

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

## FCC ID: 2AT9T-3087

**Product:** Mobile Phone

**Trade Mark:** ulefone

**Model Number:** Armor X6 Pro

**Family Model:** N/A

**Report No.:** STR220301003007E

### Prepared for

Shenzhen Ulefone Technology Co., Ltd.  
7A01, Building A, Block 1, Anhongji Tianyao Plaza,  
Longhua District, Shenzhen City, Guangdong Province China

### Prepared by

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



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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	Armor X6 Pro
Family Model	N/A
Model Difference	N/A
FCC ID:	2AT9T-3087
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12,17
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;
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:	FPC Antenna
Antenna gain:	LTE FDD Band 2: 1.3dBi LTE FDD Band 4: 1.4dBi LTE FDD Band 5: 0.6dBi LTE FDD Band 7: 1.7dBi LTE FDD Band 12: 0.3dBi LTE FDD Band 17: 0.3dBi
Power Supply:	DC 3.85V/4000mAh from Battery or DC 5V from USB Port.
Adapter:	Model: NB-0501000UM(UF) Input: 100-240V~50/60Hz 0.2A Output: 5.0V $\overline{\text{---}}$ 1000mA
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)

HW Version	P2N_01
SW Version	Armor_X7_SH2_EEA_V10
** Note1: The High Voltage DC 4.2V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

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

This submittal(s) (test report) is intended for **FCC ID: 2AT9T-3087** 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 12, Band 17.

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.

**1.6 SUMMARY OF TEST RESULTS**

<b>FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03</b>			
<b>FCC Rule</b>	<b>Test Item</b>	<b>Verdict</b>	<b>Remark</b>
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(c), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	



2.1051 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
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Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. No modifications are made to the EUT during all test items.

## 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

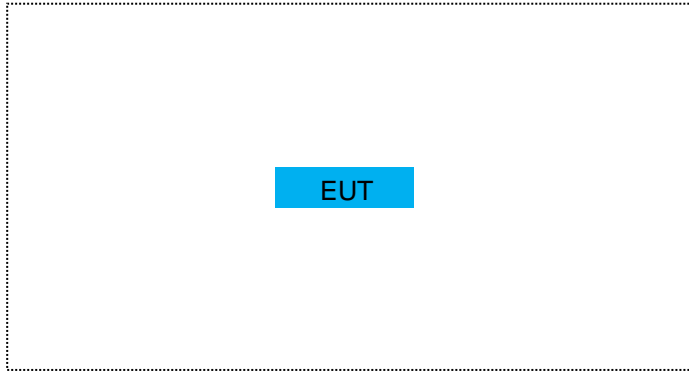
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	Armor X6 Pro	FCC ID: 2AT9T-3087	EUT

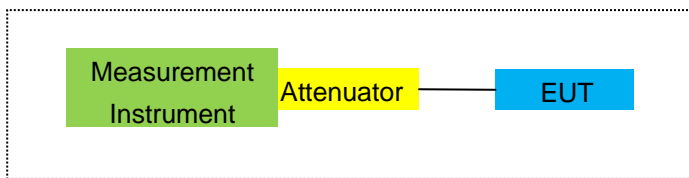
*Note: All the accessories have been used during the test.  
the following "EUT" in setup diagram means EUT system.*

## 2.4 TEST SETUP

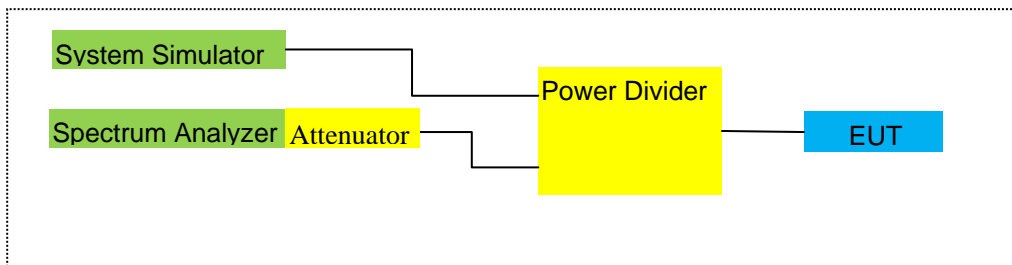
For Radiated Test Cases



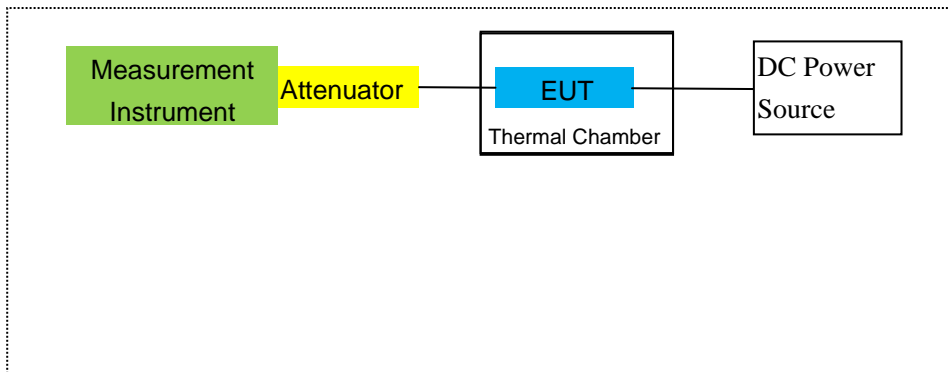
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



### 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	2019.08.28	2020.08.27	1 year
2	Test Receiver	R&S	ESPI	101318	2019.05.13	2020.05.12	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2019.04.15	2020.04.14	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2019.05.13	2020.05.12	1 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2019.05.13	2020.05.12	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2019.04.15	2020.04.14	1 year
7	Amplifier	EM	EM-30180	060538	2019.08.06	2020.08.05	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2019.05.13	2020.05.12	1 year
9	Power Meter	R&S	NRVS	100696	2019.08.06	2020.08.05	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2019.05.13	2020.05.12	1 year
11	Test Cable	N/A	R-01	N/A	2017.04.21	2020.04.20	3 year
12	Test Cable	N/A	R-02	N/A	2017.04.21	2020.04.20	3 year
13	Test Cable	N/A	R-03	N/A	2017.04.21	2020.04.20	3 year
14	Test Receiver	R&S	ESCI	101160	2019.05.13	2020.05.12	1 year
15	LISN	R&S	ENV216	101313	2019.04.15	2020.04.14	1 year
16	LISN	EMCO	3816/2	00042990	2019.05.13	2020.05.12	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2019.05.13	2020.05.12	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2017.04.21	2020.04.20	3 year
19	Test Cable	N/A	C01	N/A	2017.04.21	2020.04.20	3 year
20	Test Cable	N/A	C02	N/A	2017.04.21	2020.04.20	3 year
21	Test Cable	N/A	C03	N/A	2019.04.15	2020.04.14	1 year
22	Attenuator	MCE	24-10-34	BN9258	2019.04.15	2020.04.14	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2019.05.13	2020.05.12	1 year
24	test receiver	R&S	ESCI	a0304218	2019.05.13	2020.05.12	1 year
25	Communication Tester	R&S	CMU200	A0304247	2019.08.06	2020.08.05	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2019.05.13	2020.05.12	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2017.06.06	2020.06.05	3 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2019.08.06	2020.08.05	1 year
29	Communication Tester	R&S	CMW500	148500	2019.05.13	2020.05.12	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

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

### RESULTS

**PASS**

Test data reference attachment.



## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

### LIMITS

The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P[\text{Watts}])$ , where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is  $65 + 10\log_{10}(P) = -35\text{dBm}$  in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

### 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 display line

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

### MODES TESTED

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

### RESULTS

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

### LIMITS

The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P[\text{Watts}])$ , where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is  $65 + 10\log_{10}(P) = -35\text{dBm}$  in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

### 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
- 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 12
- LTE Band 17

### 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(a)(2), §24.232(c) and §27.50 (h)(2), (b)(10), (c)(10), (d)(4)

#### LIMITS:

22.913(a) (2)- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.  
24.232 (c) Mobile and portable stations are limited to 2 watts EIRP.  
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 in the 2500–2570 MHz and 2620–2690 MHz bands. 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

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

#### 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	1/#Midd	1850.7	-0.38	3.76	28.24	24.10	257.040	Horizontal	Pass	
		1880	-0.07	3.91	28.22	24.24	265.461	Horizontal	Pass	
		1909.3	-0.13	3.93	28.20	24.14	259.418	Horizontal	Pass	
3.0MHz Band QPSK	1/#Midd	1851.5	-0.28	3.77	28.23	24.18	261.818	Horizontal	Pass	
		1880	-0.17	3.91	28.24	24.16	260.615	Horizontal	Pass	
		1908.5	0.00	3.94	28.25	24.31	269.774	Horizontal	Pass	
5.0MHz Band QPSK	1/#Midd	1852.5	-0.41	3.77	28.31	24.13	258.821	Horizontal	Pass	
		1880	-0.13	3.91	28.22	24.18	261.818	Horizontal	Pass	
		1907.5	-0.32	3.94	28.20	23.94	247.742	Horizontal	Pass	
10.0MHz Band QPSK	1/#Midd	1855	-0.42	3.79	28.33	24.12	258.226	Horizontal	Pass	
		1880	-0.12	3.95	28.22	24.15	260.016	Horizontal	Pass	
		1905	0.04	3.97	28.19	24.26	266.686	Horizontal	Pass	
15.0MHz Band QPSK	1/#Midd	1857.5	-0.27	3.79	28.34	24.28	267.917	Horizontal	Pass	
		1880	0.16	3.95	28.22	24.42	276.694	Horizontal	Pass	
		1902.5	-0.03	3.97	28.18	24.18	261.818	Horizontal	Pass	
20.0MHz Band QPSK	1/#Midd	1860	-0.36	3.81	28.35	24.18	261.818	Horizontal	Pass	
		1880	-0.19	3.96	28.22	24.07	255.270	Horizontal	Pass	
		1900	0.17	4.00	28.16	24.33	271.019	Horizontal	Pass	
1.4MHz Band QPSK	1/#Midd	1850.7	-0.34	3.76	28.24	24.14	259.418	Vertical	Pass	
		1880	-0.14	3.91	28.22	24.17	261.216	Vertical	Pass	
		1909.3	-0.30	3.93	28.20	23.97	249.459	Vertical	Pass	
3.0MHz Band QPSK	1/#Midd	1851.5	-0.15	3.77	28.23	24.31	269.774	Vertical	Pass	
		1880	-0.11	3.91	28.24	24.22	264.241	Vertical	Pass	
		1908.5	-0.03	3.94	28.25	24.28	267.917	Vertical	Pass	
5.0MHz Band QPSK	1/#Midd	1852.5	-0.42	3.77	28.31	24.12	258.226	Vertical	Pass	
		1880	-0.07	3.91	28.22	24.24	265.461	Vertical	Pass	
		1907.5	-0.33	3.94	28.20	23.93	247.172	Vertical	Pass	
10.0MHz Band	1/#Midd	1855	-0.35	3.79	28.33	24.19	262.422	Vertical	Pass	
		1880	-0.17	3.95	28.22	24.10	257.040	Vertical	Pass	

QPSK		1905	-0.32	3.97	28.19	23.90	245.471	Vertical	Pass
15.0MHz Band QPSK	1/#Midd	1857.5	-0.37	3.79	28.34	24.18	261.818	Vertical	Pass
		1880	-0.15	3.95	28.22	24.12	258.226	Vertical	Pass
		1902.5	0.05	3.97	28.18	24.26	266.686	Vertical	Pass
20.0MHz Band QPSK	1/#Midd	1860	-0.33	3.81	28.35	24.21	263.633	Vertical	Pass
		1880	-0.12	3.96	28.22	24.14	259.418	Vertical	Pass
		1900	0.27	4.00	28.16	24.43	277.332	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	1/#Midd	1850.7	-1.65	3.76	28.24	22.83	191.867	Horizontal	Pass
		1880	-1.56	3.91	28.22	22.75	188.365	Horizontal	Pass
		1909.3	-1.54	3.93	28.20	22.73	187.499	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Midd	1851.5	-1.83	3.77	28.23	22.63	183.231	Horizontal	Pass
		1880	-1.80	3.91	28.24	22.53	179.061	Horizontal	Pass
		1908.5	-1.80	3.94	28.25	22.51	178.238	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Midd	1852.5	-1.82	3.77	28.31	22.72	187.068	Horizontal	Pass
		1880	-1.64	3.91	28.22	22.67	184.927	Horizontal	Pass
		1907.5	-1.54	3.94	28.20	22.72	187.068	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Midd	1855	-1.68	3.79	28.33	22.86	193.197	Horizontal	Pass
		1880	-1.39	3.95	28.22	22.88	194.089	Horizontal	Pass
		1905	-1.30	3.97	28.19	22.92	195.884	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Midd	1857.5	-1.77	3.79	28.34	22.78	189.671	Horizontal	Pass
		1880	-1.78	3.95	28.22	22.49	177.419	Horizontal	Pass
		1902.5	-1.50	3.97	28.18	22.71	186.638	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Midd	1860	-1.83	3.81	28.35	22.71	186.638	Horizontal	Pass
		1880	-1.50	3.96	28.22	22.76	188.799	Horizontal	Pass
		1900	-1.49	4.00	28.16	22.67	184.927	Horizontal	Pass
1.4MHz Band 16	1/#Midd	1850.7	-1.72	3.76	28.24	22.76	188.799	Vertical	Pass
		1880	-1.72	3.91	28.22	22.59	181.552	Vertical	Pass

QAM		1909.3	-1.64	3.93	28.20	22.63	183.231	Vertical	Pass
3.0MHz Band 16 QAM	1/#Midd	1851.5	-1.76	3.77	28.23	22.70	186.209	Vertical	Pass
		1880	-1.84	3.91	28.24	22.49	177.419	Vertical	Pass
		1908.5	-1.62	3.94	28.25	22.69	185.780	Vertical	Pass
5.0MHz Band 16 QAM	1/#Midd	1852.5	-1.83	3.77	28.31	22.71	186.638	Vertical	Pass
		1880	-1.66	3.91	28.22	22.65	184.077	Vertical	Pass
		1907.5	-1.56	3.94	28.20	22.70	186.209	Vertical	Pass
10.0MHz z Band 16 QAM	1/#Midd	1855	-1.85	3.79	28.33	22.69	185.780	Vertical	Pass
		1880	-1.89	3.95	28.22	22.38	172.982	Vertical	Pass
		1905	-1.62	3.97	28.19	22.60	181.970	Vertical	Pass
15.0MHz z Band 16 QAM	1/#Midd	1857.5	-2.02	3.79	28.34	22.53	179.061	Vertical	Pass
		1880	-1.85	3.95	28.22	22.42	174.582	Vertical	Pass
		1902.5	-1.73	3.97	28.18	22.48	177.011	Vertical	Pass
20.0MHz z Band 16 QAM	1/#Midd	1860	-1.97	3.81	28.35	22.57	180.717	Vertical	Pass
		1880	-1.19	3.96	28.22	23.07	202.768	Vertical	Pass
		1900	-1.51	4.00	28.16	22.65	184.077	Vertical	Pass

Note:

SG Level= Signal generator output

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

### 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	1/#Midd	1710.7	-0.87	3.12	27.58		
		1732.5	-0.97	3.27	27.61	23.37	217.270	Horizontal	Pass	
		1754.3	-0.78	3.29	27.63	23.56	226.986	Horizontal	Pass	
3.0MHz Band QPSK	1/#Midd	1711.5	-1.68	3.13	27.61	22.80	190.546	Horizontal	Pass	
		1732.5	-1.66	3.27	27.61	22.68	185.353	Horizontal	Pass	
		1753.5	-1.26	3.30	27.62	23.06	202.302	Horizontal	Pass	
5.0MHz Band QPSK	1/#Midd	1712.5	-1.09	3.13	27.63	23.41	219.280	Horizontal	Pass	
		1732.5	-2.17	3.27	27.61	22.17	164.816	Horizontal	Pass	
		1752.5	-0.58	3.30	27.60	23.72	235.505	Horizontal	Pass	

10.0MHz z Band QPSK	1/#Midd	1715	-0.80	3.15	27.64	23.69	233.884	Horizontal	Pass
		1732.5	-0.50	3.31	27.61	23.80	239.883	Horizontal	Pass
		1750	-0.41	3.33	27.59	23.84	242.103	Horizontal	Pass
15.0MHz z Band QPSK	1/#Midd	1717.5	-1.19	3.15	27.65	23.31	214.289	Horizontal	Pass
		1732.5	-1.25	3.31	27.61	23.05	201.837	Horizontal	Pass
		1747.5	-0.89	3.33	27.57	23.35	216.272	Horizontal	Pass
20.0MHz z Band QPSK	1/#Midd	1720	-0.98	3.17	27.66	23.51	224.388	Horizontal	Pass
		1732.5	-0.65	3.32	27.61	23.64	231.206	Horizontal	Pass
		1745	-1.09	3.36	27.56	23.11	204.644	Horizontal	Pass
1.4MHz Band QPSK	1/#Midd	1710.7	-1.26	3.12	27.58	23.20	208.930	Vertical	Pass
		1732.5	-1.37	3.27	27.61	22.97	198.153	Vertical	Pass
		1754.3	-1.27	3.29	27.63	23.07	202.768	Vertical	Pass
3.0MHz Band QPSK	1/#Midd	1711.5	-0.67	3.13	27.61	23.81	240.436	Vertical	Pass
		1732.5	-0.53	3.27	27.61	23.81	240.436	Vertical	Pass
		1753.5	-0.79	3.30	27.62	23.53	225.424	Vertical	Pass
5.0MHz Band QPSK	1/#Midd	1712.5	-2.28	3.13	27.63	22.22	166.725	Vertical	Pass
		1732.5	-1.81	3.27	27.61	22.53	179.061	Vertical	Pass
		1752.5	-1.62	3.30	27.60	22.68	185.353	Vertical	Pass
10.0MHz z Band QPSK	1/#Midd	1715	-1.57	3.15	27.64	22.92	195.884	Vertical	Pass
		1732.5	-1.25	3.31	27.61	23.05	201.837	Vertical	Pass
		1750	-0.77	3.33	27.59	23.49	223.357	Vertical	Pass
15.0MHz z Band QPSK	1/#Midd	1717.5	-1.07	3.15	27.65	23.43	220.293	Vertical	Pass
		1732.5	-1.16	3.31	27.61	23.14	206.063	Vertical	Pass
		1747.5	-0.80	3.33	27.57	23.44	220.800	Vertical	Pass
20.0MHz z Band QPSK	1/#Midd	1720	-1.30	3.17	27.66	23.19	208.449	Vertical	Pass
		1732.5	-0.44	3.32	27.61	23.85	242.661	Vertical	Pass
		1745	-1.01	3.36	27.56	23.19	208.449	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						Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Average		
			(dBm)	(dBm)	(dB)	Average	Average			
			(dBm)	(mW)						



1.4MHz Band 16 QAM	1/#Midd	1710.7	-1.78	3.12	27.58	22.68	185.353	Horizontal	Pass
		1732.5	-1.96	3.27	27.61	22.38	172.982	Horizontal	Pass
		1754.3	-2.28	3.29	27.63	22.06	160.694	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Midd	1711.5	-3.11	3.13	27.61	21.37	137.088	Horizontal	Pass
		1732.5	-3.15	3.27	27.61	21.19	131.522	Horizontal	Pass
		1753.5	-2.70	3.30	27.62	21.62	145.211	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Midd	1712.5	-3.47	3.13	27.63	21.03	126.765	Horizontal	Pass
		1732.5	-3.31	3.27	27.61	21.03	126.765	Horizontal	Pass
		1752.5	-1.49	3.30	27.60	22.81	190.985	Horizontal	Pass
10.0MHz z Band 16 QAM	1/#Midd	1715	-2.33	3.15	27.64	22.16	164.437	Horizontal	Pass
		1732.5	-2.38	3.31	27.61	21.92	155.597	Horizontal	Pass
		1750	-2.56	3.33	27.59	21.70	147.911	Horizontal	Pass
15.0MHz z Band 16 QAM	1/#Midd	1717.5	-2.24	3.15	27.65	22.26	168.267	Horizontal	Pass
		1732.5	-1.55	3.31	27.61	22.75	188.365	Horizontal	Pass
		1747.5	-1.57	3.33	27.57	22.67	184.927	Horizontal	Pass
20.0MHz z Band 16 QAM	1/#Midd	1720	-2.55	3.17	27.66	21.94	156.315	Horizontal	Pass
		1732.5	-1.95	3.32	27.61	22.34	171.396	Horizontal	Pass
		1745	-2.29	3.36	27.56	21.91	155.239	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Midd	1710.7	-1.84	3.12	27.58	22.62	182.810	Vertical	Pass
		1732.5	-2.05	3.27	27.61	22.29	169.434	Vertical	Pass
		1754.3	-2.14	3.29	27.63	22.20	165.959	Vertical	Pass
3.0MHz Band 16 QAM	1/#Midd	1711.5	-2.45	3.13	27.61	22.03	159.588	Vertical	Pass
		1732.5	-2.91	3.27	27.61	21.43	138.995	Vertical	Pass
		1753.5	-2.40	3.30	27.62	21.92	155.597	Vertical	Pass
5.0MHz Band 16 QAM	1/#Midd	1712.5	-3.36	3.13	27.63	21.14	130.017	Vertical	Pass
		1732.5	-2.45	3.27	27.61	21.89	154.525	Vertical	Pass
		1752.5	-2.62	3.30	27.60	21.68	147.231	Vertical	Pass
10.0MHz z Band 16 QAM	1/#Midd	1715	-1.90	3.15	27.64	22.59	181.552	Vertical	Pass
		1732.5	-2.01	3.31	27.61	22.29	169.434	Vertical	Pass
		1750	-1.57	3.33	27.59	22.69	185.780	Vertical	Pass
15.0MHz z Band 16 QAM	1/#Midd	1717.5	-2.27	3.15	27.65	22.23	167.109	Vertical	Pass
		1732.5	-2.58	3.31	27.61	21.72	148.594	Vertical	Pass
		1747.5	-2.00	3.33	27.57	22.24	167.494	Vertical	Pass
20.0MHz z Band 16 QAM	1/#Midd	1720	-1.95	3.17	27.66	22.54	179.473	Vertical	Pass
		1732.5	-2.09	3.32	27.61	22.20	165.959	Vertical	Pass
		1745	-1.31	3.36	27.56	22.89	194.536	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	Freque ncy	Result							Polarizati on Of Max. ERP	Conclu sion
			SG Level	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction  (dB)	Max. ERP	Max. ERP			
			(dBm)				Averag e	Averag e			
							(dBm)	(mW)			
1.4MHz Band QPSK	1/#M id	824.7	8.35	2.01	19.68	2.15	23.87	243.781	Horizontal	Pass	
		836.5	8.20	2.01	19.77	2.15	23.81	240.436	Horizontal	Pass	
		848.3	7.99	2.02	19.82	2.15	23.64	231.206	Horizontal	Pass	
3.0MHz Band QPSK	1/#M id	825.5	8.23	2.01	19.70	2.15	23.77	238.232	Horizontal	Pass	
		836.5	7.61	2.01	19.77	2.15	23.22	209.894	Horizontal	Pass	
		847.5	8.38	2.02	19.81	2.15	24.02	252.348	Horizontal	Pass	
5.0MHz Band QPSK	1/#M id	826.5	8.49	2.01	19.71	2.15	24.04	253.513	Horizontal	Pass	
		836.5	7.93	2.01	19.77	2.15	23.54	225.944	Horizontal	Pass	
		846.5	8.24	2.02	19.79	2.15	23.86	243.220	Horizontal	Pass	
10.0MH z Band QPSK	1/#M id	829	8.02	2.01	19.73	2.15	23.59	228.560	Horizontal	Pass	
		836.5	7.93	2.01	19.77	2.15	23.54	225.944	Horizontal	Pass	
		844	7.81	2.02	19.78	2.15	23.42	219.786	Horizontal	Pass	
1.4MHz Band QPSK	1/#M id	824.7	8.49	2.01	19.68	2.15	24.01	251.768	Vertical	Pass	
		836.5	8.12	2.01	19.77	2.15	23.73	236.048	Vertical	Pass	
		848.3	7.86	2.02	19.82	2.15	23.51	224.388	Vertical	Pass	
3.0MHz Band QPSK	1/#M id	825.5	7.75	2.01	19.70	2.15	23.29	213.304	Vertical	Pass	
		836.5	8.25	2.01	19.77	2.15	23.86	243.220	Vertical	Pass	
		847.5	7.87	2.02	19.81	2.15	23.51	224.388	Vertical	Pass	
5.0MHz Band QPSK	1/#M id	826.5	8.36	2.01	19.71	2.15	23.91	246.037	Vertical	Pass	
		836.5	7.30	2.01	19.77	2.15	22.91	195.434	Vertical	Pass	
		846.5	8.41	2.02	19.79	2.15	24.03	252.930	Vertical	Pass	
10.0MH z Band QPSK	1/#M id	829	8.49	2.01	19.73	2.15	24.06	254.683	Vertical	Pass	
		836.5	7.45	2.01	19.77	2.15	23.06	202.302	Vertical	Pass	
		844	8.10	2.02	19.78	2.15	23.71	234.963	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	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. ERP	Max. ERP			
			(dBm)				Averag e	Averag e			
							(dBm)	(mW)			
1.4MHz Band 16 QAM	1/#M id	824.7	6.20	2.01	19.68	2.15	21.72	148.594	Horizontal	Pass	
		836.5	6.60	2.01	19.77	2.15	22.21	166.341	Horizontal	Pass	
		848.3	5.88	2.02	19.82	2.15	21.53	142.233	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#M id	825.5	6.50	2.01	19.70	2.15	22.04	159.956	Horizontal	Pass	
		836.5	6.01	2.01	19.77	2.15	21.62	145.211	Horizontal	Pass	
		847.5	5.56	2.02	19.81	2.15	21.20	131.826	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#M id	826.5	6.34	2.01	19.71	2.15	21.89	154.525	Horizontal	Pass	
		836.5	6.46	2.01	19.77	2.15	22.07	161.065	Horizontal	Pass	
		846.5	6.20	2.02	19.79	2.15	21.82	152.055	Horizontal	Pass	
10.0MH z Band 16 QAM	1/#M id	829	6.49	2.01	19.73	2.15	22.06	160.694	Horizontal	Pass	
		836.5	6.01	2.01	19.77	2.15	21.62	145.211	Horizontal	Pass	
		844	6.15	2.02	19.78	2.15	21.76	149.968	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#M id	824.7	6.67	2.01	19.68	2.15	22.19	165.577	Vertical	Pass	
		836.5	5.94	2.01	19.77	2.15	21.55	142.889	Vertical	Pass	
		848.3	5.93	2.02	19.82	2.15	21.58	143.880	Vertical	Pass	
3.0MHz Band 16 QAM	1/#M id	825.5	5.90	2.01	19.70	2.15	21.44	139.316	Vertical	Pass	
		836.5	6.45	2.01	19.77	2.15	22.06	160.694	Vertical	Pass	
		847.5	5.55	2.02	19.81	2.15	21.19	131.522	Vertical	Pass	
5.0MHz Band 16 QAM	1/#M id	826.5	5.79	2.01	19.71	2.15	21.34	136.144	Vertical	Pass	
		836.5	6.53	2.01	19.77	2.15	22.14	163.682	Vertical	Pass	
		846.5	6.55	2.02	19.79	2.15	22.17	164.816	Vertical	Pass	
10.0MH z Band 16 QAM	1/#M id	829	6.28	2.01	19.73	2.15	21.85	153.109	Vertical	Pass	
		836.5	6.67	2.01	19.77	2.15	22.28	169.044	Vertical	Pass	
		844	6.10	2.02	19.78	2.15	21.71	148.252	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	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)	Average	Average			
			(dBm)	(mW)						
5.0MHz Band QPSK	1/#M id	2502.5	0.34	4.54	27.75	23.55	226.464	Horizontal	Pass	
		2535	0.26	4.69	27.72	23.29	213.304	Horizontal	Pass	
		2567.5	0.12	4.71	27.71	23.12	205.116	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#M id	2505	-0.23	4.55	27.76	22.98	198.609	Horizontal	Pass	
		2535	0.20	4.69	27.72	23.23	210.378	Horizontal	Pass	
		2565	0.06	4.72	27.70	23.04	201.372	Horizontal	Pass	
10.0MHz z Band QPSK	1/#M id	2507.5	-0.14	4.55	27.77	23.08	203.236	Horizontal	Pass	
		2535	-0.03	4.69	27.72	23.00	199.526	Horizontal	Pass	
		2562.5	-0.02	4.72	27.69	22.95	197.242	Horizontal	Pass	
10.0MHz z Band 16 QAM	1/#M id	2510	0.08	4.57	27.78	23.29	213.304	Horizontal	Pass	
		2535	-0.23	4.73	27.72	22.76	188.799	Horizontal	Pass	
		2560	0.55	4.75	27.68	23.48	222.844	Horizontal	Pass	
15.0MHz z Band QPSK	1/#M id	2502.5	-0.16	4.54	27.75	23.05	201.837	Vertical	Pass	
		2535	0.40	4.69	27.72	23.43	220.293	Vertical	Pass	
		2567.5	-0.15	4.71	27.71	22.85	192.752	Vertical	Pass	
15.0MHz z Band 16 QAM	1/#M id	2505	-0.08	4.55	27.76	23.13	205.589	Vertical	Pass	
		2535	0.44	4.69	27.72	23.47	222.331	Vertical	Pass	
		2565	-0.23	4.72	27.70	22.75	188.365	Vertical	Pass	
20.0MHz z Band QPSK	1/#M id	2507.5	0.26	4.55	27.77	23.48	222.844	Vertical	Pass	
		2535	-0.16	4.69	27.72	22.87	193.642	Vertical	Pass	
		2562.5	0.23	4.72	27.69	23.20	208.930	Vertical	Pass	
20.0MHz z Band 16 QAM	1/#M id	2510	0.38	4.57	27.78	23.59	228.560	Vertical	Pass	
		2535	0.55	4.73	27.72	23.54	225.944	Vertical	Pass	
		2560	0.42	4.75	27.68	23.35	216.272	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 7										
Mode	RB/ RB SIZE	Frequency	Result						Polarizati on Of Max. ERP	Conclusion
			SG Level	Cabl e	Antenn a Gain	Max. EIRP	Max. EIRP	Average		
			(dBm )	Loss (dBm )	(dB)	(dBm)	(mW)			
5.0MHz Band QPSK	1/#M id	2502.5	-1.66	4.54	27.75	21.55	142.889	Horizontal	Pass	
		2535	-0.93	4.69	27.72	22.10	162.181	Horizontal	Pass	
		2567.5	-0.68	4.71	27.71	22.32	170.608	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#M id	2505	-1.27	4.55	27.76	21.94	156.315	Horizontal	Pass	
		2535	-0.71	4.69	27.72	22.32	170.608	Horizontal	Pass	
		2565	-1.33	4.72	27.70	21.65	146.218	Horizontal	Pass	
10.0MH z Band QPSK	1/#M id	2507.5	-1.44	4.55	27.77	21.78	150.661	Horizontal	Pass	
		2535	-0.81	4.69	27.72	22.22	166.725	Horizontal	Pass	
		2562.5	-0.84	4.72	27.69	22.13	163.305	Horizontal	Pass	
10.0MH z Band 16 QAM	1/#M id	2510	-1.35	4.57	27.78	21.86	153.462	Horizontal	Pass	
		2535	-1.26	4.73	27.72	21.73	148.936	Horizontal	Pass	
		2560	-0.87	4.75	27.68	22.06	160.694	Horizontal	Pass	
15.0MH z Band QPSK	1/#M id	2502.5	-1.44	4.54	27.75	21.77	150.314	Vertical	Pass	
		2535	-1.65	4.69	27.72	21.38	137.404	Vertical	Pass	
		2567.5	-1.55	4.71	27.71	21.45	139.637	Vertical	Pass	
15.0MH z Band 16 QAM	1/#M id	2505	-1.62	4.55	27.76	21.59	144.212	Vertical	Pass	
		2535	-1.32	4.69	27.72	21.71	148.252	Vertical	Pass	
		2565	-0.80	4.72	27.70	22.18	165.196	Vertical	Pass	
20.0MH z Band QPSK	1/#M id	2507.5	-1.69	4.55	27.77	21.53	142.233	Vertical	Pass	
		2535	-1.27	4.69	27.72	21.76	149.968	Vertical	Pass	
		2562.5	-1.33	4.72	27.69	21.64	145.881	Vertical	Pass	
20.0MH z Band 16 QAM	1/#M id	2510	-0.93	4.57	27.78	22.28	169.044	Vertical	Pass	
		2535	-0.65	4.73	27.72	22.34	171.396	Vertical	Pass	
		2560	-1.05	4.75	27.68	21.88	154.170	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 12

Radiated Power (ERP) for Band 12											
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 QPSK	1/#M id	699.7	6.45	1.91	19.21	2.15	21.60	144.544	Vertical	Pass	
		707.5	6.11	1.91	19.26	2.15	21.31	135.207	Vertical	Pass	
		715.3	5.39	1.93	19.34	2.15	20.65	116.145	Vertical	Pass	
3.0MHz Band QPSK	1/#M id	700.5	5.93	1.91	19.21	2.15	21.08	128.233	Vertical	Pass	
		707.5	5.70	1.91	19.26	2.15	20.90	123.027	Vertical	Pass	
		714.5	5.93	1.93	19.34	2.15	21.19	131.522	Vertical	Pass	
5.0MHz Band QPSK	1/#M id	701.5	5.99	1.91	19.23	2.15	21.16	130.617	Vertical	Pass	
		707.5	6.03	1.91	19.26	2.15	21.23	132.739	Vertical	Pass	
		713.5	5.45	1.92	19.33	2.15	20.71	117.761	Vertical	Pass	
10.0MH z Band QPSK	1/#M id	704	5.54	1.91	19.25	2.15	20.73	118.304	Vertical	Pass	
		707.5	5.87	1.91	19.26	2.15	21.07	127.938	Vertical	Pass	
		711	5.85	1.92	19.32	2.15	21.10	128.825	Vertical	Pass	
1.4MHz Band QPSK	1/#M id	699.7	6.13	1.91	19.21	2.15	21.28	134.276	Horizontal	Pass	
		707.5	5.47	1.91	19.26	2.15	20.67	116.681	Horizontal	Pass	
		715.3	5.67	1.93	19.34	2.15	20.93	123.880	Horizontal	Pass	
3.0MHz Band QPSK	1/#M id	700.5	5.71	1.91	19.21	2.15	20.86	121.899	Horizontal	Pass	
		707.5	5.72	1.91	19.26	2.15	20.92	123.595	Horizontal	Pass	
		714.5	6.38	1.93	19.34	2.15	21.64	145.881	Horizontal	Pass	
5.0MHz Band QPSK	1/#M id	701.5	6.36	1.91	19.23	2.15	21.53	142.233	Horizontal	Pass	
		707.5	6.46	1.91	19.26	2.15	21.66	146.555	Horizontal	Pass	
		713.5	5.95	1.92	19.33	2.15	21.21	132.130	Horizontal	Pass	
10.0MH z Band QPSK	1/#M id	704	6.82	1.91	19.25	2.15	22.01	158.855	Horizontal	Pass	
		707.5	5.66	1.91	19.26	2.15	20.86	121.899	Horizontal	Pass	
		711	5.86	1.92	19.32	2.15	21.11	129.122	Horizontal	Pass	

Radiated Power (EIRP) for Band 12											
Mode	RB/ RB SIZE	Freque ncy	Result							Polarizati on Of Max. ERP	Conclu sion
			SG Level	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction  (dB)	Max. ERP	Max. ERP			
			(dBm)				Averag e	Averag e			
							(dBm)	(mW)			
1.4MHz Band 16 QAM	1/#M id	699.7	6.23	1.91	19.21	2.15	21.38	137.404	Vertical	Pass	
		707.5	5.97	1.91	19.26	2.15	21.17	130.918	Vertical	Pass	
		715.3	5.40	1.93	19.34	2.15	20.66	116.413	Vertical	Pass	
3.0MHz Band 16 QAM	1/#M id	700.5	6.17	1.91	19.21	2.15	21.32	135.519	Vertical	Pass	
		707.5	6.36	1.91	19.26	2.15	21.56	143.219	Vertical	Pass	
		714.5	6.77	1.93	19.34	2.15	22.03	159.588	Vertical	Pass	
5.0MHz Band 16 QAM	1/#M id	701.5	6.68	1.91	19.23	2.15	21.85	153.109	Vertical	Pass	
		707.5	6.43	1.91	19.26	2.15	21.63	145.546	Vertical	Pass	
		713.5	6.46	1.92	19.33	2.15	21.72	148.594	Vertical	Pass	
10.0MH z Band 16 QAM	1/#M id	704	6.99	1.91	19.25	2.15	22.18	165.196	Vertical	Pass	
		707.5	6.00	1.91	19.26	2.15	21.20	131.826	Vertical	Pass	
		711	6.66	1.92	19.32	2.15	21.91	155.239	Vertical	Pass	
1.4MHz Band 16 QAM	1/#M id	699.7	5.77	1.91	19.21	2.15	20.92	123.595	Horizontal	Pass	
		707.5	6.00	1.91	19.26	2.15	21.20	131.826	Horizontal	Pass	
		715.3	6.54	1.93	19.34	2.15	21.80	151.356	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#M id	700.5	6.75	1.91	19.21	2.15	21.90	154.882	Horizontal	Pass	
		707.5	7.04	1.91	19.26	2.15	22.24	167.494	Horizontal	Pass	
		714.5	6.64	1.93	19.34	2.15	21.90	154.882	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#M id	701.5	6.73	1.91	19.23	2.15	21.90	154.882	Horizontal	Pass	
		707.5	6.50	1.91	19.26	2.15	21.70	147.911	Horizontal	Pass	
		713.5	6.50	1.92	19.33	2.15	21.76	149.968	Horizontal	Pass	
10.0MH z Band 16 QAM	1/#M id	704	7.10	1.91	19.25	2.15	22.29	169.434	Horizontal	Pass	
		707.5	6.68	1.91	19.26	2.15	21.88	154.170	Horizontal	Pass	
		711	6.41	1.92	19.32	2.15	21.66	146.555	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17											
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)			
			5.0MHz Band QPSK	1/#M id	706.5	8.05	1.91	19.23	2.15		
		710	8.21	1.91	19.26	2.15	23.41	219.280	Vertical	Pass	
		713.5	8.31	1.92	19.33	2.15	23.57	227.510	Vertical	Pass	
10.0MH z Band QPSK	1/#M id	709	7.15	1.91	19.25	2.15	22.34	171.396	Vertical	Pass	
		710	7.51	1.91	19.26	2.15	22.71	186.638	Vertical	Pass	
		711	8.19	1.92	19.32	2.15	23.44	220.800	Vertical	Pass	
5.0MHz Band QPSK	1/#M id	706.5	7.73	1.91	19.23	2.15	22.90	194.984	Horizontal	Pass	
		710	8.18	1.91	19.26	2.15	23.38	217.771	Horizontal	Pass	
		713.5	7.67	1.92	19.33	2.15	22.93	196.336	Horizontal	Pass	
10.0MH z Band QPSK	1/#M id	709	7.43	1.91	19.25	2.15	22.62	182.810	Horizontal	Pass	
		710	8.06	1.91	19.26	2.15	23.26	211.836	Horizontal	Pass	
		711	8.51	1.92	19.32	2.15	23.76	237.684	Horizontal	Pass	



Radiated Power (ERP) for Band 17											
Mode	RB/ RB SIZE	Freque ncy	Result							Polarizati on Of Max. ERP	Conclu sion
			SG Level	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. ERP	Max. ERP			
			(dBm)				Averag e	Averag e			
							(dBm)	(mW)			
5.0MHz Band 16 QAM	1/#M id	706.5	7.21	1.91	19.23	2.15	22.38	172.982	Vertical	Pass	
		710	7.63	1.91	19.26	2.15	22.83	191.867	Vertical	Pass	
		713.5	7.44	1.92	19.33	2.15	22.70	186.209	Vertical	Pass	
10.0MHz z Band 16 QAM	1/#M id	709	7.25	1.91	19.25	2.15	22.44	175.388	Vertical	Pass	
		710	6.87	1.91	19.26	2.15	22.07	161.065	Vertical	Pass	
		711	6.98	1.92	19.32	2.15	22.23	167.109	Vertical	Pass	
5.0MHz Band 16 QAM	1/#M id	706.5	7.17	1.91	19.23	2.15	22.34	171.396	Horizontal	Pass	
		710	7.66	1.91	19.26	2.15	22.86	193.197	Horizontal	Pass	
		713.5	7.84	1.92	19.33	2.15	23.10	204.174	Horizontal	Pass	
10.0MHz z Band 16 QAM	1/#M id	709	7.04	1.91	19.25	2.15	22.23	167.109	Horizontal	Pass	
		710	7.99	1.91	19.26	2.15	23.19	208.449	Horizontal	Pass	
		711	7.15	1.92	19.32	2.15	22.40	173.780	Horizontal	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: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

### LIMIT

For Band 7, the minimum permissible attenuation level of any spurious emission is  $55 + \log_{10}(P)$  [Watts]).

The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P)$  [Watts]), where P is the transmitter power in Watts.

### 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 12  
LTE Band 17

**RESULTS**

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-52.37	4.04	33.51	-22.90	-13	-9.90	Horizontal
3701.4	-50.60	4.04	33.51	-21.13	-13	-8.13	Vertical
5552.1	-51.85	5.24	35.84	-21.25	-13	-8.25	Vertical
5552.1	-48.17	5.24	35.84	-17.57	-13	-4.57	Horizontal
151.8	-64.57	1.43	16.02	-49.98	-13	-36.98	Vertical
253.4	-72.11	1.30	17.99	-55.42	-13	-42.42	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-55.05	4.04	33.56	-25.53	-13	-12.53	Horizontal
3760.0	-49.36	4.04	33.56	-19.84	-13	-6.84	Vertical
5640.0	-51.19	5.24	35.91	-20.52	-13	-7.52	Vertical
5640.0	-50.03	5.24	35.91	-19.36	-13	-6.36	Horizontal
203.2	-67.14	1.62	16.97	-51.78	-13	-38.78	Vertical
198.2	-63.94	1.74	15.98	-49.71	-13	-36.71	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-54.70	4.04	34.00	-24.74	-13	-11.74	Horizontal
3818.6	-51.12	4.04	34.00	-21.16	-13	-8.16	Vertical
5727.9	-52.05	5.24	36.04	-21.25	-13	-8.25	Vertical
5727.9	-52.10	5.24	36.04	-21.30	-13	-8.30	Horizontal
138.2	-62.08	1.42	17.29	-46.21	-13	-33.21	Vertical
165.6	-61.91	1.50	17.90	-45.51	-13	-32.51	Horizontal

**16QAM 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	-56.89	4.04	33.51	-27.42	-13	-14.42	Horizontal
3701.4	-56.20	4.04	33.51	-26.73	-13	-13.73	Vertical
5552.1	-55.12	5.24	35.84	-24.52	-13	-11.52	Vertical
5552.1	-49.45	5.24	35.84	-18.85	-13	-5.85	Horizontal
256.5	-50.96	1.67	15.22	-37.41	-13	-24.41	Vertical
100.4	-58.74	1.78	17.87	-42.65	-13	-29.65	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.11	4.04	33.56	-22.59	-13	-9.59	Horizontal
3760.0	-55.54	4.04	33.56	-26.02	-13	-13.02	Vertical
5640.0	-53.24	5.24	35.91	-22.57	-13	-9.57	Vertical
5640.0	-55.13	5.24	35.91	-24.46	-13	-11.46	Horizontal
81.8	-49.76	1.78	16.56	-34.98	-13	-21.98	Vertical

123.7	-58.36	1.31	16.23	-43.44	-13	-30.44	Horizontal
<b>Test Results for High Channel 1909.3MHz</b>							
3818.6	-56.67	4.04	34.00	-26.71	-13	-13.71	Horizontal
3818.6	-57.29	4.04	34.00	-27.33	-13	-14.33	Vertical
5727.9	-56.14	5.24	36.04	-25.34	-13	-12.34	Vertical
5727.9	-52.41	5.24	36.04	-21.61	-13	-8.61	Horizontal
122.2	-60.39	1.70	16.73	-45.36	-13	-32.36	Vertical
275.4	-65.62	1.64	15.37	-51.89	-13	-38.89	Horizontal

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

<b>Test Results for Low Channel 1860MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-50.77	4.07	33.54	-21.30	-13	-8.30	Horizontal
3720.0	-52.03	4.07	33.54	-22.56	-13	-9.56	Vertical
5580.0	-46.75	5.28	35.86	-16.17	-13	-3.17	Vertical
5580.0	-47.74	5.28	35.86	-17.16	-13	-4.16	Horizontal
204.4	-49.53	1.58	16.89	-34.21	-13	-21.21	Vertical
119.1	-60.36	1.76	17.26	-44.86	-13	-31.86	Horizontal
<b>Test Results for Mid Channel 1880MHz</b>							
3760.0	-50.78	4.04	33.56	-21.26	-13	-8.26	Horizontal
3760.0	-53.30	4.04	33.56	-23.78	-13	-10.78	Vertical
5640.0	-49.67	5.24	35.91	-19.00	-13	-6.00	Vertical
5640.0	-52.39	5.24	35.91	-21.72	-13	-8.72	Horizontal
175.5	-66.71	1.46	16.27	-51.90	-13	-38.90	Vertical
252.8	-52.37	1.59	15.15	-38.81	-13	-25.81	Horizontal
<b>Test Results for High Channel 1900MHz</b>							
3800.0	-47.92	4.04	34.00	-17.96	-13	-4.96	Horizontal
3800.0	-47.21	4.04	34.00	-17.25	-13	-4.25	Vertical
5700.0	-50.19	5.24	36.04	-19.39	-13	-6.39	Vertical
5700.0	-51.43	5.24	36.04	-20.63	-13	-7.63	Horizontal
85.0	-71.21	1.36	17.39	-55.17	-13	-42.17	Vertical
95.4	-63.48	1.66	15.39	-49.75	-13	-36.75	Horizontal

**16QAM EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)**

<b>Test Results for Low Channel 1860MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-51.70	4.07	33.54	-22.23	-13	-9.23	Horizontal
3720.0	-51.95	4.07	33.54	-22.48	-13	-9.48	Vertical
5580.0	-56.13	5.28	35.86	-25.55	-13	-12.55	Vertical
5580.0	-54.47	5.28	35.86	-23.89	-13	-10.89	Horizontal
212.0	-49.67	1.50	17.65	-33.52	-13	-20.52	Vertical

161.5	-51.23	1.33	15.15	-37.41	-13	-24.41	Horizontal
<b>Test Results for Mid Channel 1880MHz</b>							
3760.0	-51.45	4.04	33.56	-21.93	-13	-8.93	Horizontal
3760.0	-52.36	4.04	33.56	-22.84	-13	-9.84	Vertical
5640.0	-51.63	5.24	35.91	-20.96	-13	-7.96	Vertical
5640.0	-54.56	5.24	35.91	-23.89	-13	-10.89	Horizontal
141.2	-53.12	1.38	17.47	-37.03	-13	-24.03	Vertical
268.6	-59.94	1.45	17.16	-44.23	-13	-31.23	Horizontal
<b>Test Results for High Channel 1900MHz</b>							
3800.0	-53.10	4.04	34.00	-23.14	-13	-10.14	Horizontal
3800.0	-49.77	4.04	34.00	-19.81	-13	-6.81	Vertical
5700.0	-50.95	5.24	36.04	-20.15	-13	-7.15	Vertical
5700.0	-54.37	5.24	36.04	-23.57	-13	-10.57	Horizontal
166.0	-56.90	1.58	15.46	-43.02	-13	-30.02	Vertical
96.2	-69.95	1.54	17.19	-54.30	-13	-41.30	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.

## 9.2 LTE BAND 4

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

<b>Test Results for Low Channel 1710.7MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-52.89	4.02	29.80	-27.11	-13	-14.11	Horizontal
3421.4	-51.38	4.02	29.80	-25.60	-13	-12.60	Vertical
5132.1	-51.56	5.24	35.84	-20.96	-13	-7.96	Vertical
5132.1	-52.62	5.24	35.84	-22.02	-13	-9.02	Horizontal
128.0	-66.78	1.68	16.04	-52.42	-13	-39.42	Vertical
263.8	-62.49	1.78	17.74	-46.52	-13	-33.52	Horizontal
<b>Test Results for Mid Channel 1732.5MHz</b>							
3465.0	-51.62	4.03	30.00	-25.65	-13	-12.65	Horizontal
3465.0	-50.44	4.03	30.00	-24.47	-13	-11.47	Vertical
5197.5	-47.63	5.25	35.86	-17.02	-13	-4.02	Vertical
5197.5	-55.63	5.25	35.86	-25.02	-13	-12.02	Horizontal
150.0	-49.53	1.72	17.69	-33.56	-13	-20.56	Vertical
112.2	-67.13	1.62	16.02	-52.72	-13	-39.72	Horizontal
<b>Test Results for High Channel 1754.3MHz</b>							
3508.6	-52.28	4.05	30.01	-26.32	-13	-13.32	Horizontal
3508.6	-44.50	4.05	30.01	-18.54	-13	-5.54	Vertical
5262.9	-55.26	5.26	35.86	-24.66	-13	-11.66	Vertical

5262.9	-56.04	5.26	35.86	-25.44	-13	-12.44	Horizontal
269.2	-49.68	1.80	16.69	-34.79	-13	-21.79	Vertical
203.5	-50.54	1.75	16.66	-35.64	-13	-22.64	Horizontal

**16QAM 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	-50.10	4.02	29.80	-24.32	-13	-11.32	Horizontal
3421.4	-53.73	4.02	29.80	-27.95	-13	-14.95	Vertical
5132.1	-50.49	5.24	35.84	-19.89	-13	-6.89	Vertical
5132.1	-48.73	5.24	35.84	-18.13	-13	-5.13	Horizontal
233.0	-68.43	1.59	16.28	-53.74	-13	-40.74	Vertical
83.1	-55.68	1.78	16.17	-41.29	-13	-28.29	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-54.59	4.03	30.00	-28.62	-13	-15.62	Horizontal
3465.0	-54.55	4.03	30.00	-28.58	-13	-15.58	Vertical
5197.5	-50.06	5.25	35.86	-19.45	-13	-6.45	Vertical
5197.5	-51.49	5.25	35.86	-20.88	-13	-7.88	Horizontal
146.9	-73.76	1.69	17.81	-57.64	-13	-44.64	Vertical
95.8	-63.08	1.54	15.15	-49.47	-13	-36.47	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-55.39	4.05	30.01	-29.43	-13	-16.43	Horizontal
3508.6	-50.68	4.05	30.01	-24.72	-13	-11.72	Vertical
5262.9	-53.09	5.26	35.86	-22.49	-13	-9.49	Vertical
5262.9	-50.38	5.26	35.86	-19.78	-13	-6.78	Horizontal
223.1	-56.33	1.35	15.69	-41.99	-13	-28.99	Vertical
194.0	-49.90	1.65	15.18	-36.37	-13	-23.37	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-55.34	4.02	29.80	-29.56	-13	-16.56	Horizontal
3440.0	-45.52	4.02	29.80	-19.74	-13	-6.74	Vertical
5160.0	-53.29	5.24	35.84	-22.69	-13	-9.69	Vertical
5160.0	-56.35	5.24	35.84	-25.75	-13	-12.75	Horizontal
266.0	-50.38	1.57	17.26	-34.69	-13	-21.69	Vertical
260.0	-56.93	1.78	16.35	-42.36	-13	-29.36	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-51.89	4.03	30.00	-25.92	-13	-12.92	Horizontal
3465.0	-44.98	4.03	30.00	-19.01	-13	-6.01	Vertical
5197.5	-56.73	5.25	35.86	-26.12	-13	-13.12	Vertical
5197.5	-51.09	5.25	35.86	-20.48	-13	-7.48	Horizontal

117.7	-68.31	1.44	17.95	-51.80	-13	-38.80	Vertical
194.2	-62.14	1.65	16.09	-47.70	-13	-34.70	Horizontal
<b>Test Results for High Channel 1745MHz</b>							
3490.0	-49.92	2.91	27.68	-25.15	-13	-12.15	Horizontal
3490.0	-46.94	2.91	27.68	-22.17	-13	-9.17	Vertical
5235.0	-49.45	5.26	35.86	-18.85	-13	-5.85	Vertical
5235.0	-52.75	5.26	35.86	-22.15	-13	-9.15	Horizontal
185.5	-57.37	1.61	16.85	-42.12	-13	-29.12	Vertical
227.8	-70.83	1.61	15.19	-57.26	-13	-44.26	Horizontal

**16QAM EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)**

<b>Test Results for Low Channel 1720MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-48.24	4.02	29.80	-22.46	-13	-9.46	Horizontal
3440.0	-51.31	4.02	29.80	-25.53	-13	-12.53	Vertical
5160.0	-46.78	5.24	35.84	-16.18	-13	-3.18	Vertical
5160.0	-53.97	5.24	35.84	-23.37	-13	-10.37	Horizontal
268.3	-54.98	1.41	16.46	-39.93	-13	-26.93	Vertical
191.1	-62.71	1.35	17.33	-46.73	-13	-33.73	Horizontal
<b>Test Results for Mid Channel 1732.5MHz</b>							
3465.0	-54.40	4.03	30.00	-28.43	-13	-15.43	Horizontal
3465.0	-54.23	4.03	30.00	-28.26	-13	-15.26	Vertical
5197.5	-53.07	5.25	35.86	-22.46	-13	-9.46	Vertical
5197.5	-49.33	5.25	35.86	-18.72	-13	-5.72	Horizontal
94.2	-58.66	1.46	15.48	-44.64	-13	-31.64	Vertical
168.4	-48.55	1.47	15.07	-34.95	-13	-21.95	Horizontal
<b>Test Results for High Channel 1745MHz</b>							
3490.0	-55.28	2.91	27.68	-30.51	-13	-17.51	Horizontal
3490.0	-50.63	2.91	27.68	-25.86	-13	-12.86	Vertical
5235.0	-58.94	5.26	35.86	-28.34	-13	-15.34	Vertical
5235.0	-58.87	5.26	35.86	-28.27	-13	-15.27	Horizontal
136.4	-57.20	1.50	15.57	-43.13	-13	-30.13	Vertical
190.3	-58.05	1.68	16.59	-43.14	-13	-30.14	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.



### 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	-55.40	2.78	27.50	-30.68	-13	-17.68	Horizontal
1649.4	-52.95	2.78	27.50	-28.23	-13	-15.23	Vertical
2474.1	-47.44	2.90	27.80	-22.54	-13	-9.54	Vertical
2474.1	-53.57	2.90	27.80	-28.67	-13	-15.67	Horizontal
271.8	-54.06	1.76	17.59	-38.23	-13	-25.23	Vertical
233.4	-61.42	1.63	15.87	-47.18	-13	-34.18	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-47.10	2.80	27.48	-22.42	-13	-9.42	Horizontal
1673.0	-52.26	2.80	27.48	-27.58	-13	-14.58	Vertical
2509.5	-46.24	2.91	27.70	-21.45	-13	-8.45	Vertical
2509.5	-51.81	2.91	27.70	-27.02	-13	-14.02	Horizontal
216.9	-54.75	1.61	15.68	-40.69	-13	-27.69	Vertical
121.5	-71.02	1.59	17.52	-55.10	-13	-42.10	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-54.44	2.82	27.43	-29.83	-13	-16.83	Horizontal
1696.6	-47.86	2.82	27.43	-23.25	-13	-10.25	Vertical
2544.9	-46.08	2.92	27.74	-21.26	-13	-8.26	Vertical
2544.9	-47.37	2.92	27.74	-22.55	-13	-9.55	Horizontal
152.6	-48.92	1.69	16.67	-33.93	-13	-20.93	Vertical
157.2	-55.18	1.70	17.18	-39.70	-13	-26.70	Horizontal

#### 16QAM 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	-51.51	2.78	27.50	-26.79	-13	-13.79	Horizontal
1649.4	-57.09	2.78	27.50	-32.37	-13	-19.37	Vertical
2474.1	-53.04	2.90	27.80	-28.14	-13	-15.14	Vertical
2474.1	-55.02	2.90	27.80	-30.12	-13	-17.12	Horizontal
241.8	-56.75	1.34	15.07	-43.02	-13	-30.02	Vertical
124.1	-65.98	1.33	15.38	-51.93	-13	-38.93	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-53.30	2.80	27.48	-28.62	-13	-15.62	Horizontal
1673.0	-53.18	2.80	27.48	-28.50	-13	-15.50	Vertical
2509.5	-51.94	2.91	27.70	-27.15	-13	-14.15	Vertical
2509.5	-55.39	2.91	27.70	-30.60	-13	-17.60	Horizontal
103.0	-65.78	1.63	16.48	-50.93	-13	-37.93	Vertical

182.4	-52.16	1.36	16.80	-36.72	-13	-23.72	Horizontal
<b>Test Results for High Channel 848.3MHz</b>							
1696.6	-53.81	2.82	27.43	-29.20	-13	-16.20	Horizontal
1696.6	-52.41	2.82	27.43	-27.80	-13	-14.80	Vertical
2544.9	-47.17	2.92	27.74	-22.35	-13	-9.35	Vertical
2544.9	-53.35	2.92	27.74	-28.53	-13	-15.53	Horizontal
126.3	-61.00	1.54	15.89	-46.65	-13	-33.65	Vertical
202.8	-72.15	1.66	15.92	-57.89	-13	-44.89	Horizontal

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

<b>Test Results for Low Channel 829MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-55.91	2.78	27.50	-31.19	-13	-18.19	Horizontal
1658.0	-50.59	2.78	27.50	-25.87	-13	-12.87	Vertical
2487.0	-50.82	2.90	27.80	-25.92	-13	-12.92	Vertical
2487.0	-49.44	2.90	27.80	-24.54	-13	-11.54	Horizontal
253.5	-70.95	1.71	15.57	-57.09	-13	-44.09	Vertical
278.7	-66.16	1.34	16.40	-51.11	-13	-38.11	Horizontal
<b>Test Results For Mid Channel 836.5MHz</b>							
1673.0	-51.13	2.80	27.48	-26.45	-13	-13.45	Horizontal
1673.0	-46.23	2.80	27.48	-21.55	-13	-8.55	Vertical
2509.5	-47.53	2.91	27.70	-22.74	-13	-9.74	Vertical
2509.5	-46.74	2.91	27.70	-21.95	-13	-8.95	Horizontal
269.0	-69.97	1.44	17.04	-54.37	-13	-41.37	Vertical
187.0	-59.20	1.76	17.62	-43.34	-13	-30.34	Horizontal
<b>Test Results for High Channel 844MHz</b>							
1688.0	-48.83	2.82	27.43	-24.22	-13	-11.22	Horizontal
1688.0	-45.15	2.82	27.43	-20.54	-13	-7.54	Vertical
2532.0	-48.32	2.92	27.74	-23.50	-13	-10.50	Vertical
2532.0	-46.39	2.92	27.74	-21.57	-13	-8.57	Horizontal
194.0	-60.27	1.74	17.70	-44.31	-13	-31.31	Vertical
240.1	-66.78	1.41	17.46	-50.72	-13	-37.72	Horizontal

**16QAM EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)**

<b>Test Results for Low Channel 829MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-52.04	2.78	27.50	-27.32	-13	-14.32	Horizontal
1658.0	-51.40	2.78	27.50	-26.68	-13	-13.68	Vertical
2487.0	-51.66	2.90	27.80	-26.76	-13	-13.76	Vertical
2487.0	-47.71	2.90	27.80	-22.81	-13	-9.81	Horizontal
120.4	-56.39	1.42	15.54	-42.27	-13	-29.27	Vertical
84.2	-57.94	1.45	15.29	-44.10	-13	-31.10	Horizontal
<b>Test Results For Mid Channel 836.5MHz</b>							

1673.0	-47.86	2.80	27.48	-23.18	-13	-10.18	Horizontal
1673.0	-54.84	2.80	27.48	-30.16	-13	-17.16	Vertical
2509.5	-54.04	2.91	27.70	-29.25	-13	-16.25	Vertical
2509.5	-56.95	2.91	27.70	-32.16	-13	-19.16	Horizontal
213.1	-71.55	1.42	15.86	-57.11	-13	-44.11	Vertical
204.0	-69.35	1.37	15.05	-55.67	-13	-42.67	Horizontal
<b>Test Results for High Channel 844MHz</b>							
1688.0	-52.29	2.82	27.43	-27.68	-13	-14.68	Horizontal
1688.0	-54.59	2.82	27.43	-29.98	-13	-16.98	Vertical
2532.0	-55.36	2.92	27.74	-30.54	-13	-17.54	Vertical
2532.0	-52.31	2.92	27.74	-27.49	-13	-14.49	Horizontal
163.3	-51.44	1.76	16.72	-36.48	-13	-23.48	Vertical
190.1	-55.91	1.50	15.48	-41.93	-13	-28.93	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.

#### 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
5005.0	-69.99	5.23	35.81	-39.41	-25	-14.41	Horizontal
5005.0	-64.41	5.23	35.81	-33.83	-25	-8.83	Vertical
7507.5	-61.94	5.67	36.85	-30.76	-25	-5.76	Vertical
7507.5	-68.07	5.67	36.85	-36.89	-25	-11.89	Horizontal
213.6	-82.52	1.73	17.97	-66.29	-25	-41.29	Vertical
319.6	-75.47	1.38	15.11	-61.73	-25	-36.73	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-66.39	5.23	35.82	-35.80	-25	-10.80	Horizontal
5070.0	-65.82	5.23	35.82	-35.23	-25	-10.23	Vertical
7605.0	-64.43	5.67	36.85	-33.25	-25	-8.25	Vertical
7605.0	-63.46	5.67	36.85	-32.28	-25	-7.28	Horizontal
269.3	-63.23	1.77	16.17	-48.82	-25	-23.82	Vertical
544.9	-76.89	1.63	15.21	-63.31	-25	-38.31	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-69.83	5.24	35.83	-39.24	-25	-14.24	Horizontal
5135.0	-60.54	5.24	35.83	-29.95	-25	-4.95	Vertical
7702.5	-65.74	5.68	36.87	-34.55	-25	-9.55	Vertical
7702.5	-61.82	5.68	36.87	-30.63	-25	-5.63	Horizontal
409.3	-83.99	1.58	17.56	-68.01	-25	-43.01	Vertical
563.5	-77.70	1.45	16.58	-62.57	-25	-37.57	Horizontal

**16QAM 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
5005.0	-71.57	5.23	35.81	-40.99	-25	-15.99	Horizontal
5005.0	-73.66	5.23	35.81	-43.08	-25	-18.08	Vertical
7507.5	-68.96	5.67	36.85	-37.78	-25	-12.78	Vertical
7507.5	-75.14	5.67	36.85	-43.96	-25	-18.96	Horizontal
519.6	-83.70	1.36	16.72	-68.34	-25	-43.34	Vertical
358.6	-76.17	1.58	16.65	-61.10	-25	-36.10	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-73.90	5.23	35.82	-43.31	-25	-18.31	Horizontal
5070.0	-71.30	5.23	35.82	-40.71	-25	-15.71	Vertical
7605.0	-69.56	5.67	36.85	-38.38	-25	-13.38	Vertical
7605.0	-70.65	5.67	36.85	-39.47	-25	-14.47	Horizontal
344.5	-76.67	1.32	17.33	-60.66	-25	-35.66	Vertical
129.1	-70.42	1.50	17.46	-54.46	-25	-29.46	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-73.00	5.24	35.83	-42.41	-25	-17.41	Horizontal
5135.0	-74.58	5.24	35.83	-43.99	-25	-18.99	Vertical
7702.5	-69.28	5.68	36.87	-38.09	-25	-13.09	Vertical
7702.5	-70.85	5.68	36.87	-39.66	-25	-14.66	Horizontal
565.4	-63.02	1.78	15.82	-48.98	-25	-23.98	Vertical
537.0	-67.93	1.55	16.68	-52.80	-25	-27.80	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
5020.0	-68.51	5.23	35.82	-37.92	-25	-12.92	Horizontal
5020.0	-65.82	5.23	35.82	-35.23	-25	-10.23	Vertical
7530.0	-60.07	5.67	36.86	-28.88	-25	-3.88	Vertical
7530.0	-65.21	5.67	36.86	-34.02	-25	-9.02	Horizontal
469.9	-66.68	1.63	15.76	-52.55	-25	-27.55	Vertical
271.7	-67.13	1.71	15.44	-53.41	-25	-28.41	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-67.43	5.23	35.82	-36.84	-25	-11.84	Horizontal
5070.0	-62.99	5.23	35.82	-32.40	-25	-7.40	Vertical
7605.0	-65.58	5.67	36.85	-34.40	-25	-9.40	Vertical
7605.0	-63.93	5.67	36.85	-32.75	-25	-7.75	Horizontal
357.3	-82.28	1.79	16.84	-67.22	-25	-42.22	Vertical
442.2	-65.86	1.71	17.64	-49.93	-25	-24.93	Horizontal
Test Results for High Channel 2560MHz							

5120.0	-64.75	5.24	35.83	-34.16	-25	-9.16	Horizontal
5120.0	-62.84	5.24	35.83	-32.25	-25	-7.25	Vertical
7680.0	-59.94	5.70	36.88	-28.76	-25	-3.76	Vertical
7680.0	-67.84	5.70	36.88	-36.66	-25	-11.66	Horizontal
545.9	-69.99	1.37	17.68	-53.68	-25	-28.68	Vertical
486.2	-66.96	1.46	15.87	-52.55	-25	-27.55	Horizontal

**16QAM 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
5020.0	-74.66	5.23	35.82	-44.07	-25	-19.07	Horizontal
5020.0	-71.02	5.23	35.82	-40.43	-25	-15.43	Vertical
7530.0	-70.92	5.67	36.86	-39.73	-25	-14.73	Vertical
7530.0	-69.37	5.67	36.86	-38.18	-25	-13.18	Horizontal
263.0	-62.55	1.38	17.72	-46.21	-25	-21.21	Vertical
86.8	-61.77	1.42	16.10	-47.09	-25	-22.09	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-75.72	5.23	35.82	-45.13	-25	-20.13	Horizontal
5070.0	-76.70	5.23	35.82	-46.11	-25	-21.11	Vertical
7605.0	-74.56	5.67	36.85	-43.38	-25	-18.38	Vertical
7605.0	-71.65	5.67	36.85	-40.47	-25	-15.47	Horizontal
158.0	-68.54	1.31	17.19	-52.66	-25	-27.66	Vertical
530.0	-60.31	1.53	15.38	-46.46	-25	-21.46	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-75.83	5.24	35.83	-45.24	-25	-20.24	Horizontal
5120.0	-75.44	5.24	35.83	-44.85	-25	-19.85	Vertical
7680.0	-68.94	5.70	36.88	-37.76	-25	-12.76	Vertical
7680.0	-69.84	5.70	36.88	-38.66	-25	-13.66	Horizontal
486.5	-65.56	1.79	16.45	-50.90	-25	-25.90	Vertical
376.5	-73.44	1.64	16.06	-59.02	-25	-34.02	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.

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-50.23	2.60	27.20	-25.63	-13	-12.63	Horizontal
1399.4	-48.42	2.60	27.20	-23.82	-13	-10.82	Vertical
2099.1	-50.13	2.85	27.54	-25.44	-13	-12.44	Vertical
2099.1	-48.15	2.85	27.54	-23.46	-13	-10.46	Horizontal
224.1	-59.61	1.49	17.78	-43.32	-13	-30.32	Vertical
153.3	-58.86	1.36	17.33	-42.89	-13	-29.89	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-54.77	2.61	27.28	-30.10	-13	-17.10	Horizontal
1415.0	-44.47	2.61	27.28	-19.80	-13	-6.80	Vertical
2122.5	-47.61	2.87	27.59	-22.89	-13	-9.89	Vertical
2122.5	-49.88	2.87	27.59	-25.16	-13	-12.16	Horizontal
137.5	-59.31	1.73	15.74	-45.29	-13	-32.29	Vertical
164.4	-50.67	1.62	15.79	-36.50	-13	-23.50	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-51.61	2.63	27.28	-26.96	-13	-13.96	Horizontal
1430.6	-45.22	2.63	27.28	-20.57	-13	-7.57	Vertical
2145.9	-44.97	2.88	27.60	-20.25	-13	-7.25	Vertical
2145.9	-48.65	2.88	27.60	-23.93	-13	-10.93	Horizontal
267.4	-72.09	1.61	18.00	-55.70	-13	-42.70	Vertical
131.2	-65.24	1.45	15.49	-51.21	-13	-38.21	Horizontal

**16QAM EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)**

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-48.70	2.60	27.20	-24.10	-13	-11.10	Horizontal
1399.4	-56.31	2.60	27.20	-31.71	-13	-18.71	Vertical
2099.1	-53.58	2.85	27.54	-28.89	-13	-15.89	Vertical
2099.1	-54.49	2.85	27.54	-29.80	-13	-16.80	Horizontal
248.2	-52.18	1.70	16.56	-37.32	-13	-24.32	Vertical
82.3	-69.11	1.34	17.94	-52.51	-13	-39.51	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.19	2.61	27.28	-19.52	-13	-6.52	Horizontal
1415.0	-51.76	2.61	27.28	-27.09	-13	-14.09	Vertical
2122.5	-48.72	2.87	27.59	-24.00	-13	-11.00	Vertical
2122.5	-47.65	2.87	27.59	-22.93	-13	-9.93	Horizontal
126.8	-58.04	1.70	17.26	-42.48	-13	-29.48	Vertical
90.4	-48.02	1.77	16.36	-33.43	-13	-20.43	Horizontal

Test Results for High Channel 715.3MHz							
1430.6	-46.33	2.63	27.28	-21.68	-13	-8.68	Horizontal
1430.6	-52.43	2.63	27.28	-27.78	-13	-14.78	Vertical
2145.9	-45.55	2.88	27.60	-20.83	-13	-7.83	Vertical
2145.9	-52.96	2.88	27.60	-28.24	-13	-15.24	Horizontal
205.7	-57.01	1.62	15.67	-42.96	-13	-29.96	Vertical
145.8	-54.18	1.60	17.71	-38.07	-13	-25.07	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-51.05	2.61	27.26	-26.40	-13	-13.40	Horizontal
1408.0	-53.09	2.61	27.26	-28.44	-13	-15.44	Vertical
2112.0	-49.53	2.87	27.58	-24.82	-13	-11.82	Vertical
2112.0	-46.75	2.87	27.58	-22.04	-13	-9.04	Horizontal
87.6	-59.25	1.31	16.97	-43.58	-13	-30.58	Vertical
248.4	-58.92	1.65	16.70	-43.87	-13	-30.87	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-54.42	2.61	27.28	-29.75	-13	-16.75	Horizontal
1415.0	-52.68	2.61	27.28	-28.01	-13	-15.01	Vertical
2122.5	-49.60	2.87	27.59	-24.88	-13	-11.88	Vertical
2122.5	-53.31	2.87	27.59	-28.59	-13	-15.59	Horizontal
117.6	-52.99	1.72	17.99	-36.72	-13	-23.72	Vertical
246.7	-69.78	1.73	17.94	-53.56	-13	-40.56	Horizontal
Test Results for High Channel 711MHz							
1422.0	-51.37	2.62	27.28	-26.71	-13	-13.71	Horizontal
1422.0	-49.91	2.62	27.28	-25.25	-13	-12.25	Vertical
2133.0	-47.31	2.87	27.60	-22.58	-13	-9.58	Vertical
2133.0	-51.44	2.87	27.60	-26.71	-13	-13.71	Horizontal
141.0	-59.04	1.58	15.93	-44.68	-13	-31.68	Vertical
166.6	-58.70	1.36	15.59	-44.47	-13	-31.47	Horizontal

**16QAM EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)**

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-54.31	2.61	27.26	-29.66	-13	-16.66	Horizontal
1408.0	-50.57	2.61	27.26	-25.92	-13	-12.92	Vertical
2112.0	-47.33	2.87	27.58	-22.62	-13	-9.62	Vertical
2112.0	-51.40	2.87	27.58	-26.69	-13	-13.69	Horizontal
150.6	-60.10	1.33	15.99	-45.44	-13	-32.44	Vertical
196.9	-59.49	1.73	17.61	-43.61	-13	-30.61	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-51.17	2.61	27.28	-26.50	-13	-13.50	Horizontal

1415.0	-57.13	2.61	27.28	-32.46	-13	-19.46	Vertical
2122.5	-48.28	2.87	27.59	-23.56	-13	-10.56	Vertical
2122.5	-51.56	2.87	27.59	-26.84	-13	-13.84	Horizontal
112.3	-62.88	1.31	16.75	-47.44	-13	-34.44	Vertical
89.5	-66.81	1.55	16.78	-51.58	-13	-38.58	Horizontal
<b>Test Results for High Channel 711MHz</b>							
1422.0	-53.28	2.62	27.28	-28.62	-13	-15.62	Horizontal
1422.0	-55.06	2.62	27.28	-30.40	-13	-17.40	Vertical
2133.0	-54.94	2.87	27.60	-30.21	-13	-17.21	Vertical
2133.0	-59.21	2.87	27.60	-34.48	-13	-21.48	Horizontal
276.6	-57.17	1.55	16.51	-42.21	-13	-29.21	Vertical
234.7	-52.75	1.76	15.94	-38.57	-13	-25.57	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.

## 9.6 LTE BAND 17

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

<b>Test Results for Low Channel 706.5MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-52.87	2.61	27.28	-28.20	-13	-15.20	Horizontal
1413.0	-45.16	2.61	27.28	-20.49	-13	-7.49	Vertical
2119.5	-48.73	2.87	27.59	-24.01	-13	-11.01	Vertical
2119.5	-47.80	2.87	27.59	-23.08	-13	-10.08	Horizontal
188.4	-49.50	1.71	16.15	-35.07	-13	-22.07	Vertical
174.4	-56.65	1.41	17.32	-40.74	-13	-27.74	Horizontal
<b>Test Results For Mid Channel 710MHz</b>							
1420.0	-55.67	2.62	27.30	-30.99	-13	-17.99	Horizontal
1420.0	-51.07	2.62	27.30	-26.39	-13	-13.39	Vertical
2130.0	-49.35	2.87	27.62	-24.60	-13	-11.60	Vertical
2130.0	-48.22	2.87	27.62	-23.47	-13	-10.47	Horizontal
124.2	-65.09	1.42	15.25	-51.27	-13	-38.27	Vertical
165.9	-55.81	1.36	17.19	-39.98	-13	-26.98	Horizontal
<b>Test Results for High Channel 713.5MHz</b>							
1427.0	-52.84	2.66	27.28	-28.22	-13	-15.22	Horizontal
1427.0	-51.10	2.66	27.28	-26.48	-13	-13.48	Vertical
2140.5	-50.01	2.88	27.60	-25.29	-13	-12.29	Vertical
2140.5	-50.14	2.88	27.60	-25.42	-13	-12.42	Horizontal
152.7	-62.91	1.32	17.29	-46.94	-13	-33.94	Vertical
125.0	-70.20	1.72	16.89	-55.04	-13	-42.04	Horizontal



**16QAM EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)**

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-54.95	2.61	27.28	-30.28	-13	-17.28	Horizontal
1413.0	-51.85	2.61	27.28	-27.18	-13	-14.18	Vertical
2119.5	-52.17	2.87	27.59	-27.45	-13	-14.45	Vertical
2119.5	-51.01	2.87	27.59	-26.29	-13	-13.29	Horizontal
186.7	-66.83	1.52	15.36	-52.99	-13	-39.99	Vertical
255.2	-51.40	1.34	17.84	-34.90	-13	-21.90	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-58.21	2.62	27.30	-33.53	-13	-20.53	Horizontal
1420.0	-56.62	2.62	27.30	-31.94	-13	-18.94	Vertical
2130.0	-56.02	2.87	27.62	-31.27	-13	-18.27	Vertical
2130.0	-49.13	2.87	27.62	-24.38	-13	-11.38	Horizontal
119.2	-56.44	1.57	15.72	-42.29	-13	-29.29	Vertical
84.3	-57.44	1.52	17.96	-41.00	-13	-28.00	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-51.58	2.66	27.28	-26.96	-13	-13.96	Horizontal
1427.0	-55.83	2.66	27.28	-31.21	-13	-18.21	Vertical
2140.5	-53.63	2.88	27.60	-28.91	-13	-15.91	Vertical
2140.5	-57.65	2.88	27.60	-32.93	-13	-19.93	Horizontal
151.9	-49.71	1.53	15.38	-35.86	-13	-22.86	Vertical
269.0	-56.92	1.76	17.35	-41.33	-13	-28.33	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-53.20	2.62	27.30	-28.52	-13	-15.52	Horizontal
1418.0	-49.57	2.62	27.30	-24.89	-13	-11.89	Vertical
2127.0	-46.90	2.87	27.62	-22.15	-13	-9.15	Vertical
2127.0	-50.30	2.87	27.62	-25.55	-13	-12.55	Horizontal
228.9	-62.76	1.35	16.91	-47.20	-13	-34.20	Vertical
253.4	-62.45	1.62	16.31	-47.76	-13	-34.76	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-54.90	2.62	27.30	-30.22	-13	-17.22	Horizontal
1420.0	-50.92	2.62	27.30	-26.24	-13	-13.24	Vertical
2130.0	-46.16	2.87	27.62	-21.41	-13	-8.41	Vertical
2130.0	-47.04	2.87	27.62	-22.29	-13	-9.29	Horizontal
197.4	-51.36	1.51	17.14	-35.73	-13	-22.73	Vertical
252.1	-63.04	1.77	16.88	-47.93	-13	-34.93	Horizontal
Test Results for High Channel 711MHz							

1422.0	-52.07	2.62	27.30	-27.39	-13	-14.39	Horizontal
1422.0	-48.66	2.62	27.30	-23.98	-13	-10.98	Vertical
2133.0	-45.99	2.87	27.62	-21.24	-13	-8.24	Vertical
2133.0	-47.70	2.87	27.62	-22.95	-13	-9.95	Horizontal
181.3	-61.24	1.78	15.95	-47.07	-13	-34.07	Vertical
184.2	-63.44	1.34	17.95	-46.84	-13	-33.84	Horizontal

**16QAM EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)**

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-52.79	2.62	27.30	-28.11	-13	-15.11	Horizontal
1418.0	-48.95	2.62	27.30	-24.27	-13	-11.27	Vertical
2127.0	-50.09	2.87	27.62	-25.34	-13	-12.34	Vertical
2127.0	-51.66	2.87	27.62	-26.91	-13	-13.91	Horizontal
128.2	-55.12	1.69	17.15	-39.66	-13	-26.66	Vertical
106.3	-61.24	1.32	16.96	-45.60	-13	-32.60	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-55.87	2.62	27.30	-31.19	-13	-18.19	Horizontal
1420.0	-50.62	2.62	27.30	-25.94	-13	-12.94	Vertical
2130.0	-50.60	2.87	27.62	-25.85	-13	-12.85	Vertical
2130.0	-54.33	2.87	27.62	-29.58	-13	-16.58	Horizontal
117.7	-67.26	1.41	17.98	-50.69	-13	-37.69	Vertical
144.2	-62.74	1.41	15.38	-48.77	-13	-35.77	Horizontal
Test Results for High Channel 711MHz							
1422.0	-53.64	2.62	27.30	-28.96	-13	-15.96	Horizontal
1422.0	-53.39	2.62	27.30	-28.71	-13	-15.71	Vertical
2133.0	-60.14	2.87	27.62	-35.39	-13	-22.39	Vertical
2133.0	-58.80	2.87	27.62	-34.05	-13	-21.05	Horizontal
114.3	-71.29	1.48	17.94	-54.83	-13	-41.83	Vertical
179.9	-68.07	1.68	15.42	-54.33	-13	-41.33	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.

## 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 4.2V.

### 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  
LTE Band 4
- LTE Band 5  
LTE Band 7  
LTE Band 12  
LTE Band 17

## 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]
<b>BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	1880	-2.77	-0.001473	2.5
3.85	1880	-5.12	-0.002723	2.5
4.2	1880	1.24	0.000660	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1880	0.68	0.000362	2.5
Extreme (50C)	1880	-4.94	-0.002628	2.5
Extreme (40C)	1880	3.25	0.001729	2.5
Extreme (30C)	1880	1.01	0.000537	2.5
Extreme (10C)	1880	-3.40	-0.001809	2.5
Extreme (0C)	1880	-2.70	-0.001436	2.5
Extreme (-10C)	1880	-4.93	-0.002622	2.5
Extreme (-20C)	1880	3.07	0.001633	2.5
Extreme (-30C)	1880	2.23	0.001186	2.5

**16QAM, (20MHz BANDWIDTH)**
**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	1880	-2.78	-0.001479	2.5
3.85	1880	-5.78	-0.003074	2.5
4.2	1880	-6.45	-0.003431	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1880	0.08	0.000043	2.5
Extreme (50C)	1880	-5.52	-0.002936	2.5
Extreme (40C)	1880	-0.94	-0.000500	2.5
Extreme (30C)	1880	-5.38	-0.002862	2.5
Extreme (10C)	1880	-1.33	-0.000707	2.5
Extreme (0C)	1880	-8.52	-0.004532	2.5
Extreme (-10C)	1880	-0.77	-0.000410	2.5
Extreme (-20C)	1880	-2.46	-0.001309	2.5
Extreme (-30C)	1880	-5.98	-0.003181	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]
<b>BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	1732.5	-3.77	-0.002176	2.5
3.85	1732.5	3.97	0.002291	2.5
4.2	1732.5	-2.93	-0.001691	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1732.5	-1.57	-0.000906	2.5
Extreme (50C)	1732.5	-0.90	-0.000519	2.5
Extreme (40C)	1732.5	-1.71	-0.000987	2.5
Extreme (30C)	1732.5	5.41	0.003123	2.5
Extreme (10C)	1732.5	-1.55	-0.000895	2.5
Extreme (0C)	1732.5	0.68	0.000392	2.5
Extreme (-10C)	1732.5	3.63	0.002095	2.5
Extreme (-20C)	1732.5	0.48	0.000277	2.5
Extreme (-30C)	1732.5	-2.79	-0.001610	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	1732.5	-3.57	-0.002061	2.5
3.85	1732.5	-3.49	-0.002014	2.5
4.2	1732.5	-2.89	-0.001668	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1732.5	-2.91	-0.001680	2.5
Extreme (50C)	1732.5	-4.67	-0.002696	2.5
Extreme (40C)	1732.5	-5.22	-0.003013	2.5
Extreme (30C)	1732.5	-4.40	-0.002540	2.5
Extreme (10C)	1732.5	-8.09	-0.004670	2.5
Extreme (0C)	1732.5	-7.72	-0.004456	2.5
Extreme (-10C)	1732.5	-1.99	-0.001149	2.5
Extreme (-20C)	1732.5	0.49	0.000283	2.5
Extreme (-30C)	1732.5	-3.31	-0.001911	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]
<b>BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	836.5	-3.32	-0.003969	2.5
3.85	836.5	-0.38	-0.000454	2.5
4.2	836.5	-1.08	-0.001291	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	836.5	-5.41	-0.006467	2.5
Extreme (50C)	836.5	1.08	0.001291	2.5
Extreme (40C)	836.5	-1.94	-0.002319	2.5
Extreme (30C)	836.5	-2.18	-0.002606	2.5
Extreme (10C)	836.5	-0.70	-0.000837	2.5
Extreme (0C)	836.5	0.56	0.000669	2.5
Extreme (-10C)	836.5	-6.37	-0.007615	2.5
Extreme (-20C)	836.5	0.83	0.000992	2.5
Extreme (-30C)	836.5	1.07	0.001279	2.5



**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	836.5	-2.32	-0.002773	2.5
3.85	836.5	1.57	0.001877	2.5
4.2	836.5	-5.21	-0.006228	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	836.5	-2.05	-0.002451	2.5
Extreme (50C)	836.5	2.00	0.002391	2.5
Extreme (40C)	836.5	0.73	0.000873	2.5
Extreme (30C)	836.5	-5.66	-0.006766	2.5
Extreme (10C)	836.5	-0.80	-0.000956	2.5
Extreme (0C)	836.5	-6.64	-0.007938	2.5
Extreme (-10C)	836.5	-7.45	-0.008906	2.5
Extreme (-20C)	836.5	0.30	0.000359	2.5
Extreme (-30C)	836.5	-5.86	-0.007005	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]
<b>BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	2535	-2.57	-0.001014	2.5
3.85	2535	4.61	0.001819	2.5
4.2	2535	3.80	0.001499	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	2535	4.80	0.001893	2.5
Extreme (50C)	2535	5.03	0.001984	2.5
Extreme (40C)	2535	0.51	0.000201	2.5
Extreme (30C)	2535	5.77	0.002276	2.5
Extreme (10C)	2535	5.47	0.002158	2.5
Extreme (0C)	2535	0.62	0.000245	2.5
Extreme (-10C)	2535	2.55	0.001006	2.5
Extreme (-20C)	2535	5.28	0.002083	2.5
Extreme (-30C)	2535	0.14	0.000055	2.5

**16QAM, (20MHz BANDWIDTH)**
**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.4	2535	-1.86	-0.000734	2.5
3.85	2535	5.37	0.002118	2.5
4.2	2535	6.54	0.002580	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	2535	5.02	0.001980	2.5
Extreme (50C)	2535	6.41	0.002529	2.5
Extreme (40C)	2535	0.87	0.000343	2.5
Extreme (30C)	2535	1.90	0.000750	2.5
Extreme (10C)	2535	0.57	0.000225	2.5
Extreme (0C)	2535	-0.84	-0.000331	2.5
Extreme (-10C)	2535	-2.62	-0.001034	2.5
Extreme (-20C)	2535	4.62	0.001822	2.5
Extreme (-30C)	2535	3.71	0.001464	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

QPSK, (10MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	707.5	-5.55	-0.007845	2.5
3.85	707.5	-5.32	-0.007519	2.5
4.2	707.5	-8.84	-0.012495	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	707.5	-9.02	-0.012749	2.5
Extreme (50C)	707.5	-5.61	-0.007929	2.5
Extreme (40C)	707.5	-5.60	-0.007915	2.5
Extreme (30C)	707.5	-1.30	-0.001837	2.5
Extreme (10C)	707.5	-5.41	-0.007647	2.5
Extreme (0C)	707.5	-6.51	-0.009201	2.5
Extreme (-10C)	707.5	-1.89	-0.002671	2.5
Extreme (-20C)	707.5	-3.23	-0.004565	2.5
Extreme (-30C)	707.5	-5.98	-0.008452	2.5

**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	707.5	-4.81	-0.006799	2.5
3.85	707.5	-5.26	-0.007435	2.5
4.2	707.5	-8.92	-0.012608	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	707.5	-0.96	-0.001357	2.5
Extreme (50C)	707.5	-5.82	-0.008226	2.5
Extreme (40C)	707.5	-2.77	-0.003915	2.5
Extreme (30C)	707.5	-3.46	-0.004890	2.5
Extreme (10C)	707.5	-8.04	-0.011364	2.5
Extreme (0C)	707.5	-0.97	-0.001371	2.5
Extreme (-10C)	707.5	-2.37	-0.003350	2.5
Extreme (-20C)	707.5	-3.51	-0.004961	2.5
Extreme (-30C)	707.5	-2.41	-0.003406	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

QPSK, (10MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	710.0	-9.43	-0.013282	2.5
3.85	710.0	-2.67	-0.003761	2.5
4.2	710.0	-4.10	-0.005775	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	710.0	-6.57	-0.009254	2.5
Extreme (50C)	710.0	-7.37	-0.010380	2.5
Extreme (40C)	710.0	-2.51	-0.003535	2.5
Extreme (30C)	710.0	-5.51	-0.007761	2.5
Extreme (10C)	710.0	-7.17	-0.010099	2.5
Extreme (0C)	710.0	-9.32	-0.013127	2.5
Extreme (-10C)	710.0	-9.51	-0.013394	2.5
Extreme (-20C)	710.0	-10.25	-0.014437	2.5
Extreme (-30C)	710.0	-7.16	-0.010085	2.5

**16QAM, (10MHz BANDWIDTH)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
3.4	710.0	-4.61	-0.006493	2.5
3.85	710.0	-6.84	-0.009634	2.5
4.2	710.0	-5.13	-0.007225	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)</b>				
Normal (25C)	710.0	-6.31	-0.008887	2.5
Extreme (50C)	710.0	-4.07	-0.005732	2.5
Extreme (40C)	710.0	-4.23	-0.005958	2.5
Extreme (30C)	710.0	-3.35	-0.004718	2.5
Extreme (10C)	710.0	-10.21	-0.014380	2.5
Extreme (0C)	710.0	-10.06	-0.014169	2.5
Extreme (-10C)	710.0	-6.14	-0.008648	2.5
Extreme (-20C)	710.0	-10.50	-0.014789	2.5
Extreme (-30C)	710.0	-8.76	-0.012338	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.

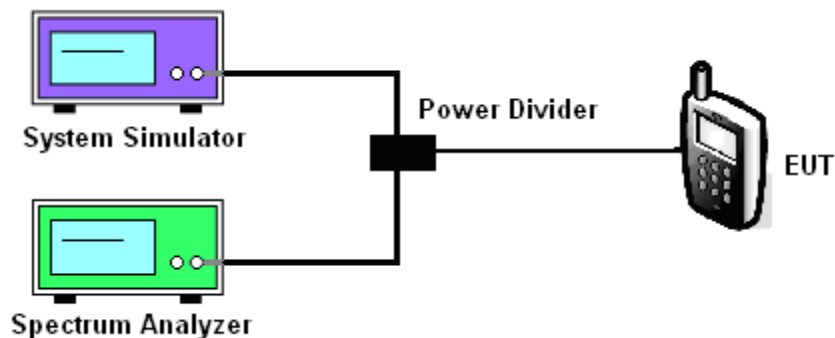
### 11.2 Measuring Instruments

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 Band2
- LTE Band 4
- LTE Band5
- LTE Band 7
- LTE Band 12
- LTE Band 17

Test data reference attachment.

----END OF REPORT----