

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

FCC ID: 2AOWK-3290

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ3290

Family Model: Note 19, Note 19 Ultra, Note 19 Pro, Note 19E,
Note 19S, Note 19 Lite, Note 19s, Note 19s Pro

Report No.: S24082606905005

Issue Date: Oct. 09, 2024

Prepared for

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TEST RESULT CERTIFICATION

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

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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 ...: GQ3290

Trade Mark.....: ulefone

Family Model.....: Note 19, Note 19 Ultra, Note 19 Pro, Note 19E, Note 19S, Note 19 Lite, Note 19s, Note 19s Pro

Test Sample Number..... S240826069006

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.

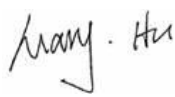
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Date of Test

Date (s) of performance of tests Aug. 26, 2024 ~ Oct. 09, 2024

Date of Issue Oct. 09, 2024

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

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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	GQ3290
Family Model	Note 19, Note 19 Ultra, Note 19 Pro, Note 19E, Note 19S, Note 19 Lite, Note 19s, Note 19s Pro
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2AOWK-3290
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7, 12, 17, 66 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 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 41 Uplink& Downlink: 2535MHz-2655MHz, LTE FDD 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:	FPC Antenna
Antenna gain:	Band 2: +0.76 dBi, Band 4: +0.71dBi, Band 5: -0.92 dBi, Band 7: +0.97dBi, Band 12: -1.25dBi, Band 17: -1.25 dBi, Band 41:+0.97 dBi , Band 66: +0.71dBi
Adapter	Model: HJ-0502000-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A 10.0W
Battery	DC 3.85V, 5000mAh, 19.250Wh
Power supply	DC 3.85V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.27V to DC 4.43V (Nominal DC 3.85V) (Note 1)
HW Version	L617A_V1
SW Version	N/A
** Note1: The High Voltage DC 4.43V and Low Voltage 3.27V 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-3290** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District, Shenzhen, Guangdong, China.

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

FCC Registration No.:463705

IC Registration No.:9270A,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2/4/5/7/12/17/41/66

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

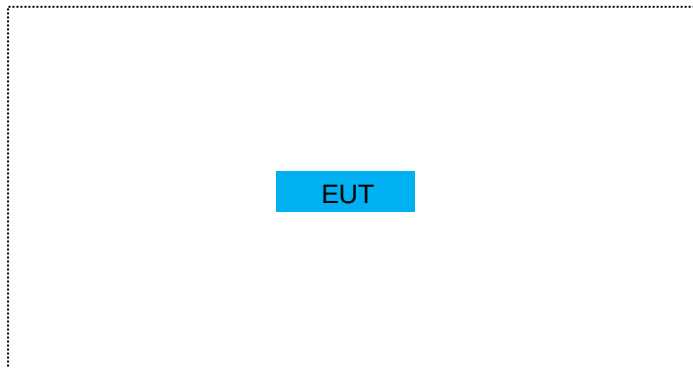
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	GQ3290	FCC ID: 2AOWK-3290	EUT

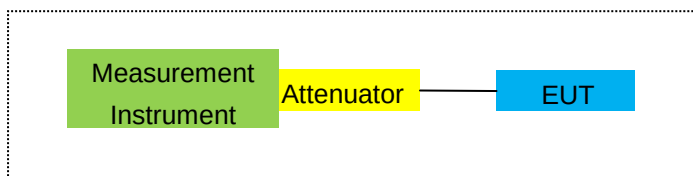
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

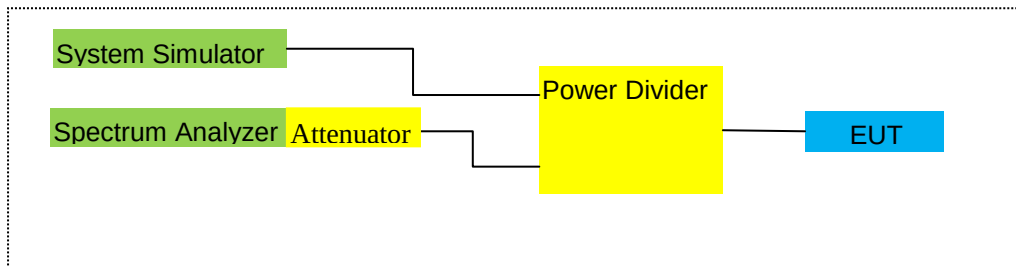
For Radiated Test Cases



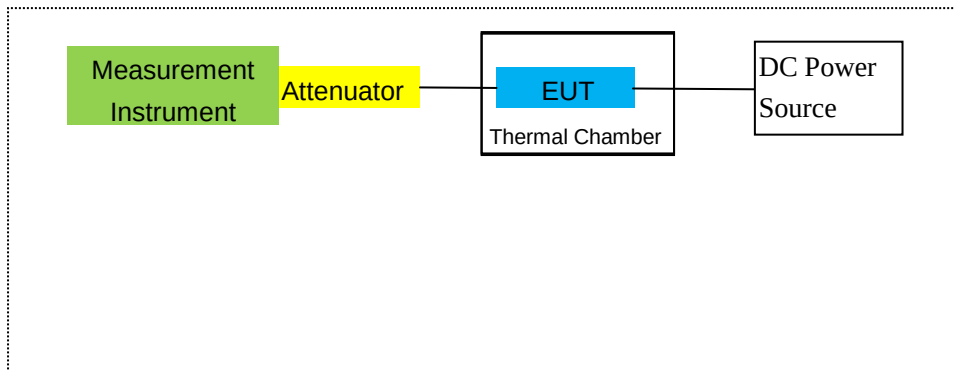
For Conducted Output Power



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	MWRFTest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest
4	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
64 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".

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 2/4/5/7/12/17/41/66

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

LIMITS

FCC: §22.917, §24.238, §27.53

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

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

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

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

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/4/5/7/12/17/41/66

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

1. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.
2. The Band 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 2/4/5/7/12/17/41/66

☐

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

☐ Band 2/4/5/7/12/17/41/66

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
1.4MHz Band QPSK	6/0	1850.7	17.44	3.76	8.90	22.58	181.134	Horizontal	Pass
		1880	14.79	3.91	8.90	19.78	95.060	Horizontal	Pass
		1909.3	15.10	3.93	8.90	20.07	101.625	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	13.50	3.77	8.90	18.63	72.946	Horizontal	Pass
		1880	15.28	3.91	8.90	20.27	106.414	Horizontal	Pass
		1908.5	16.13	3.94	8.90	21.09	128.529	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	15.86	3.77	8.90	20.99	125.603	Horizontal	Pass
		1880	16.99	3.91	8.90	21.98	157.761	Horizontal	Pass
		1907.5	16.77	3.94	8.90	21.73	148.936	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	17.11	3.79	8.90	22.22	166.725	Horizontal	Pass
		1880	17.68	3.95	8.90	22.63	183.231	Horizontal	Pass
		1905	15.89	3.97	8.90	20.82	120.781	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	15.73	3.79	8.90	20.84	121.339	Horizontal	Pass
		1880	17.33	3.95	8.90	22.28	169.044	Horizontal	Pass
		1902.5	15.99	3.97	8.90	20.92	123.595	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	16.32	3.81	8.90	21.41	138.357	Horizontal	Pass
		1880	14.93	3.96	8.90	19.87	97.051	Horizontal	Pass
		1900	16.50	4.00	8.90	21.4	138.038	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	16.09	3.76	8.90	21.23	132.739	Vertical	Pass
		1880	15.35	3.91	8.90	20.34	108.143	Vertical	Pass
		1909.3	15.83	3.93	8.90	20.8	120.226	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	16.23	3.77	8.90	21.36	136.773	Vertical	Pass
		1880	17.02	3.91	8.90	22.01	158.855	Vertical	Pass
		1908.5	15.21	3.94	8.90	20.17	103.992	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	15.99	3.77	8.90	21.12	129.420	Vertical	Pass
		1880	15.50	3.91	8.90	20.49	111.944	Vertical	Pass
		1907.5	17.59	3.94	8.90	22.55	179.887	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	14.89	3.79	8.90	20	100.000	Vertical	Pass
		1880	13.55	3.95	8.90	18.5	70.795	Vertical	Pass
		1905	14.41	3.97	8.90	19.34	85.901	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	15.61	3.79	8.90	20.72	118.032	Vertical	Pass
		1880	16.24	3.95	8.90	21.19	131.522	Vertical	Pass
		1902.5	16.50	3.97	8.90	21.43	138.995	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	17.87	3.81	8.90	22.96	197.697	Vertical	Pass
		1880	15.74	3.96	8.90	20.68	116.950	Vertical	Pass
		1900	16.60	4.00	8.90	21.5	141.254	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	6/0	1850.7	14.60	3.76	8.90	19.51	89.331	Horizontal	Pass
		1880	15.75	3.91	8.90	19.41	87.297	Horizontal	Pass
		1909.3	15.45	3.93	8.90	20.46	111.173	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	15.29	3.77	8.90	17.5	56.234	Horizontal	Pass
		1880	14.95	3.91	8.90	18.2	66.069	Horizontal	Pass
		1908.5	14.55	3.94	8.90	18.29	67.453	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	15.14	3.77	8.90	20.68	116.950	Horizontal	Pass
		1880	15.50	3.91	8.90	18.49	70.632	Horizontal	Pass
		1907.5	14.00	3.94	8.90	17.73	59.293	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	15.35	3.79	8.90	21.37	137.088	Horizontal	Pass
		1880	14.05	3.95	8.90	18.82	76.208	Horizontal	Pass
		1905	15.36	3.97	8.90	19.57	90.573	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.68	3.79	8.90	20.43	110.408	Horizontal	Pass
		1880	15.77	3.95	8.90	19.89	97.499	Horizontal	Pass
		1902.5	15.65	3.97	8.90	20.33	107.895	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	13.84	3.81	8.90	18.07	64.121	Horizontal	Pass
		1880	16.17	3.96	8.90	20.02	100.462	Horizontal	Pass
		1900	14.55	4.00	8.90	18.84	76.560	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	14.61	3.76	8.90	20.72	118.032	Vertical	Pass
		1880	15.84	3.91	8.90	19.46	88.308	Vertical	Pass
		1909.3	15.13	3.93	8.90	19.63	91.833	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	13.77	3.77	8.90	16.95	49.545	Vertical	Pass
		1880	14.83	3.91	8.90	19.52	89.536	Vertical	Pass
		1908.5	14.56	3.94	8.90	18.59	72.277	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	13.76	3.77	8.90	20.4	109.648	Vertical	Pass
		1880	15.05	3.91	8.90	21.62	145.211	Vertical	Pass
		1907.5	15.69	3.94	8.90	17.93	62.087	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	13.98	3.79	8.90	19.76	94.624	Vertical	Pass
		1880	15.57	3.95	8.90	19.46	88.308	Vertical	Pass
		1905	15.12	3.97	8.90	19.44	87.902	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.85	3.79	8.90	19.63	91.833	Vertical	Pass
		1880	14.87	3.95	8.90	20.77	119.399	Vertical	Pass
		1902.5	13.66	3.97	8.90	20.54	113.240	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	14.29	3.81	8.90	21.68	147.231	Vertical	Pass
		1880	14.90	3.96	8.90	21.84	152.757	Vertical	Pass
		1900	13.78	4.00	8.90	18.96	78.705	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	13.59	3.12	8.90	19.37	86.497	Horizontal	Pass
		1732.5	13.15	3.27	8.90	18.78	75.509	Horizontal	Pass
		1754.3	15.27	3.29	8.90	20.88	122.462	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	13.58	3.13	8.90	19.35	86.099	Horizontal	Pass
		1732.5	14.47	3.27	8.90	20.1	102.329	Horizontal	Pass
		1753.5	14.55	3.30	8.90	20.15	103.514	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	15.04	3.13	8.90	20.81	120.504	Horizontal	Pass
		1732.5	14.93	3.27	8.90	20.56	113.763	Horizontal	Pass
		1752.5	13.99	3.30	8.90	19.59	90.991	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	14.42	3.15	8.90	20.17	103.992	Horizontal	Pass
		1732.5	14.18	3.31	8.90	19.77	94.842	Horizontal	Pass
		1750	15.35	3.33	8.90	20.92	123.595	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	14.95	3.15	8.90	20.7	117.490	Horizontal	Pass
		1732.5	15.27	3.31	8.90	20.86	121.899	Horizontal	Pass
		1747.5	15.89	3.33	8.90	21.46	139.959	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.63	3.17	8.90	19.36	86.298	Horizontal	Pass
		1732.5	14.38	3.32	8.90	19.96	99.083	Horizontal	Pass
		1745	14.55	3.36	8.90	20.09	102.094	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	14.02	3.12	8.90	19.8	95.499	Vertical	Pass
		1732.5	14.44	3.27	8.90	20.07	101.625	Vertical	Pass
		1754.3	14.41	3.29	8.90	20.02	100.462	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	14.93	3.13	8.90	20.7	117.490	Vertical	Pass
		1732.5	15.46	3.27	8.90	21.09	128.529	Vertical	Pass
		1753.5	15.61	3.30	8.90	21.21	132.130	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	14.27	3.13	8.90	20.04	100.925	Vertical	Pass
		1732.5	15.26	3.27	8.90	20.89	122.744	Vertical	Pass
		1752.5	13.83	3.30	8.90	19.43	87.700	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	11.56	3.15	8.90	17.31	53.827	Vertical	Pass
		1732.5	14.86	3.31	8.90	20.45	110.917	Vertical	Pass
		1750	13.83	3.33	8.90	19.4	87.096	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	15.14	3.15	8.90	20.89	122.744	Vertical	Pass
		1732.5	14.67	3.31	8.90	20.26	106.170	Vertical	Pass
		1747.5	14.48	3.33	8.90	20.05	101.158	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	15.81	3.17	8.90	21.54	142.561	Vertical	Pass
		1732.5	16.70	3.32	8.90	22.28	169.044	Vertical	Pass
		1745	13.98	3.36	8.90	19.52	89.536	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	14.60	3.12	8.90	20.38	109.144	Horizontal	Pass
		1732.5	15.42	3.27	8.90	21.05	127.350	Horizontal	Pass
		1754.3	14.72	3.29	8.90	20.33	107.895	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.87	3.13	8.90	19.64	92.045	Horizontal	Pass
		1732.5	14.25	3.27	8.90	19.88	97.275	Horizontal	Pass
		1753.5	15.13	3.30	8.90	20.73	118.304	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.19	3.13	8.90	18.96	78.705	Horizontal	Pass
		1732.5	12.83	3.27	8.90	18.46	70.146	Horizontal	Pass
		1752.5	14.58	3.30	8.90	20.18	104.232	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	14.91	3.15	8.90	20.66	116.413	Horizontal	Pass
		1732.5	12.62	3.31	8.90	18.21	66.222	Horizontal	Pass
		1750	12.87	3.33	8.90	18.44	69.823	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.47	3.15	8.90	20.22	105.196	Horizontal	Pass
		1732.5	14.68	3.31	8.90	20.27	106.414	Horizontal	Pass
		1747.5	13.82	3.33	8.90	19.39	86.896	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	13.69	3.17	8.90	19.42	87.498	Horizontal	Pass
		1732.5	15.32	3.32	8.90	20.9	123.027	Horizontal	Pass
		1745	15.28	3.36	8.90	20.82	120.781	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	15.45	3.12	8.90	21.23	132.739	Vertical	Pass
		1732.5	15.24	3.27	8.90	20.87	122.180	Vertical	Pass
		1754.3	15.21	3.29	8.90	20.82	120.781	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.18	3.13	8.90	19.95	98.855	Vertical	Pass
		1732.5	14.18	3.27	8.90	19.81	95.719	Vertical	Pass
		1753.5	14.83	3.30	8.90	20.43	110.408	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	16.10	3.13	8.90	21.87	153.815	Vertical	Pass
		1732.5	14.18	3.27	8.90	19.81	95.719	Vertical	Pass
		1752.5	13.29	3.30	8.90	18.89	77.446	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	13.96	3.15	8.90	19.71	93.541	Vertical	Pass
		1732.5	14.54	3.31	8.90	20.13	103.039	Vertical	Pass
		1750	15.23	3.33	8.90	20.8	120.226	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.48	3.15	8.90	19.23	83.753	Vertical	Pass
		1732.5	13.65	3.31	8.90	19.24	83.946	Vertical	Pass
		1747.5	15.65	3.33	8.90	21.22	132.434	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	14.83	3.17	8.90	20.56	113.763	Vertical	Pass
		1732.5	16.39	3.32	8.90	21.97	157.398	Vertical	Pass
		1745	14.90	3.36	8.90	20.44	110.662	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	18.98	2.01	5.30	2.15	20.12	102.802	Horizontal	Pass
		836.5	20.20	2.01	5.30	2.15	21.34	136.144	Horizontal	Pass
		848.3	18.67	2.02	5.70	2.15	20.2	104.713	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	20.39	2.01	5.30	2.15	21.53	142.233	Horizontal	Pass
		836.5	20.82	2.01	5.30	2.15	21.96	157.036	Horizontal	Pass
		847.5	19.66	2.02	5.70	2.15	21.19	131.522	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	19.08	2.01	5.30	2.15	20.22	105.196	Horizontal	Pass
		836.5	20.62	2.01	5.30	2.15	21.76	149.968	Horizontal	Pass
		846.5	19.63	2.02	5.70	2.15	21.16	130.617	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	19.09	2.01	5.30	2.15	20.23	105.439	Horizontal	Pass
		836.5	20.00	2.01	5.30	2.15	21.14	130.017	Horizontal	Pass
		844	18.79	2.02	5.70	2.15	20.32	107.647	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	21.21	2.01	5.30	2.15	22.35	171.791	Vertical	Pass
		836.5	20.12	2.01	5.30	2.15	21.26	133.660	Vertical	Pass
		848.3	19.63	2.02	5.70	2.15	21.16	130.617	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	19.57	2.01	5.30	2.15	20.71	117.761	Vertical	Pass
		836.5	20.50	2.01	5.30	2.15	21.64	145.881	Vertical	Pass
		847.5	18.79	2.02	5.70	2.15	20.32	107.647	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	18.69	2.01	5.30	2.15	19.83	96.161	Vertical	Pass
		836.5	20.75	2.01	5.30	2.15	21.89	154.525	Vertical	Pass
		846.5	18.92	2.02	5.70	2.15	20.45	110.917	Vertical	Pass
10.0MHz Band QPSK	50/0	829	17.99	2.01	5.30	2.15	19.13	81.846	Vertical	Pass
		836.5	21.77	2.01	5.30	2.15	22.91	195.434	Vertical	Pass
		844	19.03	2.02	5.70	2.15	20.56	113.763	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	824.7	18.48	2.01	5.30	2.15	19.62	91.622	Horizontal	Pass
		836.5	18.86	2.01	5.30	2.15	20	100.000	Horizontal	Pass
		848.3	18.03	2.02	5.70	2.15	19.56	90.365	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	19.21	2.01	5.30	2.15	20.35	108.393	Horizontal	Pass
		836.5	17.53	2.01	5.30	2.15	18.67	73.621	Horizontal	Pass
		847.5	18.17	2.02	5.70	2.15	19.7	93.325	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	17.94	2.01	5.30	2.15	19.08	80.910	Horizontal	Pass
		836.5	16.91	2.01	5.30	2.15	18.05	63.826	Horizontal	Pass
		846.5	17.88	2.02	5.70	2.15	19.41	87.297	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	18.33	2.01	5.30	2.15	19.47	88.512	Horizontal	Pass
		836.5	18.61	2.01	5.30	2.15	19.75	94.406	Horizontal	Pass
		844	16.82	2.02	5.70	2.15	18.35	68.391	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	19.43	2.01	5.30	2.15	20.57	114.025	Vertical	Pass
		836.5	18.97	2.01	5.30	2.15	20.11	102.565	Vertical	Pass
		848.3	18.45	2.02	5.70	2.15	19.98	99.541	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	16.59	2.01	5.30	2.15	17.73	59.293	Vertical	Pass
		836.5	19.07	2.01	5.30	2.15	20.21	104.954	Vertical	Pass
		847.5	16.82	2.02	5.70	2.15	18.35	68.391	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	18.31	2.01	5.30	2.15	19.45	88.105	Vertical	Pass
		836.5	16.12	2.01	5.30	2.15	17.26	53.211	Vertical	Pass
		846.5	18.39	2.02	5.70	2.15	19.92	98.175	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	16.89	2.01	5.30	2.15	18.03	63.533	Vertical	Pass
		836.5	19.84	2.01	5.30	2.15	20.98	125.314	Vertical	Pass
		844	19.69	2.02	5.70	2.15	21.22	132.434	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	15.08	4.54	9.00	19.54	89.950	Horizontal	Pass
		2535	15.26	4.69	9.00	19.57	90.573	Horizontal	Pass
		2567.5	13.50	4.71	9.00	17.79	60.117	Horizontal	Pass
10.0MHz Band QPSK	50/0	2505	13.91	4.55	9.00	18.36	68.549	Horizontal	Pass
		2535	16.05	4.69	9.00	20.36	108.643	Horizontal	Pass
		2565	16.63	4.72	9.00	20.91	123.310	Horizontal	Pass
15.0MHz Band QPSK	75/0	2507.5	15.88	4.55	9.00	20.33	107.895	Horizontal	Pass
		2535	16.23	4.69	9.00	20.54	113.240	Horizontal	Pass
		2562.5	15.59	4.72	9.00	19.87	97.051	Horizontal	Pass
20.0MHz Band QPSK	100/0	2510	13.80	4.57	9.00	18.23	66.527	Horizontal	Pass
		2535	16.00	4.73	9.00	20.27	106.414	Horizontal	Pass
		2560	15.55	4.75	9.00	19.8	95.499	Horizontal	Pass
5.0MHz Band QPSK	25/0	2502.5	15.63	4.54	9.00	20.09	102.094	Vertical	Pass
		2535	16.28	4.69	9.00	20.59	114.551	Vertical	Pass
		2567.5	16.85	4.71	9.00	21.14	130.017	Vertical	Pass
10.0MHz Band QPSK	50/0	2505	14.23	4.55	9.00	18.68	73.790	Vertical	Pass
		2535	16.28	4.69	9.00	20.59	114.551	Vertical	Pass
		2565	16.80	4.72	9.00	21.08	128.233	Vertical	Pass
15.0MHz Band QPSK	75/0	2507.5	16.00	4.55	9.00	20.45	110.917	Vertical	Pass
		2535	18.01	4.69	9.00	22.32	170.608	Vertical	Pass
		2562.5	15.65	4.72	9.00	19.93	98.401	Vertical	Pass
20.0MHz Band QPSK	100/0	2510	16.32	4.57	9.00	20.75	118.850	Vertical	Pass
		2535	18.38	4.73	9.00	22.65	184.077	Vertical	Pass
		2560	16.43	4.75	9.00	20.68	116.950	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2502.5	13.89	4.54	9.00	18.35	68.391	Horizontal	Pass
		2535	14.65	4.69	9.00	18.96	78.705	Horizontal	Pass
		2567.5	14.07	4.71	9.00	18.36	68.549	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2505	14.65	4.55	9.00	19.1	81.283	Horizontal	Pass
		2535	13.87	4.69	9.00	18.18	65.766	Horizontal	Pass
		2565	16.14	4.72	9.00	20.42	110.154	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2507.5	15.01	4.55	9.00	19.46	88.308	Horizontal	Pass
		2535	15.71	4.69	9.00	20.02	100.462	Horizontal	Pass
		2562.5	13.09	4.72	9.00	17.37	54.576	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2510	14.79	4.57	9.00	19.22	83.560	Horizontal	Pass
		2535	13.59	4.73	9.00	17.86	61.094	Horizontal	Pass
		2560	14.05	4.75	9.00	18.3	67.608	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2502.5	14.38	4.54	9.00	18.84	76.560	Vertical	Pass
		2535	14.99	4.69	9.00	19.3	85.114	Vertical	Pass
		2567.5	15.86	4.71	9.00	20.15	103.514	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2505	14.80	4.55	9.00	19.25	84.140	Vertical	Pass
		2535	16.26	4.69	9.00	20.57	114.025	Vertical	Pass
		2565	14.99	4.72	9.00	19.27	84.528	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2507.5	15.33	4.55	9.00	19.78	95.060	Vertical	Pass
		2535	15.05	4.69	9.00	19.36	86.298	Vertical	Pass
		2562.5	14.53	4.72	9.00	18.81	76.033	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2510	16.49	4.57	9.00	20.92	123.595	Vertical	Pass
		2535	15.46	4.73	9.00	19.73	93.972	Vertical	Pass
		2560	15.15	4.75	9.00	19.4	87.096	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							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	20.01	1.91	5.60	2.15	21.55	142.889	Horizontal	Pass
		707.5	20.60	1.91	5.70	2.15	22.24	167.494	Horizontal	Pass
		715.3	18.39	1.93	5.80	2.15	20.11	102.565	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	18.75	1.91	5.60	2.15	20.29	106.905	Horizontal	Pass
		707.5	19.50	1.91	5.70	2.15	21.14	130.017	Horizontal	Pass
		714.5	19.60	1.93	5.80	2.15	21.32	135.519	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	19.78	1.91	5.60	2.15	21.32	135.519	Horizontal	Pass
		707.5	20.25	1.91	5.70	2.15	21.89	154.525	Horizontal	Pass
		713.5	20.14	1.92	5.80	2.15	21.87	153.815	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	19.64	1.91	5.60	2.15	21.18	131.220	Horizontal	Pass
		707.5	18.74	1.91	5.70	2.15	20.38	109.144	Horizontal	Pass
		711	18.29	1.92	5.80	2.15	20.02	100.462	Horizontal	Pass
1.4MHz Band QPSK	6/0	699.7	18.73	1.91	5.60	2.15	20.27	106.414	Vertical	Pass
		707.5	19.57	1.91	5.70	2.15	21.21	132.130	Vertical	Pass
		715.3	18.34	1.93	5.80	2.15	20.06	101.391	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	19.61	1.91	5.60	2.15	21.15	130.317	Vertical	Pass
		707.5	18.45	1.91	5.70	2.15	20.09	102.094	Vertical	Pass
		714.5	19.91	1.93	5.80	2.15	21.63	145.546	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	18.86	1.91	5.60	2.15	20.4	109.648	Vertical	Pass
		707.5	19.50	1.91	5.70	2.15	21.14	130.017	Vertical	Pass
		713.5	19.52	1.92	5.80	2.15	21.25	133.352	Vertical	Pass
10.0MHz Band QPSK	50/0	704	18.67	1.91	5.60	2.15	20.21	104.954	Vertical	Pass
		707.5	18.89	1.91	5.70	2.15	20.53	112.980	Vertical	Pass
		711	20.64	1.92	5.80	2.15	22.37	172.584	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
						(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	6/0	699.7	19.50	1.91	5.60	2.15	21.04	127.057	Horizontal	Pass
		707.5	19.81	1.91	5.70	2.15	21.45	139.637	Horizontal	Pass
		715.3	19.57	1.93	5.80	2.15	21.29	134.586	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	20.49	1.91	5.60	2.15	22.03	159.588	Horizontal	Pass
		707.5	18.15	1.91	5.70	2.15	19.79	95.280	Horizontal	Pass
		714.5	18.67	1.93	5.80	2.15	20.39	109.396	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	18.58	1.91	5.60	2.15	20.12	102.802	Horizontal	Pass
		707.5	20.76	1.91	5.70	2.15	22.4	173.780	Horizontal	Pass
		713.5	20.45	1.92	5.80	2.15	22.18	165.196	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	19.98	1.91	5.60	2.15	21.52	141.906	Horizontal	Pass
		707.5	18.59	1.91	5.70	2.15	20.23	105.439	Horizontal	Pass
		711	20.21	1.92	5.80	2.15	21.94	156.315	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	699.7	17.93	1.91	5.60	2.15	19.47	88.512	Vertical	Pass
		707.5	20.18	1.91	5.70	2.15	21.82	152.055	Vertical	Pass
		715.3	19.63	1.93	5.80	2.15	21.35	136.458	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	20.81	1.91	5.60	2.15	22.35	171.791	Vertical	Pass
		707.5	19.93	1.91	5.70	2.15	21.57	143.549	Vertical	Pass
		714.5	20.89	1.93	5.80	2.15	22.61	182.390	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	19.59	1.91	5.60	2.15	21.13	129.718	Vertical	Pass
		707.5	20.73	1.91	5.70	2.15	22.37	172.584	Vertical	Pass
		713.5	18.65	1.92	5.80	2.15	20.38	109.144	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	20.29	1.91	5.60	2.15	21.83	152.405	Vertical	Pass
		707.5	21.08	1.91	5.70	2.15	22.72	187.068	Vertical	Pass
		711	19.85	1.92	5.80	2.15	21.58	143.880	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 Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	19.09	1.91	5.60	2.15	20.63	115.611	Vertical	Pass
		710	19.15	1.91	5.70	2.15	20.79	119.950	Vertical	Pass
		713.5	20.62	1.92	5.80	2.15	22.35	171.791	Vertical	Pass
10.0MHz Band QPSK	50/0	709	18.42	1.91	5.60	2.15	19.96	99.083	Vertical	Pass
		710	19.42	1.91	5.70	2.15	21.06	127.644	Vertical	Pass
		711	18.16	1.92	5.80	2.15	19.89	97.499	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	18.28	1.91	5.60	2.15	19.82	95.940	Horizontal	Pass
		710	18.95	1.91	5.70	2.15	20.59	114.551	Horizontal	Pass
		713.5	19.60	1.92	5.80	2.15	21.33	135.831	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	20.89	1.91	5.60	2.15	22.43	174.985	Horizontal	Pass
		710	20.78	1.91	5.70	2.15	22.42	174.582	Horizontal	Pass
		711	18.93	1.92	5.80	2.15	20.66	116.413	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	706.5	16.81	1.91	5.6	2.15	20.83	121.060	Vertical	Pass
		710	16.39	1.91	5.7	2.15	20.85	121.619	Vertical	Pass
		713.5	17.43	1.92	5.8	2.15	21.45	139.637	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	15.91	1.91	5.6	2.15	20.62	115.345	Vertical	Pass
		710	15.84	1.91	5.7	2.15	20.87	122.180	Vertical	Pass
		711	15.59	1.92	5.8	2.15	20.48	111.686	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	17.52	1.91	5.6	2.15	20.63	115.611	Horizontal	Pass
		710	17.46	1.91	5.7	2.15	21.47	140.281	Horizontal	Pass
		713.5	16.25	1.92	5.8	2.15	20.43	110.408	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	17.30	1.91	5.6	2.15	21.48	140.605	Horizontal	Pass
		710	17.57	1.91	5.7	2.15	21.37	137.088	Horizontal	Pass
		711	16.65	1.92	5.8	2.15	20.61	115.080	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 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization	
			(dBm)			Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2498.5	17.34	4.54	9.00	21.8	151.356	Horizontal	Pass
		2593	16.98	4.69	9.00	21.29	134.586	Horizontal	Pass
		2687.5	15.86	4.71	9.00	20.15	103.514	Horizontal	Pass
10.0MHz Band QPSK	50/0	2501	17.67	4.55	9.00	22.12	162.930	Horizontal	Pass
		2593	16.93	4.69	9.00	21.24	133.045	Horizontal	Pass
		2685	16.20	4.72	9.00	20.48	111.686	Horizontal	Pass
15.0MHz Band QPSK	75/0	2503.5	14.50	4.55	9.00	18.95	78.524	Horizontal	Pass
		2593	16.92	4.69	9.00	21.23	132.739	Horizontal	Pass
		2682.5	17.46	4.72	9.00	21.74	149.279	Horizontal	Pass
20.0MHz Band QPSK	100/0	2506	16.25	4.57	9.00	20.68	116.950	Horizontal	Pass
		2593	16.67	4.73	9.00	20.94	124.165	Horizontal	Pass
		2680	17.00	4.75	9.00	21.25	133.352	Horizontal	Pass
5.0MHz Band QPSK	25/0	2498.5	17.30	4.54	9.00	21.76	149.968	Vertical	Pass
		2593	15.72	4.69	9.00	20.03	100.693	Vertical	Pass
		2687.5	16.06	4.71	9.00	20.35	108.393	Vertical	Pass
10.0MHz Band QPSK	50/0	2501	14.93	4.55	9.00	19.38	86.696	Vertical	Pass
		2593	16.19	4.69	9.00	20.5	112.202	Vertical	Pass
		2685	16.63	4.72	9.00	20.91	123.310	Vertical	Pass
15.0MHz Band QPSK	75/0	2503.5	15.62	4.55	9.00	20.07	101.625	Vertical	Pass
		2593	17.11	4.69	9.00	21.42	138.676	Vertical	Pass
		2682.5	16.71	4.72	9.00	20.99	125.603	Vertical	Pass
20.0MHz Band QPSK	100/0	2506	17.80	4.57	9.00	22.23	167.109	Vertical	Pass
		2593	14.84	4.73	9.00	19.11	81.470	Vertical	Pass
		2680	16.51	4.75	9.00	20.76	119.124	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization	
			(dBm)			Average	Average	Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2498.5	14.42	4.54	9.00	18.88	77.268	Horizontal	Pass
		2593	15.85	4.69	9.00	20.16	103.753	Horizontal	Pass
		2687.5	16.42	4.71	9.00	20.71	117.761	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2501	15.50	4.55	9.00	19.95	98.855	Horizontal	Pass
		2593	16.63	4.69	9.00	20.94	124.165	Horizontal	Pass
		2685	16.47	4.72	9.00	20.75	118.850	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2503.5	16.26	4.55	9.00	20.71	117.761	Horizontal	Pass
		2593	16.33	4.69	9.00	20.64	115.878	Horizontal	Pass
		2682.5	16.55	4.72	9.00	20.83	121.060	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2506	15.97	4.57	9.00	20.4	109.648	Horizontal	Pass
		2593	16.07	4.73	9.00	20.34	108.143	Horizontal	Pass
		2680	16.70	4.75	9.00	20.95	124.451	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2498.5	16.05	4.54	9.00	20.51	112.460	Vertical	Pass
		2593	16.15	4.69	9.00	20.46	111.173	Vertical	Pass
		2687.5	16.04	4.71	9.00	20.33	107.895	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2501	15.95	4.55	9.00	20.4	109.648	Vertical	Pass
		2593	15.87	4.69	9.00	20.18	104.232	Vertical	Pass
		2685	14.54	4.72	9.00	18.82	76.208	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2503.5	16.33	4.55	9.00	20.78	119.674	Vertical	Pass
		2593	15.69	4.69	9.00	20	100.000	Vertical	Pass
		2682.5	16.11	4.72	9.00	20.39	109.396	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2506	16.34	4.57	9.00	20.77	119.399	Vertical	Pass
		2593	16.80	4.73	9.00	21.07	127.938	Vertical	Pass
		2680	17.08	4.75	9.00	21.33	135.831	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 Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	6/0	1710.7	15.09	3.12	8.90	19.91	97.95	Horizontal	Pass
		1745	13.86	3.27	8.90	18.68	73.79	Horizontal	Pass
		1779.3	16.28	3.29	8.90	21.65	146.22	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	14.20	3.13	8.90	19.34	85.90	Horizontal	Pass
		1745	14.87	3.27	8.90	20.26	106.17	Horizontal	Pass
		1778.5	15.56	3.30	8.90	19.89	97.50	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	16.05	3.13	8.90	21.34	136.14	Horizontal	Pass
		1745	16.21	3.27	8.90	20.92	123.59	Horizontal	Pass
		1777.5	14.87	3.30	8.90	19.25	84.14	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	15.19	3.15	8.90	20.65	116.14	Horizontal	Pass
		1745	15.29	3.31	8.90	20.79	119.95	Horizontal	Pass
		1775	16.10	3.33	8.90	20.82	120.78	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	15.36	3.15	8.90	20.77	119.40	Horizontal	Pass
		1745	15.89	3.31	8.90	21.27	133.97	Horizontal	Pass
		1772.5	16.64	3.33	8.90	21.81	151.71	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.97	3.17	8.90	19.65	92.26	Horizontal	Pass
		1745	15.42	3.32	8.90	21.17	130.92	Horizontal	Pass
		1770	15.22	3.36	8.90	20.29	106.91	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	15.71	3.12	8.90	20.37	108.89	Vertical	Pass
		1745	16.21	3.27	8.90	21.41	138.36	Vertical	Pass
		1779.3	15.56	3.29	8.90	21.38	137.40	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	16.08	3.13	8.90	21.29	134.59	Vertical	Pass
		1745	16.14	3.27	8.90	21.61	144.88	Vertical	Pass
		1778.5	16.41	3.30	8.90	20.63	115.61	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	15.17	3.13	8.90	20.1	102.33	Vertical	Pass
		1745	15.65	3.27	8.90	19.88	97.27	Vertical	Pass
		1777.5	14.24	3.30	8.90	19.71	93.54	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	12.72	3.15	8.90	18.33	68.08	Vertical	Pass
		1745	16.63	3.31	8.90	21.09	128.53	Vertical	Pass
		1775	15.66	3.33	8.90	19.59	90.99	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	16.69	3.15	8.90	21.4	138.04	Vertical	Pass
		1745	16.08	3.31	8.90	21.38	137.40	Vertical	Pass
		1772.5	15.30	3.33	8.90	20.6	114.82	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	17.39	3.17	8.90	22.49	177.42	Vertical	Pass
		1745	17.54	3.32	8.90	21.63	145.55	Vertical	Pass
		1770	14.41	3.36	8.90	20.16	103.75	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	6/0	1710.7	15.06	3.12	8.9	20.84	121.34	Horizontal	Pass
		1745	15.46	3.27	8.9	21.09	128.53	Horizontal	Pass
		1779.3	15.45	3.29	8.9	21.06	127.64	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.10	3.13	8.9	20.87	122.18	Horizontal	Pass
		1745	14.73	3.27	8.9	20.36	108.64	Horizontal	Pass
		1778.5	15.67	3.3	8.9	21.27	133.97	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	14.27	3.13	8.9	20.04	100.93	Horizontal	Pass
		1745	13.25	3.27	8.9	18.88	77.27	Horizontal	Pass
		1777.5	14.41	3.3	8.9	20.01	100.23	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	15.22	3.15	8.9	20.97	125.03	Horizontal	Pass
		1745	13.42	3.31	8.9	19.01	79.62	Horizontal	Pass
		1775	13.05	3.33	8.9	18.62	72.78	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.83	3.15	8.9	19.58	90.78	Horizontal	Pass
		1745	14.77	3.31	8.9	20.36	108.64	Horizontal	Pass
		1772.5	15.33	3.33	8.9	20.9	123.03	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	14.61	3.17	8.9	20.34	108.14	Horizontal	Pass
		1745	14.82	3.32	8.9	20.4	109.65	Horizontal	Pass
		1770	14.99	3.36	8.9	20.53	112.98	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	14.31	3.12	8.9	20.09	102.09	Vertical	Pass
		1745	14.63	3.27	8.9	20.26	106.17	Vertical	Pass
		1779.3	14.56	3.29	8.9	20.17	103.99	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.03	3.13	8.9	19.8	95.50	Vertical	Pass
		1745	13.74	3.27	8.9	19.37	86.50	Vertical	Pass
		1778.5	14.73	3.3	8.9	20.33	107.89	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	15.74	3.13	8.9	21.51	141.58	Vertical	Pass
		1745	15.04	3.27	8.9	20.67	116.68	Vertical	Pass
		1777.5	13.96	3.3	8.9	19.56	90.36	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	13.64	3.15	8.9	19.39	86.90	Vertical	Pass
		1745	15.79	3.31	8.9	21.38	137.40	Vertical	Pass
		1775	16.11	3.33	8.9	21.68	147.23	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.41	3.15	8.9	20.16	103.75	Vertical	Pass
		1745	15.08	3.31	8.9	20.67	116.68	Vertical	Pass
		1772.5	14.85	3.33	8.9	20.42	110.15	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	15.48	3.17	8.9	21.21	132.13	Vertical	Pass
		1745	15.61	3.32	8.9	21.19	131.52	Vertical	Pass
		1770	16.16	3.36	8.9	21.7	147.91	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

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 2/4/5/7/12/17/41/66

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.31	4.04	33.51	-18.84	-13	-5.84	Horizontal
3701.4	-53.41	4.04	33.51	-23.94	-13	-10.94	Vertical
5552.1	-49.11	5.24	35.84	-18.51	-13	-5.51	Vertical
5552.1	-57.08	5.24	35.84	-26.48	-13	-13.48	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-49.05	4.04	33.56	-19.53	-13	-6.53	Horizontal
3760	-48.94	4.04	33.56	-19.42	-13	-6.42	Vertical
5640	-50.32	5.24	35.91	-19.65	-13	-6.65	Vertical
5640	-53.33	5.24	35.91	-22.66	-13	-9.66	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.60	4.04	34.00	-17.64	-13	-4.64	Horizontal
3818.6	-47.43	4.04	34.00	-17.47	-13	-4.47	Vertical
5727.9	-56.74	5.24	36.04	-25.94	-13	-12.94	Vertical
5727.9	-52.59	5.24	36.04	-21.79	-13	-8.79	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-52.58	4.07	33.54	-23.11	-13	-10.11	Horizontal
3720	-51.99	4.07	33.54	-22.52	-13	-9.52	Vertical
5580	-51.84	5.28	35.86	-21.26	-13	-8.26	Vertical
5580	-50.21	5.28	35.86	-19.63	-13	-6.63	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-51.26	4.04	33.56	-21.74	-13	-8.74	Horizontal
3760	-48.13	4.04	33.56	-18.61	-13	-5.61	Vertical
5640	-50.08	5.24	35.91	-19.41	-13	-6.41	Vertical
5640	-50.57	5.24	35.91	-19.90	-13	-6.90	Horizontal
Test Results for High Channel 1900MHz							
3800	-51.78	4.04	34.00	-21.82	-13	-8.82	Horizontal
3800	-54.89	4.04	34.00	-24.93	-13	-11.93	Vertical
5700	-51.19	5.24	36.04	-20.39	-13	-7.39	Vertical
5700	-57.37	5.24	36.04	-26.57	-13	-13.57	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.96	4.02	29.80	-22.18	-13	-9.18	Horizontal
3421.4	-52.78	4.02	29.80	-27.00	-13	-14.00	Vertical
5132.1	-56.49	5.24	35.84	-25.89	-13	-12.89	Vertical
5132.1	-55.30	5.24	35.84	-24.70	-13	-11.70	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-53.65	4.03	30.00	-27.68	-13	-14.68	Horizontal
3465	-51.34	4.03	30.00	-25.37	-13	-12.37	Vertical
5197.5	-56.40	5.25	35.86	-25.79	-13	-12.79	Vertical
5197.5	-55.18	5.25	35.86	-24.57	-13	-11.57	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-48.92	4.05	30.01	-22.96	-13	-9.96	Horizontal
3508.6	-53.20	4.05	30.01	-27.24	-13	-14.24	Vertical
5262.9	-56.01	5.26	35.86	-25.41	-13	-12.41	Vertical
5262.9	-55.71	5.26	35.86	-25.11	-13	-12.11	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-47.45	4.02	29.80	-21.67	-13	-8.67	Horizontal
3440	-50.59	4.02	29.80	-24.81	-13	-11.81	Vertical
5160	-57.44	5.24	35.84	-26.84	-13	-13.84	Vertical
5160	-50.28	5.24	35.84	-19.68	-13	-6.68	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-50.44	4.03	30.00	-24.47	-13	-11.47	Horizontal
3465	-52.95	4.03	30.00	-26.98	-13	-13.98	Vertical
5197.5	-49.87	5.25	35.86	-19.26	-13	-6.26	Vertical
5197.5	-57.07	5.25	35.86	-26.46	-13	-13.46	Horizontal
Test Results for High Channel 1745MHz							
2490	-50.38	2.91	27.68	-25.61	-13	-12.61	Horizontal
3490	-54.99	2.91	27.68	-30.22	-13	-17.22	Vertical
5235	-54.24	5.26	35.86	-23.64	-13	-10.64	Vertical
5235	-50.82	5.26	35.86	-20.22	-13	-7.22	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-48.29	2.78	27.50	-23.57	-13	-10.57	Horizontal
1649.4	-50.44	2.78	27.50	-25.72	-13	-12.72	Vertical
2474.1	-50.96	2.90	27.80	-26.06	-13	-13.06	Vertical
2474.1	-51.94	2.90	27.80	-27.04	-13	-14.04	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-53.21	2.78	27.48	-28.51	-13	-15.51	Horizontal
1673	-54.36	2.78	27.48	-29.66	-13	-16.66	Vertical
2509.5	-52.28	2.91	27.70	-27.49	-13	-14.49	Vertical
2509.5	-50.17	2.91	27.70	-25.38	-13	-12.38	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-48.13	2.78	27.43	-23.48	-13	-10.48	Horizontal
1696.6	-52.63	2.78	27.43	-27.98	-13	-14.98	Vertical
2544.9	-55.14	2.92	27.74	-30.32	-13	-17.32	Vertical
2544.9	-50.78	2.92	27.74	-25.96	-13	-12.96	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658	-53.93	2.78	27.50	-29.21	-13	-16.21	Horizontal
1658	-50.90	2.78	27.50	-26.18	-13	-13.18	Vertical
2487	-52.31	2.90	27.80	-27.41	-13	-14.41	Vertical
2487	-53.47	2.90	27.80	-28.57	-13	-15.57	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-52.64	2.78	27.48	-27.94	-13	-14.94	Horizontal
1673	-47.31	2.78	27.48	-22.61	-13	-9.61	Vertical
2509.5	-54.88	2.91	27.70	-30.09	-13	-17.09	Vertical
2509.5	-55.09	2.91	27.70	-30.30	-13	-17.30	Horizontal
Test Results for High Channel 844MHz							
1688	-48.24	2.78	27.43	-23.59	-13	-10.59	Horizontal
1688	-50.96	2.78	27.43	-26.31	-13	-13.31	Vertical
2532	-49.23	2.92	27.74	-24.41	-13	-11.41	Vertical
2532	-56.94	2.92	27.74	-32.12	-13	-19.12	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	-61.16	5.23	35.81	-30.58	-25	-5.58	Horizontal
5005	-59.82	5.23	35.81	-29.24	-25	-4.24	Vertical
7507.5	-61.29	5.67	36.85	-30.11	-25	-5.11	Vertical
7507.5	-60.37	5.67	36.85	-29.19	-25	-4.19	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-61.45	5.23	35.82	-30.86	-25	-5.86	Horizontal
5070	-59.86	5.23	35.82	-29.27	-25	-4.27	Vertical
7605	-59.66	5.67	36.85	-28.48	-25	-3.48	Vertical
7605	-59.72	5.67	36.85	-28.54	-25	-3.54	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-61.18	5.24	35.83	-30.59	-25	-5.59	Horizontal
5135	-61.26	5.24	35.83	-30.67	-25	-5.67	Vertical
7702.5	-59.76	5.68	36.87	-28.57	-25	-3.57	Vertical
7702.5	-63.10	5.68	36.87	-31.91	-25	-6.91	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	-60.90	5.23	35.82	-30.31	-25	-5.31	Horizontal
5020	-60.06	5.23	35.82	-29.47	-25	-4.47	Vertical
7530	-61.03	5.67	36.86	-29.84	-25	-4.84	Vertical
7530	-63.80	5.67	36.86	-32.61	-25	-7.61	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-58.36	5.23	35.82	-27.77	-25	-2.77	Horizontal
5070	-60.06	5.23	35.82	-29.47	-25	-4.47	Vertical
7605	-64.42	5.67	36.85	-33.24	-25	-8.24	Vertical
7605	-61.52	5.67	36.85	-30.34	-25	-5.34	Horizontal
Test Results for High Channel 2560MHz							
5120	-58.05	5.24	35.83	-27.46	-25	-2.46	Horizontal
5120	-60.67	5.24	35.83	-30.08	-25	-5.08	Vertical
7680	-63.17	5.70	36.88	-31.99	-25	-6.99	Vertical
7680	-63.87	5.70	36.88	-32.69	-25	-7.69	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-48.55	2.60	27.2	-23.95	-13	-10.95	Horizontal
1399.4	-53.37	2.60	27.2	-28.77	-13	-15.77	Vertical
2099.1	-52.84	2.85	27.54	-28.15	-13	-15.15	Vertical
2099.1	-50.11	2.85	27.54	-25.42	-13	-12.42	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-47.40	2.61	27.28	-22.73	-13	-9.73	Horizontal
1415	-49.15	2.61	27.28	-24.48	-13	-11.48	Vertical
2122.5	-56.35	2.87	27.59	-31.63	-13	-18.63	Vertical
2122.5	-49.76	2.87	27.59	-25.04	-13	-12.04	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-54.36	2.63	27.28	-29.71	-13	-16.71	Horizontal
1430.6	-47.97	2.63	27.28	-23.32	-13	-10.32	Vertical
2145.9	-50.59	2.88	27.60	-25.87	-13	-12.87	Vertical
2145.9	-52.46	2.88	27.60	-27.74	-13	-14.74	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408	-54.83	2.61	27.26	-30.18	-13	-17.18	Horizontal
1408	-54.65	2.61	27.26	-30.00	-13	-17.00	Vertical
2112	-55.91	2.87	27.58	-31.20	-13	-18.20	Vertical
2112	-50.17	2.87	27.58	-25.46	-13	-12.46	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-51.44	2.61	27.28	-26.77	-13	-13.77	Horizontal
1415	-47.57	2.61	27.28	-22.90	-13	-9.90	Vertical
2122.5	-52.26	2.87	27.59	-27.54	-13	-14.54	Vertical
2122.5	-52.01	2.87	27.59	-27.29	-13	-14.29	Horizontal
Test Results for High Channel 711MHz							
1422	-52.49	2.62	27.28	-27.83	-13	-14.83	Horizontal
1422	-49.81	2.62	27.28	-25.15	-13	-12.15	Vertical
2133	-51.11	2.87	27.60	-26.38	-13	-13.38	Vertical
2133	-54.42	2.87	27.60	-29.69	-13	-16.69	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	-49.37	2.61	27.28	-24.70	-13	-11.70	Horizontal
1413	-53.71	2.61	27.28	-29.04	-13	-16.04	Vertical
2119.5	-54.30	2.87	27.59	-29.58	-13	-16.58	Vertical
2119.5	-50.84	2.87	27.59	-26.12	-13	-13.12	Horizontal
Test Results For Mid Channel 710MHz							
1420	-47.96	2.62	27.30	-23.28	-13	-10.28	Horizontal
1420	-48.81	2.62	27.30	-24.13	-13	-11.13	Vertical
2130	-49.04	2.87	27.62	-24.29	-13	-11.29	Vertical
2130	-49.48	2.87	27.62	-24.73	-13	-11.73	Horizontal
Test Results for High Channel 713.5MHz							
1427	-49.82	2.66	27.28	-25.20	-13	-12.20	Horizontal
1427	-50.07	2.66	27.28	-25.45	-13	-12.45	Vertical
2140.5	-49.84	2.88	27.60	-25.12	-13	-12.12	Vertical
2140.5	-51.37	2.88	27.60	-26.65	-13	-13.65	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	-49.44	2.62	27.30	-24.76	-13	-11.76	Horizontal
1418	-52.69	2.62	27.30	-28.01	-13	-15.01	Vertical
2127	-57.74	2.87	27.62	-32.99	-13	-19.99	Vertical
2127	-50.63	2.87	27.62	-25.88	-13	-12.88	Horizontal
Test Results for Mid Channel 710MHz							
1420	-48.27	2.62	27.30	-23.59	-13	-10.59	Horizontal
1420	-54.58	2.62	27.30	-29.90	-13	-16.90	Vertical
2130	-49.22	2.87	27.62	-24.47	-13	-11.47	Vertical
2130	-57.23	2.87	27.62	-32.48	-13	-19.48	Horizontal
Test Results for High Channel 711MHz							
1422	-53.78	2.62	27.30	-29.10	-13	-16.10	Horizontal
1422	-57.31	2.62	27.30	-32.63	-13	-19.63	Vertical
2133	-56.72	2.87	27.62	-31.97	-13	-18.97	Vertical
2133	-54.67	2.87	27.62	-29.92	-13	-16.92	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 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997	-57.50	2.63	27.26	-32.87	-25	-7.87	Horizontal
4997	-56.87	2.63	27.26	-32.24	-25	-7.24	Vertical
7495.5	-55.73	2.67	27.58	-30.82	-25	-5.82	Vertical
7495.5	-56.78	2.67	27.58	-31.87	-25	-6.87	Horizontal
Test Results for Mid Channel 2595MHz							
5186	-54.70	2.62	27.28	-30.04	-25	-5.04	Horizontal
5186	-56.74	2.62	27.28	-32.08	-25	-7.08	Vertical
7779	-58.15	2.85	27.62	-33.38	-25	-8.38	Vertical
7779	-58.22	2.85	27.62	-33.45	-25	-8.45	Horizontal
Test Results for High Channel 2652.5MHz							
5375	-54.28	2.64	27.28	-29.64	-25	-4.64	Horizontal
5375	-54.93	2.64	27.28	-30.29	-25	-5.29	Vertical
8062.5	-56.23	2.85	27.70	-31.38	-25	-6.38	Vertical
8062.5	-55.57	2.85	27.70	-30.72	-25	-5.72	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012	-54.26	2.63	27.30	-29.59	-25	-4.59	Horizontal
5012	-55.81	2.63	27.30	-31.14	-25	-6.14	Vertical
7518	-54.14	2.67	27.62	-29.19	-25	-4.19	Vertical
7518	-55.15	2.67	27.62	-30.20	-25	-5.20	Horizontal
Test Results for Mid Channel 2595MHz							
5186	-53.50	2.62	27.33	-28.79	-25	-3.79	Horizontal
5186	-56.47	2.62	27.33	-31.76	-25	-6.76	Vertical
7779	-57.68	2.85	27.67	-32.86	-25	-7.86	Vertical
7779	-57.78	2.85	27.67	-32.96	-25	-7.96	Horizontal
Test Results for High Channel 2645MHz							
5360	-53.72	2.64	27.33	-29.03	-25	-4.03	Horizontal
5360	-57.86	2.64	27.33	-33.17	-25	-8.17	Vertical
8040	-54.29	2.85	27.67	-29.47	-25	-4.47	Vertical
8040	-60.41	2.85	27.67	-35.59	-25	-10.59	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 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-49.67	2.62	27.3	-24.99	-13	-11.99	Horizontal
3440	-47.33	2.62	27.3	-22.65	-13	-9.65	Vertical
5160	-55.86	2.87	27.62	-31.11	-13	-18.11	Vertical
5160	-54.73	2.87	27.62	-29.98	-13	-16.98	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-48.94	2.62	27.3	-24.26	-13	-11.26	Horizontal
3490	-47.88	2.62	27.3	-23.20	-13	-10.20	Vertical
5337.9	-55.23	2.87	27.62	-30.48	-13	-17.48	Vertical
5337.9	-57.68	2.87	27.62	-32.93	-13	-19.93	Horizontal
Test Results for High Channel 1779.3MHz							
3540	-48.68	2.62	27.3	-24.00	-13	-11.00	Horizontal
3540	-48.35	2.62	27.3	-23.67	-13	-10.67	Vertical
5310	-55.97	2.87	27.62	-31.22	-13	-18.22	Vertical
5310	-54.04	2.87	27.62	-29.29	-13	-16.29	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-51.19	2.62	27.3	-26.51	-13	-13.51	Horizontal
3440	-57.32	2.62	27.3	-32.64	-13	-19.64	Vertical
5160	-59.72	2.87	27.62	-34.97	-13	-21.97	Vertical
5160	-56.67	2.87	27.62	-31.92	-13	-18.92	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-56.67	2.62	27.3	-31.99	-13	-18.99	Horizontal
3490	-54.72	2.62	27.3	-30.04	-13	-17.04	Vertical
5337.9	-60.18	2.87	27.62	-35.43	-13	-22.43	Vertical
5337.9	-57.04	2.87	27.62	-32.29	-13	-19.29	Horizontal
Test Results for High Channel 1770MHz							
3540	-56.78	2.62	27.3	-32.10	-13	-19.10	Horizontal
3540	-54.85	2.62	27.3	-30.17	-13	-17.17	Vertical
5310	-54.43	2.87	27.62	-29.68	-13	-16.68	Vertical
5310	-51.71	2.87	27.62	-26.96	-13	-13.96	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

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 3.27V, Normal, DC 3.85V and High voltage, DC 4.43V.

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 2/4/5/7/12/17/41/66

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]
3.27	1880	15	0.007979	2.5
3.85	1880	1	0.000532	2.5
4.43	1880	2	0.001064	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9	0.004787	2.5
Extreme (50C)	1880	4	0.002128	2.5
Extreme (40C)	1880	7	0.003723	2.5
Extreme (30C)	1880	14	0.007447	2.5
Extreme (10C)	1880	13	0.006915	2.5
Extreme (0C)	1880	9	0.004787	2.5
Extreme (-10C)	1880	1	0.000532	2.5
Extreme (-20C)	1880	14	0.007447	2.5
Extreme (-30C)	1880	13	0.006915	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]
3.27	1880	2	0.001064	2.5
3.85	1880	10	0.005319	2.5
4.43	1880	2	0.001064	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13	0.006915	2.5
Extreme (50C)	1880	12	0.006383	2.5
Extreme (40C)	1880	14	0.007447	2.5
Extreme (30C)	1880	15	0.007979	2.5
Extreme (10C)	1880	7	0.003723	2.5
Extreme (0C)	1880	13	0.006915	2.5
Extreme (-10C)	1880	8	0.004255	2.5
Extreme (-20C)	1880	14	0.007447	2.5
Extreme (-30C)	1880	11	0.005851	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]
3.27	1732.5	8	0.004618	2.5
3.85	1732.5	11	0.006349	2.5
4.43	1732.5	13	0.007504	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	5	0.002886	2.5
Extreme (50C)	1732.5	8	0.004618	2.5
Extreme (40C)	1732.5	8	0.004618	2.5
Extreme (30C)	1732.5	7	0.004040	2.5
Extreme (10C)	1732.5	13	0.007504	2.5
Extreme (0C)	1732.5	15	0.008658	2.5
Extreme (-10C)	1732.5	16	0.009235	2.5
Extreme (-20C)	1732.5	7	0.004040	2.5
Extreme (-30C)	1732.5	10	0.005772	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]
3.27	1732.5	14	0.008081	2.5
3.85	1732.5	13	0.007504	2.5
4.43	1732.5	15	0.008658	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	16	0.009235	2.5
Extreme (50C)	1732.5	4	0.002309	2.5
Extreme (40C)	1732.5	10	0.005772	2.5
Extreme (30C)	1732.5	16	0.009235	2.5
Extreme (10C)	1732.5	13	0.007504	2.5
Extreme (0C)	1732.5	13	0.007504	2.5
Extreme (-10C)	1732.5	10	0.005772	2.5
Extreme (-20C)	1732.5	16	0.009235	2.5
Extreme (-30C)	1732.5	15	0.008658	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]
3.27	836.5	5	0.005977	2.5
3.85	836.5	19	0.022714	2.5
4.43	836.5	16	0.019127	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	14	0.016736	2.5
Extreme (50C)	836.5	2	0.002391	2.5
Extreme (40C)	836.5	5	0.005977	2.5
Extreme (30C)	836.5	5	0.005977	2.5
Extreme (10C)	836.5	17	0.020323	2.5
Extreme (0C)	836.5	14	0.016736	2.5
Extreme (-10C)	836.5	8	0.009564	2.5
Extreme (-20C)	836.5	17	0.020323	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]
3.27	836.5	12	0.014345	2.5
3.85	836.5	9	0.010759	2.5
4.43	836.5	6	0.007173	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	14	0.016736	2.5
Extreme (50C)	836.5	13	0.015541	2.5
Extreme (40C)	836.5	9	0.010759	2.5
Extreme (30C)	836.5	14	0.016736	2.5
Extreme (10C)	836.5	10	0.011955	2.5
Extreme (0C)	836.5	2	0.002391	2.5
Extreme (-10C)	836.5	3	0.003586	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.

10.4 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]
3.27	2535	11	0.004339	2.5
3.85	2535	17	0.006706	2.5
4.43	2535	2	0.000789	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	15	0.005917	2.5
Extreme (50C)	2535	8	0.003156	2.5
Extreme (40C)	2535	16	0.006312	2.5
Extreme (30C)	2535	8	0.003156	2.5
Extreme (10C)	2535	12	0.004734	2.5
Extreme (0C)	2535	15	0.005917	2.5
Extreme (-10C)	2535	18	0.007101	2.5
Extreme (-20C)	2535	8	0.003156	2.5
Extreme (-30C)	2535	6	0.002367	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]
3.27	2535	2	0.000789	2.5
3.85	2535	8	0.003156	2.5
4.43	2535	10	0.003945	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	14	0.005523	2.5
Extreme (50C)	2535	17	0.006706	2.5
Extreme (40C)	2535	3	0.001183	2.5
Extreme (30C)	2535	14	0.005523	2.5
Extreme (10C)	2535	7	0.002761	2.5
Extreme (0C)	2535	2	0.000789	2.5
Extreme (-10C)	2535	6	0.002367	2.5
Extreme (-20C)	2535	4	0.001578	2.5
Extreme (-30C)	2535	15	0.005917	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]
3.27	707.5	13	0.018375	2.5
3.85	707.5	19	0.026855	2.5
4.43	707.5	16	0.022615	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	2	0.002827	2.5
Extreme (50C)	707.5	15	0.021201	2.5
Extreme (40C)	707.5	14	0.019788	2.5
Extreme (30C)	707.5	10	0.014134	2.5
Extreme (10C)	707.5	17	0.024028	2.5
Extreme (0C)	707.5	17	0.024028	2.5
Extreme (-10C)	707.5	5	0.007067	2.5
Extreme (-20C)	707.5	9	0.012721	2.5
Extreme (-30C)	707.5	4	0.005654	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]
3.27	707.5	14	0.019788	2.5
3.85	707.5	12	0.016961	2.5
4.43	707.5	16	0.022615	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	12	0.016961	2.5
Extreme (50C)	707.5	13	0.018375	2.5
Extreme (40C)	707.5	7	0.009894	2.5
Extreme (30C)	707.5	14	0.019788	2.5
Extreme (10C)	707.5	11	0.015548	2.5
Extreme (0C)	707.5	8	0.011307	2.5
Extreme (-10C)	707.5	14	0.019788	2.5
Extreme (-20C)	707.5	1	0.001413	2.5
Extreme (-30C)	707.5	7	0.009894	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]
3.27	710	3	0.004225	2.5
3.85	710	15	0.021127	2.5
4.43	710	4	0.005634	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	9	0.012676	2.5
Extreme (50C)	710	13	0.018310	2.5
Extreme (40C)	710	16	0.022535	2.5
Extreme (30C)	710	8	0.011268	2.5
Extreme (10C)	710	15	0.021127	2.5
Extreme (0C)	710	14	0.019718	2.5
Extreme (-10C)	710	16	0.022535	2.5
Extreme (-20C)	710	9	0.012676	2.5
Extreme (-30C)	710	1	0.001408	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]
3.27	710	9	0.012676	2.5
3.85	710	2	0.002817	2.5
4.43	710	14	0.019718	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	16	0.022535	2.5
Extreme (50C)	710	12	0.016901	2.5
Extreme (40C)	710	14	0.019718	2.5
Extreme (30C)	710	1	0.001408	2.5
Extreme (10C)	710	12	0.016901	2.5
Extreme (0C)	710	17	0.023944	2.5
Extreme (-10C)	710	11	0.015493	2.5
Extreme (-20C)	710	11	0.015493	2.5
Extreme (-30C)	710	13	0.018310	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]
3.27	2593	13	0.005013	2.5
3.85	2593	9	0.003471	2.5
4.43	2593	11	0.004242	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	1	0.000386	2.5
Extreme (50C)	2593	15	0.005785	2.5
Extreme (40C)	2593	17	0.006556	2.5
Extreme (30C)	2593	18	0.006942	2.5
Extreme (10C)	2593	6	0.002314	2.5
Extreme (0C)	2593	11	0.004242	2.5
Extreme (-10C)	2593	8	0.003085	2.5
Extreme (-20C)	2593	10	0.003857	2.5
Extreme (-30C)	2593	15	0.005785	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]
3.27	2593	5	0.001928	2.5
3.85	2593	13	0.005013	2.5
4.43	2593	1	0.000386	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	11	0.004242	2.5
Extreme (50C)	2593	13	0.005013	2.5
Extreme (40C)	2593	21	0.008099	2.5
Extreme (30C)	2593	16	0.006170	2.5
Extreme (10C)	2593	15	0.005785	2.5
Extreme (0C)	2593	10	0.003857	2.5
Extreme (-10C)	2593	4	0.001543	2.5
Extreme (-20C)	2593	11	0.004242	2.5
Extreme (-30C)	2593	12	0.004628	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]
3.27	1745	17	0.009742	2.5
3.85	1745	11	0.006304	2.5
4.43	1745	4	0.002292	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	17	0.009742	2.5
Extreme (50C)	1745	13	0.007450	2.5
Extreme (40C)	1745	2	0.001146	2.5
Extreme (30C)	1745	13	0.007450	2.5
Extreme (10C)	1745	18	0.010315	2.5
Extreme (0C)	1745	13	0.007450	2.5
Extreme (-10C)	1745	14	0.008023	2.5
Extreme (-20C)	1745	2	0.001146	2.5
Extreme (-30C)	1745	11	0.006304	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]
3.27	1745	8	0.004585	2.5
3.85	1745	12	0.006877	2.5
4.43	1745	10	0.005731	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	8	0.004585	2.5
Extreme (50C)	1745	1	0.000573	2.5
Extreme (40C)	1745	17	0.009742	2.5
Extreme (30C)	1745	14	0.008023	2.5
Extreme (10C)	1745	3	0.001719	2.5
Extreme (0C)	1745	19	0.010888	2.5
Extreme (-10C)	1745	4	0.002292	2.5
Extreme (-20C)	1745	12	0.006877	2.5
Extreme (-30C)	1745	5	0.002865	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.

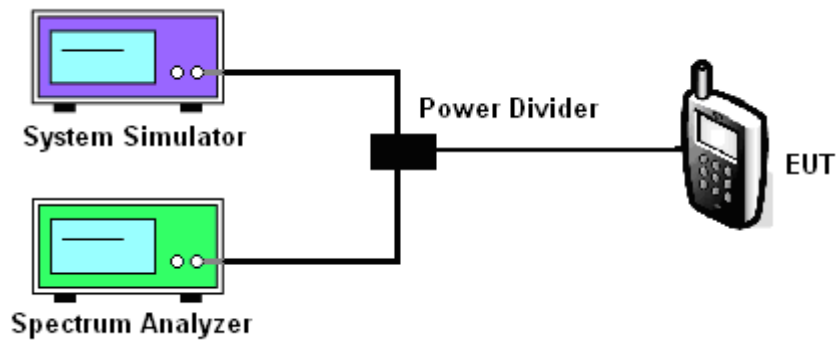
11.2 Measuring Instruments

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 2/4/5/7/12/17/41/66

Test data reference attachment.

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