

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

FCC ID: 2AOWK-5010

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ5010

Family Model: Armor Mini 20T Pro, Armor Mini 20 Pro,
Armor Mini 20 Ultra, Armor Mini 20T Ultra

Report No.: S24070203407006

Issue Date: Aug. 21, 2024

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Gotron Electronic CO.,LTD.
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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 .. : GQ5010
Trade Mark..... : ulefone
Family Model..... : Armor Mini 20T Pro, Armor Mini 20 Pro, Armor Mini 20 Ultra,
Armor Mini 20T Ultra
Test Sample Number..... S240702034007
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..... Jul. 02, 2024 ~ Aug. 21, 2024

Date of Issue Aug. 21, 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	GQ5010
Family Model	Armor Mini 20T Pro, Armor Mini 20 Pro, Armor Mini 20 Ultra, Armor Mini 20T Ultra
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2AOWK-5010
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,17 LTE 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,
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	LDS Antenna
Antenna gain:	Band 2:-0.2dBi; Band 4:-0.9dBi; Band 5:-4.2dBi; Band 7:-1.2dBi Band 12:-6.0dBi; Band 17:-6.0dBi; Band 41:-1.2dBi
Adapter	Model: UF82PD3303 Input: 100-240V~50/60Hz 0.8A Output: 5.0V---3.0A 15.0W or 9.0V---3.0A 27.0W or 12.0V---2.5A 30.0W or 15.0V---2.0A 30.0W or 20.0V---1.5A 30.0W PPS: 5.0V-11.0V---3.0A or 5.0V-16.0V---2.0A 33.0W Max
Battery	DC 3.87V, 6200mAh, 23.994Wh
Power supply	DC 3.87V from battery or DC 5V/9V/12V/15V/20V from adapter
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V) (Note 1)
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage DC 4.45V and Low Voltage DC 3.29V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AOWK-5010** 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 Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R.China.

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

FCC Registration No.:463705

IC Registration No.:9270A

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

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	GQ5010	FCC ID: 2AOWK-5010	EUT

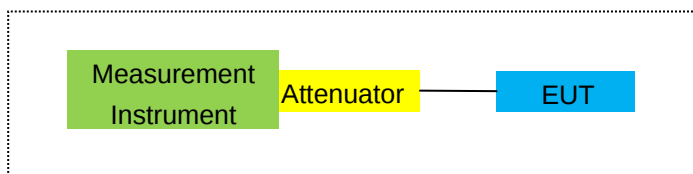
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

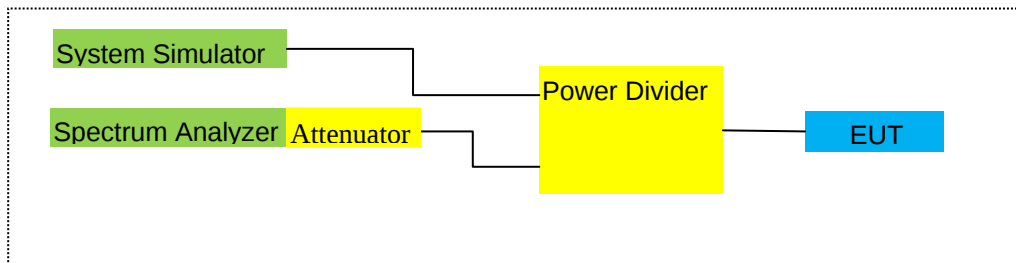
For Radiated Test Cases



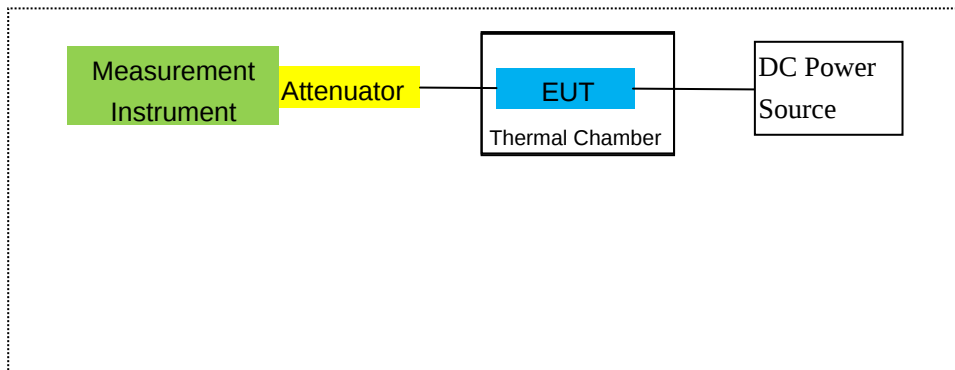
For Conducted Output Power



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	Attenuator	MCE	24-10-34	BN9258	2024.03.12	2025.03.11	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	1 year

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

Measurement Software

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

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

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

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
- ☐

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.

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

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	1/#Mid	1850.7	-4.25	3.76	28.24	20.23	105.439	Horizontal	Pass
		1880	-4.06	3.91	28.22	20.25	105.925	Horizontal	Pass
		1909.3	-3.97	3.93	28.20	20.30	107.152	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-4.31	3.77	28.23	20.15	103.514	Horizontal	Pass
		1880	-4.16	3.91	28.24	20.17	103.992	Horizontal	Pass
		1908.5	-4.03	3.94	28.25	20.28	106.660	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.20	3.77	28.31	20.34	108.143	Horizontal	Pass
		1880	-3.82	3.91	28.22	20.49	111.944	Horizontal	Pass
		1907.5	-3.75	3.94	28.20	20.51	112.460	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-4.06	3.79	28.33	20.48	111.686	Horizontal	Pass
		1880	-3.76	3.95	28.22	20.51	112.460	Horizontal	Pass
		1905	-3.65	3.97	28.19	20.57	114.025	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-4.02	3.79	28.34	20.53	112.980	Horizontal	Pass
		1880	-3.81	3.95	28.22	20.46	111.173	Horizontal	Pass
		1902.5	-3.67	3.97	28.18	20.54	113.240	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.01	3.81	28.35	20.53	112.980	Horizontal	Pass
		1880	-3.68	3.96	28.22	20.58	114.288	Horizontal	Pass
		1900	-3.62	4.00	28.16	20.54	113.240	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-5.10	3.76	28.24	19.38	86.696	Vertical	Pass
		1880	-4.57	3.91	28.22	19.74	94.189	Vertical	Pass
		1909.3	-4.55	3.93	28.20	19.72	93.756	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.15	3.77	28.23	19.31	85.310	Vertical	Pass
		1880	-4.67	3.91	28.24	19.66	92.470	Vertical	Pass
		1908.5	-4.58	3.94	28.25	19.73	93.972	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.52	3.77	28.31	19.02	79.799	Vertical	Pass
		1880	-5.15	3.91	28.22	19.16	82.414	Vertical	Pass
		1907.5	-4.49	3.94	28.20	19.77	94.842	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.13	3.79	28.33	19.41	87.297	Vertical	Pass
		1880	-5.18	3.95	28.22	19.09	81.096	Vertical	Pass
		1905	-5.13	3.97	28.19	19.09	81.096	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-4.82	3.79	28.34	19.73	93.972	Vertical	Pass
		1880	-4.97	3.95	28.22	19.30	85.114	Vertical	Pass
		1902.5	-5.11	3.97	28.18	19.10	81.283	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-5.44	3.81	28.35	19.10	81.283	Vertical	Pass
		1880	-5.18	3.96	28.22	19.08	80.910	Vertical	Pass
		1900	-4.36	4.00	28.16	19.80	95.499	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	1/#Mid	1850.7	-5.37	3.76	28.24	19.11	81.470	Horizontal	Pass
		1880	-4.84	3.91	28.22	19.47	88.512	Horizontal	Pass
		1909.3	-4.77	3.93	28.20	19.50	89.125	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.87	3.77	28.23	19.59	90.991	Horizontal	Pass
		1880	-4.95	3.91	28.24	19.38	86.696	Horizontal	Pass
		1908.5	-5.16	3.94	28.25	19.15	82.224	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.81	3.77	28.31	19.73	93.972	Horizontal	Pass
		1880	-4.72	3.91	28.22	19.59	90.991	Horizontal	Pass
		1907.5	-4.40	3.94	28.20	19.86	96.828	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.86	3.79	28.33	19.68	92.897	Horizontal	Pass
		1880	-4.85	3.95	28.22	19.42	87.498	Horizontal	Pass
		1905	-4.32	3.97	28.19	19.90	97.724	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.84	3.79	28.34	19.71	93.541	Horizontal	Pass
		1880	-4.63	3.95	28.22	19.64	92.045	Horizontal	Pass
		1902.5	-4.59	3.97	28.18	19.62	91.622	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.73	3.81	28.35	19.81	95.719	Horizontal	Pass
		1880	-4.43	3.96	28.22	19.83	96.161	Horizontal	Pass
		1900	-4.25	4.00	28.16	19.91	97.949	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.30	3.76	28.24	18.18	65.766	Vertical	Pass
		1880	-5.46	3.91	28.22	18.85	76.736	Vertical	Pass
		1909.3	-5.66	3.93	28.20	18.61	72.611	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-6.04	3.77	28.23	18.42	69.502	Vertical	Pass
		1880	-6.12	3.91	28.24	18.21	66.222	Vertical	Pass
		1908.5	-5.42	3.94	28.25	18.89	77.446	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-6.52	3.77	28.31	18.02	63.387	Vertical	Pass
		1880	-6.11	3.91	28.22	18.20	66.069	Vertical	Pass
		1907.5	-6.20	3.94	28.20	18.06	63.973	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-5.67	3.79	28.33	18.87	77.090	Vertical	Pass
		1880	-5.88	3.95	28.22	18.39	69.024	Vertical	Pass
		1905	-6.24	3.97	28.19	17.98	62.806	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-6.28	3.79	28.34	18.27	67.143	Vertical	Pass
		1880	-5.57	3.95	28.22	18.70	74.131	Vertical	Pass
		1902.5	-5.31	3.97	28.18	18.90	77.625	Vertical	Pass
20.0MHz	1/#Mid	1860	-5.70	3.81	28.35	18.84	76.560	Vertical	Pass

Band 16 QAM	1880	-5.87	3.96	28.22	18.39	69.024	Vertical	Pass
	1900	-5.84	4.00	28.16	18.32	67.920	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	1/#Mid	1710.7	-4.16	3.12	27.58	20.30	107.152	Horizontal	Pass
		1732.5	-4.15	3.27	27.61	20.19	104.472	Horizontal	Pass
		1754.3	-4.13	3.29	27.63	20.21	104.954	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.33	3.13	27.61	20.15	103.514	Horizontal	Pass
		1732.5	-4.25	3.27	27.61	20.09	102.094	Horizontal	Pass
		1753.5	-4.17	3.30	27.62	20.15	103.514	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.10	3.13	27.63	20.40	109.648	Horizontal	Pass
		1732.5	-4.00	3.27	27.61	20.34	108.143	Horizontal	Pass
		1752.5	-3.88	3.30	27.60	20.42	110.154	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.04	3.15	27.64	20.45	110.917	Horizontal	Pass
		1732.5	-3.81	3.31	27.61	20.49	111.944	Horizontal	Pass
		1750	-3.83	3.33	27.59	20.43	110.408	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.05	3.15	27.65	20.45	110.917	Horizontal	Pass
		1732.5	-3.89	3.31	27.61	20.41	109.901	Horizontal	Pass
		1747.5	-3.83	3.33	27.57	20.41	109.901	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.99	3.17	27.66	20.50	112.202	Horizontal	Pass
		1732.5	-3.82	3.32	27.61	20.47	111.429	Horizontal	Pass
		1745	-3.76	3.36	27.56	20.44	110.662	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.61	3.12	27.58	19.85	96.605	Vertical	Pass
		1732.5	-4.62	3.27	27.61	19.72	93.756	Vertical	Pass
		1754.3	-4.66	3.29	27.63	19.68	92.897	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.92	3.13	27.61	19.56	90.365	Vertical	Pass
		1732.5	-5.09	3.27	27.61	19.25	84.140	Vertical	Pass
		1753.5	-4.42	3.30	27.62	19.90	97.724	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.78	3.13	27.63	19.72	93.756	Vertical	Pass
		1732.5	-4.79	3.27	27.61	19.55	90.157	Vertical	Pass
		1752.5	-5.24	3.30	27.60	19.06	80.538	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-5.30	3.15	27.64	19.19	82.985	Vertical	Pass
		1732.5	-4.69	3.31	27.61	19.61	91.411	Vertical	Pass

QPSK		1750	-4.41	3.33	27.59	19.85	96.605	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-5.29	3.15	27.65	19.21	83.368	Vertical	Pass
Band		1732.5	-4.71	3.31	27.61	19.59	90.991	Vertical	Pass
QPSK		1747.5	-5.20	3.33	27.57	19.04	80.168	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.27	3.17	27.66	19.22	83.560	Vertical	Pass
Band		1732.5	-4.50	3.32	27.61	19.79	95.280	Vertical	Pass
QPSK		1745	-4.84	3.36	27.56	19.36	86.298	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	1/#Mid	1710.7	-4.97	3.12	27.58	19.49	88.920	Horizontal	Pass
		1732.5	-4.82	3.27	27.61	19.52	89.536	Horizontal	Pass
		1754.3	-4.82	3.29	27.63	19.52	89.536	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.91	3.13	27.61	19.57	90.573	Horizontal	Pass
		1732.5	-5.04	3.27	27.61	19.30	85.114	Horizontal	Pass
		1753.5	-5.26	3.30	27.62	19.06	80.538	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.74	3.13	27.63	19.76	94.624	Horizontal	Pass
		1732.5	-4.70	3.27	27.61	19.64	92.045	Horizontal	Pass
		1752.5	-4.39	3.30	27.60	19.91	97.949	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.81	3.15	27.64	19.68	92.897	Horizontal	Pass
		1732.5	-5.00	3.31	27.61	19.30	85.114	Horizontal	Pass
		1750	-4.38	3.33	27.59	19.88	97.275	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.61	3.15	27.65	19.89	97.499	Horizontal	Pass
		1732.5	-4.67	3.31	27.61	19.63	91.833	Horizontal	Pass
		1747.5	-4.69	3.33	27.57	19.55	90.157	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.56	3.17	27.66	19.93	98.401	Horizontal	Pass
		1732.5	-4.57	3.32	27.61	19.72	93.756	Horizontal	Pass
		1745	-4.38	3.36	27.56	19.82	95.940	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.89	3.12	27.58	18.57	71.945	Vertical	Pass
		1732.5	-5.99	3.27	27.61	18.35	68.391	Vertical	Pass
		1754.3	-6.04	3.29	27.63	18.30	67.608	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.87	3.13	27.61	18.61	72.611	Vertical	Pass
		1732.5	-5.67	3.27	27.61	18.67	73.621	Vertical	Pass
		1753.5	-6.20	3.30	27.62	18.12	64.863	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-6.17	3.13	27.63	18.33	68.077	Vertical	Pass
		1732.5	-5.80	3.27	27.61	18.54	71.450	Vertical	Pass
		1752.5	-5.90	3.30	27.60	18.40	69.183	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-6.06	3.15	27.64	18.43	69.663	Vertical	Pass
		1732.5	-6.02	3.31	27.61	18.28	67.298	Vertical	Pass
		1750	-6.25	3.33	27.59	18.01	63.241	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-5.64	3.15	27.65	18.86	76.913	Vertical	Pass
		1732.5	-6.28	3.31	27.61	18.02	63.387	Vertical	Pass
		1747.5	-5.32	3.33	27.57	18.92	77.983	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.65	3.17	27.66	18.84	76.560	Vertical	Pass

Band 16		1732.5	-5.88	3.32	27.61	18.41	69.343	Vertical	Pass
QAM		1745	-6.10	3.36	27.56	18.10	64.565	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	3#Mid	824.7	5.14	2.01	19.68	2.15	20.66	116.413	Horizontal	Pass
		836.5	5.02	2.01	19.77	2.15	20.63	115.611	Horizontal	Pass
		848.3	4.82	2.02	19.82	2.15	20.47	111.429	Horizontal	Pass
3.0MHz Band QPSK	1#Mid	825.5	4.91	2.01	19.70	2.15	20.45	110.917	Horizontal	Pass
		836.5	4.81	2.01	19.77	2.15	20.42	110.154	Horizontal	Pass
		847.5	4.68	2.02	19.81	2.15	20.32	107.647	Horizontal	Pass
5.0MHz Band QPSK	1#Mid	826.5	5.19	2.01	19.71	2.15	20.74	118.577	Horizontal	Pass
		836.5	5.07	2.01	19.77	2.15	20.68	116.950	Horizontal	Pass
		846.5	4.91	2.02	19.79	2.15	20.53	112.980	Horizontal	Pass
10.0MHz Band QPSK	1#Mid	829	5.21	2.01	19.73	2.15	20.78	119.674	Horizontal	Pass
		836.5	5.16	2.01	19.77	2.15	20.77	119.399	Horizontal	Pass
		844	5.06	2.02	19.78	2.15	20.67	116.681	Horizontal	Pass
1.4MHz Band QPSK	1#Mid	824.7	3.60	2.01	19.68	2.15	19.12	81.658	Vertical	Pass
		836.5	4.30	2.01	19.77	2.15	19.91	97.949	Vertical	Pass
		848.3	3.70	2.02	19.82	2.15	19.35	86.099	Vertical	Pass
3.0MHz Band QPSK	1#Mid	825.5	3.68	2.01	19.70	2.15	19.22	83.560	Vertical	Pass
		836.5	4.11	2.01	19.77	2.15	19.72	93.756	Vertical	Pass
		847.5	4.26	2.02	19.81	2.15	19.90	97.724	Vertical	Pass
5.0MHz Band QPSK	1#Mid	826.5	3.89	2.01	19.71	2.15	19.44	87.902	Vertical	Pass
		836.5	4.16	2.01	19.77	2.15	19.77	94.842	Vertical	Pass
		846.5	3.57	2.02	19.79	2.15	19.19	82.985	Vertical	Pass
10.0MHz Band QPSK	1#Mid	829	3.55	2.01	19.73	2.15	19.12	81.658	Vertical	Pass
		836.5	4.27	2.01	19.77	2.15	19.88	97.275	Vertical	Pass
		844	3.97	2.02	19.78	2.15	19.58	90.782	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	3/#Mid	824.7	4.29	2.01	19.68	2.15	19.81	95.719	Horizontal	Pass
		836.5	4.22	2.01	19.77	2.15	19.83	96.161	Horizontal	Pass
		848.3	4.06	2.02	19.82	2.15	19.71	93.541	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	4.37	2.01	19.70	2.15	19.91	97.949	Horizontal	Pass
		836.5	4.08	2.01	19.77	2.15	19.69	93.111	Horizontal	Pass
		847.5	3.56	2.02	19.81	2.15	19.20	83.176	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	4.69	2.01	19.71	2.15	20.24	105.682	Horizontal	Pass
		836.5	4.46	2.01	19.77	2.15	20.07	101.625	Horizontal	Pass
		846.5	4.21	2.02	19.79	2.15	19.83	96.161	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	4.69	2.01	19.73	2.15	20.26	106.170	Horizontal	Pass
		836.5	4.41	2.01	19.77	2.15	20.02	100.462	Horizontal	Pass
		844	3.95	2.02	19.78	2.15	19.56	90.365	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	2.81	2.01	19.68	2.15	18.33	68.077	Vertical	Pass
		836.5	2.81	2.01	19.77	2.15	18.42	69.502	Vertical	Pass
		848.3	3.25	2.02	19.82	2.15	18.90	77.625	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	3.73	2.01	19.70	2.15	19.27	84.528	Vertical	Pass
		836.5	3.56	2.01	19.77	2.15	19.17	82.604	Vertical	Pass
		847.5	2.51	2.02	19.81	2.15	18.15	65.313	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	3.09	2.01	19.71	2.15	18.64	73.114	Vertical	Pass
		836.5	3.67	2.01	19.77	2.15	19.28	84.723	Vertical	Pass
		846.5	3.72	2.02	19.79	2.15	19.34	85.901	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	3.90	2.01	19.73	2.15	19.47	88.512	Vertical	Pass
		836.5	3.45	2.01	19.77	2.15	19.06	80.538	Vertical	Pass
		844	3.35	2.02	19.78	2.15	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)

8.5 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	1/#Mid	2502.5	-2.44	4.54	27.75	20.77	119.399	Horizontal	Pass
		2535	-2.27	4.69	27.72	20.76	119.124	Horizontal	Pass
		2567.5	-2.20	4.71	27.71	20.80	120.226	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.37	4.55	27.76	20.84	121.339	Horizontal	Pass
		2535	-2.18	4.69	27.72	20.85	121.619	Horizontal	Pass
		2565	-2.10	4.72	27.70	20.88	122.462	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.38	4.55	27.77	20.84	121.339	Horizontal	Pass
		2535	-2.24	4.69	27.72	20.79	119.950	Horizontal	Pass
		2562.5	-2.14	4.72	27.69	20.83	121.060	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.32	4.57	27.78	20.89	122.744	Horizontal	Pass
		2535	-2.14	4.73	27.72	20.85	121.619	Horizontal	Pass
		2560	-2.10	4.75	27.68	20.83	121.060	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-3.62	4.54	27.75	19.59	90.991	Vertical	Pass
		2535	-3.72	4.69	27.72	19.31	85.310	Vertical	Pass
		2567.5	-3.60	4.71	27.71	19.40	87.096	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.48	4.55	27.76	19.73	93.972	Vertical	Pass
		2535	-3.55	4.69	27.72	19.48	88.716	Vertical	Pass
		2565	-3.82	4.72	27.70	19.16	82.414	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.84	4.55	27.77	19.38	86.696	Vertical	Pass
		2535	-3.91	4.69	27.72	19.12	81.658	Vertical	Pass
		2562.5	-3.64	4.72	27.69	19.33	85.704	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-4.22	4.57	27.78	18.99	79.250	Vertical	Pass
		2535	-3.05	4.73	27.72	19.94	98.628	Vertical	Pass
		2560	-3.89	4.75	27.68	19.04	80.168	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	1/#Mid	2502.5	-3.13	4.54	27.75	20.08	101.859	Horizontal	Pass
		2535	-2.82	4.69	27.72	20.21	104.954	Horizontal	Pass
		2567.5	-2.90	4.71	27.71	20.10	102.329	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.02	4.55	27.76	20.19	104.472	Horizontal	Pass
		2535	-3.03	4.69	27.72	20.00	100.000	Horizontal	Pass
		2565	-3.30	4.72	27.70	19.68	92.897	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.20	4.55	27.77	20.02	100.462	Horizontal	Pass
		2535	-3.17	4.69	27.72	19.86	96.828	Horizontal	Pass
		2562.5	-2.78	4.72	27.69	20.19	104.472	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.08	4.57	27.78	20.13	103.039	Horizontal	Pass
		2535	-2.75	4.73	27.72	20.24	105.682	Horizontal	Pass
		2560	-2.85	4.75	27.68	20.08	101.859	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-3.95	4.54	27.75	19.26	84.333	Vertical	Pass
		2535	-3.52	4.69	27.72	19.51	89.331	Vertical	Pass
		2567.5	-3.30	4.71	27.71	19.70	93.325	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-4.17	4.55	27.76	19.04	80.168	Vertical	Pass
		2535	-4.95	4.69	27.72	18.08	64.269	Vertical	Pass
		2565	-4.92	4.72	27.70	18.06	63.973	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-4.54	4.55	27.77	18.68	73.790	Vertical	Pass
		2535	-4.24	4.69	27.72	18.79	75.683	Vertical	Pass
		2562.5	-4.95	4.72	27.69	18.02	63.387	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.98	4.57	27.78	19.23	83.753	Vertical	Pass
		2535	-4.23	4.73	27.72	18.76	75.162	Vertical	Pass
		2560	-3.19	4.75	27.68	19.74	94.189	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. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1#Mid	699.7	5.51	1.91	19.21	2.15	20.66	116.413	Vertical	Pass
		707.5	5.43	1.91	19.26	2.15	20.63	115.611	Vertical	Pass
		715.3	5.21	1.93	19.34	2.15	20.47	111.429	Vertical	Pass
3.0MHz Band QPSK	1#Mid	700.5	5.30	1.91	19.21	2.15	20.45	110.917	Vertical	Pass
		707.5	5.22	1.91	19.26	2.15	20.42	110.154	Vertical	Pass
		714.5	5.06	1.93	19.34	2.15	20.32	107.647	Vertical	Pass
5.0MHz Band QPSK	1#Mid	701.5	5.57	1.91	19.23	2.15	20.74	118.577	Vertical	Pass
		707.5	5.48	1.91	19.26	2.15	20.68	116.950	Vertical	Pass
		713.5	5.27	1.92	19.33	2.15	20.53	112.980	Vertical	Pass
10.0MHz Band QPSK	1#Mid	704	5.59	1.91	19.25	2.15	20.78	119.674	Vertical	Pass
		707.5	5.57	1.91	19.26	2.15	20.77	119.399	Vertical	Pass
		711	5.42	1.92	19.32	2.15	20.67	116.681	Vertical	Pass
1.4MHz Band QPSK	1#Mid	699.7	4.58	1.91	19.21	2.15	19.73	93.972	Horizontal	Pass
		707.5	3.85	1.91	19.26	2.15	19.05	80.353	Horizontal	Pass
		715.3	3.70	1.93	19.34	2.15	18.96	78.705	Horizontal	Pass
3.0MHz Band QPSK	1#Mid	700.5	4.09	1.91	19.21	2.15	19.24	83.946	Horizontal	Pass
		707.5	4.51	1.91	19.26	2.15	19.71	93.541	Horizontal	Pass
		714.5	4.01	1.93	19.34	2.15	19.27	84.528	Horizontal	Pass
5.0MHz Band QPSK	1#Mid	701.5	4.59	1.91	19.23	2.15	19.76	94.624	Horizontal	Pass
		707.5	3.86	1.91	19.26	2.15	19.06	80.538	Horizontal	Pass
		713.5	4.05	1.92	19.33	2.15	19.31	85.310	Horizontal	Pass
10.0MHz Band QPSK	1#Mid	704	4.43	1.91	19.25	2.15	19.62	91.622	Horizontal	Pass
		707.5	4.22	1.91	19.26	2.15	19.42	87.498	Horizontal	Pass
		711	4.35	1.92	19.32	2.15	19.60	91.201	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	699.7	5.38	1.91	19.21	2.15	20.53	112.980	Vertical	Pass
		707.5	5.30	1.91	19.26	2.15	20.50	112.202	Vertical	Pass
		715.3	5.08	1.93	19.34	2.15	20.34	108.143	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	5.17	1.91	19.21	2.15	20.32	107.647	Vertical	Pass
		707.5	5.09	1.91	19.26	2.15	20.29	106.905	Vertical	Pass
		714.5	4.93	1.93	19.34	2.15	20.19	104.472	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	5.44	1.91	19.23	2.15	20.61	115.080	Vertical	Pass
		707.5	5.35	1.91	19.26	2.15	20.55	113.501	Vertical	Pass
		713.5	5.14	1.92	19.33	2.15	20.40	109.648	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	5.46	1.91	19.25	2.15	20.65	116.145	Vertical	Pass
		707.5	5.44	1.91	19.26	2.15	20.64	115.878	Vertical	Pass
		711	5.29	1.92	19.32	2.15	20.54	113.240	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	3.87	1.91	19.21	2.15	19.02	79.799	Horizontal	Pass
		707.5	4.45	1.91	19.26	2.15	19.65	92.257	Horizontal	Pass
		715.3	4.22	1.93	19.34	2.15	19.48	88.716	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	4.35	1.91	19.21	2.15	19.50	89.125	Horizontal	Pass
		707.5	3.78	1.91	19.26	2.15	18.98	79.068	Horizontal	Pass
		714.5	3.66	1.93	19.34	2.15	18.92	77.983	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	4.61	1.91	19.23	2.15	19.78	95.060	Horizontal	Pass
		707.5	3.73	1.91	19.26	2.15	18.93	78.163	Horizontal	Pass
		713.5	4.53	1.92	19.33	2.15	19.79	95.280	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	3.88	1.91	19.25	2.15	19.07	80.724	Horizontal	Pass
		707.5	3.91	1.91	19.26	2.15	19.11	81.470	Horizontal	Pass
		711	4.01	1.92	19.32	2.15	19.26	84.333	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	706.5	5.84	1.91	19.23	2.15	21.01	126.183	Vertical	Pass
		710	5.70	1.91	19.26	2.15	20.90	123.027	Vertical	Pass
		713.5	5.60	1.92	19.33	2.15	20.86	121.899	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	5.85	1.91	19.25	2.15	21.04	127.057	Vertical	Pass
		710	5.80	1.91	19.26	2.15	21.00	125.893	Vertical	Pass
		711	5.76	1.92	19.32	2.15	21.01	126.183	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	4.32	1.91	19.23	2.15	19.49	88.920	Horizontal	Pass
		710	4.86	1.91	19.26	2.15	20.06	101.391	Horizontal	Pass
		713.5	3.99	1.92	19.33	2.15	19.25	84.140	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	5.13	1.91	19.25	2.15	20.32	107.647	Horizontal	Pass
		710	4.72	1.91	19.26	2.15	19.92	98.175	Horizontal	Pass
		711	4.76	1.92	19.32	2.15	20.01	100.231	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. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	706.5	5.16	1.91	19.23	2.15	20.33	107.895	Vertical	Pass
		710	5.07	1.91	19.26	2.15	20.27	106.414	Vertical	Pass
		713.5	4.87	1.92	19.33	2.15	20.13	103.039	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	4.70	1.91	19.25	2.15	19.89	97.499	Vertical	Pass
		710	5.23	1.91	19.26	2.15	20.43	110.408	Vertical	Pass
		711	4.96	1.92	19.32	2.15	20.21	104.954	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	4.23	1.91	19.23	2.15	19.40	87.096	Horizontal	Pass
		710	3.68	1.91	19.26	2.15	18.88	77.268	Horizontal	Pass
		713.5	4.13	1.92	19.33	2.15	19.39	86.896	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	4.21	1.91	19.25	2.15	19.40	87.096	Horizontal	Pass
		710	3.94	1.91	19.26	2.15	19.14	82.035	Horizontal	Pass
		711	4.32	1.92	19.32	2.15	19.57	90.573	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 (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2498.5	-2.90	4.54	27.75	20.31	107.399	Horizontal	Pass
		2593	-2.75	4.69	27.72	20.28	106.660	Horizontal	Pass
		2687.5	-2.63	4.71	27.71	20.37	108.893	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2501	-2.98	4.55	27.76	20.23	105.439	Horizontal	Pass
		2593	-2.84	4.69	27.72	20.19	104.472	Horizontal	Pass
		2685	-2.83	4.72	27.70	20.15	103.514	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	-2.81	4.55	27.77	20.41	109.901	Horizontal	Pass
		2593	-2.53	4.69	27.72	20.50	112.202	Horizontal	Pass
		2682.5	-2.58	4.72	27.69	20.39	109.396	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2506	-2.42	4.57	27.78	20.79	119.950	Horizontal	Pass
		2593	-2.47	4.73	27.72	20.52	112.720	Horizontal	Pass
		2680	-2.47	4.75	27.68	20.46	111.173	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2498.5	-2.70	4.54	27.75	20.51	112.460	Vertical	Pass
		2593	-2.61	4.69	27.72	20.42	110.154	Vertical	Pass
		2687.5	-2.59	4.71	27.71	20.41	109.901	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2501	-2.68	4.55	27.76	20.53	112.980	Vertical	Pass
		2593	-2.52	4.69	27.72	20.51	112.460	Vertical	Pass
		2685	-2.59	4.72	27.70	20.39	109.396	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	-3.73	4.55	27.77	19.49	88.920	Vertical	Pass
		2593	-3.25	4.69	27.72	19.78	95.060	Vertical	Pass
		2682.5	-3.69	4.72	27.69	19.28	84.723	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2506	-4.09	4.57	27.78	19.12	81.658	Vertical	Pass
		2593	-3.52	4.73	27.72	19.47	88.512	Vertical	Pass
		2680	-3.98	4.75	27.68	18.95	78.524	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz	1/#Mid	2498.5	-2.88	4.54	27.75	20.33	107.895	Horizontal	Pass
Band 16		2593	-2.73	4.69	27.72	20.30	107.152	Horizontal	Pass
QAM		2687.5	-2.61	4.71	27.71	20.39	109.396	Horizontal	Pass
10.0MHz	1/#Mid	2501	-2.96	4.55	27.76	20.25	105.925	Horizontal	Pass
Band 16		2593	-2.82	4.69	27.72	20.21	104.954	Horizontal	Pass
QAM		2685	-2.81	4.72	27.70	20.17	103.992	Horizontal	Pass
15.0MHz	1/#Mid	2503.5	-2.79	4.55	27.77	20.43	110.408	Horizontal	Pass
Band 16		2593	-2.51	4.69	27.72	20.52	112.720	Horizontal	Pass
QAM		2682.5	-2.56	4.72	27.69	20.41	109.901	Horizontal	Pass
20.0MHz	1/#Mid	2506	-2.51	4.57	27.78	20.70	117.490	Horizontal	Pass
Band 16		2593	-2.45	4.73	27.72	20.54	113.240	Horizontal	Pass
QAM		2680	-2.45	4.75	27.68	20.48	111.686	Horizontal	Pass
5.0MHz	1/#Mid	2498.5	-2.68	4.54	27.75	20.53	112.980	Vertical	Pass
Band 16		2593	-2.59	4.69	27.72	20.44	110.662	Vertical	Pass
QAM		2687.5	-2.57	4.71	27.71	20.43	110.408	Vertical	Pass
10.0MHz	1/#Mid	2501	-2.66	4.55	27.76	20.55	113.501	Vertical	Pass
Band 16		2593	-2.50	4.69	27.72	20.53	112.980	Vertical	Pass
QAM		2685	-2.57	4.72	27.70	20.41	109.901	Vertical	Pass
15.0MHz	1/#Mid	2503.5	-4.11	4.55	27.77	19.11	81.470	Vertical	Pass
Band 16		2593	-3.89	4.69	27.72	19.14	82.035	Vertical	Pass
QAM		2682.5	-3.71	4.72	27.69	19.26	84.333	Vertical	Pass
20.0MHz	1/#Mid	2506	-4.06	4.57	27.78	19.15	82.224	Vertical	Pass
Band 16		2593	-3.95	4.73	27.72	19.04	80.168	Vertical	Pass
QAM		2680	-3.94	4.75	27.68	18.99	79.250	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

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	-48.62	4.04	33.51	-19.15	-13	-6.15	Horizontal
3701.4	-52.01	4.04	33.51	-22.54	-13	-9.54	Vertical
5552.1	-48.30	5.24	35.84	-17.70	-13	-4.70	Vertical
5552.1	-52.13	5.24	35.84	-21.53	-13	-8.53	Horizontal
211.5	-43.52	1.43	16.02	-28.93	-13	-15.93	Vertical
260.8	-35.24	1.30	17.99	-18.55	-13	-5.55	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.86	4.04	33.56	-22.34	-13	-9.34	Horizontal
3760.0	-51.18	4.04	33.56	-21.66	-13	-8.66	Vertical
5640.0	-52.00	5.24	35.91	-21.33	-13	-8.33	Vertical
5640.0	-53.26	5.24	35.91	-22.59	-13	-9.59	Horizontal
195.4	-39.73	1.62	16.97	-24.38	-13	-11.38	Vertical
429.6	-38.25	1.74	15.98	-24.02	-13	-11.02	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-46.94	4.04	34.00	-16.98	-13	-3.98	Horizontal
3818.6	-52.41	4.04	34.00	-22.45	-13	-9.45	Vertical
5727.9	-49.16	5.24	36.04	-18.36	-13	-5.36	Vertical
5727.9	-52.52	5.24	36.04	-21.72	-13	-8.72	Horizontal
192.1	-41.20	1.42	17.29	-25.33	-13	-12.33	Vertical
370.4	-44.67	1.50	17.90	-28.26	-13	-15.26	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
3720.0	-51.71	4.07	33.54	-22.24	-13	-9.24	Horizontal
3720.0	-53.11	4.07	33.54	-23.64	-13	-10.64	Vertical
5580.0	-51.55	5.28	35.86	-20.97	-13	-7.97	Vertical
5580.0	-53.42	5.28	35.86	-22.84	-13	-9.84	Horizontal
212.3	-35.39	1.58	16.89	-20.07	-13	-7.07	Vertical
325.5	-42.79	1.76	17.26	-27.29	-13	-14.29	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.74	4.04	33.56	-19.22	-13	-6.22	Horizontal
3760.0	-51.77	4.04	33.56	-22.25	-13	-9.25	Vertical
5640.0	-51.25	5.24	35.91	-20.58	-13	-7.58	Vertical
5640.0	-52.22	5.24	35.91	-21.55	-13	-8.55	Horizontal
176.9	-35.78	1.46	16.27	-20.97	-13	-7.97	Vertical
236.9	-38.48	1.59	15.15	-24.92	-13	-11.92	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.92	4.04	34.00	-22.96	-13	-9.96	Horizontal
3800.0	-44.50	4.04	34.00	-14.54	-13	-1.54	Vertical
5700.0	-52.16	5.24	36.04	-21.36	-13	-8.36	Vertical
5700.0	-49.68	5.24	36.04	-18.88	-13	-5.88	Horizontal
205.3	-42.81	1.36	17.39	-26.77	-13	-13.77	Vertical
309.8	-44.17	1.66	15.39	-30.44	-13	-17.44	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	-48.60	4.02	29.80	-22.82	-13	-9.82	Horizontal
3421.4	-45.03	4.02	29.80	-19.25	-13	-6.25	Vertical
5132.1	-49.86	5.24	35.84	-19.26	-13	-6.26	Vertical
5132.1	-49.92	5.24	35.84	-19.32	-13	-6.32	Horizontal
193.6	-44.74	1.68	16.04	-30.38	-13	-17.38	Vertical
460.8	-41.92	1.78	17.74	-25.96	-13	-12.96	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.69	4.03	30.00	-19.72	-13	-6.72	Horizontal
3465.0	-51.50	4.03	30.00	-25.53	-13	-12.53	Vertical
5197.5	-53.92	5.25	35.86	-23.31	-13	-10.31	Vertical
5197.5	-51.36	5.25	35.86	-20.75	-13	-7.75	Horizontal
180.5	-40.14	1.72	17.69	-24.17	-13	-11.17	Vertical
265.4	-41.95	1.62	16.02	-27.54	-13	-14.54	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-46.12	4.05	30.01	-20.16	-13	-7.16	Horizontal
3508.6	-50.20	4.05	30.01	-24.24	-13	-11.24	Vertical
5262.9	-53.95	5.26	35.86	-23.35	-13	-10.35	Vertical
5262.9	-51.70	5.26	35.86	-21.10	-13	-8.10	Horizontal
200.2	-39.29	1.80	16.69	-24.40	-13	-11.40	Vertical
304.2	-35.78	1.75	16.66	-20.88	-13	-7.88	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
3440.0	-46.48	4.02	29.80	-20.70	-13	-7.70	Horizontal
3440.0	-52.68	4.02	29.80	-26.90	-13	-13.90	Vertical
5160.0	-50.11	5.24	35.84	-19.51	-13	-6.51	Vertical
5160.0	-49.17	5.24	35.84	-18.57	-13	-5.57	Horizontal
203.0	-42.01	1.57	17.26	-26.32	-13	-13.32	Vertical
344.1	-35.40	1.78	16.35	-20.83	-13	-7.83	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-47.94	4.03	30.00	-21.97	-13	-8.97	Horizontal
3465.0	-53.50	4.03	30.00	-27.53	-13	-14.53	Vertical
5197.5	-47.34	5.25	35.86	-16.73	-13	-3.73	Vertical
5197.5	-53.64	5.25	35.86	-23.03	-13	-10.03	Horizontal
197.8	-38.39	1.44	17.95	-21.88	-13	-8.88	Vertical
252.8	-34.29	1.65	16.09	-19.85	-13	-6.85	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-51.07	2.91	27.68	-26.30	-13	-13.30	Horizontal
3490.0	-47.24	2.91	27.68	-22.47	-13	-9.47	Vertical
5235.0	-47.44	5.26	35.86	-16.84	-13	-3.84	Vertical
5235.0	-50.87	5.26	35.86	-20.27	-13	-7.27	Horizontal
198.5	-38.94	1.61	16.85	-23.70	-13	-10.70	Vertical
343.1	-44.66	1.61	15.19	-31.08	-13	-18.08	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	-52.57	2.78	27.50	-27.85	-13	-14.85	Horizontal
1649.4	-44.15	2.78	27.50	-19.43	-13	-6.43	Vertical
2474.1	-52.83	2.90	27.80	-27.93	-13	-14.93	Vertical
2474.1	-53.05	2.90	27.80	-28.15	-13	-15.15	Horizontal
176.0	-40.15	1.76	17.59	-24.32	-13	-11.32	Vertical
354.6	-37.71	1.63	15.87	-23.47	-13	-10.47	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-53.52	2.80	27.48	-28.84	-13	-15.84	Horizontal
1673.0	-52.85	2.80	27.48	-28.17	-13	-15.17	Vertical
2509.5	-52.29	2.91	27.70	-27.50	-13	-14.50	Vertical
2509.5	-53.03	2.91	27.70	-28.24	-13	-15.24	Horizontal
193.2	-38.27	1.61	15.68	-24.20	-13	-11.20	Vertical
427.4	-36.73	1.59	17.52	-20.81	-13	-7.81	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.35	2.82	27.43	-21.74	-13	-8.74	Horizontal
1696.6	-46.78	2.82	27.43	-22.17	-13	-9.17	Vertical
2544.9	-52.47	2.92	27.74	-27.65	-13	-14.65	Vertical
2544.9	-50.11	2.92	27.74	-25.29	-13	-12.29	Horizontal
202.8	-44.03	1.69	16.67	-29.04	-13	-16.04	Vertical
405.6	-42.62	1.70	17.18	-27.14	-13	-14.14	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
1658.0	-51.05	2.78	27.50	-26.33	-13	-13.33	Horizontal
1658.0	-48.60	2.78	27.50	-23.88	-13	-10.88	Vertical
2487.0	-44.98	2.90	27.80	-20.08	-13	-7.08	Vertical
2487.0	-49.87	2.90	27.80	-24.97	-13	-11.97	Horizontal
188.0	-42.82	1.71	15.57	-28.96	-13	-15.96	Vertical
316.0	-37.70	1.34	16.40	-22.64	-13	-9.64	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.50	2.80	27.48	-24.82	-13	-11.82	Horizontal
1673.0	-53.18	2.80	27.48	-28.50	-13	-15.50	Vertical
2509.5	-47.34	2.91	27.70	-22.55	-13	-9.55	Vertical
2509.5	-50.07	2.91	27.70	-25.28	-13	-12.28	Horizontal
203.1	-38.14	1.44	17.04	-22.54	-13	-9.54	Vertical
363.4	-34.02	1.76	17.62	-18.16	-13	-5.16	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.08	2.82	27.43	-21.47	-13	-8.47	Horizontal
1688.0	-53.02	2.82	27.43	-28.41	-13	-15.41	Vertical
2532.0	-44.81	2.92	27.74	-19.99	-13	-6.99	Vertical
2532.0	-51.51	2.92	27.74	-26.69	-13	-13.69	Horizontal
195.2	-39.85	1.74	17.70	-23.89	-13	-10.89	Vertical
434.5	-44.77	1.41	17.46	-28.71	-13	-15.71	Horizontal

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

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

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

9.4 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-64.39	5.23	35.81	-33.81	-25	-8.81	Horizontal
5005.0	-60.65	5.23	35.81	-30.07	-25	-5.07	Vertical
7507.5	-62.10	5.67	36.85	-30.92	-25	-5.92	Vertical
7507.5	-64.37	5.67	36.85	-33.19	-25	-8.19	Horizontal
194.4	-44.83	1.73	17.97	-28.59	-25	-3.59	Vertical
413.9	-44.14	1.38	15.11	-30.41	-25	-5.41	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.39	5.23	35.82	-28.80	-25	-3.80	Horizontal
5070.0	-63.12	5.23	35.82	-32.53	-25	-7.53	Vertical
7605.0	-60.98	5.67	36.85	-29.80	-25	-4.80	Vertical
7605.0	-61.56	5.67	36.85	-30.38	-25	-5.38	Horizontal
183.4	-45.47	1.77	16.17	-31.06	-25	-6.06	Vertical
280.2	-54.28	1.63	15.21	-40.70	-25	-15.70	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-64.09	5.24	35.83	-33.50	-25	-8.50	Horizontal
5135.0	-61.82	5.24	35.83	-31.23	-25	-6.23	Vertical
7702.5	-60.96	5.68	36.87	-29.77	-25	-4.77	Vertical
7702.5	-63.19	5.68	36.87	-32.00	-25	-7.00	Horizontal
212.3	-53.51	1.58	17.56	-37.53	-25	-12.53	Vertical
426.3	-54.90	1.45	16.58	-39.77	-25	-14.77	Horizontal

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

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-59.28	5.23	35.82	-28.69	-25	-3.69	Horizontal
5020.0	-61.70	5.23	35.82	-31.11	-25	-6.11	Vertical
7530.0	-62.82	5.67	36.86	-31.63	-25	-6.63	Vertical
7530.0	-61.25	5.67	36.86	-30.06	-25	-5.06	Horizontal
176.8	-50.02	1.63	15.76	-35.89	-25	-10.89	Vertical
275.1	-54.74	1.71	15.44	-41.01	-25	-16.01	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.69	5.23	35.82	-34.10	-25	-9.10	Horizontal
5070.0	-59.48	5.23	35.82	-28.89	-25	-3.89	Vertical
7605.0	-59.53	5.67	36.85	-28.35	-25	-3.35	Vertical
7605.0	-60.04	5.67	36.85	-28.86	-25	-3.86	Horizontal
183.3	-53.48	1.79	16.84	-38.42	-25	-13.42	Vertical
439.3	-44.84	1.71	17.64	-28.91	-25	-3.91	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.03	5.24	35.83	-28.44	-25	-3.44	Horizontal
5120.0	-59.34	5.24	35.83	-28.75	-25	-3.75	Vertical
7680.0	-60.82	5.70	36.88	-29.64	-25	-4.64	Vertical
7680.0	-59.11	5.70	36.88	-27.93	-25	-2.93	Horizontal
204.6	-48.08	1.79	16.84	-33.02	-25	-8.02	Vertical
405.6	-47.48	1.71	17.64	-31.55	-25	-6.55	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	-53.52	2.60	27.20	-28.92	-13	-15.92	Horizontal
1399.4	-49.18	2.60	27.20	-24.58	-13	-11.58	Vertical
2099.1	-49.74	2.85	27.54	-25.05	-13	-12.05	Vertical
2099.1	-51.57	2.85	27.54	-26.88	-13	-13.88	Horizontal
178.9	-39.85	1.49	17.78	-23.56	-13	-10.56	Vertical
234.3	-35.32	1.36	17.33	-19.35	-13	-6.35	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-47.10	2.61	27.28	-22.43	-13	-9.43	Horizontal
1415.0	-46.31	2.61	27.28	-21.64	-13	-8.64	Vertical
2122.5	-49.18	2.87	27.59	-24.46	-13	-11.46	Vertical
2122.5	-51.90	2.87	27.59	-27.18	-13	-14.18	Horizontal
211.5	-43.86	1.73	15.74	-29.85	-13	-16.85	Vertical
344.4	-42.94	1.62	15.79	-28.77	-13	-15.77	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.20	2.63	27.28	-27.55	-13	-14.55	Horizontal
1430.6	-52.65	2.63	27.28	-28.00	-13	-15.00	Vertical
2145.9	-45.91	2.88	27.60	-21.19	-13	-8.19	Vertical
2145.9	-49.04	2.88	27.60	-24.32	-13	-11.32	Horizontal
177.1	-36.32	1.61	18.00	-19.93	-13	-6.93	Vertical
461.2	-37.73	1.45	15.49	-23.70	-13	-10.70	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
1408.0	-51.00	2.61	27.26	-26.35	-13	-13.35	Horizontal
1408.0	-51.42	2.61	27.26	-26.77	-13	-13.77	Vertical
2112.0	-51.80	2.87	27.58	-27.09	-13	-14.09	Vertical
2112.0	-50.69	2.87	27.58	-25.98	-13	-12.98	Horizontal
182.1	-41.02	1.31	16.97	-25.36	-13	-12.36	Vertical
258.5	-41.11	1.65	16.70	-26.06	-13	-13.06	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-49.74	2.61	27.28	-25.07	-13	-12.07	Horizontal
1415.0	-47.27	2.61	27.28	-22.60	-13	-9.60	Vertical
2122.5	-50.34	2.87	27.59	-25.62	-13	-12.62	Vertical
2122.5	-51.48	2.87	27.59	-26.76	-13	-13.76	Horizontal
206.7	-37.73	1.72	17.99	-21.46	-13	-8.46	Vertical
428.5	-43.84	1.73	17.94	-27.63	-13	-14.63	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.82	2.62	27.28	-21.16	-13	-8.16	Horizontal
1422.0	-48.37	2.62	27.28	-23.71	-13	-10.71	Vertical
2133.0	-47.68	2.87	27.60	-22.95	-13	-9.95	Vertical
2133.0	-50.53	2.87	27.60	-25.80	-13	-12.80	Horizontal
202.2	-39.89	1.58	15.93	-25.54	-13	-12.54	Vertical
323.7	-43.59	1.36	15.59	-29.36	-13	-16.36	Horizontal

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

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

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

9.6 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-45.88	2.61	27.28	-21.21	-13	-8.21	Horizontal
1413.0	-46.72	2.61	27.28	-22.05	-13	-9.05	Vertical
2119.5	-47.00	2.87	27.59	-22.28	-13	-9.28	Vertical
2119.5	-51.52	2.87	27.59	-26.80	-13	-13.80	Horizontal
204.1	-41.21	1.71	16.15	-26.77	-13	-13.77	Vertical
399.1	-38.60	1.41	17.32	-22.69	-13	-9.69	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-52.70	2.62	27.30	-28.02	-13	-15.02	Horizontal
1420.0	-51.59	2.62	27.30	-26.91	-13	-13.91	Vertical
2130.0	-53.62	2.87	27.62	-28.87	-13	-15.87	Vertical
2130.0	-53.15	2.87	27.62	-28.40	-13	-15.40	Horizontal
186.5	-37.24	1.42	15.25	-23.42	-13	-10.42	Vertical
359.6	-38.36	1.36	17.19	-22.53	-13	-9.53	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-51.26	2.66	27.28	-26.64	-13	-13.64	Horizontal
1427.0	-45.63	2.66	27.28	-21.01	-13	-8.01	Vertical
2140.5	-46.97	2.88	27.60	-22.25	-13	-9.25	Vertical
2140.5	-50.79	2.88	27.60	-26.07	-13	-13.07	Horizontal
204.7	-34.51	1.32	17.29	-18.54	-13	-5.54	Vertical
440.3	-38.93	1.72	16.89	-23.76	-13	-10.76	Horizontal

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

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-51.95	2.62	27.30	-27.27	-13	-14.27	Horizontal
1418.0	-46.12	2.62	27.30	-21.44	-13	-8.44	Vertical
2127.0	-49.81	2.87	27.62	-25.06	-13	-12.06	Vertical
2127.0	-49.37	2.87	27.62	-24.62	-13	-11.62	Horizontal
205.3	-39.13	1.35	16.91	-23.57	-13	-10.57	Vertical
398.8	-42.60	1.62	16.31	-27.91	-13	-14.91	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-52.37	2.62	27.30	-27.69	-13	-14.69	Horizontal
1420.0	-53.03	2.62	27.30	-28.35	-13	-15.35	Vertical
2130.0	-47.62	2.87	27.62	-22.87	-13	-9.87	Vertical
2130.0	-50.08	2.87	27.62	-25.33	-13	-12.33	Horizontal
191.3	-43.91	1.51	17.14	-28.28	-13	-15.28	Vertical
342.5	-43.11	1.77	16.88	-28.00	-13	-15.00	Horizontal
Test Results for High Channel 711MHz							
1422.0	-44.66	2.62	27.30	-19.98	-13	-6.98	Horizontal
1422.0	-49.11	2.62	27.30	-24.43	-13	-11.43	Vertical
2133.0	-53.26	2.87	27.62	-28.51	-13	-15.51	Vertical
2133.0	-52.63	2.87	27.62	-27.88	-13	-14.88	Horizontal
207.0	-43.65	1.78	15.95	-29.48	-13	-16.48	Vertical
268.8	-37.83	1.34	17.95	-21.23	-13	-8.23	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 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997.0	-61.67	5.23	35.81	-31.09	-25	-6.09	Horizontal
4997.0	-63.98	5.23	35.81	-33.40	-25	-8.40	Vertical
7495.5	-63.14	5.67	36.85	-31.96	-25	-6.96	Vertical
7495.5	-61.23	5.67	36.85	-30.05	-25	-5.05	Horizontal
435.3	-48.89	1.38	15.98	-34.29	-25	-9.29	Vertical
465.8	-46.91	1.62	15.66	-32.87	-25	-7.87	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-64.50	5.23	35.82	-33.91	-25	-8.91	Horizontal
5186.0	-62.13	5.23	35.82	-31.54	-25	-6.54	Vertical
7779.0	-63.52	5.67	36.85	-32.34	-25	-7.34	Vertical
7779.0	-60.37	5.67	36.85	-29.19	-25	-4.19	Horizontal
510.4	-48.91	1.62	16.17	-34.36	-25	-9.36	Vertical
562.9	-48.24	1.74	17.63	-32.35	-25	-7.35	Horizontal
Test Results for High Channel 2687.5MHz							
5375.0	-63.32	5.24	35.83	-32.73	-25	-7.73	Horizontal
5375.0	-60.56	5.24	35.83	-29.97	-25	-4.97	Vertical
8062.5	-59.86	5.68	36.87	-28.67	-25	-3.67	Vertical
8062.5	-59.50	5.68	36.87	-28.31	-25	-3.31	Horizontal
197.6	-47.08	1.55	15.84	-32.79	-25	-7.79	Vertical
353.1	-47.72	1.51	17.06	-32.17	-25	-7.17	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012.0	-61.85	5.23	35.82	-31.26	-25	-6.26	Horizontal
5012.0	-62.65	5.23	35.82	-32.06	-25	-7.06	Vertical
7518.0	-62.37	5.67	36.86	-31.18	-25	-6.18	Vertical
7518.0	-63.33	5.67	36.86	-32.14	-25	-7.14	Horizontal
128.9	-45.22	1.43	15.51	-31.14	-25	-6.14	Vertical
344.8	-47.85	1.40	16.97	-32.28	-25	-7.28	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-59.20	5.23	35.82	-28.61	-25	-3.61	Horizontal
5186.0	-63.33	5.23	35.82	-32.74	-25	-7.74	Vertical
7779.0	-64.10	5.67	36.85	-32.92	-25	-7.92	Vertical
7779.0	-62.01	5.67	36.85	-30.83	-25	-5.83	Horizontal
100.8	-48.37	1.77	16.72	-33.42	-25	-8.42	Vertical
263.5	-48.90	1.31	16.99	-33.22	-25	-8.22	Horizontal
Test Results for High Channel 2680MHz							
5360.0	-62.31	5.24	35.83	-31.72	-25	-6.72	Horizontal
5360.0	-59.26	5.24	35.83	-28.67	-25	-3.67	Vertical
8040.0	-61.27	5.70	36.88	-30.09	-25	-5.09	Vertical
8040.0	-59.76	5.70	36.88	-28.58	-25	-3.58	Horizontal
349.9	-45.03	1.70	15.73	-31.00	-25	-6.00	Vertical
110.3	-48.89	1.75	17.33	-33.31	-25	-8.31	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 3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

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

RESULTS

See the following pages.

10.1 LTE BAND 2

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	12.7	0.006735	2.5
3.87	1880	13.5	0.007181	2.5
4.45	1880	13.5	0.007167	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.9	0.006867	2.5
Extreme (50C)	1880	11.4	0.006067	2.5
Extreme (40C)	1880	13.4	0.007132	2.5
Extreme (30C)	1880	13.8	0.007342	2.5
Extreme (10C)	1880	13.6	0.007248	2.5
Extreme (0C)	1880	12.6	0.006702	2.5
Extreme (-10C)	1880	13.1	0.006961	2.5
Extreme (-20C)	1880	13.8	0.007350	2.5
Extreme (-30C)	1880	15.1	0.008011	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	9.3	0.004973	2.5
3.87	1880	9.2	0.004902	2.5
4.45	1880	7.7	0.004115	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	10.0	0.005337	2.5
Extreme (50C)	1880	8.5	0.004508	2.5
Extreme (40C)	1880	8.2	0.004368	2.5
Extreme (30C)	1880	9.3	0.004924	2.5
Extreme (10C)	1880	8.5	0.004533	2.5
Extreme (0C)	1880	8.1	0.004308	2.5
Extreme (-10C)	1880	8.7	0.004625	2.5
Extreme (-20C)	1880	8.5	0.004500	2.5
Extreme (-30C)	1880	7.6	0.004050	2.5

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

10.2 LTE BAND 4

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1732.5	8.6	0.004989	2.5
3.87	1732.5	9.2	0.005305	2.5
4.45	1732.5	8.3	0.004763	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.0	0.004635	2.5
Extreme (50C)	1732.5	8.6	0.004962	2.5
Extreme (40C)	1732.5	7.4	0.004256	2.5
Extreme (30C)	1732.5	5.9	0.003388	2.5
Extreme (10C)	1732.5	6.8	0.003899	2.5
Extreme (0C)	1732.5	9.4	0.005447	2.5
Extreme (-10C)	1732.5	8.0	0.004595	2.5
Extreme (-20C)	1732.5	6.9	0.004002	2.5
Extreme (-30C)	1732.5	8.0	0.004592	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1732.5	9.7	0.005584	2.5
3.87	1732.5	9.4	0.005403	2.5
4.45	1732.5	8.4	0.004858	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.3	0.005389	2.5
Extreme (50C)	1732.5	8.4	0.004849	2.5
Extreme (40C)	1732.5	8.2	0.004724	2.5
Extreme (30C)	1732.5	9.5	0.005459	2.5
Extreme (10C)	1732.5	9.1	0.005251	2.5
Extreme (0C)	1732.5	8.3	0.004814	2.5
Extreme (-10C)	1732.5	9.0	0.005171	2.5
Extreme (-20C)	1732.5	8.5	0.004914	2.5
Extreme (-30C)	1732.5	8.4	0.004822	2.5

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

10.3 LTE BAND 5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	5.6	0.006641	2.5
3.87	836.5	6.8	0.008143	2.5
4.45	836.5	5.2	0.006174	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.5	0.007758	2.5
Extreme (50C)	836.5	6.2	0.007360	2.5
Extreme (40C)	836.5	6.0	0.007169	2.5
Extreme (30C)	836.5	6.4	0.007647	2.5
Extreme (10C)	836.5	5.4	0.006448	2.5
Extreme (0C)	836.5	5.0	0.005970	2.5
Extreme (-10C)	836.5	5.7	0.006850	2.5
Extreme (-20C)	836.5	6.6	0.007887	2.5
Extreme (-30C)	836.5	6.8	0.008085	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	6.3	0.007492	2.5
3.87	836.5	6.7	0.008060	2.5
4.45	836.5	5.1	0.006086	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.4	0.007625	2.5
Extreme (50C)	836.5	6.1	0.007345	2.5
Extreme (40C)	836.5	5.8	0.006987	2.5
Extreme (30C)	836.5	6.2	0.007433	2.5
Extreme (10C)	836.5	5.8	0.006889	2.5
Extreme (0C)	836.5	5.2	0.006207	2.5
Extreme (-10C)	836.5	5.8	0.006962	2.5
Extreme (-20C)	836.5	5.9	0.007094	2.5
Extreme (-30C)	836.5	6.4	0.007602	2.5

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

10.4 LTE BAND 7

Band 7 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	10.1	0.003965	2.5
3.87	2535	9.2	0.003636	2.5
4.45	2535	7.9	0.003122	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	8.9	0.003525	2.5
Extreme (50C)	2535	9.0	0.003555	2.5
Extreme (40C)	2535	8.1	0.003191	2.5
Extreme (30C)	2535	9.1	0.003591	2.5
Extreme (10C)	2535	8.3	0.003260	2.5
Extreme (0C)	2535	8.6	0.003383	2.5
Extreme (-10C)	2535	9.0	0.003555	2.5
Extreme (-20C)	2535	8.8	0.003490	2.5
Extreme (-30C)	2535	8.3	0.003267	2.5

Band 7 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	6.3	0.002504	2.5
3.87	2535	6.8	0.002666	2.5
4.45	2535	5.3	0.002109	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.8	0.002687	2.5
Extreme (50C)	2535	5.4	0.002132	2.5
Extreme (40C)	2535	5.6	0.002210	2.5
Extreme (30C)	2535	6.8	0.002693	2.5
Extreme (10C)	2535	5.8	0.002304	2.5
Extreme (0C)	2535	5.1	0.001997	2.5
Extreme (-10C)	2535	5.6	0.002196	2.5
Extreme (-20C)	2535	6.3	0.002498	2.5
Extreme (-30C)	2535	5.2	0.002063	2.5

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

10.5 LTE BAND 12

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	9.0	0.012698	2.5
3.87	707.5	9.9	0.014037	2.5
4.45	707.5	8.7	0.012280	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.7	0.012227	2.5
Extreme (50C)	707.5	7.7	0.010860	2.5
Extreme (40C)	707.5	7.3	0.010324	2.5
Extreme (30C)	707.5	7.8	0.011088	2.5
Extreme (10C)	707.5	7.2	0.010169	2.5
Extreme (0C)	707.5	8.9	0.012558	2.5
Extreme (-10C)	707.5	8.1	0.011457	2.5
Extreme (-20C)	707.5	8.4	0.011903	2.5
Extreme (-30C)	707.5	8.3	0.011670	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	7.4	0.010396	2.5
3.87	707.5	8.5	0.012004	2.5
4.45	707.5	7.0	0.009850	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	6.5	0.009175	2.5
Extreme (50C)	707.5	5.5	0.007765	2.5
Extreme (40C)	707.5	6.4	0.009110	2.5
Extreme (30C)	707.5	-7.7	-0.010912	2.5
Extreme (10C)	707.5	-8.2	-0.011590	2.5
Extreme (0C)	707.5	2.9	0.004100	2.5
Extreme (-10C)	707.5	-5.2	-0.007292	2.5
Extreme (-20C)	707.5	-8.7	-0.012302	2.5
Extreme (-30C)	707.5	-10.2	-0.014350	2.5

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

10.6 LTE BAND 17

Band 17 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	710.0	10.2	0.014353	2.5
3.87	710.0	8.8	0.012444	2.5
4.45	710.0	8.4	0.011814	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.2	0.012990	2.5
Extreme (50C)	710.0	9.1	0.012872	2.5
Extreme (40C)	710.0	7.9	0.011125	2.5
Extreme (30C)	710.0	8.6	0.012077	2.5
Extreme (10C)	710.0	8.4	0.011899	2.5
Extreme (0C)	710.0	8.6	0.012099	2.5
Extreme (-10C)	710.0	9.2	0.012946	2.5
Extreme (-20C)	710.0	9.2	0.012963	2.5
Extreme (-30C)	710.0	8.5	0.011959	2.5

Band 17 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	710.0	10.3	0.014498	2.5
3.87	710.0	8.8	0.012374	2.5
4.45	710.0	8.6	0.012163	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.3	0.013125	2.5
Extreme (50C)	710.0	9.4	0.013239	2.5
Extreme (40C)	710.0	8.0	0.011308	2.5
Extreme (30C)	710.0	8.4	0.011860	2.5
Extreme (10C)	710.0	8.3	0.011752	2.5
Extreme (0C)	710.0	8.4	0.011793	2.5
Extreme (-10C)	710.0	9.2	0.012906	2.5
Extreme (-20C)	710.0	8.8	0.012404	2.5
Extreme (-30C)	710.0	8.0	0.011229	2.5

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

10.7 LTE BAND 41

Band 41 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2593	8.3	0.003208	2.5
3.87	2593	6.5	0.002526	2.5
4.45	2593	7.9	0.003043	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	7.8	0.003006	2.5
Extreme (50C)	2593	4.4	0.001692	2.5
Extreme (40C)	2593	5.8	0.002254	2.5
Extreme (30C)	2593	5.0	0.001924	2.5
Extreme (10C)	2593	6.9	0.002665	2.5
Extreme (0C)	2593	4.9	0.001909	2.5
Extreme (-10C)	2593	9.5	0.003653	2.5
Extreme (-20C)	2593	10.7	0.004116	2.5
Extreme (-30C)	2593	5.7	0.002217	2.5

Band 41 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2593	8.1	0.003131	2.5
3.87	2593	7.0	0.002682	2.5
4.45	2593	6.7	0.002599	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	7.6	0.002934	2.5
Extreme (50C)	2593	5.2	0.001987	2.5
Extreme (40C)	2593	5.6	0.002174	2.5
Extreme (30C)	2593	4.3	0.001646	2.5
Extreme (10C)	2593	6.8	0.002635	2.5
Extreme (0C)	2593	5.1	0.001963	2.5
Extreme (-10C)	2593	9.2	0.003530	2.5
Extreme (-20C)	2593	10.4	0.004014	2.5
Extreme (-30C)	2593	5.9	0.002264	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.

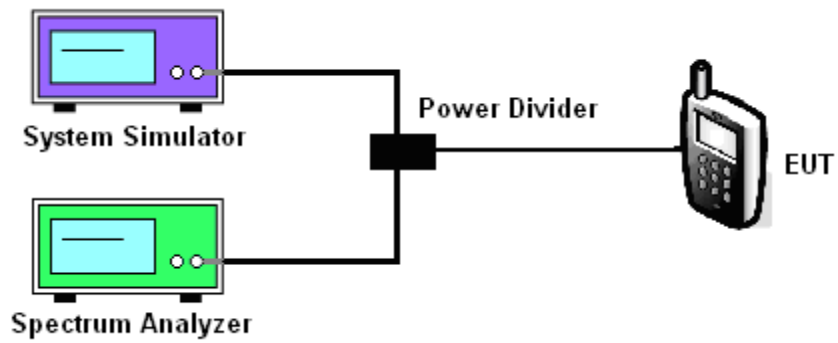
11.2 Measuring Instruments

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

Test data reference attachment.

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