

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

FCC ID: 2AOWK-3291

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ3291

Family Model: Note 21, Note 21 Ultra, Note 21 Pro, Note 21E,
Note 21S, Note 21 Lite, Note 21s, Note 21s Pro

Report No.: S24092604105006

Issue Date: Dec. 11, 2024

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

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

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

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

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

Product name.....: Mobile Phone

Model and/or type reference: GQ3291

Trade Mark.....: ulefone

Family Model.....: Note 21, Note 21 Ultra, Note 21 Pro, Note 21E, Note 21S, Note 21 Lite, Note 21s, Note 21s Pro

Test Sample Number..... S240926041005

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.

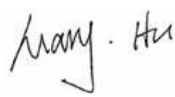
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Date of Test

Date (s) of performance of tests Sept. 26, 2024 ~ Dec. 11, 2024

Date of Issue Dec. 11, 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	GQ3291
Family Model	Note 21, Note 21 Ultra, Note 21 Pro, Note 21E, Note 21S, Note 21 Lite, Note 21s, Note 21s Pro
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2AOWK-3291
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: 2496MHz-2690MHz, 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: 0.91dBi, Band 4: 0.92dBi, Band 5: -0.71dBi, Band 7: 1.12dBi, Band 12: -1.42dBi, Band 17: -1.42dBi, Band 41: 1.12dBi, Band 66: 0.92dBi
Adapter	Model: HJ-0502000-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A 10.0W
Battery	DC 3.85V, 5000mAh, 19.25Wh
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	N/A
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-3291** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

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

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

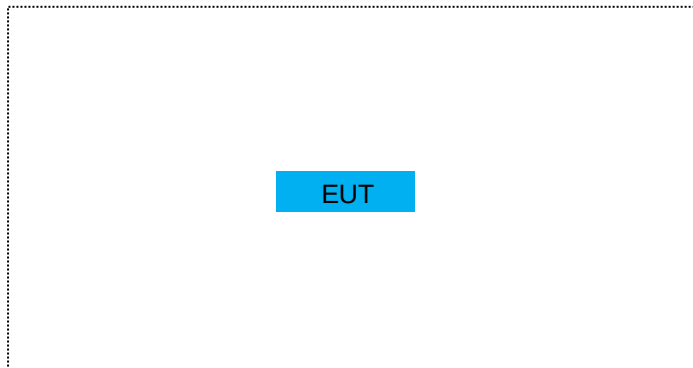
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	GQ3291	FCC ID: 2AOWK-3291	EUT

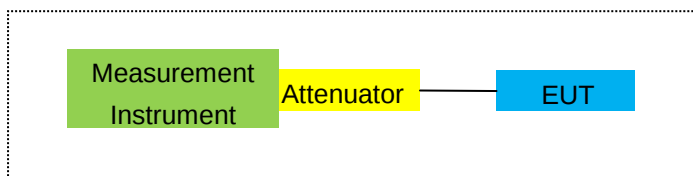
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

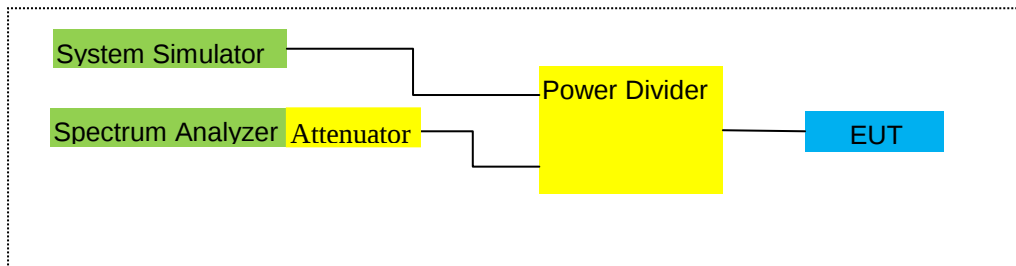
For Radiated Test Cases



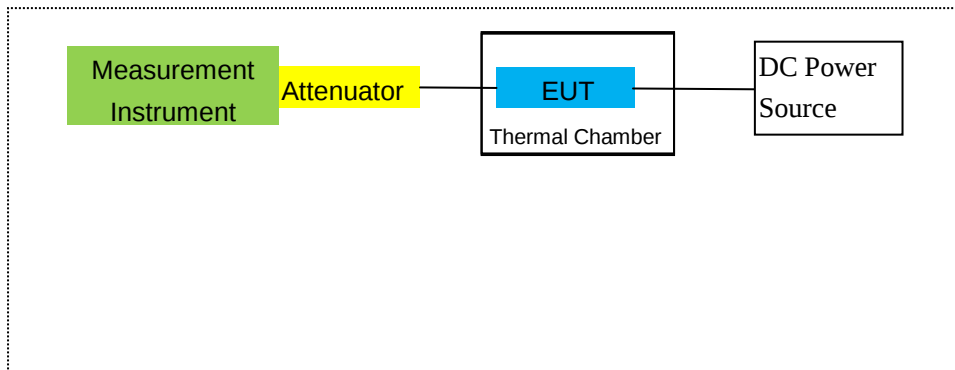
For Conducted Output Power



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
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

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

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

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

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

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

☐

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

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						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP	Max. EIRP Average (mW)	Polarization Of Max. ERP	
						Average (dBm)			
1.4MHz Band QPSK	6/0	1850.7	18.37	3.76	8.90	23.51	224.388	Horizontal	Pass
		1880	15.26	3.91	8.90	20.25	105.925	Horizontal	Pass
		1909.3	15.53	3.93	8.90	20.5	112.202	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	14.72	3.77	8.90	19.85	96.605	Horizontal	Pass
		1880	15.69	3.91	8.90	20.68	116.950	Horizontal	Pass
		1908.5	17.06	3.94	8.90	22.02	159.221	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	16.64	3.77	8.90	21.77	150.314	Horizontal	Pass
		1880	17.79	3.91	8.90	22.78	189.671	Horizontal	Pass
		1907.5	17.22	3.94	8.90	22.18	165.196	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	17.57	3.79	8.90	22.68	185.353	Horizontal	Pass
		1880	18.48	3.95	8.90	23.43	220.293	Horizontal	Pass
		1905	16.66	3.97	8.90	21.59	144.212	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	16.47	3.79	8.90	21.58	143.880	Horizontal	Pass
		1880	17.72	3.95	8.90	22.67	184.927	Horizontal	Pass
		1902.5	16.38	3.97	8.90	21.31	135.207	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	17.09	3.81	8.90	22.18	165.196	Horizontal	Pass
		1880	15.59	3.96	8.90	20.53	112.980	Horizontal	Pass
		1900	17.37	4.00	8.90	22.27	168.655	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	16.58	3.76	8.90	21.72	148.594	Vertical	Pass
		1880	15.67	3.91	8.90	20.66	116.413	Vertical	Pass
		1909.3	16.35	3.93	8.90	21.32	135.519	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	16.74	3.77	8.90	21.87	153.815	Vertical	Pass
		1880	17.39	3.91	8.90	22.38	172.982	Vertical	Pass
		1908.5	15.69	3.94	8.90	20.65	116.145	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	16.33	3.77	8.90	21.46	139.959	Vertical	Pass
		1880	15.88	3.91	8.90	20.87	122.180	Vertical	Pass
		1907.5	17.88	3.94	8.90	22.84	192.309	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	15.76	3.79	8.90	20.87	122.180	Vertical	Pass
		1880	14.40	3.95	8.90	19.35	86.099	Vertical	Pass
		1905	15.19	3.97	8.90	20.12	102.802	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	15.97	3.79	8.90	21.08	128.233	Vertical	Pass
		1880	16.49	3.95	8.90	21.44	139.316	Vertical	Pass
		1902.5	17.61	3.97	8.90	22.54	179.473	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	18.57	3.81	8.90	23.66	232.274	Vertical	Pass
		1880	16.85	3.96	8.90	21.79	151.008	Vertical	Pass
		1900	16.76	4.00	8.90	21.66	146.555	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	22.57	180.717	Horizontal	Pass
		1880	15.75	3.91	8.90	21.55	142.889	Horizontal	Pass
		1909.3	15.45	3.93	8.90	22.39	173.380	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	15.29	3.77	8.90	21.1	128.825	Horizontal	Pass
		1880	14.95	3.91	8.90	22.03	159.588	Horizontal	Pass
		1908.5	14.55	3.94	8.90	21.16	130.617	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	15.14	3.77	8.90	22.86	193.197	Horizontal	Pass
		1880	15.50	3.91	8.90	21.23	132.739	Horizontal	Pass
		1907.5	14.00	3.94	8.90	20.46	111.173	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	15.35	3.79	8.90	22.63	183.231	Horizontal	Pass
		1880	14.05	3.95	8.90	21.74	149.279	Horizontal	Pass
		1905	15.36	3.97	8.90	22.82	191.426	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.68	3.79	8.90	22.31	170.216	Horizontal	Pass
		1880	15.77	3.95	8.90	21.37	137.088	Horizontal	Pass
		1902.5	15.65	3.97	8.90	23.02	200.447	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	13.84	3.81	8.90	20.8	120.226	Horizontal	Pass
		1880	16.17	3.96	8.90	21.74	149.279	Horizontal	Pass
		1900	14.55	4.00	8.90	20.4	109.648	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	14.61	3.76	8.90	22.6	181.970	Vertical	Pass
		1880	15.84	3.91	8.90	21.07	127.938	Vertical	Pass
		1909.3	15.13	3.93	8.90	21.84	152.757	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	13.77	3.77	8.90	20.85	121.619	Vertical	Pass
		1880	14.83	3.91	8.90	22.36	172.187	Vertical	Pass
		1908.5	14.56	3.94	8.90	21.46	139.959	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	13.76	3.77	8.90	23.28	212.814	Vertical	Pass
		1880	15.05	3.91	8.90	23.18	207.970	Vertical	Pass
		1907.5	15.69	3.94	8.90	21.93	155.955	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	13.98	3.79	8.90	22.55	179.887	Vertical	Pass
		1880	15.57	3.95	8.90	21.82	152.055	Vertical	Pass
		1905	15.12	3.97	8.90	21.71	148.252	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.85	3.79	8.90	21.38	137.404	Vertical	Pass
		1880	14.87	3.95	8.90	23.46	221.820	Vertical	Pass
		1902.5	13.66	3.97	8.90	22.24	167.494	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	14.29	3.81	8.90	23.16	207.014	Vertical	Pass
		1880	14.90	3.96	8.90	23.85	242.661	Vertical	Pass
		1900	13.78	4.00	8.90	21.75	149.624	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	14.73	3.12	8.90	20.51	112.460	Horizontal	Pass
		1732.5	13.81	3.27	8.90	19.44	87.902	Horizontal	Pass
		1754.3	16.37	3.29	8.90	21.98	157.761	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	14.41	3.13	8.90	20.18	104.232	Horizontal	Pass
		1732.5	15.33	3.27	8.90	20.96	124.738	Horizontal	Pass
		1753.5	15.19	3.30	8.90	20.79	119.950	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	16.24	3.13	8.90	22.01	158.855	Horizontal	Pass
		1732.5	16.22	3.27	8.90	21.85	153.109	Horizontal	Pass
		1752.5	15.09	3.30	8.90	20.69	117.220	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	15.44	3.15	8.90	21.19	131.522	Horizontal	Pass
		1732.5	15.33	3.31	8.90	20.92	123.595	Horizontal	Pass
		1750	16.12	3.33	8.90	21.69	147.571	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	15.47	3.15	8.90	21.22	132.434	Horizontal	Pass
		1732.5	15.77	3.31	8.90	21.36	136.773	Horizontal	Pass
		1747.5	16.72	3.33	8.90	22.29	169.434	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	14.12	3.17	8.90	19.85	96.605	Horizontal	Pass
		1732.5	14.82	3.32	8.90	20.4	109.648	Horizontal	Pass
		1745	15.02	3.36	8.90	20.56	113.763	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	15.16	3.12	8.90	20.94	124.165	Vertical	Pass
		1732.5	15.69	3.27	8.90	21.32	135.519	Vertical	Pass
		1754.3	15.69	3.29	8.90	21.3	134.896	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	15.49	3.13	8.90	21.26	133.660	Vertical	Pass
		1732.5	16.44	3.27	8.90	22.07	161.065	Vertical	Pass
		1753.5	16.26	3.30	8.90	21.86	153.462	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	15.24	3.13	8.90	21.01	126.183	Vertical	Pass
		1732.5	15.80	3.27	8.90	21.43	138.995	Vertical	Pass
		1752.5	14.55	3.30	8.90	20.15	103.514	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	12.89	3.15	8.90	18.64	73.114	Vertical	Pass
		1732.5	16.06	3.31	8.90	21.65	146.218	Vertical	Pass
		1750	15.07	3.33	8.90	20.64	115.878	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	16.30	3.15	8.90	22.05	160.325	Vertical	Pass
		1732.5	16.00	3.31	8.90	21.59	144.212	Vertical	Pass
		1747.5	15.01	3.33	8.90	20.58	114.288	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	16.88	3.17	8.90	22.61	182.390	Vertical	Pass
		1732.5	17.33	3.32	8.90	22.91	195.434	Vertical	Pass
		1745	14.47	3.36	8.90	20.01	100.231	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	15.40	3.12	8.90	21.18	131.220	Horizontal	Pass
		1732.5	16.69	3.27	8.90	22.32	170.608	Horizontal	Pass
		1754.3	16.20	3.29	8.90	21.81	151.705	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.77	3.13	8.90	20.54	113.240	Horizontal	Pass
		1732.5	15.90	3.27	8.90	21.53	142.233	Horizontal	Pass
		1753.5	16.30	3.30	8.90	21.9	154.882	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	14.55	3.13	8.90	20.32	107.647	Horizontal	Pass
		1732.5	13.57	3.27	8.90	19.2	83.176	Horizontal	Pass
		1752.5	15.62	3.30	8.90	21.22	132.434	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	16.46	3.15	8.90	22.21	166.341	Horizontal	Pass
		1732.5	14.50	3.31	8.90	20.09	102.094	Horizontal	Pass
		1750	14.37	3.33	8.90	19.94	98.628	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	15.39	3.15	8.90	21.14	130.017	Horizontal	Pass
		1732.5	16.31	3.31	8.90	21.9	154.882	Horizontal	Pass
		1747.5	15.45	3.33	8.90	21.02	126.474	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	15.14	3.17	8.90	20.87	122.180	Horizontal	Pass
		1732.5	15.90	3.32	8.90	21.48	140.605	Horizontal	Pass
		1745	16.36	3.36	8.90	21.9	154.882	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	16.30	3.12	8.90	22.08	161.436	Vertical	Pass
		1732.5	15.61	3.27	8.90	21.24	133.045	Vertical	Pass
		1754.3	16.07	3.29	8.90	21.68	147.231	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.38	3.13	8.90	21.15	130.317	Vertical	Pass
		1732.5	15.69	3.27	8.90	21.32	135.519	Vertical	Pass
		1753.5	15.47	3.30	8.90	21.07	127.938	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	16.99	3.13	8.90	22.76	188.799	Vertical	Pass
		1732.5	15.85	3.27	8.90	21.48	140.605	Vertical	Pass
		1752.5	14.41	3.30	8.90	20.01	100.231	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	15.08	3.15	8.90	20.83	121.060	Vertical	Pass
		1732.5	16.10	3.31	8.90	21.69	147.571	Vertical	Pass
		1750	16.74	3.33	8.90	22.31	170.216	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.64	3.15	8.90	20.39	109.396	Vertical	Pass
		1732.5	15.14	3.31	8.90	20.73	118.304	Vertical	Pass
		1747.5	16.75	3.33	8.90	22.32	170.608	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	15.69	3.17	8.90	21.42	138.676	Vertical	Pass
		1732.5	17.36	3.32	8.90	22.94	196.789	Vertical	Pass
		1745	16.43	3.36	8.90	21.97	157.398	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	20.20	2.01	5.30	2.15	21.34	136.144	Horizontal	Pass
		836.5	21.14	2.01	5.30	2.15	22.28	169.044	Horizontal	Pass
		848.3	19.83	2.02	5.70	2.15	21.36	136.773	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	21.11	2.01	5.30	2.15	22.25	167.880	Horizontal	Pass
		836.5	21.08	2.01	5.30	2.15	22.22	166.725	Horizontal	Pass
		847.5	20.51	2.02	5.70	2.15	22.04	159.956	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	20.05	2.01	5.30	2.15	21.19	131.522	Horizontal	Pass
		836.5	20.90	2.01	5.30	2.15	22.04	159.956	Horizontal	Pass
		846.5	20.87	2.02	5.70	2.15	22.4	173.780	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	19.99	2.01	5.30	2.15	21.13	129.718	Horizontal	Pass
		836.5	21.33	2.01	5.30	2.15	22.47	176.604	Horizontal	Pass
		844	19.68	2.02	5.70	2.15	21.21	132.130	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	21.76	2.01	5.30	2.15	22.9	194.984	Vertical	Pass
		836.5	21.57	2.01	5.30	2.15	22.71	186.638	Vertical	Pass
		848.3	20.11	2.02	5.70	2.15	21.64	145.881	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	21.11	2.01	5.30	2.15	22.25	167.880	Vertical	Pass
		836.5	20.80	2.01	5.30	2.15	21.94	156.315	Vertical	Pass
		847.5	18.91	2.02	5.70	2.15	20.44	110.662	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	18.95	2.01	5.30	2.15	20.09	102.094	Vertical	Pass
		836.5	21.40	2.01	5.30	2.15	22.54	179.473	Vertical	Pass
		846.5	19.75	2.02	5.70	2.15	21.28	134.276	Vertical	Pass
10.0MHz Band QPSK	50/0	829	19.10	2.01	5.30	2.15	20.24	105.682	Vertical	Pass
		836.5	22.68	2.01	5.30	2.15	23.82	240.991	Vertical	Pass
		844	19.63	2.02	5.70	2.15	21.16	130.617	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	20.14	2.01	5.30	2.15	21.28	134.276	Horizontal	Pass
		836.5	20.63	2.01	5.30	2.15	21.77	150.314	Horizontal	Pass
		848.3	19.62	2.02	5.70	2.15	21.15	130.317	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	19.72	2.01	5.30	2.15	20.86	121.899	Horizontal	Pass
		836.5	19.14	2.01	5.30	2.15	20.28	106.660	Horizontal	Pass
		847.5	19.39	2.02	5.70	2.15	20.92	123.595	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	20.17	2.01	5.30	2.15	21.31	135.207	Horizontal	Pass
		836.5	18.64	2.01	5.30	2.15	19.78	95.060	Horizontal	Pass
		846.5	19.66	2.02	5.70	2.15	21.19	131.522	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	18.90	2.01	5.30	2.15	20.04	100.925	Horizontal	Pass
		836.5	19.18	2.01	5.30	2.15	20.32	107.647	Horizontal	Pass
		844	18.91	2.02	5.70	2.15	20.44	110.662	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	20.45	2.01	5.30	2.15	21.59	144.212	Vertical	Pass
		836.5	20.08	2.01	5.30	2.15	21.22	132.434	Vertical	Pass
		848.3	19.72	2.02	5.70	2.15	21.25	133.352	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	18.45	2.01	5.30	2.15	19.59	90.991	Vertical	Pass
		836.5	20.02	2.01	5.30	2.15	21.16	130.617	Vertical	Pass
		847.5	18.61	2.02	5.70	2.15	20.14	103.276	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	19.64	2.01	5.30	2.15	20.78	119.674	Vertical	Pass
		836.5	17.39	2.01	5.30	2.15	18.53	71.285	Vertical	Pass
		846.5	19.31	2.02	5.70	2.15	20.84	121.339	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	18.61	2.01	5.30	2.15	19.75	94.406	Vertical	Pass
		836.5	21.45	2.01	5.30	2.15	22.59	181.552	Vertical	Pass
		844	20.71	2.02	5.70	2.15	22.24	167.494	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 Gain (dBi)	Max. EIRP	Max. EIRP Average (mW)	Polarization Of Max. ERP	
						Average (dBm)			
5.0MHz Band QPSK	25/0	2502.5	18.85	4.54	9.00	23.31	214.289	Horizontal	Pass
		2535	18.99	4.69	9.00	23.3	213.796	Horizontal	Pass
		2567.5	15.80	4.71	9.00	20.09	102.094	Horizontal	Pass
10.0MHz Band QPSK	50/0	2505	16.13	4.55	9.00	20.58	114.288	Horizontal	Pass
		2535	19.15	4.69	9.00	23.46	221.820	Horizontal	Pass
		2565	17.94	4.72	9.00	22.22	166.725	Horizontal	Pass
15.0MHz Band QPSK	75/0	2507.5	18.10	4.55	9.00	22.55	179.887	Horizontal	Pass
		2535	18.26	4.69	9.00	22.57	180.717	Horizontal	Pass
		2562.5	17.79	4.72	9.00	22.07	161.065	Horizontal	Pass
20.0MHz Band QPSK	100/0	2510	15.46	4.57	9.00	19.89	97.499	Horizontal	Pass
		2535	19.21	4.73	9.00	23.48	222.844	Horizontal	Pass
		2560	18.45	4.75	9.00	22.7	186.209	Horizontal	Pass
5.0MHz Band QPSK	25/0	2502.5	17.69	4.54	9.00	22.15	164.059	Vertical	Pass
		2535	19.70	4.69	9.00	24.01	251.768	Vertical	Pass
		2567.5	18.99	4.71	9.00	23.28	212.814	Vertical	Pass
10.0MHz Band QPSK	50/0	2505	16.97	4.55	9.00	21.42	138.676	Vertical	Pass
		2535	19.01	4.69	9.00	23.32	214.783	Vertical	Pass
		2565	18.03	4.72	9.00	22.31	170.216	Vertical	Pass
15.0MHz Band QPSK	75/0	2507.5	17.47	4.55	9.00	21.92	155.597	Vertical	Pass
		2535	19.65	4.69	9.00	23.96	248.886	Vertical	Pass
		2562.5	18.58	4.72	9.00	22.86	193.197	Vertical	Pass
20.0MHz Band QPSK	100/0	2510	19.99	4.57	9.00	24.42	276.694	Vertical	Pass
		2535	19.25	4.73	9.00	23.52	224.905	Vertical	Pass
		2560	19.40	4.75	9.00	23.65	231.739	Vertical	Pass

Radiated Power (EIRP) for Band 7									
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	
5.0MHz Band 16 QAM	25/0	2502.5	15.34	4.54	9.00	19.8	95.499	Horizontal	Pass
		2535	16.71	4.69	9.00	21.02	126.474	Horizontal	Pass
		2567.5	16.97	4.71	9.00	21.26	133.660	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2505	17.26	4.55	9.00	21.71	148.252	Horizontal	Pass
		2535	17.21	4.69	9.00	21.52	141.906	Horizontal	Pass
		2565	17.82	4.72	9.00	22.1	162.181	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2507.5	17.36	4.55	9.00	21.81	151.705	Horizontal	Pass
		2535	17.80	4.69	9.00	22.11	162.555	Horizontal	Pass
		2562.5	16.66	4.72	9.00	20.94	124.165	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2510	16.73	4.57	9.00	21.16	130.617	Horizontal	Pass
		2535	15.28	4.73	9.00	19.55	90.157	Horizontal	Pass
		2560	16.59	4.75	9.00	20.84	121.339	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2502.5	17.43	4.54	9.00	21.89	154.525	Vertical	Pass
		2535	17.55	4.69	9.00	21.86	153.462	Vertical	Pass
		2567.5	17.99	4.71	9.00	22.28	169.044	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2505	16.55	4.55	9.00	21	125.893	Vertical	Pass
		2535	17.97	4.69	9.00	22.28	169.044	Vertical	Pass
		2565	15.85	4.72	9.00	20.13	103.039	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2507.5	16.97	4.55	9.00	21.42	138.676	Vertical	Pass
		2535	16.75	4.69	9.00	21.06	127.644	Vertical	Pass
		2562.5	15.71	4.72	9.00	19.99	99.770	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2510	18.47	4.57	9.00	22.9	194.984	Vertical	Pass
		2535	16.98	4.73	9.00	21.25	133.352	Vertical	Pass
		2560	17.86	4.75	9.00	22.11	162.555	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 Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	19.62	1.91	5.60	2.15	21.16	130.617	Horizontal	Pass
		707.5	20.63	1.91	5.70	2.15	22.27	168.655	Horizontal	Pass
		715.3	18.24	1.93	5.80	2.15	19.96	99.083	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	18.68	1.91	5.60	2.15	20.22	105.196	Horizontal	Pass
		707.5	19.35	1.91	5.70	2.15	20.99	125.603	Horizontal	Pass
		714.5	19.23	1.93	5.80	2.15	20.95	124.451	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	19.29	1.91	5.60	2.15	20.83	121.060	Horizontal	Pass
		707.5	19.81	1.91	5.70	2.15	21.45	139.637	Horizontal	Pass
		713.5	19.92	1.92	5.80	2.15	21.65	146.218	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	19.52	1.91	5.60	2.15	21.06	127.644	Horizontal	Pass
		707.5	18.27	1.91	5.70	2.15	19.91	97.949	Horizontal	Pass
		711	18.22	1.92	5.80	2.15	19.95	98.855	Horizontal	Pass
1.4MHz Band QPSK	6/0	699.7	18.62	1.91	5.60	2.15	20.16	103.753	Vertical	Pass
		707.5	19.16	1.91	5.70	2.15	20.8	120.226	Vertical	Pass
		715.3	17.84	1.93	5.80	2.15	19.56	90.365	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	19.59	1.91	5.60	2.15	21.13	129.718	Vertical	Pass
		707.5	18.17	1.91	5.70	2.15	19.81	95.719	Vertical	Pass
		714.5	18.63	1.93	5.80	2.15	20.35	108.393	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	18.54	1.91	5.60	2.15	20.08	101.859	Vertical	Pass
		707.5	19.21	1.91	5.70	2.15	20.85	121.619	Vertical	Pass
		713.5	19.35	1.92	5.80	2.15	21.08	128.233	Vertical	Pass
10.0MHz Band QPSK	50/0	704	18.20	1.91	5.60	2.15	19.74	94.189	Vertical	Pass
		707.5	21.05	1.91	5.70	2.15	22.69	185.780	Vertical	Pass
		711	20.39	1.92	5.80	2.15	22.12	162.930	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	18.55	1.91	5.60	2.15	20.09	102.094	18.55	Horizontal	Pass
		18.47	1.91	5.70	2.15	20.11	102.565	18.47	Horizontal	Pass
		18.62	1.93	5.80	2.15	20.34	108.143	18.62	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	19.61	1.91	5.60	2.15	21.15	130.317	19.61	Horizontal	Pass
		17.35	1.91	5.70	2.15	18.99	79.250	17.35	Horizontal	Pass
		18.01	1.93	5.80	2.15	19.73	93.972	18.01	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	17.48	1.91	5.60	2.15	19.02	79.799	17.48	Horizontal	Pass
		19.77	1.91	5.70	2.15	21.41	138.357	19.77	Horizontal	Pass
		19.65	1.92	5.80	2.15	21.38	137.404	19.65	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	18.96	1.91	5.60	2.15	20.5	112.202	18.96	Horizontal	Pass
		18.35	1.91	5.70	2.15	19.99	99.770	18.35	Horizontal	Pass
		19.34	1.92	5.80	2.15	21.07	127.938	19.34	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	17.63	1.91	5.60	2.15	19.17	82.604	17.63	Vertical	Pass
		19.64	1.91	5.70	2.15	21.28	134.276	19.64	Vertical	Pass
		18.69	1.93	5.80	2.15	20.41	109.901	18.69	Vertical	Pass
3.0MHz Band 16 QAM	15/0	20.04	1.91	5.60	2.15	21.58	143.880	20.04	Vertical	Pass
		19.25	1.91	5.70	2.15	20.89	122.744	19.25	Vertical	Pass
		20.03	1.93	5.80	2.15	21.75	149.624	20.03	Vertical	Pass
5.0MHz Band 16 QAM	25/0	19.01	1.91	5.60	2.15	20.55	113.501	19.01	Vertical	Pass
		19.94	1.91	5.70	2.15	21.58	143.880	19.94	Vertical	Pass
		17.64	1.92	5.80	2.15	19.37	86.497	17.64	Vertical	Pass
10.0MHz Band 16 QAM	50/0	19.30	1.91	5.60	2.15	20.84	121.339	19.30	Vertical	Pass
		20.27	1.91	5.70	2.15	21.91	155.239	20.27	Vertical	Pass
		19.38	1.92	5.80	2.15	21.11	129.122	19.38	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	18.81	1.91	5.60	2.15	20.35	108.393	Vertical	Pass
		710	19.53	1.91	5.70	2.15	21.17	130.918	Vertical	Pass
		713.5	19.57	1.92	5.80	2.15	21.3	134.896	Vertical	Pass
10.0MHz Band QPSK	50/0	709	17.77	1.91	5.60	2.15	19.31	85.310	Vertical	Pass
		710	19.01	1.91	5.70	2.15	20.65	116.145	Vertical	Pass
		711	16.56	1.92	5.80	2.15	18.29	67.453	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	17.65	1.91	5.60	2.15	19.19	82.985	Horizontal	Pass
		710	17.04	1.91	5.70	2.15	18.68	73.790	Horizontal	Pass
		713.5	18.31	1.92	5.80	2.15	20.04	100.925	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	19.27	1.91	5.60	2.15	20.81	120.504	Horizontal	Pass
		710	20.04	1.91	5.70	2.15	21.68	147.231	Horizontal	Pass
		711	18.96	1.92	5.80	2.15	20.69	117.220	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	20.76	119.124	Vertical	Pass
		710	16.39	1.91	5.7	2.15	20.15	103.514	Vertical	Pass
		713.5	17.43	1.92	5.8	2.15	20.91	123.310	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	15.91	1.91	5.6	2.15	20.51	112.460	Vertical	Pass
		710	15.84	1.91	5.7	2.15	21.44	139.316	Vertical	Pass
		711	15.59	1.92	5.8	2.15	21.3	134.896	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	17.52	1.91	5.6	2.15	20.76	119.124	Horizontal	Pass
		710	17.46	1.91	5.7	2.15	21.16	130.617	Horizontal	Pass
		713.5	16.25	1.92	5.8	2.15	20.71	117.761	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	17.30	1.91	5.6	2.15	20.9	123.027	Horizontal	Pass
		710	17.57	1.91	5.7	2.15	21.49	140.929	Horizontal	Pass
		711	16.65	1.92	5.8	2.15	21.85	153.109	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 (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	17.66	4.54	9.00	22.12	162.930	Horizontal	Pass
		2593	17.66	4.69	9.00	21.97	157.398	Horizontal	Pass
		2687.5	16.49	4.71	9.00	20.78	119.674	Horizontal	Pass
10.0MHz Band QPSK	50/0	2501	18.22	4.55	9.00	22.67	184.927	Horizontal	Pass
		2593	17.70	4.69	9.00	22.01	158.855	Horizontal	Pass
		2685	15.91	4.72	9.00	20.19	104.472	Horizontal	Pass
15.0MHz Band QPSK	75/0	2503.5	14.79	4.55	9.00	19.24	83.946	Horizontal	Pass
		2593	17.17	4.69	9.00	21.48	140.605	Horizontal	Pass
		2682.5	17.93	4.72	9.00	22.21	166.341	Horizontal	Pass
20.0MHz Band QPSK	100/0	2506	16.69	4.57	9.00	21.12	129.420	Horizontal	Pass
		2593	17.17	4.73	9.00	21.44	139.316	Horizontal	Pass
		2680	18.32	4.75	9.00	22.57	180.717	Horizontal	Pass
5.0MHz Band QPSK	25/0	2498.5	17.90	4.54	9.00	22.36	172.187	Vertical	Pass
		2593	16.43	4.69	9.00	20.74	118.577	Vertical	Pass
		2687.5	16.06	4.71	9.00	20.35	108.393	Vertical	Pass
10.0MHz Band QPSK	50/0	2501	15.14	4.55	9.00	19.59	90.991	Vertical	Pass
		2593	16.77	4.69	9.00	21.08	128.233	Vertical	Pass
		2685	16.89	4.72	9.00	21.17	130.918	Vertical	Pass
15.0MHz Band QPSK	75/0	2503.5	15.41	4.55	9.00	19.86	96.828	Vertical	Pass
		2593	17.93	4.69	9.00	22.24	167.494	Vertical	Pass
		2682.5	16.82	4.72	9.00	21.1	128.825	Vertical	Pass
20.0MHz Band QPSK	100/0	2506	18.04	4.57	9.00	22.47	176.604	Vertical	Pass
		2593	18.61	4.73	9.00	22.88	194.089	Vertical	Pass
		2680	17.49	4.75	9.00	21.74	149.279	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	14.94	4.54	9.00	19.4	87.096	Horizontal	Pass
		2593	17.07	4.69	9.00	21.38	137.404	Horizontal	Pass
		2687.5	17.99	4.71	9.00	22.28	169.044	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2501	17.12	4.55	9.00	21.57	143.549	Horizontal	Pass
		2593	17.91	4.69	9.00	22.22	166.725	Horizontal	Pass
		2685	18.25	4.72	9.00	22.53	179.061	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2503.5	17.63	4.55	9.00	22.08	161.436	Horizontal	Pass
		2593	17.38	4.69	9.00	21.69	147.571	Horizontal	Pass
		2682.5	18.01	4.72	9.00	22.29	169.434	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2506	17.08	4.57	9.00	21.51	141.579	Horizontal	Pass
		2593	17.30	4.73	9.00	21.57	143.549	Horizontal	Pass
		2680	17.24	4.75	9.00	21.49	140.929	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2498.5	17.50	4.54	9.00	21.96	157.036	Vertical	Pass
		2593	17.87	4.69	9.00	22.18	165.196	Vertical	Pass
		2687.5	17.65	4.71	9.00	21.94	156.315	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2501	17.39	4.55	9.00	21.84	152.757	Vertical	Pass
		2593	16.15	4.69	9.00	20.46	111.173	Vertical	Pass
		2685	16.21	4.72	9.00	20.49	111.944	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2503.5	16.99	4.55	9.00	21.44	139.316	Vertical	Pass
		2593	17.74	4.69	9.00	22.05	160.325	Vertical	Pass
		2682.5	17.97	4.72	9.00	22.25	167.880	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2506	17.62	4.57	9.00	22.05	160.325	Vertical	Pass
		2593	18.19	4.73	9.00	22.46	176.198	Vertical	Pass
		2680	18.40	4.75	9.00	22.65	184.077	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	14.06	3.12	8.90	19.84	96.383	Horizontal	Pass
		1745	12.82	3.27	8.90	18.45	69.984	Horizontal	Pass
		1779.3	15.93	3.29	8.90	21.54	142.561	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	13.23	3.13	8.90	19	79.433	Horizontal	Pass
		1745	14.38	3.27	8.90	20.01	100.231	Horizontal	Pass
		1778.5	13.79	3.30	8.90	19.39	86.896	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	15.20	3.13	8.90	20.97	125.026	Horizontal	Pass
		1745	15.17	3.27	8.90	20.8	120.226	Horizontal	Pass
		1777.5	13.51	3.30	8.90	19.11	81.470	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	14.46	3.15	8.90	20.21	104.954	Horizontal	Pass
		1745	14.75	3.31	8.90	20.34	108.143	Horizontal	Pass
		1775	15.21	3.33	8.90	20.78	119.674	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	14.60	3.15	8.90	20.35	108.393	Horizontal	Pass
		1745	15.39	3.31	8.90	20.98	125.314	Horizontal	Pass
		1772.5	15.82	3.33	8.90	21.39	137.721	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.58	3.17	8.90	19.31	85.310	Horizontal	Pass
		1745	15.27	3.32	8.90	20.85	121.619	Horizontal	Pass
		1770	14.61	3.36	8.90	20.15	103.514	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	14.27	3.12	8.90	20.05	101.158	Vertical	Pass
		1745	15.62	3.27	8.90	21.25	133.352	Vertical	Pass
		1779.3	15.31	3.29	8.90	20.92	123.595	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	15.09	3.13	8.90	20.86	121.899	Vertical	Pass
		1745	15.51	3.27	8.90	21.14	130.017	Vertical	Pass
		1778.5	14.75	3.30	8.90	20.35	108.393	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	14.04	3.13	8.90	19.81	95.719	Vertical	Pass
		1745	13.97	3.27	8.90	19.6	91.201	Vertical	Pass
		1777.5	13.61	3.30	8.90	19.21	83.368	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	14.40	3.15	8.90	20.15	103.514	Vertical	Pass
		1745	15.36	3.31	8.90	20.95	124.451	Vertical	Pass
		1775	14.42	3.33	8.90	19.99	99.770	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	15.29	3.15	8.90	21.04	127.057	Vertical	Pass
		1745	15.32	3.31	8.90	20.91	123.310	Vertical	Pass
		1772.5	14.78	3.33	8.90	20.35	108.393	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	16.33	3.17	8.90	22.06	160.694	Vertical	Pass
		1745	15.77	3.32	8.90	21.35	136.458	Vertical	Pass
		1770	14.90	3.36	8.90	20.44	110.662	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	15.39	3.12	8.9	21.17	130.918	Horizontal	Pass
		1745	15.51	3.27	8.9	21.14	130.017	Horizontal	Pass
		1779.3	15.86	3.29	8.9	21.47	140.281	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.39	3.13	8.9	21.16	130.617	Horizontal	Pass
		1745	15.06	3.27	8.9	20.69	117.220	Horizontal	Pass
		1778.5	15.76	3.3	8.9	21.36	136.773	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	14.61	3.13	8.9	20.38	109.144	Horizontal	Pass
		1745	13.46	3.27	8.9	19.09	81.096	Horizontal	Pass
		1777.5	14.83	3.3	8.9	20.43	110.408	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	15.71	3.15	8.9	21.46	139.959	Horizontal	Pass
		1745	13.73	3.31	8.9	19.32	85.507	Horizontal	Pass
		1775	13.51	3.33	8.9	19.08	80.910	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.86	3.15	8.9	19.61	91.411	Horizontal	Pass
		1745	15.17	3.31	8.9	20.76	119.124	Horizontal	Pass
		1772.5	15.34	3.33	8.9	20.91	123.310	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	14.89	3.17	8.9	20.62	115.345	Horizontal	Pass
		1745	15.16	3.32	8.9	20.74	118.577	Horizontal	Pass
		1770	15.21	3.36	8.9	20.75	118.850	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	14.76	3.12	8.9	20.54	113.240	Vertical	Pass
		1745	15.06	3.27	8.9	20.69	117.220	Vertical	Pass
		1779.3	14.64	3.29	8.9	20.25	105.925	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	14.11	3.13	8.9	19.88	97.275	Vertical	Pass
		1745	14.12	3.27	8.9	19.75	94.406	Vertical	Pass
		1778.5	15.22	3.3	8.9	20.82	120.781	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	15.47	3.13	8.9	21.24	133.045	Vertical	Pass
		1745	15.46	3.27	8.9	21.09	128.529	Vertical	Pass
		1777.5	14.12	3.3	8.9	19.72	93.756	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	13.90	3.15	8.9	19.65	92.257	Vertical	Pass
		1745	15.91	3.31	8.9	21.5	141.254	Vertical	Pass
		1775	16.12	3.33	8.9	21.69	147.571	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.71	3.15	8.9	20.46	111.173	Vertical	Pass
		1745	15.12	3.31	8.9	20.71	117.761	Vertical	Pass
		1772.5	15.16	3.33	8.9	20.73	118.304	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	15.71	3.17	8.9	21.44	139.316	Vertical	Pass
		1745	15.65	3.32	8.9	21.23	132.739	Vertical	Pass
		1770	16.22	3.36	8.9	21.76	149.968	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

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

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

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

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

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

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	-54.64	4.04	33.51	-25.17	-13	-12.17	Horizontal
3701.4	-53.50	4.04	33.51	-24.03	-13	-11.03	Vertical
5552.1	-49.66	5.24	35.84	-19.06	-13	-6.06	Vertical
5552.1	-57.30	5.24	35.84	-26.70	-13	-13.70	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-54.46	4.04	33.56	-24.94	-13	-11.94	Horizontal
3760	-48.61	4.04	33.56	-19.09	-13	-6.09	Vertical
5640	-50.15	5.24	35.91	-19.48	-13	-6.48	Vertical
5640	-57.53	5.24	35.91	-26.86	-13	-13.86	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-54.14	4.04	34.00	-24.18	-13	-11.18	Horizontal
3818.6	-52.25	4.04	34.00	-22.29	-13	-9.29	Vertical
5727.9	-51.05	5.24	36.04	-20.25	-13	-7.25	Vertical
5727.9	-52.28	5.24	36.04	-21.48	-13	-8.48	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	-48.69	4.07	33.54	-19.22	-13	-6.22	Horizontal
3720	-52.85	4.07	33.54	-23.38	-13	-10.38	Vertical
5580	-50.20	5.28	35.86	-19.62	-13	-6.62	Vertical
5580	-52.09	5.28	35.86	-21.51	-13	-8.51	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-48.34	4.04	33.56	-18.82	-13	-5.82	Horizontal
3760	-50.84	4.04	33.56	-21.32	-13	-8.32	Vertical
5640	-51.49	5.24	35.91	-20.82	-13	-7.82	Vertical
5640	-51.80	5.24	35.91	-21.13	-13	-8.13	Horizontal
Test Results for High Channel 1900MHz							
3800	-49.46	4.04	34.00	-19.50	-13	-6.50	Horizontal
3800	-54.15	4.04	34.00	-24.19	-13	-11.19	Vertical
5700	-57.21	5.24	36.04	-26.41	-13	-13.41	Vertical
5700	-54.12	5.24	36.04	-23.32	-13	-10.32	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	-48.95	4.02	29.80	-23.17	-13	-10.17	Horizontal
3421.4	-53.56	4.02	29.80	-27.78	-13	-14.78	Vertical
5132.1	-53.73	5.24	35.84	-23.13	-13	-10.13	Vertical
5132.1	-53.86	5.24	35.84	-23.26	-13	-10.26	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-52.76	4.03	30.00	-26.79	-13	-13.79	Horizontal
3465	-49.63	4.03	30.00	-23.66	-13	-10.66	Vertical
5197.5	-53.42	5.25	35.86	-22.81	-13	-9.81	Vertical
5197.5	-52.85	5.25	35.86	-22.24	-13	-9.24	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-52.93	4.05	30.01	-26.97	-13	-13.97	Horizontal
3508.6	-47.63	4.05	30.01	-21.67	-13	-8.67	Vertical
5262.9	-52.38	5.26	35.86	-21.78	-13	-8.78	Vertical
5262.9	-53.28	5.26	35.86	-22.68	-13	-9.68	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	-47.14	4.02	29.80	-21.36	-13	-8.36	Horizontal
3440	-52.91	4.02	29.80	-27.13	-13	-14.13	Vertical
5160	-57.50	5.24	35.84	-26.90	-13	-13.90	Vertical
5160	-53.40	5.24	35.84	-22.80	-13	-9.80	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-54.01	4.03	30.00	-28.04	-13	-15.04	Horizontal
3465	-54.20	4.03	30.00	-28.23	-13	-15.23	Vertical
5197.5	-54.75	5.25	35.86	-24.14	-13	-11.14	Vertical
5197.5	-57.51	5.25	35.86	-26.90	-13	-13.90	Horizontal
Test Results for High Channel 1745MHz							
2490	-49.42	2.91	27.68	-24.65	-13	-11.65	Horizontal
3490	-50.31	2.91	27.68	-25.54	-13	-12.54	Vertical
5235	-52.95	5.26	35.86	-22.35	-13	-9.35	Vertical
5235	-57.67	5.26	35.86	-27.07	-13	-14.07	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	-50.28	2.78	27.50	-25.56	-13	-12.56	Horizontal
1649.4	-48.71	2.78	27.50	-23.99	-13	-10.99	Vertical
2474.1	-57.31	2.90	27.80	-32.41	-13	-19.41	Vertical
2474.1	-49.94	2.90	27.80	-25.04	-13	-12.04	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-47.68	2.78	27.48	-22.98	-13	-9.98	Horizontal
1673	-47.97	2.78	27.48	-23.27	-13	-10.27	Vertical
2509.5	-52.45	2.91	27.70	-27.66	-13	-14.66	Vertical
2509.5	-54.80	2.91	27.70	-30.01	-13	-17.01	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-50.65	2.78	27.43	-26.00	-13	-13.00	Horizontal
1696.6	-48.89	2.78	27.43	-24.24	-13	-11.24	Vertical
2544.9	-53.69	2.92	27.74	-28.87	-13	-15.87	Vertical
2544.9	-53.30	2.92	27.74	-28.48	-13	-15.48	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	-47.23	2.78	27.50	-22.51	-13	-9.51	Horizontal
1658	-49.87	2.78	27.50	-25.15	-13	-12.15	Vertical
2487	-51.23	2.90	27.80	-26.33	-13	-13.33	Vertical
2487	-55.61	2.90	27.80	-30.71	-13	-17.71	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-47.49	2.78	27.48	-22.79	-13	-9.79	Horizontal
1673	-50.61	2.78	27.48	-25.91	-13	-12.91	Vertical
2509.5	-56.01	2.91	27.70	-31.22	-13	-18.22	Vertical
2509.5	-51.10	2.91	27.70	-26.31	-13	-13.31	Horizontal
Test Results for High Channel 844MHz							
1688	-50.85	2.78	27.43	-26.20	-13	-13.20	Horizontal
1688	-54.66	2.78	27.43	-30.01	-13	-17.01	Vertical
2532	-56.51	2.92	27.74	-31.69	-13	-18.69	Vertical
2532	-49.45	2.92	27.74	-24.63	-13	-11.63	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.

9.4 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	-58.50	5.23	35.81	-27.92	-25	-2.92	Horizontal
5005	-57.73	5.23	35.81	-27.15	-25	-2.15	Vertical
7507.5	-61.12	5.67	36.85	-29.94	-25	-4.94	Vertical
7507.5	-61.45	5.67	36.85	-30.27	-25	-5.27	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-58.23	5.23	35.82	-27.64	-25	-2.64	Horizontal
5070	-57.68	5.23	35.82	-27.09	-25	-2.09	Vertical
7605	-63.20	5.67	36.85	-32.02	-25	-7.02	Vertical
7605	-63.90	5.67	36.85	-32.72	-25	-7.72	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-58.23	5.24	35.83	-27.64	-25	-2.64	Horizontal
5135	-60.68	5.24	35.83	-30.09	-25	-5.09	Vertical
7702.5	-60.84	5.68	36.87	-29.65	-25	-4.65	Vertical
7702.5	-60.45	5.68	36.87	-29.26	-25	-4.26	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	-59.26	5.23	35.82	-28.67	-25	-3.67	Horizontal
5020	-60.82	5.23	35.82	-30.23	-25	-5.23	Vertical
7530	-64.99	5.67	36.86	-33.80	-25	-8.80	Vertical
7530	-64.51	5.67	36.86	-33.32	-25	-8.32	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-61.80	5.23	35.82	-31.21	-25	-6.21	Horizontal
5070	-58.61	5.23	35.82	-28.02	-25	-3.02	Vertical
7605	-63.86	5.67	36.85	-32.68	-25	-7.68	Vertical
7605	-60.97	5.67	36.85	-29.79	-25	-4.79	Horizontal
Test Results for High Channel 2560MHz							
5120	-57.67	5.24	35.83	-27.08	-25	-2.08	Horizontal
5120	-59.82	5.24	35.83	-29.23	-25	-4.23	Vertical
7680	-63.24	5.70	36.88	-32.06	-25	-7.06	Vertical
7680	-63.12	5.70	36.88	-31.94	-25	-6.94	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	-48.77	2.60	27.2	-24.17	-13	-11.17	Horizontal
1399.4	-52.86	2.60	27.2	-28.26	-13	-15.26	Vertical
2099.1	-51.44	2.85	27.54	-26.75	-13	-13.75	Vertical
2099.1	-54.57	2.85	27.54	-29.88	-13	-16.88	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-54.23	2.61	27.28	-29.56	-13	-16.56	Horizontal
1415	-49.38	2.61	27.28	-24.71	-13	-11.71	Vertical
2122.5	-56.59	2.87	27.59	-31.87	-13	-18.87	Vertical
2122.5	-56.45	2.87	27.59	-31.73	-13	-18.73	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-54.25	2.63	27.28	-29.60	-13	-16.60	Horizontal
1430.6	-51.59	2.63	27.28	-26.94	-13	-13.94	Vertical
2145.9	-53.15	2.88	27.60	-28.43	-13	-15.43	Vertical
2145.9	-52.66	2.88	27.60	-27.94	-13	-14.94	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	-47.31	2.61	27.26	-22.66	-13	-9.66	Horizontal
1408	-52.60	2.61	27.26	-27.95	-13	-14.95	Vertical
2112	-55.98	2.87	27.58	-31.27	-13	-18.27	Vertical
2112	-56.75	2.87	27.58	-32.04	-13	-19.04	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-51.09	2.61	27.28	-26.42	-13	-13.42	Horizontal
1415	-48.00	2.61	27.28	-23.33	-13	-10.33	Vertical
2122.5	-52.52	2.87	27.59	-27.80	-13	-14.80	Vertical
2122.5	-49.21	2.87	27.59	-24.49	-13	-11.49	Horizontal
Test Results for High Channel 711MHz							
1422	-50.32	2.62	27.28	-25.66	-13	-12.66	Horizontal
1422	-49.31	2.62	27.28	-24.65	-13	-11.65	Vertical
2133	-49.59	2.87	27.60	-24.86	-13	-11.86	Vertical
2133	-50.26	2.87	27.60	-25.53	-13	-12.53	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	-53.30	2.61	27.28	-28.63	-13	-15.63	Horizontal
1413	-54.57	2.61	27.28	-29.90	-13	-16.90	Vertical
2119.5	-53.80	2.87	27.59	-29.08	-13	-16.08	Vertical
2119.5	-56.91	2.87	27.59	-32.19	-13	-19.19	Horizontal
Test Results For Mid Channel 710MHz							
1420	-48.26	2.62	27.30	-23.58	-13	-10.58	Horizontal
1420	-50.91	2.62	27.30	-26.23	-13	-13.23	Vertical
2130	-56.70	2.87	27.62	-31.95	-13	-18.95	Vertical
2130	-57.42	2.87	27.62	-32.67	-13	-19.67	Horizontal
Test Results for High Channel 713.5MHz							
1427	-49.19	2.66	27.28	-24.57	-13	-11.57	Horizontal
1427	-49.05	2.66	27.28	-24.43	-13	-11.43	Vertical
2140.5	-51.64	2.88	27.60	-26.92	-13	-13.92	Vertical
2140.5	-53.98	2.88	27.60	-29.26	-13	-16.26	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	-49.33	2.62	27.30	-24.65	-13	-11.65	Horizontal
1418	-50.74	2.62	27.30	-26.06	-13	-13.06	Vertical
2127	-50.99	2.87	27.62	-26.24	-13	-13.24	Vertical
2127	-56.25	2.87	27.62	-31.50	-13	-18.50	Horizontal
Test Results for Mid Channel 710MHz							
1420	-54.87	2.62	27.30	-30.19	-13	-17.19	Horizontal
1420	-49.33	2.62	27.30	-24.65	-13	-11.65	Vertical
2130	-49.80	2.87	27.62	-25.05	-13	-12.05	Vertical
2130	-52.50	2.87	27.62	-27.75	-13	-14.75	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 2537MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit(dBm)	Margin(dBm)	Polarity
4997	-55.75	2.63	27.26	-31.12	-25	-6.12	Horizontal
4997	-54.07	2.63	27.26	-29.44	-25	-4.44	Vertical
7495.5	-59.55	2.67	27.58	-34.64	-25	-9.64	Vertical
7495.5	-60.43	2.67	27.58	-35.52	-25	-10.52	Horizontal
Test Results for Mid Channel 2595MHz							
5186	-56.88	2.62	27.28	-32.22	-25	-7.22	Horizontal
5186	-56.27	2.62	27.28	-31.61	-25	-6.61	Vertical
7779	-55.53	2.85	27.62	-30.76	-25	-5.76	Vertical
7779	-57.79	2.85	27.62	-33.02	-25	-8.02	Horizontal
Test Results for High Channel 2652.5MHz							
5375	-53.47	2.64	27.28	-28.83	-25	-3.83	Horizontal
5375	-57.49	2.64	27.28	-32.85	-25	-7.85	Vertical
8062.5	-56.46	2.85	27.70	-31.61	-25	-6.61	Vertical
8062.5	-56.13	2.85	27.70	-31.28	-25	-6.28	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
5186	-57.73	2.63	27.30	-33.06	-25	-8.06	Horizontal
5186	-55.31	2.63	27.30	-30.64	-25	-5.64	Vertical
7779	-54.58	2.67	27.62	-29.63	-25	-4.63	Vertical
7779	-55.14	2.67	27.62	-30.19	-25	-5.19	Horizontal
Test Results for Mid Channel 2595MHz							
5205	-56.50	2.62	27.33	-31.79	-25	-6.79	Horizontal
5205	-56.99	2.62	27.33	-32.28	-25	-7.28	Vertical
7807.5	-57.40	2.85	27.67	-32.58	-25	-7.58	Vertical
7807.5	-60.54	2.85	27.67	-35.72	-25	-10.72	Horizontal
Test Results for High Channel 2645MHz							
5360	-55.67	2.64	27.33	-30.98	-25	-5.98	Horizontal
5360	-54.04	2.64	27.33	-29.35	-25	-4.35	Vertical
8040	-57.52	2.85	27.67	-32.70	-25	-7.70	Vertical
8040	-57.23	2.85	27.67	-32.41	-25	-7.41	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
3421.4	-51.96	2.61	27.28	-27.29	-13	-14.29	Horizontal
3421.4	-48.57	2.61	27.28	-23.90	-13	-10.90	Vertical
5132.1	-53.48	2.87	27.59	-28.76	-13	-15.76	Vertical
5132.1	-52.65	2.87	27.59	-27.93	-13	-14.93	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-48.54	2.62	27.3	-23.86	-13	-10.86	Horizontal
3490	-52.32	2.62	27.3	-27.64	-13	-14.64	Vertical
5337.9	-49.54	2.87	27.62	-24.79	-13	-11.79	Vertical
5337.9	-57.28	2.87	27.62	-32.53	-13	-19.53	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-48.88	2.66	27.28	-24.26	-13	-11.26	Horizontal
3558.6	-47.04	2.66	27.28	-22.42	-13	-9.42	Vertical
5337.9	-53.36	2.88	27.6	-28.64	-13	-15.64	Vertical
5337.9	-55.76	2.88	27.6	-31.04	-13	-18.04	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	-48.09	2.62	27.3	-23.41	-13	-10.41	Horizontal
3440	-53.17	2.62	27.3	-28.49	-13	-15.49	Vertical
5160	-52.81	2.87	27.62	-28.06	-13	-15.06	Vertical
5160	-54.14	2.87	27.62	-29.39	-13	-16.39	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-48.91	2.62	27.3	-24.23	-13	-11.23	Horizontal
3490	-48.89	2.62	27.3	-24.21	-13	-11.21	Vertical
5337.9	-52.78	2.87	27.62	-28.03	-13	-15.03	Vertical
5337.9	-57.56	2.87	27.62	-32.81	-13	-19.81	Horizontal
Test Results for High Channel 1770MHz							
3540	-47.90	2.62	27.3	-23.22	-13	-10.22	Horizontal
3540	-53.56	2.62	27.3	-28.88	-13	-15.88	Vertical
5310	-49.35	2.87	27.62	-24.60	-13	-11.60	Vertical
5310	-55.31	2.87	27.62	-30.56	-13	-17.56	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

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	1	0.000532	2.5
3.85	1880	6	0.003191	2.5
4.43	1880	16	0.008511	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	2	0.001064	2.5
Extreme (50C)	1880	0	0.000000	2.5
Extreme (40C)	1880	13	0.006915	2.5
Extreme (30C)	1880	1	0.000532	2.5
Extreme (10C)	1880	15	0.007979	2.5
Extreme (0C)	1880	10	0.005319	2.5
Extreme (-10C)	1880	14	0.007447	2.5
Extreme (-20C)	1880	4	0.002128	2.5
Extreme (-30C)	1880	10	0.005319	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	10	0.005319	2.5
3.85	1880	15	0.007979	2.5
4.43	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	4	0.002128	2.5
Extreme (50C)	1880	16	0.008511	2.5
Extreme (40C)	1880	16	0.008511	2.5
Extreme (30C)	1880	0	0.000000	2.5
Extreme (10C)	1880	14	0.007447	2.5
Extreme (0C)	1880	21	0.011170	2.5
Extreme (-10C)	1880	14	0.007447	2.5
Extreme (-20C)	1880	12	0.006383	2.5
Extreme (-30C)	1880	13	0.006915	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	12	0.006926	2.5
3.85	1732.5	19	0.010967	2.5
4.43	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	7	0.004040	2.5
Extreme (50C)	1732.5	10	0.005772	2.5
Extreme (40C)	1732.5	13	0.007504	2.5
Extreme (30C)	1732.5	13	0.007504	2.5
Extreme (10C)	1732.5	8	0.004618	2.5
Extreme (0C)	1732.5	20	0.011544	2.5
Extreme (-10C)	1732.5	18	0.010390	2.5
Extreme (-20C)	1732.5	17	0.009812	2.5
Extreme (-30C)	1732.5	5	0.002886	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	16	0.009235	2.5
3.85	1732.5	2	0.001154	2.5
4.43	1732.5	3	0.001732	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	17	0.009812	2.5
Extreme (50C)	1732.5	9	0.005195	2.5
Extreme (40C)	1732.5	23	0.013276	2.5
Extreme (30C)	1732.5	4	0.002309	2.5
Extreme (10C)	1732.5	8	0.004618	2.5
Extreme (0C)	1732.5	5	0.002886	2.5
Extreme (-10C)	1732.5	19	0.010967	2.5
Extreme (-20C)	1732.5	16	0.009235	2.5
Extreme (-30C)	1732.5	19	0.010967	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	21	0.025105	2.5
3.85	836.5	19	0.022714	2.5
4.43	836.5	18	0.021518	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	17	0.020323	2.5
Extreme (50C)	836.5	18	0.021518	2.5
Extreme (40C)	836.5	14	0.016736	2.5
Extreme (30C)	836.5	7	0.008368	2.5
Extreme (10C)	836.5	7	0.008368	2.5
Extreme (0C)	836.5	19	0.022714	2.5
Extreme (-10C)	836.5	5	0.005977	2.5
Extreme (-20C)	836.5	24	0.028691	2.5
Extreme (-30C)	836.5	2	0.002391	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	21	0.025105	2.5
3.85	836.5	4	0.004782	2.5
4.43	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	23	0.027496	2.5
Extreme (50C)	836.5	19	0.022714	2.5
Extreme (40C)	836.5	9	0.010759	2.5
Extreme (30C)	836.5	20	0.023909	2.5
Extreme (10C)	836.5	16	0.019127	2.5
Extreme (0C)	836.5	8	0.009564	2.5
Extreme (-10C)	836.5	7	0.008368	2.5
Extreme (-20C)	836.5	4	0.004782	2.5
Extreme (-30C)	836.5	12	0.014345	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	16	0.006312	2.5
3.85	2535	14	0.005523	2.5
4.43	2535	1	0.000394	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	1	0.000394	2.5
Extreme (50C)	2535	9	0.003550	2.5
Extreme (40C)	2535	20	0.007890	2.5
Extreme (30C)	2535	7	0.002761	2.5
Extreme (10C)	2535	24	0.009467	2.5
Extreme (0C)	2535	13	0.005128	2.5
Extreme (-10C)	2535	16	0.006312	2.5
Extreme (-20C)	2535	1	0.000394	2.5
Extreme (-30C)	2535	26	0.010256	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	5	0.001972	2.5
3.85	2535	7	0.002761	2.5
4.43	2535	12	0.004734	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	8	0.003156	2.5
Extreme (50C)	2535	24	0.009467	2.5
Extreme (40C)	2535	1	0.000394	2.5
Extreme (30C)	2535	24	0.009467	2.5
Extreme (10C)	2535	22	0.008679	2.5
Extreme (0C)	2535	11	0.004339	2.5
Extreme (-10C)	2535	18	0.007101	2.5
Extreme (-20C)	2535	21	0.008284	2.5
Extreme (-30C)	2535	11	0.004339	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	1	0.001413	2.5
3.85	707.5	13	0.018375	2.5
4.43	707.5	24	0.033922	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8	0.011307	2.5
Extreme (50C)	707.5	23	0.032509	2.5
Extreme (40C)	707.5	0	0.000000	2.5
Extreme (30C)	707.5	10	0.014134	2.5
Extreme (10C)	707.5	16	0.022615	2.5
Extreme (0C)	707.5	3	0.004240	2.5
Extreme (-10C)	707.5	17	0.024028	2.5
Extreme (-20C)	707.5	10	0.014134	2.5
Extreme (-30C)	707.5	13	0.018375	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	9	0.012721	2.5
3.85	707.5	5	0.007067	2.5
4.43	707.5	8	0.011307	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	10	0.014134	2.5
Extreme (50C)	707.5	8	0.011307	2.5
Extreme (40C)	707.5	0	0.000000	2.5
Extreme (30C)	707.5	14	0.019788	2.5
Extreme (10C)	707.5	5	0.007067	2.5
Extreme (0C)	707.5	15	0.021201	2.5
Extreme (-10C)	707.5	13	0.018375	2.5
Extreme (-20C)	707.5	14	0.019788	2.5
Extreme (-30C)	707.5	2	0.002827	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	10	0.014085	2.5
3.85	710	16	0.022535	2.5
4.43	710	8	0.011268	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	4	0.005634	2.5
Extreme (50C)	710	19	0.026761	2.5
Extreme (40C)	710	3	0.004225	2.5
Extreme (30C)	710	6	0.008451	2.5
Extreme (10C)	710	19	0.026761	2.5
Extreme (0C)	710	10	0.014085	2.5
Extreme (-10C)	710	14	0.019718	2.5
Extreme (-20C)	710	5	0.007042	2.5
Extreme (-30C)	710	5	0.007042	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	13	0.018310	2.5
3.85	710	15	0.021127	2.5
4.43	710	18	0.025352	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	7	0.009859	2.5
Extreme (50C)	710	6	0.008451	2.5
Extreme (40C)	710	6	0.008451	2.5
Extreme (30C)	710	4	0.005634	2.5
Extreme (10C)	710	16	0.022535	2.5
Extreme (0C)	710	13	0.018310	2.5
Extreme (-10C)	710	16	0.022535	2.5
Extreme (-20C)	710	14	0.019718	2.5
Extreme (-30C)	710	6	0.008451	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	15	0.005785	2.5
3.85	2593	13	0.005013	2.5
4.43	2593	10	0.003857	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	14	0.005399	2.5
Extreme (50C)	2593	7	0.002700	2.5
Extreme (40C)	2593	15	0.005785	2.5
Extreme (30C)	2593	18	0.006942	2.5
Extreme (10C)	2593	22	0.008484	2.5
Extreme (0C)	2593	21	0.008099	2.5
Extreme (-10C)	2593	2	0.000771	2.5
Extreme (-20C)	2593	9	0.003471	2.5
Extreme (-30C)	2593	13	0.005013	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	16	0.006170	2.5
3.85	2593	15	0.005785	2.5
4.43	2593	0	0.000000	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	15	0.005785	2.5
Extreme (50C)	2593	15	0.005785	2.5
Extreme (40C)	2593	1	0.000386	2.5
Extreme (30C)	2593	22	0.008484	2.5
Extreme (10C)	2593	6	0.002314	2.5
Extreme (0C)	2593	17	0.006556	2.5
Extreme (-10C)	2593	9	0.003471	2.5
Extreme (-20C)	2593	6	0.002314	2.5
Extreme (-30C)	2593	16	0.006170	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	16	0.009169	2.5
3.85	1745	15	0.008596	2.5
4.43	1745	9	0.005158	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	14	0.008023	2.5
Extreme (40C)	1745	14	0.008023	2.5
Extreme (30C)	1745	13	0.007450	2.5
Extreme (10C)	1745	21	0.012034	2.5
Extreme (0C)	1745	0	0.000000	2.5
Extreme (-10C)	1745	2	0.001146	2.5
Extreme (-20C)	1745	13	0.007450	2.5
Extreme (-30C)	1745	12	0.006877	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	19	0.010888	2.5
4.43	1745	2	0.001146	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	10	0.005731	2.5
Extreme (30C)	1745	21	0.012034	2.5
Extreme (10C)	1745	20	0.011461	2.5
Extreme (0C)	1745	0	0.000000	2.5
Extreme (-10C)	1745	13	0.007450	2.5
Extreme (-20C)	1745	5	0.002865	2.5
Extreme (-30C)	1745	13	0.007450	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.

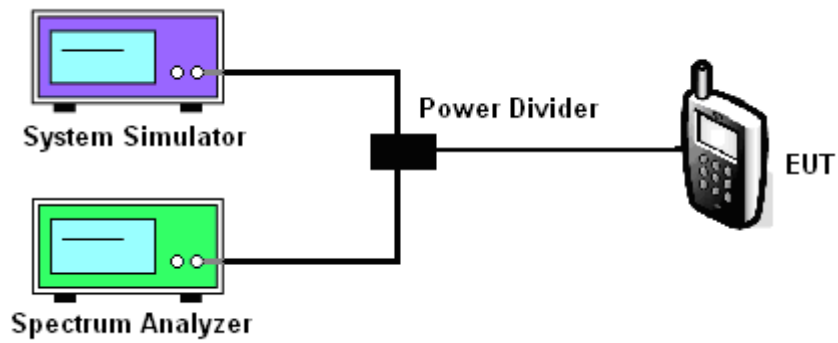
11.2 Measuring Instruments

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-----