

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

## FCC ID: 2A7DX-A53PRO

**Product:** Smart phone

**Trade Mark:** Blackview

**Model No.:** A53 Pro

**Family Model:** N/A

**Report No.:** STR230214007006E

**Issue Date:** Mar 02, 2023

### Prepared for

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### Prepared by

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### TEST RESULT CERTIFICATION

**Applicant's name** ..... : DOKE COMMUNICATION (HK) LIMITED  
**Address**..... : RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD  
 WANCHAI HONG KONG China  
**Manufacturer's Name**..... : Shenzhen DOKE Electronic Co.,Ltd  
**Address**..... : 801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road,  
 Guangming District, Shenzhen, China  
**Product name**..... : Smart phone  
**Model and/or type reference** .. : A53 Pro  
**Trade Mark**..... : Blackview  
**Family Model**..... : N/A  
**Test Sample Number**..... T230214002R002  
**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..... Feb 17, 2023 ~ Mar 02, 2023

Date of Issue ..... Mar 02, 2023

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

Testing Engineer : Allen Liu  
 (Allen Liu)

Authorized Signatory : Alex Li  
 (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	Blackview
Model Name	A53 Pro
Family Model	N/A
Model Difference	N/A
FCC ID:	2A7DX-A53PRO
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12, 17
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz;
Type of Modulation:	QPSK/16QAM/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:	0.6dBi;
Adapter	Model: QZ-01000AA00 Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A (10.0W)
Battery	DC 3.87V, 5080mAh
Power supply	DC 3.87V from battery or DC 5V from Adapter.
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.87V) (Note 1)
HW Version	HCT-M659MB-A2
SW Version	A53Pro_NEU_M659_V1.0
** 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: 2A7DX-A53PRO** filing to comply with the FCC Part 22H&24E&27.

**1.3 TEST METHODOLOGY**

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

**1.4 TEST FACILITY**

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

**MEASUREMENT UNCERTAINTY**

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

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

**1.5 SPECIAL ACCESSORIES**

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

**1.6 WORST-CASE CONFIGURATION AND MODE**

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

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

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

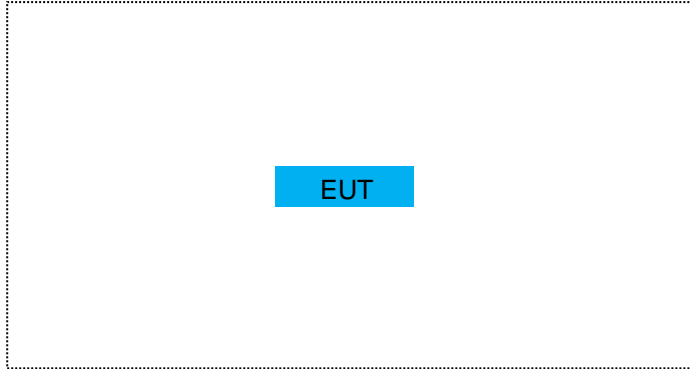
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart phone	A53 Pro	FCC ID: 2A7DX-A53PRO	EUT

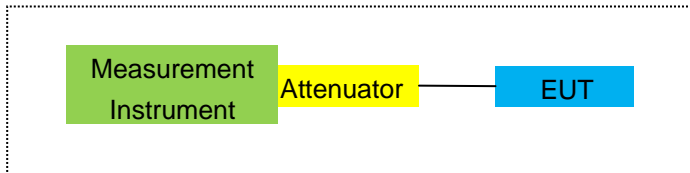
*Note: All the accessories have been used during the test.  
the following "EUT" in setup diagram means EUT system.*

## 2.4 TEST SETUP

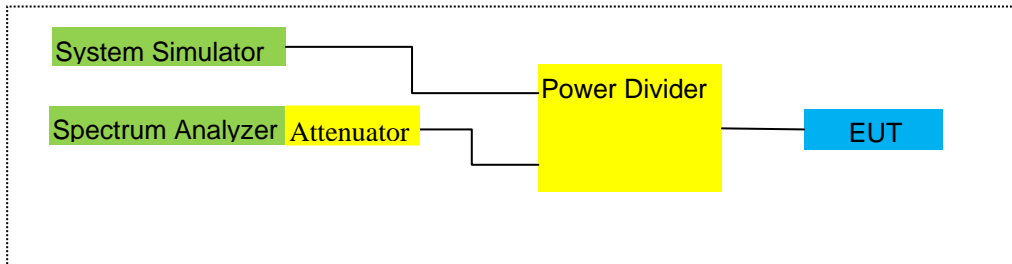
For Radiated Test Cases



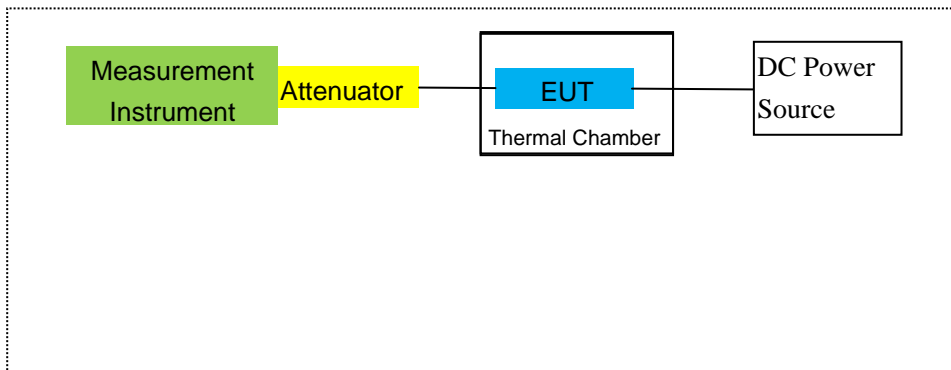
For Conducted Output Power



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



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.



### 3. TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2022.06.16	2023.06.17	1 year
2	Test Receiver	R&S	ESPI	101318	2022.04.06	2023.04.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	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	2022.03.31	2023.03.30	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2023.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2022.06.17	2023.06.16	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.04.06	2023.04.05	1 year
9	Power Meter	R&S	NRVS	100696	2022.06.17	2023.06.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2022.04.06	2023.04.05	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	2022.04.06	2023.04.05	1 year
15	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
16	LISN	EMCO	3816/2	00042990	2022.04.06	2023.04.05	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2022.04.06	2023.04.05	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2022.04.06	2023.04.05	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	2022.04.01	2023.03.31	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2022.04.01	2023.03.31	1 year
24	test receiver	R&S	ESCI	a0304218	2022.04.06	2023.04.05	1 year
25	Communication Tester	R&S	CMU200	A0304247	2022.06.16	2023.06.15	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2022.04.06	2023.04.05	1 year
27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.05.11	2023.05.10	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2022.06.16	2023.06.15	1 year
29	Communication Tester	R&S	CMW500	148500	2022.06.16	2023.06.15	1 year

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

## 4. OUTPUT POWER

### 4.1 OUTPUT POWER MEASUREMENT

#### LTE Measurement Procedure:

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

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

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

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

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

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

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

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

Test data reference attachment.

## 5. OCCUPIED BANDWIDTH

### RULE PART(S)

FCC: §2.1049

### LIMITS

For reporting purposes only

### TEST PROCEDURE

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

### MODES TESTED

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

### RESULTS

**PASS**

Test data reference attachment.

## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53,  
FCC: §22.359

### LIMITS

FCC: §22.917, §24.238, §27.53

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

(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

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

**TEST PROCEDURE**

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

**MODES TESTED**

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

**RESULTS**

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

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

### LIMITS

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

### TEST PROCEDURE

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

For each out of band emissions measurement:

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

### **MODES TESTED**

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

### 7.1 MEASUREMENT METHOD

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

Test data reference attachment.



## 8. RADIATED MEASUREMENT

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

#### RULE PART(S)

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

#### LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.  
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.  
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.  
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.  
27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

#### MODES TESTED

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

#### RESULTS

Pass

### 8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2											
Mode	RB/RB SIZE	Frequency	Result						Polarization Of	Conclusion	
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Max. ERP			
											Average
											(mW)
1.4MHz Band QPSK	1#Mid	1850.7	-3.32	3.76	28.24	21.16	130.617	Horizontal	Pass		
		1880	-3.13	3.91	28.22	21.18	131.220	Horizontal	Pass		
		1909.3	-3.04	3.93	28.20	21.23	132.739	Horizontal	Pass		
3.0MHz Band QPSK	1#Mid	1851.5	-3.38	3.77	28.23	21.08	128.233	Horizontal	Pass		
		1880	-3.23	3.91	28.24	21.10	128.825	Horizontal	Pass		
		1908.5	-3.10	3.94	28.25	21.21	132.130	Horizontal	Pass		
5.0MHz Band QPSK	1#Mid	1852.5	-3.27	3.77	28.31	21.27	133.968	Horizontal	Pass		
		1880	-2.89	3.91	28.22	21.42	138.676	Horizontal	Pass		
		1907.5	-2.82	3.94	28.20	21.44	139.316	Horizontal	Pass		
10.0MHz Band QPSK	1#Mid	1855	-3.13	3.79	28.33	21.41	138.357	Horizontal	Pass		
		1880	-2.83	3.95	28.22	21.44	139.316	Horizontal	Pass		
		1905	-2.72	3.97	28.19	21.50	141.254	Horizontal	Pass		
15.0MHz Band QPSK	1#Mid	1857.5	-3.09	3.79	28.34	21.46	139.959	Horizontal	Pass		
		1880	-2.88	3.95	28.22	21.39	137.721	Horizontal	Pass		
		1902.5	-2.74	3.97	28.18	21.47	140.281	Horizontal	Pass		
20.0MHz Band QPSK	1#Mid	1860	-3.08	3.81	28.35	21.46	139.959	Horizontal	Pass		
		1880	-2.75	3.96	28.22	<b>21.51</b>	141.579	Horizontal	Pass		
		1900	-2.69	4.00	28.16	21.47	140.281	Horizontal	Pass		
1.4MHz Band QPSK	1#Mid	1850.7	-4.22	3.76	28.24	20.26	106.170	Vertical	Pass		
		1880	-3.74	3.91	28.22	20.57	114.025	Vertical	Pass		
		1909.3	-3.63	3.93	28.20	20.64	115.878	Vertical	Pass		
3.0MHz Band QPSK	1#Mid	1851.5	-3.99	3.77	28.23	20.47	111.429	Vertical	Pass		
		1880	-4.37	3.91	28.24	19.96	99.083	Vertical	Pass		
		1908.5	-3.87	3.94	28.25	20.44	110.662	Vertical	Pass		
5.0MHz Band QPSK	1#Mid	1852.5	-3.97	3.77	28.31	20.57	114.025	Vertical	Pass		
		1880	-4.25	3.91	28.22	20.06	101.391	Vertical	Pass		
		1907.5	-3.81	3.94	28.20	20.45	110.917	Vertical	Pass		
10.0MHz Band QPSK	1#Mid	1855	-4.04	3.79	28.33	20.50	112.202	Vertical	Pass		
		1880	-3.63	3.95	28.22	20.64	115.878	Vertical	Pass		
		1905	-4.00	3.97	28.19	20.22	105.196	Vertical	Pass		
15.0MHz	1#Mid	1857.5	-3.94	3.79	28.34	20.61	115.080	Vertical	Pass		

Band QPSK		1880	-3.53	3.95	28.22	20.74	118.577	Vertical	Pass
		1902.5	-4.18	3.97	28.18	20.03	100.693	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.89	3.81	28.35	20.65	116.145	Vertical	Pass
		1880	-4.20	3.96	28.22	20.06	101.391	Vertical	Pass
		1900	-4.17	4.00	28.16	19.99	99.770	Vertical	Pass

Radiated Power (EIRP) for Band 2											
Mode	RB/RB SIZE	Frequency	Result						Polarization Of	Conclusion	
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Max. ERP			
											Average
											(mW)
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.44	3.76	28.24	20.04	100.925	Horizontal	Pass		
		1880	-3.91	3.91	28.22	20.40	109.648	Horizontal	Pass		
		1909.3	-3.84	3.93	28.20	20.43	110.408	Horizontal	Pass		
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.94	3.77	28.23	20.52	112.720	Horizontal	Pass		
		1880	-4.02	3.91	28.24	20.31	107.399	Horizontal	Pass		
		1908.5	-4.23	3.94	28.25	20.08	101.859	Horizontal	Pass		
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.88	3.77	28.31	20.66	116.413	Horizontal	Pass		
		1880	-3.79	3.91	28.22	20.52	112.720	Horizontal	Pass		
		1907.5	-3.47	3.94	28.20	20.79	119.950	Horizontal	Pass		
10.0MHz Band 16 QAM	1/#Mid	1855	-3.93	3.79	28.33	20.61	115.080	Horizontal	Pass		
		1880	-3.92	3.95	28.22	20.35	108.393	Horizontal	Pass		
		1905	-3.39	3.97	28.19	20.83	121.060	Horizontal	Pass		
15.0MHz Band 16 QAM	1/#Mid	1857.5	-3.91	3.79	28.34	20.64	115.878	Horizontal	Pass		
		1880	-3.70	3.95	28.22	20.57	114.025	Horizontal	Pass		
		1902.5	-3.66	3.97	28.18	20.55	113.501	Horizontal	Pass		
20.0MHz Band 16 QAM	1/#Mid	1860	-3.80	3.81	28.35	20.74	118.577	Horizontal	Pass		
		1880	-3.50	3.96	28.22	20.76	119.124	Horizontal	Pass		
		1900	-3.32	4.00	28.16	<b>20.84</b>	121.339	Horizontal	Pass		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-5.33	3.76	28.24	19.15	82.224	Vertical	Pass		
		1880	-5.05	3.91	28.22	19.26	84.333	Vertical	Pass		
		1909.3	-5.34	3.93	28.20	18.93	78.163	Vertical	Pass		
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.22	3.77	28.23	19.24	83.946	Vertical	Pass		
		1880	-4.49	3.91	28.24	19.84	96.383	Vertical	Pass		
		1908.5	-5.23	3.94	28.25	19.08	80.910	Vertical	Pass		
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.27	3.77	28.31	19.27	84.528	Vertical	Pass		
		1880	-5.06	3.91	28.22	19.25	84.140	Vertical	Pass		
		1907.5	-4.72	3.94	28.20	19.54	89.950	Vertical	Pass		
10.0MHz Band 16 QAM	1/#Mid	1855	-5.54	3.79	28.33	19.00	79.433	Vertical	Pass		
		1880	-4.65	3.95	28.22	19.62	91.622	Vertical	Pass		
		1905	-5.03	3.97	28.19	19.19	82.985	Vertical	Pass		
15.0MHz Band 16 QAM	1/#Mid	1857.5	-5.46	3.79	28.34	19.09	81.096	Vertical	Pass		
		1880	-4.85	3.95	28.22	19.42	87.498	Vertical	Pass		
		1902.5	-4.65	3.97	28.18	19.56	90.365	Vertical	Pass		

20.0MHz		1860	-5.23	3.81	28.35	19.31	85.310	Vertical	Pass
Band 16	1/#Mid	1880	-4.88	3.96	28.22	19.38	86.696	Vertical	Pass
QAM		1900	-5.07	4.00	28.16	19.09	81.096	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)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-3.23	3.12	27.58	21.23	132.739	Horizontal	Pass
		1732.5	-3.22	3.27	27.61	21.12	129.420	Horizontal	Pass
		1754.3	-3.20	3.29	27.63	21.14	130.017	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.40	3.13	27.61	21.08	128.233	Horizontal	Pass
		1732.5	-3.32	3.27	27.61	21.02	126.474	Horizontal	Pass
		1753.5	-3.24	3.30	27.62	21.08	128.233	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.17	3.13	27.63	21.33	135.831	Horizontal	Pass
		1732.5	-3.07	3.27	27.61	21.27	133.968	Horizontal	Pass
		1752.5	-2.95	3.30	27.60	21.35	136.458	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.11	3.15	27.64	21.38	137.404	Horizontal	Pass
		1732.5	-2.88	3.31	27.61	21.42	138.676	Horizontal	Pass
		1750	-2.90	3.33	27.59	21.36	136.773	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.12	3.15	27.65	21.38	137.404	Horizontal	Pass
		1732.5	-2.96	3.31	27.61	21.34	136.144	Horizontal	Pass
		1747.5	-2.90	3.33	27.57	21.34	136.144	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.06	3.17	27.66	<b>21.43</b>	138.995	Horizontal	Pass
		1732.5	-2.89	3.32	27.61	21.40	138.038	Horizontal	Pass
		1745	-2.83	3.36	27.56	21.37	137.088	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.57	3.12	27.58	19.89	97.499	Vertical	Pass
		1732.5	-4.03	3.27	27.61	20.31	107.399	Vertical	Pass
		1754.3	-3.50	3.29	27.63	20.84	121.339	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.73	3.13	27.61	20.75	118.850	Vertical	Pass
		1732.5	-4.20	3.27	27.61	20.14	103.276	Vertical	Pass
		1753.5	-3.79	3.30	27.62	20.53	112.980	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.36	3.13	27.63	20.14	103.276	Vertical	Pass
		1732.5	-4.09	3.27	27.61	20.25	105.925	Vertical	Pass
		1752.5	-4.02	3.30	27.60	20.28	106.660	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.14	3.15	27.64	20.35	108.393	Vertical	Pass
		1732.5	-4.10	3.31	27.61	20.20	104.713	Vertical	Pass
		1750	-3.87	3.33	27.59	20.39	109.396	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-3.78	3.15	27.65	20.72	118.032	Vertical	Pass

Band		1732.5	-3.53	3.31	27.61	20.77	119.399	Vertical	Pass
QPSK		1747.5	-4.25	3.33	27.57	19.99	99.770	Vertical	Pass
20.0MHz	1/#Mid	1720	-4.33	3.17	27.66	20.16	103.753	Vertical	Pass
Band		1732.5	-3.82	3.32	27.61	20.47	111.429	Vertical	Pass
QPSK		1745	-3.42	3.36	27.56	20.78	119.674	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.04	3.12	27.58	20.42	110.154	Horizontal	Pass
		1732.5	-3.89	3.27	27.61	20.45	110.917	Horizontal	Pass
		1754.3	-3.89	3.29	27.63	20.45	110.917	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.98	3.13	27.61	20.50	112.202	Horizontal	Pass
		1732.5	-4.11	3.27	27.61	20.23	105.439	Horizontal	Pass
		1753.5	-4.33	3.30	27.62	19.99	99.770	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.81	3.13	27.63	20.69	117.220	Horizontal	Pass
		1732.5	-3.77	3.27	27.61	20.57	114.025	Horizontal	Pass
		1752.5	-3.46	3.30	27.60	20.84	121.339	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.88	3.15	27.64	20.61	115.080	Horizontal	Pass
		1732.5	-4.07	3.31	27.61	20.23	105.439	Horizontal	Pass
		1750	-3.45	3.33	27.59	20.81	120.504	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.68	3.15	27.65	20.82	120.781	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	-3.63	3.17	27.66	<b>20.86</b>	121.899	Horizontal	Pass
		1732.5	-3.64	3.32	27.61	20.65	116.145	Horizontal	Pass
		1745	-3.45	3.36	27.56	20.75	118.850	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.64	3.12	27.58	19.82	95.940	Vertical	Pass
		1732.5	-5.40	3.27	27.61	18.94	78.343	Vertical	Pass
		1754.3	-4.50	3.29	27.63	19.84	96.383	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.97	3.13	27.61	19.51	89.331	Vertical	Pass
		1732.5	-5.31	3.27	27.61	19.03	79.983	Vertical	Pass
		1753.5	-5.40	3.30	27.62	18.92	77.983	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.07	3.13	27.63	19.43	87.700	Vertical	Pass
		1732.5	-5.38	3.27	27.61	18.96	78.705	Vertical	Pass
		1752.5	-5.30	3.30	27.60	19.00	79.433	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.89	3.15	27.64	19.60	91.201	Vertical	Pass
		1732.5	-4.47	3.31	27.61	19.83	96.161	Vertical	Pass
		1750	-4.48	3.33	27.59	19.78	95.060	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.75	3.15	27.65	19.75	94.406	Vertical	Pass
		1732.5	-5.32	3.31	27.61	18.98	79.068	Vertical	Pass
		1747.5	-5.00	3.33	27.57	19.24	83.946	Vertical	Pass



20.0MHz		1720	-5.40	3.17	27.66	19.09	81.096	Vertical	Pass
Band 16	1/#Mid	1732.5	-4.94	3.32	27.61	19.35	86.099	Vertical	Pass
QAM		1745	-4.67	3.36	27.56	19.53	89.743	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							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
						(dBm)	(mW)			
1.4MHz Band QPSK	3/#Mid	824.7	6.07	2.01	19.68	2.15	21.59	144.212	Horizontal	Pass
		836.5	5.95	2.01	19.77	2.15	21.56	143.219	Horizontal	Pass
		848.3	5.75	2.02	19.82	2.15	21.40	138.038	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	5.84	2.01	19.70	2.15	21.38	137.404	Horizontal	Pass
		836.5	5.74	2.01	19.77	2.15	21.35	136.458	Horizontal	Pass
		847.5	5.61	2.02	19.81	2.15	21.25	133.352	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.12	2.01	19.71	2.15	21.67	146.893	Horizontal	Pass
		836.5	6.00	2.01	19.77	2.15	21.61	144.877	Horizontal	Pass
		846.5	5.84	2.02	19.79	2.15	21.46	139.959	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	6.14	2.01	19.73	2.15	<b>21.71</b>	148.252	Horizontal	Pass
		836.5	6.09	2.01	19.77	2.15	21.70	147.911	Horizontal	Pass
		844	5.99	2.02	19.78	2.15	21.60	144.544	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	5.05	2.01	19.68	2.15	20.57	114.025	Vertical	Pass
		836.5	4.65	2.01	19.77	2.15	20.26	106.170	Vertical	Pass
		848.3	5.13	2.02	19.82	2.15	20.78	119.674	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	5.22	2.01	19.70	2.15	20.76	119.124	Vertical	Pass
		836.5	4.86	2.01	19.77	2.15	20.47	111.429	Vertical	Pass
		847.5	5.02	2.02	19.81	2.15	20.66	116.413	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	5.27	2.01	19.71	2.15	20.82	120.781	Vertical	Pass
		836.5	4.58	2.01	19.77	2.15	20.19	104.472	Vertical	Pass
		846.5	5.18	2.02	19.79	2.15	20.80	120.226	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	5.11	2.01	19.73	2.15	20.68	116.950	Vertical	Pass
		836.5	4.33	2.01	19.77	2.15	19.94	98.628	Vertical	Pass
		844	5.15	2.02	19.78	2.15	20.76	119.124	Vertical	Pass

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Average		
			(dBm)				Average	Average			
							(dBm)	(mW)			
1.4MHz Band 16 QAM	3/#Mid	824.7	5.22	2.01	19.68	2.15	20.74	118.577	Horizontal	Pass	
		836.5	5.15	2.01	19.77	2.15	20.76	119.124	Horizontal	Pass	
		848.3	4.99	2.02	19.82	2.15	20.64	115.878	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	5.30	2.01	19.70	2.15	20.84	121.339	Horizontal	Pass	
		836.5	5.01	2.01	19.77	2.15	20.62	115.345	Horizontal	Pass	
		847.5	4.49	2.02	19.81	2.15	20.13	103.039	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	5.62	2.01	19.71	2.15	21.17	130.918	Horizontal	Pass	
		836.5	5.39	2.01	19.77	2.15	21.00	125.893	Horizontal	Pass	
		846.5	5.14	2.02	19.79	2.15	20.76	119.124	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	5.62	2.01	19.73	2.15	<b>21.19</b>	131.522	Horizontal	Pass	
		836.5	5.34	2.01	19.77	2.15	20.95	124.451	Horizontal	Pass	
		844	4.88	2.02	19.78	2.15	20.49	111.944	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	824.7	4.34	2.01	19.68	2.15	19.86	96.828	Vertical	Pass	
		836.5	4.48	2.01	19.77	2.15	20.09	102.094	Vertical	Pass	
		848.3	4.58	2.02	19.82	2.15	20.23	105.439	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	4.99	2.01	19.70	2.15	20.53	112.980	Vertical	Pass	
		836.5	3.72	2.01	19.77	2.15	19.33	85.704	Vertical	Pass	
		847.5	4.72	2.02	19.81	2.15	20.36	108.643	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	5.13	2.01	19.71	2.15	20.68	116.950	Vertical	Pass	
		836.5	3.55	2.01	19.77	2.15	19.16	82.414	Vertical	Pass	
		846.5	3.87	2.02	19.79	2.15	19.49	88.920	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	3.70	2.01	19.73	2.15	19.27	84.528	Vertical	Pass	
		836.5	4.57	2.01	19.77	2.15	20.18	104.232	Vertical	Pass	
		844	4.63	2.02	19.78	2.15	20.24	105.682	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	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-1.51	4.54	27.75	21.70	147.911	Horizontal	Pass
		2535	-1.34	4.69	27.72	21.69	147.571	Horizontal	Pass
		2567.5	-1.27	4.71	27.71	21.73	148.936	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.44	4.55	27.76	21.77	150.314	Horizontal	Pass
		2535	-1.25	4.69	27.72	21.78	150.661	Horizontal	Pass
		2565	-1.17	4.72	27.70	21.81	151.705	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.45	4.55	27.77	21.77	150.314	Horizontal	Pass
		2535	-1.31	4.69	27.72	21.72	148.594	Horizontal	Pass
		2562.5	-1.21	4.72	27.69	21.76	149.968	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.39	4.57	27.78	<b>21.82</b>	152.055	Horizontal	Pass
		2535	-1.21	4.73	27.72	21.78	150.661	Horizontal	Pass
		2560	-1.17	4.75	27.68	21.76	149.968	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-2.50	4.54	27.75	20.71	117.761	Vertical	Pass
		2535	-3.11	4.69	27.72	19.92	98.175	Vertical	Pass
		2567.5	-2.24	4.71	27.71	20.76	119.124	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.41	4.55	27.76	20.80	120.226	Vertical	Pass
		2535	-2.25	4.69	27.72	20.78	119.674	Vertical	Pass
		2565	-2.13	4.72	27.70	20.85	121.619	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.96	4.55	27.77	20.26	106.170	Vertical	Pass
		2535	-2.78	4.69	27.72	20.25	105.925	Vertical	Pass
		2562.5	-2.52	4.72	27.69	20.45	110.917	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.85	4.57	27.78	20.36	108.643	Vertical	Pass
		2535	-2.44	4.73	27.72	20.55	113.501	Vertical	Pass
		2560	-2.31	4.75	27.68	20.62	115.345	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-2.20	4.54	27.75	21.01	126.183	Horizontal	Pass
		2535	-1.89	4.69	27.72	21.14	130.017	Horizontal	Pass
		2567.5	-1.97	4.71	27.71	21.03	126.765	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.09	4.55	27.76	21.12	129.420	Horizontal	Pass
		2535	-2.10	4.69	27.72	20.93	123.880	Horizontal	Pass
		2565	-2.37	4.72	27.70	20.61	115.080	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.27	4.55	27.77	20.95	124.451	Horizontal	Pass
		2535	-2.24	4.69	27.72	20.79	119.950	Horizontal	Pass
		2562.5	-1.85	4.72	27.69	21.12	129.420	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.15	4.57	27.78	21.06	127.644	Horizontal	Pass
		2535	-1.82	4.73	27.72	<b>21.17</b>	130.918	Horizontal	Pass
		2560	-1.92	4.75	27.68	21.01	126.183	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-4.03	4.54	27.75	19.18	82.794	Vertical	Pass
		2535	-4.02	4.69	27.72	19.01	79.616	Vertical	Pass
		2567.5	-2.58	4.71	27.71	20.42	110.154	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.65	4.55	27.76	20.56	113.763	Vertical	Pass
		2535	-2.52	4.69	27.72	20.51	112.460	Vertical	Pass
		2565	-2.97	4.72	27.70	20.01	100.231	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.83	4.55	27.77	19.39	86.896	Vertical	Pass
		2535	-3.63	4.69	27.72	19.40	87.096	Vertical	Pass
		2562.5	-2.89	4.72	27.69	20.08	101.859	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.57	4.57	27.78	19.64	92.045	Vertical	Pass
		2535	-2.92	4.73	27.72	20.07	101.625	Vertical	Pass
		2560	-2.75	4.75	27.68	20.18	104.232	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	Antenna Factor	Correction	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)	(dB)	Average	Average			
							(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	699.7	6.44	1.91	19.21	2.15	21.59	144.212	Vertical	Pass	
		707.5	6.36	1.91	19.26	2.15	21.56	143.219	Vertical	Pass	
		715.3	6.14	1.93	19.34	2.15	21.40	138.038	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	6.23	1.91	19.21	2.15	21.38	137.404	Vertical	Pass	
		707.5	6.15	1.91	19.26	2.15	21.35	136.458	Vertical	Pass	
		714.5	5.99	1.93	19.34	2.15	21.25	133.352	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	6.50	1.91	19.23	2.15	21.67	146.893	Vertical	Pass	
		707.5	6.41	1.91	19.26	2.15	21.61	144.877	Vertical	Pass	
		713.5	6.20	1.92	19.33	2.15	21.46	139.959	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	704	6.52	1.91	19.25	2.15	<b>21.71</b>	148.252	Vertical	Pass	
		707.5	6.50	1.91	19.26	2.15	21.70	147.911	Vertical	Pass	
		711	6.35	1.92	19.32	2.15	21.60	144.544	Vertical	Pass	
1.4MHz Band QPSK	1/#Mid	699.7	5.41	1.91	19.21	2.15	20.56	113.763	Horizontal	Pass	
		707.5	4.92	1.91	19.26	2.15	20.12	102.802	Horizontal	Pass	
		715.3	5.12	1.93	19.34	2.15	20.38	109.144	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	5.13	1.91	19.21	2.15	20.28	106.660	Horizontal	Pass	
		707.5	5.19	1.91	19.26	2.15	20.39	109.396	Horizontal	Pass	
		714.5	5.38	1.93	19.34	2.15	20.64	115.878	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	5.54	1.91	19.23	2.15	20.71	117.761	Horizontal	Pass	
		707.5	5.34	1.91	19.26	2.15	20.54	113.240	Horizontal	Pass	
		713.5	5.36	1.92	19.33	2.15	20.62	115.345	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	704	5.63	1.91	19.25	2.15	20.82	120.781	Horizontal	Pass	
		707.5	5.37	1.91	19.26	2.15	20.57	114.025	Horizontal	Pass	
		711	4.96	1.92	19.32	2.15	20.21	104.954	Horizontal	Pass	

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)	(dB)	Average	Average			
							(dBm)	(mW)			
1.4MHz	Band 16 QAM	699.7	6.53	1.91	19.21	2.15	21.68	147.231	Vertical	Pass	
		707.5	6.45	1.91	19.26	2.15	21.65	146.218	Vertical	Pass	
		715.3	6.23	1.93	19.34	2.15	21.49	140.929	Vertical	Pass	
3.0MHz	Band 16 QAM	700.5	6.32	1.91	19.21	2.15	21.47	140.281	Vertical	Pass	
		707.5	6.24	1.91	19.26	2.15	21.44	139.316	Vertical	Pass	
		714.5	6.08	1.93	19.34	2.15	21.34	136.144	Vertical	Pass	
5.0MHz	Band 16 QAM	701.5	6.59	1.91	19.23	2.15	21.76	149.968	Vertical	Pass	
		707.5	6.50	1.91	19.26	2.15	21.70	147.911	Vertical	Pass	
		713.5	6.29	1.92	19.33	2.15	21.55	142.889	Vertical	Pass	
10.0MHz	Band 16 QAM	704	6.61	1.91	19.25	2.15	<b>21.80</b>	151.356	Vertical	Pass	
		707.5	6.59	1.91	19.26	2.15	21.79	151.008	Vertical	Pass	
		711	6.44	1.92	19.32	2.15	21.69	147.571	Vertical	Pass	
1.4MHz	Band 16 QAM	699.7	4.92	1.91	19.21	2.15	20.07	101.625	Horizontal	Pass	
		707.5	4.94	1.91	19.26	2.15	20.14	103.276	Horizontal	Pass	
		715.3	5.41	1.93	19.34	2.15	20.67	116.681	Horizontal	Pass	
3.0MHz	Band 16 QAM	700.5	5.17	1.91	19.21	2.15	20.32	107.647	Horizontal	Pass	
		707.5	5.21	1.91	19.26	2.15	20.41	109.901	Horizontal	Pass	
		714.5	4.75	1.93	19.34	2.15	20.01	100.231	Horizontal	Pass	
5.0MHz	Band 16 QAM	701.5	4.95	1.91	19.23	2.15	20.12	102.802	Horizontal	Pass	
		707.5	5.35	1.91	19.26	2.15	20.55	113.501	Horizontal	Pass	
		713.5	4.83	1.92	19.33	2.15	20.09	102.094	Horizontal	Pass	
10.0MHz	Band 16 QAM	704	5.68	1.91	19.25	2.15	20.87	122.180	Horizontal	Pass	
		707.5	4.86	1.91	19.26	2.15	20.06	101.391	Horizontal	Pass	
		711	5.46	1.92	19.32	2.15	20.71	117.761	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

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

### 8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
							(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	706.5	6.99	1.91	19.23	2.15	22.16	164.437	Vertical	Pass
		710	6.85	1.91	19.26	2.15	22.05	160.325	Vertical	Pass
		713.5	6.75	1.92	19.33	2.15	22.01	158.855	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	7.00	1.91	19.25	2.15	<b>22.19</b>	165.577	Vertical	Pass
		710	6.95	1.91	19.26	2.15	22.15	164.059	Vertical	Pass
		711	6.91	1.92	19.32	2.15	22.16	164.437	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	5.21	1.91	19.23	2.15	20.38	109.144	Horizontal	Pass
		710	4.77	1.91	19.26	2.15	19.97	99.312	Horizontal	Pass
		713.5	5.84	1.92	19.33	2.15	21.10	128.825	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	4.92	1.91	19.25	2.15	20.11	102.565	Horizontal	Pass
		710	6.43	1.91	19.26	2.15	21.63	145.546	Horizontal	Pass
		711	6.54	1.92	19.32	2.15	21.79	151.008	Horizontal	Pass



Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP	Max. EIRP			
			(dBm)				Average	Average			
							(dBm)	(mW)			
5.0MHz	1/#Mid	706.5	6.34	1.91	19.23	2.15	21.51	141.579	Vertical	Pass	
Band 16		710	6.25	1.91	19.26	2.15	21.45	139.637	Vertical	Pass	
QAM		713.5	6.05	1.92	19.33	2.15	21.31	135.207	Vertical	Pass	
10.0MHz	1/#Mid	709	5.88	1.91	19.25	2.15	21.07	127.938	Vertical	Pass	
Band 16		710	6.41	1.91	19.26	2.15	<b>21.61</b>	144.877	Vertical	Pass	
QAM		711	6.14	1.92	19.32	2.15	21.39	137.721	Vertical	Pass	
5.0MHz	1/#Mid	706.5	5.25	1.91	19.23	2.15	20.42	110.154	Horizontal	Pass	
Band 16		710	5.33	1.91	19.26	2.15	20.53	112.980	Horizontal	Pass	
QAM		713.5	4.94	1.92	19.33	2.15	20.20	104.713	Horizontal	Pass	
10.0MHz	1/#Mid	709	5.78	1.91	19.25	2.15	20.97	125.026	Horizontal	Pass	
Band 16		710	5.43	1.91	19.26	2.15	20.63	115.611	Horizontal	Pass	
QAM		711	5.64	1.92	19.32	2.15	20.89	122.744	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)

## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

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

### LIMIT

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

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

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

### TEST PROCEDURE

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

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

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

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

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

**MODES TESTED**

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

**RESULTS**

PASS

**9.1 LTE BAND 2**

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-51.90	4.04	33.51	-22.43	-13	-9.43	Horizontal
3701.4	-51.12	4.04	33.51	-21.65	-13	-8.65	Vertical
5552.1	-46.67	5.24	35.84	-16.07	-13	-3.07	Vertical
5552.1	-50.36	5.24	35.84	-19.76	-13	-6.76	Horizontal
182.0	-39.15	1.43	16.02	-24.56	-13	-11.56	Vertical
298.9	-40.01	1.30	17.99	-23.32	-13	-10.32	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.10	4.04	33.56	-16.58	-13	-3.58	Horizontal
3760.0	-46.80	4.04	33.56	-17.28	-13	-4.28	Vertical
5640.0	-49.87	5.24	35.91	-19.20	-13	-6.20	Vertical
5640.0	-53.75	5.24	35.91	-23.08	-13	-10.08	Horizontal
205.5	-38.77	1.62	16.97	-23.42	-13	-10.42	Vertical
443.5	-35.08	1.74	15.98	-20.85	-13	-7.85	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-48.18	4.04	34.00	-18.22	-13	-5.22	Horizontal
3818.6	-50.50	4.04	34.00	-15.54	-13	-7.54	Vertical
5727.9	-49.14	5.24	36.04	-18.34	-13	-5.34	Vertical
5727.9	-53.00	5.24	36.04	-22.20	-13	-9.20	Horizontal
212.5	-41.63	1.42	17.29	-25.76	-13	-12.76	Vertical
394.0	-35.72	1.50	17.90	-19.31	-13	-6.31	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-50.17	4.07	33.54	-20.70	-13	-7.70	Horizontal
3720.0	-48.73	4.07	33.54	-19.26	-13	-6.26	Vertical
5580.0	-49.73	5.28	35.86	-19.15	-13	-6.15	Vertical
5580.0	-52.61	5.28	35.86	-22.03	-13	-9.03	Horizontal
212.9	-38.77	1.58	16.89	-23.45	-13	-10.45	Vertical
320.2	-38.84	1.76	17.26	-23.34	-13	-10.34	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-45.75	4.04	33.56	-16.23	-13	-3.23	Horizontal
3760.0	-48.05	4.04	33.56	-18.53	-13	-5.53	Vertical
5640.0	-51.86	5.24	35.91	-21.19	-13	-8.19	Vertical
5640.0	-53.22	5.24	35.91	-22.55	-13	-9.55	Horizontal
209.2	-38.51	1.46	16.27	-23.70	-13	-10.70	Vertical
415.3	-40.46	1.59	15.15	-26.90	-13	-13.90	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.62	4.04	34.00	-20.66	-13	-7.66	Horizontal
3800.0	-49.59	4.04	34.00	-19.63	-13	-6.63	Vertical
5700.0	-51.64	5.24	36.04	-20.84	-13	-7.84	Vertical
5700.0	-50.85	5.24	36.04	-20.05	-13	-7.05	Horizontal
210.9	-37.35	1.36	17.39	-21.31	-13	-8.31	Vertical
260.4	-37.66	1.66	15.39	-23.93	-13	-10.93	Horizontal

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

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

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

**9.2 LTE BAND 4**

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-46.51	4.02	29.80	-20.73	-13	-7.73	Horizontal
3421.4	-50.14	4.02	29.80	-24.36	-13	-11.36	Vertical
5132.1	-50.98	5.24	35.84	-20.38	-13	-7.38	Vertical
5132.1	-53.65	5.24	35.84	-23.05	-13	-10.05	Horizontal
208.1	-43.77	1.68	16.04	-29.41	-13	-16.41	Vertical
354.2	-39.40	1.78	17.74	-23.44	-13	-10.44	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.30	4.03	30.00	-24.33	-13	-11.33	Horizontal
3465.0	-51.24	4.03	30.00	-25.27	-13	-12.27	Vertical
5197.5	-50.25	5.25	35.86	-19.64	-13	-6.64	Vertical
5197.5	-52.18	5.25	35.86	-21.57	-13	-8.57	Horizontal
179.4	-36.98	1.72	17.69	-21.01	-13	-8.01	Vertical
293.1	-38.86	1.62	16.02	-24.45	-13	-11.45	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.92	4.05	30.01	-23.96	-13	-10.96	Horizontal
3508.6	-50.22	4.05	30.01	-24.26	-13	-11.26	Vertical
5262.9	-53.17	5.26	35.86	-22.57	-13	-9.57	Vertical
5262.9	-52.61	5.26	35.86	-22.01	-13	-9.01	Horizontal
186.9	-40.99	1.80	16.69	-26.10	-13	-13.10	Vertical
335.0	-44.93	1.75	16.66	-30.03	-13	-17.03	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-47.64	4.02	29.80	-21.86	-13	-8.86	Horizontal
3440.0	-47.81	4.02	29.80	-22.03	-13	-9.03	Vertical
5160.0	-52.42	5.24	35.84	-21.82	-13	-8.82	Vertical
5160.0	-53.25	5.24	35.84	-22.65	-13	-9.65	Horizontal
204.4	-37.25	1.57	17.26	-21.56	-13	-8.56	Vertical
426.5	-36.33	1.78	16.35	-21.76	-13	-8.76	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.40	4.03	30.00	-23.43	-13	-10.43	Horizontal
3465.0	-52.82	4.03	30.00	-26.85	-13	-13.85	Vertical
5197.5	-49.91	5.25	35.86	-19.30	-13	-6.30	Vertical
5197.5	-49.81	5.25	35.86	-19.20	-13	-6.20	Horizontal
190.0	-40.81	1.44	17.95	-24.30	-13	-11.30	Vertical
244.4	-35.95	1.65	16.09	-21.51	-13	-8.51	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.16	2.91	27.68	-28.39	-13	-15.39	Horizontal
3490.0	-51.74	2.91	27.68	-26.97	-13	-13.97	Vertical
5235.0	-50.57	5.26	35.86	-19.97	-13	-6.97	Vertical
5235.0	-49.78	5.26	35.86	-19.18	-13	-6.18	Horizontal
212.3	-39.84	1.61	16.85	-24.60	-13	-11.60	Vertical
251.3	-35.26	1.61	15.19	-21.68	-13	-8.68	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.

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-50.84	2.78	27.50	-26.12	-13	-13.12	Horizontal
1649.4	-45.47	2.78	27.50	-20.75	-13	-7.75	Vertical
2474.1	-44.76	2.90	27.80	-19.86	-13	-6.86	Vertical
2474.1	-52.94	2.90	27.80	-28.04	-13	-15.04	Horizontal
195.8	-43.12	1.76	17.59	-27.29	-13	-14.29	Vertical
324.2	-37.61	1.63	15.87	-23.37	-13	-10.37	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-50.81	2.80	27.48	-26.13	-13	-13.13	Horizontal
1673.0	-45.12	2.80	27.48	-20.44	-13	-7.44	Vertical
2509.5	-52.10	2.91	27.70	-27.31	-13	-14.31	Vertical
2509.5	-53.14	2.91	27.70	-28.35	-13	-15.35	Horizontal
203.2	-43.65	1.61	15.68	-29.58	-13	-16.58	Vertical
348.3	-37.21	1.59	17.52	-21.29	-13	-8.29	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.30	2.82	27.43	-27.69	-13	-14.69	Horizontal
1696.6	-48.09	2.82	27.43	-23.48	-13	-10.48	Vertical
2544.9	-51.56	2.92	27.74	-26.74	-13	-13.74	Vertical
2544.9	-49.65	2.92	27.74	-24.83	-13	-11.83	Horizontal
208.3	-43.12	1.69	16.67	-28.13	-13	-15.13	Vertical
423.0	-42.85	1.70	17.18	-27.37	-13	-14.37	Horizontal



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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-49.69	2.78	27.50	-24.97	-13	-11.97	Horizontal
1658.0	-44.90	2.78	27.50	-20.18	-13	-7.18	Vertical
2487.0	-51.67	2.90	27.80	-26.77	-13	-13.77	Vertical
2487.0	-50.79	2.90	27.80	-25.89	-13	-12.89	Horizontal
181.3	-43.47	1.71	15.57	-29.61	-13	-16.61	Vertical
257.6	-36.08	1.34	16.40	-21.02	-13	-8.02	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-50.15	2.80	27.48	-25.47	-13	-12.47	Horizontal
1673.0	-47.48	2.80	27.48	-22.80	-13	-9.80	Vertical
2509.5	-50.63	2.91	27.70	-25.84	-13	-12.84	Vertical
2509.5	-50.49	2.91	27.70	-25.70	-13	-12.70	Horizontal
197.6	-44.10	1.44	17.04	-28.50	-13	-15.50	Vertical
399.7	-41.11	1.76	17.62	-25.25	-13	-12.25	Horizontal
Test Results for High Channel 844MHz							
1688.0	-44.04	2.82	27.43	-19.43	-13	-6.43	Horizontal
1688.0	-49.85	2.82	27.43	-25.24	-13	-12.24	Vertical
2532.0	-44.84	2.92	27.74	-20.02	-13	-7.02	Vertical
2532.0	-50.96	2.92	27.74	-26.14	-13	-13.14	Horizontal
212.7	-38.34	1.74	17.70	-22.38	-13	-9.38	Vertical
245.5	-35.28	1.41	17.46	-19.22	-13	-6.22	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	-64.49	5.23	35.81	-33.91	-25	-8.91	Horizontal
5005.0	-64.35	5.23	35.81	-33.77	-25	-8.77	Vertical
7507.5	-64.55	5.67	36.85	-33.37	-25	-8.37	Vertical
7507.5	-61.99	5.67	36.85	-30.81	-25	-5.81	Horizontal
205.0	-53.36	1.73	17.97	-37.12	-25	-12.12	Vertical
304.1	-50.26	1.38	15.11	-36.53	-25	-11.53	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.51	5.23	35.82	-32.92	-25	-7.92	Horizontal
5070.0	-60.60	5.23	35.82	-30.01	-25	-5.01	Vertical
7605.0	-61.01	5.67	36.85	-29.83	-25	-4.83	Vertical
7605.0	-60.92	5.67	36.85	-29.74	-25	-4.74	Horizontal
202.2	-44.75	1.77	16.17	-30.34	-25	-5.34	Vertical
446.0	-51.70	1.63	15.21	-38.12	-25	-13.12	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.82	5.24	35.83	-33.23	-25	-8.23	Horizontal
5135.0	-59.84	5.24	35.83	-29.25	-25	-4.25	Vertical
7702.5	-64.65	5.68	36.87	-33.46	-25	-8.46	Vertical
7702.5	-60.21	5.68	36.87	-29.02	-25	-4.02	Horizontal
199.4	-47.38	1.58	17.56	-31.40	-25	-6.40	Vertical
306.4	-51.42	1.45	16.58	-36.29	-25	-11.29	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	-59.63	5.23	35.82	-29.04	-25	-4.04	Horizontal
5020.0	-64.35	5.23	35.82	-33.76	-25	-8.76	Vertical
7530.0	-64.01	5.67	36.86	-32.82	-25	-7.82	Vertical
7530.0	-64.66	5.67	36.86	-33.47	-25	-8.47	Horizontal
178.1	-48.24	1.63	15.76	-34.11	-25	-9.11	Vertical
414.8	-47.93	1.71	15.44	-34.20	-25	-9.20	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.14	5.23	35.82	-30.55	-25	-5.55	Horizontal
5070.0	-63.65	5.23	35.82	-33.06	-25	-8.06	Vertical
7605.0	-60.34	5.67	36.85	-29.16	-25	-4.16	Vertical
7605.0	-62.09	5.67	36.85	-30.91	-25	-5.91	Horizontal
187.6	-51.92	1.79	16.84	-36.86	-25	-11.86	Vertical
259.7	-50.90	1.71	17.64	-34.97	-25	-9.97	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.20	5.24	35.83	-29.61	-25	-4.61	Horizontal
5120.0	-64.45	5.24	35.83	-33.86	-25	-8.86	Vertical
7680.0	-63.66	5.70	36.88	-32.48	-25	-7.48	Vertical
7680.0	-60.76	5.70	36.88	-29.58	-25	-4.58	Horizontal
198.3	-46.01	1.79	16.84	-30.95	-25	-5.95	Vertical
283.6	-44.26	1.71	17.64	-28.33	-25	-3.33	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.

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-50.05	2.60	27.20	-25.45	-13	-12.45	Horizontal
1399.4	-51.00	2.60	27.20	-26.40	-13	-13.40	Vertical
2099.1	-49.54	2.85	27.54	-24.85	-13	-11.85	Vertical
2099.1	-52.33	2.85	27.54	-27.64	-13	-14.64	Horizontal
211.2	-42.72	1.49	17.78	-26.43	-13	-13.43	Vertical
395.2	-44.34	1.36	17.33	-28.37	-13	-15.37	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-52.27	2.61	27.28	-27.60	-13	-14.60	Horizontal
1415.0	-48.29	2.61	27.28	-23.62	-13	-10.62	Vertical
2122.5	-47.10	2.87	27.59	-22.38	-13	-9.38	Vertical
2122.5	-49.56	2.87	27.59	-24.84	-13	-11.84	Horizontal
187.1	-40.55	1.73	15.74	-26.54	-13	-13.54	Vertical
331.6	-37.13	1.62	15.79	-22.96	-13	-9.96	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-46.91	2.63	27.28	-22.26	-13	-9.26	Horizontal
1430.6	-47.80	2.63	27.28	-23.15	-13	-10.15	Vertical
2145.9	-50.53	2.88	27.60	-25.81	-13	-12.81	Vertical
2145.9	-52.14	2.88	27.60	-27.42	-13	-14.42	Horizontal
213.0	-44.72	1.61	18.00	-28.33	-13	-15.33	Vertical
458.9	-41.94	1.45	15.49	-27.91	-13	-14.91	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-50.60	2.61	27.26	-25.95	-13	-12.95	Horizontal
1408.0	-47.92	2.61	27.26	-23.27	-13	-10.27	Vertical
2112.0	-51.78	2.87	27.58	-27.07	-13	-14.07	Vertical
2112.0	-51.21	2.87	27.58	-26.50	-13	-13.50	Horizontal
187.1	-36.00	1.31	16.97	-20.34	-13	-7.34	Vertical
365.9	-35.93	1.65	16.70	-20.88	-13	-7.88	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-48.63	2.61	27.28	-23.96	-13	-10.96	Horizontal
1415.0	-52.01	2.61	27.28	-27.34	-13	-14.34	Vertical
2122.5	-49.88	2.87	27.59	-25.16	-13	-12.16	Vertical
2122.5	-50.42	2.87	27.59	-25.70	-13	-12.70	Horizontal
192.3	-43.18	1.72	17.99	-26.91	-13	-13.91	Vertical
454.1	-44.92	1.73	17.94	-28.71	-13	-15.71	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.56	2.62	27.28	-20.90	-13	-7.90	Horizontal
1422.0	-47.38	2.62	27.28	-22.72	-13	-9.72	Vertical
2133.0	-45.79	2.87	27.60	-21.06	-13	-8.06	Vertical
2133.0	-50.36	2.87	27.60	-25.63	-13	-12.63	Horizontal
199.0	-38.00	1.58	15.93	-23.65	-13	-10.65	Vertical
418.8	-37.49	1.36	15.59	-23.26	-13	-10.26	Horizontal

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

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

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

9.6 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	-46.21	2.61	27.28	-21.54	-13	-8.54	Horizontal
1413.0	-47.99	2.61	27.28	-23.32	-13	-10.32	Vertical
2119.5	-52.34	2.87	27.59	-27.62	-13	-14.62	Vertical
2119.5	-53.67	2.87	27.59	-28.95	-13	-15.95	Horizontal
195.0	-37.00	1.71	16.15	-22.56	-13	-9.56	Vertical
443.9	-44.60	1.41	17.32	-28.69	-13	-15.69	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-48.45	2.62	27.30	-23.77	-13	-10.77	Horizontal
1420.0	-47.43	2.62	27.30	-22.75	-13	-9.75	Vertical
2130.0	-53.21	2.87	27.62	-28.46	-13	-15.46	Vertical
2130.0	-52.19	2.87	27.62	-27.44	-13	-14.44	Horizontal
205.7	-37.77	1.42	15.25	-23.95	-13	-10.95	Vertical
394.0	-42.80	1.36	17.19	-26.97	-13	-13.97	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-52.59	2.66	27.28	-27.97	-13	-14.97	Horizontal
1427.0	-49.36	2.66	27.28	-24.74	-13	-11.74	Vertical
2140.5	-49.51	2.88	27.60	-24.79	-13	-11.79	Vertical
2140.5	-53.99	2.88	27.60	-29.27	-13	-16.27	Horizontal
196.1	-41.60	1.32	17.29	-25.63	-13	-12.63	Vertical
236.6	-40.57	1.72	16.89	-25.40	-13	-12.40	Horizontal

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

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-45.76	2.62	27.30	-21.08	-13	-8.08	Horizontal
1418.0	-48.41	2.62	27.30	-23.73	-13	-10.73	Vertical
2127.0	-53.26	2.87	27.62	-28.51	-13	-15.51	Vertical
2127.0	-51.66	2.87	27.62	-26.91	-13	-13.91	Horizontal
180.2	-36.31	1.35	16.91	-20.75	-13	-7.75	Vertical
447.2	-39.32	1.62	16.31	-24.63	-13	-11.63	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-45.09	2.62	27.30	-20.41	-13	-7.41	Horizontal
1420.0	-46.61	2.62	27.30	-21.93	-13	-8.93	Vertical
2130.0	-44.49	2.87	27.62	-19.74	-13	-6.74	Vertical
2130.0	-52.22	2.87	27.62	-27.47	-13	-14.47	Horizontal
209.7	-38.59	1.51	17.14	-22.96	-13	-9.96	Vertical
245.8	-36.13	1.77	16.88	-21.02	-13	-8.02	Horizontal
Test Results for High Channel 711MHz							
1422.0	-53.58	2.62	27.30	-28.90	-13	-15.90	Horizontal
1422.0	-45.98	2.62	27.30	-21.30	-13	-8.30	Vertical
2133.0	-49.23	2.87	27.62	-24.48	-13	-11.48	Vertical
2133.0	-53.28	2.87	27.62	-28.53	-13	-15.53	Horizontal
198.2	-38.97	1.78	15.95	-24.80	-13	-11.80	Vertical
291.4	-43.34	1.34	17.95	-26.74	-13	-13.74	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.

## 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 3.87V 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 2/4/5/7/12/17

### RESULTS

See the following pages.



10.1 LTE BAND 2

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	1880	12.4	0.006588	2.5
3.87	1880	13.8	0.007361	2.5
4.20	1880	12.9	0.006864	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.7	0.006762	2.5
Extreme (50C)	1880	11.8	0.006258	2.5
Extreme (40C)	1880	14.0	0.007435	2.5
Extreme (30C)	1880	13.6	0.007221	2.5
Extreme (10C)	1880	14.2	0.007568	2.5
Extreme (0C)	1880	11.9	0.006343	2.5
Extreme (-10C)	1880	12.7	0.006766	2.5
Extreme (-20C)	1880	14.5	0.007699	2.5
Extreme (-30C)	1880	14.5	0.007707	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	1880	9.6	0.005131	2.5
3.87	1880	8.7	0.004619	2.5
4.20	1880	8.3	0.004402	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.5	0.005063	2.5
Extreme (50C)	1880	8.9	0.004715	2.5
Extreme (40C)	1880	7.8	0.004165	2.5
Extreme (30C)	1880	8.6	0.004592	2.5
Extreme (10C)	1880	8.4	0.004472	2.5
Extreme (0C)	1880	8.6	0.004571	2.5
Extreme (-10C)	1880	9.3	0.004951	2.5
Extreme (-20C)	1880	9.0	0.004789	2.5
Extreme (-30C)	1880	7.9	0.004206	2.5

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

## 10.2 LTE BAND 4

**Band 4 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)**
**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	1732.5	8.6	0.004953	2.5
3.87	1732.5	8.8	0.005100	2.5
4.20	1732.5	8.2	0.004724	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.6	0.004971	2.5
Extreme (50C)	1732.5	8.9	0.005137	2.5
Extreme (40C)	1732.5	7.3	0.004212	2.5
Extreme (30C)	1732.5	6.2	0.003604	2.5
Extreme (10C)	1732.5	7.0	0.004053	2.5
Extreme (0C)	1732.5	9.8	0.005659	2.5
Extreme (-10C)	1732.5	8.0	0.004604	2.5
Extreme (-20C)	1732.5	7.2	0.004184	2.5
Extreme (-30C)	1732.5	8.5	0.004879	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	1732.5	9.3	0.005388	2.5
3.87	1732.5	8.5	0.004923	2.5
4.20	1732.5	8.2	0.004725	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.9	0.005691	2.5
Extreme (50C)	1732.5	9.0	0.005192	2.5
Extreme (40C)	1732.5	8.0	0.004630	2.5
Extreme (30C)	1732.5	8.6	0.004953	2.5
Extreme (10C)	1732.5	9.2	0.005303	2.5
Extreme (0C)	1732.5	7.8	0.004489	2.5
Extreme (-10C)	1732.5	9.0	0.005208	2.5
Extreme (-20C)	1732.5	8.5	0.004911	2.5
Extreme (-30C)	1732.5	7.6	0.004408	2.5

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

10.3 LTE BAND 5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	836.5	5.8	0.006902	2.5
3.87	836.5	6.8	0.008163	2.5
4.20	836.5	4.9	0.005812	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.8	0.006911	2.5
Extreme (50C)	836.5	6.4	0.007596	2.5
Extreme (40C)	836.5	6.5	0.007811	2.5
Extreme (30C)	836.5	6.6	0.007836	2.5
Extreme (10C)	836.5	5.6	0.006653	2.5
Extreme (0C)	836.5	5.7	0.006841	2.5
Extreme (-10C)	836.5	5.1	0.006120	2.5
Extreme (-20C)	836.5	5.8	0.006939	2.5
Extreme (-30C)	836.5	6.0	0.007168	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	836.5	6.3	0.007475	2.5
3.87	836.5	6.6	0.007871	2.5
4.20	836.5	5.2	0.006262	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.007440	2.5
Extreme (50C)	836.5	6.0	0.007176	2.5
Extreme (40C)	836.5	6.0	0.007169	2.5
Extreme (30C)	836.5	6.2	0.007402	2.5
Extreme (10C)	836.5	5.1	0.006101	2.5
Extreme (0C)	836.5	5.6	0.006709	2.5
Extreme (-10C)	836.5	5.5	0.006563	2.5
Extreme (-20C)	836.5	6.1	0.007251	2.5
Extreme (-30C)	836.5	6.4	0.007678	2.5

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

10.4 LTE BAND 7

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	2535	9.7	0.003835	2.5
3.87	2535	9.3	0.003657	2.5
4.20	2535	8.4	0.003310	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.8	0.003882	2.5
Extreme (50C)	2535	9.2	0.003612	2.5
Extreme (40C)	2535	8.8	0.003471	2.5
Extreme (30C)	2535	9.3	0.003679	2.5
Extreme (10C)	2535	8.0	0.003172	2.5
Extreme (0C)	2535	7.9	0.003126	2.5
Extreme (-10C)	2535	9.1	0.003593	2.5
Extreme (-20C)	2535	9.3	0.003656	2.5
Extreme (-30C)	2535	8.5	0.003353	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	2535	6.7	0.002643	2.5
3.87	2535	5.9	0.002334	2.5
4.20	2535	6.0	0.002386	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.8	0.002683	2.5
Extreme (50C)	2535	5.9	0.002341	2.5
Extreme (40C)	2535	5.8	0.002306	2.5
Extreme (30C)	2535	6.3	0.002485	2.5
Extreme (10C)	2535	5.6	0.002225	2.5
Extreme (0C)	2535	5.1	0.001993	2.5
Extreme (-10C)	2535	5.2	0.002060	2.5
Extreme (-20C)	2535	6.3	0.002487	2.5
Extreme (-30C)	2535	5.7	0.002245	2.5

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



10.5 LTE BAND 12

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	707.5	8.4	0.011917	2.5
3.87	707.5	10.3	0.014618	2.5
4.20	707.5	8.7	0.012340	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.1	0.012905	2.5
Extreme (50C)	707.5	7.7	0.010887	2.5
Extreme (40C)	707.5	7.0	0.009838	2.5
Extreme (30C)	707.5	8.3	0.011786	2.5
Extreme (10C)	707.5	7.3	0.010326	2.5
Extreme (0C)	707.5	8.8	0.012496	2.5
Extreme (-10C)	707.5	8.3	0.011671	2.5
Extreme (-20C)	707.5	8.7	0.012279	2.5
Extreme (-30C)	707.5	7.5	0.010536	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	707.5	7.0	0.009942	2.5
3.87	707.5	8.3	0.011744	2.5
4.20	707.5	7.8	0.011013	2.5

**Frequency error vs. Temperature**

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

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

## 10.6 LTE BAND 17

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

#### Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	710.0	9.8	0.013799	2.5
3.87	710.0	8.7	0.012294	2.5
4.20	710.0	8.0	0.011205	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.5	0.013360	2.5
Extreme (50C)	710.0	9.4	0.013227	2.5
Extreme (40C)	710.0	8.5	0.012027	2.5
Extreme (30C)	710.0	9.0	0.012700	2.5
Extreme (10C)	710.0	8.6	0.012048	2.5
Extreme (0C)	710.0	8.0	0.011256	2.5
Extreme (-10C)	710.0	9.3	0.013165	2.5
Extreme (-20C)	710.0	8.7	0.012287	2.5
Extreme (-30C)	710.0	8.2	0.011541	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	710.0	10.3	0.014493	2.5
3.87	710.0	9.3	0.013062	2.5
4.20	710.0	8.6	0.012069	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.5	0.013348	2.5
Extreme (50C)	710.0	8.7	0.012306	2.5
Extreme (40C)	710.0	8.7	0.012196	2.5
Extreme (30C)	710.0	9.2	0.012993	2.5
Extreme (10C)	710.0	8.5	0.012017	2.5
Extreme (0C)	710.0	8.8	0.012359	2.5
Extreme (-10C)	710.0	9.3	0.013096	2.5
Extreme (-20C)	710.0	8.5	0.011945	2.5
Extreme (-30C)	710.0	7.9	0.011149	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.

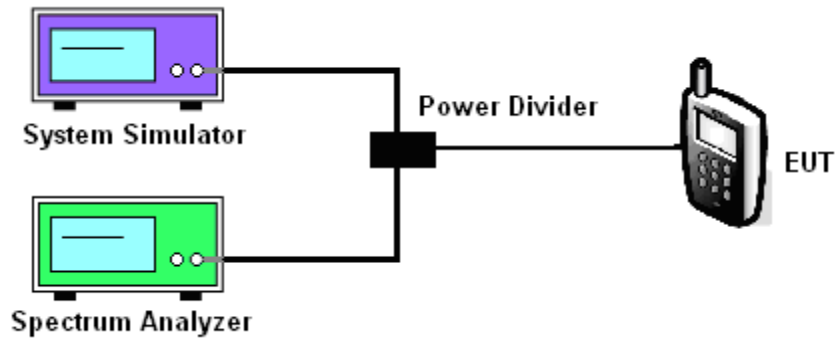
### 11.2 Measuring Instruments

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

Test data reference attachment.

----END OF REPORT----