

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

FCC ID: 2AOWK-5015

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ5015

Family Model: Armor X31 Pro, Armor X31 Ultra,
Armor X31E, Armor X31S, Armor X31 Lite,
Armor X31s, Armor X31s Pro

Report No.: S24111401207006

Issue Date: Dec. 25, 2024

Prepared for

Shenzhen Gotron Electronic CO.,LTD.
7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,
Shenzhen City, Guangdong Province China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan
District, Shenzhen, Guangdong, People's Republic of China
Tel. 0755-23200050 Website: <http://www.ntek.org.cn>

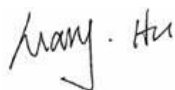
TEST RESULT CERTIFICATION

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: GQ5015
Trade Mark.....: ulefone
Family Model.....: Armor X31 Pro, Armor X31 Ultra, Armor X31E, Armor X31S, Armor X31 Lite, Armor X31s, Armor X31s Pro
Test Sample Number: S241114012004
Date of Test.....: Nov. 14, 2024 ~ Dec. 25, 2024
Standards.....: FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedureANSI 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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Test Result..... **Pass**

Prepared : 
 By : _____
 Mary Hu
 (Project Engineer)

Reviewed : 
 By : _____
 Aaron Cheng
 (Supervisor)

Approved : 
 By : _____
 Alex Li
 (Manager)

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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	GQ5015
Family Model	Armor X31 Pro, Armor X31 Ultra, Armor X31E, Armor X31S, Armor X31 Lite, Armor X31s, Armor X31s Pro
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2AOWK-5015
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,12,17,66,71 TDD Band 41
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 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE TDD Band 41 Uplink: 2496MHz-2690MHz, LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz; LTE FDD Band 71 Uplink: 663MHz-698MHz, Downlink: 617MHz-652MHz;
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: -1.81 dBi, Band 4: -1.24 dBi, Band 5: -1.21 dBi, Band 12: -1.63 dBi, Band 17: -1.63 dBi, Band 41: -3.35 dBi, Band 66: -1.24 dBi, Band 71: -1.63 dBi
Adapter	Model: QZ-0180AA2H Input: 100-240V~50/60Hz 0.5A Output: 5.0V $\overline{\text{---}}$ 3.0A 15.0W or 9.0V $\overline{\text{---}}$ 2.22A 20.0W Max. or 12.0V $\overline{\text{---}}$ 1.67A 20.0W Max.
Battery	DC 3.87V, 6050mAh, 23.41Wh
Power Rating	DC 3.87V from battery or DC 5V/9V/12V from adapter
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V) (Note 1)

HW Version	N/A
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-5015** 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.

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-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expanded 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 2/4/5/12/17/41/66/71

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	GQ5015	FCC ID: 2AOWK-5015	EUT

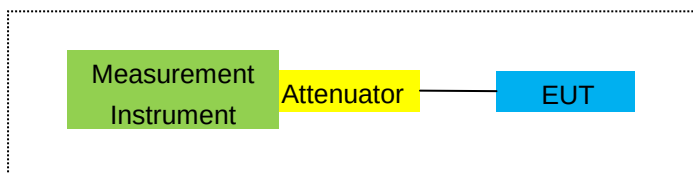
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

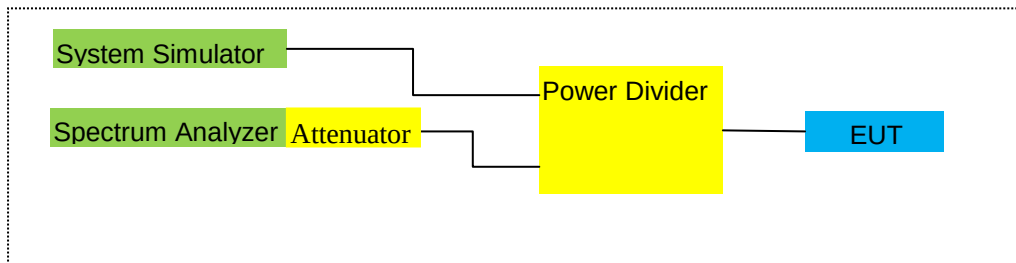
For Radiated Test Cases



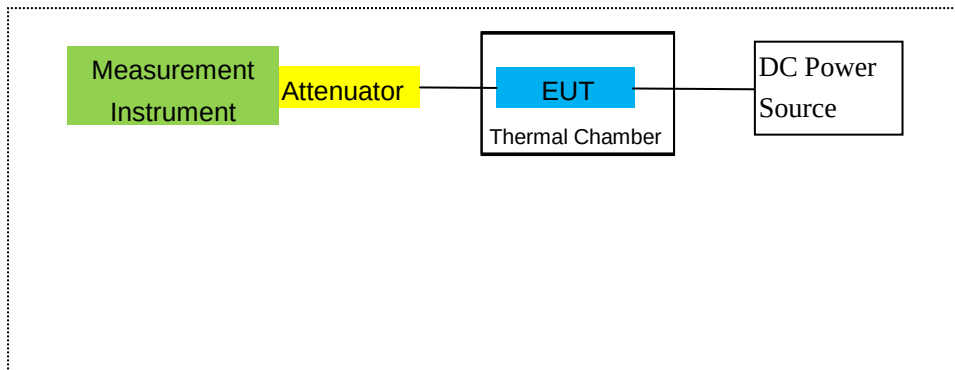
For Conducted Output Power



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	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	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	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	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	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	2025.03.11	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	2024.03.12	2025.03.11	1 year
23	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
24	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year

26	DC Power Source	N/A	PS-6005D	2017040292 3	2024.04.25	2027.04.24	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.

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 2/4/5/12/17/41/66/71

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;

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 2/4/5/12/17/41/66/71

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 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 2/4/5/12/17/41/66/71

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

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 2/4/5/12/17/41/66/71

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)	Antenna Gain (dBi)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1850.7	15.93	3.76	8.90	21.07	127.938	Horizontal	Pass
		1880	12.76	3.91	8.90	17.75	59.566	Horizontal	Pass
		1909.3	13.88	3.93	8.90	18.85	76.736	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	12.35	3.77	8.90	17.48	55.976	Horizontal	Pass
		1880	13.43	3.91	8.90	18.42	69.502	Horizontal	Pass
		1908.5	14.87	3.94	8.90	19.83	96.161	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	14.44	3.77	8.90	19.57	90.573	Horizontal	Pass
		1880	15.48	3.91	8.90	20.47	111.429	Horizontal	Pass
		1907.5	14.86	3.94	8.90	19.82	95.940	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	15.22	3.79	8.90	20.33	107.895	Horizontal	Pass
		1880	16.17	3.95	8.90	21.12	129.420	Horizontal	Pass
		1905	15.09	3.97	8.90	20.02	100.462	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	14.66	3.79	8.90	19.77	94.842	Horizontal	Pass
		1880	15.97	3.95	8.90	20.92	123.595	Horizontal	Pass
		1902.5	14.80	3.97	8.90	19.73	93.972	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	15.53	3.81	8.90	20.62	115.345	Horizontal	Pass
		1880	13.20	3.96	8.90	18.14	65.163	Horizontal	Pass
		1900	15.67	4.00	8.90	20.57	114.025	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	14.45	3.76	8.90	19.59	90.991	Vertical	Pass
		1880	13.58	3.91	8.90	18.57	71.945	Vertical	Pass
		1909.3	14.38	3.93	8.90	19.35	86.099	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	14.61	3.77	8.90	19.74	94.189	Vertical	Pass
		1880	15.92	3.91	8.90	20.91	123.310	Vertical	Pass
		1908.5	13.83	3.94	8.90	18.79	75.683	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	14.14	3.77	8.90	19.27	84.528	Vertical	Pass
		1880	13.73	3.91	8.90	18.72	74.473	Vertical	Pass
		1907.5	16.06	3.94	8.90	21.02	126.474	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	14.10	3.79	8.90	19.21	83.368	Vertical	Pass
		1880	12.21	3.95	8.90	17.16	52.000	Vertical	Pass
		1905	13.50	3.97	8.90	18.43	69.663	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	14.07	3.79	8.90	19.18	82.794	Vertical	Pass
		1880	14.49	3.95	8.90	19.44	87.902	Vertical	Pass
		1902.5	15.90	3.97	8.90	20.83	121.060	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	16.72	3.81	8.90	21.81	151.705	Vertical	Pass
		1880	14.90	3.96	8.90	19.84	96.383	Vertical	Pass
		1900	14.51	4.00	8.90	19.41	87.297	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1850.7	14.60	3.76	8.90	19.73	93.972	Horizontal	Pass
		1880	15.75	3.91	8.90	18.49	70.632	Horizontal	Pass
		1909.3	15.45	3.93	8.90	19.95	98.855	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	15.29	3.77	8.90	18.54	71.450	Horizontal	Pass
		1880	14.95	3.91	8.90	19.13	81.846	Horizontal	Pass
		1908.5	14.55	3.94	8.90	18.16	65.464	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	15.14	3.77	8.90	19.74	94.189	Horizontal	Pass
		1880	15.50	3.91	8.90	18.8	75.858	Horizontal	Pass
		1907.5	14.00	3.94	8.90	18.15	65.313	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	15.35	3.79	8.90	20.06	101.391	Horizontal	Pass
		1880	14.05	3.95	8.90	18.77	75.336	Horizontal	Pass
		1905	15.36	3.97	8.90	20.16	103.753	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.68	3.79	8.90	19.59	90.991	Horizontal	Pass
		1880	15.77	3.95	8.90	18.64	73.114	Horizontal	Pass
		1902.5	15.65	3.97	8.90	20.8	120.226	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	13.84	3.81	8.90	18.58	72.111	Horizontal	Pass
		1880	16.17	3.96	8.90	19.49	88.920	Horizontal	Pass
		1900	14.55	4.00	8.90	18.14	65.163	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	14.61	3.76	8.90	19.54	89.950	Vertical	Pass
		1880	15.84	3.91	8.90	18.48	70.469	Vertical	Pass
		1909.3	15.13	3.93	8.90	19.21	83.368	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	13.77	3.77	8.90	18.05	63.826	Vertical	Pass
		1880	14.83	3.91	8.90	19.55	90.157	Vertical	Pass
		1908.5	14.56	3.94	8.90	19.23	83.753	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	13.76	3.77	8.90	21.03	126.765	Vertical	Pass
		1880	15.05	3.91	8.90	20.37	108.893	Vertical	Pass
		1907.5	15.69	3.94	8.90	19.37	86.497	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	13.98	3.79	8.90	19.75	94.406	Vertical	Pass
		1880	15.57	3.95	8.90	19.61	91.411	Vertical	Pass
		1905	15.12	3.97	8.90	19.35	86.099	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.85	3.79	8.90	19.11	81.470	Vertical	Pass
		1880	14.87	3.95	8.90	20.76	119.124	Vertical	Pass
		1902.5	13.66	3.97	8.90	19.47	88.512	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	14.29	3.81	8.90	20.98	125.314	Vertical	Pass
		1880	14.90	3.96	8.90	21.31	135.207	Vertical	Pass
		1900	13.78	4.00	8.90	19.55	90.157	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 Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	12.63	3.12	8.90	18.41	69.343	Horizontal	Pass
		1732.5	12.42	3.27	8.90	18.05	63.826	Horizontal	Pass
		1754.3	14.05	3.29	8.90	19.66	92.470	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	12.45	3.13	8.90	18.22	66.374	Horizontal	Pass
		1732.5	13.70	3.27	8.90	19.33	85.704	Horizontal	Pass
		1753.5	12.98	3.30	8.90	18.58	72.111	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	14.03	3.13	8.90	19.8	95.499	Horizontal	Pass
		1732.5	13.91	3.27	8.90	19.54	89.950	Horizontal	Pass
		1752.5	12.80	3.30	8.90	18.4	69.183	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	13.15	3.15	8.90	18.9	77.625	Horizontal	Pass
		1732.5	13.92	3.31	8.90	19.51	89.331	Horizontal	Pass
		1750	14.20	3.33	8.90	19.77	94.842	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	13.55	3.15	8.90	19.3	85.114	Horizontal	Pass
		1732.5	13.99	3.31	8.90	19.58	90.782	Horizontal	Pass
		1747.5	15.30	3.33	8.90	20.87	122.180	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	12.24	3.17	8.90	17.97	62.661	Horizontal	Pass
		1732.5	12.89	3.32	8.90	18.47	70.307	Horizontal	Pass
		1745	13.16	3.36	8.90	18.7	74.131	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	13.49	3.12	8.90	19.27	84.528	Vertical	Pass
		1732.5	13.63	3.27	8.90	19.26	84.333	Vertical	Pass
		1754.3	14.20	3.29	8.90	19.81	95.719	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	13.51	3.13	8.90	19.28	84.723	Vertical	Pass
		1732.5	14.29	3.27	8.90	19.92	98.175	Vertical	Pass
		1753.5	14.57	3.30	8.90	20.17	103.992	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	12.91	3.13	8.90	18.68	73.790	Vertical	Pass
		1732.5	14.39	3.27	8.90	20.02	100.462	Vertical	Pass
		1752.5	12.39	3.30	8.90	17.99	62.951	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	10.80	3.15	8.90	16.55	45.186	Vertical	Pass
		1732.5	14.12	3.31	8.90	19.71	93.541	Vertical	Pass
		1750	13.05	3.33	8.90	18.62	72.778	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	14.77	3.15	8.90	20.52	112.720	Vertical	Pass
		1732.5	13.82	3.31	8.90	19.41	87.297	Vertical	Pass
		1747.5	13.40	3.33	8.90	18.97	78.886	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	15.44	3.17	8.90	21.17	130.918	Vertical	Pass
		1732.5	15.38	3.32	8.90	20.96	124.738	Vertical	Pass
		1745	12.44	3.36	8.90	17.98	62.806	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	14.13	3.12	8.90	19.91	97.852	Horizontal	Pass
		1732.5	15.11	3.27	8.90	20.74	118.659	Horizontal	Pass
		1754.3	14.97	3.29	8.90	20.58	114.353	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.50	3.13	8.90	19.27	84.554	Horizontal	Pass
		1732.5	14.31	3.27	8.90	19.94	98.553	Horizontal	Pass
		1753.5	14.60	3.30	8.90	20.20	104.800	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.36	3.13	8.90	19.13	81.860	Horizontal	Pass
		1732.5	11.97	3.27	8.90	17.60	57.548	Horizontal	Pass
		1752.5	13.57	3.30	8.90	19.17	82.529	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	14.78	3.15	8.90	20.53	113.033	Horizontal	Pass
		1732.5	12.73	3.31	8.90	18.32	67.920	Horizontal	Pass
		1750	12.75	3.33	8.90	18.32	67.959	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.36	3.15	8.90	19.11	81.492	Horizontal	Pass
		1732.5	14.56	3.31	8.90	20.15	103.515	Horizontal	Pass
		1747.5	13.32	3.33	8.90	18.89	77.530	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	13.23	3.17	8.90	18.96	78.719	Horizontal	Pass
		1732.5	14.00	3.32	8.90	19.58	90.711	Horizontal	Pass
		1745	14.52	3.36	8.90	20.06	101.288	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	14.47	3.12	8.90	20.25	105.814	Vertical	Pass
		1732.5	13.90	3.27	8.90	19.53	89.697	Vertical	Pass
		1754.3	13.99	3.29	8.90	19.60	91.243	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.28	3.13	8.90	20.05	101.239	Vertical	Pass
		1732.5	14.01	3.27	8.90	19.64	92.122	Vertical	Pass
		1753.5	13.70	3.30	8.90	19.30	85.030	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	15.71	3.13	8.90	21.48	140.489	Vertical	Pass
		1732.5	14.10	3.27	8.90	19.73	94.039	Vertical	Pass
		1752.5	13.16	3.30	8.90	18.76	75.096	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	13.09	3.15	8.90	18.84	76.520	Vertical	Pass
		1732.5	14.32	3.31	8.90	19.91	98.029	Vertical	Pass
		1750	15.14	3.33	8.90	20.71	117.661	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.36	3.15	8.90	19.11	81.469	Vertical	Pass
		1732.5	13.78	3.31	8.90	19.37	86.506	Vertical	Pass
		1747.5	15.17	3.33	8.90	20.74	118.475	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	13.72	3.17	8.90	19.45	88.040	Vertical	Pass
		1732.5	15.97	3.32	8.90	21.55	142.818	Vertical	Pass
		1745	14.60	3.36	8.90	20.14	103.183	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 Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	17.01	2.01	5.30	2.15	18.15	65.313	Horizontal	Pass
		836.5	18.34	2.01	5.30	2.15	19.48	88.716	Horizontal	Pass
		848.3	17.63	2.02	5.70	2.15	19.16	82.414	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	18.58	2.01	5.30	2.15	19.72	93.756	Horizontal	Pass
		836.5	19.49	2.01	5.30	2.15	20.63	115.611	Horizontal	Pass
		847.5	19.10	2.02	5.70	2.15	20.63	115.611	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	17.49	2.01	5.30	2.15	18.63	72.946	Horizontal	Pass
		836.5	18.85	2.01	5.30	2.15	19.99	99.770	Horizontal	Pass
		846.5	19.36	2.02	5.70	2.15	20.89	122.744	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	17.44	2.01	5.30	2.15	18.58	72.111	Horizontal	Pass
		836.5	19.86	2.01	5.30	2.15	21.00	125.893	Horizontal	Pass
		844	17.50	2.02	5.70	2.15	19.03	79.983	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	20.09	2.01	5.30	2.15	21.23	132.739	Vertical	Pass
		836.5	20.22	2.01	5.30	2.15	21.36	136.773	Vertical	Pass
		848.3	18.64	2.02	5.70	2.15	20.17	103.992	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	18.95	2.01	5.30	2.15	20.09	102.094	Vertical	Pass
		836.5	18.44	2.01	5.30	2.15	19.58	90.782	Vertical	Pass
		847.5	16.23	2.02	5.70	2.15	17.76	59.704	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	17.75	2.01	5.30	2.15	18.89	77.446	Vertical	Pass
		836.5	17.86	2.01	5.30	2.15	19.00	79.433	Vertical	Pass
		846.5	18.05	2.02	5.70	2.15	19.58	90.782	Vertical	Pass
10.0MHz Band QPSK	50/0	829	17.20	2.01	5.30	2.15	18.34	68.234	Vertical	Pass
		836.5	20.58	2.01	5.30	2.15	21.72	148.594	Vertical	Pass
		844	16.99	2.02	5.70	2.15	18.52	71.121	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	824.7	18.43	2.01	5.30	2.15	19.57	90.573	Horizontal	Pass
		836.5	18.34	2.01	5.30	2.15	19.48	88.716	Horizontal	Pass
		848.3	18.07	2.02	5.70	2.15	19.6	91.201	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	18.52	2.01	5.30	2.15	19.66	92.470	Horizontal	Pass
		836.5	17.10	2.01	5.30	2.15	18.24	66.681	Horizontal	Pass
		847.5	18.52	2.02	5.70	2.15	20.05	101.158	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	17.78	2.01	5.30	2.15	18.92	77.983	Horizontal	Pass
		836.5	17.23	2.01	5.30	2.15	18.37	68.707	Horizontal	Pass
		846.5	17.38	2.02	5.70	2.15	18.91	77.804	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	16.89	2.01	5.30	2.15	18.03	63.533	Horizontal	Pass
		836.5	17.39	2.01	5.30	2.15	18.53	71.285	Horizontal	Pass
		844	17.90	2.02	5.70	2.15	19.43	87.700	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	18.85	2.01	5.30	2.15	19.99	99.770	Vertical	Pass
		836.5	18.59	2.01	5.30	2.15	19.73	93.972	Vertical	Pass
		848.3	17.95	2.02	5.70	2.15	19.48	88.716	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	16.64	2.01	5.30	2.15	17.78	59.979	Vertical	Pass
		836.5	18.25	2.01	5.30	2.15	19.39	86.896	Vertical	Pass
		847.5	17.26	2.02	5.70	2.15	18.79	75.683	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	17.94	2.01	5.30	2.15	19.08	80.910	Vertical	Pass
		836.5	16.07	2.01	5.30	2.15	17.21	52.602	Vertical	Pass
		846.5	18.25	2.02	5.70	2.15	19.78	95.060	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	17.16	2.01	5.30	2.15	18.3	67.608	Vertical	Pass
		836.5	19.82	2.01	5.30	2.15	20.96	124.738	Vertical	Pass
		844	18.98	2.02	5.70	2.15	20.51	112.460	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 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	19.02	1.91	5.60	2.15	20.56	113.763	Horizontal	Pass
		707.5	19.85	1.91	5.70	2.15	21.49	140.929	Horizontal	Pass
		715.3	16.66	1.93	5.80	2.15	18.38	68.865	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	17.45	1.91	5.60	2.15	18.99	79.250	Horizontal	Pass
		707.5	18.24	1.91	5.70	2.15	19.88	97.275	Horizontal	Pass
		714.5	18.36	1.93	5.80	2.15	20.08	101.859	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	18.80	1.91	5.60	2.15	20.34	108.143	Horizontal	Pass
		707.5	18.53	1.91	5.70	2.15	20.17	103.992	Horizontal	Pass
		713.5	18.24	1.92	5.80	2.15	19.97	99.312	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	18.21	1.91	5.60	2.15	19.75	94.406	Horizontal	Pass
		707.5	17.20	1.91	5.70	2.15	18.84	76.560	Horizontal	Pass
		711	16.77	1.92	5.80	2.15	18.5	70.795	Horizontal	Pass
1.4MHz Band QPSK	6/0	699.7	17.04	1.91	5.60	2.15	18.58	72.111	Vertical	Pass
		707.5	17.66	1.91	5.70	2.15	19.3	85.114	Vertical	Pass
		715.3	16.39	1.93	5.80	2.15	18.11	64.714	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	18.17	1.91	5.60	2.15	19.71	93.541	Vertical	Pass
		707.5	17.01	1.91	5.70	2.15	18.65	73.282	Vertical	Pass
		714.5	19.38	1.93	5.80	2.15	21.1	128.825	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	17.69	1.91	5.60	2.15	19.23	83.753	Vertical	Pass
		707.5	18.03	1.91	5.70	2.15	19.67	92.683	Vertical	Pass
		713.5	17.79	1.92	5.80	2.15	19.52	89.536	Vertical	Pass
10.0MHz Band QPSK	50/0	704	17.27	1.91	5.60	2.15	18.81	76.033	Vertical	Pass
		707.5	19.87	1.91	5.70	2.15	21.51	141.579	Vertical	Pass
		711	19.61	1.92	5.80	2.15	21.34	136.144	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	699.7	17.98	1.91	5.60	2.15	19.52	89.536	Horizontal	Pass
		707.5	18.29	1.91	5.70	2.15	19.93	98.401	Horizontal	Pass
		715.3	18.05	1.93	5.80	2.15	19.77	94.842	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	18.97	1.91	5.60	2.15	20.51	112.460	Horizontal	Pass
		707.5	16.63	1.91	5.70	2.15	18.27	67.143	Horizontal	Pass
		714.5	17.15	1.93	5.80	2.15	18.87	77.090	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	17.06	1.91	5.60	2.15	18.6	72.444	Horizontal	Pass
		707.5	18.47	1.91	5.70	2.15	20.11	102.565	Horizontal	Pass
		713.5	18.93	1.92	5.80	2.15	20.66	116.413	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	18.46	1.91	5.60	2.15	20	100.000	Horizontal	Pass
		707.5	17.07	1.91	5.70	2.15	18.71	74.302	Horizontal	Pass
		711	18.69	1.92	5.80	2.15	20.42	110.154	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	699.7	16.41	1.91	5.60	2.15	17.95	62.373	Vertical	Pass
		707.5	18.66	1.91	5.70	2.15	20.3	107.152	Vertical	Pass
		715.3	18.11	1.93	5.80	2.15	19.83	96.161	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	19.29	1.91	5.60	2.15	20.83	121.060	Vertical	Pass
		707.5	18.41	1.91	5.70	2.15	20.05	101.158	Vertical	Pass
		714.5	18.39	1.93	5.80	2.15	20.11	102.565	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	18.07	1.91	5.60	2.15	19.61	91.411	Vertical	Pass
		707.5	18.48	1.91	5.70	2.15	20.12	102.802	Vertical	Pass
		713.5	17.13	1.92	5.80	2.15	18.86	76.913	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	18.77	1.91	5.60	2.15	20.31	107.399	Vertical	Pass
		707.5	19.32	1.91	5.70	2.15	20.96	124.738	Vertical	Pass
		711	18.33	1.92	5.80	2.15	20.06	101.391	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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	18.29	1.91	5.60	2.15	19.83	96.161	Vertical	Pass
		710	19.33	1.91	5.70	2.15	20.97	125.026	Vertical	Pass
		713.5	19.62	1.92	5.80	2.15	21.35	136.458	Vertical	Pass
10.0MHz Band QPSK	50/0	709	17.38	1.91	5.60	2.15	18.92	77.983	Vertical	Pass
		710	18.54	1.91	5.70	2.15	20.18	104.232	Vertical	Pass
		711	16.26	1.92	5.80	2.15	17.99	62.951	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	17.15	1.91	5.60	2.15	18.69	73.961	Horizontal	Pass
		710	17.12	1.91	5.70	2.15	18.76	75.162	Horizontal	Pass
		713.5	18.06	1.92	5.80	2.15	19.79	95.280	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	18.66	1.91	5.60	2.15	20.2	104.713	Horizontal	Pass
		710	19.51	1.91	5.70	2.15	21.15	130.317	Horizontal	Pass
		711	19.98	1.92	5.80	2.15	21.71	148.252	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	706.5	16.81	1.91	5.6	2.15	19.36	86.298	Vertical	Pass
		710	16.39	1.91	5.7	2.15	20.51	112.460	Vertical	Pass
		713.5	17.43	1.92	5.8	2.15	20.35	108.393	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	15.91	1.91	5.6	2.15	20.05	101.158	Vertical	Pass
		710	15.84	1.91	5.7	2.15	20.65	116.145	Vertical	Pass
		711	15.59	1.92	5.8	2.15	20.34	108.143	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	17.52	1.91	5.6	2.15	20.8	120.226	Horizontal	Pass
		710	17.46	1.91	5.7	2.15	20.93	123.880	Horizontal	Pass
		713.5	16.25	1.92	5.8	2.15	20.57	114.025	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	17.30	1.91	5.6	2.15	20.82	120.781	Horizontal	Pass
		710	17.57	1.91	5.7	2.15	20.96	124.738	Horizontal	Pass
		711	16.65	1.92	5.8	2.15	20.53	112.980	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)

ERP=EIRP-2.15

8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2498.5	16.32	4.54	9.00	20.78	119.674	Horizontal	Pass
		2593	16.14	4.69	9.00	20.45	110.917	Horizontal	Pass
		2687.5	14.65	4.71	9.00	18.94	78.343	Horizontal	Pass
10.0MHz Band QPSK	50/0	2501	16.24	4.55	9.00	20.69	117.220	Horizontal	Pass
		2593	15.61	4.69	9.00	19.92	98.175	Horizontal	Pass
		2685	14.56	4.72	9.00	18.84	76.560	Horizontal	Pass
15.0MHz Band QPSK	75/0	2503.5	13.47	4.55	9.00	17.92	61.944	Horizontal	Pass
		2593	15.81	4.69	9.00	20.12	102.802	Horizontal	Pass
		2682.5	16.40	4.72	9.00	20.68	116.950	Horizontal	Pass
20.0MHz Band QPSK	100/0	2506	14.96	4.57	9.00	19.39	86.896	Horizontal	Pass
		2593	15.34	4.73	9.00	19.61	91.411	Horizontal	Pass
		2680	16.14	4.75	9.00	20.39	109.396	Horizontal	Pass
5.0MHz Band QPSK	25/0	2498.5	16.25	4.54	9.00	20.71	117.761	Vertical	Pass
		2593	15.13	4.69	9.00	19.44	87.902	Vertical	Pass
		2687.5	14.76	4.71	9.00	19.05	80.353	Vertical	Pass
10.0MHz Band QPSK	50/0	2501	13.82	4.55	9.00	18.27	67.143	Vertical	Pass
		2593	15.32	4.69	9.00	19.63	91.833	Vertical	Pass
		2685	15.58	4.72	9.00	19.86	96.828	Vertical	Pass
15.0MHz Band QPSK	75/0	2503.5	13.90	4.55	9.00	18.35	68.391	Vertical	Pass
		2593	16.49	4.69	9.00	20.8	120.226	Vertical	Pass
		2682.5	15.39	4.72	9.00	19.67	92.683	Vertical	Pass
20.0MHz Band QPSK	100/0	2506	16.46	4.57	9.00	20.89	122.744	Vertical	Pass
		2593	13.98	4.73	9.00	18.25	66.834	Vertical	Pass
		2680	15.50	4.75	9.00	19.75	94.406	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2498.5	13.74	4.54	9.00	18.2	66.069	Horizontal	Pass
		2593	14.92	4.69	9.00	19.23	83.753	Horizontal	Pass
		2687.5	16.52	4.71	9.00	20.81	120.504	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2501	15.61	4.55	9.00	20.06	101.391	Horizontal	Pass
		2593	16.15	4.69	9.00	20.46	111.173	Horizontal	Pass
		2685	15.95	4.72	9.00	20.23	105.439	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2503.5	15.79	4.55	9.00	20.24	105.682	Horizontal	Pass
		2593	16.02	4.69	9.00	20.33	107.895	Horizontal	Pass
		2682.5	16.01	4.72	9.00	20.29	106.905	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2506	15.76	4.57	9.00	20.19	104.472	Horizontal	Pass
		2593	15.96	4.73	9.00	20.23	105.439	Horizontal	Pass
		2680	16.44	4.75	9.00	20.69	117.220	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2498.5	16.60	4.54	9.00	21.06	127.644	Vertical	Pass
		2593	15.54	4.69	9.00	19.85	96.605	Vertical	Pass
		2687.5	16.53	4.71	9.00	20.82	120.781	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2501	16.57	4.55	9.00	21.02	126.474	Vertical	Pass
		2593	15.56	4.69	9.00	19.87	97.051	Vertical	Pass
		2685	14.13	4.72	9.00	18.41	69.343	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2503.5	15.60	4.55	9.00	20.05	101.158	Vertical	Pass
		2593	15.99	4.69	9.00	20.3	107.152	Vertical	Pass
		2682.5	16.39	4.72	9.00	20.67	116.681	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2506	15.96	4.57	9.00	20.39	109.396	Vertical	Pass
		2593	16.89	4.73	9.00	21.16	130.617	Vertical	Pass
		2680	16.44	4.75	9.00	20.69	117.220	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)

8.9 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	15.09	3.12	8.90	20.08	101.859	Horizontal	Pass
		1745	13.86	3.27	8.90	19	79.433	Horizontal	Pass
		1779.3	16.28	3.29	8.90	21.31	135.207	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	14.20	3.13	8.90	18.93	78.163	Horizontal	Pass
		1745	14.87	3.27	8.90	20.35	108.393	Horizontal	Pass
		1778.5	15.56	3.30	8.90	19.35	86.099	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	16.05	3.13	8.90	21.27	133.968	Horizontal	Pass
		1745	16.21	3.27	8.90	21.17	130.918	Horizontal	Pass
		1777.5	14.87	3.30	8.90	18.92	77.983	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	15.19	3.15	8.90	20.85	121.619	Horizontal	Pass
		1745	15.29	3.31	8.90	20.86	121.899	Horizontal	Pass
		1775	16.10	3.33	8.90	20.63	115.611	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	15.36	3.15	8.90	20.51	112.460	Horizontal	Pass
		1745	15.89	3.31	8.90	21.35	136.458	Horizontal	Pass
		1772.5	16.64	3.33	8.90	21.87	153.815	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.97	3.17	8.90	19.37	86.497	Horizontal	Pass
		1745	15.42	3.32	8.90	21.32	135.519	Horizontal	Pass
		1770	15.22	3.36	8.90	20.39	109.396	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	15.71	3.12	8.90	20.54	113.240	Vertical	Pass
		1745	16.21	3.27	8.90	21.81	151.705	Vertical	Pass
		1779.3	15.56	3.29	8.90	21.04	127.057	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	16.08	3.13	8.90	20.85	121.619	Vertical	Pass
		1745	16.14	3.27	8.90	21.53	142.233	Vertical	Pass
		1778.5	16.41	3.30	8.90	20.98	125.314	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	15.17	3.13	8.90	20	100.000	Vertical	Pass
		1745	15.65	3.27	8.90	19.48	88.716	Vertical	Pass
		1777.5	14.24	3.30	8.90	19.34	85.901	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	12.72	3.15	8.90	18.07	64.121	Vertical	Pass
		1745	16.63	3.31	8.90	21.48	140.605	Vertical	Pass
		1775	15.66	3.33	8.90	19.66	92.470	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	16.69	3.15	8.90	21.32	135.519	Vertical	Pass
		1745	16.08	3.31	8.90	21.6	144.544	Vertical	Pass
		1772.5	15.30	3.33	8.90	20.72	118.032	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	17.39	3.17	8.90	21.88	154.170	Vertical	Pass
		1745	17.54	3.32	8.90	21.8	151.356	Vertical	Pass
		1770	14.41	3.36	8.90	19.02	79.799	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	14.14	3.12	8.9	19.92	98.175	Horizontal	Pass
		1745	13.56	3.27	8.9	19.19	82.985	Horizontal	Pass
		1779.3	14.25	3.29	8.9	19.86	96.828	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.77	3.13	8.9	19.54	89.950	Horizontal	Pass
		1745	14.16	3.27	8.9	19.79	95.280	Horizontal	Pass
		1778.5	13.92	3.3	8.9	19.52	89.536	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.28	3.13	8.9	19.05	80.353	Horizontal	Pass
		1745	12.69	3.27	8.9	18.32	67.920	Horizontal	Pass
		1777.5	14.25	3.3	8.9	19.85	96.605	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	14.47	3.15	8.9	20.22	105.196	Horizontal	Pass
		1745	12.48	3.31	8.9	18.07	64.121	Horizontal	Pass
		1775	11.70	3.33	8.9	17.27	53.333	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	11.98	3.15	8.9	17.73	59.293	Horizontal	Pass
		1745	12.90	3.31	8.9	18.49	70.632	Horizontal	Pass
		1772.5	13.78	3.33	8.9	19.35	86.099	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	13.01	3.17	8.9	18.74	74.817	Horizontal	Pass
		1745	13.55	3.32	8.9	19.13	81.846	Horizontal	Pass
		1770	12.98	3.36	8.9	18.52	71.121	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	12.83	3.12	8.9	18.61	72.611	Vertical	Pass
		1745	13.14	3.27	8.9	18.77	75.336	Vertical	Pass
		1779.3	13.09	3.29	8.9	18.7	74.131	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	12.81	3.13	8.9	18.58	72.111	Vertical	Pass
		1745	12.82	3.27	8.9	18.45	69.984	Vertical	Pass
		1778.5	13.78	3.3	8.9	19.38	86.696	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.95	3.13	8.9	19.72	93.756	Vertical	Pass
		1745	14.15	3.27	8.9	19.78	95.060	Vertical	Pass
		1777.5	12.19	3.3	8.9	17.79	60.117	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	12.91	3.15	8.9	18.66	73.451	Vertical	Pass
		1745	14.25	3.31	8.9	19.84	96.383	Vertical	Pass
		1775	14.35	3.33	8.9	19.92	98.175	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.09	3.15	8.9	18.84	76.560	Vertical	Pass
		1745	13.60	3.31	8.9	19.19	82.985	Vertical	Pass
		1772.5	13.50	3.33	8.9	19.07	80.724	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	14.24	3.17	8.9	19.97	99.312	Vertical	Pass
		1745	14.21	3.32	8.9	19.79	95.280	Vertical	Pass
		1770	14.72	3.36	8.9	20.26	106.170	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)

8.10 LTE BAND 71

Radiated Power (ERP) for Band 71										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	665.5	6.51	1.91	19.68	2.15	22.13	163.305	Horizontal	Pass
		680.5	5.68	1.91	19.77	2.15	21.39	137.721	Horizontal	Pass
		695.5	6.04	1.93	19.82	2.15	21.78	150.661	Horizontal	Pass
10.0MHz Band QPSK	50/0	668	5.59	1.91	19.70	2.15	21.23	132.739	Horizontal	Pass
		680.5	5.65	1.91	19.77	2.15	21.36	136.773	Horizontal	Pass
		693	4.94	1.93	19.81	2.15	20.67	116.681	Horizontal	Pass
15.0MHz Band QPSK	75/0	670.5	6.03	1.91	19.71	2.15	21.68	147.231	Horizontal	Pass
		680.5	5.63	1.91	19.77	2.15	21.34	136.144	Horizontal	Pass
		690.5	4.61	1.92	19.79	2.15	20.33	107.895	Horizontal	Pass
20.0MHz Band QPSK	100/0	673	5.69	1.91	19.73	2.15	21.36	136.773	Horizontal	Pass
		683	5.06	1.91	19.77	2.15	20.77	119.399	Horizontal	Pass
		688	5.68	1.92	19.78	2.15	21.39	137.721	Horizontal	Pass
5.0MHz Band QPSK	25/0	665.5	5.09	1.91	19.68	2.15	20.71	117.761	Vertical	Pass
		680.5	5.88	1.91	19.77	2.15	21.59	144.212	Vertical	Pass
		695.5	5.76	1.93	19.82	2.15	21.5	141.254	Vertical	Pass
15.0MHz Band QPSK	50/0	668	6.37	1.91	19.70	2.15	22.01	158.855	Vertical	Pass
		680.5	6.07	1.91	19.77	2.15	21.78	150.661	Vertical	Pass
		693	6.08	1.93	19.81	2.15	21.81	151.705	Vertical	Pass
15.0MHz Band QPSK	75/0	670.5	4.93	1.91	19.71	2.15	20.58	114.288	Vertical	Pass
		680.5	4.96	1.91	19.77	2.15	20.67	116.681	Vertical	Pass
		690.5	5.64	1.92	19.79	2.15	21.36	136.773	Vertical	Pass
20MHz Band QPSK	100/0	673	5.47	1.91	19.73	2.15	21.14	130.017	Vertical	Pass
		683	6.24	1.91	19.77	2.15	21.95	156.675	Vertical	Pass
		688	6.45	1.92	19.78	2.15	22.16	164.437	Vertical	Pass

Radiated Power (ERP) for Band 71										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	665.5	3.94	1.91	19.68	2.15	19.56	90.365	Horizontal	Pass
		680.5	4.16	1.91	19.77	2.15	19.87	97.051	Horizontal	Pass
		695.5	5.55	1.93	19.82	2.15	21.29	134.586	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	668	5.03	1.91	19.70	2.15	20.67	116.681	Horizontal	Pass
		680.5	5.97	1.91	19.77	2.15	21.68	147.231	Horizontal	Pass
		693	6.05	1.93	19.81	2.15	21.78	150.661	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	670.5	4.98	1.91	19.71	2.15	20.63	115.611	Horizontal	Pass
		680.5	5.50	1.91	19.77	2.15	21.21	132.130	Horizontal	Pass
		690.5	5.55	1.92	19.79	2.15	21.27	133.968	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	673	5.74	1.91	19.73	2.15	21.41	138.357	Horizontal	Pass
		683	4.43	1.91	19.77	2.15	20.14	103.276	Horizontal	Pass
		688	5.76	1.92	19.78	2.15	21.47	140.281	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	665.5	5.64	1.91	19.68	2.15	21.26	133.660	Vertical	Pass
		680.5	4.72	1.91	19.77	2.15	20.43	110.408	Vertical	Pass
		695.5	5.41	1.93	19.82	2.15	21.15	130.317	Vertical	Pass
10.0MHz Band 16 QAM	50/0	668	5.32	1.91	19.70	2.15	20.96	124.738	Vertical	Pass
		680.5	4.98	1.91	19.77	2.15	20.69	117.220	Vertical	Pass
		693	5.84	1.93	19.81	2.15	21.57	143.549	Vertical	Pass
15.0MHz Band 16 QAM	75/0	670.5	4.31	1.91	19.71	2.15	19.96	99.083	Vertical	Pass
		680.5	3.63	1.91	19.77	2.15	19.34	85.901	Vertical	Pass
		690.5	5.24	1.92	19.79	2.15	20.96	124.738	Vertical	Pass
20.0MHz Band 16 QAM	100/0	673	5.71	1.91	19.73	2.15	21.38	137.404	Vertical	Pass
		683	6.07	1.91	19.77	2.15	21.78	150.661	Vertical	Pass
		688	6.08	1.92	19.78	2.15	21.79	151.008	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=EIRP-2.15

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

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 2/4/5/12/17/41/66/71

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	-49.48	4.04	33.51	-20.01	-13	-7.01	Horizontal
3701.4	-53.29	4.04	33.51	-23.82	-13	-10.82	Vertical
5552.1	-54.08	5.24	35.84	-23.48	-13	-10.48	Vertical
5552.1	-52.88	5.24	35.84	-22.28	-13	-9.28	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-52.97	4.04	33.56	-23.45	-13	-10.45	Horizontal
3760	-53.05	4.04	33.56	-23.53	-13	-10.53	Vertical
5640	-51.99	5.24	35.91	-21.32	-13	-8.32	Vertical
5640	-50.07	5.24	35.91	-19.40	-13	-6.40	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-54.13	4.04	34.00	-24.17	-13	-11.17	Horizontal
3818.6	-49.87	4.04	34.00	-19.91	-13	-6.91	Vertical
5727.9	-55.64	5.24	36.04	-24.84	-13	-11.84	Vertical
5727.9	-50.64	5.24	36.04	-19.84	-13	-6.84	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	-51.95	4.07	33.54	-22.48	-13	-9.48	Horizontal
3720	-49.99	4.07	33.54	-20.52	-13	-7.52	Vertical
5580	-52.31	5.28	35.86	-21.73	-13	-8.73	Vertical
5580	-50.08	5.28	35.86	-19.50	-13	-6.50	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-50.23	4.04	33.56	-20.71	-13	-7.71	Horizontal
3760	-48.90	4.04	33.56	-19.38	-13	-6.38	Vertical
5640	-55.10	5.24	35.91	-24.43	-13	-11.43	Vertical
5640	-53.79	5.24	35.91	-23.12	-13	-10.12	Horizontal
Test Results for High Channel 1900MHz							
3800	-48.62	4.04	34.00	-18.66	-13	-5.66	Horizontal
3800	-52.53	4.04	34.00	-22.57	-13	-9.57	Vertical
5700	-55.44	5.24	36.04	-24.64	-13	-11.64	Vertical
5700	-54.43	5.24	36.04	-23.63	-13	-10.63	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	-51.52	4.02	29.80	-25.74	-13	-12.74	Horizontal
3421.4	-54.81	4.02	29.80	-29.03	-13	-16.03	Vertical
5132.1	-57.25	5.24	35.84	-26.65	-13	-13.65	Vertical
5132.1	-53.97	5.24	35.84	-23.37	-13	-10.37	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-47.08	4.03	30.00	-21.11	-13	-8.11	Horizontal
3465	-52.88	4.03	30.00	-26.91	-13	-13.91	Vertical
5197.5	-52.39	5.25	35.86	-21.78	-13	-8.78	Vertical
5197.5	-52.96	5.25	35.86	-22.35	-13	-9.35	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-50.97	4.05	30.01	-25.01	-13	-12.01	Horizontal
3508.6	-49.50	4.05	30.01	-23.54	-13	-10.54	Vertical
5262.9	-55.16	5.26	35.86	-24.56	-13	-11.56	Vertical
5262.9	-52.12	5.26	35.86	-21.52	-13	-8.52	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	-52.49	4.02	29.80	-26.71	-13	-13.71	Horizontal
3440	-51.37	4.02	29.80	-25.59	-13	-12.59	Vertical
5160	-52.13	5.24	35.84	-21.53	-13	-8.53	Vertical
5160	-55.74	5.24	35.84	-25.14	-13	-12.14	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-49.30	4.03	30.00	-23.33	-13	-10.33	Horizontal
3465	-48.45	4.03	30.00	-22.48	-13	-9.48	Vertical
5197.5	-53.95	5.25	35.86	-23.34	-13	-10.34	Vertical
5197.5	-50.32	5.25	35.86	-19.71	-13	-6.71	Horizontal
Test Results for High Channel 1745MHz							
2490	-48.44	2.91	27.68	-23.67	-13	-10.67	Horizontal
3490	-52.05	2.91	27.68	-27.28	-13	-14.28	Vertical
5235	-57.38	5.26	35.86	-26.78	-13	-13.78	Vertical
5235	-52.10	5.26	35.86	-21.50	-13	-8.50	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	-49.23	2.78	27.50	-24.51	-13	-11.51	Horizontal
1649.4	-52.99	2.78	27.50	-28.27	-13	-15.27	Vertical
2474.1	-57.67	2.90	27.80	-32.77	-13	-19.77	Vertical
2474.1	-57.65	2.90	27.80	-32.75	-13	-19.75	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-53.04	2.78	27.48	-28.34	-13	-15.34	Horizontal
1673	-49.20	2.78	27.48	-24.50	-13	-11.50	Vertical
2509.5	-57.54	2.91	27.70	-32.75	-13	-19.75	Vertical
2509.5	-49.99	2.91	27.70	-25.20	-13	-12.20	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-47.99	2.78	27.43	-23.34	-13	-10.34	Horizontal
1696.6	-50.56	2.78	27.43	-25.91	-13	-12.91	Vertical
2544.9	-50.99	2.92	27.74	-26.17	-13	-13.17	Vertical
2544.9	-55.01	2.92	27.74	-30.19	-13	-17.19	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ 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
1658	-53.21	2.78	27.50	-28.49	-13	-15.49	Horizontal
1658	-52.01	2.78	27.50	-27.29	-13	-14.29	Vertical
2487	-49.49	2.90	27.80	-24.59	-13	-11.59	Vertical
2487	-56.34	2.90	27.80	-31.44	-13	-18.44	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-50.06	2.78	27.48	-25.36	-13	-12.36	Horizontal
1673	-50.26	2.78	27.48	-25.56	-13	-12.56	Vertical
2509.5	-50.15	2.91	27.70	-25.36	-13	-12.36	Vertical
2509.5	-49.73	2.91	27.70	-24.94	-13	-11.94	Horizontal
Test Results for High Channel 848.3MHz							
1688	-53.79	2.78	27.43	-29.14	-13	-16.14	Horizontal
1688	-50.79	2.78	27.43	-26.14	-13	-13.14	Vertical
2532	-52.89	2.92	27.74	-28.07	-13	-15.07	Vertical
2532	-56.03	2.92	27.74	-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.

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	-54.88	2.60	27.2	-30.28	-13	-17.28	Horizontal
1399.4	-48.27	2.60	27.2	-23.67	-13	-10.67	Vertical
2099.1	-56.80	2.85	27.54	-32.11	-13	-19.11	Vertical
2099.1	-57.66	2.85	27.54	-32.97	-13	-19.97	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-48.61	2.61	27.28	-23.94	-13	-10.94	Horizontal
1415	-47.05	2.61	27.28	-22.38	-13	-9.38	Vertical
2122.5	-49.57	2.87	27.59	-24.85	-13	-11.85	Vertical
2122.5	-57.57	2.87	27.59	-32.85	-13	-19.85	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-49.70	2.63	27.28	-25.05	-13	-12.05	Horizontal
1430.6	-47.59	2.63	27.28	-22.94	-13	-9.94	Vertical
2145.9	-57.69	2.88	27.60	-32.97	-13	-19.97	Vertical
2145.9	-53.61	2.88	27.60	-28.89	-13	-15.89	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	-53.03	2.61	27.26	-28.38	-13	-15.38	Horizontal
1408	-53.27	2.61	27.26	-28.62	-13	-15.62	Vertical
2112	-49.70	2.87	27.58	-24.99	-13	-11.99	Vertical
2112	-49.88	2.87	27.58	-25.17	-13	-12.17	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-50.25	2.61	27.28	-25.58	-13	-12.58	Horizontal
1415	-54.77	2.61	27.28	-30.10	-13	-17.10	Vertical
2122.5	-50.07	2.87	27.59	-25.35	-13	-12.35	Vertical
2122.5	-52.88	2.87	27.59	-28.16	-13	-15.16	Horizontal
Test Results for High Channel 711MHz							
1422	-50.01	2.62	27.28	-25.35	-13	-12.35	Horizontal
1422	-48.12	2.62	27.28	-23.46	-13	-10.46	Vertical
2133	-56.86	2.87	27.60	-32.13	-13	-19.13	Vertical
2133	-51.72	2.87	27.60	-26.99	-13	-13.99	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	-51.32	2.61	27.28	-26.65	-13	-13.65	Horizontal
1413	-50.44	2.61	27.28	-25.77	-13	-12.77	Vertical
2119.5	-52.05	2.87	27.59	-27.33	-13	-14.33	Vertical
2119.5	-52.27	2.87	27.59	-27.55	-13	-14.55	Horizontal
Test Results For Mid Channel 710MHz							
1420	-49.60	2.62	27.30	-24.92	-13	-11.92	Horizontal
1420	-49.03	2.62	27.30	-24.35	-13	-11.35	Vertical
2130	-56.90	2.87	27.62	-32.15	-13	-19.15	Vertical
2130	-51.53	2.87	27.62	-26.78	-13	-13.78	Horizontal
Test Results for High Channel 713.5MHz							
1427	-49.92	2.66	27.28	-25.30	-13	-12.30	Horizontal
1427	-50.09	2.66	27.28	-25.47	-13	-12.47	Vertical
2140.5	-51.94	2.88	27.60	-27.22	-13	-14.22	Vertical
2140.5	-54.39	2.88	27.60	-29.67	-13	-16.67	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	-51.52	2.62	27.30	-26.84	-13	-13.84	Horizontal
1418	-52.43	2.62	27.30	-27.75	-13	-14.75	Vertical
2127	-54.18	2.87	27.62	-29.43	-13	-16.43	Vertical
2127	-50.72	2.87	27.62	-25.97	-13	-12.97	Horizontal
Test Results for Mid Channel 710MHz							
1420	-49.40	2.62	27.30	-24.72	-13	-11.72	Horizontal
1420	-52.83	2.62	27.30	-28.15	-13	-15.15	Vertical
2130	-54.99	2.87	27.62	-30.24	-13	-17.24	Vertical
2130	-51.16	2.87	27.62	-26.41	-13	-13.41	Horizontal
Test Results for High Channel 711MHz							
1422	-47.42	2.62	27.30	-22.74	-13	-9.74	Horizontal
1422	-50.68	2.62	27.30	-26.00	-13	-13.00	Vertical
2133	-52.64	2.87	27.62	-27.89	-13	-14.89	Vertical
2133	-57.29	2.87	27.62	-32.54	-13	-19.54	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 41

QPSK EIRP POWER FOR LTE BAND 41 (5MHZ BANDWIDTH)

Test Results for Low Channel 2598.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997	-57.19	2.63	27.26	-32.56	-25	-7.56	Horizontal
4997	-56.41	2.63	27.26	-31.78	-25	-6.78	Vertical
7495.5	-56.02	2.67	27.58	-31.11	-25	-6.11	Vertical
7495.5	-55.50	2.67	27.58	-30.59	-25	-5.59	Horizontal
Test Results for Mid Channel 2593MHz							
5186	-54.97	2.62	27.28	-30.31	-25	-5.31	Horizontal
5186	-55.47	2.62	27.28	-30.81	-25	-5.81	Vertical
7779	-56.34	2.85	27.62	-31.57	-25	-6.57	Vertical
7779	-56.53	2.85	27.62	-31.76	-25	-6.76	Horizontal
Test Results for High Channel 2697.5MHz							
5375	-52.78	2.64	27.28	-28.14	-25	-3.14	Horizontal
5375	-56.10	2.64	27.28	-31.46	-25	-6.46	Vertical
8062.5	-52.57	2.85	27.70	-27.72	-25	-2.72	Vertical
8062.5	-56.18	2.85	27.70	-31.33	-25	-6.33	Horizontal

QPSK EIRP POWER FOR LTE BAND 41 (20MHZ BANDWIDTH)

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012	-52.30	2.63	27.30	-27.63	-25	-2.63	Horizontal
5012	-53.38	2.63	27.30	-28.71	-25	-3.71	Vertical
7518	-55.42	2.67	27.62	-30.47	-25	-5.47	Vertical
7518	-56.42	2.67	27.62	-31.47	-25	-6.47	Horizontal
Test Results for Mid Channel 2593MHz							
5186	-52.20	2.62	27.33	-27.49	-25	-2.49	Horizontal
5186	-52.83	2.62	27.33	-28.12	-25	-3.12	Vertical
7779	-56.42	2.85	27.67	-31.60	-25	-6.60	Vertical
7779	-52.64	2.85	27.67	-27.82	-25	-2.82	Horizontal
Test Results for High Channel 2680MHz							
5360	-57.38	2.64	27.33	-32.69	-25	-7.69	Horizontal
5360	-57.57	2.64	27.33	-32.88	-25	-7.88	Vertical
8040	-52.90	2.85	27.67	-28.08	-25	-3.08	Vertical
8040	-54.88	2.85	27.67	-30.06	-25	-5.06	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.

9.8 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	-47.77	2.61	27.28	-23.10	-13	-10.10	Horizontal
3421.4	-48.09	2.61	27.28	-23.42	-13	-10.42	Vertical
5132.1	-49.01	2.87	27.59	-24.29	-13	-11.29	Vertical
5132.1	-52.02	2.87	27.59	-27.30	-13	-14.30	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-48.79	2.62	27.3	-24.11	-13	-11.11	Horizontal
3490	-53.18	2.62	27.3	-28.50	-13	-15.50	Vertical
5337.9	-50.49	2.87	27.62	-25.74	-13	-12.74	Vertical
5337.9	-54.81	2.87	27.62	-30.06	-13	-17.06	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-50.56	2.66	27.28	-25.94	-13	-12.94	Horizontal
3558.6	-47.29	2.66	27.28	-22.67	-13	-9.67	Vertical
5337.9	-56.04	2.88	27.6	-31.32	-13	-18.32	Vertical
5337.9	-50.32	2.88	27.6	-25.60	-13	-12.60	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	-54.86	2.62	27.3	-30.18	-13	-17.18	Horizontal
3440	-53.34	2.62	27.3	-28.66	-13	-15.66	Vertical
5160	-49.59	2.87	27.62	-24.84	-13	-11.84	Vertical
5160	-51.25	2.87	27.62	-26.50	-13	-13.50	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-54.06	2.62	27.3	-29.38	-13	-16.38	Horizontal
3490	-49.50	2.62	27.3	-24.82	-13	-11.82	Vertical
5337.9	-56.68	2.87	27.62	-31.93	-13	-18.93	Vertical
5337.9	-54.24	2.87	27.62	-29.49	-13	-16.49	Horizontal
Test Results for High Channel 1770MHz							
3540	-52.65	2.62	27.3	-27.97	-13	-14.97	Horizontal
3540	-48.09	2.62	27.3	-23.41	-13	-10.41	Vertical
5310	-57.90	2.87	27.62	-33.15	-13	-20.15	Vertical
5310	-55.66	2.87	27.62	-30.91	-13	-17.91	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.

9.9 LTE BAND 71

QPSK EIRP POWER FOR LTE BAND 71 (5MHZ BANDWIDTH)

Test Results for Low Channel 665.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1331	-52.12	2.61	27.28	-27.45	-13	-14.45	Horizontal
1331	-54.87	2.61	27.28	-30.20	-13	-17.20	Vertical
1996.5	-49.71	2.87	27.59	-24.99	-13	-11.99	Vertical
1996.5	-54.62	2.87	27.59	-29.90	-13	-16.90	Horizontal
Test Results for Mid Channel 680.5MHz							
1361	-48.49	2.62	27.30	-23.81	-13	-10.81	Horizontal
1361	-53.22	2.62	27.30	-28.54	-13	-15.54	Vertical
2041.5	-53.30	2.87	27.62	-28.55	-13	-15.55	Vertical
2041.5	-51.88	2.87	27.62	-27.13	-13	-14.13	Horizontal
Test Results for High Channel 695.5MHz							
1391	-54.37	2.66	27.28	-29.75	-13	-16.75	Horizontal
1391	-48.74	2.66	27.28	-24.12	-13	-11.12	Vertical
2086.5	-56.86	2.88	27.60	-32.14	-13	-19.14	Vertical
2086.5	-50.12	2.88	27.60	-25.40	-13	-12.40	Horizontal

QPSK EIRP POWER FOR LTE BAND 71 (20MHZ BANDWIDTH)

Test Results for Low Channel 673MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1346	-50.06	2.62	27.30	-25.38	-13	-12.38	Horizontal
1346	-54.98	2.62	27.30	-30.30	-13	-17.30	Vertical
2019	-51.49	2.87	27.62	-26.74	-13	-13.74	Vertical
2019	-56.47	2.87	27.62	-31.72	-13	-18.72	Horizontal
Test Results for Mid Channel 683MHz							
1366	-47.66	2.62	27.30	-22.98	-13	-9.98	Horizontal
1366	-53.35	2.62	27.30	-28.67	-13	-15.67	Vertical
2049	-54.83	2.87	27.62	-30.08	-13	-17.08	Vertical
2049	-56.40	2.87	27.62	-31.65	-13	-18.65	Horizontal
Test Results for High Channel 688MHz							
1376	-52.77	2.62	27.30	-28.09	-13	-15.09	Horizontal
1376	-53.65	2.62	27.30	-28.97	-13	-15.97	Vertical
2064	-57.51	2.87	27.62	-32.76	-13	-19.76	Vertical
2064	-54.33	2.87	27.62	-29.58	-13	-16.58	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 2/4/5/12/17/41/66/71

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	1	0.000532	2.5
3.87	1880	13	0.006915	2.5
4.45	1880	6	0.003191	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	16	0.008511	2.5
Extreme (50C)	1880	2	0.001064	2.5
Extreme (40C)	1880	19	0.010106	2.5
Extreme (30C)	1880	13	0.006915	2.5
Extreme (10C)	1880	12	0.006383	2.5
Extreme (0C)	1880	3	0.001596	2.5
Extreme (-10C)	1880	16	0.008511	2.5
Extreme (-20C)	1880	4	0.002128	2.5
Extreme (-30C)	1880	7	0.003723	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	6	0.003191	2.5
3.87	1880	13	0.006915	2.5
4.45	1880	17	0.009043	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	3	0.001596	2.5
Extreme (50C)	1880	16	0.008511	2.5
Extreme (40C)	1880	18	0.009574	2.5
Extreme (30C)	1880	6	0.003191	2.5
Extreme (10C)	1880	22	0.011702	2.5
Extreme (0C)	1880	13	0.006915	2.5
Extreme (-10C)	1880	12	0.006383	2.5
Extreme (-20C)	1880	13	0.006915	2.5
Extreme (-30C)	1880	18	0.009574	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	0	0.000000	2.5
3.87	1732.5	16	0.009235	2.5
4.45	1732.5	11	0.006349	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	3	0.001732	2.5
Extreme (50C)	1732.5	4	0.002309	2.5
Extreme (40C)	1732.5	15	0.008658	2.5
Extreme (30C)	1732.5	17	0.009812	2.5
Extreme (10C)	1732.5	18	0.010390	2.5
Extreme (0C)	1732.5	7	0.004040	2.5
Extreme (-10C)	1732.5	12	0.006926	2.5
Extreme (-20C)	1732.5	9	0.005195	2.5
Extreme (-30C)	1732.5	13	0.007504	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	11	0.006349	2.5
3.87	1732.5	7	0.004040	2.5
4.45	1732.5	5	0.002886	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	19	0.010967	2.5
Extreme (50C)	1732.5	13	0.007504	2.5
Extreme (40C)	1732.5	8	0.004618	2.5
Extreme (30C)	1732.5	6	0.003463	2.5
Extreme (10C)	1732.5	18	0.010390	2.5
Extreme (0C)	1732.5	22	0.012698	2.5
Extreme (-10C)	1732.5	19	0.010967	2.5
Extreme (-20C)	1732.5	3	0.001732	2.5
Extreme (-30C)	1732.5	1	0.000577	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	18	0.021518	2.5
3.87	836.5	17	0.020323	2.5
4.45	836.5	1	0.001195	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6	0.007173	2.5
Extreme (50C)	836.5	17	0.020323	2.5
Extreme (40C)	836.5	16	0.019127	2.5
Extreme (30C)	836.5	15	0.017932	2.5
Extreme (10C)	836.5	1	0.001195	2.5
Extreme (0C)	836.5	14	0.016736	2.5
Extreme (-10C)	836.5	11	0.013150	2.5
Extreme (-20C)	836.5	12	0.014345	2.5
Extreme (-30C)	836.5	5	0.005977	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	6	0.007173	2.5
3.87	836.5	3	0.003586	2.5
4.45	836.5	2	0.002391	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	16	0.019127	2.5
Extreme (50C)	836.5	17	0.020323	2.5
Extreme (40C)	836.5	11	0.013150	2.5
Extreme (30C)	836.5	24	0.028691	2.5
Extreme (10C)	836.5	17	0.020323	2.5
Extreme (0C)	836.5	12	0.014345	2.5
Extreme (-10C)	836.5	17	0.020323	2.5
Extreme (-20C)	836.5	13	0.015541	2.5
Extreme (-30C)	836.5	11	0.013150	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	11	0.015548	2.5
3.87	707.5	17	0.024028	2.5
4.45	707.5	10	0.014134	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	18	0.025442	2.5
Extreme (50C)	707.5	25	0.035336	2.5
Extreme (40C)	707.5	21	0.029682	2.5
Extreme (30C)	707.5	18	0.025442	2.5
Extreme (10C)	707.5	9	0.012721	2.5
Extreme (0C)	707.5	7	0.009894	2.5
Extreme (-10C)	707.5	7	0.009894	2.5
Extreme (-20C)	707.5	6	0.008481	2.5
Extreme (-30C)	707.5	0	0.000000	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	2	0.002827	2.5
3.87	707.5	4	0.005654	2.5
4.45	707.5	7	0.009894	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	14	0.019788	2.5
Extreme (50C)	707.5	4	0.005654	2.5
Extreme (40C)	707.5	15	0.021201	2.5
Extreme (30C)	707.5	3	0.004240	2.5
Extreme (10C)	707.5	6	0.008481	2.5
Extreme (0C)	707.5	1	0.001413	2.5
Extreme (-10C)	707.5	16	0.022615	2.5
Extreme (-20C)	707.5	12	0.016961	2.5
Extreme (-30C)	707.5	23	0.032509	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	5	0.007042	2.5
3.87	710	14	0.019718	2.5
4.45	710	11	0.015493	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	1	0.001408	2.5
Extreme (50C)	710	0	0.000000	2.5
Extreme (40C)	710	8	0.011268	2.5
Extreme (30C)	710	9	0.012676	2.5
Extreme (10C)	710	15	0.021127	2.5
Extreme (0C)	710	16	0.022535	2.5
Extreme (-10C)	710	17	0.023944	2.5
Extreme (-20C)	710	13	0.018310	2.5
Extreme (-30C)	710	14	0.019718	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	6	0.008451	2.5
3.87	710	6	0.008451	2.5
4.45	710	13	0.018310	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	14	0.019718	2.5
Extreme (50C)	710	15	0.021127	2.5
Extreme (40C)	710	13	0.018310	2.5
Extreme (30C)	710	3	0.004225	2.5
Extreme (10C)	710	6	0.008451	2.5
Extreme (0C)	710	12	0.016901	2.5
Extreme (-10C)	710	17	0.023944	2.5
Extreme (-20C)	710	4	0.005634	2.5
Extreme (-30C)	710	8	0.011268	2.5

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

10.7 LTE BAND 41

Band 41 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	2593	19	0.007327	2.5
3.87	2593	14	0.005399	2.5
4.45	2593	13	0.005013	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	0	0.000000	2.5
Extreme (50C)	2593	4	0.001543	2.5
Extreme (40C)	2593	11	0.004242	2.5
Extreme (30C)	2593	6	0.002314	2.5
Extreme (10C)	2593	7	0.002700	2.5
Extreme (0C)	2593	13	0.005013	2.5
Extreme (-10C)	2593	5	0.001928	2.5
Extreme (-20C)	2593	14	0.005399	2.5
Extreme (-30C)	2593	2	0.000771	2.5

Band 41 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	2593	7	0.002700	2.5
3.87	2593	3	0.001157	2.5
4.45	2593	17	0.006556	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	7	0.002700	2.5
Extreme (50C)	2593	13	0.005013	2.5
Extreme (40C)	2593	14	0.005399	2.5
Extreme (30C)	2593	23	0.008870	2.5
Extreme (10C)	2593	3	0.001157	2.5
Extreme (0C)	2593	24	0.009256	2.5
Extreme (-10C)	2593	10	0.003857	2.5
Extreme (-20C)	2593	18	0.006942	2.5
Extreme (-30C)	2593	24	0.009256	2.5

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

10.8 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	0.003438	2.5
3.87	1745	24	0.013754	2.5
4.45	1745	23	0.013181	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	18	0.010315	2.5
Extreme (50C)	1745	12	0.006877	2.5
Extreme (40C)	1745	5	0.002865	2.5
Extreme (30C)	1745	10	0.005731	2.5
Extreme (10C)	1745	13	0.007450	2.5
Extreme (0C)	1745	16	0.009169	2.5
Extreme (-10C)	1745	9	0.005158	2.5
Extreme (-20C)	1745	9	0.005158	2.5
Extreme (-30C)	1745	1	0.000573	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	0.004585	2.5
3.87	1745	19	0.010888	2.5
4.45	1745	17	0.009742	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	1	0.000573	2.5
Extreme (50C)	1745	0	0.000000	2.5
Extreme (40C)	1745	19	0.010888	2.5
Extreme (30C)	1745	12	0.006877	2.5
Extreme (10C)	1745	1	0.000573	2.5
Extreme (0C)	1745	17	0.009742	2.5
Extreme (-10C)	1745	5	0.002865	2.5
Extreme (-20C)	1745	4	0.002292	2.5
Extreme (-30C)	1745	9	0.005158	2.5

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

10.9 LTE BAND 71

Band 71 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	683	16	0.023426	2.5
3.87	683	16	0.023426	2.5
4.45	683	2	0.002928	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	683	4	0.005857	2.5
Extreme (50C)	683	7	0.010249	2.5
Extreme (40C)	683	6	0.008785	2.5
Extreme (30C)	683	5	0.007321	2.5
Extreme (10C)	683	4	0.005857	2.5
Extreme (0C)	683	11	0.016105	2.5
Extreme (-10C)	683	5	0.007321	2.5
Extreme (-20C)	683	13	0.019034	2.5
Extreme (-30C)	683	16	0.023426	2.5

Band 71 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	683	16	0.023426	2.5
3.87	683	22	0.032211	2.5
4.45	683	18	0.026354	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	683	20	0.029283	2.5
Extreme (50C)	683	22	0.032211	2.5
Extreme (40C)	683	18	0.026354	2.5
Extreme (30C)	683	20	0.029283	2.5
Extreme (10C)	683	15	0.021962	2.5
Extreme (0C)	683	18	0.026354	2.5
Extreme (-10C)	683	20	0.029283	2.5
Extreme (-20C)	683	22	0.032211	2.5
Extreme (-30C)	683	18	0.026354	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.

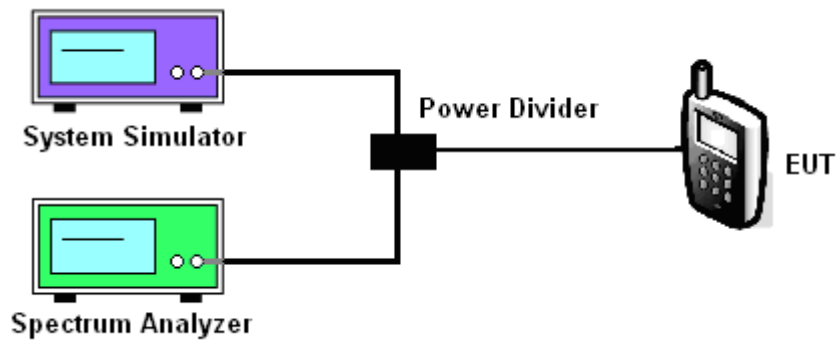
11.2 Measuring Instruments

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 2/4/5/12/17/41/66/71

Test data reference attachment.

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