

FCC CFR47 PART 22H, 24E, 27, 90S CERTIFICATION TEST REPORT FCC ID: 2AOWK-5002TH

Product: Mobile Phone

Trade Mark: ulefone

Model No.: GQ5002

Family Model: Armor 12S, Armor 12, Armor 12T, Armor 12P,
Armor 12E, Armor 12X, Armor 12 Pro

Report No.: STR221008002006E

Issue Date: Nov 21, 2022

Prepared for

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

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
1/F, Building E, Fenda Science Park, Sanwei Community,
Xixiang Street Bao'an District, Shenzhen 518126 P.R. China
Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090
Website: <http://www.ntek.org.cn>

TEST RESULT CERTIFICATION

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

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

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

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

Product name..... : Mobile Phone

Model and/or type reference .. : GQ5002

Trade Mark..... : ulefone

Family Model..... : Armor 12S, Armor 12, Armor 12T, Armor 12P, Armor 12E, Armor 12X, Armor 12 Pro

Test Sample Number..... T221008001R004

Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27, Part 90S

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.

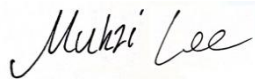
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Date of Test

Date (s) of performance of tests..... Oct 08, 2022 ~ Nov 21, 2022

Date of Issue Nov 21, 2022

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

Testing Engineer : 
(Mukzi Lee)

Authorized Signatory : 
(Alex Li)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	uifone
Model Name	GQ5002
Family Model	Armor 12S, Armor 12, Armor 12T, Armor 12P, Armor 12E, Armor 12X, Armor 12 Pro
Model Difference	All the model are the same circuit and RF module,except the model names.
FCC ID:	2AOWK-5002TH
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,13,17,25,41
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 13 Uplink: 777MHz-787MHz, Downlink: 746MHz-756MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 25 Uplink: 1850MHz-1915MHz, Downlink: 1930MHz-1995MHz; LTE FDD Band 41 Uplink: 2496MHz-2690MHz,
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM CARD	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 2: -0.1 dBi, Band 4: -0.8 dBi, Band 5: -3.7 dBi, Band 7: -0.9 dBi, Band 12: -5.2 dBi, Band 13: -6 dBi; Band 17: -5.2 dBi; Band 25: -0.1 dBi Band 41: -0.9 dBi
Adapter	Model: HJ-FC038K7-US Input: 100-240V~50/60Hz 0.6A Output: 5V---3.0A OR 9V---2.0A OR 12V---1.5A
Battery	DC 3.85V, 5180mAh, 19.94Wh
Power Rating	DC 3.85V from battery or DC 5V from adapter

Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)
HW Version	A200H_02
SW Version	Armor 12S_TH1_EEA_V01
** Note1: The High Voltage DC 4.2V and Low Voltage 3.4V 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-5002TH** filing to comply with the FCC Part 22H&24E&27&90S.

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90S, ANSI C63.26:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R.China.

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2/4/5/7/12/13/17/25/41

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	GQ5002	FCC ID: 2AOWK-5002TH	EUT

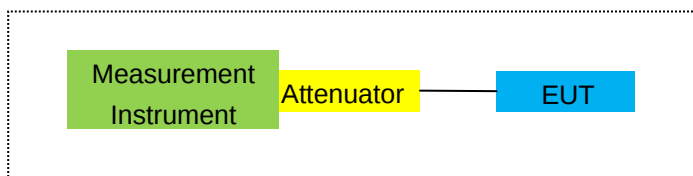
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

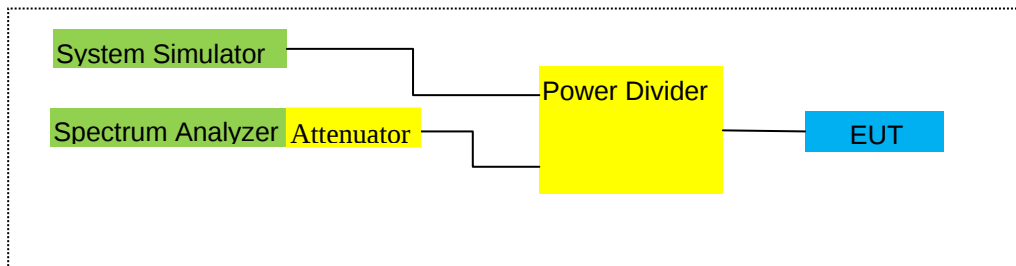
For Radiated Test Cases



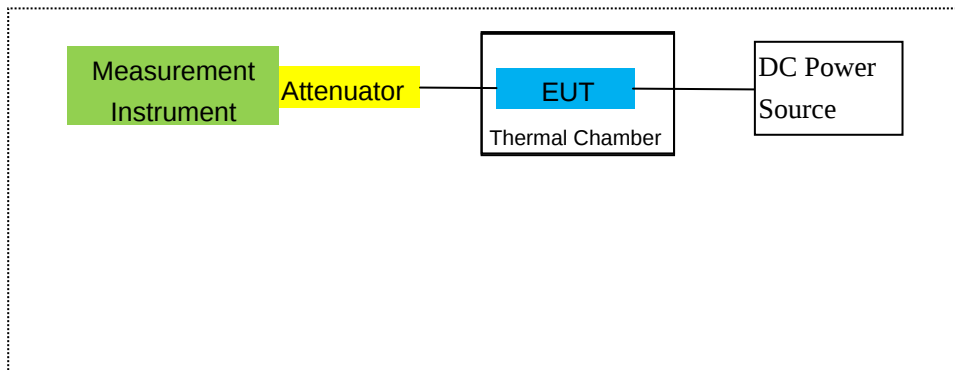
For Conducted Output Power



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	2022.06.16	2023.06.17	1 year
2	Test Receiver	R&S	ESPI	101318	2022.04.06	2023.04.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2023.03.30	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2021.11.07 2022.11.07	2022.11.06 2023.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2022.06.17	2023.06.16	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.04.06	2023.04.05	1 year
9	Power Meter	R&S	NRVS	100696	2022.06.17	2023.06.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2022.04.06	2023.04.05	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	2022.04.06	2023.04.05	1 year
15	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
16	LISN	EMCO	3816/2	00042990	2022.04.06	2023.04.05	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2022.04.06	2023.04.05	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2022.04.06	2023.04.05	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2022.04.01	2023.03.31	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2022.04.01	2023.03.31	1 year
24	test receiver	R&S	ESCI	a0304218	2022.04.06	2023.04.05	1 year
25	Communication Tester	R&S	CMU200	A0304247	2022.06.16	2023.06.15	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2022.04.06	2023.04.05	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2020.05.11	2023.05.10	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2022.06.16	2023.06.15	1 year
29	Communication Tester	R&S	CMW500	148500	2022.06.16	2023.06.15	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.

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 2/4/5/7/12/13/17/25/41

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, and §90.691

FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

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

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

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

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

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/4/5/7/12/13/17/25/41

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

1. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log (P)$ dB.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- ☐
- ☐ Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

MODES TESTED

- ☐ Band 2/4/5/7/12/13/17/25/41
- ☐

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 and §90.635

LIMITS:

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

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

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

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

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

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

Band 2/4/5/7/12/13/17/25/41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-3.35	3.76	28.24	21.13	129.718	Horizontal	Pass
		1880	-3.17	3.91	28.22	21.14	130.017	Horizontal	Pass
		1909.3	-3.12	3.93	28.20	21.15	130.317	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.38	3.77	28.23	21.08	128.233	Horizontal	Pass
		1880	-3.21	3.91	28.24	21.12	129.420	Horizontal	Pass
		1908.5	-3.24	3.94	28.25	21.07	127.938	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.50	3.77	28.31	21.04	127.057	Horizontal	Pass
		1880	-3.23	3.91	28.22	21.08	128.233	Horizontal	Pass
		1907.5	-3.15	3.94	28.20	21.11	129.122	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.44	3.79	28.33	21.10	128.825	Horizontal	Pass
		1880	-3.13	3.95	28.22	21.14	130.017	Horizontal	Pass
		1905	-3.06	3.97	28.19	21.16	130.617	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.46	3.79	28.34	21.09	128.529	Horizontal	Pass
		1880	-3.15	3.95	28.22	21.12	129.420	Horizontal	Pass
		1902.5	-3.15	3.97	28.18	21.06	127.644	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.45	3.81	28.35	21.09	128.529	Horizontal	Pass
		1880	-3.22	3.96	28.22	21.04	127.057	Horizontal	Pass
		1900	-3.10	4.00	28.16	21.06	127.644	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-3.34	3.76	28.24	21.14	130.017	Vertical	Pass
		1880	-3.22	3.91	28.22	21.09	128.529	Vertical	Pass
		1909.3	-3.13	3.93	28.20	21.14	130.017	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.36	3.77	28.23	21.10	128.825	Vertical	Pass
		1880	-3.19	3.91	28.24	21.14	130.017	Vertical	Pass
		1908.5	-3.14	3.94	28.25	21.17	130.918	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.52	3.77	28.31	21.02	126.474	Vertical	Pass
		1880	-3.25	3.91	28.22	21.06	127.644	Vertical	Pass
		1907.5	-3.11	3.94	28.20	21.15	130.317	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.42	3.79	28.33	21.12	129.420	Vertical	Pass
		1880	-3.10	3.95	28.22	21.17	130.918	Vertical	Pass
		1905	-3.03	3.97	28.19	21.19	131.522	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-3.50	3.79	28.34	21.05	127.350	Vertical	Pass
Band		1880	-3.10	3.95	28.22	21.17	130.918	Vertical	Pass
QPSK		1902.5	-3.17	3.97	28.18	21.04	127.057	Vertical	Pass
20.0MHz	1/#Mid	1860	-3.30	3.81	28.35	21.24	133.045	Vertical	Pass
Band		1880	-3.03	3.96	28.22	21.23	132.739	Vertical	Pass
QPSK		1900	-2.92	4.00	28.16	21.24	133.045	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.19	3.76	28.24	20.29	106.905	Horizontal	Pass
		1880	-4.03	3.91	28.22	20.28	106.660	Horizontal	Pass
		1909.3	-3.94	3.93	28.20	20.33	107.895	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.19	3.77	28.23	20.27	106.414	Horizontal	Pass
		1880	-4.02	3.91	28.24	20.31	107.399	Horizontal	Pass
		1908.5	-4.01	3.94	28.25	20.30	107.152	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.25	3.77	28.31	20.29	106.905	Horizontal	Pass
		1880	-3.93	3.91	28.22	20.38	109.144	Horizontal	Pass
		1907.5	-3.87	3.94	28.20	20.39	109.396	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.25	3.79	28.33	20.29	106.905	Horizontal	Pass
		1880	-3.92	3.95	28.22	20.35	108.393	Horizontal	Pass
		1905	-3.89	3.97	28.19	20.33	107.895	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.23	3.79	28.34	20.32	107.647	Horizontal	Pass
		1880	-3.87	3.95	28.22	20.40	109.648	Horizontal	Pass
		1902.5	-3.97	3.97	28.18	20.24	105.682	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.21	3.81	28.35	20.33	107.895	Horizontal	Pass
		1880	-4.01	3.96	28.22	20.25	105.925	Horizontal	Pass
		1900	-3.79	4.00	28.16	20.37	108.893	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.23	3.76	28.24	20.25	105.925	Vertical	Pass
		1880	-3.94	3.91	28.22	20.37	108.893	Vertical	Pass
		1909.3	-3.99	3.93	28.20	20.28	106.660	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.08	3.77	28.23	20.38	109.144	Vertical	Pass
		1880	-4.00	3.91	28.24	20.33	107.895	Vertical	Pass
		1908.5	-4.03	3.94	28.25	20.28	106.660	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-4.21	3.77	28.31	20.33	107.895	Vertical	Pass

Band 16		1880	-4.00	3.91	28.22	20.31	107.399	Vertical	Pass
QAM		1907.5	-3.88	3.94	28.20	20.38	109.144	Vertical	Pass
10.0MHz	1/#Mid	1855	-4.22	3.79	28.33	20.32	107.647	Vertical	Pass
Band 16		1880	-3.91	3.95	28.22	20.36	108.643	Vertical	Pass
QAM		1905	-3.90	3.97	28.19	20.32	107.647	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-4.29	3.79	28.34	20.26	106.170	Vertical	Pass
Band 16		1880	-3.93	3.95	28.22	20.34	108.143	Vertical	Pass
QAM		1902.5	-3.95	3.97	28.18	20.26	106.170	Vertical	Pass
20.0MHz	1/#Mid	1860	-4.10	3.81	28.35	20.44	110.662	Vertical	Pass
Band 16		1880	-3.82	3.96	28.22	20.44	110.662	Vertical	Pass
QAM		1900	-3.74	4.00	28.16	20.42	110.154	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-4.54	3.12	27.58	19.92	98.175	Horizontal	Pass
		1732.5	-4.38	3.27	27.61	19.96	99.083	Horizontal	Pass
		1754.3	-4.34	3.29	27.63	20.00	100.000	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.51	3.13	27.61	19.97	99.312	Horizontal	Pass
		1732.5	-4.47	3.27	27.61	19.87	97.051	Horizontal	Pass
		1753.5	-4.42	3.30	27.62	19.90	97.724	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.60	3.13	27.63	19.90	97.724	Horizontal	Pass
		1732.5	-4.50	3.27	27.61	19.84	96.383	Horizontal	Pass
		1752.5	-4.44	3.30	27.60	19.86	96.828	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.62	3.15	27.64	19.87	97.051	Horizontal	Pass
		1732.5	-4.34	3.31	27.61	19.96	99.083	Horizontal	Pass
		1750	-4.27	3.33	27.59	19.99	99.770	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.55	3.15	27.65	19.95	98.855	Horizontal	Pass
		1732.5	-4.43	3.31	27.61	19.87	97.051	Horizontal	Pass
		1747.5	-4.36	3.33	27.57	19.88	97.275	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.55	3.17	27.66	19.94	98.628	Horizontal	Pass
		1732.5	-4.44	3.32	27.61	19.85	96.605	Horizontal	Pass
		1745	-4.37	3.36	27.56	19.83	96.161	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.52	3.12	27.58	19.94	98.628	Vertical	Pass
		1732.5	-4.34	3.27	27.61	20.00	100.000	Vertical	Pass
		1754.3	-4.44	3.29	27.63	19.90	97.724	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.49	3.13	27.61	19.99	99.770	Vertical	Pass
		1732.5	-4.49	3.27	27.61	19.85	96.605	Vertical	Pass
		1753.5	-4.33	3.30	27.62	19.99	99.770	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.56	3.13	27.63	19.94	98.628	Vertical	Pass
		1732.5	-4.51	3.27	27.61	19.83	96.161	Vertical	Pass
		1752.5	-4.43	3.30	27.60	19.87	97.051	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.53	3.15	27.64	19.96	99.083	Vertical	Pass
		1732.5	-4.44	3.31	27.61	19.86	96.828	Vertical	Pass
		1750	-4.31	3.33	27.59	19.95	98.855	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-4.63	3.15	27.65	19.87	97.051	Vertical	Pass
		1732.5	-4.38	3.31	27.61	19.92	98.175	Vertical	Pass
		1747.5	-4.35	3.33	27.57	19.89	97.499	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.45	3.17	27.66	20.04	100.925	Vertical	Pass
		1732.5	-4.28	3.32	27.61	20.01	100.231	Vertical	Pass
		1745	-4.18	3.36	27.56	20.02	100.462	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.21	3.12	27.58	19.25	84.140	Horizontal	Pass
		1732.5	-5.06	3.27	27.61	19.28	84.723	Horizontal	Pass
		1754.3	-5.00	3.29	27.63	19.34	85.901	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.15	3.13	27.61	19.33	85.704	Horizontal	Pass
		1732.5	-5.04	3.27	27.61	19.30	85.114	Horizontal	Pass
		1753.5	-5.04	3.30	27.62	19.28	84.723	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.23	3.13	27.63	19.27	84.528	Horizontal	Pass
		1732.5	-5.02	3.27	27.61	19.32	85.507	Horizontal	Pass
		1752.5	-4.91	3.30	27.60	19.39	86.896	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-5.19	3.15	27.64	19.30	85.114	Horizontal	Pass
		1732.5	-4.92	3.31	27.61	19.38	86.696	Horizontal	Pass
		1750	-4.95	3.33	27.59	19.31	85.310	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-5.14	3.15	27.65	19.36	86.298	Horizontal	Pass
		1732.5	-4.91	3.31	27.61	19.39	86.896	Horizontal	Pass
		1747.5	-4.88	3.33	27.57	19.36	86.298	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-5.25	3.17	27.66	19.24	83.946	Horizontal	Pass
		1732.5	-5.00	3.32	27.61	19.29	84.918	Horizontal	Pass
		1745	-4.90	3.36	27.56	19.30	85.114	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.16	3.12	27.58	19.30	85.114	Vertical	Pass
		1732.5	-5.02	3.27	27.61	19.32	85.507	Vertical	Pass
		1754.3	-4.94	3.29	27.63	19.40	87.096	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.11	3.13	27.61	19.37	86.497	Vertical	Pass
		1732.5	-5.06	3.27	27.61	19.28	84.723	Vertical	Pass
		1753.5	-5.08	3.30	27.62	19.24	83.946	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-5.13	3.13	27.63	19.37	86.497	Vertical	Pass

Band 16 QAM		1732.5	-5.00	3.27	27.61	19.34	85.901	Vertical	Pass
		1752.5	-4.96	3.30	27.60	19.34	85.901	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-5.21	3.15	27.64	19.28	84.723	Vertical	Pass
		1732.5	-5.04	3.31	27.61	19.26	84.333	Vertical	Pass
		1750	-4.93	3.33	27.59	19.33	85.704	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-5.20	3.15	27.65	19.30	85.114	Vertical	Pass
		1732.5	-4.93	3.31	27.61	19.37	86.497	Vertical	Pass
		1747.5	-5.00	3.33	27.57	19.24	83.946	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-5.04	3.17	27.66	19.45	88.105	Vertical	Pass
		1732.5	-4.87	3.32	27.61	19.42	87.498	Vertical	Pass
		1745	-4.75	3.36	27.56	19.45	88.105	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/R B SIZE	Frequenc y	Result							Conclu sion
			SG Level	Cable Loss (dBm)	Facto r (dB)	Correctio n	Max. ERP	Max. ERP	Polarizatio n Of Max. ERP	
			(dBm)			(dB)	Averag e	Averag e		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	824.7	1.75	2.01	19.68	2.15	17.27	53.333	Horizontal	Pass
		836.5	1.66	2.01	19.77	2.15	17.27	53.333	Horizontal	Pass
		848.3	1.51	2.02	19.82	2.15	17.16	52.000	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	1.76	2.01	19.70	2.15	17.30	53.703	Horizontal	Pass
		836.5	1.68	2.01	19.77	2.15	17.29	53.580	Horizontal	Pass
		847.5	1.63	2.02	19.81	2.15	17.27	53.333	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	1.58	2.01	19.71	2.15	17.13	51.642	Horizontal	Pass
		836.5	1.52	2.01	19.77	2.15	17.13	51.642	Horizontal	Pass
		846.5	1.57	2.02	19.79	2.15	17.19	52.360	Horizontal	Pass
10.0MH z Band QPSK	1/#Mid	829	1.72	2.01	19.73	2.15	17.29	53.580	Horizontal	Pass
		836.5	1.61	2.01	19.77	2.15	17.22	52.723	Horizontal	Pass
		844	1.50	2.02	19.78	2.15	17.11	51.404	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	1.76	2.01	19.68	2.15	17.28	53.456	Vertical	Pass
		836.5	1.60	2.01	19.77	2.15	17.21	52.602	Vertical	Pass
		848.3	1.52	2.02	19.82	2.15	17.17	52.119	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	1.73	2.01	19.70	2.15	17.27	53.333	Vertical	Pass
		836.5	1.58	2.01	19.77	2.15	17.19	52.360	Vertical	Pass
		847.5	1.60	2.02	19.81	2.15	17.24	52.966	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	1.60	2.01	19.71	2.15	17.15	51.880	Vertical	Pass
		836.5	1.59	2.01	19.77	2.15	17.20	52.481	Vertical	Pass
		846.5	1.56	2.02	19.79	2.15	17.18	52.240	Vertical	Pass
10.0MH z Band QPSK	1/#Mid	829	1.76	2.01	19.73	2.15	17.33	54.075	Vertical	Pass
		836.5	1.71	2.01	19.77	2.15	17.32	53.951	Vertical	Pass
		844	1.70	2.02	19.78	2.15	17.31	53.827	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/R B SIZE	Frequenc y	Result							Concl usion
			SG Level	Cable Loss (dBm)	Facto r (dB)	Correctio n	Max. ERP	Max. ERP	Polarizatio n Of Max. ERP	
						(dB)	Averag e	Averag e		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	824.7	1.01	2.01	19.68	2.15	16.53	44.978	Horizontal	Pass
		836.5	0.98	2.01	19.77	2.15	16.59	45.604	Horizontal	Pass
		848.3	0.89	2.02	19.82	2.15	16.54	45.082	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	0.94	2.01	19.70	2.15	16.48	44.463	Horizontal	Pass
		836.5	0.94	2.01	19.77	2.15	16.55	45.186	Horizontal	Pass
		847.5	0.87	2.02	19.81	2.15	16.51	44.771	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	0.98	2.01	19.71	2.15	16.53	44.978	Horizontal	Pass
		836.5	0.85	2.01	19.77	2.15	16.46	44.259	Horizontal	Pass
		846.5	0.91	2.02	19.79	2.15	16.53	44.978	Horizontal	Pass
10.0MH z Band 16 QAM	1/#Mid	829	0.98	2.01	19.73	2.15	16.55	45.186	Horizontal	Pass
		836.5	0.94	2.01	19.77	2.15	16.55	45.186	Horizontal	Pass
		844	0.88	2.02	19.78	2.15	16.49	44.566	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	0.95	2.01	19.68	2.15	16.47	44.361	Vertical	Pass
		836.5	0.84	2.01	19.77	2.15	16.45	44.157	Vertical	Pass
		848.3	0.86	2.02	19.82	2.15	16.51	44.771	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	1.04	2.01	19.70	2.15	16.58	45.499	Vertical	Pass
		836.5	0.89	2.01	19.77	2.15	16.50	44.668	Vertical	Pass
		847.5	0.95	2.02	19.81	2.15	16.59	45.604	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	1.02	2.01	19.71	2.15	16.57	45.394	Vertical	Pass
		836.5	0.85	2.01	19.77	2.15	16.46	44.259	Vertical	Pass
		846.5	0.92	2.02	19.79	2.15	16.54	45.082	Vertical	Pass
10.0MH z Band 16 QAM	1/#Mid	829	1.06	2.01	19.73	2.15	16.63	46.026	Vertical	Pass
		836.5	1.04	2.01	19.77	2.15	16.65	46.238	Vertical	Pass
		844	1.04	2.02	19.78	2.15	16.65	46.238	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	Average	Average	Of Max. ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-2.31	4.54	27.75	20.90	123.027	Horizontal	Pass
		2535	-2.13	4.69	27.72	20.90	123.027	Horizontal	Pass
		2567.5	-2.07	4.71	27.71	20.93	123.880	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.36	4.55	27.76	20.85	121.619	Horizontal	Pass
		2535	-2.03	4.69	27.72	21.00	125.893	Horizontal	Pass
		2565	-2.03	4.72	27.70	20.95	124.451	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.29	4.55	27.77	20.93	123.880	Horizontal	Pass
		2535	-2.10	4.69	27.72	20.93	123.880	Horizontal	Pass
		2562.5	-2.03	4.72	27.69	20.94	124.165	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.22	4.57	27.78	20.99	125.603	Horizontal	Pass
		2535	-2.03	4.73	27.72	20.96	124.738	Horizontal	Pass
		2560	-1.98	4.75	27.68	20.95	124.451	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-2.32	4.54	27.75	20.89	122.744	Vertical	Pass
		2535	-2.14	4.69	27.72	20.89	122.744	Vertical	Pass
		2567.5	-2.02	4.71	27.71	20.98	125.314	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.28	4.55	27.76	20.93	123.880	Vertical	Pass
		2535	-2.17	4.69	27.72	20.86	121.899	Vertical	Pass
		2565	-2.12	4.72	27.70	20.86	121.899	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.25	4.55	27.77	20.97	125.026	Vertical	Pass
		2535	-2.19	4.69	27.72	20.84	121.339	Vertical	Pass
		2562.5	-2.09	4.72	27.69	20.88	122.462	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.18	4.57	27.78	21.03	126.765	Vertical	Pass
		2535	-1.99	4.73	27.72	21.00	125.893	Vertical	Pass
		2560	-1.89	4.75	27.68	21.04	127.057	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	1/#Midd	2502.5	-2.94	4.54	27.75	20.27	106.414	Horizontal	Pass
		2535	-2.77	4.69	27.72	20.26	106.170	Horizontal	Pass
		2567.5	-2.83	4.71	27.71	20.17	103.992	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Midd	2505	-3.00	4.55	27.76	20.21	104.954	Horizontal	Pass
		2535	-2.83	4.69	27.72	20.20	104.713	Horizontal	Pass
		2565	-2.73	4.72	27.70	20.25	105.925	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Midd	2507.5	-3.00	4.55	27.77	20.22	105.196	Horizontal	Pass
		2535	-2.90	4.69	27.72	20.13	103.039	Horizontal	Pass
		2562.5	-2.77	4.72	27.69	20.20	104.713	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Midd	2510	-3.05	4.57	27.78	20.16	103.753	Horizontal	Pass
		2535	-2.77	4.73	27.72	20.22	105.196	Horizontal	Pass
		2560	-2.66	4.75	27.68	20.27	106.414	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Midd	2502.5	-3.00	4.54	27.75	20.21	104.954	Vertical	Pass
		2535	-2.76	4.69	27.72	20.27	106.414	Vertical	Pass
		2567.5	-2.81	4.71	27.71	20.19	104.472	Vertical	Pass
10.0MHz Band 16 QAM	1/#Midd	2505	-3.01	4.55	27.76	20.20	104.713	Vertical	Pass
		2535	-2.79	4.69	27.72	20.24	105.682	Vertical	Pass
		2565	-2.78	4.72	27.70	20.20	104.713	Vertical	Pass
15.0MHz Band 16 QAM	1/#Midd	2507.5	-3.05	4.55	27.77	20.17	103.992	Vertical	Pass
		2535	-2.79	4.69	27.72	20.24	105.682	Vertical	Pass
		2562.5	-2.79	4.72	27.69	20.18	104.232	Vertical	Pass
20.0MHz Band 16 QAM	1/#Midd	2510	-2.87	4.57	27.78	20.34	108.143	Vertical	Pass
		2535	-2.66	4.73	27.72	20.33	107.895	Vertical	Pass
		2560	-2.59	4.75	27.68	20.34	108.143	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	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	699.7	0.58	1.91	19.21	2.15	15.73	37.411	Vertical	Pass
		707.5	0.57	1.91	19.26	2.15	15.77	37.757	Vertical	Pass
		715.3	0.42	1.93	19.34	2.15	15.68	36.983	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	0.65	1.91	19.21	2.15	15.80	38.019	Vertical	Pass
		707.5	0.49	1.91	19.26	2.15	15.69	37.068	Vertical	Pass
		714.5	0.45	1.93	19.34	2.15	15.71	37.239	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	0.62	1.91	19.23	2.15	15.79	37.931	Vertical	Pass
		707.5	0.46	1.91	19.26	2.15	15.66	36.813	Vertical	Pass
		713.5	0.51	1.92	19.33	2.15	15.77	37.757	Vertical	Pass
10.0Hz Band QPSK	1/#Mid	704	0.59	1.91	19.25	2.15	15.78	37.844	Vertical	Pass
		707.5	0.54	1.91	19.26	2.15	15.74	37.497	Vertical	Pass
		711	0.52	1.92	19.32	2.15	15.77	37.757	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	0.53	1.91	19.21	2.15	15.68	36.983	Horizontal	Pass
		707.5	0.50	1.91	19.26	2.15	15.70	37.154	Horizontal	Pass
		715.3	0.44	1.93	19.34	2.15	15.70	37.154	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	0.59	1.91	19.21	2.15	15.74	37.497	Horizontal	Pass
		707.5	0.56	1.91	19.26	2.15	15.76	37.670	Horizontal	Pass
		714.5	0.41	1.93	19.34	2.15	15.67	36.898	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	0.53	1.91	19.23	2.15	15.70	37.154	Horizontal	Pass
		707.5	0.45	1.91	19.26	2.15	15.65	36.728	Horizontal	Pass
		713.5	0.37	1.92	19.33	2.15	15.63	36.559	Horizontal	Pass
10.0Hz Band QPSK	1/#Mid	704	0.64	1.91	19.25	2.15	15.83	38.282	Horizontal	Pass
		707.5	0.64	1.91	19.26	2.15	15.84	38.371	Horizontal	Pass
		711	0.57	1.92	19.32	2.15	15.82	38.194	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/R B SIZE	Frequen cy	Result							Conclus ion
			SG Level	Cable Loss (dBm)	Antenn a Gain (dB)	Correction	Max. EIRP	Max. EIRP	Polarizatio n Of Max. ERP	
			(dBm)			(dB)	Averag e	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mi d	699.7	-0.08	1.91	19.21	2.15	15.07	32.137	Vertical	Pass
		707.5	-0.01	1.91	19.26	2.15	15.19	33.037	Vertical	Pass
		715.3	-0.21	1.93	19.34	2.15	15.05	31.989	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mi d	700.5	0.03	1.91	19.21	2.15	15.18	32.961	Vertical	Pass
		707.5	-0.02	1.91	19.26	2.15	15.18	32.961	Vertical	Pass
		714.5	-0.20	1.93	19.34	2.15	15.06	32.063	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mi d	701.5	-0.01	1.91	19.23	2.15	15.16	32.810	Vertical	Pass
		707.5	-0.11	1.91	19.26	2.15	15.09	32.285	Vertical	Pass
		713.5	-0.16	1.92	19.33	2.15	15.10	32.359	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mi d	704	-0.11	1.91	19.25	2.15	15.08	32.211	Vertical	Pass
		707.5	-0.08	1.91	19.26	2.15	15.12	32.509	Vertical	Pass
		711	-0.19	1.92	19.32	2.15	15.06	32.063	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mi d	699.7	0.04	1.91	19.21	2.15	15.19	33.037	Horizontal	Pass
		707.5	-0.05	1.91	19.26	2.15	15.15	32.734	Horizontal	Pass
		715.3	-0.13	1.93	19.34	2.15	15.13	32.584	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mi d	700.5	-0.07	1.91	19.21	2.15	15.08	32.211	Horizontal	Pass
		707.5	-0.08	1.91	19.26	2.15	15.12	32.509	Horizontal	Pass
		714.5	-0.11	1.93	19.34	2.15	15.15	32.734	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mi d	701.5	-0.02	1.91	19.23	2.15	15.15	32.734	Horizontal	Pass
		707.5	-0.08	1.91	19.26	2.15	15.12	32.509	Horizontal	Pass
		713.5	-0.10	1.92	19.33	2.15	15.16	32.810	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mi d	704	0.05	1.91	19.25	2.15	15.24	33.420	Horizontal	Pass
		707.5	0.03	1.91	19.26	2.15	15.23	33.343	Horizontal	Pass
		711	-0.01	1.92	19.32	2.15	15.24	33.420	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 13

Radiated Power (ERP) for Band 13										
Mode	RB/R B SIZE	Freque ncy	Result							Conclusio n
			SG Level	Cable Loss (dBm)	Facto r (dB)	Correctio n	Max. EPR	Max. EPR	Polarizatio n Of Max. ERP	
			(dBm)				Averag e	Averag e		
							(dB)	(dBm)		
5.0MHz Band QPSK	1/#Mid	779.5	0.11	1.95	19.23	2.15	15.24	33.420	Vertical	Pass
		782	0.03	1.95	19.26	2.15	15.19	33.037	Vertical	Pass
		784.5	-0.04	1.96	19.33	2.15	15.18	32.961	Vertical	Pass
10.0MH z Band QPSK	1/#Mid	782	0.08	1.95	19.25	2.15	15.23	33.343	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	779.5	0.15	1.95	19.23	2.15	15.28	33.729	Horizontal	Pass
		782	0.07	1.95	19.26	2.15	15.23	33.343	Horizontal	Pass
		784.5	-0.01	1.96	19.33	2.15	15.21	33.189	Horizontal	Pass
10.0MH z Band QPSK	1/#Mid	782	0.17	1.95	19.25	2.15	15.32	34.041	Horizontal	Pass

Radiated Power (ERP) for Band 13										
Mode	RB/R B SIZE	Frequenc y	Result							Conclusio n
			SG Level	Cable Loss (dBm)	Facto r (dB)	Correctio n	Max. EPR	Max. EPR	Polarizatio n Of Max. ERP	
			(dBm)				Averag e	Averag e		
						(dB)	(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	779.5	-0.57	1.95	19.23	2.15	14.56	28.576	Vertical	Pass
		782	-0.63	1.95	19.26	2.15	14.53	28.379	Vertical	Pass
		784.5	-0.66	1.96	19.33	2.15	14.56	28.576	Vertical	Pass
10.0MH z Band 16 QAM	1/#Mid	782	-0.62	1.95	19.25	2.15	14.53	28.379	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	779.5	-0.64	1.95	19.23	2.15	14.49	28.119	Horizontal	Pass
		782	-0.63	1.95	19.26	2.15	14.53	28.379	Horizontal	Pass
		784.5	-0.72	1.96	19.33	2.15	14.50	28.184	Horizontal	Pass
10.0MH z Band 16 QAM	1/#Mid	782	-0.51	1.95	19.25	2.15	14.64	29.107	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)

8.8 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
							(dBm)	(mW)		
5.0MHz Band QPSK	1/#Midd	706.5	1.07	1.91	19.23	2.15	16.24	42.073	Vertical	Pass
		710	1.02	1.91	19.26	2.15	16.22	41.879	Vertical	Pass
		713.5	0.91	1.92	19.33	2.15	16.17	41.400	Vertical	Pass
10.0MHz Band QPSK	1/#Midd	709	0.99	1.91	19.25	2.15	16.18	41.495	Vertical	Pass
		710	1.06	1.91	19.26	2.15	16.26	42.267	Vertical	Pass
		711	0.89	1.92	19.32	2.15	16.14	41.115	Vertical	Pass
5.0MHz Band QPSK	1/#Midd	706.5	1.10	1.91	19.23	2.15	16.27	42.364	Horizontal	Pass
		710	1.02	1.91	19.26	2.15	16.22	41.879	Horizontal	Pass
		713.5	0.98	1.92	19.33	2.15	16.24	42.073	Horizontal	Pass
10.0MHz Band QPSK	1/#Midd	709	1.16	1.91	19.25	2.15	16.35	43.152	Horizontal	Pass
		710	1.11	1.91	19.26	2.15	16.31	42.756	Horizontal	Pass
		711	1.08	1.92	19.32	2.15	16.33	42.954	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
					(dB)		(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	706.5	0.18	1.91	19.23	2.15	15.35	34.277	Vertical	Pass
		710	0.29	1.91	19.26	2.15	15.49	35.400	Vertical	Pass
		713.5	0.23	1.92	19.33	2.15	15.49	35.400	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	0.22	1.91	19.25	2.15	15.41	34.754	Vertical	Pass
		710	0.16	1.91	19.26	2.15	15.36	34.356	Vertical	Pass
		711	0.23	1.92	19.32	2.15	15.48	35.318	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	0.31	1.91	19.23	2.15	15.48	35.318	Horizontal	Pass
		710	0.28	1.91	19.26	2.15	15.48	35.318	Horizontal	Pass
		713.5	0.15	1.92	19.33	2.15	15.41	34.754	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	0.33	1.91	19.25	2.15	15.52	35.645	Horizontal	Pass
		710	0.34	1.91	19.26	2.15	15.54	35.810	Horizontal	Pass
		711	0.25	1.92	19.32	2.15	15.50	35.481	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)

8.9 LTE BAND 25

Radiated Power (EIRP) for Band 25									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-3.33	3.12	27.58	21.13	129.718	Horizontal	Pass
		1882.5	-3.26	3.27	27.61	21.08	128.233	Horizontal	Pass
		1914.3	-3.18	3.29	27.63	21.16	130.617	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.36	3.13	27.61	21.12	129.420	Horizontal	Pass
		1882.5	-3.14	3.27	27.61	21.20	131.826	Horizontal	Pass
		1753.5	-3.21	3.30	27.62	21.11	129.122	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.39	3.13	27.63	21.11	129.122	Horizontal	Pass
		1882.5	-3.24	3.27	27.61	21.10	128.825	Horizontal	Pass
		1912.5	-3.12	3.30	27.60	21.18	131.220	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.38	3.15	27.64	21.11	129.122	Horizontal	Pass
		1882.5	-3.14	3.31	27.61	21.16	130.617	Horizontal	Pass
		1910	-3.08	3.33	27.59	21.18	131.220	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.45	3.15	27.65	21.05	127.350	Horizontal	Pass
		1882.5	-3.24	3.31	27.61	21.06	127.644	Horizontal	Pass
		1907.5	-3.04	3.33	27.57	21.20	131.826	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.39	3.17	27.66	21.10	128.825	Horizontal	Pass
		1882.5	-3.13	3.32	27.61	21.16	130.617	Horizontal	Pass
		1905	-3.10	3.36	27.56	21.10	128.825	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-3.39	3.12	27.58	21.07	127.938	Vertical	Pass
		1882.5	-3.27	3.27	27.61	21.07	127.938	Vertical	Pass
		1914.3	-3.16	3.29	27.63	21.18	131.220	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.42	3.13	27.61	21.06	127.644	Vertical	Pass
		1882.5	-3.18	3.27	27.61	21.16	130.617	Vertical	Pass
		1753.5	-3.27	3.30	27.62	21.05	127.350	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.44	3.13	27.63	21.06	127.644	Vertical	Pass
		1882.5	-3.21	3.27	27.61	21.13	129.718	Vertical	Pass
		1912.5	-3.21	3.30	27.60	21.09	128.529	Vertical	Pass
10.0MHz Band	1/#Mid	1855	-3.36	3.15	27.64	21.13	129.718	Vertical	Pass
		1882.5	-3.16	3.31	27.61	21.14	130.017	Vertical	Pass

QPSK		1910	-3.06	3.33	27.59	21.20	131.826	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-3.43	3.15	27.65	21.07	127.938	Vertical	Pass
Band		1882.5	-3.21	3.31	27.61	21.09	128.529	Vertical	Pass
QPSK		1907.5	-3.11	3.33	27.57	21.13	129.718	Vertical	Pass
20.0MHz	1/#Mid	1860	-3.28	3.17	27.66	21.21	132.130	Vertical	Pass
Band		1882.5	-3.09	3.32	27.61	21.20	131.826	Vertical	Pass
QPSK		1905	-2.95	3.36	27.56	21.25	133.352	Vertical	Pass

Radiated Power (EIRP) for Band 25									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP		
						Average	Average		
						(dBm)	(mW)		
1.4MHz	1/#Mid	1850.7	-4.15	3.12	27.58	20.31	107.399	Horizontal	Pass
Band 16		1882.5	-3.97	3.27	27.61	20.37	108.893	Horizontal	Pass
QAM		1914.3	-4.00	3.29	27.63	20.34	108.143	Horizontal	Pass
3.0MHz	1/#Mid	1851.5	-4.11	3.13	27.61	20.37	108.893	Horizontal	Pass
Band 16		1882.5	-4.04	3.27	27.61	20.30	107.152	Horizontal	Pass
QAM		1753.5	-3.95	3.30	27.62	20.37	108.893	Horizontal	Pass
5.0MHz	1/#Mid	1852.5	-4.20	3.13	27.63	20.30	107.152	Horizontal	Pass
Band 16		1882.5	-4.05	3.27	27.61	20.29	106.905	Horizontal	Pass
QAM		1912.5	-3.96	3.30	27.60	20.34	108.143	Horizontal	Pass
10.0MHz	1/#Mid	1855	-4.15	3.15	27.64	20.34	108.143	Horizontal	Pass
Band 16		1882.5	-4.00	3.31	27.61	20.30	107.152	Horizontal	Pass
QAM		1910	-3.91	3.33	27.59	20.35	108.393	Horizontal	Pass
15.0MHz	1/#Mid	1857.5	-4.25	3.15	27.65	20.25	105.925	Horizontal	Pass
Band 16		1882.5	-3.99	3.31	27.61	20.31	107.399	Horizontal	Pass
QAM		1907.5	-3.87	3.33	27.57	20.37	108.893	Horizontal	Pass
20.0MHz	1/#Mid	1860	-4.25	3.17	27.66	20.24	105.682	Horizontal	Pass
Band 16		1882.5	-3.89	3.32	27.61	20.40	109.648	Horizontal	Pass
QAM		1905	-3.92	3.36	27.56	20.28	106.660	Horizontal	Pass
1.4MHz	1/#Mid	1850.7	-4.12	3.12	27.58	20.34	108.143	Vertical	Pass
Band 16		1882.5	-4.08	3.27	27.61	20.26	106.170	Vertical	Pass
QAM		1914.3	-4.07	3.29	27.63	20.27	106.414	Vertical	Pass
3.0MHz	1/#Mid	1851.5	-4.21	3.13	27.61	20.27	106.414	Vertical	Pass
Band 16		1882.5	-3.98	3.27	27.61	20.36	108.643	Vertical	Pass
QAM		1753.5	-3.99	3.30	27.62	20.33	107.895	Vertical	Pass

5.0MHz	1/#Mid	1852.5	-4.26	3.13	27.63	20.24	105.682	Vertical	Pass
Band 16		1882.5	-4.01	3.27	27.61	20.33	107.895	Vertical	Pass
QAM		1912.5	-4.01	3.30	27.60	20.29	106.905	Vertical	Pass
10.0MHz	1/#Mid	1855	-4.18	3.15	27.64	20.31	107.399	Vertical	Pass
Band 16		1882.5	-4.03	3.31	27.61	20.27	106.414	Vertical	Pass
QAM		1910	-4.00	3.33	27.59	20.26	106.170	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-4.20	3.15	27.65	20.30	107.152	Vertical	Pass
Band 16		1882.5	-3.95	3.31	27.61	20.35	108.393	Vertical	Pass
QAM		1907.5	-3.96	3.33	27.57	20.28	106.660	Vertical	Pass
20.0MHz	1/#Mid	1860	-4.06	3.17	27.66	20.43	110.408	Vertical	Pass
Band 16		1882.5	-3.87	3.32	27.61	20.42	110.154	Vertical	Pass
QAM		1905	-3.75	3.36	27.56	20.45	110.917	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.10 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable Loss (dBm)	Factor (dB)	Max.	Max.	Polarization Of Max. ERP	
			Level			EIRP	EIRP		
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2557.5	-1.93	4.54	27.75	21.28	134.276	Horizontal	Pass
		2605	-1.72	4.69	27.72	21.31	135.207	Horizontal	Pass
		2652.5	-1.61	4.71	27.71	21.39	137.721	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.86	4.55	27.76	21.35	136.458	Horizontal	Pass
		2605	-1.69	4.69	27.72	21.34	136.144	Horizontal	Pass
		2650	-1.61	4.72	27.70	21.37	137.088	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-1.98	4.55	27.77	21.24	133.045	Horizontal	Pass
		2605	-1.70	4.69	27.72	21.33	135.831	Horizontal	Pass
		2647.5	-1.59	4.72	27.69	21.38	137.404	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2565	-1.87	4.57	27.78	21.34	136.144	Horizontal	Pass
		2605	-1.70	4.73	27.72	21.29	134.586	Horizontal	Pass
		2645	-1.61	4.75	27.68	21.32	135.519	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2557.5	-1.88	4.54	27.75	21.33	135.831	Vertical	Pass
		2605	-1.64	4.69	27.72	21.39	137.721	Vertical	Pass
		2652.5	-1.66	4.71	27.71	21.34	136.144	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.96	4.55	27.76	21.25	133.352	Vertical	Pass
		2605	-1.70	4.69	27.72	21.33	135.831	Vertical	Pass
		2650	-1.58	4.72	27.70	21.40	138.038	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-1.87	4.55	27.77	21.35	136.458	Vertical	Pass
		2605	-1.64	4.69	27.72	21.39	137.721	Vertical	Pass
		2647.5	-1.71	4.72	27.69	21.26	133.660	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2565	-1.77	4.57	27.78	21.44	139.316	Vertical	Pass
		2605	-1.59	4.73	27.72	21.40	138.038	Vertical	Pass
		2645	-1.52	4.75	27.68	21.41	138.357	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2557.5	-2.66	4.54	27.75	20.55	113.501	Horizontal	Pass
		2605	-2.53	4.69	27.72	20.50	112.202	Horizontal	Pass
		2652.5	-2.44	4.71	27.71	20.56	113.763	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-2.77	4.55	27.76	20.44	110.662	Horizontal	Pass
		2605	-2.50	4.69	27.72	20.53	112.980	Horizontal	Pass
		2650	-2.51	4.72	27.70	20.47	111.429	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-2.76	4.55	27.77	20.46	111.173	Horizontal	Pass
		2605	-2.50	4.69	27.72	20.53	112.980	Horizontal	Pass
		2647.5	-2.49	4.72	27.69	20.48	111.686	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-2.72	4.57	27.78	20.49	111.944	Horizontal	Pass
		2605	-2.44	4.73	27.72	20.55	113.501	Horizontal	Pass
		2645	-2.36	4.75	27.68	20.57	114.025	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2557.5	-2.70	4.54	27.75	20.51	112.460	Vertical	Pass
		2605	-2.53	4.69	27.72	20.50	112.202	Vertical	Pass
		2652.5	-2.49	4.71	27.71	20.51	112.460	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-2.62	4.55	27.76	20.59	114.551	Vertical	Pass
		2605	-2.54	4.69	27.72	20.49	111.944	Vertical	Pass
		2650	-2.54	4.72	27.70	20.44	110.662	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-2.71	4.55	27.77	20.51	112.460	Vertical	Pass
		2605	-2.56	4.69	27.72	20.47	111.429	Vertical	Pass
		2647.5	-2.51	4.72	27.69	20.46	111.173	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-2.60	4.57	27.78	20.61	115.080	Vertical	Pass
		2605	-2.36	4.73	27.72	20.63	115.611	Vertical	Pass
		2645	-2.31	4.75	27.68	20.62	115.345	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 2/4/5/7/12/13/17/25/41

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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-52.81	4.04	33.51	-23.34	-13	-10.34	Horizontal
3701.4	-51.92	4.04	33.51	-22.45	-13	-9.45	Vertical
5552.1	-46.21	5.24	35.84	-15.61	-13	-2.61	Vertical
5552.1	-51.52	5.24	35.84	-20.92	-13	-7.92	Horizontal
202.5	-37.99	1.43	16.02	-23.40	-13	-10.40	Vertical
417.0	-43.18	1.30	17.99	-26.49	-13	-13.49	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.76	4.04	33.56	-22.24	-13	-9.24	Horizontal
3760.0	-52.08	4.04	33.56	-22.56	-13	-9.56	Vertical
5640.0	-45.70	5.24	35.91	-15.03	-13	-2.03	Vertical
5640.0	-50.52	5.24	35.91	-19.85	-13	-6.85	Horizontal
188.1	-43.25	1.62	16.97	-27.90	-13	-14.90	Vertical
456.0	-40.57	1.74	15.98	-26.34	-13	-13.34	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-50.55	4.04	34.00	-20.59	-13	-7.59	Horizontal
3818.6	-48.87	4.04	34.00	-18.91	-13	-5.91	Vertical
5727.9	-52.63	5.24	36.04	-21.83	-13	-8.83	Vertical
5727.9	-52.33	5.24	36.04	-21.53	-13	-8.53	Horizontal
180.8	-36.92	1.42	17.29	-21.05	-13	-8.05	Vertical
234.7	-39.59	1.50	17.90	-23.18	-13	-10.18	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-48.47	4.07	33.54	-19.00	-13	-6.00	Horizontal
3720.0	-53.09	4.07	33.54	-23.62	-13	-10.62	Vertical
5580.0	-50.04	5.28	35.86	-19.46	-13	-6.46	Vertical
5580.0	-51.55	5.28	35.86	-20.97	-13	-7.97	Horizontal
192.6	-44.23	1.58	16.89	-28.91	-13	-15.91	Vertical
403.3	-37.56	1.76	17.26	-22.06	-13	-9.06	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.54	4.04	33.56	-23.02	-13	-10.02	Horizontal
3760.0	-53.93	4.04	33.56	-24.41	-13	-11.41	Vertical
5640.0	-53.84	5.24	35.91	-23.17	-13	-10.17	Vertical
5640.0	-50.62	5.24	35.91	-19.95	-13	-6.95	Horizontal
192.6	-44.16	1.46	16.27	-29.35	-13	-16.35	Vertical
429.0	-42.75	1.59	15.15	-29.19	-13	-16.19	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.06	4.04	34.00	-20.10	-13	-7.10	Horizontal
3800.0	-52.81	4.04	34.00	-22.85	-13	-9.85	Vertical
5700.0	-46.67	5.24	36.04	-15.87	-13	-2.87	Vertical
5700.0	-53.25	5.24	36.04	-22.45	-13	-9.45	Horizontal
181.2	-42.17	1.36	17.39	-26.13	-13	-13.13	Vertical
246.4	-43.97	1.66	15.39	-30.24	-13	-17.24	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.53	4.02	29.80	-21.75	-13	-8.75	Horizontal
3421.4	-44.11	4.02	29.80	-18.33	-13	-5.33	Vertical
5132.1	-51.61	5.24	35.84	-21.01	-13	-8.01	Vertical
5132.1	-52.87	5.24	35.84	-22.27	-13	-9.27	Horizontal
192.6	-37.10	1.68	16.04	-22.74	-13	-9.74	Vertical
300.8	-37.66	1.78	17.74	-21.70	-13	-8.70	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-52.66	4.03	30.00	-26.69	-13	-13.69	Horizontal
3465.0	-45.10	4.03	30.00	-19.13	-13	-6.13	Vertical
5197.5	-46.20	5.25	35.86	-15.59	-13	-2.59	Vertical
5197.5	-51.60	5.25	35.86	-20.99	-13	-7.99	Horizontal
193.6	-38.55	1.72	17.69	-22.58	-13	-9.58	Vertical
295.0	-39.21	1.62	16.02	-24.80	-13	-11.80	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-51.77	4.05	30.01	-25.81	-13	-12.81	Horizontal
3508.6	-49.87	4.05	30.01	-23.91	-13	-10.91	Vertical
5262.9	-46.99	5.26	35.86	-16.39	-13	-3.39	Vertical
5262.9	-50.50	5.26	35.86	-19.90	-13	-6.90	Horizontal
197.4	-39.42	1.80	16.69	-24.53	-13	-11.53	Vertical
232.7	-37.38	1.75	16.66	-22.48	-13	-9.48	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-53.00	4.02	29.80	-27.22	-13	-14.22	Horizontal
3440.0	-50.60	4.02	29.80	-24.82	-13	-11.82	Vertical
5160.0	-44.23	5.24	35.84	-13.63	-13	-0.63	Vertical
5160.0	-49.34	5.24	35.84	-18.74	-13	-5.74	Horizontal
175.9	-40.30	1.57	17.26	-24.61	-13	-11.61	Vertical
463.4	-37.28	1.78	16.35	-22.71	-13	-9.71	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-51.48	4.03	30.00	-25.51	-13	-12.51	Horizontal
3465.0	-52.48	4.03	30.00	-26.51	-13	-13.51	Vertical
5197.5	-48.23	5.25	35.86	-17.62	-13	-4.62	Vertical
5197.5	-53.51	5.25	35.86	-22.90	-13	-9.90	Horizontal
199.4	-40.16	1.44	17.95	-23.65	-13	-10.65	Vertical
434.2	-37.20	1.65	16.09	-22.76	-13	-9.76	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-52.35	4.05	27.68	-28.72	-13	-15.72	Horizontal
3490.0	-50.46	4.05	27.68	-26.83	-13	-13.83	Vertical
5235.0	-44.10	5.26	35.86	-13.50	-13	-0.50	Vertical
5235.0	-53.07	5.26	35.86	-22.47	-13	-9.47	Horizontal
192.3	-37.65	1.61	16.85	-22.41	-13	-9.41	Vertical
251.2	-42.16	1.61	15.19	-28.58	-13	-15.58	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-49.60	2.78	27.50	-24.88	-13	-11.88	Horizontal
1649.4	-45.88	2.78	27.50	-21.16	-13	-8.16	Vertical
2474.1	-47.22	2.90	27.80	-22.32	-13	-9.32	Vertical
2474.1	-52.28	2.90	27.80	-27.38	-13	-14.38	Horizontal
200.9	-38.64	1.76	17.59	-22.81	-13	-9.81	Vertical
238.5	-43.10	1.63	15.87	-28.86	-13	-15.86	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-48.75	2.80	27.48	-24.07	-13	-11.07	Horizontal
1673.0	-45.35	2.80	27.48	-20.67	-13	-7.67	Vertical
2509.5	-53.60	2.91	27.70	-28.81	-13	-15.81	Vertical
2509.5	-49.89	2.91	27.70	-25.10	-13	-12.10	Horizontal
203.8	-35.53	1.61	15.68	-21.46	-13	-8.46	Vertical
302.0	-38.63	1.59	17.52	-22.71	-13	-9.71	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-44.67	2.82	27.43	-20.06	-13	-7.06	Horizontal
1696.6	-45.69	2.82	27.43	-21.08	-13	-8.08	Vertical
2544.9	-48.22	2.92	27.74	-23.40	-13	-10.40	Vertical
2544.9	-51.90	2.92	27.74	-27.08	-13	-14.08	Horizontal
207.5	-40.20	1.69	16.67	-25.21	-13	-12.21	Vertical
411.2	-39.05	1.70	17.18	-23.57	-13	-10.57	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-48.97	2.78	27.50	-24.25	-13	-11.25	Horizontal
1658.0	-51.93	2.78	27.50	-27.21	-13	-14.21	Vertical
2487.0	-45.29	2.90	27.80	-20.39	-13	-7.39	Vertical
2487.0	-49.96	2.90	27.80	-25.06	-13	-12.06	Horizontal
184.8	-36.03	1.71	15.57	-22.17	-13	-9.17	Vertical
349.0	-38.32	1.34	16.40	-23.26	-13	-10.26	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-44.39	2.80	27.48	-19.71	-13	-6.71	Horizontal
1673.0	-45.67	2.80	27.48	-20.99	-13	-7.99	Vertical
2509.5	-49.24	2.91	27.70	-24.45	-13	-11.45	Vertical
2509.5	-53.81	2.91	27.70	-29.02	-13	-16.02	Horizontal
203.7	-38.14	1.44	17.04	-22.54	-13	-9.54	Vertical
426.6	-43.07	1.76	17.62	-27.21	-13	-14.21	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.52	2.82	27.43	-21.91	-13	-8.91	Horizontal
1688.0	-47.85	2.82	27.43	-23.24	-13	-10.24	Vertical
2532.0	-46.05	2.92	27.74	-21.23	-13	-8.23	Vertical
2532.0	-51.64	2.92	27.74	-26.82	-13	-13.82	Horizontal
190.4	-39.22	1.74	17.70	-23.26	-13	-10.26	Vertical
289.2	-34.79	1.41	17.46	-18.73	-13	-5.73	Horizontal

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

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

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

9.4 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-59.89	5.23	35.81	-29.31	-25	-4.31	Horizontal
5005.0	-61.81	5.23	35.81	-31.23	-25	-6.23	Vertical
7507.5	-64.63	5.67	36.85	-33.45	-25	-8.45	Vertical
7507.5	-62.30	5.67	36.85	-31.12	-25	-6.12	Horizontal
187.6	-47.37	1.73	17.97	-31.13	-25	-6.13	Vertical
297.1	-49.05	1.38	15.11	-35.32	-25	-10.32	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.06	5.23	35.82	-31.47	-25	-6.47	Horizontal
5070.0	-62.87	5.23	35.82	-32.28	-25	-7.28	Vertical
7605.0	-62.86	5.67	36.85	-31.68	-25	-6.68	Vertical
7605.0	-59.20	5.67	36.85	-28.02	-25	-3.02	Horizontal
201.7	-52.46	1.77	16.17	-38.05	-25	-13.05	Vertical
331.5	-45.81	1.63	15.21	-32.23	-25	-7.23	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-60.50	5.24	35.83	-29.91	-25	-4.91	Horizontal
5135.0	-62.72	5.24	35.83	-32.13	-25	-7.13	Vertical
7702.5	-60.62	5.68	36.87	-29.43	-25	-4.43	Vertical
7702.5	-62.21	5.68	36.87	-31.02	-25	-6.02	Horizontal
183.6	-49.09	1.58	17.56	-33.11	-25	-8.11	Vertical
289.7	-51.41	1.45	16.58	-36.28	-25	-11.28	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	-60.19	5.23	35.82	-29.60	-25	-4.60	Horizontal
5020.0	-60.76	5.23	35.82	-30.17	-25	-5.17	Vertical
7530.0	-61.76	5.67	36.86	-30.57	-25	-5.57	Vertical
7530.0	-64.05	5.67	36.86	-32.86	-25	-7.86	Horizontal
189.3	-51.02	1.63	15.76	-36.89	-25	-11.89	Vertical
402.1	-48.09	1.71	15.44	-34.36	-25	-9.36	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.10	5.23	35.82	-29.51	-25	-4.51	Horizontal
5070.0	-59.25	5.23	35.82	-28.66	-25	-3.66	Vertical
7605.0	-60.13	5.67	36.85	-28.95	-25	-3.95	Vertical
7605.0	-60.24	5.67	36.85	-29.06	-25	-4.06	Horizontal
188.5	-50.78	1.79	16.84	-35.72	-25	-10.72	Vertical
405.9	-47.95	1.71	17.64	-32.02	-25	-7.02	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-61.80	5.24	35.83	-31.21	-25	-6.21	Horizontal
5120.0	-59.78	5.24	35.83	-29.19	-25	-4.19	Vertical
7680.0	-59.60	5.70	36.88	-28.42	-25	-3.42	Vertical
7680.0	-60.76	5.70	36.88	-29.58	-25	-4.58	Horizontal
177.8	-47.40	1.79	16.84	-32.34	-25	-7.34	Vertical
393.9	-44.61	1.71	17.64	-28.68	-25	-3.68	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

9.5 LTE BAND 12

QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-46.23	2.60	27.20	-21.63	-13	-8.63	Horizontal
1399.4	-52.67	2.60	27.20	-28.07	-13	-15.07	Vertical
2099.1	-44.12	2.85	27.54	-19.43	-13	-6.43	Vertical
2099.1	-49.59	2.85	27.54	-24.90	-13	-11.90	Horizontal
179.0	-36.04	1.49	17.78	-19.75	-13	-6.75	Vertical
335.9	-37.99	1.36	17.33	-22.02	-13	-9.02	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.82	2.61	27.28	-20.15	-13	-7.15	Horizontal
1415.0	-47.36	2.61	27.28	-22.69	-13	-9.69	Vertical
2122.5	-46.51	2.87	27.59	-21.79	-13	-8.79	Vertical
2122.5	-51.96	2.87	27.59	-27.24	-13	-14.24	Horizontal
202.4	-36.88	1.73	15.74	-22.87	-13	-9.87	Vertical
351.6	-38.87	1.62	15.79	-24.70	-13	-11.70	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-46.15	2.63	27.28	-21.50	-13	-8.50	Horizontal
1430.6	-48.09	2.63	27.28	-23.44	-13	-10.44	Vertical
2145.9	-47.66	2.88	27.60	-22.94	-13	-9.94	Vertical
2145.9	-53.81	2.88	27.60	-29.09	-13	-16.09	Horizontal
213.0	-40.13	1.61	18.00	-23.74	-13	-10.74	Vertical
390.5	-35.71	1.45	15.49	-21.68	-13	-8.68	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-53.66	2.61	27.26	-29.01	-13	-16.01	Horizontal
1408.0	-46.06	2.61	27.26	-21.41	-13	-8.41	Vertical
2112.0	-51.69	2.87	27.58	-26.98	-13	-13.98	Vertical
2112.0	-53.68	2.87	27.58	-28.97	-13	-15.97	Horizontal
203.2	-37.08	1.31	16.97	-21.42	-13	-8.42	Vertical
426.9	-41.67	1.65	16.70	-26.62	-13	-13.62	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-51.58	2.61	27.28	-26.91	-13	-13.91	Horizontal
1415.0	-51.73	2.61	27.28	-27.06	-13	-14.06	Vertical
2122.5	-45.85	2.87	27.59	-21.13	-13	-8.13	Vertical
2122.5	-52.44	2.87	27.59	-27.72	-13	-14.72	Horizontal
212.9	-44.99	1.72	17.99	-28.72	-13	-15.72	Vertical
439.5	-38.78	1.73	17.94	-22.57	-13	-9.57	Horizontal
Test Results for High Channel 711MHz							
1422.0	-51.14	2.62	27.28	-26.48	-13	-13.48	Horizontal
1422.0	-45.99	2.62	27.28	-21.33	-13	-8.33	Vertical
2133.0	-46.30	2.87	27.60	-21.57	-13	-8.57	Vertical
2133.0	-50.12	2.87	27.60	-25.39	-13	-12.39	Horizontal
209.5	-36.54	1.58	15.93	-22.19	-13	-9.19	Vertical
324.0	-35.29	1.36	15.59	-21.06	-13	-8.06	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 13

QPSK EIRP POWER FOR LTE BAND 13 (5MHZ BANDWIDTH)

Test Results for Low Channel 779.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1559.0	-70.68	2.61	27.28	-46.01	-40	-6.01	Horizontal
1559.0	-72.48	2.61	27.28	-47.81	-40	-7.81	Vertical
2338.5	-72.38	2.87	27.59	-47.66	-13	-34.66	Vertical
2338.5	-67.36	2.87	27.59	-42.64	-13	-29.64	Horizontal
192.9	-70.61	1.71	16.15	-56.17	-13	-43.17	Vertical
384.4	-74.40	1.41	17.32	-58.49	-13	-45.49	Horizontal
Test Results For Mid Channel 782MHz							
1564.0	-76.11	2.62	27.30	-51.43	-40	-11.43	Horizontal
1564.0	-76.42	2.62	27.30	-51.74	-40	-11.74	Vertical
2346.0	-72.05	2.87	27.62	-47.30	-13	-34.30	Vertical
2346.0	-67.52	2.87	27.62	-42.77	-13	-29.77	Horizontal
210.5	-67.16	1.42	15.25	-53.34	-13	-40.34	Vertical
325.4	-69.03	1.36	17.19	-53.20	-13	-40.20	Horizontal
Test Results for High Channel 784.5MHz							
1569.0	-72.41	2.66	27.28	-47.79	-40	-7.79	Horizontal
1569.0	-68.15	2.66	27.28	-43.53	-40	-3.53	Vertical
2353.5	-69.28	2.88	27.60	-44.56	-13	-31.56	Vertical
2353.5	-72.11	2.88	27.60	-47.39	-13	-34.39	Horizontal
197.4	-69.47	1.32	17.29	-53.50	-13	-40.50	Vertical
293.5	-71.70	1.72	16.89	-56.53	-13	-43.53	Horizontal

QPSK EIRP POWER FOR LTE BAND 13 (10MHZ BANDWIDTH)

Test Results for Channel 782MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1564.0	-74.53	2.62	27.30	-49.85	-40	-9.85	Horizontal
1564.0	-77.32	2.62	27.30	-52.64	-40	-12.64	Vertical
2346.0	-74.94	2.87	27.62	-50.19	-13	-37.19	Vertical
2346.0	-71.32	2.87	27.62	-46.57	-13	-33.57	Horizontal
175.3	-71.36	1.35	16.91	-55.80	-13	-42.80	Vertical
451.2	-70.70	1.62	16.31	-56.01	-13	-43.01	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.

9.7 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	-53.53	2.61	27.28	-28.86	-13	-15.86	Horizontal
1413.0	-44.88	2.61	27.28	-20.21	-13	-7.21	Vertical
2119.5	-45.00	2.87	27.59	-20.28	-13	-7.28	Vertical
2119.5	-51.80	2.87	27.59	-27.08	-13	-14.08	Horizontal
184.6	-39.43	1.71	16.15	-24.99	-13	-11.99	Vertical
321.5	-39.52	1.41	17.32	-23.61	-13	-10.61	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-44.08	2.62	27.30	-19.40	-13	-6.40	Horizontal
1420.0	-52.85	2.62	27.30	-28.17	-13	-15.17	Vertical
2130.0	-48.69	2.87	27.62	-23.94	-13	-10.94	Vertical
2130.0	-52.44	2.87	27.62	-27.69	-13	-14.69	Horizontal
199.5	-41.96	1.42	15.25	-28.14	-13	-15.14	Vertical
282.8	-44.50	1.36	17.19	-28.67	-13	-15.67	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-45.43	2.66	27.28	-20.81	-13	-7.81	Horizontal
1427.0	-51.02	2.66	27.28	-26.40	-13	-13.40	Vertical
2140.5	-53.50	2.88	27.60	-28.78	-13	-15.78	Vertical
2140.5	-50.79	2.88	27.60	-26.07	-13	-13.07	Horizontal
176.2	-39.66	1.32	17.29	-23.69	-13	-10.69	Vertical
396.3	-35.03	1.72	16.89	-19.86	-13	-6.86	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	-52.74	2.62	27.30	-28.06	-13	-15.06	Horizontal
1418.0	-47.87	2.62	27.30	-23.19	-13	-10.19	Vertical
2127.0	-48.91	2.87	27.62	-24.16	-13	-11.16	Vertical
2127.0	-53.29	2.87	27.62	-28.54	-13	-15.54	Horizontal
198.2	-34.57	1.35	16.91	-19.01	-13	-6.01	Vertical
413.3	-35.14	1.62	16.31	-20.45	-13	-7.45	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-45.61	2.62	27.30	-20.93	-13	-7.93	Horizontal
1420.0	-50.65	2.62	27.30	-25.97	-13	-12.97	Vertical
2130.0	-53.91	2.87	27.62	-29.16	-13	-16.16	Vertical
2130.0	-53.20	2.87	27.62	-28.45	-13	-15.45	Horizontal
192.3	-36.09	1.51	17.14	-20.46	-13	-7.46	Vertical
407.1	-44.45	1.77	16.88	-29.34	-13	-16.34	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.34	2.62	27.30	-20.66	-13	-7.66	Horizontal
1422.0	-53.27	2.62	27.30	-28.59	-13	-15.59	Vertical
2133.0	-48.70	2.87	27.62	-23.95	-13	-10.95	Vertical
2133.0	-50.09	2.87	27.62	-25.34	-13	-12.34	Horizontal
198.3	-40.15	1.78	15.95	-25.98	-13	-12.98	Vertical
417.8	-35.13	1.34	17.95	-18.53	-13	-5.53	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.

9.8 LTE BAND 25

QPSK EIRP POWER FOR LTE BAND 25 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-49.13	4.26	29.80	-23.59	-13	-10.59	Horizontal
3701.4	-46.07	4.26	29.80	-20.53	-13	-7.53	Vertical
5552.1	-52.36	5.36	35.84	-21.88	-13	-8.88	Vertical
5552.1	-52.37	5.36	35.84	-21.89	-13	-8.89	Horizontal
193.2	-36.34	1.68	16.04	-21.98	-13	-8.98	Vertical
404.8	-43.25	1.78	17.74	-27.29	-13	-14.29	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765.0	-50.83	4.28	30.00	-25.11	-13	-12.11	Horizontal
3765.0	-53.29	4.28	30.00	-27.57	-13	-14.57	Vertical
5647.5	-51.66	5.41	35.86	-21.21	-13	-8.21	Vertical
5647.5	-49.30	5.41	35.86	-18.85	-13	-5.85	Horizontal
191.8	-34.11	1.72	17.69	-18.14	-13	-5.14	Vertical
368.1	-39.89	1.62	16.02	-25.48	-13	-12.48	Horizontal
Test Results for High Channel 1914.3MHz							
3828.6	-44.84	4.31	30.01	-19.14	-13	-6.14	Horizontal
3828.6	-48.44	4.31	30.01	-22.74	-13	-9.74	Vertical
5742.9	-45.12	5.43	35.86	-14.69	-13	-1.69	Vertical
5742.9	-53.94	5.43	35.86	-23.51	-13	-10.51	Horizontal
206.4	-40.29	1.80	16.69	-25.40	-13	-12.40	Vertical
294.6	-36.30	1.75	16.66	-21.40	-13	-8.40	Horizontal

QPSK EIRP POWER FOR LTE BAND 25 (20MHZ BANDWIDTH)

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-45.46	4.29	29.80	-19.95	-13	-6.95	Horizontal
3720.0	-50.88	4.29	29.80	-25.37	-13	-12.37	Vertical
5580.0	-49.18	5.38	35.84	-18.72	-13	-5.72	Vertical
5580.0	-50.21	5.38	35.84	-19.75	-13	-6.75	Horizontal
212.9	-42.69	1.57	17.26	-27.00	-13	-14.00	Vertical
417.3	-34.03	1.78	16.35	-19.46	-13	-6.46	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765.0	-47.43	4.28	30.00	-21.71	-13	-8.71	Horizontal
3765.0	-45.00	4.28	30.00	-19.28	-13	-6.28	Vertical
5647.5	-53.72	5.41	35.86	-23.27	-13	-10.27	Vertical
5647.5	-50.69	5.41	35.86	-20.24	-13	-7.24	Horizontal
201.6	-43.06	1.44	17.95	-26.55	-13	-13.55	Vertical
285.5	-34.29	1.65	16.09	-19.85	-13	-6.85	Horizontal
Test Results for High Channel 1905MHz							
3810.0	-48.73	4.35	27.68	-25.40	-13	-12.40	Horizontal
3810.0	-45.34	4.35	27.68	-22.01	-13	-9.01	Vertical
5715.0	-47.19	5.42	35.86	-16.75	-13	-3.75	Vertical
5715.0	-49.26	5.42	35.86	-18.82	-13	-5.82	Horizontal
179.6	-44.12	1.61	16.85	-28.88	-13	-15.88	Vertical
264.8	-44.25	1.61	15.19	-30.67	-13	-17.67	Horizontal

9.9 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997.0	-59.91	5.13	35.81	-29.23	-25	-4.23	Horizontal
4997.0	-63.19	5.13	35.81	-32.51	-25	-7.51	Vertical
7495.5	-62.20	5.42	36.85	-30.77	-25	-5.77	Vertical
7495.5	-59.99	5.42	36.85	-28.56	-25	-3.56	Horizontal
183.3	-47.15	1.56	17.97	-30.74	-25	-5.74	Vertical
443.9	-45.05	1.33	15.11	-31.27	-25	-6.27	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-64.25	5.16	35.82	-33.59	-25	-8.59	Horizontal
5186.0	-63.92	5.16	35.82	-33.26	-25	-8.26	Vertical
7779.0	-64.90	5.53	36.85	-33.58	-25	-8.58	Vertical
7779.0	-64.31	5.53	36.85	-32.99	-25	-7.99	Horizontal
200.1	-48.35	1.77	16.17	-33.94	-25	-8.94	Vertical
389.2	-45.25	1.63	15.21	-31.67	-25	-6.67	Horizontal
Test Results for High Channel 2687.5MHz							
5375.0	-61.49	5.23	35.83	-30.89	-25	-5.89	Horizontal
5375.0	-60.28	5.23	35.83	-29.68	-25	-4.68	Vertical
8062.5	-62.74	5.62	36.87	-31.49	-25	-6.49	Vertical
8062.5	-59.86	5.62	36.87	-28.61	-25	-3.61	Horizontal
175.5	-46.27	1.58	17.56	-30.29	-25	-5.29	Vertical
452.9	-46.24	1.45	16.58	-31.11	-25	-6.11	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012.0	-60.21	5.23	35.82	-29.62	-25	-4.62	Horizontal
5012.0	-61.67	5.23	35.82	-31.08	-25	-6.08	Vertical
7518.0	-59.92	5.67	36.86	-28.73	-25	-3.73	Vertical
7518.0	-64.47	5.67	36.86	-33.28	-25	-8.28	Horizontal
181.0	-50.41	1.55	15.76	-36.20	-25	-11.20	Vertical
290.7	-44.69	1.62	15.44	-30.87	-25	-5.87	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-61.56	5.16	35.82	-30.90	-25	-5.90	Horizontal
5186.0	-63.34	5.16	35.82	-32.68	-25	-7.68	Vertical
7779.0	-62.78	5.53	36.85	-31.46	-25	-6.46	Vertical
7779.0	-59.97	5.53	36.85	-28.65	-25	-3.65	Horizontal
193.6	-51.26	1.58	16.84	-36.00	-25	-11.00	Vertical
289.7	-54.33	1.61	17.64	-38.30	-25	-13.30	Horizontal
Test Results for High Channel 2680MHz							
5360.0	-60.65	5.24	35.83	-30.06	-25	-5.06	Horizontal
5360.0	-63.07	5.24	35.83	-32.48	-25	-7.48	Vertical
8040.0	-60.86	5.70	36.88	-29.68	-25	-4.68	Vertical
8040.0	-64.76	5.70	36.88	-33.58	-25	-8.58	Horizontal
184.4	-46.01	1.48	16.84	-30.65	-25	-5.65	Vertical
313.8	-47.67	1.59	17.64	-31.62	-25	-6.62	Horizontal

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

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

We test both H direction and V direction, recorded worst case direction.

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

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.4V, Normal, DC 3.85V and High voltage, DC 4.2V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2/4/5/12/13/25/41

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]
3.40	1880	12.7	0.006746	2.5
3.85	1880	13.8	0.007332	2.5
4.20	1880	13.8	0.007338	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.4	0.006570	2.5
Extreme (50C)	1880	11.8	0.006299	2.5
Extreme (40C)	1880	13.7	0.007273	2.5
Extreme (30C)	1880	13.4	0.007123	2.5
Extreme (10C)	1880	13.4	0.007153	2.5
Extreme (0C)	1880	12.2	0.006497	2.5
Extreme (-10C)	1880	13.3	0.007090	2.5
Extreme (-20C)	1880	14.4	0.007638	2.5
Extreme (-30C)	1880	14.5	0.007714	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]
3.40	1880	9.5	0.005056	2.5
3.85	1880	9.1	0.004818	2.5
4.20	1880	8.2	0.004362	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.8	0.005200	2.5
Extreme (50C)	1880	9.2	0.004912	2.5
Extreme (40C)	1880	8.1	0.004317478	2.5
Extreme (30C)	1880	8.7	0.004612662	2.5
Extreme (10C)	1880	9.0	0.004800193	2.5
Extreme (0C)	1880	7.8	0.004142368	2.5
Extreme (-10C)	1880	8.6	0.004581557	2.5
Extreme (-20C)	1880	9.3	0.004952237	2.5
Extreme (-30C)	1880	8.6	0.004558294	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]
3.40	1732.5	8.4	0.004861	2.5
3.85	1732.5	8.6	0.004958	2.5
4.20	1732.5	8.4	0.004845	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.3	0.004800	2.5
Extreme (50C)	1732.5	9.0	0.005169	2.5
Extreme (40C)	1732.5	7.3	0.004215	2.5
Extreme (30C)	1732.5	5.5	0.003202	2.5
Extreme (10C)	1732.5	6.8	0.003919	2.5
Extreme (0C)	1732.5	9.8	0.005661	2.5
Extreme (-10C)	1732.5	8.2	0.004760	2.5
Extreme (-20C)	1732.5	6.8	0.003927	2.5
Extreme (-30C)	1732.5	8.5	0.004892	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]
3.40	1732.5	9.8	0.005662	2.5
3.85	1732.5	9.0	0.005195	2.5
4.20	1732.5	8.6	0.004953	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.6	0.005514	2.5
Extreme (50C)	1732.5	9.3	0.005365	2.5
Extreme (40C)	1732.5	8.0	0.004636	2.5
Extreme (30C)	1732.5	9.2	0.005289	2.5
Extreme (10C)	1732.5	8.6	0.004975	2.5
Extreme (0C)	1732.5	8.4	0.004824	2.5
Extreme (-10C)	1732.5	8.7	0.005005	2.5
Extreme (-20C)	1732.5	9.0	0.005174	2.5
Extreme (-30C)	1732.5	8.3	0.004797	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]
3.40	836.5	5.7	0.006786	2.5
3.85	836.5	6.6	0.007913	2.5
4.20	836.5	4.4	0.005227	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.6	0.006726	2.5
Extreme (50C)	836.5	5.6	0.006731	2.5
Extreme (40C)	836.5	6.1	0.007263	2.5
Extreme (30C)	836.5	6.3	0.007567	2.5
Extreme (10C)	836.5	5.5	0.006573	2.5
Extreme (0C)	836.5	5.1	0.006137	2.5
Extreme (-10C)	836.5	5.2	0.006251	2.5
Extreme (-20C)	836.5	6.5	0.007810	2.5
Extreme (-30C)	836.5	6.5	0.007771	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]
3.40	836.5	6.1	0.007332	2.5
3.85	836.5	6.3	0.007519	2.5
4.20	836.5	4.9	0.005827	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.5	0.007776	2.5
Extreme (50C)	836.5	5.7	0.006808	2.5
Extreme (40C)	836.5	6.2	0.007417	2.5
Extreme (30C)	836.5	6.3	0.007538	2.5
Extreme (10C)	836.5	5.1	0.006152	2.5
Extreme (0C)	836.5	5.4	0.006440	2.5
Extreme (-10C)	836.5	5.8	0.006918	2.5
Extreme (-20C)	836.5	6.4	0.007602	2.5
Extreme (-30C)	836.5	6.6	0.007948	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]
3.40	2535	10.4	0.004115	2.5
3.85	2535	8.6	0.003385	2.5
4.20	2535	8.1	0.003196	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.7	0.003843	2.5
Extreme (50C)	2535	9.3	0.003657	2.5
Extreme (40C)	2535	8.5	0.003362	2.5
Extreme (30C)	2535	9.0	0.003557	2.5
Extreme (10C)	2535	7.7	0.003043	2.5
Extreme (0C)	2535	8.1	0.003176	2.5
Extreme (-10C)	2535	9.3	0.003662	2.5
Extreme (-20C)	2535	8.6	0.003385	2.5
Extreme (-30C)	2535	8.2	0.003252	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]
3.40	2535	6.9	0.002722	2.5
3.85	2535	6.7	0.002629	2.5
4.20	2535	5.5	0.002168	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	6.0	0.002366	2.5
Extreme (40C)	2535	5.6	0.002193	2.5
Extreme (30C)	2535	6.6	0.002597	2.5
Extreme (10C)	2535	5.8	0.002273	2.5
Extreme (0C)	2535	4.7	0.001854	2.5
Extreme (-10C)	2535	4.8	0.001907	2.5
Extreme (-20C)	2535	6.0	0.002384	2.5
Extreme (-30C)	2535	5.2	0.002067	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]
3.40	707.5	8.5	0.011975	2.5
3.85	707.5	10.4	0.014722	2.5
4.20	707.5	9.1	0.012838	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.4	0.011828	2.5
Extreme (50C)	707.5	7.5	0.010660	2.5
Extreme (40C)	707.5	7.0	0.009861	2.5
Extreme (30C)	707.5	7.9	0.011101	2.5
Extreme (10C)	707.5	6.9	0.009785	2.5
Extreme (0C)	707.5	8.6	0.012127	2.5
Extreme (-10C)	707.5	8.0	0.011298	2.5
Extreme (-20C)	707.5	9.2	0.013017	2.5
Extreme (-30C)	707.5	8.2	0.011586	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]
3.40	707.5	7.4	0.010483	2.5
3.85	707.5	8.4	0.011872	2.5
4.20	707.5	7.1	0.010003	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.1	0.012848	2.5
Extreme (50C)	707.5	8.6	0.012184	2.5
Extreme (40C)	707.5	8.6	0.012137	2.5
Extreme (30C)	707.5	8.1	0.011494	2.5
Extreme (10C)	707.5	8.4	0.011832	2.5
Extreme (0C)	707.5	7.3	0.010266	2.5
Extreme (-10C)	707.5	7.2	0.010190	2.5
Extreme (-20C)	707.5	9.0	0.012741	2.5
Extreme (-30C)	707.5	8.5	0.011949	2.5

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

10.6 LTE BAND 13

Band 13 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]
3.40	782.0	12.5	0.015956	2.5
3.85	782.0	13.5	0.017221	2.5
4.20	782.0	13.0	0.016621	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	14.4	0.018467	2.5
Extreme (50C)	782.0	13.4	0.017142	2.5
Extreme (40C)	782.0	14.8	0.018883	2.5
Extreme (30C)	782.0	14.6	0.018617	2.5
Extreme (10C)	782.0	14.1	0.017977	2.5
Extreme (0C)	782.0	14.0	0.017851	2.5
Extreme (-10C)	782.0	13.7	0.017529	2.5
Extreme (-20C)	782.0	14.0	0.017899	2.5
Extreme (-30C)	782.0	13.9	0.017767	2.5

Band 13 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]
3.40	782.0	12.9	0.016511	2.5
3.85	782.0	13.7	0.017552	2.5
4.20	782.0	13.5	0.017294	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	12.4	0.015795	2.5
Extreme (50C)	782.0	11.8	0.015098	2.5
Extreme (40C)	782.0	13.6	0.017355	2.5
Extreme (30C)	782.0	14.0	0.017839	2.5
Extreme (10C)	782.0	14.2	0.018130	2.5
Extreme (0C)	782.0	12.4	0.015800	2.5
Extreme (-10C)	782.0	13.2	0.016827	2.5
Extreme (-20C)	782.0	13.9	0.017797	2.5
Extreme (-30C)	782.0	14.6	0.018724	2.5

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

10.7 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]
3.40	710.0	10.3	0.014450	2.5
3.85	710.0	8.8	0.012334	2.5
4.20	710.0	8.3	0.011678	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.8	0.013841	2.5
Extreme (50C)	710.0	9.1	0.012834	2.5
Extreme (40C)	710.0	7.7	0.010809	2.5
Extreme (30C)	710.0	8.5	0.012024	2.5
Extreme (10C)	710.0	9.0	0.012726	2.5
Extreme (0C)	710.0	8.4	0.011839	2.5
Extreme (-10C)	710.0	8.6	0.012125	2.5
Extreme (-20C)	710.0	8.5	0.012037	2.5
Extreme (-30C)	710.0	8.4	0.011786	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]
3.40	710.0	9.7	0.013643	2.5
3.85	710.0	9.3	0.013130	2.5
4.20	710.0	8.3	0.011653	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.4	0.013294	2.5
Extreme (50C)	710.0	8.8	0.012365	2.5
Extreme (40C)	710.0	8.7	0.012202	2.5
Extreme (30C)	710.0	8.5	0.011917	2.5
Extreme (10C)	710.0	7.7	0.010897	2.5
Extreme (0C)	710.0	8.0	0.011328	2.5
Extreme (-10C)	710.0	9.7	0.013699	2.5
Extreme (-20C)	710.0	9.2	0.012995	2.5
Extreme (-30C)	710.0	8.4	0.011785	2.5

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

10.8 LTE BAND 25

Band 25 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]
3.40	1882.5	9.3	0.004960	2.5
3.85	1882.5	8.6	0.004565	2.5
4.20	1882.5	7.9	0.004223	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	9.4	0.004995	2.5
Extreme (50C)	1882.5	9.3	0.004938	2.5
Extreme (40C)	1882.5	8.1	0.004289	2.5
Extreme (30C)	1882.5	8.8	0.004667	2.5
Extreme (10C)	1882.5	8.5	0.004506	2.5
Extreme (0C)	1882.5	8.6	0.004547	2.5
Extreme (-10C)	1882.5	8.7	0.004648	2.5
Extreme (-20C)	1882.5	8.9	0.004734	2.5
Extreme (-30C)	1882.5	8.2	0.004356	2.5

Band 25 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]
3.40	1882.5	10.1	0.005376	2.5
3.85	1882.5	8.5	0.004500	2.5
4.20	1882.5	8.8	0.004681	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	9.7	0.005179	2.5
Extreme (50C)	1882.5	8.9	0.004747	2.5
Extreme (40C)	1882.5	8.3	0.004419	2.5
Extreme (30C)	1882.5	8.5	0.004500	2.5
Extreme (10C)	1882.5	8.0	0.004237	2.5
Extreme (0C)	1882.5	8.6	0.004579	2.5
Extreme (-10C)	1882.5	9.6	0.005095	2.5
Extreme (-20C)	1882.5	8.9	0.004706	2.5
Extreme (-30C)	1882.5	8.3	0.004395	2.5

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

10.9 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]
3.40	2593	10.3	0.003960	2.5
3.85	2593	9.3	0.003603	2.5
4.20	2593	8.8	0.003398	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	9.6	0.003711	2.5
Extreme (50C)	2593	9.1	0.003514	2.5
Extreme (40C)	2593	8.2	0.003150	2.5
Extreme (30C)	2593	9.2	0.003563	2.5
Extreme (10C)	2593	8.5	0.003291	2.5
Extreme (0C)	2593	8.0	0.003090	2.5
Extreme (-10C)	2593	8.9	0.003442	2.5
Extreme (-20C)	2593	8.7	0.003349	2.5
Extreme (-30C)	2593	8.6	0.003317	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]
3.40	2593	6.9	0.002661	2.5
3.85	2593	6.3	0.002430	2.5
4.20	2593	5.4	0.002086	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	6.9	0.002661	2.5
Extreme (50C)	2593	5.2	0.001992	2.5
Extreme (40C)	2593	5.2	0.002013	2.5
Extreme (30C)	2593	6.5	0.002505	2.5
Extreme (10C)	2593	6.2	0.002386	2.5
Extreme (0C)	2593	5.4	0.002100	2.5
Extreme (-10C)	2593	5.0	0.001927	2.5
Extreme (-20C)	2593	5.9	0.002285	2.5
Extreme (-30C)	2593	6.0	0.002315	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.

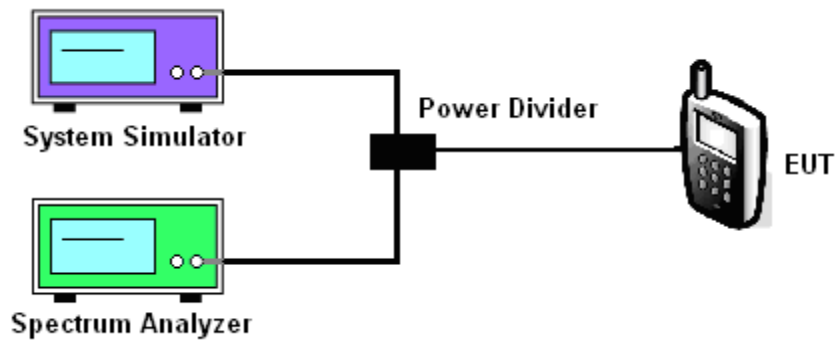
11.2 Measuring Instruments

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 2/4/5/7/12/13/17/25/41

Test data reference attachment.

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