

# **FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT FCC ID: 2ABOSSKYELITEV55**

**Product:** Smart Phone  
**Trade Mark:** SKY DEVICES  
**Model Number:** Elite V55  
**Family Model:** N/A  
**Report No.:** STR211119002006E

## **Prepared for**

SKY PHONE LLC

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## **Prepared by**

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TEST RESULT CERTIFICATION

Applicant's name : SKY PHONE LLC
Address: 1348 Washington Av. Suite 350 Miami Beach Florida United States 33139
Manufacturer's Name: SKY PHONE LLC
Address: 1348 Washington Av. Suite 350 Miami Beach Florida United States 33139
Product name: Smart Phone
Model and/or type reference : Elite V55
Family Model: N/A
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: Nov 19 . 2021 ~ Dec 08. 2021
Date of Issue : Dec 08. 2021
Test Result : Pass

Testing Engineer : Mukzi Lee (Mukzi Lee)
Authorized Signatory : Alex (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:	Smart Phone
Trade Mark	SKY DEVICES
Model Name	Elite V55
Family Model	N/A
Model Difference	N/A
FCC ID:	2ABOSSKYELITEV55
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,12,17, 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 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM
SIM Card	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	-1 dBi;
Adapter	Input: AC 100-240V~50/60Hz 0.2A Output: DC 5V $\overline{\text{---}}$ 1A
Battery	DC 3.8V, 2000mAh, 7.6Wh
Power supply	DC 3.8V from battery or DC 5V from Adapter.
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.8V) (Note 1)
HW Version	1239SWF-V00
SW Version	Elite_V55_SkyDevices_V1.0_20211202
** 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: 2ABOSSKYELITEV55** 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 12, Band 17, Band 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

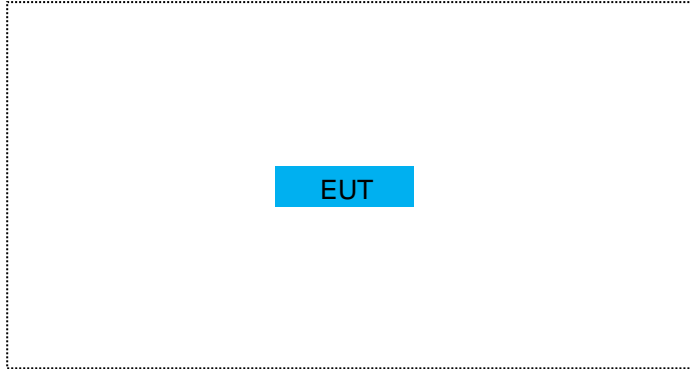
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	Elite V55	FCC ID: 2ABOSSKYELITEV55	EUT

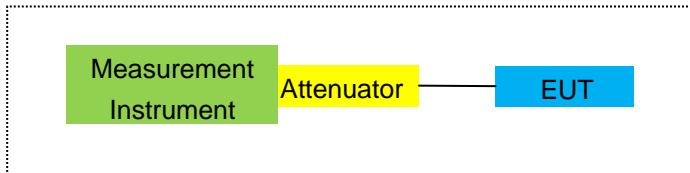
*Note: All the accessories have been used during the test.  
the following “EUT” in setup diagram means EUT system.*

**2.4 TEST SETUP**

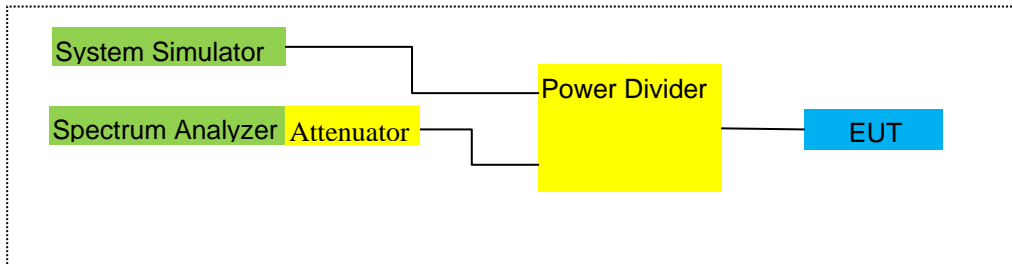
For Radiated Test Cases



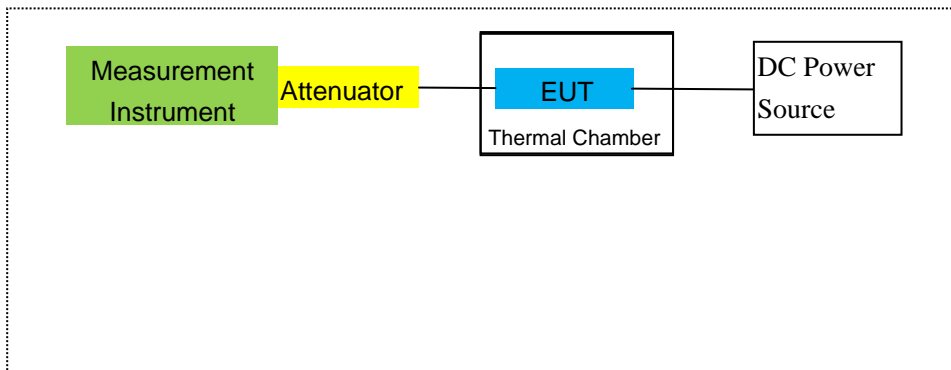
For Conducted Output Power



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	2021.07.01	2022.06.30	1 year
2	Test Receiver	R&S	ESPI	101318	2021.04.27	2022.04.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.11.19 2021.11.07	2021.11.18 2022.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2021.07.01	2022.06.30	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2021.04.27	2022.04.26	1 year
9	Power Meter	R&S	NRVS	100696	2021.07.01	2022.06.30	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2021.04.27	2022.04.26	1 year
11	Test Cable	N/A	R-01	N/A	2019.08.06	2022.08.05	3 year
12	Test Cable	N/A	R-02	N/A	2019.08.06	2022.08.05	3 year
13	Test Cable	N/A	R-03	N/A	2019.06.28	2022.06.27	3 year
14	Test Receiver	R&S	ESCI	101160	2021.04.27	2022.04.26	1 year
15	LISN	R&S	ENV216	101313	2021.04.27	2022.04.26	1 year
16	LISN	EMCO	3816/2	00042990	2021.04.27	2022.04.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2021.04.27	2022.04.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2021.04.27	2022.04.26	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2021.07.01	2022.06.30	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2021.04.27	2022.04.26	1 year
24	test receiver	R&S	ESCI	a0304218	2021.04.27	2022.04.26	1 year
25	Communication Tester	R&S	CMU200	A0304247	2021.07.01	2022.06.30	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2021.04.27	2022.04.26	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.05.11	2023.05.10	3 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	1 year
29	Communication Tester	R&S	CMW500	148500	2021.07.01	2022.06.30	1 year
30	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	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 12
- LTE Band 17
- LTE Band 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**

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 17
- LTE Band 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 1GHz, and 1 MHz for the measurement above 1 GHz.

### **MODES TESTED**

- LTE Band 2/4/5/12/17/66
- 

### 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

- LTE Band 2/4/5/12/17/66

#### RESULTS

Pass

### 8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-4.91	3.76	28.24	19.57	90.573	Horizontal	Pass
		1880	-4.85	3.91	28.22	19.46	88.308	Horizontal	Pass
		1909.3	-4.75	3.93	28.20	19.52	89.536	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.02	3.77	28.23	19.44	87.902	Horizontal	Pass
		1880	-4.85	3.91	28.24	19.48	88.716	Horizontal	Pass
		1908.5	-4.77	3.94	28.25	19.54	89.950	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.07	3.77	28.31	19.47	88.512	Horizontal	Pass
		1880	-4.88	3.91	28.22	19.43	87.700	Horizontal	Pass
		1907.5	-4.69	3.94	28.20	19.57	90.573	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.04	3.79	28.33	19.50	89.125	Horizontal	Pass
		1880	-4.80	3.95	28.22	19.47	88.512	Horizontal	Pass
		1905	-4.63	3.97	28.19	19.59	90.991	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-5.05	3.79	28.34	19.50	89.125	Horizontal	Pass
		1880	-4.72	3.95	28.22	19.55	90.157	Horizontal	Pass
		1902.5	-4.69	3.97	28.18	19.52	89.536	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-5.09	3.81	28.35	19.45	88.105	Horizontal	Pass
		1880	-4.84	3.96	28.22	19.42	87.498	Horizontal	Pass
		1900	-4.73	4.00	28.16	19.43	87.700	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-4.98	3.76	28.24	19.50	89.125	Vertical	Pass
		1880	-4.82	3.91	28.22	19.49	88.920	Vertical	Pass
		1909.3	-4.78	3.93	28.20	19.49	88.920	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.00	3.77	28.23	19.46	88.308	Vertical	Pass
		1880	-4.80	3.91	28.24	19.53	89.743	Vertical	Pass
		1908.5	-4.84	3.94	28.25	19.47	88.512	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.96	3.77	28.31	19.58	90.782	Vertical	Pass
		1880	-4.72	3.91	28.22	19.59	90.991	Vertical	Pass
		1907.5	-4.82	3.94	28.20	19.44	87.902	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.05	3.79	28.33	19.49	88.920	Vertical	Pass
		1880	-4.68	3.95	28.22	19.59	90.991	Vertical	Pass
		1905	-4.73	3.97	28.19	19.49	88.920	Vertical	Pass

15.0MHz		1857.5	-5.05	3.79	28.34	19.50	89.125	Vertical	Pass
Band	1/#Mid	1880	-4.80	3.95	28.22	19.47	88.512	Vertical	Pass
QPSK		1902.5	-4.67	3.97	28.18	19.54	89.950	Vertical	Pass
20.0MHz		1860	-4.89	3.81	28.35	19.65	92.257	Vertical	Pass
Band	1/#Mid	1880	-4.64	3.96	28.22	19.62	91.622	Vertical	Pass
QPSK		1900	-4.53	4.00	28.16	19.63	91.833	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)

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.10	3.76	28.24	18.38	68.865	Horizontal	Pass
		1880	-5.93	3.91	28.22	18.38	68.865	Horizontal	Pass
		1909.3	-5.81	3.93	28.20	18.46	70.146	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-6.06	3.77	28.23	18.40	69.183	Horizontal	Pass
		1880	-5.96	3.91	28.24	18.37	68.707	Horizontal	Pass
		1908.5	-5.96	3.94	28.25	18.35	68.391	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-6.20	3.77	28.31	18.34	68.234	Horizontal	Pass
		1880	-5.85	3.91	28.22	18.46	70.146	Horizontal	Pass
		1907.5	-5.90	3.94	28.20	18.36	68.549	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.06	3.79	28.33	18.48	70.469	Horizontal	Pass
		1880	-5.88	3.95	28.22	18.39	69.024	Horizontal	Pass
		1905	-5.76	3.97	28.19	18.46	70.146	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-6.15	3.79	28.34	18.40	69.183	Horizontal	Pass
		1880	-5.84	3.95	28.22	18.43	69.663	Horizontal	Pass
		1902.5	-5.86	3.97	28.18	18.35	68.391	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-6.14	3.81	28.35	18.40	69.183	Horizontal	Pass
		1880	-5.81	3.96	28.22	18.45	69.984	Horizontal	Pass
		1900	-5.80	4.00	28.16	18.36	68.549	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.04	3.76	28.24	18.44	69.823	Vertical	Pass
		1880	-5.83	3.91	28.22	18.48	70.469	Vertical	Pass
		1909.3	-5.86	3.93	28.20	18.41	69.343	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-6.00	3.77	28.23	18.46	70.146	Vertical	Pass
		1880	-5.86	3.91	28.24	18.47	70.307	Vertical	Pass
		1908.5	-5.94	3.94	28.25	18.37	68.707	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-6.16	3.77	28.31	18.38	68.865	Vertical	Pass
		1880	-5.88	3.91	28.22	18.43	69.663	Vertical	Pass
		1907.5	-5.78	3.94	28.20	18.48	70.469	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.15	3.79	28.33	18.39	69.024	Vertical	Pass
		1880	-5.88	3.95	28.22	18.39	69.024	Vertical	Pass
		1905	-5.86	3.97	28.19	18.36	68.549	Vertical	Pass
15.0MHz Band 16	1/#Mid	1857.5	-6.17	3.79	28.34	18.38	68.865	Vertical	Pass
		1880	-5.78	3.95	28.22	18.49	70.632	Vertical	Pass

QAM		1902.5	-5.83	3.97	28.18	18.38	68.865	Vertical	Pass
20.0MHz	1/#Mid	1860	-6.00	3.81	28.35	18.54	71.450	Vertical	Pass
Band 16		1880	-5.72	3.96	28.22	18.54	71.450	Vertical	Pass
QAM		1900	-5.66	4.00	28.16	18.50	70.795	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

### 8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-3.68	3.12	27.58	20.78	119.674	Horizontal	Pass
		1732.5	-3.65	3.27	27.61	20.69	117.220	Horizontal	Pass
		1754.3	-3.68	3.29	27.63	20.66	116.413	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.77	3.13	27.61	20.71	117.761	Horizontal	Pass
		1732.5	-3.61	3.27	27.61	20.73	118.304	Horizontal	Pass
		1753.5	-3.53	3.30	27.62	20.79	119.950	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.86	3.13	27.63	20.64	115.878	Horizontal	Pass
		1732.5	-3.72	3.27	27.61	20.62	115.345	Horizontal	Pass
		1752.5	-3.67	3.30	27.60	20.63	115.611	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.80	3.15	27.64	20.69	117.220	Horizontal	Pass
		1732.5	-3.51	3.31	27.61	20.79	119.950	Horizontal	Pass
		1750	-3.49	3.33	27.59	20.77	119.399	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.73	3.15	27.65	20.77	119.399	Horizontal	Pass
		1732.5	-3.62	3.31	27.61	20.68	116.950	Horizontal	Pass
		1747.5	-3.56	3.33	27.57	20.68	116.950	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.79	3.17	27.66	20.70	117.490	Horizontal	Pass
		1732.5	-3.59	3.32	27.61	20.70	117.490	Horizontal	Pass
		1745	-3.46	3.36	27.56	20.74	118.577	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-3.69	3.12	27.58	20.77	119.399	Vertical	Pass
		1732.5	-3.65	3.27	27.61	20.69	117.220	Vertical	Pass
		1754.3	-3.57	3.29	27.63	20.77	119.399	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.83	3.13	27.61	20.65	116.145	Vertical	Pass
		1732.5	-3.61	3.27	27.61	20.73	118.304	Vertical	Pass
		1753.5	-3.68	3.30	27.62	20.64	115.878	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.88	3.13	27.63	20.62	115.345	Vertical	Pass
		1732.5	-3.55	3.27	27.61	20.79	119.950	Vertical	Pass
		1752.5	-3.56	3.30	27.60	20.74	118.577	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.75	3.15	27.64	20.74	118.577	Vertical	Pass
		1732.5	-3.61	3.31	27.61	20.69	117.220	Vertical	Pass
		1750	-3.46	3.33	27.59	20.80	120.226	Vertical	Pass

15.0MHz		1717.5	-3.83	3.15	27.65	20.67	116.681	Vertical	Pass
Band	1/#Mid	1732.5	-3.55	3.31	27.61	20.75	118.850	Vertical	Pass
QPSK		1747.5	-3.47	3.33	27.57	20.77	119.399	Vertical	Pass
20.0MHz		1720	-3.69	3.17	27.66	20.80	120.226	Vertical	Pass
Band	1/#Mid	1732.5	-3.45	3.32	27.61	20.84	121.339	Vertical	Pass
QPSK		1745	-3.37	3.36	27.56	20.83	121.060	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)

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
				(dBm)	(mW)				
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.70	3.12	27.58	19.76	94.624	Horizontal	Pass
		1732.5	-4.62	3.27	27.61	19.72	93.756	Horizontal	Pass
		1754.3	-4.63	3.29	27.63	19.71	93.541	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.77	3.13	27.61	19.71	93.541	Horizontal	Pass
		1732.5	-4.68	3.27	27.61	19.66	92.470	Horizontal	Pass
		1753.5	-4.57	3.30	27.62	19.75	94.406	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.84	3.13	27.63	19.66	92.470	Horizontal	Pass
		1732.5	-4.67	3.27	27.61	19.67	92.683	Horizontal	Pass
		1752.5	-4.55	3.30	27.60	19.75	94.406	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.80	3.15	27.64	19.69	93.111	Horizontal	Pass
		1732.5	-4.57	3.31	27.61	19.73	93.972	Horizontal	Pass
		1750	-4.58	3.33	27.59	19.68	92.897	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.73	3.15	27.65	19.77	94.842	Horizontal	Pass
		1732.5	-4.63	3.31	27.61	19.67	92.683	Horizontal	Pass
		1747.5	-4.46	3.33	27.57	19.78	95.060	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.77	3.17	27.66	19.72	93.756	Horizontal	Pass
		1732.5	-4.59	3.32	27.61	19.70	93.325	Horizontal	Pass
		1745	-4.43	3.36	27.56	19.77	94.842	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.70	3.12	27.58	19.76	94.624	Vertical	Pass
		1732.5	-4.66	3.27	27.61	19.68	92.897	Vertical	Pass
		1754.3	-4.55	3.29	27.63	19.79	95.280	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.74	3.13	27.61	19.74	94.189	Vertical	Pass
		1732.5	-4.64	3.27	27.61	19.70	93.325	Vertical	Pass
		1753.5	-4.67	3.30	27.62	19.65	92.257	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.71	3.13	27.63	19.79	95.280	Vertical	Pass
		1732.5	-4.60	3.27	27.61	19.74	94.189	Vertical	Pass
		1752.5	-4.57	3.30	27.60	19.73	93.972	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.83	3.15	27.64	19.66	92.470	Vertical	Pass
		1732.5	-4.56	3.31	27.61	19.74	94.189	Vertical	Pass
		1750	-4.60	3.33	27.59	19.66	92.470	Vertical	Pass
15.0MHz Band 16	1/#Mid	1717.5	-4.81	3.15	27.65	19.69	93.111	Vertical	Pass
		1732.5	-4.51	3.31	27.61	19.79	95.280	Vertical	Pass



QAM		1747.5	-4.59	3.33	27.57	19.65	92.257	Vertical	Pass
20.0MHz	1/#Mid	1720	-4.67	3.17	27.66	19.82	95.940	Vertical	Pass
Band 16		1732.5	-4.46	3.32	27.61	19.83	96.161	Vertical	Pass
QAM		1745	-4.40	3.36	27.56	19.80	95.499	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	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)		Average	Average			
					(dB)	(dBm)	(mW)				
1.4MHz Band QPSK	3/#Mid	824.7	3.98	2.01	19.68	2.15	19.50	89.125	Horizontal	Pass	
		836.5	3.86	2.01	19.77	2.15	19.47	88.512	Horizontal	Pass	
		848.3	3.79	2.02	19.82	2.15	19.44	87.902	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	3.93	2.01	19.70	2.15	19.47	88.512	Horizontal	Pass	
		836.5	3.79	2.01	19.77	2.15	19.40	87.096	Horizontal	Pass	
		847.5	3.81	2.02	19.81	2.15	19.45	88.105	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	3.78	2.01	19.71	2.15	19.33	85.704	Horizontal	Pass	
		836.5	3.77	2.01	19.77	2.15	19.38	86.696	Horizontal	Pass	
		846.5	3.80	2.02	19.79	2.15	19.42	87.498	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	829	3.75	2.01	19.73	2.15	19.32	85.507	Horizontal	Pass	
		836.5	3.72	2.01	19.77	2.15	19.33	85.704	Horizontal	Pass	
		844	3.77	2.02	19.78	2.15	19.38	86.696	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	824.7	3.95	2.01	19.68	2.15	19.47	88.512	Vertical	Pass	
		836.5	3.76	2.01	19.77	2.15	19.37	86.497	Vertical	Pass	
		848.3	3.73	2.02	19.82	2.15	19.38	86.696	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	3.89	2.01	19.70	2.15	19.43	87.700	Vertical	Pass	
		836.5	3.83	2.01	19.77	2.15	19.44	87.902	Vertical	Pass	
		847.5	3.72	2.02	19.81	2.15	19.36	86.298	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	3.79	2.01	19.71	2.15	19.34	85.901	Vertical	Pass	
		836.5	3.81	2.01	19.77	2.15	19.42	87.498	Vertical	Pass	
		846.5	3.87	2.02	19.79	2.15	19.49	88.920	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	829	3.97	2.01	19.73	2.15	19.54	89.950	Vertical	Pass	
		836.5	3.91	2.01	19.77	2.15	19.52	89.536	Vertical	Pass	
		844	3.89	2.02	19.78	2.15	19.50	89.125	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)

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
				(dBm)	(mW)					
1.4MHz Band 16 QAM	3#/Mid	824.7	3.94	2.01	19.68	2.15	19.46	88.308	824.7	Pass
		836.5	3.78	2.01	19.77	2.15	19.39	86.896	836.5	Pass
		848.3	3.84	2.02	19.82	2.15	19.49	88.920	848.3	Pass
3.0MHz Band 16 QAM	1#/Mid	825.5	3.88	2.01	19.70	2.15	19.42	87.498	825.5	Pass
		836.5	3.88	2.01	19.77	2.15	19.49	88.920	836.5	Pass
		847.5	3.83	2.02	19.81	2.15	19.47	88.512	847.5	Pass
5.0MHz Band 16 QAM	1#/Mid	826.5	3.94	2.01	19.71	2.15	19.49	88.920	826.5	Pass
		836.5	3.78	2.01	19.77	2.15	19.39	86.896	836.5	Pass
		846.5	3.86	2.02	19.79	2.15	19.48	88.716	846.5	Pass
10.0MHz Band 16 QAM	1#/Mid	829	3.82	2.01	19.73	2.15	19.39	86.896	829	Pass
		836.5	3.86	2.01	19.77	2.15	19.47	88.512	836.5	Pass
		844	3.79	2.02	19.78	2.15	19.40	87.096	844	Pass
1.4MHz Band 16 QAM	1#/Mid	824.7	3.90	2.01	19.68	2.15	19.42	87.498	824.7	Pass
		836.5	3.75	2.01	19.77	2.15	19.36	86.298	836.5	Pass
		848.3	3.78	2.02	19.82	2.15	19.43	87.700	848.3	Pass
3.0MHz Band 16 QAM	1#/Mid	825.5	3.88	2.01	19.70	2.15	19.42	87.498	825.5	Pass
		836.5	3.85	2.01	19.77	2.15	19.46	88.308	836.5	Pass
		847.5	3.72	2.02	19.81	2.15	19.36	86.298	847.5	Pass
5.0MHz Band 16 QAM	1#/Mid	826.5	3.86	2.01	19.71	2.15	19.41	87.297	826.5	Pass
		836.5	3.75	2.01	19.77	2.15	19.36	86.298	836.5	Pass
		846.5	3.79	2.02	19.79	2.15	19.41	87.297	846.5	Pass
10.0MHz Band 16 QAM	1#/Mid	829	3.94	2.01	19.73	2.15	19.51	89.331	829	Pass
		836.5	3.91	2.01	19.77	2.15	19.52	89.536	836.5	Pass
		844	3.93	2.02	19.78	2.15	19.54	89.950	844	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 12

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
			1.4MHz Band QPSK	1/#Mid	699.7	5.61	1.91	19.21	2.15		
		707.5	5.54	1.91	19.26	2.15	20.74	118.577	Vertical	Pass	
		715.3	5.53	1.93	19.34	2.15	20.79	119.950	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	5.58	1.91	19.21	2.15	20.73	118.304	Vertical	Pass	
		707.5	5.55	1.91	19.26	2.15	20.75	118.850	Vertical	Pass	
		714.5	5.50	1.93	19.34	2.15	20.76	119.124	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	5.59	1.91	19.23	2.15	20.76	119.124	Vertical	Pass	
		707.5	5.59	1.91	19.26	2.15	20.79	119.950	Vertical	Pass	
		713.5	5.51	1.92	19.33	2.15	20.77	119.399	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	704	5.54	1.91	19.25	2.15	20.73	118.304	Vertical	Pass	
		707.5	5.49	1.91	19.26	2.15	20.69	117.220	Vertical	Pass	
		711	5.35	1.92	19.32	2.15	20.60	114.815	Vertical	Pass	
1.4MHz Band QPSK	1/#Mid	699.7	5.62	1.91	19.21	2.15	20.77	119.399	Horizontal	Pass	
		707.5	5.48	1.91	19.26	2.15	20.68	116.950	Horizontal	Pass	
		715.3	5.41	1.93	19.34	2.15	20.67	116.681	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	5.57	1.91	19.21	2.15	20.72	118.032	Horizontal	Pass	
		707.5	5.53	1.91	19.26	2.15	20.73	118.304	Horizontal	Pass	
		714.5	5.50	1.93	19.34	2.15	20.76	119.124	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	5.53	1.91	19.23	2.15	20.70	117.490	Horizontal	Pass	
		707.5	5.45	1.91	19.26	2.15	20.65	116.145	Horizontal	Pass	
		713.5	5.47	1.92	19.33	2.15	20.73	118.304	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	704	5.62	1.91	19.25	2.15	20.81	120.504	Horizontal	Pass	
		707.5	5.62	1.91	19.26	2.15	20.82	120.781	Horizontal	Pass	
		711	5.60	1.92	19.32	2.15	20.85	121.619	Horizontal	Pass	

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
				(dBm)	(mW)					
1.4MHz Band 16 QAM	1/#Mid	699.7	4.63	1.91	19.21	2.15	19.78	95.060	Vertical	Pass
		707.5	4.57	1.91	19.26	2.15	19.77	94.842	Vertical	Pass
		715.3	4.64	1.93	19.34	2.15	19.90	97.724	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	4.68	1.91	19.21	2.15	19.83	96.161	Vertical	Pass
		707.5	4.57	1.91	19.26	2.15	19.77	94.842	Vertical	Pass
		714.5	4.54	1.93	19.34	2.15	19.80	95.499	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	4.67	1.91	19.23	2.15	19.84	96.383	Vertical	Pass
		707.5	4.54	1.91	19.26	2.15	19.74	94.189	Vertical	Pass
		713.5	4.59	1.92	19.33	2.15	19.85	96.605	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	4.53	1.91	19.25	2.15	19.72	93.756	Vertical	Pass
		707.5	4.53	1.91	19.26	2.15	19.73	93.972	Vertical	Pass
		711	4.47	1.92	19.32	2.15	19.72	93.756	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	4.67	1.91	19.21	2.15	19.82	95.940	Horizontal	Pass
		707.5	4.63	1.91	19.26	2.15	19.83	96.161	Horizontal	Pass
		715.3	4.53	1.93	19.34	2.15	19.79	95.280	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	4.66	1.91	19.21	2.15	19.81	95.719	Horizontal	Pass
		707.5	4.65	1.91	19.26	2.15	19.85	96.605	Horizontal	Pass
		714.5	4.52	1.93	19.34	2.15	19.78	95.060	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	4.56	1.91	19.23	2.15	19.73	93.972	Horizontal	Pass
		707.5	4.58	1.91	19.26	2.15	19.78	95.060	Horizontal	Pass
		713.5	4.47	1.92	19.33	2.15	19.73	93.972	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	4.75	1.91	19.25	2.15	19.94	98.628	Horizontal	Pass
		707.5	4.70	1.91	19.26	2.15	19.90	97.724	Horizontal	Pass
		711	4.69	1.92	19.32	2.15	19.94	98.628	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)

### 8.6 LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band QPSK	1/#Mid	706.5	4.16	1.91	19.23	2.15	19.33	85.704	Vertical	Pass	
		710	4.15	1.91	19.26	2.15	19.35	86.099	Vertical	Pass	
		713.5	4.01	1.92	19.33	2.15	19.27	84.528	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	709	4.20	1.91	19.25	2.15	19.39	86.896	Vertical	Pass	
		710	4.09	1.91	19.26	2.15	19.29	84.918	Vertical	Pass	
		711	4.09	1.92	19.32	2.15	19.34	85.901	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	706.5	4.10	1.91	19.23	2.15	19.27	84.528	Horizontal	Pass	
		710	4.16	1.91	19.26	2.15	19.36	86.298	Horizontal	Pass	
		713.5	4.01	1.92	19.33	2.15	19.27	84.528	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	709	4.22	1.91	19.25	2.15	19.41	87.297	Horizontal	Pass	
		710	4.22	1.91	19.26	2.15	19.42	87.498	Horizontal	Pass	
		711	4.16	1.92	19.32	2.15	19.41	87.297	Horizontal	Pass	

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
							Average	Average		
							(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	706.5	3.26	1.91	19.23	2.15	18.43	69.663	Vertical	Pass
		710	3.24	1.91	19.26	2.15	18.44	69.823	Vertical	Pass
		713.5	3.19	1.92	19.33	2.15	18.45	69.984	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	3.26	1.91	19.25	2.15	18.45	69.984	Vertical	Pass
		710	3.27	1.91	19.26	2.15	18.47	70.307	Vertical	Pass
		711	3.19	1.92	19.32	2.15	18.44	69.823	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	3.22	1.91	19.23	2.15	18.39	69.024	Horizontal	Pass
		710	3.29	1.91	19.26	2.15	18.49	70.632	Horizontal	Pass
		713.5	3.11	1.92	19.33	2.15	18.37	68.707	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	3.35	1.91	19.25	2.15	18.54	71.450	Horizontal	Pass
		710	3.32	1.91	19.26	2.15	18.52	71.121	Horizontal	Pass
		711	3.28	1.92	19.32	2.15	18.53	71.285	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 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average (dBm)	Average (mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-4.22	3.76	28.24	20.26	106.170	Horizontal	Pass
		1745	-4.05	3.91	28.22	20.26	106.170	Horizontal	Pass
		1779.3	-3.94	3.93	28.2	20.33	107.895	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.09	3.77	28.23	20.37	108.893	Horizontal	Pass
		1745	-3.93	3.91	28.24	20.40	109.648	Horizontal	Pass
		1778.5	-3.94	3.94	28.25	20.37	108.893	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.17	3.77	28.31	20.37	108.893	Horizontal	Pass
		1745	-4.03	3.91	28.22	20.28	106.660	Horizontal	Pass
		1777.5	-3.94	3.94	28.2	20.32	107.647	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.27	3.79	28.33	20.27	106.414	Horizontal	Pass
		1745	-3.93	3.95	28.22	20.34	108.143	Horizontal	Pass
		1775	-3.88	3.97	28.19	20.34	108.143	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.18	3.79	28.34	20.37	108.893	Horizontal	Pass
		1745	-3.98	3.95	28.22	20.29	106.905	Horizontal	Pass
		1772.5	-3.86	3.97	28.18	20.35	108.393	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.21	3.81	28.35	20.33	107.895	Horizontal	Pass
		1745	-3.88	3.96	28.22	20.38	109.144	Horizontal	Pass
		1770	-3.94	4	28.16	20.22	105.196	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.12	3.76	28.24	20.36	108.643	Vertical	Pass
		1745	-4.05	3.91	28.22	20.26	106.170	Vertical	Pass
		1779.3	-3.97	3.93	28.2	20.30	107.152	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.15	3.77	28.23	20.31	107.399	Vertical	Pass
		1745	-3.95	3.91	28.24	20.38	109.144	Vertical	Pass
		1778.5	-3.99	3.94	28.25	20.32	107.647	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.29	3.77	28.31	20.25	105.925	Vertical	Pass
		1745	-4.04	3.91	28.22	20.27	106.414	Vertical	Pass
		1777.5	-3.97	3.94	28.2	20.29	106.905	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-4.18	3.79	28.34	20.37	108.893	Vertical	Pass
		1745	-3.93	3.95	28.22	20.34	108.143	Vertical	Pass



QPSK		1775	-3.85	3.97	28.18	20.36	108.643	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-4.18	3.81	28.35	20.36	108.643	Vertical	Pass
Band		1745	-4.00	3.96	28.22	20.26	106.170	Vertical	Pass
QPSK		1772.5	-3.84	4	28.16	20.32	107.647	Vertical	Pass
20.0MHz	1/#Mid	1720	-4.12	3.79	28.34	20.43	110.408	Vertical	Pass
Band		1745	-3.86	3.95	28.22	20.41	109.901	Vertical	Pass
QPSK		1770	-3.78	3.97	28.18	20.43	110.408	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.54	3.76	28.24	19.94	98.628	Horizontal	Pass
		1745	-4.35	3.91	28.22	19.96	99.083	Horizontal	Pass
		1779.3	-4.41	3.93	28.2	19.86	96.828	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.51	3.77	28.23	19.95	98.855	Horizontal	Pass
		1745	-4.47	3.91	28.24	19.86	96.828	Horizontal	Pass
		1778.5	-4.41	3.94	28.25	19.90	97.724	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.56	3.77	28.31	19.98	99.541	Horizontal	Pass
		1745	-4.36	3.91	28.22	19.95	98.855	Horizontal	Pass
		1777.5	-4.31	3.94	28.2	19.95	98.855	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.56	3.79	28.33	19.98	99.541	Horizontal	Pass
		1745	-4.30	3.95	28.22	19.97	99.312	Horizontal	Pass
		1775	-4.33	3.97	28.19	19.89	97.499	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.60	3.79	28.34	19.95	98.855	Horizontal	Pass
		1745	-4.41	3.95	28.22	19.86	96.828	Horizontal	Pass
		1772.5	-4.22	3.97	28.18	19.99	99.770	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.69	3.81	28.35	19.85	96.605	Horizontal	Pass
		1745	-4.30	3.96	28.22	19.96	99.083	Horizontal	Pass
		1770	-4.17	4	28.16	19.99	99.770	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.55	3.76	28.24	19.93	98.401	Vertical	Pass
		1745	-4.31	3.91	28.22	20.00	100.000	Vertical	Pass
		1779.3	-4.38	3.93	28.2	19.89	97.499	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.50	3.77	28.23	19.96	99.083	Vertical	Pass
		1745	-4.40	3.91	28.24	19.93	98.401	Vertical	Pass
		1778.5	-4.43	3.94	28.25	19.88	97.275	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.60	3.77	28.31	19.94	98.628	Vertical	Pass
		1745	-4.39	3.91	28.22	19.92	98.175	Vertical	Pass
		1777.5	-4.36	3.94	28.2	19.90	97.724	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.63	3.79	28.34	19.92	98.175	Vertical	Pass
		1745	-4.39	3.95	28.22	19.88	97.275	Vertical	Pass
		1775	-4.23	3.97	28.18	19.98	99.541	Vertical	Pass
15.0MHz Band 16	1/#Mid	1717.5	-4.55	3.81	28.35	19.99	99.770	Vertical	Pass
		1745	-4.26	3.96	28.22	20.00	100.000	Vertical	Pass

QAM		1772.5	-4.25	4	28.16	19.91	97.949	Vertical	Pass
20.0MHz	1/#Mid	1720	-4.52	3.79	28.34	20.03	100.693	Vertical	Pass
Band 16		1745	-4.25	3.95	28.22	20.02	100.462	Vertical	Pass
QAM		1770	-4.19	3.97	28.18	20.02	100.462	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 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

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

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

### TEST PROCEDURE

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

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \text{ Log}_{10} (p)$ , dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \text{ Log}_{10} (p)$ , dB at the channel edges and  $55 + 10 \text{ Log}_{10} (p)$  at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

**MODES TESTED**

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 17
- LTE Band 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-53.78	4.04	33.51	-24.31	-13	-11.31	Horizontal
3701.4	-47.35	4.04	33.51	-17.88	-13	-4.88	Vertical
5552.1	-46.51	5.24	35.84	-15.91	-13	-2.91	Vertical
5552.1	-50.06	5.24	35.84	-19.46	-13	-6.46	Horizontal
199.3	-38.91	1.43	16.02	-24.32	-13	-11.32	Vertical
303.9	-36.88	1.30	17.99	-20.19	-13	-7.19	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.58	4.04	33.56	-18.06	-13	-5.06	Horizontal
3760.0	-44.39	4.04	33.56	-14.87	-13	-1.87	Vertical
5640.0	-44.28	5.24	35.91	-13.61	-13	-0.61	Vertical
5640.0	-53.84	5.24	35.91	-23.17	-13	-10.17	Horizontal
210.5	-37.94	1.62	16.97	-22.59	-13	-9.59	Vertical
371.5	-34.96	1.74	15.98	-20.73	-13	-7.73	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.36	4.04	34.00	-17.40	-13	-4.40	Horizontal
3818.6	-45.51	4.04	34.00	-15.55	-13	-2.55	Vertical
5727.9	-45.65	5.24	36.04	-14.85	-13	-1.85	Vertical
5727.9	-50.16	5.24	36.04	-19.36	-13	-6.36	Horizontal
196.9	-34.97	1.42	17.29	-19.10	-13	-6.10	Vertical
458.8	-40.87	1.50	17.90	-24.46	-13	-11.46	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-52.71	4.07	33.54	-23.24	-13	-10.24	Horizontal
3720.0	-46.04	4.07	33.54	-16.57	-13	-3.57	Vertical
5580.0	-48.95	5.28	35.86	-18.37	-13	-5.37	Vertical
5580.0	-53.30	5.28	35.86	-22.72	-13	-9.72	Horizontal
196.6	-44.38	1.58	16.89	-29.06	-13	-16.06	Vertical
270.1	-44.56	1.76	17.26	-29.06	-13	-16.06	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.51	4.04	33.56	-17.99	-13	-4.99	Horizontal
3760.0	-48.37	4.04	33.56	-18.85	-13	-5.85	Vertical
5640.0	-53.13	5.24	35.91	-22.46	-13	-9.46	Vertical
5640.0	-50.89	5.24	35.91	-20.22	-13	-7.22	Horizontal
207.7	-40.46	1.46	16.27	-25.65	-13	-12.65	Vertical
302.3	-43.83	1.59	15.15	-30.27	-13	-17.27	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-46.76	4.04	34.00	-16.80	-13	-3.80	Horizontal
3800.0	-45.45	4.04	34.00	-15.49	-13	-2.49	Vertical
5700.0	-49.08	5.24	36.04	-18.28	-13	-5.28	Vertical
5700.0	-49.31	5.24	36.04	-18.51	-13	-5.51	Horizontal
211.7	-36.30	1.36	17.39	-20.26	-13	-7.26	Vertical
449.9	-34.15	1.66	15.39	-20.42	-13	-7.42	Horizontal

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-46.63	4.02	29.80	-20.85	-13	-7.85	Horizontal
3421.4	-46.00	4.02	29.80	-20.22	-13	-7.22	Vertical
5132.1	-52.81	5.24	35.84	-22.21	-13	-9.21	Vertical
5132.1	-51.76	5.24	35.84	-21.16	-13	-8.16	Horizontal
185.3	-38.00	1.68	16.04	-23.64	-13	-10.64	Vertical
396.8	-44.75	1.78	17.74	-28.79	-13	-15.79	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-47.47	4.03	30.00	-21.50	-13	-8.50	Horizontal
3465.0	-46.13	4.03	30.00	-20.16	-13	-7.16	Vertical
5197.5	-49.18	5.25	35.86	-18.57	-13	-5.57	Vertical
5197.5	-53.74	5.25	35.86	-23.13	-13	-10.13	Horizontal
206.4	-38.08	1.72	17.69	-22.11	-13	-9.11	Vertical
268.5	-41.64	1.62	16.02	-27.23	-13	-14.23	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-44.79	4.05	30.01	-18.83	-13	-5.83	Horizontal
3508.6	-48.88	4.05	30.01	-22.92	-13	-9.92	Vertical
5262.9	-47.10	5.26	35.86	-16.50	-13	-3.50	Vertical
5262.9	-49.94	5.26	35.86	-19.34	-13	-6.34	Horizontal
179.5	-43.12	1.80	16.69	-28.23	-13	-15.23	Vertical
280.6	-41.81	1.75	16.66	-26.91	-13	-13.91	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	-45.04	4.02	29.80	-19.26	-13	-6.26	Horizontal
3440.0	-44.66	4.02	29.80	-18.88	-13	-5.88	Vertical
5160.0	-46.51	5.24	35.84	-15.91	-13	-2.91	Vertical
5160.0	-49.02	5.24	35.84	-18.42	-13	-5.42	Horizontal
179.5	-42.70	1.57	17.26	-27.01	-13	-14.01	Vertical
276.7	-40.45	1.78	16.35	-25.88	-13	-12.88	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.76	4.03	30.00	-19.79	-13	-6.79	Horizontal
3465.0	-52.17	4.03	30.00	-26.20	-13	-13.20	Vertical
5197.5	-51.31	5.25	35.86	-20.70	-13	-7.70	Vertical
5197.5	-49.91	5.25	35.86	-19.30	-13	-6.30	Horizontal
185.2	-35.25	1.44	17.95	-18.74	-13	-5.74	Vertical
438.4	-42.91	1.65	16.09	-28.47	-13	-15.47	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-46.35	2.91	27.68	-21.58	-13	-8.58	Horizontal
3490.0	-44.33	2.91	27.68	-19.56	-13	-6.56	Vertical
5235.0	-48.97	5.26	35.86	-18.37	-13	-5.37	Vertical
5235.0	-49.10	5.26	35.86	-18.50	-13	-5.50	Horizontal
208.7	-41.28	1.61	16.85	-26.04	-13	-13.04	Vertical
237.9	-35.93	1.61	15.19	-22.35	-13	-9.35	Horizontal

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

<b>Test Results for Low Channel 824.7MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-47.06	2.78	27.50	-22.34	-13	-9.34	Horizontal
1649.4	-50.10	2.78	27.50	-25.38	-13	-12.38	Vertical
2474.1	-50.91	2.90	27.80	-26.01	-13	-13.01	Vertical
2474.1	-51.88	2.90	27.80	-26.98	-13	-13.98	Horizontal
180.1	-37.24	1.76	17.59	-21.41	-13	-8.41	Vertical
424.9	-35.01	1.63	15.87	-20.77	-13	-7.77	Horizontal
<b>Test Results For Mid Channel 836.5MHz</b>							
1673.0	-52.12	2.80	27.48	-27.44	-13	-14.44	Horizontal
1673.0	-50.65	2.80	27.48	-25.97	-13	-12.97	Vertical
2509.5	-45.46	2.91	27.70	-20.67	-13	-7.67	Vertical
2509.5	-50.65	2.91	27.70	-25.86	-13	-12.86	Horizontal
191.4	-35.71	1.61	15.68	-21.64	-13	-8.64	Vertical
396.4	-44.34	1.59	17.52	-28.42	-13	-15.42	Horizontal
<b>Test Results for High Channel 848.3MHz</b>							
1696.6	-53.62	2.82	27.43	-29.01	-13	-16.01	Horizontal
1696.6	-48.99	2.82	27.43	-24.38	-13	-11.38	Vertical
2544.9	-46.19	2.92	27.74	-21.37	-13	-8.37	Vertical
2544.9	-50.98	2.92	27.74	-26.16	-13	-13.16	Horizontal
197.4	-34.57	1.69	16.67	-19.58	-13	-6.58	Vertical
272.6	-35.35	1.70	17.18	-19.87	-13	-6.87	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	-52.61	2.78	27.50	-27.89	-13	-14.89	Horizontal
1658.0	-51.70	2.78	27.50	-26.98	-13	-13.98	Vertical
2487.0	-53.87	2.90	27.80	-28.97	-13	-15.97	Vertical
2487.0	-51.47	2.90	27.80	-26.57	-13	-13.57	Horizontal
193.3	-43.03	1.71	15.57	-29.17	-13	-16.17	Vertical
370.6	-44.12	1.34	16.40	-29.06	-13	-16.06	Horizontal
<b>Test Results for Mid Channel 836.5MHz</b>							
1673.0	-46.78	2.80	27.48	-22.10	-13	-9.10	Horizontal
1673.0	-50.43	2.80	27.48	-25.75	-13	-12.75	Vertical
2509.5	-44.81	2.91	27.70	-20.02	-13	-7.02	Vertical
2509.5	-50.75	2.91	27.70	-25.96	-13	-12.96	Horizontal
212.5	-35.73	1.44	17.04	-20.13	-13	-7.13	Vertical
293.1	-43.82	1.76	17.62	-27.96	-13	-14.96	Horizontal
<b>Test Results for High Channel 844MHz</b>							
1688.0	-53.94	2.82	27.43	-29.33	-13	-16.33	Horizontal
1688.0	-46.71	2.82	27.43	-22.10	-13	-9.10	Vertical
2532.0	-46.13	2.92	27.74	-21.31	-13	-8.31	Vertical
2532.0	-52.07	2.92	27.74	-27.25	-13	-14.25	Horizontal
177.5	-40.06	1.74	17.70	-24.10	-13	-11.10	Vertical
372.0	-41.66	1.41	17.46	-25.60	-13	-12.60	Horizontal

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (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 12

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

<b>Test Results for Low Channel 699.7MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-50.39	2.60	27.20	-25.79	-13	-12.79	Horizontal
1399.4	-50.25	2.60	27.20	-25.65	-13	-12.65	Vertical
2099.1	-52.80	2.85	27.54	-28.11	-13	-15.11	Vertical
2099.1	-51.56	2.85	27.54	-26.87	-13	-13.87	Horizontal
178.2	-37.42	1.49	17.78	-21.13	-13	-8.13	Vertical
423.8	-44.19	1.36	17.33	-28.22	-13	-15.22	Horizontal
<b>Test Results For Mid Channel 707.5MHz</b>							
1415.0	-53.03	2.61	27.28	-28.36	-13	-15.36	Horizontal
1415.0	-51.05	2.61	27.28	-26.38	-13	-13.38	Vertical
2122.5	-46.78	2.87	27.59	-22.06	-13	-9.06	Vertical
2122.5	-49.43	2.87	27.59	-24.71	-13	-11.71	Horizontal
189.2	-38.73	1.73	15.74	-24.72	-13	-11.72	Vertical
315.0	-43.50	1.62	15.79	-29.33	-13	-16.33	Horizontal
<b>Test Results for High Channel 715.3MHz</b>							
1430.6	-48.76	2.63	27.28	-24.11	-13	-11.11	Horizontal
1430.6	-47.21	2.63	27.28	-22.56	-13	-9.56	Vertical
2145.9	-50.32	2.88	27.60	-25.60	-13	-12.60	Vertical
2145.9	-52.87	2.88	27.60	-28.15	-13	-15.15	Horizontal
201.2	-34.33	1.61	18.00	-17.94	-13	-4.94	Vertical
329.1	-42.46	1.45	15.49	-28.43	-13	-15.43	Horizontal

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

<b>Test Results for Low Channel 704MHz</b>							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-49.01	2.61	27.26	-24.36	-13	-11.36	Horizontal
1408.0	-53.61	2.61	27.26	-28.96	-13	-15.96	Vertical
2112.0	-45.55	2.87	27.58	-20.84	-13	-7.84	Vertical
2112.0	-52.66	2.87	27.58	-27.95	-13	-14.95	Horizontal
187.5	-36.52	1.31	16.97	-20.86	-13	-7.86	Vertical
352.3	-35.43	1.65	16.70	-20.38	-13	-7.38	Horizontal
<b>Test Results for Mid Channel 707.5MHz</b>							
1415.0	-53.47	2.61	27.28	-28.80	-13	-15.80	Horizontal
1415.0	-47.66	2.61	27.28	-22.99	-13	-9.99	Vertical
2122.5	-53.84	2.87	27.59	-29.12	-13	-16.12	Vertical
2122.5	-51.90	2.87	27.59	-27.18	-13	-14.18	Horizontal
188.1	-40.60	1.72	17.99	-24.33	-13	-11.33	Vertical
329.2	-39.32	1.73	17.94	-23.11	-13	-10.11	Horizontal
<b>Test Results for High Channel 711MHz</b>							
1422.0	-52.33	2.62	27.28	-27.67	-13	-14.67	Horizontal
1422.0	-48.37	2.62	27.28	-23.71	-13	-10.71	Vertical
2133.0	-52.58	2.87	27.60	-27.85	-13	-14.85	Vertical
2133.0	-52.99	2.87	27.60	-28.26	-13	-15.26	Horizontal
188.8	-35.44	1.58	15.93	-21.09	-13	-8.09	Vertical
313.9	-38.46	1.36	15.59	-24.23	-13	-11.23	Horizontal

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

9.5 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-51.47	2.61	27.28	-26.80	-13	-13.80	Horizontal
1413.0	-53.14	2.61	27.28	-28.47	-13	-15.47	Vertical
2119.5	-49.61	2.87	27.59	-24.89	-13	-11.89	Vertical
2119.5	-53.75	2.87	27.59	-29.03	-13	-16.03	Horizontal
186.7	-37.69	1.71	16.15	-23.25	-13	-10.25	Vertical
344.8	-36.21	1.41	17.32	-20.30	-13	-7.30	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-50.51	2.62	27.30	-25.83	-13	-12.83	Horizontal
1420.0	-47.24	2.62	27.30	-22.56	-13	-9.56	Vertical
2130.0	-44.62	2.87	27.62	-19.87	-13	-6.87	Vertical
2130.0	-49.18	2.87	27.62	-24.43	-13	-11.43	Horizontal
181.8	-37.39	1.42	15.25	-23.57	-13	-10.57	Vertical
369.1	-34.96	1.36	17.19	-19.13	-13	-6.13	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-52.98	2.66	27.28	-28.36	-13	-15.36	Horizontal
1427.0	-48.19	2.66	27.28	-23.57	-13	-10.57	Vertical
2140.5	-52.50	2.88	27.60	-27.78	-13	-14.78	Vertical
2140.5	-53.31	2.88	27.60	-28.59	-13	-15.59	Horizontal
199.0	-42.18	1.32	17.29	-26.21	-13	-13.21	Vertical
287.9	-41.34	1.72	16.89	-26.17	-13	-13.17	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	-50.00	2.62	27.30	-25.32	-13	-12.32	Horizontal
1418.0	-49.76	2.62	27.30	-25.08	-13	-12.08	Vertical
2127.0	-49.87	2.87	27.62	-25.12	-13	-12.12	Vertical
2127.0	-53.43	2.87	27.62	-28.68	-13	-15.68	Horizontal
191.6	-37.39	1.35	16.91	-21.83	-13	-8.83	Vertical
234.9	-37.06	1.62	16.31	-22.37	-13	-9.37	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-44.08	2.62	27.30	-19.40	-13	-6.40	Horizontal
1420.0	-51.00	2.62	27.30	-26.32	-13	-13.32	Vertical
2130.0	-48.90	2.87	27.62	-24.15	-13	-11.15	Vertical
2130.0	-53.72	2.87	27.62	-28.97	-13	-15.97	Horizontal
208.1	-39.66	1.51	17.14	-24.03	-13	-11.03	Vertical
239.3	-38.43	1.77	16.88	-23.32	-13	-10.32	Horizontal
Test Results for High Channel 711MHz							
1422.0	-48.96	2.62	27.30	-24.28	-13	-11.28	Horizontal
1422.0	-52.32	2.62	27.30	-27.64	-13	-14.64	Vertical
2133.0	-47.96	2.87	27.62	-23.21	-13	-10.21	Vertical
2133.0	-52.29	2.87	27.62	-27.54	-13	-14.54	Horizontal
180.1	-36.57	1.78	15.95	-22.40	-13	-9.40	Vertical
304.4	-42.28	1.34	17.95	-25.68	-13	-12.68	Horizontal

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

9.6 LTE BAND 66

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-61.33	3.84	35.81	-29.36	-25	-4.36	Horizontal
3421.4	-61.68	3.84	35.81	-29.71	-25	-4.71	Vertical
5132.1	-64.18	5.18	36.85	-32.51	-25	-7.51	Vertical
5132.1	-59.89	5.18	36.85	-28.22	-25	-3.22	Horizontal
196.2	-46.87	1.56	17.97	-30.46	-25	-5.46	Vertical
384.7	-50.44	1.33	15.11	-36.66	-25	-11.66	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-64.70	3.85	35.82	-32.73	-25	-7.73	Horizontal
3490.0	-61.10	3.85	35.82	-29.13	-25	-4.13	Vertical
5235.0	-59.20	5.21	36.85	-27.56	-25	-2.56	Vertical
5235.0	-61.43	5.21	36.85	-29.79	-25	-4.79	Horizontal
180.4	-49.03	1.77	16.17	-34.62	-25	-9.62	Vertical
298.1	-54.27	1.63	15.21	-40.69	-25	-15.69	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-64.98	3.86	35.83	-33.01	-25	-8.01	Horizontal
3558.6	-62.25	3.86	35.83	-30.28	-25	-5.28	Vertical
5337.9	-60.97	5.24	36.87	-29.34	-25	-4.34	Vertical
5337.9	-61.46	5.24	36.87	-29.83	-25	-4.83	Horizontal
192.1	-46.63	1.58	17.56	-30.65	-25	-5.65	Vertical
342.2	-46.80	1.45	16.58	-31.67	-25	-6.67	Horizontal



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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-63.31	3.84	35.82	-31.33	-25	-6.33	Horizontal
3440.0	-59.05	3.84	35.82	-27.07	-25	-2.07	Vertical
5160.0	-59.88	5.18	36.86	-28.20	-25	-3.20	Vertical
5160.0	-62.10	5.18	36.86	-30.42	-25	-5.42	Horizontal
208.2	-51.45	1.56	15.76	-37.25	-25	-12.25	Vertical
389.5	-49.49	1.33	15.44	-35.38	-25	-10.38	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-61.29	3.85	35.82	-29.32	-25	-4.32	Horizontal
3490.0	-60.01	3.85	35.82	-28.04	-25	-3.04	Vertical
5235.0	-61.59	5.21	36.85	-29.95	-25	-4.95	Vertical
5235.0	-60.92	5.21	36.85	-29.28	-25	-4.28	Horizontal
184.7	-53.03	1.77	16.84	-37.95	-25	-12.95	Vertical
453.6	-50.35	1.63	17.64	-34.34	-25	-9.34	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-62.18	3.86	35.83	-30.21	-25	-5.21	Horizontal
3540.0	-62.72	3.86	35.83	-30.75	-25	-5.75	Vertical
5310.0	-59.77	5.24	36.88	-28.13	-25	-3.13	Vertical
5310.0	-63.37	5.24	36.88	-31.73	-25	-6.73	Horizontal
207.0	-44.44	1.58	16.84	-29.17	-25	-4.17	Vertical
460.7	-45.59	1.45	17.64	-29.40	-25	-4.40	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 3.8V 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 12
- LTE Band 17
- LTE Band 66

## 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	12.4	0.006601	2.5
3.8	1880	13.4	0.007128	2.5
4.2	1880	13.2	0.007011	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	12.4	0.006584	2.5
Extreme (50C)	1880	11.9	0.006336	2.5
Extreme (40C)	1880	13.7	0.007272	2.5
Extreme (30C)	1880	13.4	0.007148	2.5
Extreme (10C)	1880	13.7	0.007297	2.5
Extreme (0C)	1880	12.0	0.006360	2.5
Extreme (-10C)	1880	13.5	0.007160	2.5
Extreme (-20C)	1880	14.2	0.007569	2.5
Extreme (-30C)	1880	14.3	0.007582	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	10.2	0.005436	2.5
3.8	1880	8.9	0.004727	2.5
4.2	1880	8.2	0.004356	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	9.9	0.005261	2.5
Extreme (50C)	1880	9.0	0.004811	2.5
Extreme (40C)	1880	7.6	0.004060461	2.5
Extreme (30C)	1880	9.4	0.004996435	2.5
Extreme (10C)	1880	9.0	0.004797251	2.5
Extreme (0C)	1880	7.8	0.004143651	2.5
Extreme (-10C)	1880	9.4	0.004973858	2.5
Extreme (-20C)	1880	9.0	0.004813134	2.5
Extreme (-30C)	1880	8.3	0.004388577	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	8.9	0.005146	2.5
3.8	1732.5	8.4	0.004849	2.5
4.2	1732.5	8.5	0.004893	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	8.1	0.004672	2.5
Extreme (50C)	1732.5	9.0	0.005174	2.5
Extreme (40C)	1732.5	7.4	0.004272	2.5
Extreme (30C)	1732.5	6.3	0.003638	2.5
Extreme (10C)	1732.5	6.6	0.003820	2.5
Extreme (0C)	1732.5	9.1	0.005237	2.5
Extreme (-10C)	1732.5	8.1	0.004702	2.5
Extreme (-20C)	1732.5	7.3	0.004196	2.5
Extreme (-30C)	1732.5	8.8	0.005055	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	9.8	0.005640	2.5
3.8	1732.5	8.6	0.004955	2.5
4.2	1732.5	7.9	0.004559	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	9.9	0.005737	2.5
Extreme (50C)	1732.5	9.1	0.005247	2.5
Extreme (40C)	1732.5	8.0	0.004600	2.5
Extreme (30C)	1732.5	8.5	0.004925	2.5
Extreme (10C)	1732.5	8.6	0.004989	2.5
Extreme (0C)	1732.5	7.9	0.004573	2.5
Extreme (-10C)	1732.5	9.3	0.005352	2.5
Extreme (-20C)	1732.5	9.1	0.005257	2.5
Extreme (-30C)	1732.5	8.3	0.004815	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	6.0	0.007169	2.5
3.8	836.5	7.0	0.008390	2.5
4.2	836.5	4.6	0.005545	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	5.7	0.006802	2.5
Extreme (50C)	836.5	5.6	0.006722	2.5
Extreme (40C)	836.5	6.2	0.007422	2.5
Extreme (30C)	836.5	6.2	0.007445	2.5
Extreme (10C)	836.5	5.3	0.006351	2.5
Extreme (0C)	836.5	5.7	0.006837	2.5
Extreme (-10C)	836.5	5.6	0.006751	2.5
Extreme (-20C)	836.5	5.8	0.006931	2.5
Extreme (-30C)	836.5	6.2	0.007416	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	5.4	0.006435	2.5
3.8	836.5	7.0	0.008382	2.5
4.2	836.5	4.4	0.005256	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	5.7	0.006761	2.5
Extreme (50C)	836.5	5.5	0.006611	2.5
Extreme (40C)	836.5	5.9	0.007057	2.5
Extreme (30C)	836.5	6.8	0.008145	2.5
Extreme (10C)	836.5	5.9	0.007002	2.5
Extreme (0C)	836.5	5.2	0.006194	2.5
Extreme (-10C)	836.5	5.3	0.006319	2.5
Extreme (-20C)	836.5	6.1	0.007349	2.5
Extreme (-30C)	836.5	5.8	0.006970	2.5

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



10.4 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	8.2	0.011595	2.5
3.8	707.5	10.2	0.014459	2.5
4.2	707.5	8.1	0.011473	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	8.7	0.012235	2.5
Extreme (50C)	707.5	7.7	0.010896	2.5
Extreme (40C)	707.5	7.4	0.010419	2.5
Extreme (30C)	707.5	8.4	0.011849	2.5
Extreme (10C)	707.5	7.0	0.009892	2.5
Extreme (0C)	707.5	8.6	0.012137	2.5
Extreme (-10C)	707.5	8.1	0.011444	2.5
Extreme (-20C)	707.5	9.3	0.013134	2.5
Extreme (-30C)	707.5	7.9	0.011120	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	7.7	0.010861	2.5
3.8	707.5	8.0	0.011288	2.5
4.2	707.5	7.6	0.010786	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	9.2	0.013054	2.5
Extreme (50C)	707.5	8.0	0.011304	2.5
Extreme (40C)	707.5	9.3	0.013200	2.5
Extreme (30C)	707.5	8.3	0.011718	2.5
Extreme (10C)	707.5	8.5	0.012076	2.5
Extreme (0C)	707.5	7.7	0.010836	2.5
Extreme (-10C)	707.5	7.6	0.010746	2.5
Extreme (-20C)	707.5	9.0	0.012748	2.5
Extreme (-30C)	707.5	8.8	0.012433	2.5

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

10.5 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	9.5	0.013323	2.5
3.8	710.0	8.6	0.012131	2.5
4.2	710.0	7.9	0.011129	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	9.3	0.013126	2.5
Extreme (50C)	710.0	9.1	0.012869	2.5
Extreme (40C)	710.0	7.7	0.010912	2.5
Extreme (30C)	710.0	8.9	0.012500	2.5
Extreme (10C)	710.0	9.1	0.012802	2.5
Extreme (0C)	710.0	7.9	0.011173	2.5
Extreme (-10C)	710.0	8.6	0.012073	2.5
Extreme (-20C)	710.0	9.4	0.013187	2.5
Extreme (-30C)	710.0	7.8	0.010964	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	10.3	0.014559	2.5
3.8	710.0	9.1	0.012794	2.5
4.2	710.0	8.2	0.011511	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	9.6	0.013486	2.5
Extreme (50C)	710.0	8.4	0.011881	2.5
Extreme (40C)	710.0	8.4	0.011867	2.5
Extreme (30C)	710.0	9.2	0.012969	2.5
Extreme (10C)	710.0	8.3	0.011742	2.5
Extreme (0C)	710.0	8.3	0.011749	2.5
Extreme (-10C)	710.0	9.2	0.012963	2.5
Extreme (-20C)	710.0	9.2	0.012901	2.5
Extreme (-30C)	710.0	8.6	0.012138	2.5

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

10.6 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>				
3.4	1745	6.4	0.003648	2.5
3.8	1745	6.8	0.003885	2.5
4.2	1745	7.4	0.004244	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	5.9	0.003394	2.5
Extreme (50C)	1745	7.8	0.004460	2.5
Extreme (40C)	1745	6.2	0.003564	2.5
Extreme (30C)	1745	6.6	0.003790	2.5
Extreme (10C)	1745	7.2	0.004145	2.5
Extreme (0C)	1745	6.3	0.003604	2.5
Extreme (-10C)	1745	5.5	0.003138	2.5
Extreme (-20C)	1745	6.2	0.003562	2.5
Extreme (-30C)	1745	5.9	0.003355	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>				
3.4	1745	8.6	0.004920	2.5
3.8	1745	7.7	0.004394	2.5
4.2	1745	9.7	0.005585	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	9.0	0.005144	2.5
Extreme (50C)	1745	7.8	0.004478	2.5
Extreme (40C)	1745	8.1	0.004648	2.5
Extreme (30C)	1745	8.1	0.004659	2.5
Extreme (10C)	1745	9.0	0.005137	2.5
Extreme (0C)	1745	6.9	0.003974	2.5
Extreme (-10C)	1745	8.2	0.004709	2.5
Extreme (-20C)	1745	8.4	0.004830	2.5
Extreme (-30C)	1745	5.4	0.003078	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.

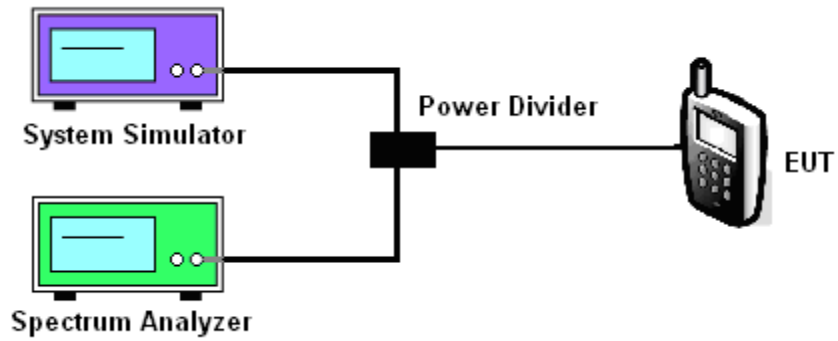
### 11.2 Measuring Instruments

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
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 17
- LTE Band 66

Test data reference attachment.

----END OF REPORT----