

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

FCC ID: 2AOWKGQ3083

Product: Mobile Phone

Trade Mark: ulefone

Model Number: GQ3083

Armor 7, Armor 7S, Armor 7X,

Family Model: Armor 7E, Armor 7P, Armor 7A,
Armor 7 Pro, Armor 7 lite

Report No.: STR190815002007E

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Gotron Electronic CO.,LTD.
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Manufacturer's Name : Shenzhen Gotron Electronic CO.,LTD.
Address : 518, 5F, R&D building, Tsinghua Hi-Tech park, Nanshan district, Shenzhen 518057 P.R.China
Product name : Mobile Phone
Model and/or type reference : GQ3083
Family Model : Armor 7, Armor 7S, Armor 7X, Armor 7E, Armor 7P, Armor 7A, Armor 7 Pro, Armor 7 lite
Standards : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.26:2015
ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test
Date (s) of performance of tests : 16 Aug. 2019 ~ 29 Sep. 2019
Date of Issue : 16 Oct. 2019
Test Result : Pass

Testing Engineer : [Signature] (Allen Liu)
Technical Manager : [Signature] (Jason Chen)
Authorized Signatory : [Signature] (Sam Chen)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	ulefone
Model Name	GQ3083
Family Model	Armor 7, Armor 7S, Armor 7X, Armor 7E, Armor 7P, Armor 7A, Armor 7 Pro, Armor 7 lite
Model Difference	All models are the same circuit and RF module, except the model name.
FCC ID:	2AOWKGQ3083
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,66,71
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 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz; LTE FDD Band 71 Uplink: 663MHz-698MHz, Downlink: 617MHz-652MHz;
Type of Modulation:	QPSK/16QAM
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:	LTE FDD Band 2: 1.92dBi; LTE FDD Band 4: 0.34dBi; LTE FDD Band 5: 0.98dBi; LTE FDD Band 7: 1.73dBi LTE FDD Band 66: 0.34dBi; LTE FDD Band 71: 0.34dBi
Power Supply:	DC 3.85V/5500mAh from Battery or DC 5V from USB Port.
Adapter:	Model: HG-0503000K7-US Input: 100-240V~50/60Hz 0.6A Output: 5V---3A
Extreme Vol. Limits:	DC 3.4V to DC 4.4V (Nominal DC 3.85V) (Note 1)
HW Version	X90T_03
SW Version	Armor_7_TF1_EEA_V01
** Note1: The High Voltage DC 4.4V 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: 2AOWKGGQ3083** filing to comply with the FCC Part 22H&24E &27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-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 = 2Uc(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, Band 4, Band 5, Band 7, Band 66, Band 71.

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission’s requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

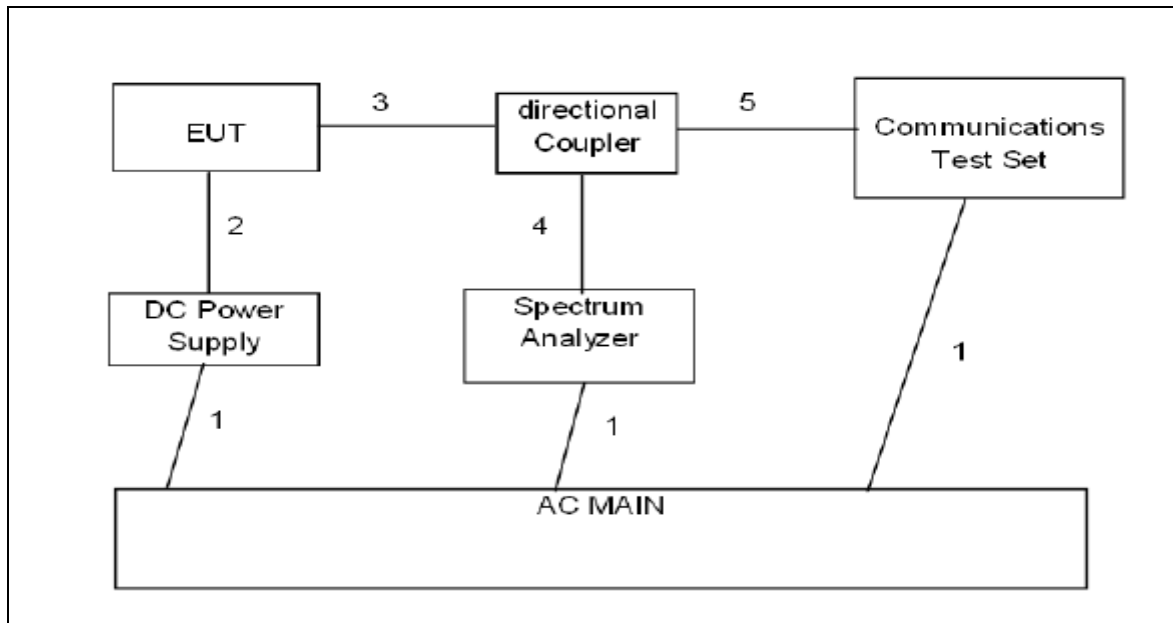
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	GQ3083	FCC ID: 2AOWKGGQ3083	EUT

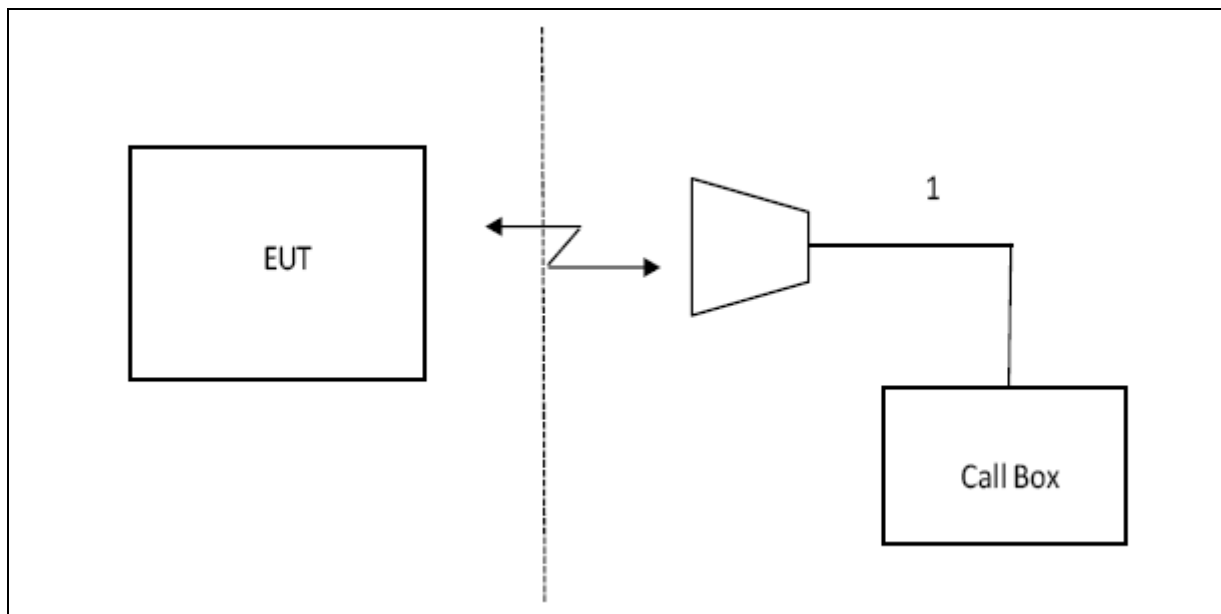
*Note: All the accessories have been used during the test.
the following “EUT” in setup diagram means EUT system.*

2.4 TEST SETUP

CONDUCTED SETUP DIAGRAM FOR TESTS



RADIATED SETUP DIAGRAM FOR TESTS



3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2019.10.07
TEST RECEIVER	R&S	ESCI	A0304218	2020.05.12
COMMUNICATION TESTER	R&S	CMU200	117858	2020.05.12
COMMUNICATION TESTER	R&S	CMW500	148500	2020.05.12
TEST RECEIVER	R&S	ESPI	101318	2020.05.12
LISN	SCHWARZBECK	NSLK8127	A0304233	2020.05.12
CLIMATE CHAMBER	ALBATROSS	--	--	2020.05.12
Loop Antenna	ARA	PLA-1030/B	1029	2020.05.12
Biological Antenna	TESEQ	CBL6111D	31216	2020.05.12
Horn Antenna	EM	EM-AH-10180	2011071402	2020.05.12
DC Power Source	N/A	PS-6005D	20170402923	2020.05.12

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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
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

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 66
- LTE Band 71

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §22.359

LIMITS

FCC: §22.359, §24.238,

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 that $43 + 10 \log (P)$ 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.

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 (704, 716, 824, 849, 1710 and 1755, 1850 and 1910MHz)

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

Set display line at -13 dBm

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

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

LTE Band 66

LTE Band 71

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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.

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 display line at -13 dBm

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

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

LTE Band 66

LTE Band 71

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

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

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

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

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

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

LTE Band 66

LTE Band 71

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	6/0	1850.7	-1.94	3.76	28.24	22.54	179.562	Horizontal	Pass	
		1880	-1.68	3.91	28.22	22.63	183.205	Horizontal	Pass	
		1909.3	-1.69	3.93	28.20	22.58	181.097	Horizontal	Pass	
3.0MHz Band QPSK	15/0	1851.5	-1.94	3.77	28.23	22.52	178.635	Horizontal	Pass	
		1880	-1.81	3.91	28.24	22.52	178.843	Horizontal	Pass	
		1908.5	-1.73	3.94	28.25	22.58	181.155	Horizontal	Pass	
5.0MHz Band QPSK	25/0	1852.5	-2.08	3.77	28.31	22.46	176.347	Horizontal	Pass	
		1880	-1.79	3.91	28.22	22.52	178.842	Horizontal	Pass	
		1907.5	-1.89	3.94	28.20	22.37	172.499	Horizontal	Pass	
10.0MHz Band QPSK	50/0	1855	-2.05	3.79	28.33	22.49	177.355	Horizontal	Pass	
		1880	-1.68	3.95	28.22	22.59	181.381	Horizontal	Pass	
		1905	-1.58	3.97	28.19	22.64	183.588	Horizontal	Pass	
15.0MHz Band QPSK	75/0	1857.5	-1.80	3.79	28.34	22.75	188.545	Horizontal	Pass	
		1880	-1.52	3.95	28.22	22.75	188.317	Horizontal	Pass	
		1902.5	-1.43	3.97	28.18	22.78	189.518	Horizontal	Pass	
20.0MHz Band QPSK	100/0	1860	-2.00	3.81	28.35	22.54	179.433	Horizontal	Pass	
		1880	-1.77	3.96	28.22	22.49	177.217	Horizontal	Pass	
		1900	-1.47	4.00	28.16	22.69	185.918	Horizontal	Pass	
1.4MHz Band QPSK	6/0	1850.7	-1.98	3.76	28.24	22.50	177.980	Vertical	Pass	
		1880	-1.78	3.91	28.22	22.53	179.044	Vertical	Pass	
		1909.3	-1.79	3.93	28.20	22.48	177.195	Vertical	Pass	
3.0MHz Band QPSK	15/0	1851.5	-1.80	3.77	28.23	22.66	184.520	Vertical	Pass	
		1880	-1.65	3.91	28.24	22.68	185.258	Vertical	Pass	
		1908.5	-1.58	3.94	28.25	22.73	187.651	Vertical	Pass	
5.0MHz Band QPSK	25/0	1852.5	-2.00	3.77	28.31	22.54	179.446	Vertical	Pass	
		1880	-1.70	3.91	28.22	22.61	182.577	Vertical	Pass	
		1907.5	-1.87	3.94	28.20	22.39	173.455	Vertical	Pass	
10.0MHz Band	50/0	1855	-1.94	3.79	28.33	22.60	182.151	Vertical	Pass	
		1880	-1.73	3.95	28.22	22.54	179.500	Vertical	Pass	

QPSK		1905	-1.76	3.97	28.19	22.46	176.115	Vertical	Pass
15.0MHz z Band QPSK	75/0	1857.5	-1.91	3.79	28.34	22.64	183.863	Vertical	Pass
		1880	-1.66	3.95	28.22	22.61	182.200	Vertical	Pass
		1902.5	-1.38	3.97	28.18	22.83	191.795	Vertical	Pass
20.0MHz z Band QPSK	100/0	1860	-1.92	3.81	28.35	22.62	182.903	Vertical	Pass
		1880	-1.82	3.96	28.22	22.44	175.212	Vertical	Pass
		1900	-1.30	4.00	28.16	22.86	193.409	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band 16 QAM	6/0	1850.7	-2.54	3.76	28.24	21.94	156.139	Horizontal	Pass
		1880	-2.31	3.91	28.22	22.00	158.577	Horizontal	Pass
		1909.3	-2.25	3.93	28.20	22.02	159.281	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-2.54	3.77	28.23	21.92	155.694	Horizontal	Pass
		1880	-2.50	3.91	28.24	21.83	152.573	Horizontal	Pass
		1908.5	-2.35	3.94	28.25	21.96	156.962	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-2.63	3.77	28.31	21.91	155.071	Horizontal	Pass
		1880	-2.23	3.91	28.22	22.08	161.267	Horizontal	Pass
		1907.5	-2.35	3.94	28.20	21.91	155.384	Horizontal	Pass
10.0MHz z Band 16 QAM	50/0	1855	-2.57	3.79	28.33	21.97	157.350	Horizontal	Pass
		1880	-2.25	3.95	28.22	22.02	159.375	Horizontal	Pass
		1905	-2.30	3.97	28.19	21.92	155.482	Horizontal	Pass
15.0MHz z Band 16 QAM	75/0	1857.5	-2.63	3.79	28.34	21.92	155.724	Horizontal	Pass
		1880	-2.36	3.95	28.22	21.91	155.285	Horizontal	Pass
		1902.5	-2.27	3.97	28.18	21.94	156.431	Horizontal	Pass
20.0MHz z Band 16 QAM	100/0	1860	-2.59	3.81	28.35	21.95	156.778	Horizontal	Pass
		1880	-2.22	3.96	28.22	22.04	159.925	Horizontal	Pass
		1900	-2.33	4.00	28.16	21.83	152.423	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-2.48	3.76	28.24	22.00	158.336	Vertical	Pass
		1880	-2.41	3.91	28.22	21.90	154.935	Vertical	Pass
		1909.3	-2.20	3.93	28.20	22.07	160.992	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-2.56	3.77	28.23	21.90	155.000	Vertical	Pass
		1880	-2.49	3.91	28.24	21.84	152.923	Vertical	Pass
		1908.5	-2.33	3.94	28.25	21.98	157.895	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-2.58	3.77	28.31	21.96	157.159	Vertical	Pass
		1880	-2.43	3.91	28.22	21.88	154.288	Vertical	Pass
		1907.5	-2.22	3.94	28.20	22.04	160.112	Vertical	Pass
10.0MHz z Band 16 QAM	50/0	1855	-2.74	3.79	28.33	21.80	151.249	Vertical	Pass
		1880	-2.43	3.95	28.22	21.84	152.792	Vertical	Pass
		1905	-2.52	3.97	28.19	21.70	147.754	Vertical	Pass
15.0MHz z Band	75/0	1857.5	-2.75	3.79	28.34	21.80	151.265	Vertical	Pass
		1880	-2.40	3.95	28.22	21.87	153.938	Vertical	Pass

16 QAM		1902.5	-2.35	3.97	28.18	21.86	153.602	Vertical	Pass
20.0MH	100/0	1860	-2.54	3.81	28.35	22.00	158.402	Vertical	Pass
z Band		1880	-2.17	3.96	28.22	22.09	161.964	Vertical	Pass
16 QAM		1900	-2.21	4.00	28.16	21.95	156.838	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	6/0	1710.7	-2.62	3.12	27.58	21.84	152.825	Horizontal	Pass	
		1732.5	-2.71	3.27	27.61	21.63	145.657	Horizontal	Pass	
		1754.3	-2.35	3.29	27.63	21.99	158.299	Horizontal	Pass	
3.0MHz Band QPSK	15/0	1711.5	-2.74	3.13	27.61	21.74	149.316	Horizontal	Pass	
		1732.5	-2.51	3.27	27.61	21.83	152.542	Horizontal	Pass	
		1753.5	-2.43	3.30	27.62	21.89	154.433	Horizontal	Pass	
5.0MHz Band QPSK	25/0	1712.5	-2.41	3.13	27.63	22.09	161.822	Horizontal	Pass	
		1732.5	-2.11	3.27	27.61	22.23	166.946	Horizontal	Pass	
		1752.5	-2.17	3.30	27.60	22.13	163.150	Horizontal	Pass	
10.0MHz Band QPSK	50/0	1715	-2.45	3.15	27.64	22.04	159.996	Horizontal	Pass	
		1732.5	-2.44	3.31	27.61	21.86	153.419	Horizontal	Pass	
		1750	-2.34	3.33	27.59	21.92	155.769	Horizontal	Pass	
15.0MHz Band QPSK	75/0	1717.5	-2.76	3.15	27.65	21.74	149.250	Horizontal	Pass	
		1732.5	-2.34	3.31	27.61	21.96	157.037	Horizontal	Pass	
		1747.5	-2.36	3.33	27.57	21.88	154.166	Horizontal	Pass	
20.0MHz Band QPSK	100/0	1720	-2.58	3.17	27.66	21.91	155.080	Horizontal	Pass	
		1732.5	-2.35	3.32	27.61	21.94	156.252	Horizontal	Pass	
		1745	-2.46	3.36	27.56	21.74	149.152	Horizontal	Pass	
1.4MHz Band QPSK	6/0	1710.7	-2.57	3.12	27.58	21.89	154.464	Vertical	Pass	
		1732.5	-2.51	3.27	27.61	21.83	152.310	Vertical	Pass	
		1754.3	-2.49	3.29	27.63	21.85	153.073	Vertical	Pass	
3.0MHz Band QPSK	15/0	1711.5	-2.55	3.13	27.61	21.93	155.913	Vertical	Pass	
		1732.5	-2.37	3.27	27.61	21.97	157.425	Vertical	Pass	
		1753.5	-2.53	3.30	27.62	21.79	151.126	Vertical	Pass	
5.0MHz Band QPSK	25/0	1712.5	-2.29	3.13	27.63	22.21	166.404	Vertical	Pass	
		1732.5	-2.20	3.27	27.61	22.14	163.528	Vertical	Pass	
		1752.5	-2.12	3.30	27.60	22.18	165.056	Vertical	Pass	
10.0MHz Band QPSK	50/0	1715	-2.56	3.15	27.64	21.93	155.809	Vertical	Pass	
		1732.5	-2.41	3.31	27.61	21.89	154.616	Vertical	Pass	
		1750	-2.34	3.33	27.59	21.92	155.677	Vertical	Pass	

15.0MH z Band QPSK	75/0	1717.5	-2.69	3.15	27.65	21.81	151.641	Vertical	Pass
		1732.5	-2.29	3.31	27.61	22.01	158.964	Vertical	Pass
		1747.5	-2.23	3.33	27.57	22.01	158.713	Vertical	Pass
20.0MH z Band QPSK	100/0	1720	-2.20	3.17	27.66	22.29	169.297	Vertical	Pass
		1732.5	-2.38	3.32	27.61	21.91	155.133	Vertical	Pass
		1745	-2.35	3.36	27.56	21.85	153.251	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average (dBm)	Average (mW)		
1.4MHz Band 16 QAM	6/0	1710.7	-3.15	3.12	27.58	21.31	135.201	Horizontal	Pass
		1732.5	-3.02	3.27	27.61	21.32	135.407	Horizontal	Pass
		1754.3	-3.14	3.29	27.63	21.20	131.963	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-3.94	3.13	27.61	20.54	113.346	Horizontal	Pass
		1732.5	-3.80	3.27	27.61	20.54	113.301	Horizontal	Pass
		1753.5	-3.71	3.30	27.62	20.61	114.956	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-4.08	3.13	27.63	20.42	110.209	Horizontal	Pass
		1732.5	-3.95	3.27	27.61	20.39	109.313	Horizontal	Pass
		1752.5	-2.96	3.30	27.60	21.34	136.101	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-3.31	3.15	27.64	21.18	131.238	Horizontal	Pass
		1732.5	-3.01	3.31	27.61	21.29	134.516	Horizontal	Pass
		1750	-3.22	3.33	27.59	21.04	126.997	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-3.15	3.15	27.65	21.35	136.328	Horizontal	Pass
		1732.5	-2.98	3.31	27.61	21.32	135.471	Horizontal	Pass
		1747.5	-2.88	3.33	27.57	21.36	136.639	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-3.40	3.17	27.66	21.09	128.659	Horizontal	Pass
		1732.5	-3.18	3.32	27.61	21.11	129.083	Horizontal	Pass
		1745	-3.01	3.36	27.56	21.19	131.607	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-3.20	3.12	27.58	21.26	133.803	Vertical	Pass
		1732.5	-3.07	3.27	27.61	21.27	133.860	Vertical	Pass
		1754.3	-3.08	3.29	27.63	21.26	133.617	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-3.79	3.13	27.61	20.69	117.114	Vertical	Pass
		1732.5	-3.74	3.27	27.61	20.60	114.860	Vertical	Pass
		1753.5	-3.67	3.30	27.62	20.65	116.193	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-4.00	3.13	27.63	20.50	112.234	Vertical	Pass
		1732.5	-3.78	3.27	27.61	20.56	113.865	Vertical	Pass
		1752.5	-3.90	3.30	27.60	20.40	109.751	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-3.19	3.15	27.64	21.30	134.828	Vertical	Pass
		1732.5	-2.98	3.31	27.61	21.32	135.446	Vertical	Pass
		1750	-3.17	3.33	27.59	21.09	128.446	Vertical	Pass
15.0MHz Band	75/0	1717.5	-3.34	3.15	27.65	21.16	130.613	Vertical	Pass
		1732.5	-3.19	3.31	27.61	21.11	129.174	Vertical	Pass

16 QAM		1747.5	-3.20	3.33	27.57	21.04	127.098	Vertical	Pass
20.0MH	100/0	1720	-3.26	3.17	27.66	21.23	132.883	Vertical	Pass
z Band		1732.5	-3.10	3.32	27.61	21.19	131.574	Vertical	Pass
16 QAM		1745	-2.80	3.36	27.56	21.40	138.142	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5											
Mode	RB/ RB SIZE	Frequ ncy	Result							Polarizati on Of Max. ERP	Conclu sion
			SG Level (dBm)	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. ERP Averag e (dBm)	Max. ERP Averag e (mW)			
1.4MHz Band QPSK	6/0	824.7	4.94	2.01	19.68	2.15	20.46	111.285	Horizontal	Pass	
		836.5	4.99	2.01	19.77	2.15	20.60	114.944	Horizontal	Pass	
		848.3	4.92	2.02	19.82	2.15	20.57	113.909	Horizontal	Pass	
3.0MHz Band QPSK	15/0	825.5	5.06	2.01	19.70	2.15	20.60	114.885	Horizontal	Pass	
		836.5	4.98	2.01	19.77	2.15	20.59	114.485	Horizontal	Pass	
		847.5	4.91	2.02	19.81	2.15	20.55	113.545	Horizontal	Pass	
5.0MHz Band QPSK	25/0	826.5	4.81	2.01	19.71	2.15	20.36	108.720	Horizontal	Pass	
		836.5	4.78	2.01	19.77	2.15	20.39	109.490	Horizontal	Pass	
		846.5	4.75	2.02	19.79	2.15	20.37	108.885	Horizontal	Pass	
10.0MH z Band QPSK	50/0	829	4.81	2.01	19.73	2.15	20.38	109.205	Horizontal	Pass	
		836.5	4.78	2.01	19.77	2.15	20.39	109.299	Horizontal	Pass	
		844	4.80	2.02	19.78	2.15	20.41	109.889	Horizontal	Pass	
1.4MHz Band QPSK	6/0	824.7	5.08	2.01	19.68	2.15	20.60	114.895	Vertical	Pass	
		836.5	4.98	2.01	19.77	2.15	20.59	114.600	Vertical	Pass	
		848.3	4.90	2.02	19.82	2.15	20.55	113.593	Vertical	Pass	
3.0MHz Band QPSK	15/0	825.5	5.04	2.01	19.70	2.15	20.58	114.245	Vertical	Pass	
		836.5	4.85	2.01	19.77	2.15	20.46	111.244	Vertical	Pass	
		847.5	4.88	2.02	19.81	2.15	20.52	112.620	Vertical	Pass	
5.0MHz Band QPSK	25/0	826.5	4.79	2.01	19.71	2.15	20.34	108.041	Vertical	Pass	
		836.5	4.68	2.01	19.77	2.15	20.29	106.953	Vertical	Pass	
		846.5	4.87	2.02	19.79	2.15	20.49	111.857	Vertical	Pass	
10.0MH z Band QPSK	50/0	829	4.96	2.01	19.73	2.15	20.53	112.937	Vertical	Pass	
		836.5	4.85	2.01	19.77	2.15	20.46	111.106	Vertical	Pass	
		844	5.14	2.02	19.78	2.15	20.75	118.913	Vertical	Pass	

Note:

SG Level= Signal generator output

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

Radiated Power (ERP) for Band 5											
Mode	RB/ RB SIZE	Freque ncy	Result							Polarizati on Of Max. ERP	Conclu sion
			SG Level (dBm)	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. ERP Averag e (dBm)	Max. ERP Averag e (mW)			
1.4MHz Band 16 QAM	6/0	824.7	4.82	2.01	19.68	2.15	20.34	108.188	Horizontal	Pass	
		836.5	4.90	2.01	19.77	2.15	20.51	112.386	Horizontal	Pass	
		848.3	4.88	2.02	19.82	2.15	20.53	112.926	Horizontal	Pass	
3.0MHz Band 16 QAM	15/0	825.5	5.14	2.01	19.70	2.15	20.68	116.833	Horizontal	Pass	
		836.5	4.96	2.01	19.77	2.15	20.57	114.065	Horizontal	Pass	
		847.5	4.86	2.02	19.81	2.15	20.50	112.163	Horizontal	Pass	
5.0MHz Band 16 QAM	25/0	826.5	4.95	2.01	19.71	2.15	20.50	112.187	Horizontal	Pass	
		836.5	4.99	2.01	19.77	2.15	20.60	114.743	Horizontal	Pass	
		846.5	4.89	2.02	19.79	2.15	20.51	112.349	Horizontal	Pass	
10.0MH z Band 16 QAM	50/0	829	5.12	2.01	19.73	2.15	20.69	117.241	Horizontal	Pass	
		836.5	5.00	2.01	19.77	2.15	20.61	115.173	Horizontal	Pass	
		844	5.03	2.02	19.78	2.15	20.64	115.794	Horizontal	Pass	
1.4MHz Band 16 QAM	6/0	824.7	4.96	2.01	19.68	2.15	20.48	111.743	Vertical	Pass	
		836.5	4.85	2.01	19.77	2.15	20.46	111.299	Vertical	Pass	
		848.3	4.90	2.02	19.82	2.15	20.55	113.500	Vertical	Pass	
3.0MHz Band 16 QAM	15/0	825.5	4.98	2.01	19.70	2.15	20.52	112.849	Vertical	Pass	
		836.5	4.97	2.01	19.77	2.15	20.58	114.193	Vertical	Pass	
		847.5	4.77	2.02	19.81	2.15	20.41	109.944	Vertical	Pass	
5.0MHz Band 16 QAM	25/0	826.5	5.04	2.01	19.71	2.15	20.59	114.485	Vertical	Pass	
		836.5	4.99	2.01	19.77	2.15	20.60	114.855	Vertical	Pass	
		846.5	4.92	2.02	19.79	2.15	20.54	113.325	Vertical	Pass	
10.0MH z Band 16 QAM	50/0	829	5.16	2.01	19.73	2.15	20.73	118.179	Vertical	Pass	
		836.5	5.11	2.01	19.77	2.15	20.72	117.938	Vertical	Pass	
		844	5.04	2.02	19.78	2.15	20.65	116.089	Vertical	Pass	

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7										
Mode	RB/ RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band QPSK	25/0	2502.5	-1.74	4.54	27.75	21.47	140.281	Horizontal	Pass	
		2535	-1.62	4.69	27.72	21.41	138.357	Horizontal	Pass	
		2567.5	-1.71	4.71	27.71	21.29	134.586	Horizontal	Pass	
5.0MHz Band 16 QAM	25/0	2502.5	-2.88	4.54	27.75	20.33	107.895	Horizontal	Pass	
		2535	-2.69	4.69	27.72	20.34	108.143	Horizontal	Pass	
		2567.5	-2.65	4.71	27.71	20.35	108.393	Horizontal	Pass	
10.0MHz z Band QPSK	50/0	2505	-1.73	4.55	27.76	21.48	140.605	Horizontal	Pass	
		2535	-1.42	4.69	27.72	21.61	144.877	Horizontal	Pass	
		2565	-1.55	4.72	27.70	21.43	138.995	Horizontal	Pass	
10.0MHz z Band 16 QAM	50/0	2505	-2.66	4.55	27.76	20.55	113.501	Horizontal	Pass	
		2535	-2.44	4.69	27.72	20.59	114.551	Horizontal	Pass	
		2565	-2.53	4.72	27.70	20.45	110.917	Horizontal	Pass	
15.0MHz z Band QPSK	75/0	2507.5	-1.56	4.55	27.77	21.26	133.660	Horizontal	Pass	
		2535	-1.45	4.69	27.72	21.58	143.880	Horizontal	Pass	
		2562.5	-1.63	4.72	27.69	21.34	136.144	Horizontal	Pass	
15.0MHz z Band 16 QAM	75/0	2507.5	-2.77	4.55	27.77	20.45	110.917	Horizontal	Pass	
		2535	-2.64	4.69	27.72	20.39	109.396	Horizontal	Pass	
		2562.5	-2.67	4.72	27.69	20.30	107.152	Horizontal	Pass	
20.0MHz z Band QPSK	100/0	2510	-2.00	4.57	27.78	21.21	132.130	Horizontal	Pass	
		2535	-1.89	4.73	27.72	21.10	128.825	Horizontal	Pass	
		2560	-1.67	4.75	27.68	21.66	146.555	Horizontal	Pass	
20.0MHz z Band 16 QAM	100/0	2510	-1.50	4.57	27.78	21.71	148.252	Horizontal	Pass	
		2535	-2.71	4.73	27.72	20.28	106.660	Horizontal	Pass	
		2560	-2.83	4.75	27.68	20.10	102.329	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 7										
Mode	RB/ RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band QPSK	25/0	2502.5	-1.86	4.54	27.75	21.35	136.49	Vertical	Pass	
		2535	-1.53	4.69	27.72	21.50	141.37	Vertical	Pass	
		2567.5	-1.51	4.71	27.71	21.49	140.92	Vertical	Pass	
5.0MHz Band 16 QAM	25/0	2502.5	-2.74	4.54	27.75	20.47	111.33	Vertical	Pass	
		2535	-1.89	4.69	27.72	21.14	130.02	Vertical	Pass	
		2567.5	-2.55	4.71	27.71	20.45	110.95	Vertical	Pass	
10.0MHz z Band QPSK	50/0	2505	-1.69	4.55	27.76	21.52	141.88	Vertical	Pass	
		2535	-1.59	4.69	27.72	21.44	139.25	Vertical	Pass	
		2565	-1.68	4.72	27.70	21.30	134.86	Vertical	Pass	
10.0MHz z Band 16 QAM	50/0	2505	-2.92	4.55	27.76	20.29	106.82	Vertical	Pass	
		2535	-2.46	4.69	27.72	20.57	114.09	Vertical	Pass	
		2565	-2.68	4.72	27.70	20.30	107.15	Vertical	Pass	
15.0MHz z Band QPSK	75/0	2507.5	-2.04	4.55	27.77	21.18	131.10	Vertical	Pass	
		2535	-1.50	4.69	27.72	21.53	142.24	Vertical	Pass	
		2562.5	-2.05	4.72	27.69	20.92	123.58	Vertical	Pass	
15.0MHz z Band 16 QAM	75/0	2507.5	-2.61	4.55	27.77	20.61	115.02	Vertical	Pass	
		2535	-3.08	4.69	27.72	19.95	98.94	Vertical	Pass	
		2562.5	-2.28	4.72	27.69	20.69	117.25	Vertical	Pass	
20.0MHz z Band QPSK	100/0	2510	-1.99	4.57	27.78	21.22	132.57	Vertical	Pass	
		2535	-1.66	4.73	27.72	21.33	135.98	Vertical	Pass	
		2560	-1.45	4.75	27.68	21.48	140.60	Vertical	Pass	
20.0MHz z Band 16 QAM	100/0	2510	-2.17	4.57	27.78	21.04	127.06	Vertical	Pass	
		2535	-1.28	4.73	27.72	21.71	148.25	Vertical	Pass	
		2560	-1.61	4.75	27.68	21.32	135.52	Vertical	Pass	

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 66

Radiated Power (EIRP) for Band 66										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	6/0	1710.7	-1.94	3.76	28.24	22.54	179.562	Horizontal	Pass	
		1745	-1.68	3.91	28.22	22.63	183.205	Horizontal	Pass	
		1779.3	-1.69	3.93	28.20	22.58	181.097	Horizontal	Pass	
3.0MHz Band QPSK	15/0	1711.5	-1.94	3.77	28.23	22.52	178.635	Horizontal	Pass	
		1745	-1.81	3.91	28.24	22.52	178.843	Horizontal	Pass	
		1778.5	-1.73	3.94	28.25	22.58	181.155	Horizontal	Pass	
5.0MHz Band QPSK	25/0	1712.5	-2.08	3.77	28.31	22.46	176.347	Horizontal	Pass	
		1745	-1.79	3.91	28.22	22.52	178.842	Horizontal	Pass	
		1777.5	-1.89	3.94	28.20	22.37	172.499	Horizontal	Pass	
10.0MHz Band QPSK	50/0	1715	-2.05	3.79	28.33	22.49	177.355	Horizontal	Pass	
		1745	-1.68	3.95	28.22	22.59	181.381	Horizontal	Pass	
		1775	-1.58	3.97	28.19	22.64	183.588	Horizontal	Pass	
15.0MHz Band QPSK	75/0	1717.5	-1.80	3.79	28.34	22.75	188.545	Horizontal	Pass	
		1745	-1.52	3.95	28.22	22.75	188.317	Horizontal	Pass	
		1772.5	-1.43	3.97	28.18	22.78	189.518	Horizontal	Pass	
20.0MHz Band QPSK	100/0	1720	-2.00	3.81	28.35	22.54	179.433	Horizontal	Pass	
		1745	-1.77	3.96	28.22	22.49	177.217	Horizontal	Pass	
		1770	-1.47	4.00	28.16	22.69	185.918	Horizontal	Pass	
1.4MHz Band QPSK	6/0	1710.7	-1.98	3.76	28.24	22.50	177.980	Vertical	Pass	
		1745	-1.78	3.91	28.22	22.53	179.044	Vertical	Pass	
		1779.3	-1.79	3.93	28.20	22.48	177.195	Vertical	Pass	
3.0MHz Band QPSK	15/0	1711.5	-1.80	3.77	28.23	22.66	184.520	Vertical	Pass	
		1745	-1.65	3.91	28.24	22.68	185.258	Vertical	Pass	
		1778.5	-1.58	3.94	28.25	22.73	187.651	Vertical	Pass	
5.0MHz Band QPSK	25/0	1712.5	-2.00	3.77	28.31	22.54	179.446	Vertical	Pass	
		1745	-1.70	3.91	28.22	22.61	182.577	Vertical	Pass	
		1777.5	-1.87	3.94	28.20	22.39	173.455	Vertical	Pass	
10.0MHz Band QPSK	50/0	1715	-1.94	3.79	28.33	22.60	182.151	Vertical	Pass	
		1745	-1.73	3.95	28.22	22.54	179.500	Vertical	Pass	
		1775	-1.76	3.97	28.19	22.46	176.115	Vertical	Pass	

15.0MH z Band QPSK	75/0	1717.5	-1.91	3.79	28.34	22.64	183.863	Vertical	Pass
		1745	-1.66	3.95	28.22	22.61	182.200	Vertical	Pass
		1772.5	-1.38	3.97	28.18	22.83	191.795	Vertical	Pass
20.0MH z Band QPSK	100/0	1720	-1.92	3.81	28.35	22.62	182.903	Vertical	Pass
		1745	-1.82	3.96	28.22	22.44	175.212	Vertical	Pass
		1770	-1.30	4.00	28.16	22.86	193.409	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average (dBm)	Average (mW)		
1.4MHz Band 16 QAM	6/0	1710.7	-2.54	3.76	28.24	21.94	156.139	Horizontal	Pass
		1745	-2.31	3.91	28.22	22.00	158.577	Horizontal	Pass
		1779.3	-2.25	3.93	28.20	22.02	159.281	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.54	3.77	28.23	21.92	155.694	Horizontal	Pass
		1745	-2.50	3.91	28.24	21.83	152.573	Horizontal	Pass
		1778.5	-2.35	3.94	28.25	21.96	156.962	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-2.63	3.77	28.31	21.91	155.071	Horizontal	Pass
		1745	-2.23	3.91	28.22	22.08	161.267	Horizontal	Pass
		1777.5	-2.35	3.94	28.20	21.91	155.384	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-2.57	3.79	28.33	21.97	157.350	Horizontal	Pass
		1745	-2.25	3.95	28.22	22.02	159.375	Horizontal	Pass
		1775	-2.30	3.97	28.19	21.92	155.482	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-2.63	3.79	28.34	21.92	155.724	Horizontal	Pass
		1745	-2.36	3.95	28.22	21.91	155.285	Horizontal	Pass
		1772.5	-2.27	3.97	28.18	21.94	156.431	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-2.59	3.81	28.35	21.95	156.778	Horizontal	Pass
		1745	-2.22	3.96	28.22	22.04	159.925	Horizontal	Pass
		1770	-2.33	4.00	28.16	21.83	152.423	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-2.48	3.76	28.24	22.00	158.336	Vertical	Pass
		1745	-2.41	3.91	28.22	21.90	154.935	Vertical	Pass
		1779.3	-2.20	3.93	28.20	22.07	160.992	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.56	3.77	28.23	21.90	155.000	Vertical	Pass
		1745	-2.49	3.91	28.24	21.84	152.923	Vertical	Pass
		1778.5	-2.33	3.94	28.25	21.98	157.895	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-2.58	3.77	28.31	21.96	157.159	Vertical	Pass
		1745	-2.43	3.91	28.22	21.88	154.288	Vertical	Pass
		1777.5	-2.22	3.94	28.20	22.04	160.112	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-2.74	3.79	28.33	21.80	151.249	Vertical	Pass
		1745	-2.43	3.95	28.22	21.84	152.792	Vertical	Pass
		1775	-2.52	3.97	28.19	21.70	147.754	Vertical	Pass
15.0MHz Band	75/0	1717.5	-2.75	3.79	28.34	21.80	151.265	Vertical	Pass
		1745	-2.40	3.95	28.22	21.87	153.938	Vertical	Pass

16 QAM		1772.5	-2.35	3.97	28.18	21.86	153.602	Vertical	Pass
20.0MH	100/0	1720	-2.54	3.81	28.35	22.00	158.402	Vertical	Pass
z Band		1745	-2.17	3.96	28.22	22.09	161.964	Vertical	Pass
16 QAM		1770	-2.21	4.00	28.16	21.95	156.838	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.7 LTE BAND 71

Radiated Power (EIRP) for Band 71										
Mode	RB/ RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
			5.0MHz Band QPSK	25/0	665.5	-1.23	4.54	27.75		
		680.5	-1.11	4.69	27.72	21.92	155.597	Horizontal	Pass	
		695.5	-1.20	4.71	27.71	21.80	151.356	Horizontal	Pass	
5.0MHz Band 16 QAM	25/0	665.5	-2.37	4.54	27.75	20.84	121.339	Horizontal	Pass	
		680.5	-2.18	4.69	27.72	20.85	121.619	Horizontal	Pass	
		695.5	-2.14	4.71	27.71	20.86	121.899	Horizontal	Pass	
10.0MHz z Band QPSK	50/0	668	-1.22	4.55	27.76	21.99	158.125	Horizontal	Pass	
		680.5	-0.91	4.69	27.72	22.12	162.930	Horizontal	Pass	
		693	-1.04	4.72	27.70	21.94	156.315	Horizontal	Pass	
10.0MHz z Band 16 QAM	50/0	668	-2.15	4.55	27.76	21.06	127.644	Horizontal	Pass	
		680.5	-1.93	4.69	27.72	21.10	128.825	Horizontal	Pass	
		693	-2.02	4.72	27.70	20.96	124.738	Horizontal	Pass	
15.0MHz z Band QPSK	75/0	670.5	-1.05	4.55	27.77	21.77	150.314	Horizontal	Pass	
		680.5	-0.94	4.69	27.72	22.09	161.808	Horizontal	Pass	
		690.5	-1.12	4.72	27.69	21.85	153.109	Horizontal	Pass	
15.0MHz z Band 16 QAM	75/0	670.5	-2.26	4.55	27.77	20.96	124.738	Horizontal	Pass	
		680.5	-2.13	4.69	27.72	20.90	123.027	Horizontal	Pass	
		690.5	-2.16	4.72	27.69	20.81	120.504	Horizontal	Pass	
20.0MHz z Band QPSK	100/0	673	-1.49	4.57	27.78	21.72	148.594	Horizontal	Pass	
		683	-1.38	4.73	27.72	21.61	144.877	Horizontal	Pass	
		688	-1.16	4.75	27.68	22.17	164.816	Horizontal	Pass	
20.0MHz z Band 16 QAM	100/0	673	-0.99	4.57	27.78	22.22	166.725	Horizontal	Pass	
		683	-2.20	4.73	27.72	20.79	119.950	Horizontal	Pass	
		688	-2.32	4.75	27.68	20.61	115.080	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 71										
Mode	RB/ RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
			5.0MHz Band QPSK	25/0	665.5	-1.67	4.54	27.75		
		680.5	-1.34	4.69	27.72	21.69	147.70	Vertical	Pass	
		695.5	-1.32	4.71	27.71	21.68	147.22	Vertical	Pass	
5.0MHz Band 16 QAM	25/0	665.5	-2.55	4.54	27.75	20.66	116.31	Vertical	Pass	
		680.5	-1.70	4.69	27.72	21.33	135.83	Vertical	Pass	
		695.5	-2.36	4.71	27.71	20.64	115.92	Vertical	Pass	
10.0MHz z Band QPSK	50/0	668	-1.50	4.55	27.76	21.71	148.23	Vertical	Pass	
		680.5	-1.40	4.69	27.72	21.63	145.47	Vertical	Pass	
		693	-1.49	4.72	27.70	21.49	140.89	Vertical	Pass	
10.0MHz z Band 16 QAM	50/0	668	-2.73	4.55	27.76	20.48	111.60	Vertical	Pass	
		680.5	-2.27	4.69	27.72	20.76	119.19	Vertical	Pass	
		693	-2.49	4.72	27.70	20.49	111.94	Vertical	Pass	
15.0MHz z Band QPSK	75/0	670.5	-1.85	4.55	27.77	21.37	136.96	Vertical	Pass	
		680.5	-1.31	4.69	27.72	21.72	148.60	Vertical	Pass	
		690.5	-1.86	4.72	27.69	21.11	129.10	Vertical	Pass	
15.0MHz z Band 16 QAM	75/0	670.5	-2.42	4.55	27.77	20.80	120.16	Vertical	Pass	
		680.5	-2.89	4.69	27.72	20.14	103.36	Vertical	Pass	
		690.5	-2.09	4.72	27.69	20.88	122.49	Vertical	Pass	
20.0MHz z Band QPSK	100/0	673	-1.80	4.57	27.78	21.41	138.50	Vertical	Pass	
		683	-1.47	4.73	27.72	21.52	142.06	Vertical	Pass	
		688	-1.26	4.75	27.68	21.67	146.89	Vertical	Pass	
20.0MHz z Band 16 QAM	100/0	673	-1.98	4.57	27.78	21.23	132.74	Vertical	Pass	
		683	-1.09	4.73	27.72	21.90	154.88	Vertical	Pass	
		688	-1.42	4.75	27.68	21.51	141.58	Vertical	Pass	

Note:

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

§22.917 (e) and §24.238 (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 $43 + 10 \text{ Log}_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \text{ Log}_{10}(p)$, dB at the channel edges and $55 + 10 \text{ Log}_{10}(p)$ 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
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 66
- LTE Band 71

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-57.41	4.04	33.51	-27.94	-13	-14.94	Horizontal
3701.4	-58.14	4.04	33.51	-28.67	-13	-15.67	Vertical
5552.1	-55.78	5.24	35.84	-25.18	-13	-12.18	Vertical
5552.1	-56.11	5.24	35.84	-25.51	-13	-12.51	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-57.11	4.04	33.56	-27.59	-13	-14.59	Horizontal
3760	-55.41	4.04	33.56	-25.89	-13	-12.89	Vertical
5640	-56.54	5.24	35.91	-25.87	-13	-12.87	Vertical
5640	-55.78	5.24	35.91	-25.11	-13	-12.11	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-57.24	4.04	34.00	-27.28	-13	-14.28	Horizontal
3818.6	-56.42	4.04	34.00	-26.46	-13	-13.46	Vertical
5727.9	-55.94	5.24	36.04	-25.14	-13	-12.14	Vertical
5727.9	-56.50	5.24	36.04	-25.70	-13	-12.70	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	-54.86	4.07	33.54	-25.39	-13	-12.39	Horizontal
3720	-54.75	4.07	33.54	-25.28	-13	-12.28	Vertical
5580	-56.45	5.28	35.86	-25.87	-13	-12.87	Vertical
5580	-57.50	5.28	35.86	-26.92	-13	-13.92	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-55.78	4.04	33.56	-26.26	-13	-13.26	Horizontal
3760	-56.21	4.04	33.56	-26.69	-13	-13.69	Vertical
5640	-57.41	5.24	35.91	-26.74	-13	-13.74	Vertical
5640	-56.11	5.24	35.91	-25.44	-13	-12.44	Horizontal
Test Results for High Channel 1900MHz							
3800	-56.21	4.04	34.00	-26.25	-13	-13.25	Horizontal
3800	-55.78	4.04	34.00	-25.82	-13	-12.82	Vertical
5700	-56.21	5.24	36.04	-25.41	-13	-12.41	Vertical
5700	-57.42	5.24	36.04	-26.62	-13	-13.62	Horizontal

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

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

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

Below 1G:

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
177.47	-60.68	1.81	19.20	-43.29	-13	-30.29	Horizontal
296.45	-61.61	1.82	19.31	-44.12	-13	-31.12	Vertical
193	-61.29	1.82	19.22	-43.89	-13	-30.89	Vertical
297.25	-60.64	1.81	19.24	-43.21	-13	-30.21	Horizontal
Test Results for Mid Channel 1880MHz							
120.53	-62.92	1.81	18.11	-46.62	-13	-33.62	Horizontal
177.47	-60.93	1.91	19.20	-43.64	-13	-30.64	Vertical
496.7	-61.54	1.91	19.34	-44.11	-13	-31.11	Vertical
617.42	-61.75	1.91	19.21	-44.45	-13	-31.45	Horizontal
Test Results for High Channel 1909.3MHz							
174.77	-59.29	1.91	19.20	-42.00	-13	-29.00	Horizontal
300.68	-58.64	1.92	19.33	-41.23	-13	-28.23	Vertical
461.78	-58.84	1.91	19.22	-41.53	-13	-28.53	Vertical
659.06	-58.85	1.91	19.21	-41.55	-13	-28.55	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.

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	-52.44	4.02	29.80	-26.66	-13	-13.66	Horizontal
3421.4	-53.11	4.02	29.80	-27.33	-13	-14.33	Vertical
5132.1	-56.21	5.24	35.84	-25.61	-13	-12.61	Vertical
5132.1	-57.53	5.24	35.84	-26.93	-13	-13.93	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-50.15	4.03	30.00	-24.18	-13	-11.18	Horizontal
3465	-50.87	4.03	30.00	-24.90	-13	-11.90	Vertical
5197.5	-55.21	5.25	35.86	-24.60	-13	-11.60	Vertical
5197.5	-55.50	5.25	35.86	-24.89	-13	-11.89	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-53.21	4.05	30.01	-27.25	-13	-14.25	Horizontal
3508.6	-54.97	4.05	30.01	-29.01	-13	-16.01	Vertical
5262.9	-55.32	5.26	35.86	-24.72	-13	-11.72	Vertical
5262.9	-54.73	5.26	35.86	-24.13	-13	-11.13	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	-55.11	4.02	29.80	-29.33	-13	-16.33	Horizontal
3440	-53.45	4.02	29.80	-27.67	-13	-14.67	Vertical
5160	-56.20	5.24	35.84	-25.60	-13	-12.60	Vertical
5160	-57.41	5.24	35.84	-26.81	-13	-13.81	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-52.42	4.03	30.00	-26.45	-13	-13.45	Horizontal
3465	-53.64	4.03	30.00	-27.67	-13	-14.67	Vertical
5197.5	-55.75	5.25	35.86	-25.14	-13	-12.14	Vertical
5197.5	-56.24	5.25	35.86	-25.63	-13	-12.63	Horizontal
Test Results for High Channel 1745MHz							
3490	-52.42	2.91	27.68	-27.65	-13	-14.65	Horizontal
3490	-55.78	2.91	27.68	-31.01	-13	-18.01	Vertical
5235	-56.42	5.26	35.86	-25.82	-13	-12.82	Vertical
5235	-57.11	5.26	35.86	-26.51	-13	-13.51	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.

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	-55.28	2.78	27.50	-30.56	-13	-17.56	Horizontal
1649.4	-49.82	2.78	27.50	-25.10	-13	-12.10	Vertical
2474.1	-52.78	2.90	27.80	-27.88	-13	-14.88	Vertical
2474.1	-53.94	2.90	27.80	-29.04	-13	-16.04	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-55.46	2.80	27.48	-30.78	-13	-17.78	Horizontal
1673	-53.56	2.80	27.48	-28.88	-13	-15.88	Vertical
2509.5	-56.12	2.91	27.70	-31.33	-13	-18.33	Vertical
2509.5	-52.60	2.91	27.70	-27.81	-13	-14.81	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-54.09	2.82	27.43	-29.48	-13	-16.48	Horizontal
1696.6	-53.50	2.82	27.43	-28.89	-13	-15.89	Vertical
2544.9	-49.69	2.92	27.74	-24.87	-13	-11.87	Vertical
2544.9	-55.78	2.92	27.74	-30.96	-13	-17.96	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658	-53.43	2.78	27.50	-28.71	-13	-15.71	Horizontal
1658	-55.98	2.78	27.50	-31.26	-13	-18.26	Vertical
2487	-56.48	2.90	27.80	-31.58	-13	-18.58	Vertical
2487	-49.46	2.90	27.80	-24.56	-13	-11.56	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-52.81	2.80	27.48	-28.13	-13	-15.13	Horizontal
1673	-55.61	2.80	27.48	-30.93	-13	-17.93	Vertical
2509.5	-56.43	2.91	27.70	-31.64	-13	-18.64	Vertical
2509.5	-55.82	2.91	27.70	-31.03	-13	-18.03	Horizontal
Test Results for High Channel 844MHz							
1688	-54.85	2.82	27.43	-30.24	-13	-17.24	Horizontal
1688	-55.65	2.82	27.43	-31.04	-13	-18.04	Vertical
2532	-54.46	2.92	27.74	-29.64	-13	-16.64	Vertical
2532	-56.17	2.92	27.74	-31.35	-13	-18.35	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.

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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005	-81.93	5.23	35.81	-51.35	-25.00	-26.35	Horizontal
5005	-81.22	5.23	35.81	-50.64	-25.00	-25.64	Vertical
7507.5	-80.23	5.67	36.85	-49.05	-25.00	-24.05	Vertical
7507.5	-79.82	5.67	36.85	-48.64	-25.00	-23.64	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-78.62	5.23	35.82	-48.03	-25.00	-23.03	Horizontal
5070	-79.71	5.23	35.82	-49.12	-25.00	-24.12	Vertical
7605	-80.26	5.67	36.85	-49.08	-25.00	-24.08	Vertical
7605	-80.74	5.67	36.85	-49.56	-25.00	-24.56	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-82.83	5.24	35.83	-52.24	-25.00	-27.24	Horizontal
5135	-80.39	5.24	35.83	-49.80	-25.00	-24.80	Vertical
7702.5	-81.22	5.68	36.87	-50.03	-25.00	-25.03	Vertical
7702.5	-81.56	5.68	36.87	-50.37	-25.00	-25.37	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020	-79.59	5.23	35.82	-49.00	-25.00	-24.00	Horizontal
5020	-79.02	5.23	35.82	-48.43	-25.00	-23.43	Vertical
7530	-79.98	5.67	36.86	-48.79	-25.00	-23.79	Vertical
7530	-80.01	5.67	36.86	-48.82	-25.00	-23.82	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-81.46	5.23	35.82	-50.87	-25.00	-25.87	Horizontal
5070	-80.79	5.23	35.82	-50.20	-25.00	-25.20	Vertical
7605	-80.59	5.67	36.85	-49.41	-25.00	-24.41	Vertical
7605	-82.13	5.67	36.85	-50.95	-25.00	-25.95	Horizontal
Test Results for High Channel 2560MHz							
5120	-79.31	5.24	35.83	-48.72	-25.00	-23.72	Horizontal
5120	-79.26	5.24	35.83	-48.67	-25.00	-23.67	Vertical
7680	-79.58	5.70	36.88	-48.40	-25.00	-23.40	Vertical
7680	-78.98	5.70	36.88	-47.80	-25.00	-22.80	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.

9.5 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-48.62	2.60	27.20	-24.02	-13	-11.02	Horizontal
3421.4	-49.99	2.60	27.20	-25.39	-13	-12.39	Vertical
5132.1	-49.33	2.85	27.54	-24.64	-13	-11.64	Vertical
5132.1	-49.37	2.85	27.54	-24.68	-13	-11.68	Horizontal
Test Results For Mid Channel 1745MHz							
3490	-51.51	2.61	27.28	-26.84	-13	-13.84	Horizontal
3490	-49.11	2.61	27.28	-24.44	-13	-11.44	Vertical
5235	-50.30	2.87	27.59	-25.58	-13	-12.58	Vertical
5235	-51.73	2.87	27.59	-27.01	-13	-14.01	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-51.80	2.63	27.28	-27.15	-13	-14.15	Horizontal
3558.6	-56.22	2.63	27.28	-31.57	-13	-18.57	Vertical
5337.9	-53.01	2.88	27.60	-28.29	-13	-15.29	Vertical
5337.9	-50.41	2.88	27.60	-25.69	-13	-12.69	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-48.87	2.61	27.26	-24.22	-13	-11.22	Horizontal
3440	-52.03	2.61	27.26	-27.38	-13	-14.38	Vertical
5160	-50.93	2.87	27.58	-26.22	-13	-13.22	Vertical
5160	-51.74	2.87	27.58	-27.03	-13	-14.03	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-50.19	2.61	27.28	-25.52	-13	-12.52	Horizontal
3490	-54.13	2.61	27.28	-29.46	-13	-16.46	Vertical
5235	-52.69	2.87	27.59	-27.97	-13	-14.97	Vertical
5235	-52.19	2.87	27.59	-27.47	-13	-14.47	Horizontal
Test Results for High Channel 1770MHz							
3540	-54.05	2.62	27.28	-29.39	-13	-16.39	Horizontal
3540	-49.23	2.62	27.28	-24.57	-13	-11.57	Vertical
5310	-52.33	2.87	27.60	-27.60	-13	-14.60	Vertical
5310	-51.94	2.87	27.60	-27.21	-13	-14.21	Horizontal

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

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

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

9.6 LTE BAND 71

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

Test Results for Low Channel 665.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1331	-51.20	2.61	27.28	-26.53	-13	-13.53	Horizontal
1331	-52.11	2.61	27.28	-27.44	-13	-14.44	Vertical
1996.5	-51.56	2.87	27.59	-26.84	-13	-13.84	Vertical
1996.5	-51.22	2.87	27.59	-26.50	-13	-13.50	Horizontal
Test Results For Mid Channel 680.5MHz							
1361	-50.67	2.62	27.30	-25.99	-13	-12.99	Horizontal
1361	-52.53	2.62	27.30	-27.85	-13	-14.85	Vertical
2041.5	-53.25	2.87	27.62	-28.50	-13	-15.50	Vertical
2041.5	-55.90	2.87	27.62	-31.15	-13	-18.15	Horizontal
Test Results for High Channel 695.5MHz							
1391	-52.83	2.66	27.28	-28.21	-13	-15.21	Horizontal
1391	-54.28	2.66	27.28	-29.66	-13	-16.66	Vertical
2086.5	-51.40	2.88	27.60	-26.68	-13	-13.68	Vertical
2086.5	-50.10	2.88	27.60	-25.38	-13	-12.38	Horizontal

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

Test Results for Low Channel 673MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1346	-53.73	2.62	27.30	-29.05	-13	-16.05	Horizontal
1346	-51.59	2.62	27.30	-26.91	-13	-13.91	Vertical
2019	-52.76	2.87	27.62	-28.01	-13	-15.01	Vertical
2019	-55.85	2.87	27.62	-31.10	-13	-18.10	Horizontal
Test Results for Mid Channel 683MHz							
1366	-53.29	2.62	27.30	-28.61	-13	-15.61	Horizontal
1366	-50.80	2.62	27.30	-26.12	-13	-13.12	Vertical
2049	-55.16	2.87	27.62	-30.41	-13	-17.41	Vertical
2049	-50.74	2.87	27.62	-25.99	-13	-12.99	Horizontal
Test Results for High Channel 688MHz							
1376	-51.78	2.62	27.30	-27.10	-13	-14.10	Horizontal
1376	-52.39	2.62	27.30	-27.71	-13	-14.71	Vertical
2064	-51.34	2.87	27.62	-26.59	-13	-13.59	Vertical
2064	-54.29	2.87	27.62	-29.54	-13	-16.54	Horizontal

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

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

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

10. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = -30° to $+50^{\circ}$ C

Voltage = low voltage, DC 3.3V, Normal, DC 3.85V and High voltage, DC 4.4V.

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 $+50^{\circ}$ C is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

LTE Band 66

LTE Band 71

RESULTS

See the following pages.

10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-14.1	-0.007500	2.5
3.85	1880	-14.2	-0.007553	2.5
4.4	1880	-13.7	-0.007287	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-14.1	-0.007500	2.5
Extreme (50C)	1880	-12	-0.006383	2.5
Extreme (40C)	1880	-12.1	-0.006436	2.5
Extreme (30C)	1880	-14.2	-0.007553	2.5
Extreme (10C)	1880	-14.7	-0.007819	2.5
Extreme (0C)	1880	-14.6	-0.007766	2.5
Extreme (-10C)	1880	-16.3	-0.008670	2.5
Extreme (-20C)	1880	-15.5	-0.008245	2.5
Extreme (-30C)	1880	-16.2	-0.008617	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-20.0	-0.010638	2.5
3.85	1880	-16.4	-0.008723	2.5
4.4	1880	-19.6	-0.010426	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-20.3	-0.010798	2.5
Extreme (50C)	1880	-21.5	-0.011436	2.5
Extreme (40C)	1880	-21.1	-0.011223	2.5
Extreme (30C)	1880	-19.6	-0.010426	2.5
Extreme (10C)	1880	-20.2	-0.010745	2.5
Extreme (0C)	1880	-19.1	-0.010160	2.5
Extreme (-10C)	1880	-18.5	-0.009840	2.5
Extreme (-20C)	1880	-18.3	-0.009734	2.5
Extreme (-30C)	1880	-17.6	-0.009362	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	-15.9	-0.009177	2.5
3.85	1732.5	-15.9	-0.009177	2.5
4.4	1732.5	-16	-0.009235	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-12.8	-0.007388	2.5
Extreme (50C)	1732.5	-14.5	-0.008369	2.5
Extreme (40C)	1732.5	-14.2	-0.008196	2.5
Extreme (30C)	1732.5	-14.2	-0.008196	2.5
Extreme (10C)	1732.5	-12.5	-0.007215	2.5
Extreme (0C)	1732.5	-11.7	-0.006753	2.5
Extreme (-10C)	1732.5	-12	-0.006926	2.5
Extreme (-20C)	1732.5	-16.2	-0.009351	2.5
Extreme (-30C)	1732.5	-14.6	-0.008427	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	-13.6	-0.007850	2.5
3.85	1732.5	-14.3	-0.008254	2.5
4.4	1732.5	-14.1	-0.008139	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-14.2	-0.008196	2.5
Extreme (50C)	1732.5	-11.2	-0.006465	2.5
Extreme (40C)	1732.5	-11.7	-0.006753	2.5
Extreme (30C)	1732.5	-13	-0.007504	2.5
Extreme (10C)	1732.5	-13.6	-0.007850	2.5
Extreme (0C)	1732.5	-13.3	-0.007677	2.5
Extreme (-10C)	1732.5	-11.5	-0.006638	2.5
Extreme (-20C)	1732.5	-13.1	-0.007561	2.5
Extreme (-30C)	1732.5	-13	-0.007504	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-11.9	-0.014226	2.5
3.85	836.5	-11.5	-0.013748	2.5
4.4	836.5	-12.1	-0.014465	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-11.6	-0.013867	2.5
Extreme (50C)	836.5	-12.6	-0.015063	2.5
Extreme (40C)	836.5	-12.1	-0.014465	2.5
Extreme (30C)	836.5	-11.9	-0.014226	2.5
Extreme (10C)	836.5	-11.8	-0.014106	2.5
Extreme (0C)	836.5	-10.7	-0.012791	2.5
Extreme (-10C)	836.5	-12.3	-0.014704	2.5
Extreme (-20C)	836.5	-15.1	-0.018051	2.5
Extreme (-30C)	836.5	-16.3	-0.019486	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-12.3	-0.014704	2.5
3.85	836.5	-12.5	-0.014943	2.5
4.4	836.5	-12.9	-0.015421	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-12.8	-0.015302	2.5
Extreme (50C)	836.5	-13.9	-0.016617	2.5
Extreme (40C)	836.5	-13.9	-0.016617	2.5
Extreme (30C)	836.5	-13.1	-0.015660	2.5
Extreme (10C)	836.5	-12.3	-0.014704	2.5
Extreme (0C)	836.5	-11.3	-0.013509	2.5
Extreme (-10C)	836.5	-13.1	-0.015660	2.5
Extreme (-20C)	836.5	-12.9	-0.015421	2.5
Extreme (-30C)	836.5	-11.8	-0.014106	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

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	-23.0	-0.009073	2.5
3.85	2535	-23.4	-0.009231	2.5
4.4	2535	-23.8	-0.009389	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-23.7	-0.009349	2.5
Extreme (50C)	2535	-26.5	-0.010454	2.5
Extreme (40C)	2535	-28.6	-0.011282	2.5
Extreme (30C)	2535	-23.6	-0.009310	2.5
Extreme (10C)	2535	-23.2	-0.009152	2.5
Extreme (0C)	2535	-22.3	-0.008797	2.5
Extreme (-10C)	2535	-25.5	-0.010059	2.5
Extreme (-20C)	2535	-24	-0.009467	2.5
Extreme (-30C)	2535	-27.1	-0.010690	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	-24.9	-0.009822	2.5
3.85	2535	-25.3	-0.009980	2.5
4.4	2535	-25.3	-0.009980	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-24.6	-0.009704	2.5
Extreme (50C)	2535	-26.1	-0.010296	2.5
Extreme (40C)	2535	-27.6	-0.010888	2.5
Extreme (30C)	2535	-24.7	-0.009744	2.5
Extreme (10C)	2535	-24.8	-0.009783	2.5
Extreme (0C)	2535	-25.5	-0.010059	2.5
Extreme (-10C)	2535	-26.3	-0.010375	2.5
Extreme (-20C)	2535	-25.9	-0.010217	2.5
Extreme (-30C)	2535	-26.6	-0.010493	2.5

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

10.5 LTE BAND 66

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1745	-16.6	-0.009513	2.5
3.85	1745	-16.7	-0.009570	2.5
4.4	1745	-16.2	-0.009284	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1745	-16.6	-0.009513	2.5
Extreme (50C)	1745	-14.5	-0.008309	2.5
Extreme (40C)	1745	-14.6	-0.008367	2.5
Extreme (30C)	1745	-16.7	-0.009570	2.5
Extreme (10C)	1745	-17.2	-0.009857	2.5
Extreme (0C)	1745	-17.1	-0.009799	2.5
Extreme (-10C)	1745	-18.8	-0.010774	2.5
Extreme (-20C)	1745	-18	-0.010315	2.5
Extreme (-30C)	1745	-18.7	-0.010716	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 16QAM, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1745	-22.5	-0.012894	2.5
3.85	1745	-18.9	-0.010831	2.5
4.4	1745	-22.1	-0.012665	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1745	-22.8	-0.013066	2.5
Extreme (50C)	1745	-24	-0.013754	2.5
Extreme (40C)	1745	-23.6	-0.013524	2.5
Extreme (30C)	1745	-22.1	-0.012665	2.5
Extreme (10C)	1745	-22.7	-0.013009	2.5
Extreme (0C)	1745	-21.6	-0.012378	2.5
Extreme (-10C)	1745	-21	-0.012034	2.5
Extreme (-20C)	1745	-20.8	-0.011920	2.5
Extreme (-30C)	1745	-20.1	-0.011519	2.5

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

10.6 LTE BAND 71

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 71 QPSK, (CH 133322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	683	-16.6	-0.024305	2.5
3.85	683	-16.7	-0.024451	2.5
4.4	683	-16.2	-0.023719	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 71 QPSK, (CH 133322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	683	-16.6	-0.024305	2.5
Extreme (50C)	683	-14.5	-0.021230	2.5
Extreme (40C)	683	-14.6	-0.021376	2.5
Extreme (30C)	683	-16.7	-0.024451	2.5
Extreme (10C)	683	-17.2	-0.025183	2.5
Extreme (0C)	683	-17.1	-0.025037	2.5
Extreme (-10C)	683	-18.8	-0.027526	2.5
Extreme (-20C)	683	-18	-0.026354	2.5
Extreme (-30C)	683	-18.7	-0.027379	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 71 16QAM, (CH 133322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	683	-22.5	-0.032943	2.5
3.85	683	-18.9	-0.027672	2.5
4.4	683	-22.1	-0.032357	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 71 QPSK, (CH 133322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	683	-22.8	-0.033382	2.5
Extreme (50C)	683	-24	-0.035139	2.5
Extreme (40C)	683	-23.6	-0.034553	2.5
Extreme (30C)	683	-22.1	-0.032357	2.5
Extreme (10C)	683	-22.7	-0.033236	2.5
Extreme (0C)	683	-21.6	-0.031625	2.5
Extreme (-10C)	683	-21	-0.030747	2.5
Extreme (-20C)	683	-20.8	-0.030454	2.5
Extreme (-30C)	683	-20.1	-0.029429	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.

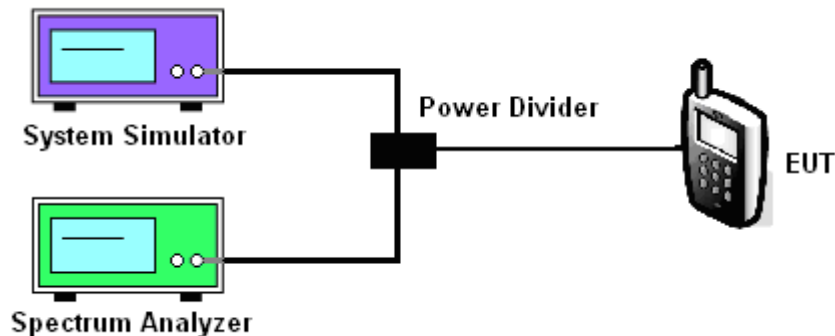
11.2 Measuring Instruments

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 GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS 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
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 66
- LTE Band 71

Test data reference attachment.

----END OF REPORT----