

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

## FCC ID: 2AOWK-3120

**Product:** Tablet

**Trade Mark:** ulefone

**Model No.:** GQ3120

**Family Model:** Armor Pad 3 Pro, Armor Pad 3,  
Armor Pad 3 Ultra,Armor Pad 3E,  
Armor Pad 3S, Armor Pad 3 Lite,  
Armor Pad 3 Pro+, Armor Pad 3s,  
Armor Pad 3s Pro

**Report No.:** S24012208507006

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### Prepared for

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

### Prepared by

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



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# 1. GENERAL INFORMATION

## 1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Tablet
Trade Mark	ulefone
Model Name	GQ3120
Family Model	Armor Pad 3 Pro, Armor Pad 3, Armor Pad 3 Ultra, Armor Pad 3E, Armor Pad 3S, Armor Pad 3 Lite, Armor Pad 3 Pro+, Armor Pad 3s, Armor Pad 3s Pro
Model Difference	All the model are the same circuit and RF module, except the model names.
FCC ID:	2AOWK-3120
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12,17,66 LTE TDD Band 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE TDD Band 41 Uplink& Downlink: 2555MHz-2655MHz,  LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM Card:	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.54 dBi, Band 4: 0.71dBi, Band 5: 1.69dBi, Band 7: 2.78dBi, Band 12: -0.27 dBi, Band 17: -0.27 dBi, Band 41: 0.2 dBi, Band 66: 0.71dBi
Adapter	Model: HJ-PD66W-US Input: 100-240V~50/60Hz 1.5A Output: 5.0V---3.0A OR 9.0---3.0A OR 12.0V---3.0A OR 15.0V---3.0A OR 20.0V---3.25A OR 11.0V---6.0A 66W
Battery	DC 3.85V, 33280mAh, 128.128Wh
Power supply	DC 3.85V from battery or DC 5V from adapter

Extreme Vol. Limits:	DC 3.27V to DC 4.43V (Nominal DC 3.85) (Note 1)
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage DC 4.43V and Low Voltage 3.27V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

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

This submittal(s) (test report) is intended for **FCC ID: 2AOWK-3120** filing to comply with the FCC Part 22H&24E&27&90S.

**1.3 TEST METHODOLOGY**

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

**1.4 TEST FACILITY**

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

ShenZhen NTEK Testing Technology Co., Ltd.  
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street  
Bao'an District, Shenzhen 518126 P.R. China

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

**MEASUREMENT UNCERTAINTY**

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

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

**1.5 SPECIAL ACCESSORIES**

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

**1.6 WORST-CASE CONFIGURATION AND MODE**

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

The device has LTE Bands of: Band 2/4/5/7/12/17/41/66

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

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

## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT CONFIGURATION

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

### 2.2 EUT EXERCISE

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

### 2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

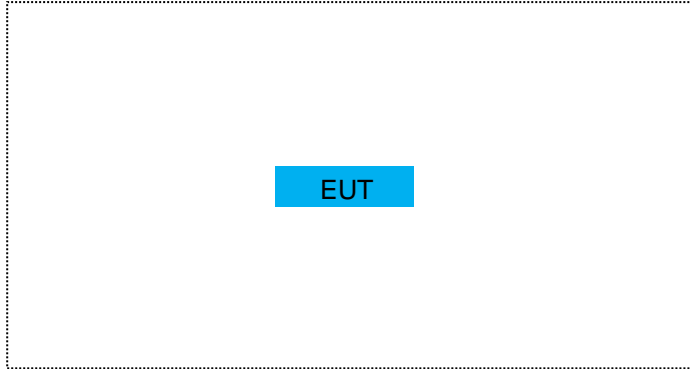
Item	Equipment	Model No.	ID or Specification	Note
1	Tablet	GQ3120	FCC ID: 2AOWK-3120	EUT

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

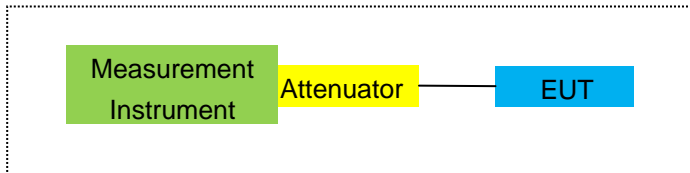


## 2.4 TEST SETUP

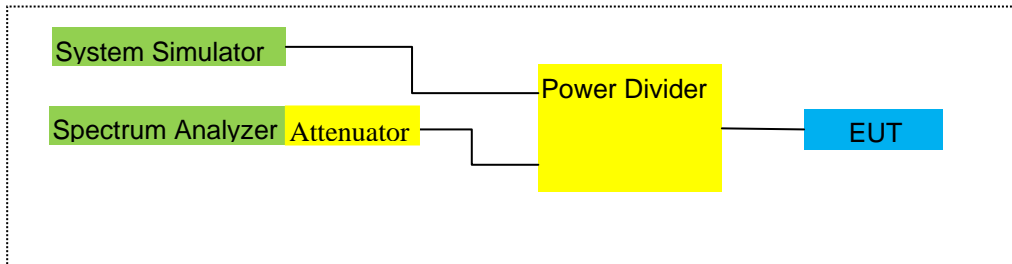
For Radiated Test Cases



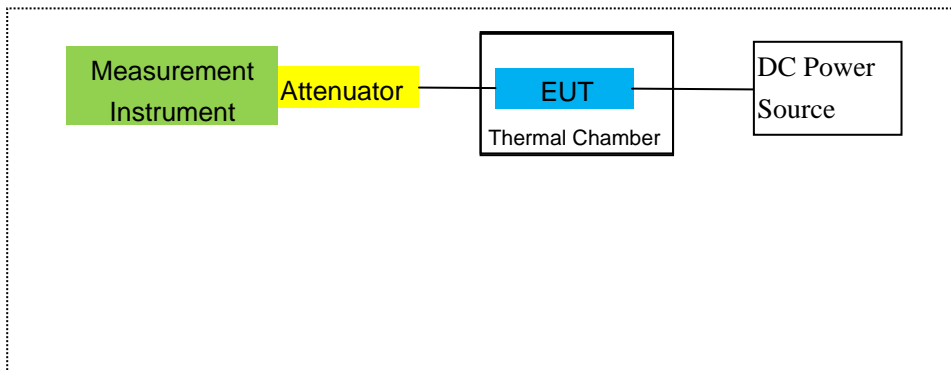
For Conducted Output Power



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	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16	2024.03.15	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2023.05.06	2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2025.03.30	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2025.11.06	3 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2023.11.03	2026.11.02	3 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.05.29	2024.05.28	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2023.03.27	2024.03.26	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
24	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	1 year
25	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27	2024.03.26	1 year
27	DC Power Source	N/A	PS-6005D	2017040292 3	2023.05.06	2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2023.05.29	2024.05.28	1 year
29	Communication Tester	R&S	CMW500	148500	2023.05.29	2024.05.28	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

## 4. OUTPUT POWER

### 4.1 OUTPUT POWER MEASUREMENT

#### LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3**

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS\_01".3

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks ( $N_{RB}$ )	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	$\leq 1$
			5	>6	$\leq 1$
			10	>6	$\leq 1$
			15	>8	$\leq 1$
			20	>10	$\leq 1$
NS_04	6.6.2.2.2	41	5	>6	$\leq 1$
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	$\geq 50$	$\leq 1$
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	$\leq 3$
NS_09	6.6.3.3.4	21	10, 15	> 40	$\leq 1$
				> 55	$\leq 2$
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 <sup>1</sup>	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

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

Test data reference attachment.

## 5. OCCUPIED BANDWIDTH

### RULE PART(S)

FCC: §2.1049

### LIMITS

For reporting purposes only

### TEST PROCEDURE

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

### MODES TESTED

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

### RESULTS

**PASS**

Test data reference attachment.

## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

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

FCC: §22.359

### LIMITS

FCC: §22.917, §24.238, §27.53

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

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

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

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

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

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

**TEST PROCEDURE**

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

**MODES TESTED**

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

**RESULTS**

Test data reference attachment.



## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

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

### LIMITS

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

### TEST PROCEDURE

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

For each out of band emissions measurement:

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

### **MODES TESTED**

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

#### 7.1 MEASUREMENT METHOD

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

Test data reference attachment.

## 8. RADIATED MEASUREMENT

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

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

#### LIMITS:

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

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

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

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

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

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

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

#### MODES TESTED

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

#### RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	1/#Mid	1850.7	-2.70	3.76	28.24	21.78	150.661	Horizontal	Pass	
		1880	-2.49	3.91	28.22	21.82	152.055	Horizontal	Pass	
		1909.3	-2.46	3.93	28.20	21.81	151.705	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-2.75	3.77	28.23	21.71	148.252	Horizontal	Pass	
		1880	-2.61	3.91	28.24	21.72	148.594	Horizontal	Pass	
		1908.5	-2.54	3.94	28.25	21.77	150.314	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-2.80	3.77	28.31	21.74	149.279	Horizontal	Pass	
		1880	-2.51	3.91	28.22	21.80	151.356	Horizontal	Pass	
		1907.5	-2.58	3.94	28.20	21.68	147.231	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-2.83	3.79	28.33	21.71	148.252	Horizontal	Pass	
		1880	-2.50	3.95	28.22	21.77	150.314	Horizontal	Pass	
		1905	-2.41	3.97	28.19	21.81	151.705	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	1857.5	-2.79	3.79	28.34	21.76	149.968	Horizontal	Pass	
		1880	-2.46	3.95	28.22	21.81	151.705	Horizontal	Pass	
		1902.5	-2.48	3.97	28.18	21.73	148.936	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	1860	-2.81	3.81	28.35	21.73	148.936	Horizontal	Pass	
		1880	-2.48	3.96	28.22	21.78	150.661	Horizontal	Pass	
		1900	-2.32	4.00	28.16	21.84	152.757	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1850.7	-2.68	3.76	28.24	21.80	151.356	Vertical	Pass	
		1880	-2.53	3.91	28.22	21.78	150.661	Vertical	Pass	
		1909.3	-2.49	3.93	28.20	21.78	150.661	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-2.75	3.77	28.23	21.71	148.252	Vertical	Pass	
		1880	-2.54	3.91	28.24	21.79	151.008	Vertical	Pass	
		1908.5	-2.51	3.94	28.25	21.80	151.356	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-2.75	3.77	28.31	21.79	151.008	Vertical	Pass	
		1880	-2.53	3.91	28.22	21.78	150.661	Vertical	Pass	
		1907.5	-2.48	3.94	28.20	21.78	150.661	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-2.71	3.79	28.33	21.83	152.405	Vertical	Pass	
		1880	-2.56	3.95	28.22	21.71	148.252	Vertical	Pass	
		1905	-2.41	3.97	28.19	21.81	151.705	Vertical	Pass	

15.0MHz Band QPSK	1/#Mid	1857.5	-2.79	3.79	28.34	21.76	149.968	Vertical	Pass
		1880	-2.49	3.95	28.22	21.78	150.661	Vertical	Pass
		1902.5	-2.49	3.97	28.18	21.72	148.594	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-2.65	3.81	28.35	21.89	154.525	Vertical	Pass
		1880	-2.40	3.96	28.22	21.86	153.462	Vertical	Pass
		1900	-2.28	4.00	28.16	21.88	154.170	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-3.15	3.76	28.24	21.33	135.831	Horizontal	Pass
		1880	-3.04	3.91	28.22	21.27	133.968	Horizontal	Pass
		1909.3	-3.08	3.93	28.20	21.19	131.522	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.23	3.77	28.23	21.23	132.739	Horizontal	Pass
		1880	-3.07	3.91	28.24	21.26	133.660	Horizontal	Pass
		1908.5	-3.07	3.94	28.25	21.24	133.045	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.22	3.77	28.31	21.32	135.519	Horizontal	Pass
		1880	-3.12	3.91	28.22	21.19	131.522	Horizontal	Pass
		1907.5	-2.92	3.94	28.20	21.34	136.144	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-3.21	3.79	28.33	21.33	135.831	Horizontal	Pass
		1880	-2.93	3.95	28.22	21.34	136.144	Horizontal	Pass
		1905	-2.91	3.97	28.19	21.31	135.207	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-3.31	3.79	28.34	21.24	133.045	Horizontal	Pass
		1880	-3.08	3.95	28.22	21.19	131.522	Horizontal	Pass
		1902.5	-2.87	3.97	28.18	21.34	136.144	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-3.23	3.81	28.35	21.31	135.207	Horizontal	Pass
		1880	-3.09	3.96	28.22	21.17	130.918	Horizontal	Pass
		1900	-2.96	4.00	28.16	21.20	131.826	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-3.17	3.76	28.24	21.31	135.207	Vertical	Pass
		1880	-3.02	3.91	28.22	21.29	134.586	Vertical	Pass
		1909.3	-2.98	3.93	28.20	21.29	134.586	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.24	3.77	28.23	21.22	132.434	Vertical	Pass
		1880	-3.07	3.91	28.24	21.26	133.660	Vertical	Pass
		1908.5	-3.04	3.94	28.25	21.27	133.968	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-3.24	3.77	28.31	21.30	134.896	Vertical	Pass

Band 16		1880	-3.12	3.91	28.22	21.19	131.522	Vertical	Pass
QAM		1907.5	-2.99	3.94	28.20	21.27	133.968	Vertical	Pass
10.0MHz	1/#Mid	1855	-3.23	3.79	28.33	21.31	135.207	Vertical	Pass
Band 16		1880	-2.94	3.95	28.22	21.33	135.831	Vertical	Pass
QAM		1905	-2.96	3.97	28.19	21.26	133.660	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-3.22	3.79	28.34	21.33	135.831	Vertical	Pass
Band 16		1880	-2.97	3.95	28.22	21.30	134.896	Vertical	Pass
QAM		1902.5	-2.92	3.97	28.18	21.29	134.586	Vertical	Pass
20.0MHz	1/#Mid	1860	-3.18	3.81	28.35	21.36	136.773	Vertical	Pass
Band 16		1880	-2.91	3.96	28.22	21.35	136.458	Vertical	Pass
QAM		1900	-2.80	4.00	28.16	21.36	136.773	Vertical	Pass

**Note:**

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average (dBm)	Average (mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-3.08	3.12	27.58	21.38	137.404	Horizontal	Pass
		1732.5	-2.90	3.27	27.61	21.44	139.316	Horizontal	Pass
		1754.3	-2.92	3.29	27.63	21.42	138.676	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.06	3.13	27.61	21.42	138.676	Horizontal	Pass
		1732.5	-2.92	3.27	27.61	21.42	138.676	Horizontal	Pass
		1753.5	-2.88	3.30	27.62	21.44	139.316	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.15	3.13	27.63	21.35	136.458	Horizontal	Pass
		1732.5	-2.99	3.27	27.61	21.35	136.458	Horizontal	Pass
		1752.5	-2.85	3.30	27.60	21.45	139.637	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.01	3.15	27.64	21.48	140.605	Horizontal	Pass
		1732.5	-2.86	3.31	27.61	21.44	139.316	Horizontal	Pass
		1750	-2.80	3.33	27.59	21.46	139.959	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.15	3.15	27.65	21.35	136.458	Horizontal	Pass
		1732.5	-2.93	3.31	27.61	21.37	137.088	Horizontal	Pass
		1747.5	-2.83	3.33	27.57	21.41	138.357	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.08	3.17	27.66	21.41	138.357	Horizontal	Pass
		1732.5	-2.82	3.32	27.61	21.47	140.281	Horizontal	Pass
		1745	-2.79	3.36	27.56	21.41	138.357	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.96	3.12	27.58	21.50	141.254	Vertical	Pass
		1732.5	-2.95	3.27	27.61	21.39	137.721	Vertical	Pass
		1754.3	-2.91	3.29	27.63	21.43	138.995	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.05	3.13	27.61	21.43	138.995	Vertical	Pass
		1732.5	-2.87	3.27	27.61	21.47	140.281	Vertical	Pass
		1753.5	-2.95	3.30	27.62	21.37	137.088	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.08	3.13	27.63	21.42	138.676	Vertical	Pass
		1732.5	-2.86	3.27	27.61	21.48	140.605	Vertical	Pass
		1752.5	-2.88	3.30	27.60	21.42	138.676	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.09	3.15	27.64	21.40	138.038	Vertical	Pass
		1732.5	-2.91	3.31	27.61	21.39	137.721	Vertical	Pass
		1750	-2.87	3.33	27.59	21.39	137.721	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-3.13	3.15	27.65	21.37	137.088	Vertical	Pass
		1732.5	-2.82	3.31	27.61	21.48	140.605	Vertical	Pass
		1747.5	-2.77	3.33	27.57	21.47	140.281	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.94	3.17	27.66	21.55	142.889	Vertical	Pass
		1732.5	-2.75	3.32	27.61	21.54	142.561	Vertical	Pass
		1745	-2.66	3.36	27.56	21.54	142.561	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP		
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.89	3.12	27.58	20.57	114.025	Horizontal	Pass
		1732.5	-3.87	3.27	27.61	20.47	111.429	Horizontal	Pass
		1754.3	-3.75	3.29	27.63	20.59	114.551	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.91	3.13	27.61	20.57	114.025	Horizontal	Pass
		1732.5	-3.76	3.27	27.61	20.58	114.288	Horizontal	Pass
		1753.5	-3.78	3.30	27.62	20.54	113.240	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.02	3.13	27.63	20.48	111.686	Horizontal	Pass
		1732.5	-3.83	3.27	27.61	20.51	112.460	Horizontal	Pass
		1752.5	-3.78	3.30	27.60	20.52	112.720	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.90	3.15	27.64	20.59	114.551	Horizontal	Pass
		1732.5	-3.76	3.31	27.61	20.54	113.240	Horizontal	Pass
		1750	-3.80	3.33	27.59	20.46	111.173	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.98	3.15	27.65	20.52	112.720	Horizontal	Pass
		1732.5	-3.74	3.31	27.61	20.56	113.763	Horizontal	Pass
		1747.5	-3.76	3.33	27.57	20.48	111.686	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.90	3.17	27.66	20.59	114.551	Horizontal	Pass
		1732.5	-3.73	3.32	27.61	20.56	113.763	Horizontal	Pass
		1745	-3.65	3.36	27.56	20.55	113.501	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.92	3.12	27.58	20.54	113.240	Vertical	Pass
		1732.5	-3.84	3.27	27.61	20.50	112.202	Vertical	Pass
		1754.3	-3.78	3.29	27.63	20.56	113.763	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.90	3.13	27.61	20.58	114.288	Vertical	Pass
		1732.5	-3.81	3.27	27.61	20.53	112.980	Vertical	Pass
		1753.5	-3.72	3.30	27.62	20.60	114.815	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-3.91	3.13	27.63	20.59	114.551	Vertical	Pass

Band 16		1732.5	-3.83	3.27	27.61	20.51	112.460	Vertical	Pass
QAM		1752.5	-3.81	3.30	27.60	20.49	111.944	Vertical	Pass
10.0MHz	1/#Mid	1715	-3.88	3.15	27.64	20.61	115.080	Vertical	Pass
Band 16		1732.5	-3.80	3.31	27.61	20.50	112.202	Vertical	Pass
QAM		1750	-3.76	3.33	27.59	20.50	112.202	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-3.92	3.15	27.65	20.58	114.288	Vertical	Pass
Band 16		1732.5	-3.77	3.31	27.61	20.53	112.980	Vertical	Pass
QAM		1747.5	-3.73	3.33	27.57	20.51	112.460	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.85	3.17	27.66	20.64	115.878	Vertical	Pass
Band 16		1732.5	-3.65	3.32	27.61	20.64	115.878	Vertical	Pass
QAM		1745	-3.57	3.36	27.56	20.63	115.611	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 (dBm)	Factor (dB)	Correction (dB)	Max. ERP	Max. ERP			
			(dBm)				Average	Average			
							(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	824.7	6.87	2.01	19.68	2.15	22.39	173.380	Horizontal	Pass	
		836.5	6.86	2.01	19.77	2.15	22.47	176.604	Horizontal	Pass	
		848.3	6.82	2.02	19.82	2.15	22.47	176.604	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	6.86	2.01	19.70	2.15	22.40	173.780	Horizontal	Pass	
		836.5	6.85	2.01	19.77	2.15	22.46	176.198	Horizontal	Pass	
		847.5	6.78	2.02	19.81	2.15	22.42	174.582	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	6.80	2.01	19.71	2.15	22.35	171.791	Horizontal	Pass	
		836.5	6.72	2.01	19.77	2.15	22.33	171.002	Horizontal	Pass	
		846.5	6.71	2.02	19.79	2.15	22.33	171.002	Horizontal	Pass	
10.0MHz z Band QPSK	1/#Mid	829	6.91	2.01	19.73	2.15	22.48	177.011	Horizontal	Pass	
		836.5	6.80	2.01	19.77	2.15	22.41	174.181	Horizontal	Pass	
		844	6.74	2.02	19.78	2.15	22.35	171.791	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	824.7	6.84	2.01	19.68	2.15	22.36	172.187	Vertical	Pass	
		836.5	6.85	2.01	19.77	2.15	22.46	176.198	Vertical	Pass	
		848.3	6.70	2.02	19.82	2.15	22.35	171.791	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	6.87	2.01	19.70	2.15	22.41	174.181	Vertical	Pass	
		836.5	6.75	2.01	19.77	2.15	22.36	172.187	Vertical	Pass	
		847.5	6.75	2.02	19.81	2.15	22.39	173.380	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	6.93	2.01	19.71	2.15	22.48	177.011	Vertical	Pass	
		836.5	6.77	2.01	19.77	2.15	22.38	172.982	Vertical	Pass	
		846.5	6.83	2.02	19.79	2.15	22.45	175.792	Vertical	Pass	
10.0MHz z Band QPSK	1/#Mid	829	6.94	2.01	19.73	2.15	22.51	178.238	Vertical	Pass	
		836.5	6.92	2.01	19.77	2.15	22.53	179.061	Vertical	Pass	
		844	6.91	2.02	19.78	2.15	22.52	178.649	Vertical	Pass	

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result								Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction (dB)	Max. ERP	Max. ERP	Polarization Of Max. ERP		
			(dBm)				Average (dBm)	Average (mW)			
1.4MHz Band 16 QAM	1/#Mid	824.7	6.16	2.01	19.68	2.15	21.68	147.231	Horizontal	Pass	
		836.5	5.94	2.01	19.77	2.15	21.55	142.889	Horizontal	Pass	
		848.3	5.94	2.02	19.82	2.15	21.59	144.212	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	6.10	2.01	19.70	2.15	21.64	145.881	Horizontal	Pass	
		836.5	5.97	2.01	19.77	2.15	21.58	143.880	Horizontal	Pass	
		847.5	6.01	2.02	19.81	2.15	21.65	146.218	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	5.99	2.01	19.71	2.15	21.54	142.561	Horizontal	Pass	
		836.5	6.06	2.01	19.77	2.15	21.67	146.893	Horizontal	Pass	
		846.5	6.04	2.02	19.79	2.15	21.66	146.555	Horizontal	Pass	
10.0MHz z Band 16 QAM	1/#Mid	829	6.11	2.01	19.73	2.15	21.68	147.231	Horizontal	Pass	
		836.5	5.95	2.01	19.77	2.15	21.56	143.219	Horizontal	Pass	
		844	5.95	2.02	19.78	2.15	21.56	143.219	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	824.7	6.04	2.01	19.68	2.15	21.56	143.219	Vertical	Pass	
		836.5	6.02	2.01	19.77	2.15	21.63	145.546	Vertical	Pass	
		848.3	5.99	2.02	19.82	2.15	21.64	145.881	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	6.04	2.01	19.70	2.15	21.58	143.880	Vertical	Pass	
		836.5	6.04	2.01	19.77	2.15	21.65	146.218	Vertical	Pass	
		847.5	5.95	2.02	19.81	2.15	21.59	144.212	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	6.14	2.01	19.71	2.15	21.69	147.571	Vertical	Pass	
		836.5	6.08	2.01	19.77	2.15	21.69	147.571	Vertical	Pass	
		846.5	5.95	2.02	19.79	2.15	21.57	143.549	Vertical	Pass	
10.0MHz z Band 16 QAM	1/#Mid	829	6.12	2.01	19.73	2.15	21.69	147.571	Vertical	Pass	
		836.5	6.09	2.01	19.77	2.15	21.70	147.911	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)

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
				(dBm)	(mW)				
5.0MHz Band QPSK	1/#Mid	2502.5	-0.32	4.54	27.75	22.89	194.536	Horizontal	Pass
		2535	-0.18	4.69	27.72	22.85	192.752	Horizontal	Pass
		2567.5	-0.06	4.71	27.71	22.94	196.789	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.31	4.55	27.76	22.90	194.984	Horizontal	Pass
		2535	-0.16	4.69	27.72	22.87	193.642	Horizontal	Pass
		2565	-0.13	4.72	27.70	22.85	192.752	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.36	4.55	27.77	22.86	193.197	Horizontal	Pass
		2535	-0.17	4.69	27.72	22.86	193.197	Horizontal	Pass
		2562.5	-0.06	4.72	27.69	22.91	195.434	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.34	4.57	27.78	22.87	193.642	Horizontal	Pass
		2535	-0.04	4.73	27.72	22.95	197.242	Horizontal	Pass
		2560	0.05	4.75	27.68	22.98	198.609	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-0.32	4.54	27.75	22.89	194.536	Vertical	Pass
		2535	-0.16	4.69	27.72	22.87	193.642	Vertical	Pass
		2567.5	-0.11	4.71	27.71	22.89	194.536	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.31	4.55	27.76	22.90	194.984	Vertical	Pass
		2535	-0.16	4.69	27.72	22.87	193.642	Vertical	Pass
		2565	-0.05	4.72	27.70	22.93	196.336	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.27	4.55	27.77	22.95	197.242	Vertical	Pass
		2535	-0.07	4.69	27.72	22.96	197.697	Vertical	Pass
		2562.5	-0.06	4.72	27.69	22.91	195.434	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.18	4.57	27.78	23.03	200.909	Vertical	Pass
		2535	0.03	4.73	27.72	23.02	200.447	Vertical	Pass
		2560	0.06	4.75	27.68	22.99	199.067	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
					(dBm)	(mW)			
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.10	4.54	27.75	22.11	162.555	Horizontal	Pass
		2535	-0.94	4.69	27.72	22.09	161.808	Horizontal	Pass
		2567.5	-0.84	4.71	27.71	22.16	164.437	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.09	4.55	27.76	22.12	162.930	Horizontal	Pass
		2535	-0.89	4.69	27.72	22.14	163.682	Horizontal	Pass
		2565	-0.82	4.72	27.70	22.16	164.437	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.14	4.55	27.77	22.08	161.436	Horizontal	Pass
		2535	-0.95	4.69	27.72	22.08	161.436	Horizontal	Pass
		2562.5	-0.95	4.72	27.69	22.02	159.221	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.08	4.57	27.78	22.13	163.305	Horizontal	Pass
		2535	-0.84	4.73	27.72	22.15	164.059	Horizontal	Pass
		2560	-0.85	4.75	27.68	22.08	161.436	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.11	4.54	27.75	22.10	162.181	Vertical	Pass
		2535	-0.87	4.69	27.72	22.16	164.437	Vertical	Pass
		2567.5	-0.90	4.71	27.71	22.10	162.181	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.04	4.55	27.76	22.17	164.816	Vertical	Pass
		2535	-0.90	4.69	27.72	22.13	163.305	Vertical	Pass
		2565	-0.91	4.72	27.70	22.07	161.065	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.06	4.55	27.77	22.16	164.437	Vertical	Pass
		2535	-0.89	4.69	27.72	22.14	163.682	Vertical	Pass
		2562.5	-0.86	4.72	27.69	22.11	162.555	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.00	4.57	27.78	22.21	166.341	Vertical	Pass
		2535	-0.77	4.73	27.72	22.22	166.725	Vertical	Pass
		2560	-0.73	4.75	27.68	22.20	165.959	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP			
			(dBm)			(dB)	Average	Average			
							(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	699.7	0.07	1.91	19.21	2.15	15.22	33.266	Vertical	Pass	
		707.5	-0.01	1.91	19.26	2.15	15.19	33.037	Vertical	Pass	
		715.3	-0.09	1.93	19.34	2.15	15.17	32.885	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	0.01	1.91	19.21	2.15	15.16	32.810	Vertical	Pass	
		707.5	-0.04	1.91	19.26	2.15	15.16	32.810	Vertical	Pass	
		714.5	-0.15	1.93	19.34	2.15	15.11	32.434	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	-0.03	1.91	19.23	2.15	15.14	32.659	Vertical	Pass	
		707.5	0.02	1.91	19.26	2.15	15.22	33.266	Vertical	Pass	
		713.5	-0.06	1.92	19.33	2.15	15.20	33.113	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	704	-0.09	1.91	19.25	2.15	15.10	32.359	Vertical	Pass	
		707.5	0.01	1.91	19.26	2.15	15.21	33.189	Vertical	Pass	
		711	-0.07	1.92	19.32	2.15	15.18	32.961	Vertical	Pass	
1.4MHz Band QPSK	1/#Mid	699.7	0.07	1.91	19.21	2.15	15.22	33.266	Horizontal	Pass	
		707.5	-0.01	1.91	19.26	2.15	15.19	33.037	Horizontal	Pass	
		715.3	-0.12	1.93	19.34	2.15	15.14	32.659	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	0.01	1.91	19.21	2.15	15.16	32.810	Horizontal	Pass	
		707.5	-0.08	1.91	19.26	2.15	15.12	32.509	Horizontal	Pass	
		714.5	-0.18	1.93	19.34	2.15	15.08	32.211	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	0.03	1.91	19.23	2.15	15.20	33.113	Horizontal	Pass	
		707.5	0.00	1.91	19.26	2.15	15.20	33.113	Horizontal	Pass	
		713.5	-0.13	1.92	19.33	2.15	15.13	32.584	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	704	0.04	1.91	19.25	2.15	15.23	33.343	Horizontal	Pass	
		707.5	0.08	1.91	19.26	2.15	15.28	33.729	Horizontal	Pass	
		711	0.00	1.92	19.32	2.15	15.25	33.497	Horizontal	Pass	

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP			
			(dBm)			(dB)	Average	Average			
							(dBm)	(mW)			
1.4MHz Band 16 QAM	1/#Mid	699.7	-0.32	1.91	19.21	2.15	14.83	30.409	Vertical	Pass	
		707.5	-0.28	1.91	19.26	2.15	14.92	31.046	Vertical	Pass	
		715.3	-0.34	1.93	19.34	2.15	14.92	31.046	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	-0.36	1.91	19.21	2.15	14.79	30.130	Vertical	Pass	
		707.5	-0.31	1.91	19.26	2.15	14.89	30.832	Vertical	Pass	
		714.5	-0.36	1.93	19.34	2.15	14.90	30.903	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	-0.32	1.91	19.23	2.15	14.85	30.549	Vertical	Pass	
		707.5	-0.28	1.91	19.26	2.15	14.92	31.046	Vertical	Pass	
		713.5	-0.49	1.92	19.33	2.15	14.77	29.992	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	-0.41	1.91	19.25	2.15	14.78	30.061	Vertical	Pass	
		707.5	-0.30	1.91	19.26	2.15	14.90	30.903	Vertical	Pass	
		711	-0.51	1.92	19.32	2.15	14.74	29.785	Vertical	Pass	
1.4MHz Band 16 QAM	1/#Mid	699.7	-0.25	1.91	19.21	2.15	14.90	30.903	Horizontal	Pass	
		707.5	-0.36	1.91	19.26	2.15	14.84	30.479	Horizontal	Pass	
		715.3	-0.46	1.93	19.34	2.15	14.80	30.200	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	-0.32	1.91	19.21	2.15	14.83	30.409	Horizontal	Pass	
		707.5	-0.31	1.91	19.26	2.15	14.89	30.832	Horizontal	Pass	
		714.5	-0.38	1.93	19.34	2.15	14.88	30.761	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	-0.29	1.91	19.23	2.15	14.88	30.761	Horizontal	Pass	
		707.5	-0.37	1.91	19.26	2.15	14.83	30.409	Horizontal	Pass	
		713.5	-0.34	1.92	19.33	2.15	14.92	31.046	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	-0.24	1.91	19.25	2.15	14.95	31.261	Horizontal	Pass	
		707.5	-0.25	1.91	19.26	2.15	14.95	31.261	Horizontal	Pass	
		711	-0.28	1.92	19.32	2.15	14.97	31.405	Horizontal	Pass	

**Note:**

SG Level= Signal generator output

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

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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)			
5.0MHz Band QPSK	1/#Mid	706.5	-2.96	1.91	19.23	2.15	12.21	16.634	Vertical	Pass	
		710	-2.88	1.91	19.26	2.15	12.32	17.061	Vertical	Pass	
		713.5	-2.96	1.92	19.33	2.15	12.30	16.982	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	709	-3.00	1.91	19.25	2.15	12.19	16.558	Vertical	Pass	
		710	-3.00	1.91	19.26	2.15	12.20	16.596	Vertical	Pass	
		711	-2.98	1.92	19.32	2.15	12.27	16.866	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	706.5	-2.94	1.91	19.23	2.15	12.23	16.711	Horizontal	Pass	
		710	-2.91	1.91	19.26	2.15	12.29	16.943	Horizontal	Pass	
		713.5	-2.99	1.92	19.33	2.15	12.27	16.866	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	709	-2.86	1.91	19.25	2.15	12.33	17.100	Horizontal	Pass	
		710	-2.82	1.91	19.26	2.15	12.38	17.298	Horizontal	Pass	
		711	-2.89	1.92	19.32	2.15	12.36	17.219	Horizontal	Pass	

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Correction (dB)	Max. ERP (dBm)	Max. ERP (mW)	Polarization Of Max. ERP	
							Average	Average		
5.0MHz Band 16 QAM	1/#Mid	706.5	-3.37	1.91	19.23	2.15	11.80	15.136	Vertical	Pass
		710	-3.42	1.91	19.26	2.15	11.78	15.066	Vertical	Pass
		713.5	-3.46	1.92	19.33	2.15	11.80	15.136	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	-3.34	1.91	19.25	2.15	11.85	15.311	Vertical	Pass
		710	-3.41	1.91	19.26	2.15	11.79	15.101	Vertical	Pass
		711	-3.39	1.92	19.32	2.15	11.86	15.346	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	-3.28	1.91	19.23	2.15	11.89	15.453	Horizontal	Pass
		710	-3.35	1.91	19.26	2.15	11.85	15.311	Horizontal	Pass
		713.5	-3.35	1.92	19.33	2.15	11.91	15.524	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	-3.25	1.91	19.25	2.15	11.94	15.631	Horizontal	Pass
		710	-3.23	1.91	19.26	2.15	11.97	15.740	Horizontal	Pass
		711	-3.27	1.92	19.32	2.15	11.98	15.776	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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



8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band QPSK	1/#Mid	2557.5	1.15	4.54	27.75	24.36	272.898	Horizontal	Pass	
		2605	1.32	4.69	27.72	24.35	272.270	Horizontal	Pass	
		2652.5	1.28	4.71	27.71	24.28	267.917	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	2560	1.04	4.55	27.76	24.25	266.073	Horizontal	Pass	
		2605	1.26	4.69	27.72	24.29	268.534	Horizontal	Pass	
		2650	1.35	4.72	27.70	24.33	271.019	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	2562.5	1.02	4.55	27.77	24.24	265.461	Horizontal	Pass	
		2605	1.31	4.69	27.72	24.34	271.644	Horizontal	Pass	
		2647.5	1.29	4.72	27.69	24.26	266.686	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	2565	1.03	4.57	27.78	24.24	265.461	Horizontal	Pass	
		2605	1.27	4.73	27.72	24.26	266.686	Horizontal	Pass	
		2645	1.45	4.75	27.68	24.38	274.157	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	2557.5	1.13	4.54	27.75	24.34	271.644	Vertical	Pass	
		2605	1.22	4.69	27.72	24.25	266.073	Vertical	Pass	
		2652.5	1.25	4.71	27.71	24.25	266.073	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	2560	1.13	4.55	27.76	24.34	271.644	Vertical	Pass	
		2605	1.33	4.69	27.72	24.36	272.898	Vertical	Pass	
		2650	1.33	4.72	27.70	24.31	269.774	Vertical	Pass	
15.0MHz Band QPSK	1/#Mid	2562.5	1.05	4.55	27.77	24.27	267.301	Vertical	Pass	
		2605	1.22	4.69	27.72	24.25	266.073	Vertical	Pass	
		2647.5	1.37	4.72	27.69	24.34	271.644	Vertical	Pass	
20.0MHz Band QPSK	1/#Mid	2565	1.19	4.57	27.78	24.40	275.423	Vertical	Pass	
		2605	1.41	4.73	27.72	24.40	275.423	Vertical	Pass	
		2645	1.50	4.75	27.68	24.43	277.332	Vertical	Pass	

Radiated Power (EIRP) for Band 41										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band 16 QAM	1/#Mid	2557.5	0.39	4.54	27.75	23.60	229.087	Horizontal	Pass	
		2605	0.66	4.69	27.72	23.69	233.884	Horizontal	Pass	
		2652.5	0.60	4.71	27.71	23.60	229.087	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	2560	0.33	4.55	27.76	23.54	225.944	Horizontal	Pass	
		2605	0.56	4.69	27.72	23.59	228.560	Horizontal	Pass	
		2650	0.63	4.72	27.70	23.61	229.615	Horizontal	Pass	
15.0MHz Band 16 QAM	1/#Mid	2562.5	0.37	4.55	27.77	23.59	228.560	Horizontal	Pass	
		2605	0.64	4.69	27.72	23.67	232.809	Horizontal	Pass	
		2647.5	0.68	4.72	27.69	23.65	231.739	Horizontal	Pass	
20.0MHz Band 16 QAM	1/#Mid	2565	0.39	4.57	27.78	23.60	229.087	Horizontal	Pass	
		2605	0.69	4.73	27.72	23.68	233.346	Horizontal	Pass	
		2645	0.69	4.75	27.68	23.62	230.144	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	2557.5	0.41	4.54	27.75	23.62	230.144	Vertical	Pass	
		2605	0.59	4.69	27.72	23.62	230.144	Vertical	Pass	
		2652.5	0.54	4.71	27.71	23.54	225.944	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	2560	0.47	4.55	27.76	23.68	233.346	Vertical	Pass	
		2605	0.59	4.69	27.72	23.62	230.144	Vertical	Pass	
		2650	0.65	4.72	27.70	23.63	230.675	Vertical	Pass	
15.0MHz Band 16 QAM	1/#Mid	2562.5	0.39	4.55	27.77	23.61	229.615	Vertical	Pass	
		2605	0.57	4.69	27.72	23.60	229.087	Vertical	Pass	
		2647.5	0.57	4.72	27.69	23.54	225.944	Vertical	Pass	
20.0MHz Band 16 QAM	1/#Mid	2565	0.49	4.57	27.78	23.70	234.423	Vertical	Pass	
		2605	0.74	4.73	27.72	23.73	236.048	Vertical	Pass	
		2645	0.79	4.75	27.68	23.72	235.505	Vertical	Pass	

Note:

SG Level= Signal generator output

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

8.9 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-2.92	3.76	28.24	21.56	143.219	Horizontal	Pass
		1745	-2.78	3.91	28.22	21.53	142.233	Horizontal	Pass
		1779.3	-2.73	3.93	28.2	21.54	142.561	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.91	3.77	28.23	21.55	142.889	Horizontal	Pass
		1745	-2.77	3.91	28.24	21.56	143.219	Horizontal	Pass
		1778.5	-2.83	3.94	28.25	21.48	140.605	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.11	3.77	28.31	21.43	138.995	Horizontal	Pass
		1745	-2.78	3.91	28.22	21.53	142.233	Horizontal	Pass
		1777.5	-2.72	3.94	28.2	21.54	142.561	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.02	3.79	28.33	21.52	141.906	Horizontal	Pass
		1745	-2.80	3.95	28.22	21.47	140.281	Horizontal	Pass
		1775	-2.69	3.97	28.19	21.53	142.233	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.09	3.79	28.34	21.46	139.959	Horizontal	Pass
		1745	-2.76	3.95	28.22	21.51	141.579	Horizontal	Pass
		1772.5	-2.72	3.97	28.18	21.49	140.929	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.11	3.81	28.35	21.43	138.995	Horizontal	Pass
		1745	-2.70	3.96	28.22	21.56	143.219	Horizontal	Pass
		1770	-2.65	4	28.16	21.51	141.579	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.97	3.76	28.24	21.51	141.579	Vertical	Pass
		1745	-2.75	3.91	28.22	21.56	143.219	Vertical	Pass
		1779.3	-2.69	3.93	28.2	21.58	143.880	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.99	3.77	28.23	21.47	140.281	Vertical	Pass
		1745	-2.78	3.91	28.24	21.55	142.889	Vertical	Pass
		1778.5	-2.78	3.94	28.25	21.53	142.233	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.06	3.77	28.31	21.48	140.605	Vertical	Pass
		1745	-2.86	3.91	28.22	21.45	139.637	Vertical	Pass
		1777.5	-2.78	3.94	28.2	21.48	140.605	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.96	3.79	28.34	21.59	144.212	Vertical	Pass
		1745	-2.66	3.95	28.22	21.61	144.877	Vertical	Pass
		1775	-2.61	3.97	28.18	21.60	144.544	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-3.04	3.81	28.35	21.50	141.254	Vertical	Pass
		1745	-2.80	3.96	28.22	21.46	139.959	Vertical	Pass
		1772.5	-2.65	4	28.16	21.51	141.579	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.93	3.79	28.34	21.62	145.211	Vertical	Pass
		1745	-2.65	3.95	28.22	21.62	145.211	Vertical	Pass
		1770	-2.60	3.97	28.18	21.61	144.877	Vertical	Pass

Radiated Power (EIRP) for Band 66										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.64	3.76	28.24	20.84	121.339	Horizontal	Pass	
		1745	-3.44	3.91	28.22	20.87	122.180	Horizontal	Pass	
		1779.3	-3.49	3.93	28.2	20.78	119.674	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.70	3.77	28.23	20.76	119.124	Horizontal	Pass	
		1745	-3.55	3.91	28.24	20.78	119.674	Horizontal	Pass	
		1778.5	-3.41	3.94	28.25	20.90	123.027	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.80	3.77	28.31	20.74	118.577	Horizontal	Pass	
		1745	-3.44	3.91	28.22	20.87	122.180	Horizontal	Pass	
		1777.5	-3.44	3.94	28.2	20.82	120.781	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	1715	-3.75	3.79	28.33	20.79	119.950	Horizontal	Pass	
		1745	-3.45	3.95	28.22	20.82	120.781	Horizontal	Pass	
		1775	-3.39	3.97	28.19	20.83	121.060	Horizontal	Pass	
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.70	3.79	28.34	20.85	121.619	Horizontal	Pass	
		1745	-3.38	3.95	28.22	20.89	122.744	Horizontal	Pass	
		1772.5	-3.37	3.97	28.18	20.84	121.339	Horizontal	Pass	
20.0MHz Band 16 QAM	1/#Mid	1720	-3.72	3.81	28.35	20.82	120.781	Horizontal	Pass	
		1745	-3.45	3.96	28.22	20.81	120.504	Horizontal	Pass	
		1770	-3.37	4	28.16	20.79	119.950	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.72	3.76	28.24	20.76	119.124	Vertical	Pass	
		1745	-3.53	3.91	28.22	20.78	119.674	Vertical	Pass	
		1779.3	-3.45	3.93	28.2	20.82	120.781	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.60	3.77	28.23	20.86	121.899	Vertical	Pass	
		1745	-3.52	3.91	28.24	20.81	120.504	Vertical	Pass	
		1778.5	-3.48	3.94	28.25	20.83	121.060	Vertical	Pass	
5.0MHz	1/#Mid	1712.5	-3.70	3.77	28.31	20.84	121.339	Vertical	Pass	

Band 16		1745	-3.48	3.91	28.22	20.83	121.060	Vertical	Pass
QAM		1777.5	-3.41	3.94	28.2	20.85	121.619	Vertical	Pass
10.0MHz	1/#Mid	1715	-3.68	3.79	28.34	20.87	122.180	Vertical	Pass
Band 16		1745	-3.45	3.95	28.22	20.82	120.781	Vertical	Pass
QAM		1775	-3.39	3.97	28.18	20.82	120.781	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-3.76	3.81	28.35	20.78	119.674	Vertical	Pass
Band 16		1745	-3.50	3.96	28.22	20.76	119.124	Vertical	Pass
QAM		1772.5	-3.27	4	28.16	20.89	122.744	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.64	3.79	28.34	20.91	123.310	Vertical	Pass
Band 16		1745	-3.35	3.95	28.22	20.92	123.595	Vertical	Pass
QAM		1770	-3.27	3.97	28.18	20.94	124.165	Vertical	Pass

**Note:**

SG Level= Signal generator output

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

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

## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

### LIMIT

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

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

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

### TEST PROCEDURE

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

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

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

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

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

**MODES TESTED**

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

**RESULTS**

PASS

**9.1 LTE BAND 2**

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.54	4.04	33.51	-19.07	-13	-6.07	Horizontal
3701.4	-49.39	4.04	33.51	-19.92	-13	-6.92	Vertical
5552.1	-52.58	5.24	35.84	-21.98	-13	-8.98	Vertical
5552.1	-50.93	5.24	35.84	-20.33	-13	-7.33	Horizontal
197.6	-44.94	1.43	16.02	-30.35	-13	-17.35	Vertical
373.8	-43.63	1.30	17.99	-26.94	-13	-13.94	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.48	4.04	33.56	-21.96	-13	-8.96	Horizontal
3760.0	-48.19	4.04	33.56	-18.67	-13	-5.67	Vertical
5640.0	-46.24	5.24	35.91	-15.57	-13	-2.57	Vertical
5640.0	-51.97	5.24	35.91	-21.30	-13	-8.30	Horizontal
178.3	-44.15	1.62	16.97	-28.80	-13	-15.80	Vertical
385.1	-44.53	1.74	15.98	-30.30	-13	-17.30	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.46	4.04	34.00	-19.50	-13	-6.50	Horizontal
3818.6	-47.30	4.04	34.00	-17.34	-13	-4.34	Vertical
5727.9	-53.49	5.24	36.04	-22.69	-13	-9.69	Vertical
5727.9	-52.94	5.24	36.04	-22.14	-13	-9.14	Horizontal
176.7	-39.08	1.42	17.29	-23.21	-13	-10.21	Vertical
271.5	-38.90	1.50	17.90	-22.49	-13	-9.49	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	-52.88	4.07	33.54	-23.41	-13	-10.41	Horizontal
3720.0	-50.90	4.07	33.54	-21.43	-13	-8.43	Vertical
5580.0	-44.20	5.28	35.86	-13.62	-13	-0.62	Vertical
5580.0	-51.57	5.28	35.86	-20.99	-13	-7.99	Horizontal
188.0	-42.12	1.58	16.89	-26.80	-13	-13.80	Vertical
376.6	-41.90	1.76	17.26	-26.40	-13	-13.40	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-50.23	4.04	33.56	-20.71	-13	-7.71	Horizontal
3760.0	-46.59	4.04	33.56	-17.07	-13	-4.07	Vertical
5640.0	-47.31	5.24	35.91	-16.64	-13	-3.64	Vertical
5640.0	-50.48	5.24	35.91	-19.81	-13	-6.81	Horizontal
185.6	-44.29	1.46	16.27	-29.48	-13	-16.48	Vertical
255.5	-43.04	1.59	15.15	-29.48	-13	-16.48	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-53.39	4.04	34.00	-23.43	-13	-10.43	Horizontal
3800.0	-50.89	4.04	34.00	-20.93	-13	-7.93	Vertical
5700.0	-48.98	5.24	36.04	-18.18	-13	-5.18	Vertical
5700.0	-53.40	5.24	36.04	-22.60	-13	-9.60	Horizontal
177.3	-44.70	1.36	17.39	-28.66	-13	-15.66	Vertical
380.0	-44.67	1.66	15.39	-30.94	-13	-17.94	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	-51.16	4.02	29.80	-25.38	-13	-12.38	Horizontal
3421.4	-47.88	4.02	29.80	-22.10	-13	-9.10	Vertical
5132.1	-51.80	5.24	35.84	-21.20	-13	-8.20	Vertical
5132.1	-50.89	5.24	35.84	-20.29	-13	-7.29	Horizontal
207.3	-38.52	1.68	16.04	-24.16	-13	-11.16	Vertical
360.0	-43.70	1.78	17.74	-27.74	-13	-14.74	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-46.16	4.03	30.00	-20.19	-13	-7.19	Horizontal
3465.0	-49.50	4.03	30.00	-23.53	-13	-10.53	Vertical
5197.5	-52.05	5.25	35.86	-21.44	-13	-8.44	Vertical
5197.5	-50.17	5.25	35.86	-19.56	-13	-6.56	Horizontal
189.2	-35.73	1.72	17.69	-19.76	-13	-6.76	Vertical
312.1	-37.18	1.62	16.02	-22.77	-13	-9.77	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-44.22	4.05	30.01	-18.26	-13	-5.26	Horizontal
3508.6	-48.91	4.05	30.01	-22.95	-13	-9.95	Vertical
5262.9	-49.27	5.26	35.86	-18.67	-13	-5.67	Vertical
5262.9	-51.60	5.26	35.86	-21.00	-13	-8.00	Horizontal
190.5	-34.42	1.80	16.69	-19.53	-13	-6.53	Vertical
411.3	-40.61	1.75	16.66	-25.71	-13	-12.71	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	-50.37	4.02	29.80	-24.59	-13	-11.59	Horizontal
3440.0	-45.35	4.02	29.80	-19.57	-13	-6.57	Vertical
5160.0	-51.01	5.24	35.84	-20.41	-13	-7.41	Vertical
5160.0	-53.95	5.24	35.84	-23.35	-13	-10.35	Horizontal
193.8	-44.37	1.57	17.26	-28.68	-13	-15.68	Vertical
355.4	-44.61	1.78	16.35	-30.04	-13	-17.04	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.52	4.03	30.00	-24.55	-13	-11.55	Horizontal
3465.0	-46.11	4.03	30.00	-20.14	-13	-7.14	Vertical
5197.5	-50.75	5.25	35.86	-20.14	-13	-7.14	Vertical
5197.5	-53.21	5.25	35.86	-22.60	-13	-9.60	Horizontal
211.9	-44.73	1.44	17.95	-28.22	-13	-15.22	Vertical
319.6	-43.01	1.65	16.09	-28.57	-13	-15.57	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-50.03	4.05	27.68	-26.40	-13	-13.40	Horizontal
3490.0	-45.75	4.05	27.68	-22.12	-13	-9.12	Vertical
5235.0	-50.61	5.26	35.86	-20.01	-13	-7.01	Vertical
5235.0	-49.86	5.26	35.86	-19.26	-13	-6.26	Horizontal
188.4	-38.31	1.61	16.85	-23.07	-13	-10.07	Vertical
356.0	-40.37	1.61	15.19	-26.79	-13	-13.79	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)**

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	-48.08	2.78	27.50	-23.36	-13	-10.36	Horizontal
1649.4	-45.35	2.78	27.50	-20.63	-13	-7.63	Vertical
2474.1	-52.45	2.90	27.80	-27.55	-13	-14.55	Vertical
2474.1	-51.47	2.90	27.80	-26.57	-13	-13.57	Horizontal
187.7	-42.83	1.76	17.59	-27.00	-13	-14.00	Vertical
282.6	-34.53	1.63	15.87	-20.29	-13	-7.29	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-50.62	2.80	27.48	-25.94	-13	-12.94	Horizontal
1673.0	-51.61	2.80	27.48	-26.93	-13	-13.93	Vertical
2509.5	-45.01	2.91	27.70	-20.22	-13	-7.22	Vertical
2509.5	-49.59	2.91	27.70	-24.80	-13	-11.80	Horizontal
179.5	-38.50	1.61	15.68	-24.43	-13	-11.43	Vertical
236.5	-34.72	1.59	17.52	-18.80	-13	-5.80	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-51.86	2.82	27.43	-27.25	-13	-14.25	Horizontal
1696.6	-52.72	2.82	27.43	-28.11	-13	-15.11	Vertical
2544.9	-53.05	2.92	27.74	-28.23	-13	-15.23	Vertical
2544.9	-50.06	2.92	27.74	-25.24	-13	-12.24	Horizontal
198.9	-39.81	1.69	16.67	-24.82	-13	-11.82	Vertical
327.9	-41.35	1.70	17.18	-25.87	-13	-12.87	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-51.40	2.78	27.50	-26.68	-13	-13.68	Horizontal
1658.0	-46.41	2.78	27.50	-21.69	-13	-8.69	Vertical
2487.0	-51.31	2.90	27.80	-26.41	-13	-13.41	Vertical
2487.0	-52.88	2.90	27.80	-27.98	-13	-14.98	Horizontal
191.4	-39.40	1.71	15.57	-25.54	-13	-12.54	Vertical
393.7	-34.39	1.34	16.40	-19.33	-13	-6.33	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-50.38	2.80	27.48	-25.70	-13	-12.70	Horizontal
1673.0	-51.77	2.80	27.48	-27.09	-13	-14.09	Vertical
2509.5	-53.49	2.91	27.70	-28.70	-13	-15.70	Vertical
2509.5	-49.85	2.91	27.70	-25.06	-13	-12.06	Horizontal
212.4	-42.33	1.44	17.04	-26.73	-13	-13.73	Vertical
368.1	-40.82	1.76	17.62	-24.96	-13	-11.96	Horizontal
Test Results for High Channel 844MHz							
1688.0	-53.33	2.82	27.43	-28.72	-13	-15.72	Horizontal
1688.0	-46.16	2.82	27.43	-21.55	-13	-8.55	Vertical
2532.0	-44.11	2.92	27.74	-19.29	-13	-6.29	Vertical
2532.0	-49.60	2.92	27.74	-24.78	-13	-11.78	Horizontal
198.5	-43.20	1.74	17.70	-27.24	-13	-14.24	Vertical
282.3	-36.46	1.41	17.46	-20.40	-13	-7.40	Horizontal

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

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

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

**9.4 LTE BAND 7**

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-63.81	5.23	35.81	-33.23	-25	-8.23	Horizontal
5005.0	-60.41	5.23	35.81	-29.83	-25	-4.83	Vertical
7507.5	-61.27	5.67	36.85	-30.09	-25	-5.09	Vertical
7507.5	-61.31	5.67	36.85	-30.13	-25	-5.13	Horizontal
201.9	-50.54	1.73	17.97	-34.30	-25	-9.30	Vertical
315.5	-50.83	1.38	15.11	-37.10	-25	-12.10	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.50	5.23	35.82	-33.91	-25	-8.91	Horizontal
5070.0	-64.49	5.23	35.82	-33.90	-25	-8.90	Vertical
7605.0	-59.47	5.67	36.85	-28.29	-25	-3.29	Vertical
7605.0	-61.94	5.67	36.85	-30.76	-25	-5.76	Horizontal
207.4	-50.38	1.77	16.17	-35.97	-25	-10.97	Vertical
445.5	-51.28	1.63	15.21	-37.70	-25	-12.70	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.58	5.24	35.83	-28.99	-25	-3.99	Horizontal
5135.0	-60.78	5.24	35.83	-30.19	-25	-5.19	Vertical
7702.5	-64.11	5.68	36.87	-32.92	-25	-7.92	Vertical
7702.5	-59.41	5.68	36.87	-28.22	-25	-3.22	Horizontal
207.8	-45.13	1.58	17.56	-29.15	-25	-4.15	Vertical
264.8	-50.15	1.45	16.58	-35.02	-25	-10.02	Horizontal

**QPSK EIRP POWER FOR LTE BAND 7 (20.0MHZ BANDWIDTH)**

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-61.88	5.23	35.82	-31.29	-25	-6.29	Horizontal
5020.0	-60.98	5.23	35.82	-30.39	-25	-5.39	Vertical
7530.0	-59.95	5.67	36.86	-28.76	-25	-3.76	Vertical
7530.0	-61.41	5.67	36.86	-30.22	-25	-5.22	Horizontal
197.8	-48.81	1.63	15.76	-34.68	-25	-9.68	Vertical
286.0	-47.77	1.71	15.44	-34.04	-25	-9.04	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.30	5.23	35.82	-29.71	-25	-4.71	Horizontal
5070.0	-61.85	5.23	35.82	-31.26	-25	-6.26	Vertical
7605.0	-61.98	5.67	36.85	-30.80	-25	-5.80	Vertical
7605.0	-64.01	5.67	36.85	-32.83	-25	-7.83	Horizontal
202.7	-49.04	1.79	16.84	-33.98	-25	-8.98	Vertical
328.6	-46.15	1.71	17.64	-30.22	-25	-5.22	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-62.93	5.24	35.83	-32.34	-25	-7.34	Horizontal
5120.0	-62.09	5.24	35.83	-31.50	-25	-6.50	Vertical
7680.0	-60.17	5.70	36.88	-28.99	-25	-3.99	Vertical
7680.0	-63.07	5.70	36.88	-31.89	-25	-6.89	Horizontal
177.6	-48.95	1.79	16.84	-33.89	-25	-8.89	Vertical
256.4	-47.54	1.71	17.64	-31.61	-25	-6.61	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

**9.5 LTE BAND 12**

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-51.35	2.60	27.20	-26.75	-13	-13.75	Horizontal
1399.4	-44.79	2.60	27.20	-20.19	-13	-7.19	Vertical
2099.1	-48.05	2.85	27.54	-23.36	-13	-10.36	Vertical
2099.1	-50.80	2.85	27.54	-26.11	-13	-13.11	Horizontal
188.3	-43.76	1.49	17.78	-27.47	-13	-14.47	Vertical
443.6	-37.81	1.36	17.33	-21.84	-13	-8.84	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-49.47	2.61	27.28	-24.80	-13	-11.80	Horizontal
1415.0	-47.05	2.61	27.28	-22.38	-13	-9.38	Vertical
2122.5	-53.64	2.87	27.59	-28.92	-13	-15.92	Vertical
2122.5	-50.57	2.87	27.59	-25.85	-13	-12.85	Horizontal
195.0	-42.54	1.73	15.74	-28.53	-13	-15.53	Vertical
265.4	-34.54	1.62	15.79	-20.37	-13	-7.37	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-53.25	2.63	27.28	-28.60	-13	-15.60	Horizontal
1430.6	-48.41	2.63	27.28	-23.76	-13	-10.76	Vertical
2145.9	-47.88	2.88	27.60	-23.16	-13	-10.16	Vertical
2145.9	-52.58	2.88	27.60	-27.86	-13	-14.86	Horizontal
180.9	-41.79	1.61	18.00	-25.40	-13	-12.40	Vertical
397.0	-36.63	1.45	15.49	-22.60	-13	-9.60	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	-49.03	2.61	27.26	-24.38	-13	-11.38	Horizontal
1408.0	-53.30	2.61	27.26	-28.65	-13	-15.65	Vertical
2112.0	-49.35	2.87	27.58	-24.64	-13	-11.64	Vertical
2112.0	-51.21	2.87	27.58	-26.50	-13	-13.50	Horizontal
180.9	-39.98	1.31	16.97	-24.32	-13	-11.32	Vertical
347.4	-39.53	1.65	16.70	-24.48	-13	-11.48	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-52.62	2.61	27.28	-27.95	-13	-14.95	Horizontal
1415.0	-44.05	2.61	27.28	-19.38	-13	-6.38	Vertical
2122.5	-50.65	2.87	27.59	-25.93	-13	-12.93	Vertical
2122.5	-50.67	2.87	27.59	-25.95	-13	-12.95	Horizontal
204.0	-43.10	1.72	17.99	-26.83	-13	-13.83	Vertical
372.9	-37.91	1.73	17.94	-21.70	-13	-8.70	Horizontal
Test Results for High Channel 711MHz							
1422.0	-47.50	2.62	27.28	-22.84	-13	-9.84	Horizontal
1422.0	-53.30	2.62	27.28	-28.64	-13	-15.64	Vertical
2133.0	-51.83	2.87	27.60	-27.10	-13	-14.10	Vertical
2133.0	-51.43	2.87	27.60	-26.70	-13	-13.70	Horizontal
207.9	-40.51	1.58	15.93	-26.16	-13	-13.16	Vertical
448.6	-38.23	1.36	15.59	-24.00	-13	-11.00	Horizontal

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

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

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

**9.6 LTE BAND 17**

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-51.81	2.61	27.28	-27.14	-13	-14.14	Horizontal
1413.0	-52.28	2.61	27.28	-27.61	-13	-14.61	Vertical
2119.5	-49.49	2.87	27.59	-24.77	-13	-11.77	Vertical
2119.5	-51.87	2.87	27.59	-27.15	-13	-14.15	Horizontal
205.5	-42.90	1.71	16.15	-28.46	-13	-15.46	Vertical
388.9	-38.34	1.41	17.32	-22.43	-13	-9.43	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-47.23	2.62	27.30	-22.55	-13	-9.55	Horizontal
1420.0	-47.85	2.62	27.30	-23.17	-13	-10.17	Vertical
2130.0	-45.91	2.87	27.62	-21.16	-13	-8.16	Vertical
2130.0	-53.48	2.87	27.62	-28.73	-13	-15.73	Horizontal
204.3	-35.86	1.42	15.25	-22.04	-13	-9.04	Vertical
318.8	-42.55	1.36	17.19	-26.72	-13	-13.72	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-51.06	2.66	27.28	-26.44	-13	-13.44	Horizontal
1427.0	-48.68	2.66	27.28	-24.06	-13	-11.06	Vertical
2140.5	-45.53	2.88	27.60	-20.81	-13	-7.81	Vertical
2140.5	-51.79	2.88	27.60	-27.07	-13	-14.07	Horizontal
205.4	-34.55	1.32	17.29	-18.58	-13	-5.58	Vertical
400.7	-42.95	1.72	16.89	-27.78	-13	-14.78	Horizontal

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

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-53.37	2.62	27.30	-28.69	-13	-15.69	Horizontal
1418.0	-50.33	2.62	27.30	-25.65	-13	-12.65	Vertical
2127.0	-49.29	2.87	27.62	-24.54	-13	-11.54	Vertical
2127.0	-52.15	2.87	27.62	-27.40	-13	-14.40	Horizontal
184.9	-37.05	1.35	16.91	-21.49	-13	-8.49	Vertical
422.2	-44.59	1.62	16.31	-29.90	-13	-16.90	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-48.63	2.62	27.30	-23.95	-13	-10.95	Horizontal
1420.0	-47.49	2.62	27.30	-22.81	-13	-9.81	Vertical
2130.0	-52.08	2.87	27.62	-27.33	-13	-14.33	Vertical
2130.0	-49.49	2.87	27.62	-24.74	-13	-11.74	Horizontal
192.4	-44.75	1.51	17.14	-29.12	-13	-16.12	Vertical
252.5	-43.23	1.77	16.88	-28.12	-13	-15.12	Horizontal
Test Results for High Channel 711MHz							
1422.0	-52.71	2.62	27.30	-28.03	-13	-15.03	Horizontal
1422.0	-51.83	2.62	27.30	-27.15	-13	-14.15	Vertical
2133.0	-48.10	2.87	27.62	-23.35	-13	-10.35	Vertical
2133.0	-49.89	2.87	27.62	-25.14	-13	-12.14	Horizontal
195.3	-42.86	1.78	15.95	-28.69	-13	-15.69	Vertical
326.8	-38.93	1.34	17.95	-22.33	-13	-9.33	Horizontal

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

**9.7 LTE BAND 41**

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

Test Results for Low Channel 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5115.0	-59.52	5.13	35.81	-28.84	-25	-3.84	Horizontal
5115.0	-64.34	5.13	35.81	-33.66	-25	-8.66	Vertical
7672.5	-62.45	5.42	36.85	-31.02	-25	-6.02	Vertical
7672.5	-63.19	5.42	36.85	-31.76	-25	-6.76	Horizontal
201.4	-53.06	1.56	17.97	-36.65	-25	-11.65	Vertical
426.0	-51.34	1.33	15.11	-37.56	-25	-12.56	Horizontal
Test Results for Mid Channel 2593MHz							
5210.0	-59.63	5.16	35.82	-28.97	-25	-3.97	Horizontal
5210.0	-64.70	5.16	35.82	-34.04	-25	-9.04	Vertical
7815.0	-61.73	5.53	36.85	-30.41	-25	-5.41	Vertical
7815.0	-60.88	5.53	36.85	-29.56	-25	-4.56	Horizontal
180.1	-49.15	1.77	16.17	-34.74	-25	-9.74	Vertical
433.9	-49.39	1.63	15.21	-35.81	-25	-10.81	Horizontal
Test Results for High Channel 2687.5MHz							
5305.0	-60.47	5.23	35.83	-29.87	-25	-4.87	Horizontal
5305.0	-60.02	5.23	35.83	-29.42	-25	-4.42	Vertical
7957.5	-60.33	5.62	36.87	-29.08	-25	-4.08	Vertical
7957.5	-63.74	5.62	36.87	-32.49	-25	-7.49	Horizontal
183.1	-52.23	1.58	17.56	-36.25	-25	-11.25	Vertical
451.2	-47.36	1.45	16.58	-32.23	-25	-7.23	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5130.0	-64.66	5.23	35.82	-34.07	-25	-9.07	Horizontal
5130.0	-62.55	5.23	35.82	-31.96	-25	-6.96	Vertical
7695.0	-64.34	5.67	36.86	-33.15	-25	-8.15	Vertical
7695.0	-61.27	5.67	36.86	-30.08	-25	-5.08	Horizontal
200.5	-44.97	1.55	15.76	-30.76	-25	-5.76	Vertical
454.0	-49.47	1.62	15.44	-35.65	-25	-10.65	Horizontal
Test Results for Mid Channel 2593MHz							
5210.0	-62.39	5.16	35.82	-31.73	-25	-6.73	Horizontal
5210.0	-60.51	5.16	35.82	-29.85	-25	-4.85	Vertical
7815.0	-63.39	5.53	36.85	-32.07	-25	-7.07	Vertical
7815.0	-59.13	5.53	36.85	-27.81	-25	-2.81	Horizontal
211.4	-51.04	1.58	16.84	-35.78	-25	-10.78	Vertical
255.1	-53.44	1.61	17.64	-37.41	-25	-12.41	Horizontal
Test Results for High Channel 2680MHz							
5290.0	-61.43	5.24	35.83	-30.84	-25	-5.84	Horizontal
5290.0	-59.08	5.24	35.83	-28.49	-25	-3.49	Vertical
7935.0	-64.75	5.70	36.88	-33.57	-25	-8.57	Vertical
7935.0	-59.26	5.70	36.88	-28.08	-25	-3.08	Horizontal
175.6	-48.48	1.48	16.84	-33.12	-25	-8.12	Vertical
443.2	-47.38	1.59	17.64	-31.33	-25	-6.33	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.

**9.8 LTE BAND 66**

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

Test Results for Low Channel 1710.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-59.58	3.84	35.81	-27.61	-13	-14.61	Horizontal
3421.4	-61.32	3.84	35.81	-29.35	-13	-16.35	Vertical
5132.1	-60.21	5.18	36.85	-28.54	-13	-15.54	Vertical
5132.1	-61.38	5.18	36.85	-29.71	-13	-16.71	Horizontal
200.3	-46.81	1.56	17.97	-30.40	-13	-17.40	Vertical
247.0	-49.20	1.33	15.11	-35.42	-13	-22.42	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-64.55	3.85	35.82	-32.58	-13	-19.58	Horizontal
3490.0	-62.37	3.85	35.82	-30.40	-13	-17.40	Vertical
5235.0	-63.70	5.21	36.85	-32.06	-13	-19.06	Vertical
5235.0	-63.95	5.21	36.85	-32.31	-13	-19.31	Horizontal
202.6	-46.83	1.77	16.17	-32.42	-13	-19.42	Vertical
440.3	-47.66	1.63	15.21	-34.08	-13	-21.08	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-61.82	3.86	35.83	-29.85	-13	-16.85	Horizontal
3558.6	-60.69	3.86	35.83	-28.72	-13	-15.72	Vertical
5337.9	-63.59	5.24	36.87	-31.96	-13	-18.96	Vertical
5337.9	-63.74	5.24	36.87	-32.11	-13	-19.11	Horizontal
186.6	-48.68	1.58	17.56	-32.70	-13	-19.70	Vertical
299.7	-52.80	1.45	16.58	-37.67	-13	-24.67	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	-59.25	3.84	35.82	-27.27	-13	-14.27	Horizontal
3440.0	-64.72	3.84	35.82	-32.74	-13	-19.74	Vertical
5160.0	-61.24	5.18	36.86	-29.56	-13	-16.56	Vertical
5160.0	-60.61	5.18	36.86	-28.93	-13	-15.93	Horizontal
197.4	-53.71	1.56	15.76	-39.51	-13	-26.51	Vertical
414.2	-54.42	1.33	15.44	-40.31	-13	-27.31	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-59.97	3.85	35.82	-28.00	-13	-15.00	Horizontal
3490.0	-63.51	3.85	35.82	-31.54	-13	-18.54	Vertical
5235.0	-61.94	5.21	36.85	-30.30	-13	-17.30	Vertical
5235.0	-64.49	5.21	36.85	-32.85	-13	-19.85	Horizontal
198.8	-44.80	1.77	16.84	-29.72	-13	-16.72	Vertical
294.7	-48.64	1.63	17.64	-32.63	-13	-19.63	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-59.87	3.86	35.83	-27.90	-13	-14.90	Horizontal
3540.0	-60.68	3.86	35.83	-28.71	-13	-15.71	Vertical
5310.0	-63.30	5.24	36.88	-31.66	-13	-18.66	Vertical
5310.0	-63.15	5.24	36.88	-31.51	-13	-18.51	Horizontal
211.9	-46.27	1.58	16.84	-31.00	-13	-18.00	Vertical
333.7	-47.75	1.45	17.64	-31.56	-13	-18.56	Horizontal

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

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

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

## 10. FREQUENCY STABILITY

### RULE PART(S)

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

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  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 3.27V, Normal, DC 3.85V and High voltage, DC 4.43V.

### Frequency Stability vs Temperature:

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

### Frequency Stability vs Voltage:

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

### MODES TESTED

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

### RESULTS

See the following pages.



10.1 LTE BAND 2

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1880	12.2	0.006509	2.5
3.85	1880	14.3	0.007596	2.5
4.43	1880	13.7	0.007299	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.4	0.006614	2.5
Extreme (50C)	1880	11.7	0.006235	2.5
Extreme (40C)	1880	13.5	0.007200	2.5
Extreme (30C)	1880	13.2	0.007004	2.5
Extreme (10C)	1880	14.3	0.007604	2.5
Extreme (0C)	1880	11.8	0.006257	2.5
Extreme (-10C)	1880	13.2	0.007035	2.5
Extreme (-20C)	1880	14.4	0.007636	2.5
Extreme (-30C)	1880	14.6	0.007780	2.5

**Band 2 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1880	9.8	0.005205	2.5
3.85	1880	8.8	0.004683	2.5
4.43	1880	8.6	0.004571	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	10.0	0.005300	2.5
Extreme (50C)	1880	8.4	0.004480	2.5
Extreme (40C)	1880	8.4	0.004451009	2.5
Extreme (30C)	1880	9.4	0.004983529	2.5
Extreme (10C)	1880	8.5	0.004528644	2.5
Extreme (0C)	1880	7.6	0.004066839	2.5
Extreme (-10C)	1880	9.1	0.004844626	2.5
Extreme (-20C)	1880	9.2	0.004919558	2.5
Extreme (-30C)	1880	8.0	0.004235491	2.5

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

10.2 LTE BAND 4

**Band 4 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1732.5	8.9	0.005128	2.5
3.85	1732.5	9.3	0.005392	2.5
4.43	1732.5	8.5	0.004923	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.8	0.005091	2.5
Extreme (50C)	1732.5	8.4	0.004872	2.5
Extreme (40C)	1732.5	7.1	0.004115	2.5
Extreme (30C)	1732.5	6.1	0.003495	2.5
Extreme (10C)	1732.5	6.8	0.003927	2.5
Extreme (0C)	1732.5	9.7	0.005593	2.5
Extreme (-10C)	1732.5	8.8	0.005058	2.5
Extreme (-20C)	1732.5	7.1	0.004085	2.5
Extreme (-30C)	1732.5	8.3	0.004810	2.5

**Band 4 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1732.5	10.0	0.005762	2.5
3.85	1732.5	9.3	0.005394	2.5
4.43	1732.5	7.7	0.004441	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.6	0.005525	2.5
Extreme (50C)	1732.5	8.6	0.004983	2.5
Extreme (40C)	1732.5	8.4	0.004859	2.5
Extreme (30C)	1732.5	9.1	0.005277	2.5
Extreme (10C)	1732.5	8.4	0.004860	2.5
Extreme (0C)	1732.5	8.3	0.004814	2.5
Extreme (-10C)	1732.5	9.0	0.005210	2.5
Extreme (-20C)	1732.5	8.5	0.004908	2.5
Extreme (-30C)	1732.5	8.3	0.004819	2.5

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

10.3 LTE BAND 5

**Band 5 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	836.5	5.8	0.006924	2.5
3.85	836.5	6.8	0.008087	2.5
4.43	836.5	4.6	0.005451	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.7	0.006797	2.5
Extreme (50C)	836.5	6.0	0.007120	2.5
Extreme (40C)	836.5	6.5	0.007748	2.5
Extreme (30C)	836.5	6.5	0.007826	2.5
Extreme (10C)	836.5	5.0	0.005979	2.5
Extreme (0C)	836.5	5.4	0.006478	2.5
Extreme (-10C)	836.5	5.6	0.006641	2.5
Extreme (-20C)	836.5	6.2	0.007409	2.5
Extreme (-30C)	836.5	5.9	0.007053	2.5

**Band 5 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	836.5	5.4	0.006468	2.5
3.85	836.5	6.4	0.007618	2.5
4.43	836.5	4.8	0.005720	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.5	0.007807	2.5
Extreme (50C)	836.5	6.2	0.007402	2.5
Extreme (40C)	836.5	6.0	0.007217	2.5
Extreme (30C)	836.5	6.1	0.007236	2.5
Extreme (10C)	836.5	5.8	0.006927	2.5
Extreme (0C)	836.5	5.1	0.006043	2.5
Extreme (-10C)	836.5	5.2	0.006255	2.5
Extreme (-20C)	836.5	5.9	0.007099	2.5
Extreme (-30C)	836.5	6.1	0.007254	2.5

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

### 10.4 LTE BAND 7

#### Band 7 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

##### Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	2535	9.7	0.003844	2.5
3.85	2535	8.9	0.003493	2.5
4.43	2535	8.2	0.003237	2.5

##### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.8	0.003871	2.5
Extreme (50C)	2535	9.1	0.003599	2.5
Extreme (40C)	2535	8.8	0.003472	2.5
Extreme (30C)	2535	8.6	0.003396	2.5
Extreme (10C)	2535	8.0	0.003160	2.5
Extreme (0C)	2535	8.1	0.003182	2.5
Extreme (-10C)	2535	9.4	0.003700	2.5
Extreme (-20C)	2535	9.1	0.003602	2.5
Extreme (-30C)	2535	7.9	0.003127	2.5

**Band 7 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	2535	6.9	0.002722	2.5
3.85	2535	6.1	0.002413	2.5
4.43	2535	5.7	0.002240	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.3	0.002108	2.5
Extreme (40C)	2535	5.5	0.002150	2.5
Extreme (30C)	2535	6.7	0.002635	2.5
Extreme (10C)	2535	6.0	0.002373	2.5
Extreme (0C)	2535	4.8	0.001879	2.5
Extreme (-10C)	2535	4.9	0.001934	2.5
Extreme (-20C)	2535	6.3	0.002481	2.5
Extreme (-30C)	2535	5.4	0.002118	2.5

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



10.5 LTE BAND 12

**Band 12 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	707.5	9.0	0.012738	2.5
3.85	707.5	10.0	0.014147	2.5
4.43	707.5	8.7	0.012325	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.2	0.013037	2.5
Extreme (50C)	707.5	7.9	0.011122	2.5
Extreme (40C)	707.5	7.3	0.010267	2.5
Extreme (30C)	707.5	7.8	0.011090	2.5
Extreme (10C)	707.5	7.8	0.011016	2.5
Extreme (0C)	707.5	9.5	0.013365	2.5
Extreme (-10C)	707.5	8.5	0.012024	2.5
Extreme (-20C)	707.5	8.8	0.012386	2.5
Extreme (-30C)	707.5	7.3	0.010361	2.5

**Band 12 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	707.5	7.6	0.010794	2.5
3.85	707.5	8.2	0.011641	2.5
4.43	707.5	6.9	0.009784	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.8	0.012465	2.5
Extreme (50C)	707.5	8.8	0.012392	2.5
Extreme (40C)	707.5	9.0	0.012769	2.5
Extreme (30C)	707.5	7.8	0.011029	2.5
Extreme (10C)	707.5	8.6	0.012137	2.5
Extreme (0C)	707.5	7.5	0.010610	2.5
Extreme (-10C)	707.5	7.0	0.009949	2.5
Extreme (-20C)	707.5	8.6	0.012118	2.5
Extreme (-30C)	707.5	8.5	0.012026	2.5

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

### 10.6 LTE BAND 17

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	710.0	10.0	0.014043	2.5
3.85	710.0	8.6	0.012106	2.5
4.43	710.0	8.6	0.012065	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.8	0.013786	2.5
Extreme (50C)	710.0	9.2	0.012893	2.5
Extreme (40C)	710.0	8.5	0.011960	2.5
Extreme (30C)	710.0	9.3	0.013036	2.5
Extreme (10C)	710.0	8.8	0.012338	2.5
Extreme (0C)	710.0	8.4	0.011779	2.5
Extreme (-10C)	710.0	9.1	0.012752	2.5
Extreme (-20C)	710.0	9.1	0.012848	2.5
Extreme (-30C)	710.0	8.5	0.011978	2.5

**Band 17 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	710.0	10.2	0.014373	2.5
3.85	710.0	9.3	0.013140	2.5
4.43	710.0	8.8	0.012405	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.2	0.013002	2.5
Extreme (50C)	710.0	9.4	0.013201	2.5
Extreme (40C)	710.0	7.9	0.011151	2.5
Extreme (30C)	710.0	8.8	0.012444	2.5
Extreme (10C)	710.0	8.4	0.011900	2.5
Extreme (0C)	710.0	8.4	0.011812	2.5
Extreme (-10C)	710.0	8.9	0.012584	2.5
Extreme (-20C)	710.0	8.5	0.011913	2.5
Extreme (-30C)	710.0	8.6	0.012134	2.5

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

10.7 LTE BAND 41

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	2593	10.3	0.003964	2.5
3.85	2593	9.2	0.003537	2.5
4.43	2593	8.7	0.003372	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	8.9	0.003451	2.5
Extreme (50C)	2593	9.1	0.003500	2.5
Extreme (40C)	2593	8.4	0.003238	2.5
Extreme (30C)	2593	8.9	0.003414	2.5
Extreme (10C)	2593	7.7	0.002965	2.5
Extreme (0C)	2593	8.5	0.003269	2.5
Extreme (-10C)	2593	9.2	0.003543	2.5
Extreme (-20C)	2593	8.6	0.003304	2.5
Extreme (-30C)	2593	8.7	0.003373	2.5

**Band 41 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	2593	6.9	0.002661	2.5
3.85	2593	6.9	0.002653	2.5
4.43	2593	5.4	0.002085	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	6.9	0.002661	2.5
Extreme (50C)	2593	5.7	0.002183	2.5
Extreme (40C)	2593	5.1	0.001972	2.5
Extreme (30C)	2593	6.4	0.002472	2.5
Extreme (10C)	2593	5.4	0.002087	2.5
Extreme (0C)	2593	5.3	0.002047	2.5
Extreme (-10C)	2593	5.4	0.002097	2.5
Extreme (-20C)	2593	5.6	0.002165	2.5
Extreme (-30C)	2593	6.1	0.002358	2.5

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

10.8 LTE BAND 66

**Band 66 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1745	6.0	0.003447	2.5
3.85	1745	6.9	0.003946	2.5
4.43	1745	7.1	0.004054	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	5.5	0.003154	2.5
Extreme (50C)	1745	7.5	0.004275	2.5
Extreme (40C)	1745	6.9	0.003949	2.5
Extreme (30C)	1745	6.7	0.003863	2.5
Extreme (10C)	1745	7.7	0.004440	2.5
Extreme (0C)	1745	6.2	0.003526	2.5
Extreme (-10C)	1745	5.5	0.003180	2.5
Extreme (-20C)	1745	6.2	0.003527	2.5
Extreme (-30C)	1745	5.6	0.003190	2.5

**Band 66 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	1745	8.4	0.004818	2.5
3.85	1745	7.8	0.004488	2.5
4.43	1745	9.7	0.005554	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	8.5	0.004890	2.5
Extreme (50C)	1745	7.7	0.004390	2.5
Extreme (40C)	1745	8.9	0.005108	2.5
Extreme (30C)	1745	7.8	0.004474	2.5
Extreme (10C)	1745	8.8	0.005045	2.5
Extreme (0C)	1745	6.4	0.003680	2.5
Extreme (-10C)	1745	9.0	0.005133	2.5
Extreme (-20C)	1745	8.9	0.005092	2.5
Extreme (-30C)	1745	5.8	0.003351	2.5

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



## 11. Peak-to-Average Ratio

### 11.1 Description of the PAR Measurement

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

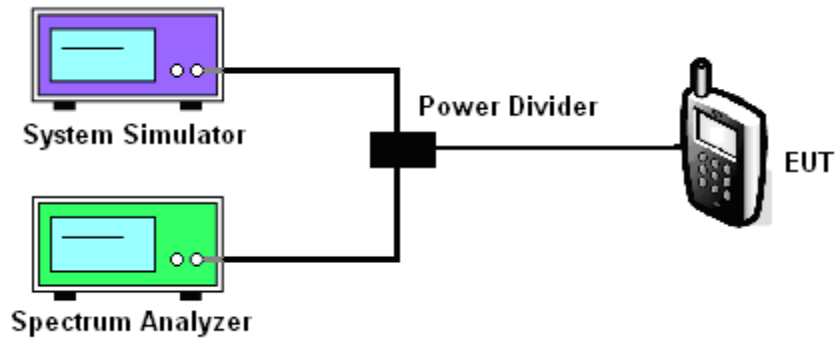
### 11.2 Measuring Instruments

See list of measuring instruments of this test report.

### 11.3 Test Procedures

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

### 11.4 Test Setup



### MODES TESTED

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

Test data reference attachment.

----END OF REPORT----