	-7.41	Vertical
7605.0	-59.95	5.67	36.85	-28.77	-25	-3.77	Horizontal
198.0	-46.20	1.77	16.17	-31.79	-25	-6.79	Vertical
447.8	-50.57	1.63	15.21	-36.99	-25	-11.99	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-61.06	5.24	35.83	-30.47	-25	-5.47	Horizontal
5135.0	-64.83	5.24	35.83	-34.24	-25	-9.24	Vertical
7702.5	-61.42	5.68	36.87	-30.23	-25	-5.23	Vertical
7702.5	-61.90	5.68	36.87	-30.71	-25	-5.71	Horizontal
205.7	-51.82	1.58	17.56	-35.84	-25	-10.84	Vertical
403.9	-48.65	1.45	16.58	-33.52	-25	-8.52	Horizontal

QPSK EIRP POWER FOR LTE BAND 7 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-59.29	5.23	35.82	-28.70	-25	-3.70	Horizontal
5020.0	-63.31	5.23	35.82	-32.72	-25	-7.72	Vertical
7530.0	-61.66	5.67	36.86	-30.47	-25	-5.47	Vertical
7530.0	-59.75	5.67	36.86	-28.56	-25	-3.56	Horizontal
194.7	-52.13	1.63	15.76	-38.00	-25	-13.00	Vertical
351.6	-46.15	1.71	15.44	-32.42	-25	-7.42	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.51	5.23	35.82	-31.92	-25	-6.92	Horizontal
5070.0	-63.94	5.23	35.82	-33.35	-25	-8.35	Vertical
7605.0	-59.22	5.67	36.85	-28.04	-25	-3.04	Vertical
7605.0	-64.13	5.67	36.85	-32.95	-25	-7.95	Horizontal
179.5	-46.71	1.79	16.84	-31.65	-25	-6.65	Vertical
314.5	-54.39	1.71	17.64	-38.46	-25	-13.46	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-61.84	5.24	35.83	-31.25	-25	-6.25	Horizontal
5120.0	-64.54	5.24	35.83	-33.95	-25	-8.95	Vertical
7680.0	-60.40	5.70	36.88	-29.22	-25	-4.22	Vertical
7680.0	-61.41	5.70	36.88	-30.23	-25	-5.23	Horizontal
197.2	-48.46	1.79	16.84	-33.40	-25	-8.40	Vertical
381.6	-44.14	1.71	17.64	-28.21	-25	-3.21	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

. 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-45.35	2.60	27.20	-20.75	-13	-7.75	Horizontal
1399.4	-53.58	2.60	27.20	-28.98	-13	-15.98	Vertical
2099.1	-52.93	2.85	27.54	-28.24	-13	-15.24	Vertical
2099.1	-51.80	2.85	27.54	-27.11	-13	-14.11	Horizontal
209.2	-42.52	1.49	17.78	-26.23	-13	-13.23	Vertical
430.5	-40.75	1.36	17.33	-24.78	-13	-11.78	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-49.46	2.61	27.28	-24.79	-13	-11.79	Horizontal
1415.0	-49.70	2.61	27.28	-25.03	-13	-12.03	Vertical
2122.5	-50.04	2.87	27.59	-25.32	-13	-12.32	Vertical
2122.5	-53.61	2.87	27.59	-28.89	-13	-15.89	Horizontal
175.3	-34.77	1.73	15.74	-20.76	-13	-7.76	Vertical
366.9	-43.03	1.62	15.79	-28.86	-13	-15.86	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-53.47	2.63	27.28	-28.82	-13	-15.82	Horizontal
1430.6	-51.80	2.63	27.28	-27.15	-13	-14.15	Vertical
2145.9	-49.72	2.88	27.60	-25.00	-13	-12.00	Vertical
2145.9	-50.46	2.88	27.60	-25.74	-13	-12.74	Horizontal
177.0	-36.94	1.61	18.00	-20.55	-13	-7.55	Vertical
421.5	-40.07	1.45	15.49	-26.04	-13	-13.04	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-52.69	2.61	27.26	-28.04	-13	-15.04	Horizontal
1408.0	-47.89	2.61	27.26	-23.24	-13	-10.24	Vertical
2112.0	-52.49	2.87	27.58	-27.78	-13	-14.78	Vertical
2112.0	-53.91	2.87	27.58	-29.20	-13	-16.20	Horizontal
181.4	-39.90	1.31	16.97	-24.24	-13	-11.24	Vertical
422.6	-40.95	1.65	16.70	-25.90	-13	-12.90	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-53.27	2.61	27.28	-28.60	-13	-15.60	Horizontal
1415.0	-50.98	2.61	27.28	-26.31	-13	-13.31	Vertical
2122.5	-50.66	2.87	27.59	-25.94	-13	-12.94	Vertical
2122.5	-49.11	2.87	27.59	-24.39	-13	-11.39	Horizontal
208.6	-42.86	1.72	17.99	-26.59	-13	-13.59	Vertical
247.9	-37.55	1.73	17.94	-21.34	-13	-8.34	Horizontal
Test Results for High Channel 711MHz							
1422.0	-46.12	2.62	27.28	-21.46	-13	-8.46	Horizontal
1422.0	-44.01	2.62	27.28	-19.35	-13	-6.35	Vertical
2133.0	-45.35	2.87	27.60	-20.62	-13	-7.62	Vertical
2133.0	-52.83	2.87	27.60	-28.10	-13	-15.10	Horizontal
189.7	-35.19	1.58	15.93	-20.84	-13	-7.84	Vertical
360.7	-39.87	1.36	15.59	-25.64	-13	-12.64	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 17

QPSK EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-50.76	2.61	27.28	-26.09	-13	-13.09	Horizontal
1413.0	-48.16	2.61	27.28	-23.49	-13	-10.49	Vertical
2119.5	-51.79	2.87	27.59	-27.07	-13	-14.07	Vertical
2119.5	-51.73	2.87	27.59	-27.01	-13	-14.01	Horizontal
209.7	-42.59	1.71	16.15	-28.15	-13	-15.15	Vertical
280.7	-43.82	1.41	17.32	-27.91	-13	-14.91	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-53.22	2.62	27.30	-28.54	-13	-15.54	Horizontal
1420.0	-44.84	2.62	27.30	-20.16	-13	-7.16	Vertical
2130.0	-52.89	2.87	27.62	-28.14	-13	-15.14	Vertical
2130.0	-52.52	2.87	27.62	-27.77	-13	-14.77	Horizontal
194.4	-35.94	1.42	15.25	-22.12	-13	-9.12	Vertical
394.4	-37.93	1.36	17.19	-22.10	-13	-9.10	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-48.45	2.66	27.28	-23.83	-13	-10.83	Horizontal
1427.0	-53.74	2.66	27.28	-29.12	-13	-16.12	Vertical
2140.5	-49.58	2.88	27.60	-24.86	-13	-11.86	Vertical
2140.5	-50.13	2.88	27.60	-25.41	-13	-12.41	Horizontal
189.4	-34.32	1.32	17.29	-18.35	-13	-5.35	Vertical
376.1	-43.20	1.72	16.89	-28.03	-13	-15.03	Horizontal

QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-53.58	2.62	27.30	-28.90	-13	-15.90	Horizontal
1418.0	-52.38	2.62	27.30	-27.70	-13	-14.70	Vertical
2127.0	-48.23	2.87	27.62	-23.48	-13	-10.48	Vertical
2127.0	-51.44	2.87	27.62	-26.69	-13	-13.69	Horizontal
209.0	-35.75	1.35	16.91	-20.19	-13	-7.19	Vertical
282.9	-44.50	1.62	16.31	-29.81	-13	-16.81	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-51.78	2.62	27.30	-27.10	-13	-14.10	Horizontal
1420.0	-50.35	2.62	27.30	-25.67	-13	-12.67	Vertical
2130.0	-45.23	2.87	27.62	-20.48	-13	-7.48	Vertical
2130.0	-53.36	2.87	27.62	-28.61	-13	-15.61	Horizontal
199.3	-42.05	1.51	17.14	-26.42	-13	-13.42	Vertical
452.3	-40.54	1.77	16.88	-25.43	-13	-12.43	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.12	2.62	27.30	-25.44	-13	-12.44	Horizontal
1422.0	-49.28	2.62	27.30	-24.60	-13	-11.60	Vertical
2133.0	-44.06	2.87	27.62	-19.31	-13	-6.31	Vertical
2133.0	-49.74	2.87	27.62	-24.99	-13	-11.99	Horizontal
182.5	-39.27	1.78	15.95	-25.10	-13	-12.10	Vertical
404.0	-41.19	1.34	17.95	-24.59	-13	-11.59	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

9.7 LTE BAND 66

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

Test Results for Low Channel 1710.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-61.88	3.84	35.81	-29.91	-13	-16.91	Horizontal
3421.4	-61.60	3.84	35.81	-29.63	-13	-16.63	Vertical
5132.1	-62.78	5.18	36.85	-31.11	-13	-18.11	Vertical
5132.1	-62.93	5.18	36.85	-31.26	-13	-18.26	Horizontal
186.2	-53.71	1.56	17.97	-37.30	-13	-24.30	Vertical
424.8	-53.58	1.33	15.11	-39.80	-13	-26.80	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-64.83	3.85	35.82	-32.86	-13	-19.86	Horizontal
3490.0	-63.69	3.85	35.82	-31.72	-13	-18.72	Vertical
5235.0	-64.73	5.21	36.85	-33.09	-13	-20.09	Vertical
5235.0	-63.84	5.21	36.85	-32.20	-13	-19.20	Horizontal
185.1	-53.74	1.77	16.17	-39.33	-13	-26.33	Vertical
366.5	-54.76	1.63	15.21	-41.18	-13	-28.18	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-62.92	3.86	35.83	-30.95	-13	-17.95	Horizontal
3558.6	-63.72	3.86	35.83	-31.75	-13	-18.75	Vertical
5337.9	-60.09	5.24	36.87	-28.46	-13	-15.46	Vertical
5337.9	-64.21	5.24	36.87	-32.58	-13	-19.58	Horizontal
195.4	-54.83	1.58	17.56	-38.85	-13	-25.85	Vertical
245.8	-47.89	1.45	16.58	-32.76	-13	-19.76	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-59.74	3.84	35.82	-27.76	-13	-14.76	Horizontal
3440.0	-59.62	3.84	35.82	-27.64	-13	-14.64	Vertical
5160.0	-62.01	5.18	36.86	-30.33	-13	-17.33	Vertical
5160.0	-59.27	5.18	36.86	-27.59	-13	-14.59	Horizontal
189.0	-45.23	1.56	15.76	-31.03	-13	-18.03	Vertical
359.7	-48.23	1.33	15.44	-34.12	-13	-21.12	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-61.35	3.85	35.82	-29.38	-13	-16.38	Horizontal
3490.0	-61.35	3.85	35.82	-29.38	-13	-16.38	Vertical
5235.0	-59.85	5.21	36.85	-28.21	-13	-15.21	Vertical
5235.0	-62.12	5.21	36.85	-30.48	-13	-17.48	Horizontal
186.4	-53.81	1.77	16.84	-38.73	-13	-25.73	Vertical
248.9	-53.48	1.63	17.64	-37.47	-13	-24.47	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-60.69	3.86	35.83	-28.72	-13	-15.72	Horizontal
3540.0	-59.54	3.86	35.83	-27.57	-13	-14.57	Vertical
5310.0	-62.33	5.24	36.88	-30.69	-13	-17.69	Vertical
5310.0	-60.11	5.24	36.88	-28.47	-13	-15.47	Horizontal
210.3	-46.23	1.58	16.84	-30.96	-13	-17.96	Vertical
443.0	-47.40	1.45	17.64	-31.21	-13	-18.21	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.

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 3.29, Normal, DC 3.87V and High voltage, DC 4.45.

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 2/4/5/7/12/17/66

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]
3.29	1880	12.8	0.006797	2.5
3.87	1880	13.9	0.007405	2.5
4.45	1880	13.5	0.007177	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.3	0.006556	2.5
Extreme (50C)	1880	11.4	0.006071	2.5
Extreme (40C)	1880	13.8	0.007365	2.5
Extreme (30C)	1880	13.1	0.006986	2.5
Extreme (10C)	1880	13.5	0.007173	2.5
Extreme (0C)	1880	11.9	0.006341	2.5
Extreme (-10C)	1880	12.5	0.006674	2.5
Extreme (-20C)	1880	13.7	0.007272	2.5
Extreme (-30C)	1880	14.7	0.007825	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]
3.29	1880	9.8	0.005196	2.5
3.87	1880	8.4	0.004475	2.5
4.45	1880	8.2	0.004354	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.1	0.004842	2.5
Extreme (50C)	1880	8.6	0.004554	2.5
Extreme (40C)	1880	7.6	0.004057666	2.5
Extreme (30C)	1880	9.0	0.004773837	2.5
Extreme (10C)	1880	9.0	0.004793615	2.5
Extreme (0C)	1880	8.1	0.004293933	2.5
Extreme (-10C)	1880	9.0	0.004762408	2.5
Extreme (-20C)	1880	8.8	0.004675785	2.5
Extreme (-30C)	1880	8.3	0.004422587	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]
3.29	1732.5	9.0	0.005171	2.5
3.87	1732.5	9.2	0.005304	2.5
4.45	1732.5	8.8	0.005068	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.8	0.005103	2.5
Extreme (50C)	1732.5	9.1	0.005272	2.5
Extreme (40C)	1732.5	7.2	0.004153	2.5
Extreme (30C)	1732.5	5.4	0.003122	2.5
Extreme (10C)	1732.5	6.7	0.003884	2.5
Extreme (0C)	1732.5	9.1	0.005225	2.5
Extreme (-10C)	1732.5	8.4	0.004865	2.5
Extreme (-20C)	1732.5	7.0	0.004018	2.5
Extreme (-30C)	1732.5	8.7	0.005034	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]
3.29	1732.5	9.9	0.005743	2.5
3.87	1732.5	8.5	0.004924	2.5
4.45	1732.5	7.8	0.004498	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.7	0.005618	2.5
Extreme (50C)	1732.5	9.2	0.005336	2.5
Extreme (40C)	1732.5	8.4	0.004838	2.5
Extreme (30C)	1732.5	9.1	0.005256	2.5
Extreme (10C)	1732.5	8.4	0.004850	2.5
Extreme (0C)	1732.5	8.2	0.004708	2.5
Extreme (-10C)	1732.5	9.3	0.005366	2.5
Extreme (-20C)	1732.5	8.8	0.005077	2.5
Extreme (-30C)	1732.5	7.6	0.004394	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]
3.29	836.5	5.7	0.006838	2.5
3.87	836.5	6.7	0.007981	2.5
4.45	836.5	4.9	0.005823	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.1	0.007332	2.5
Extreme (50C)	836.5	6.0	0.007202	2.5
Extreme (40C)	836.5	6.0	0.007137	2.5
Extreme (30C)	836.5	6.0	0.007177	2.5
Extreme (10C)	836.5	5.7	0.006795	2.5
Extreme (0C)	836.5	5.3	0.006326	2.5
Extreme (-10C)	836.5	5.4	0.006433	2.5
Extreme (-20C)	836.5	5.7	0.006761	2.5
Extreme (-30C)	836.5	6.7	0.007990	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]
3.29	836.5	5.7	0.006846	2.5
3.87	836.5	6.3	0.007483	2.5
4.45	836.5	5.1	0.006110	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.7	0.006829	2.5
Extreme (50C)	836.5	5.7	0.006771	2.5
Extreme (40C)	836.5	6.2	0.007380	2.5
Extreme (30C)	836.5	6.4	0.007609	2.5
Extreme (10C)	836.5	5.4	0.006479	2.5
Extreme (0C)	836.5	5.8	0.006929	2.5
Extreme (-10C)	836.5	5.7	0.006779	2.5
Extreme (-20C)	836.5	6.1	0.007240	2.5
Extreme (-30C)	836.5	6.6	0.007917	2.5

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

10.4 LTE BAND 7

Band 7 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]
3.29	2535	9.6	0.003781	2.5
3.87	2535	8.6	0.003405	2.5
4.45	2535	8.6	0.003384	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.9	0.003901	2.5
Extreme (50C)	2535	9.3	0.003676	2.5
Extreme (40C)	2535	8.8	0.003468	2.5
Extreme (30C)	2535	9.2	0.003621	2.5
Extreme (10C)	2535	7.6	0.003000	2.5
Extreme (0C)	2535	8.2	0.003237	2.5
Extreme (-10C)	2535	9.9	0.003898	2.5
Extreme (-20C)	2535	9.3	0.003671	2.5
Extreme (-30C)	2535	8.7	0.003414	2.5

Band 7 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]
3.29	2535	6.9	0.002722	2.5
3.87	2535	6.7	0.002636	2.5
4.45	2535	5.5	0.002186	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.9	0.002324	2.5
Extreme (40C)	2535	5.0	0.001960	2.5
Extreme (30C)	2535	6.5	0.002566	2.5
Extreme (10C)	2535	5.3	0.002088	2.5
Extreme (0C)	2535	5.3	0.002072	2.5
Extreme (-10C)	2535	5.0	0.001966	2.5
Extreme (-20C)	2535	6.1	0.002391	2.5
Extreme (-30C)	2535	5.9	0.002329	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]
3.29	707.5	8.5	0.012037	2.5
3.87	707.5	10.4	0.014661	2.5
4.45	707.5	8.2	0.011590	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.7	0.012333	2.5
Extreme (50C)	707.5	7.4	0.010430	2.5
Extreme (40C)	707.5	7.1	0.009991	2.5
Extreme (30C)	707.5	8.8	0.012435	2.5
Extreme (10C)	707.5	7.6	0.010690	2.5
Extreme (0C)	707.5	9.0	0.012717	2.5
Extreme (-10C)	707.5	8.8	0.012491	2.5
Extreme (-20C)	707.5	8.6	0.012167	2.5
Extreme (-30C)	707.5	7.5	0.010596	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]
3.29	707.5	6.9	0.009808	2.5
3.87	707.5	8.3	0.011667	2.5
4.45	707.5	7.1	0.010041	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.3	0.013169	2.5
Extreme (50C)	707.5	8.7	0.012337	2.5
Extreme (40C)	707.5	9.4	0.013255	2.5
Extreme (30C)	707.5	7.6	0.010713	2.5
Extreme (10C)	707.5	8.4	0.011937	2.5
Extreme (0C)	707.5	7.9	0.011159	2.5
Extreme (-10C)	707.5	7.3	0.010276	2.5
Extreme (-20C)	707.5	9.2	0.013044	2.5
Extreme (-30C)	707.5	8.5	0.011982	2.5

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

10.6 LTE BAND 17

Band 17 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]
3.29	710.0	10.3	0.014484	2.5
3.87	710.0	8.7	0.012262	2.5
4.45	710.0	7.9	0.011113	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.8	0.013800	2.5
Extreme (50C)	710.0	8.5	0.011990	2.5
Extreme (40C)	710.0	8.4	0.011818	2.5
Extreme (30C)	710.0	9.5	0.013332	2.5
Extreme (10C)	710.0	8.8	0.012410	2.5
Extreme (0C)	710.0	8.2	0.011574	2.5
Extreme (-10C)	710.0	9.5	0.013319	2.5
Extreme (-20C)	710.0	9.3	0.013036	2.5
Extreme (-30C)	710.0	8.0	0.011251	2.5

Band 17 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]
3.29	710.0	10.2	0.014320	2.5
3.87	710.0	8.4	0.011855	2.5
4.45	710.0	8.8	0.012452	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.2	0.012949	2.5
Extreme (50C)	710.0	8.9	0.012530	2.5
Extreme (40C)	710.0	8.4	0.011814	2.5
Extreme (30C)	710.0	8.5	0.012021	2.5
Extreme (10C)	710.0	7.9	0.011137	2.5
Extreme (0C)	710.0	8.6	0.012060	2.5
Extreme (-10C)	710.0	9.7	0.013704	2.5
Extreme (-20C)	710.0	9.1	0.012757	2.5
Extreme (-30C)	710.0	8.0	0.011310	2.5

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

10.7 LTE BAND 66

Band 66 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]
3.29	1745	6.8	0.003901	2.5
3.87	1745	7.0	0.003994	2.5
4.45	1745	7.8	0.004446	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	5.3	0.003017	2.5
Extreme (50C)	1745	7.8	0.004476	2.5
Extreme (40C)	1745	6.6	0.003800	2.5
Extreme (30C)	1745	7.3	0.004206	2.5
Extreme (10C)	1745	7.5	0.004312	2.5
Extreme (0C)	1745	6.6	0.003776	2.5
Extreme (-10C)	1745	5.5	0.003152	2.5
Extreme (-20C)	1745	6.6	0.003786	2.5
Extreme (-30C)	1745	5.1	0.002936	2.5

Band 66 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]
3.29	1745	8.8	0.005044	2.5
3.87	1745	7.3	0.004201	2.5
4.45	1745	9.8	0.005636	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	8.8	0.005056	2.5
Extreme (50C)	1745	8.1	0.004653	2.5
Extreme (40C)	1745	8.9	0.005097	2.5
Extreme (30C)	1745	7.8	0.004462	2.5
Extreme (10C)	1745	8.8	0.005057	2.5
Extreme (0C)	1745	6.9	0.003931	2.5
Extreme (-10C)	1745	8.7	0.004974	2.5
Extreme (-20C)	1745	8.2	0.004686	2.5
Extreme (-30C)	1745	5.1	0.002921	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.

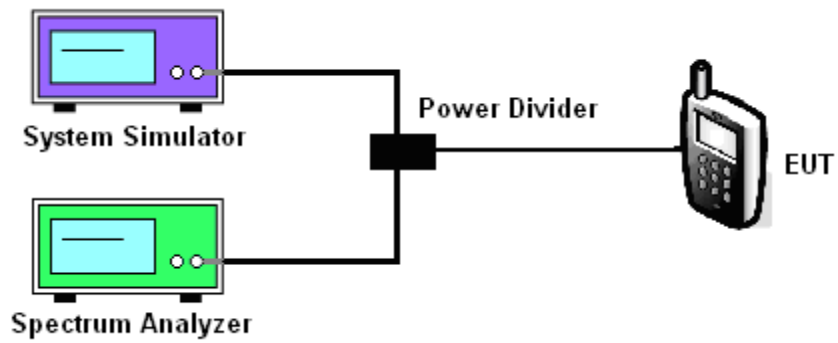
11.2 Measuring Instruments

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 2/4/5/7/12/17/66

Test data reference attachment.

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