

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

## FCC ID: 2AOWK-3107

**Product:** Mobile Phone

**Trade Mark:** ulefone

**Model No.:** GQ3107

**Family Model:** Armor 21, Armor 21 Pro, Armor 21 Lite, Armor 21 Plus,  
Armor 21S, Armor 21P, Armor 21T, Armor 21E

**Report No.:** STR230314008006E

**Issue Date:** May 15, 2023

### Prepared for

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### Prepared by

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Shenzhen Gotron Electronic CO.,LTD.  
**Address**..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,  
Shenzhen City, Guangdong Province China  
**Manufacturer's Name**..... : Shenzhen Gotron Electronic CO.,LTD.  
**Address**..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,  
Shenzhen City, Guangdong Province China  
**Product name**..... : Mobile Phone  
**Model and/or type reference** .. : GQ3107  
**Trade Mark**..... : ulefone  
**Family Model**..... : Armor 21, Armor 21 Pro, Armor 21 Lite, Armor 21 Plus, Armor 21S,  
Armor 21P, Armor 21T, Armor 21E  
**Test Sample Number**..... T230314002R001  
**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..... Mar 29, 2023 ~ May 12, 2023

Date of Issue ..... May 15, 2023

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

Testing Engineer :



(Allen Liu)

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	ulefone
Model Name	GQ3107
Family Model	Armor 21, Armor 21 Pro, Armor 21 Lite, Armor 21 Plus, Armor 21S, Armor 21P, Armor 21T, Armor 21E
Model Difference	All models are the same circuit and RF module, except the model name.
FCC ID:	2AOWK-3107
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12,17,41,66
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 41 Uplink: 2555MHz-2655MHz, (see note 2) LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	1 dBi
Adapter	Model: UF82PD3301 Input: 100-240V~50/60Hz 0.8A Output: 5.0V---3.0A 15.0W or 9.0V---3.0A 27.0W or 11.0V---3.0A 33.0W or 12.0V---2.5A 30.0W or 15.0V---2.0A 30.0W or 20.0V---1.5A 30.0W PPS:3.3V-11.0V---3.0A 33.0W Max
Battery	DC 3.85V, 9600mAh
Power supply	DC 3.85V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.4V to DC 4.4V (Nominal DC 3.85V) (Note 1)
HW Version	F1-02
SW Version	Armor 21_TF1_EEA_V10
** Note1: The High Voltage DC 4.4V and Low Voltage DC 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

Note2:channel list:

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	40265	2557.5
	10	40290	2560
	15	40315	2562.5
	20	40340	2565
Mid Range	5/10/15/20	40740	2605
High Range	5	41215	2652.5
	10	41190	2650
	15	41165	2647.5
	20	41140	2645

**1.2 RELATED SUBMITTAL(S) / GRANT (S)**

This submittal(s) (test report) is intended for **FCC ID: 2AOWK-3107** 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 2/4/5/7/12/17/41/66

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

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



## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT CONFIGURATION

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

### 2.2 EUT EXERCISE

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

### 2.3 CONFIGURATION OF EUT SYSTEM

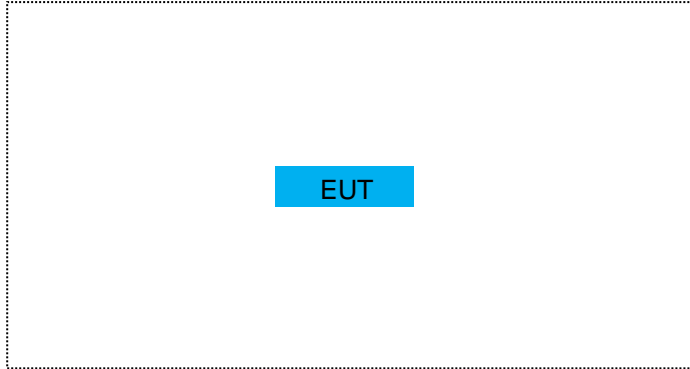
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	GQ3107	FCC ID: 2AOWK-3107	EUT

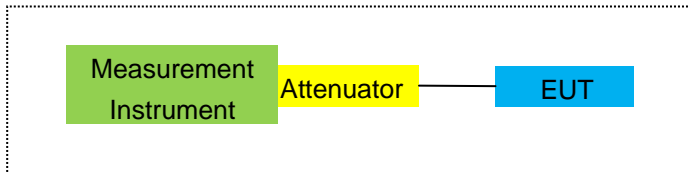
*Note: All the accessories have been used during the test.  
the following "EUT" in setup diagram means EUT system.*

## 2.4 TEST SETUP

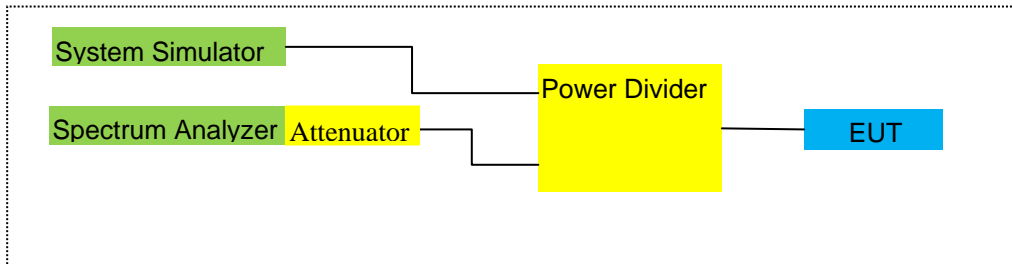
For Radiated Test Cases



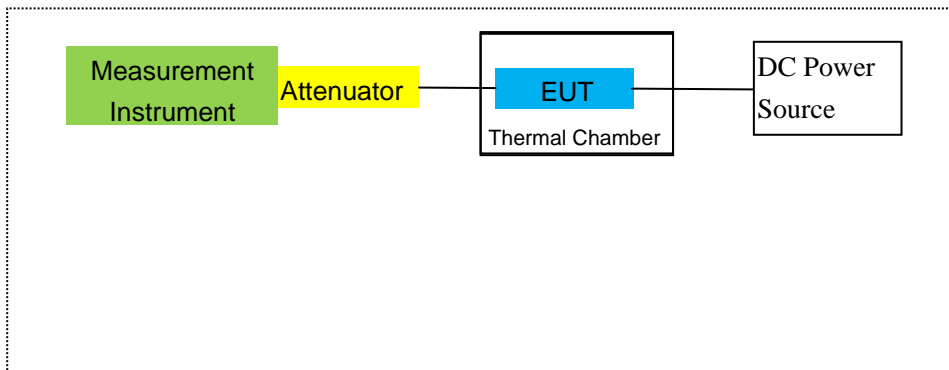
For Conducted Output Power



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	2022.06.17	2023.06.16	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.27	2024.03.26	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-1018 0	2011071402	2023.03.27	2024.03.26	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.06.17	2023.06.16	1 year
7	Amplifier	EM	EM-30180	060538	2022.06.17	2023.06.16	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2023.03.27	2024.03.26	1 year
9	Power Meter	R&S	NRVS	100696	2022.06.17	2023.06.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.0 5	2023.03.27	2024.03.26	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	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2023.03.27	2024.03.26	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
24	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	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	2023.03.27	2024.03.26	1 year
27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.05.11 2023.05.06	2023.05.10 2026.05.05	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	$\leq 1$
			5	>6	$\leq 1$
			10	>6	$\leq 1$
			15	>8	$\leq 1$
			20	>10	$\leq 1$
NS_04	6.6.2.2.2	41	5	>6	$\leq 1$
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	$\geq 50$	$\leq 1$
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	$\leq 3$
NS_09	6.6.3.3.4	21	10, 15	> 40	$\leq 1$
				> 55	$\leq 2$
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 <sup>1</sup>	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

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

Test data reference attachment.

## 5. OCCUPIED BANDWIDTH

### RULE PART(S)

FCC: §2.1049

### LIMITS

For reporting purposes only

### TEST PROCEDURE

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

### MODES TESTED

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

### RESULTS

**PASS**

Test data reference attachment.

## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

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

FCC: §22.359

### LIMITS

FCC: §22.917, §24.238, §27.53

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

(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less 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.

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



**TEST PROCEDURE**

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

**MODES TESTED**

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

**RESULTS**

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

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

### LIMITS

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

### TEST PROCEDURE

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

For each out of band emissions measurement:

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

### **MODES TESTED**

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

### 7.1 MEASUREMENT METHOD

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

Test data reference attachment.

## 8. RADIATED MEASUREMENT

### 8.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

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

#### LIMITS:

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

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

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

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

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

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

#### MODES TESTED

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

#### RESULTS

Pass

## 8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result					Polarization Of	Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	1#Mid	1850.7	-2.79	3.76	28.24	21.69	147.571	Horizontal	Pass	
		1880	-2.60	3.91	28.22	21.71	148.252	Horizontal	Pass	
		1909.3	-2.51	3.93	28.20	21.76	149.968	Horizontal	Pass	
3.0MHz Band QPSK	1#Mid	1851.5	-2.85	3.77	28.23	21.61	144.877	Horizontal	Pass	
		1880	-2.70	3.91	28.24	21.63	145.546	Horizontal	Pass	
		1908.5	-2.57	3.94	28.25	21.74	149.279	Horizontal	Pass	
5.0MHz Band QPSK	1#Mid	1852.5	-2.74	3.77	28.31	21.80	151.356	Horizontal	Pass	
		1880	-2.36	3.91	28.22	21.95	156.675	Horizontal	Pass	
		1907.5	-2.29	3.94	28.20	21.97	157.398	Horizontal	Pass	
10.0MHz Band QPSK	1#Mid	1855	-2.60	3.79	28.33	21.94	156.315	Horizontal	Pass	
		1880	-2.30	3.95	28.22	21.97	157.398	Horizontal	Pass	
		1905	-2.19	3.97	28.19	22.03	159.588	Horizontal	Pass	
15.0MHz Band QPSK	1#Mid	1857.5	-2.56	3.79	28.34	21.99	158.125	Horizontal	Pass	
		1880	-2.35	3.95	28.22	21.92	155.597	Horizontal	Pass	
		1902.5	-2.21	3.97	28.18	22.00	158.489	Horizontal	Pass	
20.0MHz Band QPSK	1#Mid	1860	-2.55	3.81	28.35	21.99	158.125	Horizontal	Pass	
		1880	-2.22	3.96	28.22	<b>22.04</b>	159.956	Horizontal	Pass	
		1900	-2.16	4.00	28.16	22.00	158.489	Horizontal	Pass	
1.4MHz Band QPSK	1#Mid	1850.7	-3.30	3.76	28.24	21.18	131.220	Vertical	Pass	
		1880	-3.72	3.91	28.22	20.59	114.551	Vertical	Pass	
		1909.3	-3.05	3.93	28.20	21.22	132.434	Vertical	Pass	
3.0MHz Band QPSK	1#Mid	1851.5	-4.00	3.77	28.23	20.46	111.173	Vertical	Pass	
		1880	-3.85	3.91	28.24	20.48	111.686	Vertical	Pass	
		1908.5	-3.74	3.94	28.25	20.57	114.025	Vertical	Pass	
5.0MHz Band QPSK	1#Mid	1852.5	-3.94	3.77	28.31	20.60	114.815	Vertical	Pass	
		1880	-3.80	3.91	28.22	20.51	112.460	Vertical	Pass	
		1907.5	-3.08	3.94	28.20	21.18	131.220	Vertical	Pass	
10.0MHz Band QPSK	1#Mid	1855	-3.22	3.79	28.33	21.32	135.519	Vertical	Pass	
		1880	-3.39	3.95	28.22	20.88	122.462	Vertical	Pass	
		1905	-3.15	3.97	28.19	21.07	127.938	Vertical	Pass	
15.0MHz	1#Mid	1857.5	-3.17	3.79	28.34	21.38	137.404	Vertical	Pass	

Band QPSK		1880	-3.35	3.95	28.22	20.92	123.595	Vertical	Pass
		1902.5	-3.17	3.97	28.18	21.04	127.057	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.80	3.81	28.35	20.74	118.577	Vertical	Pass
		1880	-3.17	3.96	28.22	21.09	128.529	Vertical	Pass
		1900	-3.49	4.00	28.16	20.67	116.681	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-3.91	3.76	28.24	20.57	114.025	Horizontal	Pass
		1880	-3.38	3.91	28.22	20.93	123.880	Horizontal	Pass
		1909.3	-3.31	3.93	28.20	20.96	124.738	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.41	3.77	28.23	21.05	127.350	Horizontal	Pass
		1880	-3.49	3.91	28.24	20.84	121.339	Horizontal	Pass
		1908.5	-3.70	3.94	28.25	20.61	115.080	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.35	3.77	28.31	21.19	131.522	Horizontal	Pass
		1880	-3.26	3.91	28.22	21.05	127.350	Horizontal	Pass
		1907.5	-2.94	3.94	28.20	21.32	135.519	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-3.40	3.79	28.33	21.14	130.017	Horizontal	Pass
		1880	-3.39	3.95	28.22	20.88	122.462	Horizontal	Pass
		1905	-2.86	3.97	28.19	21.36	136.773	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-3.38	3.79	28.34	21.17	130.918	Horizontal	Pass
		1880	-3.17	3.95	28.22	21.10	128.825	Horizontal	Pass
		1902.5	-3.13	3.97	28.18	21.08	128.233	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-3.27	3.81	28.35	21.27	133.968	Horizontal	Pass
		1880	-2.97	3.96	28.22	21.29	134.586	Horizontal	Pass
		1900	-2.79	4.00	28.16	<b>21.37</b>	137.088	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.84	3.76	28.24	19.64	92.045	Vertical	Pass
		1880	-4.09	3.91	28.22	20.22	105.196	Vertical	Pass
		1909.3	-4.73	3.93	28.20	19.54	89.950	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.17	3.77	28.23	20.29	106.905	Vertical	Pass
		1880	-4.60	3.91	28.24	19.73	93.972	Vertical	Pass
		1908.5	-4.48	3.94	28.25	19.83	96.161	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.81	3.77	28.31	19.73	93.972	Vertical	Pass
		1880	-4.40	3.91	28.22	19.91	97.949	Vertical	Pass
		1907.5	-4.38	3.94	28.20	19.88	97.275	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-5.01	3.79	28.33	19.53	89.743	Vertical	Pass
		1880	-4.67	3.95	28.22	19.60	91.201	Vertical	Pass
		1905	-3.99	3.97	28.19	20.23	105.439	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.84	3.79	28.34	19.71	93.541	Vertical	Pass
		1880	-4.07	3.95	28.22	20.20	104.713	Vertical	Pass
		1902.5	-4.74	3.97	28.18	19.47	88.512	Vertical	Pass

20.0MHz		1860	-4.79	3.81	28.35	19.75	94.406	Vertical	Pass
Band 16	1/#Mid	1880	-4.05	3.96	28.22	20.21	104.954	Vertical	Pass
QAM		1900	-4.25	4.00	28.16	19.91	97.949	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					Polarization Of	Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)	Average	Average			
						(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	1710.7	-2.70	3.12	27.58	21.76	149.968	Horizontal	Pass	
		1732.5	-2.69	3.27	27.61	21.65	146.218	Horizontal	Pass	
		1754.3	-2.67	3.29	27.63	21.67	146.893	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	-2.87	3.13	27.61	21.61	144.877	Horizontal	Pass	
		1732.5	-2.79	3.27	27.61	21.55	142.889	Horizontal	Pass	
		1753.5	-2.71	3.30	27.62	21.61	144.877	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	-2.64	3.13	27.63	21.86	153.462	Horizontal	Pass	
		1732.5	-2.54	3.27	27.61	21.80	151.356	Horizontal	Pass	
		1752.5	-2.42	3.30	27.60	21.88	154.170	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	1715	-2.58	3.15	27.64	21.91	155.239	Horizontal	Pass	
		1732.5	-2.35	3.31	27.61	21.95	156.675	Horizontal	Pass	
		1750	-2.37	3.33	27.59	21.89	154.525	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	1717.5	-2.59	3.15	27.65	21.91	155.239	Horizontal	Pass	
		1732.5	-2.43	3.31	27.61	21.87	153.815	Horizontal	Pass	
		1747.5	-2.37	3.33	27.57	21.87	153.815	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	1720	-2.53	3.17	27.66	<b>21.96</b>	157.036	Horizontal	Pass	
		1732.5	-2.36	3.32	27.61	21.93	155.955	Horizontal	Pass	
		1745	-2.30	3.36	27.56	21.90	154.882	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1710.7	-3.37	3.12	27.58	21.09	128.529	Vertical	Pass	
		1732.5	-2.99	3.27	27.61	21.35	136.458	Vertical	Pass	
		1754.3	-3.17	3.29	27.63	21.17	130.918	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	-3.68	3.13	27.61	20.80	120.226	Vertical	Pass	
		1732.5	-3.43	3.27	27.61	20.91	123.310	Vertical	Pass	
		1753.5	-3.56	3.30	27.62	20.76	119.124	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	-3.68	3.13	27.63	20.82	120.781	Vertical	Pass	
		1732.5	-3.18	3.27	27.61	21.16	130.617	Vertical	Pass	
		1752.5	-3.72	3.30	27.60	20.58	114.288	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	1715	-3.49	3.15	27.64	21.00	125.893	Vertical	Pass	
		1732.5	-3.09	3.31	27.61	21.21	132.130	Vertical	Pass	
		1750	-2.99	3.33	27.59	21.27	133.968	Vertical	Pass	



15.0MHz Band QPSK	1/#Mid	1717.5	-3.81	3.15	27.65	20.69	117.220	Vertical	Pass
		1732.5	-3.77	3.31	27.61	20.53	112.980	Vertical	Pass
		1747.5	-3.27	3.33	27.57	20.97	125.026	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.91	3.17	27.66	20.58	114.288	Vertical	Pass
		1732.5	-3.47	3.32	27.61	20.82	120.781	Vertical	Pass
		1745	-3.11	3.36	27.56	21.09	128.529	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
			(dBm)	(dB)	(dBm)	(mW)			
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.51	3.12	27.58	20.95	124.451	Horizontal	Pass
		1732.5	-3.36	3.27	27.61	20.98	125.314	Horizontal	Pass
		1754.3	-3.36	3.29	27.63	20.98	125.314	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.45	3.13	27.61	21.03	126.765	Horizontal	Pass
		1732.5	-3.58	3.27	27.61	20.76	119.124	Horizontal	Pass
		1753.5	-3.80	3.30	27.62	20.52	112.720	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.28	3.13	27.63	21.22	132.434	Horizontal	Pass
		1732.5	-3.24	3.27	27.61	21.10	128.825	Horizontal	Pass
		1752.5	-2.93	3.30	27.60	21.37	137.088	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.35	3.15	27.64	21.14	130.017	Horizontal	Pass
		1732.5	-3.54	3.31	27.61	20.76	119.124	Horizontal	Pass
		1750	-2.92	3.33	27.59	21.34	136.144	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.15	3.15	27.65	21.35	136.458	Horizontal	Pass
		1732.5	-3.21	3.31	27.61	21.09	128.529	Horizontal	Pass
		1747.5	-3.23	3.33	27.57	21.01	126.183	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.10	3.17	27.66	<b>21.39</b>	137.721	Horizontal	Pass
		1732.5	-3.11	3.32	27.61	21.18	131.220	Horizontal	Pass
		1745	-2.92	3.36	27.56	21.28	134.276	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.62	3.12	27.58	19.84	96.383	Vertical	Pass
		1732.5	-4.15	3.27	27.61	20.19	104.472	Vertical	Pass
		1754.3	-4.93	3.29	27.63	19.41	87.297	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.23	3.13	27.61	20.25	105.925	Vertical	Pass
		1732.5	-4.42	3.27	27.61	19.92	98.175	Vertical	Pass
		1753.5	-4.88	3.30	27.62	19.44	87.902	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.62	3.13	27.63	19.88	97.275	Vertical	Pass
		1732.5	-4.08	3.27	27.61	20.26	106.170	Vertical	Pass
		1752.5	-4.68	3.30	27.60	19.62	91.622	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.25	3.15	27.64	20.24	105.682	Vertical	Pass
		1732.5	-4.23	3.31	27.61	20.07	101.625	Vertical	Pass
		1750	-4.11	3.33	27.59	20.15	103.514	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.74	3.15	27.65	19.76	94.624	Vertical	Pass
		1732.5	-4.71	3.31	27.61	19.59	90.991	Vertical	Pass
		1747.5	-4.50	3.33	27.57	19.74	94.189	Vertical	Pass

20.0MHz		1720	-4.34	3.17	27.66	20.15	103.514	Vertical	Pass
Band 16	1/#Mid	1732.5	-4.52	3.32	27.61	19.77	94.842	Vertical	Pass
QAM		1745	-4.39	3.36	27.56	19.81	95.719	Vertical	Pass

**Note:**

SG Level= Signal generator output

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

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

### 8.4 LTE BAND 5

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	3/#Mid	824.7	6.60	2.01	19.68	2.15	22.12	162.930	Horizontal	Pass	
		836.5	6.48	2.01	19.77	2.15	22.09	161.808	Horizontal	Pass	
		848.3	6.28	2.02	19.82	2.15	21.93	155.955	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	6.37	2.01	19.70	2.15	21.91	155.239	Horizontal	Pass	
		836.5	6.27	2.01	19.77	2.15	21.88	154.170	Horizontal	Pass	
		847.5	6.14	2.02	19.81	2.15	21.78	150.661	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	6.65	2.01	19.71	2.15	22.20	165.959	Horizontal	Pass	
		836.5	6.53	2.01	19.77	2.15	22.14	163.682	Horizontal	Pass	
		846.5	6.37	2.02	19.79	2.15	21.99	158.125	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	829	6.67	2.01	19.73	2.15	<b>22.24</b>	167.494	Horizontal	Pass	
		836.5	6.62	2.01	19.77	2.15	22.23	167.109	Horizontal	Pass	
		844	6.52	2.02	19.78	2.15	22.13	163.305	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	824.7	5.76	2.01	19.68	2.15	21.28	134.276	Vertical	Pass	
		836.5	5.01	2.01	19.77	2.15	20.62	115.345	Vertical	Pass	
		848.3	5.15	2.02	19.82	2.15	20.80	120.226	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	5.33	2.01	19.70	2.15	20.87	122.180	Vertical	Pass	
		836.5	5.40	2.01	19.77	2.15	21.01	126.183	Vertical	Pass	
		847.5	5.55	2.02	19.81	2.15	21.19	131.522	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	5.22	2.01	19.71	2.15	20.77	119.399	Vertical	Pass	
		836.5	5.49	2.01	19.77	2.15	21.10	128.825	Vertical	Pass	
		846.5	4.86	2.02	19.79	2.15	20.48	111.686	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	829	5.58	2.01	19.73	2.15	21.15	130.317	Vertical	Pass	
		836.5	4.94	2.01	19.77	2.15	20.55	113.501	Vertical	Pass	
		844	4.96	2.02	19.78	2.15	20.57	114.025	Vertical	Pass	

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band 16 QAM	3/#Mid	824.7	5.75	2.01	19.68	2.15	21.27	133.968	Horizontal	Pass	
		836.5	5.68	2.01	19.77	2.15	21.29	134.586	Horizontal	Pass	
		848.3	5.52	2.02	19.82	2.15	21.17	130.918	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	5.83	2.01	19.70	2.15	21.37	137.088	Horizontal	Pass	
		836.5	5.54	2.01	19.77	2.15	21.15	130.317	Horizontal	Pass	
		847.5	5.02	2.02	19.81	2.15	20.66	116.413	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	6.15	2.01	19.71	2.15	21.70	147.911	Horizontal	Pass	
		836.5	5.92	2.01	19.77	2.15	21.53	142.233	Horizontal	Pass	
		846.5	5.67	2.02	19.79	2.15	21.29	134.586	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	6.15	2.01	19.73	2.15	<b>21.72</b>	148.594	Horizontal	Pass	
		836.5	5.87	2.01	19.77	2.15	21.48	140.605	Horizontal	Pass	
		844	5.41	2.02	19.78	2.15	21.02	126.474	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	824.7	4.28	2.01	19.68	2.15	19.80	95.499	Vertical	Pass	
		836.5	4.28	2.01	19.77	2.15	19.89	97.499	Vertical	Pass	
		848.3	4.73	2.02	19.82	2.15	20.38	109.144	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	5.39	2.01	19.70	2.15	20.93	123.880	Vertical	Pass	
		836.5	5.10	2.01	19.77	2.15	20.71	117.761	Vertical	Pass	
		847.5	5.18	2.02	19.81	2.15	20.82	120.781	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	5.59	2.01	19.71	2.15	21.14	130.017	Vertical	Pass	
		836.5	4.03	2.01	19.77	2.15	19.64	92.045	Vertical	Pass	
		846.5	4.75	2.02	19.79	2.15	20.37	108.893	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	4.66	2.01	19.73	2.15	20.23	105.439	Vertical	Pass	
		836.5	4.93	2.01	19.77	2.15	20.54	113.240	Vertical	Pass	
		844	5.03	2.02	19.78	2.15	20.64	115.878	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					Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP		
			(dBm)	(dBm)	(dB)	Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-0.98	4.54	27.75	22.23	167.109	Horizontal	Pass
		2535	-0.81	4.69	27.72	22.22	166.725	Horizontal	Pass
		2567.5	-0.74	4.71	27.71	22.26	168.267	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.91	4.55	27.76	22.30	169.824	Horizontal	Pass
		2535	-0.72	4.69	27.72	22.31	170.216	Horizontal	Pass
		2565	-0.64	4.72	27.70	22.34	171.396	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.92	4.55	27.77	22.30	169.824	Horizontal	Pass
		2535	-0.78	4.69	27.72	22.25	167.880	Horizontal	Pass
		2562.5	-0.68	4.72	27.69	22.29	169.434	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.86	4.57	27.78	<b>22.35</b>	171.791	Horizontal	Pass
		2535	-0.68	4.73	27.72	22.31	170.216	Horizontal	Pass
		2560	-0.64	4.75	27.68	22.29	169.434	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-2.69	4.54	27.75	20.52	112.720	Vertical	Pass
		2535	-2.09	4.69	27.72	20.94	124.165	Vertical	Pass
		2567.5	-1.93	4.71	27.71	21.07	127.938	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.10	4.55	27.76	21.11	129.122	Vertical	Pass
		2535	-2.51	4.69	27.72	20.52	112.720	Vertical	Pass
		2565	-2.01	4.72	27.70	20.97	125.026	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.68	4.55	27.77	20.54	113.240	Vertical	Pass
		2535	-2.39	4.69	27.72	20.64	115.878	Vertical	Pass
		2562.5	-1.70	4.72	27.69	21.27	133.968	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.74	4.57	27.78	20.47	111.429	Vertical	Pass
		2535	-2.32	4.73	27.72	20.67	116.681	Vertical	Pass
		2560	-1.66	4.75	27.68	21.27	133.968	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.67	4.54	27.75	21.54	142.561	Horizontal	Pass
		2535	-1.36	4.69	27.72	21.67	146.893	Horizontal	Pass
		2567.5	-1.44	4.71	27.71	21.56	143.219	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.56	4.55	27.76	21.65	146.218	Horizontal	Pass
		2535	-1.57	4.69	27.72	21.46	139.959	Horizontal	Pass
		2565	-1.84	4.72	27.70	21.14	130.017	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.74	4.55	27.77	21.48	140.605	Horizontal	Pass
		2535	-1.71	4.69	27.72	21.32	135.519	Horizontal	Pass
		2562.5	-1.32	4.72	27.69	21.65	146.218	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.62	4.57	27.78	21.59	144.212	Horizontal	Pass
		2535	-1.29	4.73	27.72	<b>21.70</b>	147.911	Horizontal	Pass
		2560	-1.39	4.75	27.68	21.54	142.561	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.88	4.54	27.75	21.33	135.831	Vertical	Pass
		2535	-2.63	4.69	27.72	20.40	109.648	Vertical	Pass
		2567.5	-2.10	4.71	27.71	20.90	123.027	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.95	4.55	27.76	20.26	106.170	Vertical	Pass
		2535	-1.81	4.69	27.72	21.22	132.434	Vertical	Pass
		2565	-2.10	4.72	27.70	20.88	122.462	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.30	4.55	27.77	19.92	98.175	Vertical	Pass
		2535	-2.81	4.69	27.72	20.22	105.196	Vertical	Pass
		2562.5	-1.69	4.72	27.69	21.28	134.276	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.83	4.57	27.78	20.38	109.144	Vertical	Pass
		2535	-1.75	4.73	27.72	21.24	133.045	Vertical	Pass
		2560	-2.97	4.75	27.68	19.96	99.083	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 Factor	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
						(dB)	(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	699.7	6.97	1.91	19.21	2.15	22.12	162.930	Vertical	Pass
		707.5	6.89	1.91	19.26	2.15	22.09	161.808	Vertical	Pass
		715.3	6.67	1.93	19.34	2.15	21.93	155.955	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	6.76	1.91	19.21	2.15	21.91	155.239	Vertical	Pass
		707.5	6.68	1.91	19.26	2.15	21.88	154.170	Vertical	Pass
		714.5	6.52	1.93	19.34	2.15	21.78	150.661	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	7.03	1.91	19.23	2.15	22.20	165.959	Vertical	Pass
		707.5	6.94	1.91	19.26	2.15	22.14	163.682	Vertical	Pass
		713.5	6.73	1.92	19.33	2.15	21.99	158.125	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	704	7.05	1.91	19.25	2.15	<b>22.24</b>	167.494	Vertical	Pass
		707.5	7.03	1.91	19.26	2.15	22.23	167.109	Vertical	Pass
		711	6.88	1.92	19.32	2.15	22.13	163.305	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	5.79	1.91	19.21	2.15	20.94	124.165	Horizontal	Pass
		707.5	5.98	1.91	19.26	2.15	21.18	131.220	Horizontal	Pass
		715.3	5.42	1.93	19.34	2.15	20.68	116.950	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	5.37	1.91	19.21	2.15	20.52	112.720	Horizontal	Pass
		707.5	5.63	1.91	19.26	2.15	20.83	121.060	Horizontal	Pass
		714.5	5.22	1.93	19.34	2.15	20.48	111.686	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	6.20	1.91	19.23	2.15	21.37	137.088	Horizontal	Pass
		707.5	5.53	1.91	19.26	2.15	20.73	118.304	Horizontal	Pass
		713.5	6.10	1.92	19.33	2.15	21.36	136.773	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	704	5.69	1.91	19.25	2.15	20.88	122.462	Horizontal	Pass
		707.5	5.76	1.91	19.26	2.15	20.96	124.738	Horizontal	Pass
		711	5.17	1.92	19.32	2.15	20.42	110.154	Horizontal	Pass



Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Average		
			(dBm)	(dBm)	(dB)		(dBm)	(mW)			
						(dB)	(dBm)	(mW)			
1.4MHz Band 16 QAM	1/#Mid	699.7	6.89	1.91	19.21	2.15	22.04	159.956	Vertical	Pass	
		707.5	6.81	1.91	19.26	2.15	22.01	158.855	Vertical	Pass	
		715.3	6.59	1.93	19.34	2.15	21.85	153.109	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	6.68	1.91	19.21	2.15	21.83	152.405	Vertical	Pass	
		707.5	6.60	1.91	19.26	2.15	21.80	151.356	Vertical	Pass	
		714.5	6.44	1.93	19.34	2.15	21.70	147.911	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	6.95	1.91	19.23	2.15	22.12	162.930	Vertical	Pass	
		707.5	6.86	1.91	19.26	2.15	22.06	160.694	Vertical	Pass	
		713.5	6.65	1.92	19.33	2.15	21.91	155.239	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	6.97	1.91	19.25	2.15	<b>22.16</b>	164.437	Vertical	Pass	
		707.5	6.95	1.91	19.26	2.15	22.15	164.059	Vertical	Pass	
		711	6.80	1.92	19.32	2.15	22.05	160.325	Vertical	Pass	
1.4MHz Band 16 QAM	1/#Mid	699.7	5.83	1.91	19.21	2.15	20.98	125.314	Horizontal	Pass	
		707.5	6.03	1.91	19.26	2.15	21.23	132.739	Horizontal	Pass	
		715.3	5.24	1.93	19.34	2.15	20.50	112.202	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	5.79	1.91	19.21	2.15	20.94	124.165	Horizontal	Pass	
		707.5	5.93	1.91	19.26	2.15	21.13	129.718	Horizontal	Pass	
		714.5	5.50	1.93	19.34	2.15	20.76	119.124	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	5.55	1.91	19.23	2.15	20.72	118.032	Horizontal	Pass	
		707.5	5.99	1.91	19.26	2.15	21.19	131.522	Horizontal	Pass	
		713.5	5.91	1.92	19.33	2.15	21.17	130.918	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	5.62	1.91	19.25	2.15	20.81	120.504	Horizontal	Pass	
		707.5	5.66	1.91	19.26	2.15	20.86	121.899	Horizontal	Pass	
		711	5.30	1.92	19.32	2.15	20.55	113.501	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

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

### 8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	706.5	7.35	1.91	19.23	2.15	22.52	178.649	Vertical	Pass
		710	7.21	1.91	19.26	2.15	22.41	174.181	Vertical	Pass
		713.5	7.11	1.92	19.33	2.15	22.37	172.584	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	7.36	1.91	19.25	2.15	<b>22.55</b>	179.887	Vertical	Pass
		710	7.31	1.91	19.26	2.15	22.51	178.238	Vertical	Pass
		711	7.27	1.92	19.32	2.15	22.52	178.649	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	6.98	1.91	19.23	2.15	22.15	164.059	Horizontal	Pass
		710	5.24	1.91	19.26	2.15	20.44	110.662	Horizontal	Pass
		713.5	5.15	1.92	19.33	2.15	20.41	109.901	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	6.91	1.91	19.25	2.15	22.10	162.181	Horizontal	Pass
		710	5.32	1.91	19.26	2.15	20.52	112.720	Horizontal	Pass
		711	6.22	1.92	19.32	2.15	21.47	140.281	Horizontal	Pass

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP			
			(dBm)				Average	Average			
				(dB)	(dBm)		(mW)				
5.0MHz	1/#Mid	706.5	6.70	1.91	19.23	2.15	21.87	153.815	Vertical	Pass	
Band 16		710	6.61	1.91	19.26	2.15	21.81	151.705	Vertical	Pass	
QAM		713.5	6.41	1.92	19.33	2.15	21.67	146.893	Vertical	Pass	
10.0MHz	1/#Mid	709	6.24	1.91	19.25	2.15	21.43	138.995	Vertical	Pass	
Band 16		710	6.77	1.91	19.26	2.15	<b>21.97</b>	157.398	Vertical	Pass	
QAM		711	6.50	1.92	19.32	2.15	21.75	149.624	Vertical	Pass	
5.0MHz	1/#Mid	706.5	5.56	1.91	19.23	2.15	20.73	118.304	Horizontal	Pass	
Band 16		710	6.04	1.91	19.26	2.15	21.24	133.045	Horizontal	Pass	
QAM		713.5	5.45	1.92	19.33	2.15	20.71	117.761	Horizontal	Pass	
10.0MHz	1/#Mid	709	5.98	1.91	19.25	2.15	21.17	130.918	Horizontal	Pass	
Band 16		710	5.90	1.91	19.26	2.15	21.10	128.825	Horizontal	Pass	
QAM		711	5.33	1.92	19.32	2.15	20.58	114.288	Horizontal	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2557.5	-1.28	4.54	27.75	21.93	155.955	Horizontal	Pass
		2605	-1.13	4.69	27.72	21.90	154.882	Horizontal	Pass
		2652.5	-1.01	4.71	27.71	21.99	158.125	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.36	4.55	27.76	21.85	153.109	Horizontal	Pass
		2605	-1.22	4.69	27.72	21.81	151.705	Horizontal	Pass
		2650	-1.21	4.72	27.70	21.77	150.314	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-1.19	4.55	27.77	22.03	159.588	Horizontal	Pass
		2605	-0.91	4.69	27.72	22.12	162.930	Horizontal	Pass
		2647.5	-0.96	4.72	27.69	22.01	158.855	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2565	-1.07	4.57	27.78	22.14	163.682	Horizontal	Pass
		2605	-0.85	4.73	27.72	22.14	163.682	Horizontal	Pass
		2645	-0.85	4.75	27.68	22.08	161.436	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2557.5	-1.08	4.54	27.75	22.13	163.305	Vertical	Pass
		2605	-0.99	4.69	27.72	22.04	159.956	Vertical	Pass
		2652.5	-0.97	4.71	27.71	22.03	159.588	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.06	4.55	27.76	21.01	126.183	Vertical	Pass
		2605	-0.90	4.69	27.72	22.13	163.305	Vertical	Pass
		2650	-0.97	4.72	27.70	22.01	158.855	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-2.30	4.55	27.77	20.92	123.595	Vertical	Pass
		2605	-2.08	4.69	27.72	20.95	124.451	Vertical	Pass
		2647.5	-1.68	4.72	27.69	21.29	134.586	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2565	-2.49	4.57	27.78	20.72	118.032	Vertical	Pass
		2605	-2.58	4.73	27.72	20.41	109.901	Vertical	Pass
		2645	-1.92	4.75	27.68	<b>22.15</b>	164.059	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2557.5	-1.50	4.54	27.75	21.71	148.252	Horizontal	Pass
		2605	-1.35	4.69	27.72	21.68	147.231	Horizontal	Pass
		2652.5	-1.23	4.71	27.71	21.77	150.314	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-1.58	4.55	27.76	21.63	145.546	Horizontal	Pass
		2605	-1.44	4.69	27.72	21.59	144.212	Horizontal	Pass
		2650	-1.43	4.72	27.70	21.55	142.889	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-1.41	4.55	27.77	21.81	151.705	Horizontal	Pass
		2605	-1.13	4.69	27.72	21.90	154.882	Horizontal	Pass
		2647.5	-1.18	4.72	27.69	21.79	151.008	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-1.29	4.57	27.78	21.92	155.597	Horizontal	Pass
		2605	-1.07	4.73	27.72	21.92	155.597	Horizontal	Pass
		2645	-1.07	4.75	27.68	21.86	153.462	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2557.5	-1.30	4.54	27.75	21.91	155.239	Vertical	Pass
		2605	-1.21	4.69	27.72	21.82	152.055	Vertical	Pass
		2652.5	-1.19	4.71	27.71	21.81	151.705	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-1.28	4.55	27.76	20.75	118.850	Vertical	Pass
		2605	-1.12	4.69	27.72	21.91	155.239	Vertical	Pass
		2650	-1.19	4.72	27.70	21.79	151.008	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-2.60	4.55	27.77	20.62	115.345	Vertical	Pass
		2605	-2.79	4.69	27.72	20.24	105.682	Vertical	Pass
		2647.5	-2.19	4.72	27.69	20.78	119.674	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-2.33	4.57	27.78	20.88	122.462	Vertical	Pass
		2605	-2.61	4.73	27.72	20.38	109.144	Vertical	Pass
		2645	-2.18	4.75	27.68	<b>21.93</b>	155.955	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

### 8.9 LTE BAND 66

Radiated Power (EIRP) for Band 66										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP			
							Average			
							(mW)			
1.4MHz Band QPSK	1/#Mid	1710.7	-2.55	3.76	28.24	21.93	155.955	Horizontal	Pass	
		1745	-2.41	3.91	28.22	21.90	154.882	Horizontal	Pass	
		1779.3	-2.28	3.93	28.2	21.99	158.125	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	-2.61	3.77	28.23	21.85	153.109	Horizontal	Pass	
		1745	-2.52	3.91	28.24	21.81	151.705	Horizontal	Pass	
		1778.5	-2.54	3.94	28.25	21.77	150.314	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	-2.51	3.77	28.31	22.03	159.588	Horizontal	Pass	
		1745	-2.19	3.91	28.22	22.12	162.930	Horizontal	Pass	
		1777.5	-2.25	3.94	28.2	22.01	158.855	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	1715	-2.40	3.79	28.33	22.14	163.682	Horizontal	Pass	
		1745	-2.13	3.95	28.22	22.14	163.682	Horizontal	Pass	
		1775	-2.14	3.97	28.19	22.08	161.436	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	1717.5	-2.42	3.79	28.34	22.13	163.305	Horizontal	Pass	
		1745	-2.23	3.95	28.22	22.04	159.956	Horizontal	Pass	
		1772.5	-2.18	3.97	28.18	22.03	159.588	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	1720	-2.39	3.81	28.35	<b>22.15</b>	164.059	Horizontal	Pass	
		1745	-2.13	3.96	28.22	22.13	163.305	Horizontal	Pass	
		1770	-2.15	4	28.16	22.01	158.855	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1710.7	-4.06	3.76	28.24	20.42	110.154	Vertical	Pass	
		1745	-3.60	3.91	28.22	20.71	117.761	Vertical	Pass	
		1779.3	-2.91	3.93	28.2	21.36	136.773	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	-3.18	3.77	28.23	21.28	134.276	Vertical	Pass	
		1745	-3.51	3.91	28.24	20.82	120.781	Vertical	Pass	
		1778.5	-3.68	3.94	28.25	20.63	115.611	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	-3.13	3.77	28.31	21.41	138.357	Vertical	Pass	
		1745	-3.76	3.91	28.22	20.55	113.501	Vertical	Pass	
		1777.5	-3.59	3.94	28.2	20.67	116.681	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	1715	-3.75	3.79	28.34	20.80	120.226	Vertical	Pass	
		1745	-3.13	3.95	28.22	21.14	130.017	Vertical	Pass	
		1775	-3.50	3.97	28.18	20.71	117.761	Vertical	Pass	

15.0MHz Band QPSK	1/#Mid	1717.5	-3.91	3.81	28.35	20.63	115.611	Vertical	Pass
		1745	-3.67	3.96	28.22	20.59	114.551	Vertical	Pass
		1772.5	-3.42	4	28.16	20.74	118.577	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.79	3.79	28.34	20.76	119.124	Vertical	Pass
		1745	-3.00	3.95	28.22	21.27	133.968	Vertical	Pass
		1770	-2.99	3.97	28.18	21.22	132.434	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.38	3.76	28.24	21.10	128.825	Horizontal	Pass
		1745	-2.99	3.91	28.22	21.32	135.519	Horizontal	Pass
		1779.3	-3.17	3.93	28.2	21.10	128.825	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.77	3.77	28.23	20.69	117.220	Horizontal	Pass
		1745	-3.02	3.91	28.24	21.31	135.207	Horizontal	Pass
		1778.5	-3.31	3.94	28.25	21.00	125.893	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.19	3.77	28.31	21.35	136.458	Horizontal	Pass
		1745	-3.25	3.91	28.22	21.06	127.644	Horizontal	Pass
		1777.5	-2.92	3.94	28.2	21.34	136.144	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.24	3.79	28.33	21.30	134.896	Horizontal	Pass
		1745	-2.90	3.95	28.22	21.37	137.088	Horizontal	Pass
		1775	-3.22	3.97	28.19	21.00	125.893	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.23	3.79	28.34	21.32	135.519	Horizontal	Pass
		1745	-3.05	3.95	28.22	21.22	132.434	Horizontal	Pass
		1772.5	-2.84	3.97	28.18	21.37	137.088	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.06	3.81	28.35	<b>21.48</b>	140.605	Horizontal	Pass
		1745	-2.84	3.96	28.22	21.42	138.676	Horizontal	Pass
		1770	-2.78	4	28.16	21.38	137.404	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.79	3.76	28.24	20.69	117.220	Vertical	Pass
		1745	-3.92	3.91	28.22	20.39	109.396	Vertical	Pass
		1779.3	-3.57	3.93	28.2	20.70	117.490	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.03	3.77	28.23	19.43	87.700	Vertical	Pass
		1745	-4.80	3.91	28.24	19.53	89.743	Vertical	Pass
		1778.5	-3.22	3.94	28.25	21.09	128.529	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.07	3.77	28.31	19.47	88.512	Vertical	Pass
		1745	-3.48	3.91	28.22	20.83	121.060	Vertical	Pass
		1777.5	-4.45	3.94	28.2	19.81	95.719	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.59	3.79	28.34	20.96	124.738	Vertical	Pass
		1745	-3.04	3.95	28.22	21.23	132.739	Vertical	Pass
		1775	-3.23	3.97	28.18	20.98	125.314	Vertical	Pass
15.0MHz Band 16	1/#Mid	1717.5	-3.94	3.81	28.35	20.60	114.815	Vertical	Pass
		1745	-3.62	3.96	28.22	20.64	115.878	Vertical	Pass



QAM		1772.5	-3.09	4	28.16	21.07	127.938	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.42	3.79	28.34	21.13	129.718	Vertical	Pass
Band 16		1745	-3.48	3.95	28.22	20.79	119.950	Vertical	Pass
QAM		1770	-3.10	3.97	28.18	21.11	129.122	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

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

### LIMIT

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

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

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

### TEST PROCEDURE

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

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \text{ Log}_{10} (p)$ , 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 2/4/5/7/12/17/41/66

#### **RESULTS**

PASS

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-47.39	4.04	33.51	-17.92	-13	-4.92	Horizontal
3701.4	-49.32	4.04	33.51	-19.85	-13	-6.85	Vertical
5552.1	-49.73	5.24	35.84	-19.13	-13	-6.13	Vertical
5552.1	-53.36	5.24	35.84	-22.76	-13	-9.76	Horizontal
207.4	-40.55	1.43	16.02	-25.96	-13	-12.96	Vertical
243.4	-34.75	1.30	17.99	-18.06	-13	-5.06	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.74	4.04	33.56	-20.22	-13	-7.22	Horizontal
3760.0	-47.01	4.04	33.56	-17.49	-13	-4.49	Vertical
5640.0	-50.39	5.24	35.91	-19.72	-13	-6.72	Vertical
5640.0	-53.55	5.24	35.91	-22.88	-13	-9.88	Horizontal
178.6	-43.10	1.62	16.97	-27.75	-13	-14.75	Vertical
375.3	-40.63	1.74	15.98	-26.40	-13	-13.40	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-51.36	4.04	34.00	-21.40	-13	-8.40	Horizontal
3818.6	-49.78	4.04	34.00	-19.82	-13	-6.82	Vertical
5727.9	-50.53	5.24	36.04	-19.73	-13	-6.73	Vertical
5727.9	-50.90	5.24	36.04	-20.10	-13	-7.10	Horizontal
186.0	-38.25	1.42	17.29	-22.38	-13	-9.38	Vertical
307.8	-41.07	1.50	17.90	-24.66	-13	-11.66	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-51.28	4.07	33.54	-21.81	-13	-8.81	Horizontal
3720.0	-49.80	4.07	33.54	-20.33	-13	-7.33	Vertical
5580.0	-50.18	5.28	35.86	-19.60	-13	-6.60	Vertical
5580.0	-49.98	5.28	35.86	-19.40	-13	-6.40	Horizontal
189.9	-38.99	1.58	16.89	-23.67	-13	-10.67	Vertical
361.8	-41.70	1.76	17.26	-26.20	-13	-13.20	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.65	4.04	33.56	-17.13	-13	-4.13	Horizontal
3760.0	-45.30	4.04	33.56	-15.78	-13	-2.78	Vertical
5640.0	-53.60	5.24	35.91	-22.93	-13	-9.93	Vertical
5640.0	-53.88	5.24	35.91	-23.21	-13	-10.21	Horizontal
202.6	-41.08	1.46	16.27	-26.27	-13	-13.27	Vertical
304.0	-44.24	1.59	15.15	-30.68	-13	-17.68	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-51.25	4.04	34.00	-21.29	-13	-8.29	Horizontal
3800.0	-53.30	4.04	34.00	-23.34	-13	-10.34	Vertical
5700.0	-47.16	5.24	36.04	-16.36	-13	-3.36	Vertical
5700.0	-49.93	5.24	36.04	-19.13	-13	-6.13	Horizontal
203.6	-37.89	1.36	17.39	-21.85	-13	-8.85	Vertical
315.1	-38.14	1.66	15.39	-24.41	-13	-11.41	Horizontal

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

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

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

**9.2 LTE BAND 4**

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.27	4.02	29.80	-21.49	-13	-8.49	Horizontal
3421.4	-52.34	4.02	29.80	-26.56	-13	-13.56	Vertical
5132.1	-50.42	5.24	35.84	-19.82	-13	-6.82	Vertical
5132.1	-53.71	5.24	35.84	-23.11	-13	-10.11	Horizontal
194.9	-43.45	1.68	16.04	-29.09	-13	-16.09	Vertical
384.3	-42.40	1.78	17.74	-26.44	-13	-13.44	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.65	4.03	30.00	-23.68	-13	-10.68	Horizontal
3465.0	-47.45	4.03	30.00	-21.48	-13	-8.48	Vertical
5197.5	-49.33	5.25	35.86	-18.72	-13	-5.72	Vertical
5197.5	-50.35	5.25	35.86	-19.74	-13	-6.74	Horizontal
193.4	-38.98	1.72	17.69	-23.01	-13	-10.01	Vertical
238.5	-35.65	1.62	16.02	-21.24	-13	-8.24	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-47.13	4.05	30.01	-21.17	-13	-8.17	Horizontal
3508.6	-45.28	4.05	30.01	-19.32	-13	-6.32	Vertical
5262.9	-48.58	5.26	35.86	-17.98	-13	-4.98	Vertical
5262.9	-51.55	5.26	35.86	-20.95	-13	-7.95	Horizontal
209.8	-38.81	1.80	16.69	-23.92	-13	-10.92	Vertical
459.2	-36.55	1.75	16.66	-21.65	-13	-8.65	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-51.05	4.02	29.80	-25.27	-13	-12.27	Horizontal
3440.0	-50.84	4.02	29.80	-25.06	-13	-12.06	Vertical
5160.0	-52.42	5.24	35.84	-21.82	-13	-8.82	Vertical
5160.0	-50.56	5.24	35.84	-19.96	-13	-6.96	Horizontal
209.5	-38.75	1.57	17.26	-23.06	-13	-10.06	Vertical
266.9	-34.34	1.78	16.35	-19.77	-13	-6.77	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-47.95	4.03	30.00	-21.98	-13	-8.98	Horizontal
3465.0	-47.32	4.03	30.00	-21.35	-13	-8.35	Vertical
5197.5	-51.22	5.25	35.86	-20.61	-13	-7.61	Vertical
5197.5	-49.35	5.25	35.86	-18.74	-13	-5.74	Horizontal
200.1	-43.98	1.44	17.95	-27.47	-13	-14.47	Vertical
237.7	-37.58	1.65	16.09	-23.14	-13	-10.14	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.08	2.91	27.68	-28.31	-13	-15.31	Horizontal
3490.0	-44.47	2.91	27.68	-19.70	-13	-6.70	Vertical
5235.0	-50.36	5.26	35.86	-19.76	-13	-6.76	Vertical
5235.0	-51.68	5.26	35.86	-21.08	-13	-8.08	Horizontal
182.3	-42.53	1.61	16.85	-27.29	-13	-14.29	Vertical
250.7	-42.09	1.61	15.19	-28.51	-13	-15.51	Horizontal

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

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

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-44.36	2.78	27.50	-19.64	-13	-6.64	Horizontal
1649.4	-52.23	2.78	27.50	-27.51	-13	-14.51	Vertical
2474.1	-44.10	2.90	27.80	-19.20	-13	-6.20	Vertical
2474.1	-53.75	2.90	27.80	-28.85	-13	-15.85	Horizontal
210.4	-37.06	1.76	17.59	-21.23	-13	-8.23	Vertical
431.3	-37.13	1.63	15.87	-22.89	-13	-9.89	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-48.88	2.80	27.48	-24.20	-13	-11.20	Horizontal
1673.0	-49.98	2.80	27.48	-25.30	-13	-12.30	Vertical
2509.5	-46.74	2.91	27.70	-21.95	-13	-8.95	Vertical
2509.5	-52.97	2.91	27.70	-28.18	-13	-15.18	Horizontal
200.9	-41.65	1.61	15.68	-27.58	-13	-14.58	Vertical
365.2	-38.08	1.59	17.52	-22.16	-13	-9.16	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.07	2.82	27.43	-21.46	-13	-8.46	Horizontal
1696.6	-44.66	2.82	27.43	-20.05	-13	-7.05	Vertical
2544.9	-49.28	2.92	27.74	-24.46	-13	-11.46	Vertical
2544.9	-49.57	2.92	27.74	-24.75	-13	-11.75	Horizontal
185.5	-37.30	1.69	16.67	-22.31	-13	-9.31	Vertical
243.6	-43.62	1.70	17.18	-28.14	-13	-15.14	Horizontal



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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-53.64	2.78	27.50	-28.92	-13	-15.92	Horizontal
1658.0	-53.14	2.78	27.50	-28.42	-13	-15.42	Vertical
2487.0	-48.37	2.90	27.80	-23.47	-13	-10.47	Vertical
2487.0	-52.53	2.90	27.80	-27.63	-13	-14.63	Horizontal
212.9	-40.60	1.71	15.57	-26.74	-13	-13.74	Vertical
466.9	-43.44	1.34	16.40	-28.38	-13	-15.38	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-47.52	2.80	27.48	-22.84	-13	-9.84	Horizontal
1673.0	-50.74	2.80	27.48	-26.06	-13	-13.06	Vertical
2509.5	-44.45	2.91	27.70	-19.66	-13	-6.66	Vertical
2509.5	-52.59	2.91	27.70	-27.80	-13	-14.80	Horizontal
189.0	-42.91	1.44	17.04	-27.31	-13	-14.31	Vertical
349.7	-38.87	1.76	17.62	-23.01	-13	-10.01	Horizontal
Test Results for High Channel 844MHz							
1688.0	-45.61	2.82	27.43	-21.00	-13	-8.00	Horizontal
1688.0	-51.42	2.82	27.43	-26.81	-13	-13.81	Vertical
2532.0	-52.67	2.92	27.74	-27.85	-13	-14.85	Vertical
2532.0	-50.31	2.92	27.74	-25.49	-13	-12.49	Horizontal
179.1	-35.02	1.74	17.70	-19.06	-13	-6.06	Vertical
256.2	-35.59	1.41	17.46	-19.53	-13	-6.53	Horizontal

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : P<sub>Mea</sub>(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	-63.65	5.23	35.81	-33.07	-25	-8.07	Horizontal
5005.0	-62.33	5.23	35.81	-31.75	-25	-6.75	Vertical
7507.5	-64.38	5.67	36.85	-33.20	-25	-8.20	Vertical
7507.5	-62.51	5.67	36.85	-31.33	-25	-6.33	Horizontal
194.8	-47.24	1.73	17.97	-31.00	-25	-6.00	Vertical
407.6	-44.49	1.38	15.11	-30.76	-25	-5.76	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.91	5.23	35.82	-29.32	-25	-4.32	Horizontal
5070.0	-64.31	5.23	35.82	-33.72	-25	-8.72	Vertical
7605.0	-64.65	5.67	36.85	-33.47	-25	-8.47	Vertical
7605.0	-63.59	5.67	36.85	-32.41	-25	-7.41	Horizontal
195.4	-52.75	1.77	16.17	-38.34	-25	-13.34	Vertical
323.4	-48.03	1.63	15.21	-34.45	-25	-9.45	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-62.63	5.24	35.83	-32.04	-25	-7.04	Horizontal
5135.0	-64.86	5.24	35.83	-34.27	-25	-9.27	Vertical
7702.5	-62.43	5.68	36.87	-31.24	-25	-6.24	Vertical
7702.5	-63.84	5.68	36.87	-32.65	-25	-7.65	Horizontal
195.2	-50.07	1.58	17.56	-34.09	-25	-9.09	Vertical
387.0	-48.71	1.45	16.58	-33.58	-25	-8.58	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	-60.43	5.23	35.82	-29.84	-25	-4.84	Horizontal
5020.0	-63.80	5.23	35.82	-33.21	-25	-8.21	Vertical
7530.0	-60.31	5.67	36.86	-29.12	-25	-4.12	Vertical
7530.0	-64.86	5.67	36.86	-33.67	-25	-8.67	Horizontal
203.8	-52.45	1.63	15.76	-38.32	-25	-13.32	Vertical
433.0	-48.11	1.71	15.44	-34.38	-25	-9.38	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.09	5.23	35.82	-31.50	-25	-6.50	Horizontal
5070.0	-62.87	5.23	35.82	-32.28	-25	-7.28	Vertical
7605.0	-60.44	5.67	36.85	-29.26	-25	-4.26	Vertical
7605.0	-64.78	5.67	36.85	-33.60	-25	-8.60	Horizontal
178.0	-53.30	1.79	16.84	-38.24	-25	-13.24	Vertical
390.2	-54.28	1.71	17.64	-38.35	-25	-13.35	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.54	5.24	35.83	-29.95	-25	-4.95	Horizontal
5120.0	-63.23	5.24	35.83	-32.64	-25	-7.64	Vertical
7680.0	-61.09	5.70	36.88	-29.91	-25	-4.91	Vertical
7680.0	-63.51	5.70	36.88	-32.33	-25	-7.33	Horizontal
198.0	-49.60	1.79	16.84	-34.54	-25	-9.54	Vertical
278.1	-47.47	1.71	17.64	-31.54	-25	-6.54	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-47.89	2.60	27.20	-23.29	-13	-10.29	Horizontal
1399.4	-45.66	2.60	27.20	-21.06	-13	-8.06	Vertical
2099.1	-51.25	2.85	27.54	-26.56	-13	-13.56	Vertical
2099.1	-49.93	2.85	27.54	-25.24	-13	-12.24	Horizontal
188.4	-41.13	1.49	17.78	-24.84	-13	-11.84	Vertical
252.1	-40.98	1.36	17.33	-25.01	-13	-12.01	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-49.70	2.61	27.28	-25.03	-13	-12.03	Horizontal
1415.0	-47.00	2.61	27.28	-22.33	-13	-9.33	Vertical
2122.5	-53.38	2.87	27.59	-28.66	-13	-15.66	Vertical
2122.5	-49.12	2.87	27.59	-24.40	-13	-11.40	Horizontal
208.6	-37.94	1.73	15.74	-23.93	-13	-10.93	Vertical
390.5	-37.88	1.62	15.79	-23.71	-13	-10.71	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-44.88	2.63	27.28	-20.23	-13	-7.23	Horizontal
1430.6	-52.29	2.63	27.28	-27.64	-13	-14.64	Vertical
2145.9	-51.06	2.88	27.60	-26.34	-13	-13.34	Vertical
2145.9	-51.02	2.88	27.60	-26.30	-13	-13.30	Horizontal
186.1	-41.31	1.61	18.00	-24.92	-13	-11.92	Vertical
369.0	-37.81	1.45	15.49	-23.78	-13	-10.78	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-49.58	2.61	27.26	-24.93	-13	-11.93	Horizontal
1408.0	-45.01	2.61	27.26	-20.36	-13	-7.36	Vertical
2112.0	-49.79	2.87	27.58	-25.08	-13	-12.08	Vertical
2112.0	-51.75	2.87	27.58	-27.04	-13	-14.04	Horizontal
195.9	-37.04	1.31	16.97	-21.38	-13	-8.38	Vertical
245.7	-38.82	1.65	16.70	-23.77	-13	-10.77	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-45.49	2.61	27.28	-20.82	-13	-7.82	Horizontal
1415.0	-50.40	2.61	27.28	-25.73	-13	-12.73	Vertical
2122.5	-45.99	2.87	27.59	-21.27	-13	-8.27	Vertical
2122.5	-52.74	2.87	27.59	-28.02	-13	-15.02	Horizontal
177.8	-44.75	1.72	17.99	-28.48	-13	-15.48	Vertical
263.7	-43.98	1.73	17.94	-27.77	-13	-14.77	Horizontal
Test Results for High Channel 711MHz							
1422.0	-46.22	2.62	27.28	-21.56	-13	-8.56	Horizontal
1422.0	-49.71	2.62	27.28	-25.05	-13	-12.05	Vertical
2133.0	-46.77	2.87	27.60	-22.04	-13	-9.04	Vertical
2133.0	-51.89	2.87	27.60	-27.16	-13	-14.16	Horizontal
189.3	-36.16	1.58	15.93	-21.81	-13	-8.81	Vertical
308.4	-37.79	1.36	15.59	-23.56	-13	-10.56	Horizontal

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

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

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

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-47.69	2.61	27.28	-23.02	-13	-10.02	Horizontal
1413.0	-49.51	2.61	27.28	-24.84	-13	-11.84	Vertical
2119.5	-46.25	2.87	27.59	-21.53	-13	-8.53	Vertical
2119.5	-49.12	2.87	27.59	-24.40	-13	-11.40	Horizontal
181.7	-41.84	1.71	16.15	-27.40	-13	-14.40	Vertical
390.0	-44.80	1.41	17.32	-28.89	-13	-15.89	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-49.20	2.62	27.30	-24.52	-13	-11.52	Horizontal
1420.0	-52.38	2.62	27.30	-27.70	-13	-14.70	Vertical
2130.0	-49.86	2.87	27.62	-25.11	-13	-12.11	Vertical
2130.0	-52.50	2.87	27.62	-27.75	-13	-14.75	Horizontal
185.6	-44.45	1.42	15.25	-30.63	-13	-17.63	Vertical
327.3	-36.84	1.36	17.19	-21.01	-13	-8.01	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-53.20	2.66	27.28	-28.58	-13	-15.58	Horizontal
1427.0	-50.70	2.66	27.28	-26.08	-13	-13.08	Vertical
2140.5	-48.32	2.88	27.60	-23.60	-13	-10.60	Vertical
2140.5	-52.29	2.88	27.60	-27.57	-13	-14.57	Horizontal
199.7	-42.01	1.32	17.29	-26.04	-13	-13.04	Vertical
395.7	-37.57	1.72	16.89	-22.40	-13	-9.40	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	-44.52	2.62	27.30	-19.84	-13	-6.84	Horizontal
1418.0	-45.76	2.62	27.30	-21.08	-13	-8.08	Vertical
2127.0	-46.69	2.87	27.62	-21.94	-13	-8.94	Vertical
2127.0	-52.27	2.87	27.62	-27.52	-13	-14.52	Horizontal
193.3	-40.10	1.35	16.91	-24.54	-13	-11.54	Vertical
462.6	-41.95	1.62	16.31	-27.26	-13	-14.26	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-49.11	2.62	27.30	-24.43	-13	-11.43	Horizontal
1420.0	-47.71	2.62	27.30	-23.03	-13	-10.03	Vertical
2130.0	-48.99	2.87	27.62	-24.24	-13	-11.24	Vertical
2130.0	-52.26	2.87	27.62	-27.51	-13	-14.51	Horizontal
195.3	-37.45	1.51	17.14	-21.82	-13	-8.82	Vertical
267.9	-34.60	1.77	16.88	-19.49	-13	-6.49	Horizontal
Test Results for High Channel 711MHz							
1422.0	-44.73	2.62	27.30	-20.05	-13	-7.05	Horizontal
1422.0	-45.01	2.62	27.30	-20.33	-13	-7.33	Vertical
2133.0	-52.18	2.87	27.62	-27.43	-13	-14.43	Vertical
2133.0	-53.20	2.87	27.62	-28.45	-13	-15.45	Horizontal
185.0	-35.48	1.78	15.95	-21.31	-13	-8.31	Vertical
358.5	-40.99	1.34	17.95	-24.39	-13	-11.39	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74  
 Margin = Spurious Emission Level - Limit  
 Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

**9.7 LTE BAND 41**  
**QPSK EIRP POWER FOR LTE BAND 41 (5MHZ BANDWIDTH)**

Test Results for Low Channel 2557.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5115.0	-63.83	5.23	35.81	-33.25	-25	-8.25	Horizontal
5115.0	-61.21	5.23	35.81	-30.63	-25	-5.63	Vertical
7672.5	-60.82	5.67	36.85	-29.64	-25	-4.64	Vertical
7672.5	-60.19	5.67	36.85	-29.01	-25	-4.01	Horizontal
435.3	-48.47	1.38	15.98	-33.87	-25	-8.87	Vertical
465.8	-44.90	1.62	15.66	-30.86	-25	-5.86	Horizontal
Test Results for Mid Channel 2605MHz							
5210.0	-62.76	5.23	35.82	-32.17	-25	-7.17	Horizontal
5210.0	-61.24	5.23	35.82	-30.65	-25	-5.65	Vertical
7815.0	-62.72	5.67	36.85	-31.54	-25	-6.54	Vertical
7815.0	-62.05	5.67	36.85	-30.87	-25	-5.87	Horizontal
510.4	-46.19	1.62	16.17	-31.64	-25	-6.64	Vertical
562.9	-46.77	1.74	17.63	-30.88	-25	-5.88	Horizontal
Test Results for High Channel 2652.5MHz							
5305.0	-64.42	5.24	35.83	-33.83	-25	-8.83	Horizontal
5305.0	-62.12	5.24	35.83	-31.53	-25	-6.53	Vertical
7957.5	-62.25	5.68	36.87	-31.06	-25	-6.06	Vertical
7957.5	-63.99	5.68	36.87	-32.80	-25	-7.80	Horizontal
197.6	-44.78	1.55	15.84	-30.49	-25	-5.49	Vertical
353.1	-47.45	1.51	17.06	-31.90	-25	-6.90	Horizontal



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

Test Results for Low Channel 2565MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5130.0	-63.52	5.23	35.82	-32.93	-25	-7.93	Horizontal
5130.0	-60.37	5.23	35.82	-29.78	-25	-4.78	Vertical
7695.0	-62.73	5.67	36.86	-31.54	-25	-6.54	Vertical
7695.0	-62.54	5.67	36.86	-31.35	-25	-6.35	Horizontal
128.9	-49.43	1.43	15.51	-35.35	-25	-10.35	Vertical
344.8	-48.94	1.40	16.97	-33.37	-25	-8.37	Horizontal
Test Results for Mid Channel 2605MHz							
5210.0	-60.65	5.23	35.82	-30.06	-25	-5.06	Horizontal
5210.0	-64.94	5.23	35.82	-34.35	-25	-9.35	Vertical
7815.0	-62.01	5.67	36.85	-30.83	-25	-5.83	Vertical
7815.0	-59.74	5.67	36.85	-28.56	-25	-3.56	Horizontal
100.8	-44.55	1.77	16.72	-29.60	-25	-4.60	Vertical
263.5	-47.73	1.31	16.99	-32.05	-25	-7.05	Horizontal
Test Results for High Channel 2645MHz							
5290.0	-62.88	5.24	35.83	-32.29	-25	-7.29	Horizontal
5290.0	-60.49	5.24	35.83	-29.90	-25	-4.90	Vertical
7935.0	-59.21	5.70	36.88	-28.03	-25	-3.03	Vertical
7935.0	-64.80	5.70	36.88	-33.62	-25	-8.62	Horizontal
349.9	-48.19	1.70	15.73	-34.16	-25	-9.16	Vertical
110.3	-48.56	1.75	17.33	-32.98	-25	-7.98	Horizontal

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ ARpl (dBm)

Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

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

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

9.8 LTE BAND 66

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-51.41	4.02	29.80	-25.63	-13	-12.63	Horizontal
3421.4	-54.41	4.02	29.80	-28.63	-13	-15.63	Vertical
5132.1	-49.15	5.24	35.84	-18.55	-13	-5.55	Vertical
5132.1	-52.52	5.24	35.84	-21.92	-13	-8.92	Horizontal
112.6	-46.04	1.52	15.57	-31.99	-13	-18.99	Vertical
220.5	-45.92	1.33	17.14	-30.11	-13	-17.11	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-46.29	4.03	30.00	-20.32	-13	-7.32	Horizontal
3490.0	-47.12	4.03	30.00	-21.15	-13	-8.15	Vertical
5235.0	-49.76	5.25	35.86	-19.15	-13	-6.15	Vertical
5235.0	-51.82	5.25	35.86	-21.21	-13	-8.21	Horizontal
157.3	-50.93	1.53	17.13	-35.33	-13	-22.33	Vertical
213.1	-46.85	1.41	15.95	-32.31	-13	-19.31	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-46.37	4.05	30.01	-20.41	-13	-7.41	Horizontal
3558.6	-48.47	4.05	30.01	-22.51	-13	-9.51	Vertical
5337.9	-54.08	5.26	35.86	-23.48	-13	-10.48	Vertical
5337.9	-49.61	5.26	35.86	-19.01	-13	-6.01	Horizontal
170.6	-45.34	1.44	15.51	-31.27	-13	-18.27	Vertical
169.0	-52.37	1.78	15.76	-38.39	-13	-25.39	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-47.05	4.02	29.80	-21.27	-13	-8.27	Horizontal
3440.0	-49.60	4.02	29.80	-23.82	-13	-10.82	Vertical
5160.0	-52.34	5.24	35.84	-21.74	-13	-8.74	Vertical
5160.0	-50.05	5.24	35.84	-19.45	-13	-6.45	Horizontal
268.8	-54.73	1.62	17.02	-39.33	-13	-26.33	Vertical
161.4	-44.69	1.32	17.31	-28.70	-13	-15.70	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-50.66	4.03	30.00	-24.69	-13	-11.69	Horizontal
3490.0	-50.26	4.03	30.00	-24.29	-13	-11.29	Vertical
5235.0	-51.74	5.25	35.86	-21.13	-13	-8.13	Vertical
5235.0	-49.82	5.25	35.86	-19.21	-13	-6.21	Horizontal
159.9	-46.22	1.45	15.17	-32.50	-13	-19.50	Vertical
172.1	-53.69	1.48	17.82	-37.35	-13	-24.35	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-44.43	2.91	27.68	-19.66	-13	-6.66	Horizontal
3540.0	-45.58	2.91	27.68	-20.81	-13	-7.81	Vertical
5310.0	-53.18	5.26	35.86	-22.58	-13	-9.58	Vertical
5310.0	-47.45	5.26	35.86	-16.85	-13	-3.85	Horizontal
197.3	-48.18	1.76	16.38	-33.56	-13	-20.56	Vertical
158.5	-47.63	1.43	17.13	-31.93	-13	-18.93	Horizontal

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

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

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

## 10. FREQUENCY STABILITY

### RULE PART(S)

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

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  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. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
- Voltage = low voltage, DC 3.4V, 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  $-30^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

### Frequency Stability vs Voltage:

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

### MODES TESTED

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

### RESULTS

See the following pages.

10.1 LTE BAND 2

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	1880	12.6	0.006706	2.5
3.85	1880	13.3	0.007097	2.5
4.40	1880	13.6	0.007258	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.8	0.006816	2.5
Extreme (50C)	1880	11.3	0.006014	2.5
Extreme (40C)	1880	13.6	0.007231	2.5
Extreme (30C)	1880	13.3	0.007052	2.5
Extreme (10C)	1880	13.9	0.007403	2.5
Extreme (0C)	1880	11.9	0.006316	2.5
Extreme (-10C)	1880	13.1	0.006956	2.5
Extreme (-20C)	1880	13.7	0.007312	2.5
Extreme (-30C)	1880	14.4	0.007677	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	9.7	0.005134	2.5
3.85	1880	8.4	0.004474	2.5
4.40	1880	8.6	0.004559	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.7	0.005180	2.5
Extreme (50C)	1880	9.4	0.004974	2.5
Extreme (40C)	1880	7.7	0.004114	2.5
Extreme (30C)	1880	8.7	0.004645	2.5
Extreme (10C)	1880	8.9	0.004744	2.5
Extreme (0C)	1880	7.7	0.004090	2.5
Extreme (-10C)	1880	9.0	0.004773	2.5
Extreme (-20C)	1880	8.7	0.004642	2.5
Extreme (-30C)	1880	7.6	0.004069	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	0.004876	2.5
3.85	1732.5	8.7	0.005034	2.5
4.40	1732.5	8.0	0.004603	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.0	0.004600	2.5
Extreme (50C)	1732.5	9.0	0.005219	2.5
Extreme (40C)	1732.5	7.8	0.004524	2.5
Extreme (30C)	1732.5	6.0	0.003470	2.5
Extreme (10C)	1732.5	7.1	0.004106	2.5
Extreme (0C)	1732.5	9.5	0.005473	2.5
Extreme (-10C)	1732.5	8.3	0.004792	2.5
Extreme (-20C)	1732.5	6.6	0.003812	2.5
Extreme (-30C)	1732.5	8.5	0.004906	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	9.4	0.005404	2.5
3.85	1732.5	9.3	0.005367	2.5
4.40	1732.5	7.8	0.004477	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.3	0.005391	2.5
Extreme (50C)	1732.5	8.5	0.004920	2.5
Extreme (40C)	1732.5	8.3	0.004809	2.5
Extreme (30C)	1732.5	9.2	0.005282	2.5
Extreme (10C)	1732.5	9.3	0.005361	2.5
Extreme (0C)	1732.5	7.7	0.004466	2.5
Extreme (-10C)	1732.5	8.8	0.005080	2.5
Extreme (-20C)	1732.5	9.1	0.005280	2.5
Extreme (-30C)	1732.5	8.1	0.004658	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	6.2	0.007411	2.5
3.85	836.5	6.5	0.007807	2.5
4.40	836.5	5.0	0.005988	2.5

##### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.007442	2.5
Extreme (50C)	836.5	5.6	0.006747	2.5
Extreme (40C)	836.5	6.6	0.007847	2.5
Extreme (30C)	836.5	6.8	0.008179	2.5
Extreme (10C)	836.5	5.5	0.006533	2.5
Extreme (0C)	836.5	5.1	0.006073	2.5
Extreme (-10C)	836.5	5.4	0.006440	2.5
Extreme (-20C)	836.5	6.2	0.007419	2.5
Extreme (-30C)	836.5	6.4	0.007687	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	5.7	0.006849	2.5
3.85	836.5	6.9	0.008207	2.5
4.40	836.5	4.8	0.005705	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.3	0.007574	2.5
Extreme (50C)	836.5	6.0	0.007224	2.5
Extreme (40C)	836.5	5.8	0.006888	2.5
Extreme (30C)	836.5	6.7	0.008042	2.5
Extreme (10C)	836.5	4.9	0.005878	2.5
Extreme (0C)	836.5	5.5	0.006615	2.5
Extreme (-10C)	836.5	6.0	0.007149	2.5
Extreme (-20C)	836.5	6.5	0.007766	2.5
Extreme (-30C)	836.5	6.4	0.007701	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	9.6	0.003802	2.5
3.85	2535	9.3	0.003682	2.5
4.40	2535	8.2	0.003226	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.4	0.003690	2.5
Extreme (50C)	2535	8.7	0.003434	2.5
Extreme (40C)	2535	8.5	0.003352	2.5
Extreme (30C)	2535	8.6	0.003403	2.5
Extreme (10C)	2535	8.4	0.003309	2.5
Extreme (0C)	2535	8.7	0.003425	2.5
Extreme (-10C)	2535	8.9	0.003523	2.5
Extreme (-20C)	2535	8.7	0.003441	2.5
Extreme (-30C)	2535	8.3	0.003274	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	6.2	0.002462	2.5
3.85	2535	5.9	0.002334	2.5
4.40	2535	5.8	0.002287	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.7	0.002648	2.5
Extreme (50C)	2535	5.8	0.002270	2.5
Extreme (40C)	2535	5.0	0.001979	2.5
Extreme (30C)	2535	6.6	0.002615	2.5
Extreme (10C)	2535	5.7	0.002264	2.5
Extreme (0C)	2535	5.2	0.002042	2.5
Extreme (-10C)	2535	5.3	0.002089	2.5
Extreme (-20C)	2535	6.3	0.002501	2.5
Extreme (-30C)	2535	5.4	0.002112	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	9.2	0.012963	2.5
3.85	707.5	9.7	0.013741	2.5
4.40	707.5	8.8	0.012447	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.4	0.011937	2.5
Extreme (50C)	707.5	7.6	0.010810	2.5
Extreme (40C)	707.5	7.2	0.010183	2.5
Extreme (30C)	707.5	8.1	0.011514	2.5
Extreme (10C)	707.5	7.9	0.011129	2.5
Extreme (0C)	707.5	9.2	0.012939	2.5
Extreme (-10C)	707.5	7.9	0.011186	2.5
Extreme (-20C)	707.5	9.3	0.013182	2.5
Extreme (-30C)	707.5	7.5	0.010546	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	7.7	0.010846	2.5
3.85	707.5	8.7	0.012330	2.5
4.40	707.5	7.6	0.010804	2.5

**Frequency error vs. Temperature**

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

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

## 10.6 LTE BAND 17

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

#### Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	710.0	9.7	0.013693	2.5
3.85	710.0	8.9	0.012597	2.5
4.40	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	9.3	0.013072	2.5
Extreme (50C)	710.0	8.8	0.012442	2.5
Extreme (40C)	710.0	8.4	0.011791	2.5
Extreme (30C)	710.0	9.3	0.013156	2.5
Extreme (10C)	710.0	9.2	0.012974	2.5
Extreme (0C)	710.0	7.6	0.010707	2.5
Extreme (-10C)	710.0	9.0	0.012678	2.5
Extreme (-20C)	710.0	8.5	0.011978	2.5
Extreme (-30C)	710.0	8.5	0.012038	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	10.5	0.014767	2.5
3.85	710.0	9.4	0.013234	2.5
4.40	710.0	8.6	0.012070	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.5	0.013354	2.5
Extreme (50C)	710.0	9.1	0.012777	2.5
Extreme (40C)	710.0	8.7	0.012238	2.5
Extreme (30C)	710.0	9.0	0.012641	2.5
Extreme (10C)	710.0	8.2	0.011491	2.5
Extreme (0C)	710.0	8.7	0.012265	2.5
Extreme (-10C)	710.0	9.3	0.013167	2.5
Extreme (-20C)	710.0	8.5	0.012011	2.5
Extreme (-30C)	710.0	8.2	0.011616	2.5

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



10.7 LTE BAND 41

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	2593	6.0	0.002319	2.5
3.85	2593	6.6	0.002528	2.5
4.40	2593	7.2	0.002778	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	5.2	0.002020	2.5
Extreme (50C)	2593	7.5	0.002893	2.5
Extreme (40C)	2593	6.3	0.002438	2.5
Extreme (30C)	2593	7.4	0.002847	2.5
Extreme (10C)	2593	7.3	0.002799	2.5
Extreme (0C)	2593	6.4	0.002476	2.5
Extreme (-10C)	2593	5.9	0.002277	2.5
Extreme (-20C)	2593	6.1	0.002343	2.5
Extreme (-30C)	2593	5.3	0.002055	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	8.7	0.003336	2.5
3.85	2593	7.1	0.002740	2.5
4.40	2593	9.2	0.003536	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	8.4	0.003255	2.5
Extreme (50C)	2593	7.8	0.003016	2.5
Extreme (40C)	2593	8.7	0.003366	2.5
Extreme (30C)	2593	8.3	0.003202	2.5
Extreme (10C)	2593	8.3	0.003217	2.5
Extreme (0C)	2593	6.3	0.002444	2.5
Extreme (-10C)	2593	8.9	0.003426	2.5
Extreme (-20C)	2593	8.6	0.003326	2.5
Extreme (-30C)	2593	5.5	0.002111	2.5

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

10.8 LTE BAND 66

QPSK, (20MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.40	1745	7.1	0.003915	2.5
3.85	1745	7.0	0.003812	2.5
4.40	1745	7.6	0.004172	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1745	5.6	0.002985	2.5
Extreme (50C)	1745	7.5	0.004317	2.5
Extreme (40C)	1745	6.5	0.003454	2.5
Extreme (30C)	1745	7.5	0.003974	2.5
Extreme (10C)	1745	8.4	0.004509	2.5
Extreme (0C)	1745	6.4	0.003463	2.5
Extreme (-10C)	1745	6.4	0.003313	2.5
Extreme (-20C)	1745	7.2	0.003852	2.5
Extreme (-30C)	1745	6.9	0.003423	2.5

**16QAM, (20MHz BANDWIDTH)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 66 16QAM, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.40	1745	8.1	0.00462	2.5
3.85	1745	8.0	0.004436	2.5
4.40	1745	9.1	0.005194	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 66 16QAM, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1745	9.6	0.005061	2.5
Extreme (50C)	1745	8.2	0.004447	2.5
Extreme (40C)	1745	8.9	0.004757	2.5
Extreme (30C)	1745	8.6	0.004539	2.5
Extreme (10C)	1745	8.7	0.004636	2.5
Extreme (0C)	1745	7.0	0.003824	2.5
Extreme (-10C)	1745	9.1	0.004745	2.5
Extreme (-20C)	1745	9.1	0.004918	2.5
Extreme (-30C)	1745	6.1	0.003037	2.5

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

## 11. Peak-to-Average Ratio

### 11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

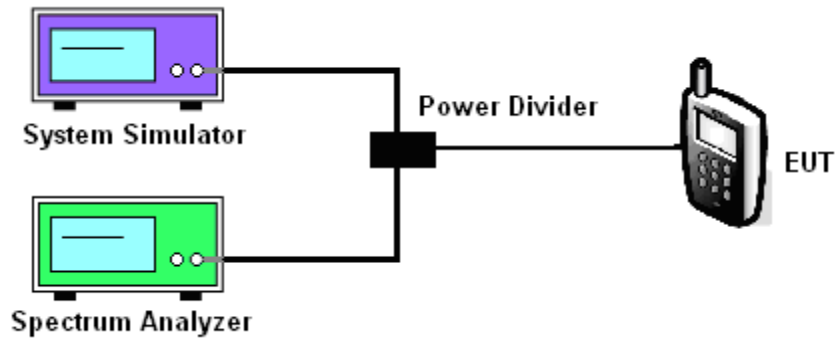
### 11.2 Measuring Instruments

See list of measuring instruments of this test report.

### 11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For LTE operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

### 11.4 Test Setup



### MODES TESTED

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

Test data reference attachment.

----END OF REPORT----