

# **FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT FCC ID: 2AHZ5N21**

**Product:** Smartphone

**Trade Mark:** CUBOT

**Model No.:** NOTE 21

**Family Model:** N/A

**Report No.:** S23060903806006

**Issue Date:** Jul 14, 2023

## **Prepared for**

Shenzhen Huafurui Technology Co., Ltd

Unit 1401 14/F, Jin qi zhi gu mansion Liu xian street ,Xili, Nan shan district,Shenzhen, 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>

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Shenzhen Huafurui Technology Co., Ltd  
**Address**..... : Unit 1401 14/F, Jin qi zhi gu mansion Liu xian street ,Xili, Nan shan district,Shenzhen, China  
**Manufacturer's Name**..... : Shenzhen Huafurui Technology Co., Ltd  
**Address**..... : Unit 1401 14/F, Jin qi zhi gu mansion Liu xian street ,Xili, Nan shan district,Shenzhen, China  
**Product name**..... : Smartphone  
**Model and/or type reference** .. : NOTE 21  
**Trade Mark**..... : CUBOT  
**Family Model**..... : N/A  
**Test Sample Number**..... : S230609038006  
**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.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

**Date of Test** .....

Date (s) of performance of tests..... Jun 12, 2023 ~ Jul 13, 2023

Date of Issue ..... Jul 14, 2023

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

Testing Engineer :



(Allen Liu)

Authorized Signatory :



(Alex Li)

## TABLE OF CONTENTS

<b>1. GENERAL INFORMATION.....</b>	<b>5</b>
<b>1. GENERAL INFORMATION.....</b>	<b>5</b>
<b>1.1 PRODUCT DESCRIPTION.....</b>	<b>5</b>
<b>1.3 TEST METHODOLOGY.....</b>	<b>7</b>
<b>1.4 TEST FACILITY.....</b>	<b>7</b>
<b>MEASUREMENT UNCERTAINTY.....</b>	<b>7</b>
<b>1.5 SPECIAL ACCESSORIES.....</b>	<b>7</b>
<b>1.6 WORST-CASE CONFIGURATION AND MODE.....</b>	<b>7</b>
<b>2. SYSTEM TEST CONFIGURATION.....</b>	<b>8</b>
<b>2.1 EUT CONFIGURATION.....</b>	<b>8</b>
<b>2.2 EUT EXERCISE.....</b>	<b>8</b>
<b>2.3 CONFIGURATION OF EUT SYSTEM.....</b>	<b>8</b>
<b>2.4 TEST SETUP.....</b>	<b>9</b>
<b>3.TEST AND MEASUREMENT EQUIPMENT.....</b>	<b>10</b>
<b>4. OUTPUT POWER.....</b>	<b>12</b>
<b>4.1 OUTPUT POWER MEASUREMENT.....</b>	<b>12</b>
<b>6. BANDEDGE AND EMISSION MASK.....</b>	<b>15</b>
<b>7. OUT OF BAND EMISSIONS.....</b>	<b>17</b>
<b>7.1 MEASUREMENT METHOD.....</b>	<b>17</b>
<b>8. RADIATED MEASUREMENT.....</b>	<b>18</b>
<b>8.1. RADIATED POWER (ERP &amp; EIRP).....</b>	<b>18</b>
<b>8.2 LTE BAND 2.....</b>	<b>19</b>
<b>8.3 LTE BAND 4.....</b>	<b>23</b>

8.4 LTE BAND 5.....	27
8.5 LTE BAND 7.....	29
8.6 LTE BAND 12 .....	31
8.7 LTE BAND 17 .....	33
8.8 LTE BAND 41 .....	35
9. SPURIOUS RADIATION EMISSION .....	37
9.1 LTE BAND 2.....	39
9.2 LTE BAND 4.....	41
9.3 LTE BAND 5.....	43
9.4 LTE BAND 7.....	45
9.5 LTE BAND 12 .....	47
9.6 LTE BAND 17 .....	49
9.7 LTE BAND 41 .....	51
10. FREQUENCY STABILITY .....	53
10.1 LTE BAND 2 .....	54
10.2 LTE BAND 4 .....	56
10.3 LTE BAND 5 .....	58
10.4 LTE BAND 7 .....	60
10.5 LTE BAND 12 .....	62
10.6 LTE BAND 17 .....	64
10.7 LTE BAND 41 .....	66
11. PEAK-TO-AVERAGE RATIO.....	68
11.1 Description of the PAR Measurement .....	68
11.2 Measuring Instruments .....	68
11.3 Test Procedures.....	68
11.4 Test Setup.....	69

## 1. GENERAL INFORMATION

### 1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smartphone
Trade Mark	CUBOT
Model Name	NOTE 21
Family Model	N/A
Model Difference	N/A
FCC ID:	2AHZ5N21
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12,17,41
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 FDD Band 41 Uplink: 2535MHz-2655MHz, (see note 2)
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	LTE-B2 :-0.34dBi; LTE-B4 : -1.78dBi; LTE-B5 : -2.76dBi; LTE-B7 : -1.1dBi; LTE-B12 : -1.22dBi; LTE-B17 : -1.22dBi; LTE-B41:-1.1Bi
Adapter	Model: HJ-0502000W2-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A 10.0W
Battery	DC 3.87V, 5200mAh
Power supply	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.4V to DC 4.4V (Nominal DC 3.87V) (Note 1)
Hardware version:	G2291U-MT-V1.0
Firmware version:	G2233G-UF-V1.1
Software version:	CUBOT_NOTE_21_D043C_V1.0

\*\* Note1: The High Voltage DC 4.4V and Low Voltage DC 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.

Note2:channel list:

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	40065	2557.5
	10	40090	2560
	15	40115	2562.5

	20	40140	2565
Mid Range	5/10/15/20	40640	2605
High Range	5	41215	2652.5
	10	41190	2650
	15	41165	2647.5
	20	41140	2645

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

This submittal(s) (test report) is intended for **FCC ID: 2AHZ5N21** 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% ( $U = 2U_c(y)$ )	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

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	Smartphone	NOTE 21	FCC ID: 2AHZ5N21	EUT

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

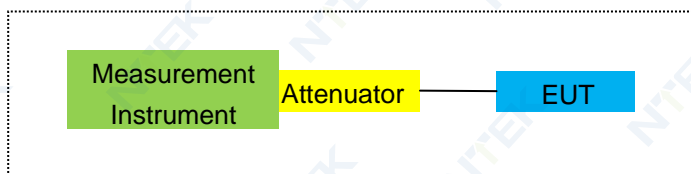


## 2.4 TEST SETUP

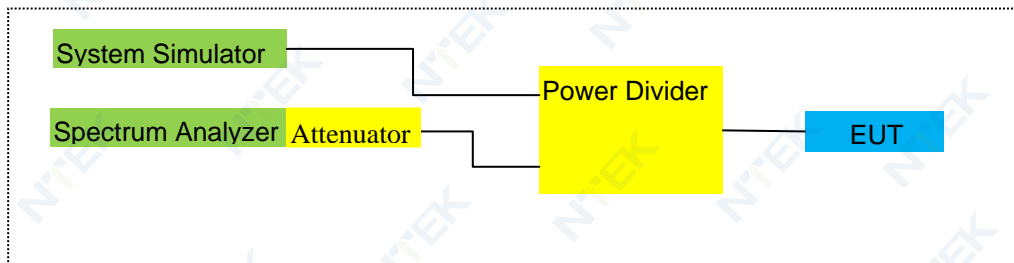
For Radiated Test Cases



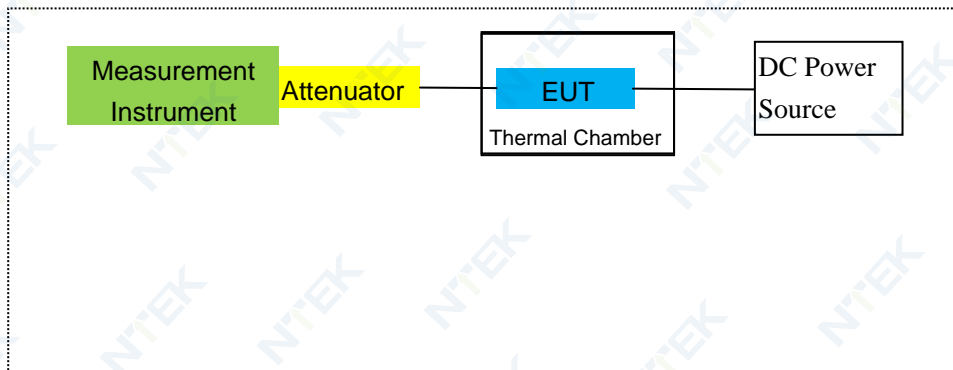
For Conducted Output Power



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	2023.03.27	2024.03.26	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	2023.03.27	2024.03.26	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2023.05.29	2024.05.28	1 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2023.03.27	2024.03.26	1 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.03.27	2024.03.26	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	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 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
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

### 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 than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

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



**TEST PROCEDURE**

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

**MODES TESTED**

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

**RESULTS**

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

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

### LIMITS

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

### TEST PROCEDURE

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

For each out of band emissions measurement:

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

### MODES TESTED

- ☐ Band 2/4/5/7/12/17/41
- ☐

### 7.1 MEASUREMENT METHOD

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

Test data reference attachment.

## 8. RADIATED MEASUREMENT

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

#### RULE PART(S)

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

#### LIMITS:

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

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

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

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

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

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

#### MODES TESTED

☐ Band 2/4/5/7/12/17/41

#### RESULTS

Pass

## 8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
						(mW)			
1.4MHz	1/#Mid	1850.7	-2.94	3.76	28.24	21.54	142.561	Horizontal	Pass
Band		1880	-2.75	3.91	28.22	21.56	143.219	Horizontal	Pass
QPSK		1909.3	-2.66	3.93	28.20	21.61	144.877	Horizontal	Pass
3.0MHz	1/#Mid	1851.5	-3.00	3.77	28.23	21.46	139.959	Horizontal	Pass
Band		1880	-2.85	3.91	28.24	21.48	140.605	Horizontal	Pass
QPSK		1908.5	-2.72	3.94	28.25	21.59	144.212	Horizontal	Pass
5.0MHz	1/#Mid	1852.5	-2.89	3.77	28.31	21.65	146.218	Horizontal	Pass
Band		1880	-2.51	3.91	28.22	21.80	151.356	Horizontal	Pass
QPSK		1907.5	-2.44	3.94	28.20	21.82	152.055	Horizontal	Pass
10.0MHz	1/#Mid	1855	-2.75	3.79	28.33	21.79	151.008	Horizontal	Pass
Band		1880	-2.45	3.95	28.22	21.82	152.055	Horizontal	Pass
QPSK		1905	-2.34	3.97	28.19	21.88	154.170	Horizontal	Pass
15.0MHz	1/#Mid	1857.5	-2.71	3.79	28.34	21.84	152.757	Horizontal	Pass
Band		1880	-2.50	3.95	28.22	21.77	150.314	Horizontal	Pass
QPSK		1902.5	-2.36	3.97	28.18	21.85	153.109	Horizontal	Pass
20.0MHz	1/#Mid	1860	-2.70	3.81	28.35	21.84	152.757	Horizontal	Pass
Band		1880	-2.37	3.96	28.22	21.89	154.525	Horizontal	Pass
QPSK		1900	-2.31	4.00	28.16	21.85	153.109	Horizontal	Pass
1.4MHz	1/#Mid	1850.7	-3.51	3.76	28.24	20.97	125.026	Vertical	Pass
Band		1880	-3.29	3.91	28.22	21.02	126.474	Vertical	Pass
QPSK		1909.3	-3.74	3.93	28.20	20.53	112.980	Vertical	Pass
3.0MHz	1/#Mid	1851.5	-4.11	3.77	28.23	20.35	108.393	Vertical	Pass
Band		1880	-3.31	3.91	28.24	21.02	126.474	Vertical	Pass
QPSK		1908.5	-3.21	3.94	28.25	21.10	128.825	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-4.23	3.77	28.31	20.31	107.399	Vertical	Pass
Band		1880	-3.53	3.91	28.22	20.78	119.674	Vertical	Pass
QPSK		1907.5	-3.45	3.94	28.20	20.81	120.504	Vertical	Pass
10.0MHz	1/#Mid	1855	-3.36	3.79	28.33	21.18	131.220	Vertical	Pass
Band		1880	-3.30	3.95	28.22	20.97	125.026	Vertical	Pass
QPSK		1905	-3.60	3.97	28.19	20.62	115.345	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-3.84	3.79	28.34	20.71	117.761	Vertical	Pass

Band		1880	-3.13	3.95	28.22	21.14	130.017	Vertical	Pass
QPSK		1902.5	-3.25	3.97	28.18	20.96	124.738	Vertical	Pass
20.0MHz	1/#Mid	1860	-3.54	3.81	28.35	21.00	125.893	Vertical	Pass
Band		1880	-3.32	3.96	28.22	20.94	124.165	Vertical	Pass
QPSK		1900	-2.97	4.00	28.16	21.19	131.522	Vertical	Pass

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result						Conclusion	
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP		
							Average			
							(mW)			
1.4MHz	Band 16  QAM	1/#Mid	1850.7	-4.06	3.76	28.24	20.42	110.154	Horizontal	Pass
1880			-3.53	3.91	28.22	20.78	119.674	Horizontal	Pass	
1909.3			-3.46	3.93	28.20	20.81	120.504	Horizontal	Pass	
3.0MHz	Band 16  QAM	1/#Mid	1851.5	-3.56	3.77	28.23	20.90	123.027	Horizontal	Pass
1880			-3.64	3.91	28.24	20.69	117.220	Horizontal	Pass	
1908.5			-3.85	3.94	28.25	20.46	111.173	Horizontal	Pass	
5.0MHz	Band 16  QAM	1/#Mid	1852.5	-3.50	3.77	28.31	21.04	127.057	Horizontal	Pass
1880			-3.41	3.91	28.22	20.90	123.027	Horizontal	Pass	
1907.5			-3.09	3.94	28.20	21.17	130.918	Horizontal	Pass	
10.0MHz	Band 16  QAM	1/#Mid	1855	-3.55	3.79	28.33	20.99	125.603	Horizontal	Pass
1880			-3.54	3.95	28.22	20.73	118.304	Horizontal	Pass	
1905			-3.01	3.97	28.19	21.21	132.130	Horizontal	Pass	
15.0MHz	Band 16  QAM	1/#Mid	1857.5	-3.53	3.79	28.34	21.02	126.474	Horizontal	Pass
1880			-3.32	3.95	28.22	20.95	124.451	Horizontal	Pass	
1902.5			-3.28	3.97	28.18	20.93	123.880	Horizontal	Pass	
20.0MHz	Band 16  QAM	1/#Mid	1860	-3.42	3.81	28.35	21.12	129.420	Horizontal	Pass
1880			-3.12	3.96	28.22	21.14	130.017	Horizontal	Pass	
1900			-2.94	4.00	28.16	21.22	132.434	Horizontal	Pass	
1.4MHz	Band 16  QAM	1/#Mid	1850.7	-4.92	3.76	28.24	19.56	90.365	Vertical	Pass
1880			-4.33	3.91	28.22	19.98	99.541	Vertical	Pass	
1909.3			-4.59	3.93	28.20	19.68	92.897	Vertical	Pass	
3.0MHz	Band 16  QAM	1/#Mid	1851.5	-4.70	3.77	28.23	19.76	94.624	Vertical	Pass
1880			-4.15	3.91	28.24	20.18	104.232	Vertical	Pass	
1908.5			-4.69	3.94	28.25	19.62	91.622	Vertical	Pass	
5.0MHz	Band 16  QAM	1/#Mid	1852.5	-4.66	3.77	28.31	19.88	97.275	Vertical	Pass
1880			-4.49	3.91	28.22	19.82	95.940	Vertical	Pass	
1907.5			-4.11	3.94	28.20	20.15	103.514	Vertical	Pass	
10.0MHz	Band 16  QAM	1/#Mid	1855	-4.53	3.79	28.33	20.01	100.231	Vertical	Pass
1880			-4.35	3.95	28.22	19.92	98.175	Vertical	Pass	
1905			-4.02	3.97	28.19	20.20	104.713	Vertical	Pass	
15.0MHz	Band 16  QAM	1/#Mid	1857.5	-4.51	3.79	28.34	20.04	100.925	Vertical	Pass
1880			-4.45	3.95	28.22	19.82	95.940	Vertical	Pass	
1902.5			-4.51	3.97	28.18	19.70	93.325	Vertical	Pass	

20.0MHz		1860	-4.76	3.81	28.35	19.78	95.060	Vertical	Pass
Band 16	1/#Mid	1880	-4.88	3.96	28.22	19.38	86.696	Vertical	Pass
QAM		1900	-4.39	4.00	28.16	19.77	94.842	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	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz	1/#Mid	1710.7	-2.85	3.12	27.58	21.61	144.877	Horizontal	Pass
Band		1732.5	-2.84	3.27	27.61	21.50	141.254	Horizontal	Pass
QPSK		1754.3	-2.82	3.29	27.63	21.52	141.906	Horizontal	Pass
3.0MHz	1/#Mid	1711.5	-3.02	3.13	27.61	21.46	139.959	Horizontal	Pass
Band		1732.5	-2.94	3.27	27.61	21.40	138.038	Horizontal	Pass
QPSK		1753.5	-2.86	3.30	27.62	21.46	139.959	Horizontal	Pass
5.0MHz	1/#Mid	1712.5	-2.79	3.13	27.63	21.71	148.252	Horizontal	Pass
Band		1732.5	-2.69	3.27	27.61	21.65	146.218	Horizontal	Pass
QPSK		1752.5	-2.57	3.30	27.60	21.73	148.936	Horizontal	Pass
10.0MHz	1/#Mid	1715	-2.73	3.15	27.64	21.76	149.968	Horizontal	Pass
Band		1732.5	-2.50	3.31	27.61	21.80	151.356	Horizontal	Pass
QPSK		1750	-2.52	3.33	27.59	21.74	149.279	Horizontal	Pass
15.0MHz	1/#Mid	1717.5	-2.74	3.15	27.65	21.76	149.968	Horizontal	Pass
Band		1732.5	-2.58	3.31	27.61	21.72	148.594	Horizontal	Pass
QPSK		1747.5	-2.52	3.33	27.57	21.72	148.594	Horizontal	Pass
20.0MHz	1/#Mid	1720	-2.68	3.17	27.66	21.81	151.705	Horizontal	Pass
Band		1732.5	-2.51	3.32	27.61	21.78	150.661	Horizontal	Pass
QPSK		1745	-2.45	3.36	27.56	21.75	149.624	Horizontal	Pass
1.4MHz	1/#Mid	1710.7	-3.48	3.12	27.58	20.98	125.314	Vertical	Pass
Band		1732.5	-3.73	3.27	27.61	20.61	115.080	Vertical	Pass
QPSK		1754.3	-3.85	3.29	27.63	20.49	111.944	Vertical	Pass
3.0MHz	1/#Mid	1711.5	-3.75	3.13	27.61	20.73	118.304	Vertical	Pass
Band		1732.5	-4.00	3.27	27.61	20.34	108.143	Vertical	Pass
QPSK		1753.5	-3.51	3.30	27.62	20.81	120.504	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-3.51	3.13	27.63	20.99	125.603	Vertical	Pass
Band		1732.5	-3.24	3.27	27.61	21.10	128.825	Vertical	Pass
QPSK		1752.5	-4.03	3.30	27.60	20.27	106.414	Vertical	Pass
10.0MHz	1/#Mid	1715	-3.58	3.15	27.64	20.91	123.310	Vertical	Pass
Band		1732.5	-3.46	3.31	27.61	20.84	121.339	Vertical	Pass
QPSK		1750	-3.78	3.33	27.59	20.48	111.686	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-4.00	3.15	27.65	20.50	112.202	Vertical	Pass

Band		1732.5	-3.59	3.31	27.61	20.71	117.761	Vertical	Pass
QPSK		1747.5	-3.34	3.33	27.57	20.90	123.027	Vertical	Pass
20.0MHz		1720	-3.76	3.17	27.66	20.73	118.304	Vertical	Pass
Band	1/#Mid	1732.5	-3.27	3.32	27.61	21.02	126.474	Vertical	Pass
QPSK		1745	-3.21	3.36	27.56	20.99	125.603	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz	1/#Mid	1710.7	-3.66	3.12	27.58	20.80	120.226	Horizontal	Pass
Band 16		1732.5	-3.51	3.27	27.61	20.83	121.060	Horizontal	Pass
QAM		1754.3	-3.51	3.29	27.63	20.83	121.060	Horizontal	Pass
3.0MHz	1/#Mid	1711.5	-3.60	3.13	27.61	20.88	122.462	Horizontal	Pass
Band 16		1732.5	-3.73	3.27	27.61	20.61	115.080	Horizontal	Pass
QAM		1753.5	-3.95	3.30	27.62	20.37	108.893	Horizontal	Pass
5.0MHz	1/#Mid	1712.5	-3.43	3.13	27.63	21.07	127.938	Horizontal	Pass
Band 16		1732.5	-3.39	3.27	27.61	20.95	124.451	Horizontal	Pass
QAM		1752.5	-3.08	3.30	27.60	21.22	132.434	Horizontal	Pass
10.0MHz	1/#Mid	1715	-3.50	3.15	27.64	20.99	125.603	Horizontal	Pass
Band 16		1732.5	-3.69	3.31	27.61	20.61	115.080	Horizontal	Pass
QAM		1750	-3.07	3.33	27.59	21.19	131.522	Horizontal	Pass
15.0MHz	1/#Mid	1717.5	-3.30	3.15	27.65	21.20	131.826	Horizontal	Pass
Band 16		1732.5	-3.36	3.31	27.61	20.94	124.165	Horizontal	Pass
QAM		1747.5	-3.38	3.33	27.57	20.86	121.899	Horizontal	Pass
20.0MHz	1/#Mid	1720	-3.25	3.17	27.66	21.24	133.045	Horizontal	Pass
Band 16		1732.5	-3.26	3.32	27.61	21.03	126.765	Horizontal	Pass
QAM		1745	-3.07	3.36	27.56	21.13	129.718	Horizontal	Pass
1.4MHz	1/#Mid	1710.7	-5.12	3.12	27.58	19.34	85.901	Vertical	Pass
Band 16		1732.5	-4.16	3.27	27.61	20.18	104.232	Vertical	Pass
QAM		1754.3	-4.63	3.29	27.63	19.71	93.541	Vertical	Pass
3.0MHz	1/#Mid	1711.5	-5.10	3.13	27.61	19.38	86.696	Vertical	Pass
Band 16		1732.5	-4.34	3.27	27.61	20.00	100.000	Vertical	Pass
QAM		1753.5	-4.28	3.30	27.62	20.04	100.925	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-4.92	3.13	27.63	19.58	90.782	Vertical	Pass
Band 16		1732.5	-4.55	3.27	27.61	19.79	95.280	Vertical	Pass
QAM		1752.5	-4.53	3.30	27.60	19.77	94.842	Vertical	Pass
10.0MHz	1/#Mid	1715	-4.88	3.15	27.64	19.61	91.411	Vertical	Pass
Band 16		1732.5	-4.18	3.31	27.61	20.12	102.802	Vertical	Pass
QAM		1750	-4.35	3.33	27.59	19.91	97.949	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-4.92	3.15	27.65	19.58	90.782	Vertical	Pass
Band 16		1732.5	-4.42	3.31	27.61	19.88	97.275	Vertical	Pass
QAM		1747.5	-4.53	3.33	27.57	19.71	93.541	Vertical	Pass

20.0MHz		1720	-4.83	3.17	27.66	19.66	92.470	Vertical	Pass
Band 16	1/#Mid	1732.5	-4.66	3.32	27.61	19.63	91.833	Vertical	Pass
QAM		1745	-4.73	3.36	27.56	19.47	88.512	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	Cable	Antenna	Correction	Max.	Max.	Polarization	
			Level	Loss	Factor		EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)		Average	Average	ERP	
1.4MHz Band QPSK	3/#Mid	824.7	6.45	2.01	19.68	2.15	21.97	157.398	Horizontal	Pass
		836.5	6.33	2.01	19.77	2.15	21.94	156.315	Horizontal	Pass
		848.3	6.13	2.02	19.82	2.15	21.78	150.661	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.22	2.01	19.70	2.15	21.76	149.968	Horizontal	Pass
		836.5	6.12	2.01	19.77	2.15	21.73	148.936	Horizontal	Pass
		847.5	5.99	2.02	19.81	2.15	21.63	145.546	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.50	2.01	19.71	2.15	22.05	160.325	Horizontal	Pass
		836.5	6.38	2.01	19.77	2.15	21.99	158.125	Horizontal	Pass
		846.5	6.22	2.02	19.79	2.15	21.84	152.757	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	6.52	2.01	19.73	2.15	22.09	161.808	Horizontal	Pass
		836.5	6.47	2.01	19.77	2.15	22.08	161.436	Horizontal	Pass
		844	6.37	2.02	19.78	2.15	21.98	157.761	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	5.36	2.01	19.68	2.15	20.88	122.462	Vertical	Pass
		836.5	5.28	2.01	19.77	2.15	20.89	122.744	Vertical	Pass
		848.3	5.27	2.02	19.82	2.15	20.92	123.595	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.89	2.01	19.70	2.15	20.43	110.408	Vertical	Pass
		836.5	5.15	2.01	19.77	2.15	20.76	119.124	Vertical	Pass
		847.5	4.80	2.02	19.81	2.15	20.44	110.662	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	5.30	2.01	19.71	2.15	20.85	121.619	Vertical	Pass
		836.5	5.27	2.01	19.77	2.15	20.88	122.462	Vertical	Pass
		846.5	4.98	2.02	19.79	2.15	20.60	114.815	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	5.38	2.01	19.73	2.15	20.95	124.451	Vertical	Pass
		836.5	4.94	2.01	19.77	2.15	20.55	113.501	Vertical	Pass
		844	5.36	2.02	19.78	2.15	20.97	125.026	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna		Max.	Max.	Polarization	
			Level	Loss	Factor	Correction	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	ERP	
							(dBm)	(mW)		
1.4MHz	Band 16 QAM	824.7	5.60	2.01	19.68	2.15	21.12	129.420	Horizontal	Pass
		836.5	5.53	2.01	19.77	2.15	21.14	130.017	Horizontal	Pass
		848.3	5.37	2.02	19.82	2.15	21.02	126.474	Horizontal	Pass
3.0MHz	Band 16 QAM	825.5	5.68	2.01	19.70	2.15	21.22	132.434	Horizontal	Pass
		836.5	5.39	2.01	19.77	2.15	21.00	125.893	Horizontal	Pass
		847.5	4.87	2.02	19.81	2.15	20.51	112.460	Horizontal	Pass
5.0MHz	Band 16 QAM	826.5	6.00	2.01	19.71	2.15	21.55	142.889	Horizontal	Pass
		836.5	5.77	2.01	19.77	2.15	21.38	137.404	Horizontal	Pass
		846.5	5.52	2.02	19.79	2.15	21.14	130.017	Horizontal	Pass
10.0MHz	Band 16 QAM	829	6.00	2.01	19.73	2.15	21.57	143.549	Horizontal	Pass
		836.5	5.72	2.01	19.77	2.15	21.33	135.831	Horizontal	Pass
		844	5.26	2.02	19.78	2.15	20.87	122.180	Horizontal	Pass
1.4MHz	Band 16 QAM	824.7	5.23	2.01	19.68	2.15	20.75	118.850	Vertical	Pass
		836.5	4.78	2.01	19.77	2.15	20.39	109.396	Vertical	Pass
		848.3	4.21	2.02	19.82	2.15	19.86	96.828	Vertical	Pass
3.0MHz	Band 16 QAM	825.5	5.51	2.01	19.70	2.15	21.05	127.350	Vertical	Pass
		836.5	3.83	2.01	19.77	2.15	19.44	87.902	Vertical	Pass
		847.5	5.37	2.02	19.81	2.15	21.01	126.183	Vertical	Pass
5.0MHz	Band 16 QAM	826.5	5.12	2.01	19.71	2.15	20.67	116.681	Vertical	Pass
		836.5	3.76	2.01	19.77	2.15	19.37	86.497	Vertical	Pass
		846.5	4.63	2.02	19.79	2.15	20.25	105.925	Vertical	Pass
10.0MHz	Band 16 QAM	829	4.26	2.01	19.73	2.15	19.83	96.161	Vertical	Pass
		836.5	3.87	2.01	19.77	2.15	19.48	88.716	Vertical	Pass
		844	4.65	2.02	19.78	2.15	20.26	106.170	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	-1.13	4.54	27.75	22.08	161.436	Horizontal	Pass
		2535	-0.96	4.69	27.72	22.07	161.065	Horizontal	Pass
		2567.5	-0.89	4.71	27.71	22.11	162.555	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.06	4.55	27.76	22.15	164.059	Horizontal	Pass
		2535	-0.87	4.69	27.72	22.16	164.437	Horizontal	Pass
		2565	-0.79	4.72	27.70	22.19	165.577	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.07	4.55	27.77	22.15	164.059	Horizontal	Pass
		2535	-0.93	4.69	27.72	22.10	162.181	Horizontal	Pass
		2562.5	-0.83	4.72	27.69	22.14	163.682	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.01	4.57	27.78	<b>22.20</b>	165.959	Horizontal	Pass
		2535	-0.83	4.73	27.72	22.16	164.437	Horizontal	Pass
		2560	-0.79	4.75	27.68	22.14	163.682	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-2.72	4.54	27.75	20.49	111.944	Vertical	Pass
		2535	-2.64	4.69	27.72	20.39	109.396	Vertical	Pass
		2567.5	-1.98	4.71	27.71	21.02	126.474	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.72	4.55	27.76	20.49	111.944	Vertical	Pass
		2535	-2.52	4.69	27.72	20.51	112.460	Vertical	Pass
		2565	-1.97	4.72	27.70	21.01	126.183	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.86	4.55	27.77	20.36	108.643	Vertical	Pass
		2535	-2.72	4.69	27.72	20.31	107.399	Vertical	Pass
		2562.5	-2.64	4.72	27.69	20.33	107.895	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.62	4.57	27.78	20.59	114.551	Vertical	Pass
		2535	-1.97	4.73	27.72	21.02	126.474	Vertical	Pass
		2560	-2.60	4.75	27.68	20.33	107.895	Vertical	Pass



Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz	1/#Mid	2502.5	-1.82	4.54	27.75	21.39	137.721	Horizontal	Pass
Band 16		2535	-1.51	4.69	27.72	21.52	141.906	Horizontal	Pass
QAM		2567.5	-1.59	4.71	27.71	21.41	138.357	Horizontal	Pass
10.0MHz	1/#Mid	2505	-1.71	4.55	27.76	21.50	141.254	Horizontal	Pass
Band 16		2535	-1.72	4.69	27.72	21.31	135.207	Horizontal	Pass
QAM		2565	-1.99	4.72	27.70	20.99	125.603	Horizontal	Pass
15.0MHz	1/#Mid	2507.5	-1.89	4.55	27.77	21.33	135.831	Horizontal	Pass
Band 16		2535	-1.86	4.69	27.72	21.17	130.918	Horizontal	Pass
QAM		2562.5	-1.47	4.72	27.69	21.50	141.254	Horizontal	Pass
20.0MHz	1/#Mid	2510	-1.77	4.57	27.78	21.44	139.316	Horizontal	Pass
Band 16		2535	-1.44	4.73	27.72	21.55	142.889	Horizontal	Pass
QAM		2560	-1.54	4.75	27.68	21.39	137.721	Horizontal	Pass
5.0MHz	1/#Mid	2502.5	-3.27	4.54	27.75	19.94	98.628	Vertical	Pass
Band 16		2535	-1.80	4.69	27.72	21.23	132.739	Vertical	Pass
QAM		2567.5	-2.30	4.71	27.71	20.70	117.490	Vertical	Pass
10.0MHz	1/#Mid	2505	-3.94	4.55	27.76	19.27	84.528	Vertical	Pass
Band 16		2535	-2.83	4.69	27.72	20.20	104.713	Vertical	Pass
QAM		2565	-2.89	4.72	27.70	20.09	102.094	Vertical	Pass
15.0MHz	1/#Mid	2507.5	-3.19	4.55	27.77	20.03	100.693	Vertical	Pass
Band 16		2535	-3.07	4.69	27.72	19.96	99.083	Vertical	Pass
QAM		2562.5	-2.92	4.72	27.69	20.05	101.158	Vertical	Pass
20.0MHz	1/#Mid	2510	-3.43	4.57	27.78	19.78	95.060	Vertical	Pass
Band 16		2535	-1.77	4.73	27.72	21.22	132.434	Vertical	Pass
QAM		2560	-2.92	4.75	27.68	20.01	100.231	Vertical	Pass

Note:

SG Level= Signal generator output

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

## 8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna		Max.	Max.	Polarization	
			Level	Loss	Factor	Correction	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	ERP	
1.4MHz	1/#Mid	699.7	6.65	1.91	19.21	2.15	21.80	151.356	Vertical	Pass
Band		707.5	6.57	1.91	19.26	2.15	21.77	150.314	Vertical	Pass
QPSK		715.3	6.35	1.93	19.34	2.15	21.61	144.877	Vertical	Pass
3.0MHz	1/#Mid	700.5	6.44	1.91	19.21	2.15	21.59	144.212	Vertical	Pass
Band		707.5	6.36	1.91	19.26	2.15	21.56	143.219	Vertical	Pass
QPSK		714.5	6.20	1.93	19.34	2.15	21.46	139.959	Vertical	Pass
5.0MHz	1/#Mid	701.5	6.71	1.91	19.23	2.15	21.88	154.170	Vertical	Pass
Band		707.5	6.62	1.91	19.26	2.15	21.82	152.055	Vertical	Pass
QPSK		713.5	6.41	1.92	19.33	2.15	21.67	146.893	Vertical	Pass
10.0MHz	1/#Mid	704	6.73	1.91	19.25	2.15	21.92	155.597	Vertical	Pass
Band		707.5	6.71	1.91	19.26	2.15	21.91	155.239	Vertical	Pass
QPSK		711	6.56	1.92	19.32	2.15	21.81	151.705	Vertical	Pass
1.4MHz	1/#Mid	699.7	5.08	1.91	19.21	2.15	20.23	105.439	Horizontal	Pass
Band		707.5	5.57	1.91	19.26	2.15	20.77	119.399	Horizontal	Pass
QPSK		715.3	5.32	1.93	19.34	2.15	20.58	114.288	Horizontal	Pass
3.0MHz	1/#Mid	700.5	5.89	1.91	19.21	2.15	21.04	127.057	Horizontal	Pass
Band		707.5	5.00	1.91	19.26	2.15	20.20	104.713	Horizontal	Pass
QPSK		714.5	5.46	1.93	19.34	2.15	20.72	118.032	Horizontal	Pass
5.0MHz	1/#Mid	701.5	5.46	1.91	19.23	2.15	20.63	115.611	Horizontal	Pass
Band		707.5	5.46	1.91	19.26	2.15	20.66	116.413	Horizontal	Pass
QPSK		713.5	5.10	1.92	19.33	2.15	20.36	108.643	Horizontal	Pass
10.0MHz	1/#Mid	704	5.44	1.91	19.25	2.15	20.63	115.611	Horizontal	Pass
Band		707.5	5.27	1.91	19.26	2.15	20.47	111.429	Horizontal	Pass
QPSK		711	5.34	1.92	19.32	2.15	20.59	114.551	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization Of Max.	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	ERP	
							(dBm)	(mW)		
1.4MHz	1/#Mid	699.7	6.71	1.91	19.21	2.15	21.86	153.462	Vertical	Pass
Band 16		707.5	6.63	1.91	19.26	2.15	21.83	152.405	Vertical	Pass
QAM		715.3	6.41	1.93	19.34	2.15	21.67	146.893	Vertical	Pass
3.0MHz	1/#Mid	700.5	6.50	1.91	19.21	2.15	21.65	146.218	Vertical	Pass
Band 16		707.5	6.42	1.91	19.26	2.15	21.62	145.211	Vertical	Pass
QAM		714.5	6.26	1.93	19.34	2.15	21.52	141.906	Vertical	Pass
5.0MHz	1/#Mid	701.5	6.77	1.91	19.23	2.15	21.94	156.315	Vertical	Pass
Band 16		707.5	6.68	1.91	19.26	2.15	21.88	154.170	Vertical	Pass
QAM		713.5	6.47	1.92	19.33	2.15	21.73	148.936	Vertical	Pass
10.0MHz	1/#Mid	704	6.79	1.91	19.25	2.15	21.98	157.761	Vertical	Pass
Band 16		707.5	6.77	1.91	19.26	2.15	21.97	157.398	Vertical	Pass
QAM		711	6.62	1.92	19.32	2.15	21.87	153.815	Vertical	Pass
1.4MHz	1/#Mid	699.7	5.52	1.91	19.21	2.15	20.67	116.681	Horizontal	Pass
Band 16		707.5	5.92	1.91	19.26	2.15	21.12	129.420	Horizontal	Pass
QAM		715.3	5.60	1.93	19.34	2.15	20.86	121.899	Horizontal	Pass
3.0MHz	1/#Mid	700.5	5.84	1.91	19.21	2.15	20.99	125.603	Horizontal	Pass
Band 16		707.5	5.70	1.91	19.26	2.15	20.90	123.027	Horizontal	Pass
QAM		714.5	5.63	1.93	19.34	2.15	20.89	122.744	Horizontal	Pass
5.0MHz	1/#Mid	701.5	5.47	1.91	19.23	2.15	20.64	115.878	Horizontal	Pass
Band 16		707.5	5.60	1.91	19.26	2.15	20.80	120.226	Horizontal	Pass
QAM		713.5	5.16	1.92	19.33	2.15	20.42	110.154	Horizontal	Pass
10.0MHz	1/#Mid	704	5.77	1.91	19.25	2.15	20.96	124.738	Horizontal	Pass
Band 16		707.5	5.06	1.91	19.26	2.15	20.26	106.170	Horizontal	Pass
QAM		711	5.42	1.92	19.32	2.15	20.67	116.681	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	Cable	Antenna	Correction	Max.	Max.	Polarization	
			Level	Loss	Factor		EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)		Average	Average	ERP	
5.0MHz Band QPSK	1/#Mid	706.5	7.17	1.91	19.23	2.15	22.34	171.396	Vertical	Pass
		710	7.03	1.91	19.26	2.15	22.23	167.109	Vertical	Pass
		713.5	6.93	1.92	19.33	2.15	22.19	165.577	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	7.18	1.91	19.25	2.15	22.37	172.584	Vertical	Pass
		710	7.13	1.91	19.26	2.15	22.33	171.002	Vertical	Pass
		711	7.09	1.92	19.32	2.15	22.34	171.396	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	5.47	1.91	19.23	2.15	20.64	115.878	Horizontal	Pass
		710	5.83	1.91	19.26	2.15	21.03	126.765	Horizontal	Pass
		713.5	6.14	1.92	19.33	2.15	21.40	138.038	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	6.28	1.91	19.25	2.15	21.47	140.281	Horizontal	Pass
		710	6.59	1.91	19.26	2.15	21.79	151.008	Horizontal	Pass
		711	5.00	1.92	19.32	2.15	20.25	105.925	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz	1/#Mid	706.5	6.64	1.91	19.23	2.15	21.81	151.705	Vertical	Pass
Band 16		710	6.55	1.91	19.26	2.15	21.75	149.624	Vertical	Pass
QAM		713.5	6.35	1.92	19.33	2.15	21.61	144.877	Vertical	Pass
10.0MHz	1/#Mid	709	6.18	1.91	19.25	2.15	21.37	137.088	Vertical	Pass
Band 16		710	6.71	1.91	19.26	2.15	21.91	155.239	Vertical	Pass
QAM		711	6.44	1.92	19.32	2.15	21.69	147.571	Vertical	Pass
5.0MHz	1/#Mid	706.5	5.10	1.91	19.23	2.15	20.27	106.414	Horizontal	Pass
Band 16		710	5.64	1.91	19.26	2.15	20.84	121.339	Horizontal	Pass
QAM		713.5	5.17	1.92	19.33	2.15	20.43	110.408	Horizontal	Pass
10.0MHz	1/#Mid	709	5.44	1.91	19.25	2.15	20.63	115.611	Horizontal	Pass
Band 16		710	5.15	1.91	19.26	2.15	20.35	108.393	Horizontal	Pass
QAM		711	5.93	1.92	19.32	2.15	21.18	131.220	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

## 8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max.	
				(dBm)	(dB)	(dBm)	(mW)	ERP	
5.0MHz	1/#Mid	2537.5	-1.42	4.54	27.75	21.79	151.008	Horizontal	Pass
Band		2595	-1.27	4.69	27.72	21.76	149.968	Horizontal	Pass
QPSK		2652.5	-1.15	4.71	27.71	21.85	153.109	Horizontal	Pass
10.0MHz	1/#Mid	2540	-1.50	4.55	27.76	21.71	148.252	Horizontal	Pass
Band		2595	-1.36	4.69	27.72	21.67	146.893	Horizontal	Pass
QPSK		2650	-1.35	4.72	27.70	21.63	145.546	Horizontal	Pass
15.0MHz	1/#Mid	2542.5	-1.33	4.55	27.77	21.89	154.525	Horizontal	Pass
Band		2595	-1.05	4.69	27.72	21.98	157.761	Horizontal	Pass
QPSK		2647.5	-1.10	4.72	27.69	21.87	153.815	Horizontal	Pass
20.0MHz	1/#Mid	2545	-1.21	4.57	27.78	22.00	158.489	Horizontal	Pass
Band		2595	-0.98	4.73	27.72	<b>22.01</b>	158.855	Horizontal	Pass
QPSK		2645	-0.99	4.75	27.68	21.94	156.315	Horizontal	Pass
5.0MHz	1/#Mid	2537.5	-1.22	4.54	27.75	21.99	158.125	Vertical	Pass
Band		2595	-1.13	4.69	27.72	21.90	154.882	Vertical	Pass
QPSK		2652.5	-1.11	4.71	27.71	21.89	154.525	Vertical	Pass
10.0MHz	1/#Mid	2540	-1.89	4.55	27.76	21.32	135.519	Vertical	Pass
Band		2595	-1.04	4.69	27.72	21.99	158.125	Vertical	Pass
QPSK		2650	-1.11	4.72	27.70	21.87	153.815	Vertical	Pass
15.0MHz	1/#Mid	2542.5	-2.11	4.55	27.77	21.11	129.122	Vertical	Pass
Band		2595	-2.04	4.69	27.72	20.99	125.603	Vertical	Pass
QPSK		2647.5	-2.25	4.72	27.69	20.72	118.032	Vertical	Pass
20.0MHz	1/#Mid	2545	-2.82	4.57	27.78	20.39	109.396	Vertical	Pass
Band		2595	-2.21	4.73	27.72	20.78	119.674	Vertical	Pass
QPSK		2645	-1.72	4.75	27.68	21.21	132.130	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
5.0MHz	1/#Mid	2537.5	-1.46	4.54	27.75	21.75	149.624	Horizontal	Pass
Band 16		2595	-1.31	4.69	27.72	21.72	148.594	Horizontal	Pass
QAM		2652.5	-1.19	4.71	27.71	21.81	151.705	Horizontal	Pass
10.0MHz	1/#Mid	2540	-1.54	4.55	27.76	21.67	146.893	Horizontal	Pass
Band 16		2595	-1.40	4.69	27.72	21.63	145.546	Horizontal	Pass
QAM		2650	-1.39	4.72	27.70	21.59	144.212	Horizontal	Pass
15.0MHz	1/#Mid	2542.5	-1.37	4.55	27.77	21.85	153.109	Horizontal	Pass
Band 16		2595	-1.09	4.69	27.72	21.94	156.315	Horizontal	Pass
QAM		2647.5	-1.14	4.72	27.69	21.83	152.405	Horizontal	Pass
20.0MHz	1/#Mid	2545	-1.25	4.57	27.78	21.96	157.036	Horizontal	Pass
Band 16		2595	-0.97	4.73	27.72	22.02	159.221	Horizontal	Pass
QAM		2645	-1.03	4.75	27.68	21.90	154.882	Horizontal	Pass
5.0MHz	1/#Mid	2537.5	-1.26	4.54	27.75	21.95	156.675	Vertical	Pass
Band 16		2595	-1.17	4.69	27.72	21.86	153.462	Vertical	Pass
QAM		2652.5	-1.15	4.71	27.71	21.85	153.109	Vertical	Pass
10.0MHz	1/#Mid	2540	-1.33	4.55	27.76	21.88	154.170	Vertical	Pass
Band 16		2595	-1.08	4.69	27.72	21.95	156.675	Vertical	Pass
QAM		2650	-1.15	4.72	27.70	21.83	152.405	Vertical	Pass
15.0MHz	1/#Mid	2542.5	-2.91	4.55	27.77	20.31	107.399	Vertical	Pass
Band 16		2595	-2.09	4.69	27.72	20.94	124.165	Vertical	Pass
QAM		2647.5	-2.42	4.72	27.69	20.55	113.501	Vertical	Pass
20.0MHz	1/#Mid	2545	-2.77	4.57	27.78	20.44	110.662	Vertical	Pass
Band 16		2595	-2.69	4.73	27.72	20.30	107.152	Vertical	Pass
QAM		2645	-2.68	4.75	27.68	20.25	105.925	Vertical	Pass

Note:

SG Level= Signal generator output

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

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



## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

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

### LIMIT

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

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

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

### TEST PROCEDURE

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

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB at the channel edges and  $55 + 10 \log_{10}(p)$  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

#### **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	-49.90	4.04	33.51	-20.43	-13	-7.43	Horizontal
3701.4	-49.73	4.04	33.51	-20.26	-13	-7.26	Vertical
5552.1	-48.93	5.24	35.84	-18.33	-13	-5.33	Vertical
5552.1	-49.24	5.24	35.84	-18.64	-13	-5.64	Horizontal
201.8	-39.29	1.43	16.02	-24.70	-13	-11.70	Vertical
329.4	-35.14	1.30	17.99	-18.45	-13	-5.45	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.95	4.04	33.56	-19.43	-13	-6.43	Horizontal
3760.0	-49.26	4.04	33.56	-19.74	-13	-6.74	Vertical
5640.0	-50.28	5.24	35.91	-19.61	-13	-6.61	Vertical
5640.0	-49.96	5.24	35.91	-19.29	-13	-6.29	Horizontal
191.1	-39.71	1.62	16.97	-24.36	-13	-11.36	Vertical
264.6	-42.14	1.74	15.98	-27.91	-13	-14.91	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-52.05	4.04	34.00	-22.09	-13	-9.09	Horizontal
3818.6	-48.37	4.04	34.00	-18.41	-13	-5.41	Vertical
5727.9	-52.21	5.24	36.04	-21.41	-13	-8.41	Vertical
5727.9	-53.51	5.24	36.04	-22.71	-13	-9.71	Horizontal
178.0	-35.49	1.42	17.29	-19.62	-13	-6.62	Vertical
383.7	-34.34	1.50	17.90	-17.93	-13	-4.93	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	-52.05	4.07	33.54	-22.58	-13	-9.58	Horizontal
3720.0	-51.06	4.07	33.54	-21.59	-13	-8.59	Vertical
5580.0	-45.55	5.28	35.86	-14.97	-13	-1.97	Vertical
5580.0	-51.89	5.28	35.86	-21.31	-13	-8.31	Horizontal
177.5	-42.69	1.58	16.89	-27.37	-13	-14.37	Vertical
279.4	-42.52	1.76	17.26	-27.02	-13	-14.02	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.88	4.04	33.56	-22.36	-13	-9.36	Horizontal
3760.0	-50.68	4.04	33.56	-21.16	-13	-8.16	Vertical
5640.0	-47.50	5.24	35.91	-16.83	-13	-3.83	Vertical
5640.0	-52.24	5.24	35.91	-21.57	-13	-8.57	Horizontal
176.3	-36.66	1.46	16.27	-21.85	-13	-8.85	Vertical
398.2	-34.48	1.59	15.15	-20.92	-13	-7.92	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.62	4.04	34.00	-22.66	-13	-9.66	Horizontal
3800.0	-47.48	4.04	34.00	-17.52	-13	-4.52	Vertical
5700.0	-47.71	5.24	36.04	-16.91	-13	-3.91	Vertical
5700.0	-49.01	5.24	36.04	-18.21	-13	-5.21	Horizontal
176.4	-35.64	1.36	17.39	-19.60	-13	-6.60	Vertical
294.9	-41.89	1.66	15.39	-28.16	-13	-15.16	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-45.37	4.02	29.80	-19.59	-13	-6.59	Horizontal
3421.4	-46.69	4.02	29.80	-20.91	-13	-7.91	Vertical
5132.1	-51.12	5.24	35.84	-20.52	-13	-7.52	Vertical
5132.1	-52.63	5.24	35.84	-22.03	-13	-9.03	Horizontal
209.5	-37.90	1.68	16.04	-23.54	-13	-10.54	Vertical
245.5	-34.89	1.78	17.74	-18.93	-13	-5.93	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-47.27	4.03	30.00	-21.30	-13	-8.30	Horizontal
3465.0	-53.70	4.03	30.00	-27.73	-13	-14.73	Vertical
5197.5	-48.17	5.25	35.86	-17.56	-13	-4.56	Vertical
5197.5	-49.45	5.25	35.86	-18.84	-13	-5.84	Horizontal
192.7	-37.11	1.72	17.69	-21.14	-13	-8.14	Vertical
419.3	-38.44	1.62	16.02	-24.03	-13	-11.03	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-46.54	4.05	30.01	-20.58	-13	-7.58	Horizontal
3508.6	-53.60	4.05	30.01	-27.64	-13	-14.64	Vertical
5262.9	-48.02	5.26	35.86	-17.42	-13	-4.42	Vertical
5262.9	-51.15	5.26	35.86	-20.55	-13	-7.55	Horizontal
206.8	-41.57	1.80	16.69	-26.68	-13	-13.68	Vertical
415.3	-41.23	1.75	16.66	-26.33	-13	-13.33	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	-50.61	4.02	29.80	-24.83	-13	-11.83	Horizontal
3440.0	-50.03	4.02	29.80	-24.25	-13	-11.25	Vertical
5160.0	-50.36	5.24	35.84	-19.76	-13	-6.76	Vertical
5160.0	-50.96	5.24	35.84	-20.36	-13	-7.36	Horizontal
210.5	-34.38	1.57	17.26	-18.69	-13	-5.69	Vertical
264.2	-35.20	1.78	16.35	-20.63	-13	-7.63	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-44.71	4.03	30.00	-18.74	-13	-5.74	Horizontal
3465.0	-51.93	4.03	30.00	-25.96	-13	-12.96	Vertical
5197.5	-52.25	5.25	35.86	-21.64	-13	-8.64	Vertical
5197.5	-50.94	5.25	35.86	-20.33	-13	-7.33	Horizontal
199.8	-42.24	1.44	17.95	-25.73	-13	-12.73	Vertical
250.3	-40.88	1.65	16.09	-26.44	-13	-13.44	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-45.65	2.91	27.68	-20.88	-13	-7.88	Horizontal
3490.0	-52.69	2.91	27.68	-27.92	-13	-14.92	Vertical
5235.0	-52.00	5.26	35.86	-21.40	-13	-8.40	Vertical
5235.0	-49.47	5.26	35.86	-18.87	-13	-5.87	Horizontal
196.7	-44.56	1.61	16.85	-29.32	-13	-16.32	Vertical
410.4	-41.44	1.61	15.19	-27.86	-13	-14.86	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-50.46	2.78	27.50	-25.74	-13	-12.74	Horizontal
1649.4	-44.80	2.78	27.50	-20.08	-13	-7.08	Vertical
2474.1	-47.81	2.90	27.80	-22.91	-13	-9.91	Vertical
2474.1	-51.81	2.90	27.80	-26.91	-13	-13.91	Horizontal
186.5	-35.58	1.76	17.59	-19.75	-13	-6.75	Vertical
421.8	-41.11	1.63	15.87	-26.87	-13	-13.87	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-45.87	2.80	27.48	-21.19	-13	-8.19	Horizontal
1673.0	-48.09	2.80	27.48	-23.41	-13	-10.41	Vertical
2509.5	-46.38	2.91	27.70	-21.59	-13	-8.59	Vertical
2509.5	-53.41	2.91	27.70	-28.62	-13	-15.62	Horizontal
178.0	-40.11	1.61	15.68	-26.04	-13	-13.04	Vertical
312.1	-35.41	1.59	17.52	-19.49	-13	-6.49	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.67	2.82	27.43	-28.06	-13	-15.06	Horizontal
1696.6	-50.29	2.82	27.43	-25.68	-13	-12.68	Vertical
2544.9	-50.58	2.92	27.74	-25.76	-13	-12.76	Vertical
2544.9	-52.17	2.92	27.74	-27.35	-13	-14.35	Horizontal
195.8	-43.97	1.69	16.67	-28.98	-13	-15.98	Vertical
298.3	-36.28	1.70	17.18	-20.80	-13	-7.80	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	-49.25	2.78	27.50	-24.53	-13	-11.53	Horizontal
1658.0	-48.25	2.78	27.50	-23.53	-13	-10.53	Vertical
2487.0	-47.04	2.90	27.80	-22.14	-13	-9.14	Vertical
2487.0	-49.58	2.90	27.80	-24.68	-13	-11.68	Horizontal
200.5	-44.05	1.71	15.57	-30.19	-13	-17.19	Vertical
269.5	-40.64	1.34	16.40	-25.58	-13	-12.58	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-45.12	2.80	27.48	-20.44	-13	-7.44	Horizontal
1673.0	-49.36	2.80	27.48	-24.68	-13	-11.68	Vertical
2509.5	-48.47	2.91	27.70	-23.68	-13	-10.68	Vertical
2509.5	-49.71	2.91	27.70	-24.92	-13	-11.92	Horizontal
181.6	-41.41	1.44	17.04	-25.81	-13	-12.81	Vertical
410.1	-37.97	1.76	17.62	-22.11	-13	-9.11	Horizontal
Test Results for High Channel 844MHz							
1688.0	-51.25	2.82	27.43	-26.64	-13	-13.64	Horizontal
1688.0	-51.50	2.82	27.43	-26.89	-13	-13.89	Vertical
2532.0	-52.90	2.92	27.74	-28.08	-13	-15.08	Vertical
2532.0	-52.85	2.92	27.74	-28.03	-13	-15.03	Horizontal
201.8	-38.23	1.74	17.70	-22.27	-13	-9.27	Vertical
447.6	-42.82	1.41	17.46	-26.76	-13	-13.76	Horizontal

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

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

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

#### 9.4 LTE BAND 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	-59.26	5.23	35.81	-28.68	-25	-3.68	Horizontal
5005.0	-60.11	5.23	35.81	-29.53	-25	-4.53	Vertical
7507.5	-61.43	5.67	36.85	-30.25	-25	-5.25	Vertical
7507.5	-62.86	5.67	36.85	-31.68	-25	-6.68	Horizontal
201.8	-52.95	1.73	17.97	-36.71	-25	-11.71	Vertical
439.8	-50.14	1.38	15.11	-36.41	-25	-11.41	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.20	5.23	35.82	-30.61	-25	-5.61	Horizontal
5070.0	-63.32	5.23	35.82	-32.73	-25	-7.73	Vertical
7605.0	-63.88	5.67	36.85	-32.70	-25	-7.70	Vertical
7605.0	-63.43	5.67	36.85	-32.25	-25	-7.25	Horizontal
202.2	-48.68	1.77	16.17	-34.27	-25	-9.27	Vertical
377.1	-51.76	1.63	15.21	-38.18	-25	-13.18	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-61.26	5.24	35.83	-30.67	-25	-5.67	Horizontal
5135.0	-60.32	5.24	35.83	-29.73	-25	-4.73	Vertical
7702.5	-64.00	5.68	36.87	-32.81	-25	-7.81	Vertical
7702.5	-61.83	5.68	36.87	-30.64	-25	-5.64	Horizontal
204.5	-51.70	1.58	17.56	-35.72	-25	-10.72	Vertical
308.5	-45.93	1.45	16.58	-30.80	-25	-5.80	Horizontal

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

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-63.13	5.23	35.82	-32.54	-25	-7.54	Horizontal
5020.0	-62.98	5.23	35.82	-32.39	-25	-7.39	Vertical
7530.0	-64.55	5.67	36.86	-33.36	-25	-8.36	Vertical
7530.0	-61.44	5.67	36.86	-30.25	-25	-5.25	Horizontal
188.5	-53.84	1.63	15.76	-39.71	-25	-14.71	Vertical
405.5	-48.63	1.71	15.44	-34.90	-25	-9.90	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.28	5.23	35.82	-28.69	-25	-3.69	Horizontal
5070.0	-64.67	5.23	35.82	-34.08	-25	-9.08	Vertical
7605.0	-61.43	5.67	36.85	-30.25	-25	-5.25	Vertical
7605.0	-61.90	5.67	36.85	-30.72	-25	-5.72	Horizontal
203.8	-46.45	1.79	16.84	-31.39	-25	-6.39	Vertical
389.9	-52.06	1.71	17.64	-36.13	-25	-11.13	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.99	5.24	35.83	-29.40	-25	-4.40	Horizontal
5120.0	-62.04	5.24	35.83	-31.45	-25	-6.45	Vertical
7680.0	-63.85	5.70	36.88	-32.67	-25	-7.67	Vertical
7680.0	-61.48	5.70	36.88	-30.30	-25	-5.30	Horizontal
176.2	-47.86	1.79	16.84	-32.80	-25	-7.80	Vertical
459.8	-47.80	1.71	17.64	-31.87	-25	-6.87	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	-48.13	2.60	27.20	-23.53	-13	-10.53	Horizontal
1399.4	-48.19	2.60	27.20	-23.59	-13	-10.59	Vertical
2099.1	-45.05	2.85	27.54	-20.36	-13	-7.36	Vertical
2099.1	-52.25	2.85	27.54	-27.56	-13	-14.56	Horizontal
176.3	-36.98	1.49	17.78	-20.69	-13	-7.69	Vertical
261.3	-40.70	1.36	17.33	-24.73	-13	-11.73	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.42	2.61	27.28	-19.75	-13	-6.75	Horizontal
1415.0	-45.64	2.61	27.28	-20.97	-13	-7.97	Vertical
2122.5	-52.81	2.87	27.59	-28.09	-13	-15.09	Vertical
2122.5	-51.65	2.87	27.59	-26.93	-13	-13.93	Horizontal
188.5	-42.17	1.73	15.74	-28.16	-13	-15.16	Vertical
449.8	-38.15	1.62	15.79	-23.98	-13	-10.98	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-47.87	2.63	27.28	-23.22	-13	-10.22	Horizontal
1430.6	-48.90	2.63	27.28	-24.25	-13	-11.25	Vertical
2145.9	-50.32	2.88	27.60	-25.60	-13	-12.60	Vertical
2145.9	-51.55	2.88	27.60	-26.83	-13	-13.83	Horizontal
206.3	-38.06	1.61	18.00	-21.67	-13	-8.67	Vertical
296.0	-38.67	1.45	15.49	-24.64	-13	-11.64	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	-44.52	2.61	27.26	-19.87	-13	-6.87	Horizontal
1408.0	-47.16	2.61	27.26	-22.51	-13	-9.51	Vertical
2112.0	-52.04	2.87	27.58	-27.33	-13	-14.33	Vertical
2112.0	-49.16	2.87	27.58	-24.45	-13	-11.45	Horizontal
175.6	-42.40	1.31	16.97	-26.74	-13	-13.74	Vertical
239.3	-41.47	1.65	16.70	-26.42	-13	-13.42	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-45.22	2.61	27.28	-20.55	-13	-7.55	Horizontal
1415.0	-46.89	2.61	27.28	-22.22	-13	-9.22	Vertical
2122.5	-50.76	2.87	27.59	-26.04	-13	-13.04	Vertical
2122.5	-53.56	2.87	27.59	-28.84	-13	-15.84	Horizontal
207.9	-43.82	1.72	17.99	-27.55	-13	-14.55	Vertical
357.3	-44.44	1.73	17.94	-28.23	-13	-15.23	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.97	2.62	27.28	-26.31	-13	-13.31	Horizontal
1422.0	-48.14	2.62	27.28	-23.48	-13	-10.48	Vertical
2133.0	-47.29	2.87	27.60	-22.56	-13	-9.56	Vertical
2133.0	-52.91	2.87	27.60	-28.18	-13	-15.18	Horizontal
212.5	-41.96	1.58	15.93	-27.61	-13	-14.61	Vertical
408.0	-37.10	1.36	15.59	-22.87	-13	-9.87	Horizontal

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

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

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

## 9.6 LTE BAND 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	-53.39	2.61	27.28	-28.72	-13	-15.72	Horizontal
1413.0	-46.96	2.61	27.28	-22.29	-13	-9.29	Vertical
2119.5	-53.53	2.87	27.59	-28.81	-13	-15.81	Vertical
2119.5	-49.35	2.87	27.59	-24.63	-13	-11.63	Horizontal
191.2	-40.71	1.71	16.15	-26.27	-13	-13.27	Vertical
441.0	-38.47	1.41	17.32	-22.56	-13	-9.56	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-49.41	2.62	27.30	-24.73	-13	-11.73	Horizontal
1420.0	-45.35	2.62	27.30	-20.67	-13	-7.67	Vertical
2130.0	-44.25	2.87	27.62	-19.50	-13	-6.50	Vertical
2130.0	-52.53	2.87	27.62	-27.78	-13	-14.78	Horizontal
189.8	-41.78	1.42	15.25	-27.96	-13	-14.96	Vertical
424.1	-36.47	1.36	17.19	-20.64	-13	-7.64	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-49.49	2.66	27.28	-24.87	-13	-11.87	Horizontal
1427.0	-47.46	2.66	27.28	-22.84	-13	-9.84	Vertical
2140.5	-44.72	2.88	27.60	-20.00	-13	-7.00	Vertical
2140.5	-53.94	2.88	27.60	-29.22	-13	-16.22	Horizontal
206.8	-34.46	1.32	17.29	-18.49	-13	-5.49	Vertical
389.9	-38.66	1.72	16.89	-23.49	-13	-10.49	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	-49.38	2.62	27.30	-24.70	-13	-11.70	Horizontal
1418.0	-44.48	2.62	27.30	-19.80	-13	-6.80	Vertical
2127.0	-51.97	2.87	27.62	-27.22	-13	-14.22	Vertical
2127.0	-53.25	2.87	27.62	-28.50	-13	-15.50	Horizontal
188.0	-38.72	1.35	16.91	-23.16	-13	-10.16	Vertical
396.6	-41.75	1.62	16.31	-27.06	-13	-14.06	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-46.26	2.62	27.30	-21.58	-13	-8.58	Horizontal
1420.0	-49.95	2.62	27.30	-25.27	-13	-12.27	Vertical
2130.0	-45.91	2.87	27.62	-21.16	-13	-8.16	Vertical
2130.0	-52.46	2.87	27.62	-27.71	-13	-14.71	Horizontal
194.0	-38.40	1.51	17.14	-22.77	-13	-9.77	Vertical
360.0	-38.91	1.77	16.88	-23.80	-13	-10.80	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.71	2.62	27.30	-21.03	-13	-8.03	Horizontal
1422.0	-49.99	2.62	27.30	-25.31	-13	-12.31	Vertical
2133.0	-52.59	2.87	27.62	-27.84	-13	-14.84	Vertical
2133.0	-53.19	2.87	27.62	-28.44	-13	-15.44	Horizontal
182.4	-35.44	1.78	15.95	-21.27	-13	-8.27	Vertical
387.6	-42.46	1.34	17.95	-25.86	-13	-12.86	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 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5075.0	-61.99	5.23	35.81	-31.41	-25	-6.41	Horizontal
5075.0	-60.47	5.23	35.81	-29.89	-25	-4.89	Vertical
7612.5	-60.06	5.67	36.85	-28.88	-25	-3.88	Vertical
7612.5	-61.72	5.67	36.85	-30.54	-25	-5.54	Horizontal
435.3	-47.99	1.38	15.98	-33.39	-25	-8.39	Vertical
465.8	-45.88	1.62	15.66	-31.84	-25	-6.84	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-60.72	5.23	35.82	-30.13	-25	-5.13	Horizontal
5190.0	-64.06	5.23	35.82	-33.47	-25	-8.47	Vertical
7785.0	-64.91	5.67	36.85	-33.73	-25	-8.73	Vertical
7785.0	-60.02	5.67	36.85	-28.84	-25	-3.84	Horizontal
510.4	-46.33	1.62	16.17	-31.78	-25	-6.78	Vertical
562.9	-48.01	1.74	17.63	-32.12	-25	-7.12	Horizontal
Test Results for High Channel 2652.5MHz							
5305.0	-64.99	5.24	35.83	-34.40	-25	-9.40	Horizontal
5305.0	-61.65	5.24	35.83	-31.06	-25	-6.06	Vertical
7957.5	-61.93	5.68	36.87	-30.74	-25	-5.74	Vertical
7957.5	-63.37	5.68	36.87	-32.18	-25	-7.18	Horizontal
197.6	-45.37	1.55	15.84	-31.08	-25	-6.08	Vertical
353.1	-47.02	1.51	17.06	-31.47	-25	-6.47	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5090.0	-59.06	5.23	35.82	-28.47	-25	-3.47	Horizontal
5090.0	-61.42	5.23	35.82	-30.83	-25	-5.83	Vertical
7635.0	-59.47	5.67	36.86	-28.28	-25	-3.28	Vertical
7635.0	-62.82	5.67	36.86	-31.63	-25	-6.63	Horizontal
128.9	-49.33	1.43	15.51	-35.25	-25	-10.25	Vertical
344.8	-49.72	1.40	16.97	-34.15	-25	-9.15	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-60.30	5.23	35.82	-29.71	-25	-4.71	Horizontal
5190.0	-62.91	5.23	35.82	-32.32	-25	-7.32	Vertical
7785.0	-62.19	5.67	36.85	-31.01	-25	-6.01	Vertical
7785.0	-60.75	5.67	36.85	-29.57	-25	-4.57	Horizontal
100.8	-47.23	1.77	16.72	-32.28	-25	-7.28	Vertical
263.5	-45.55	1.31	16.99	-29.87	-25	-4.87	Horizontal
Test Results for High Channel 2645MHz							
5290.0	-63.51	5.24	35.83	-32.92	-25	-7.92	Horizontal
5290.0	-64.88	5.24	35.83	-34.29	-25	-9.29	Vertical
7935.0	-63.88	5.70	36.88	-32.70	-25	-7.70	Vertical
7935.0	-60.58	5.70	36.88	-29.40	-25	-4.40	Horizontal
349.9	-46.36	1.70	15.73	-32.33	-25	-7.33	Vertical
110.3	-46.22	1.75	17.33	-30.64	-25	-5.64	Horizontal

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

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

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

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

## 10. FREQUENCY STABILITY

### RULE PART(S)

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

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.4V, Normal, DC 3.87V and High voltage, DC 4.4V.

### Frequency Stability vs Temperature:

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

### Frequency Stability vs Voltage:

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

### MODES TESTED

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

### 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	8.3	0.00444	2.5
3.87	1880	6.9	0.00366	2.5
4.40	1880	5.6	0.00299	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	6.7	0.00354	2.5
Extreme (50C)	1880	7.4	0.00393	2.5
Extreme (40C)	1880	8.5	0.00452	2.5
Extreme (30C)	1880	9.1	0.00486	2.5
Extreme (10C)	1880	9.0	0.00477	2.5
Extreme (0C)	1880	6.1	0.00324	2.5
Extreme (-10C)	1880	7.8	0.00417	2.5
Extreme (-20C)	1880	8.6	0.00455	2.5
Extreme (-30C)	1880	5.5	0.00292	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	7.4	0.00394	2.5
3.87	1880	6.2	0.00332	2.5
4.40	1880	7.0	0.00372	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	7.3	0.00388	2.5
Extreme (50C)	1880	6.6	0.00353	2.5
Extreme (40C)	1880	5.2	0.00274	2.5
Extreme (30C)	1880	7.0	0.00371	2.5
Extreme (10C)	1880	5.9	0.00316	2.5
Extreme (0C)	1880	4.8	0.00254	2.5
Extreme (-10C)	1880	9.3	0.00497	2.5
Extreme (-20C)	1880	5.7	0.00303	2.5
Extreme (-30C)	1880	6.2	0.00329	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	6.6	0.00380	2.5
3.87	1732.5	5.9	0.00342	2.5
4.40	1732.5	6.2	0.00358	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	4.5	0.00259	2.5
Extreme (50C)	1732.5	10.0	0.00576	2.5
Extreme (40C)	1732.5	5.7	0.00327	2.5
Extreme (30C)	1732.5	6.3	0.00365	2.5
Extreme (10C)	1732.5	6.1	0.00350	2.5
Extreme (0C)	1732.5	9.4	0.00543	2.5
Extreme (-10C)	1732.5	5.9	0.00342	2.5
Extreme (-20C)	1732.5	5.9	0.00342	2.5
Extreme (-30C)	1732.5	6.2	0.00359	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	6.2	0.00356	2.5
3.87	1732.5	6.7	0.00386	2.5
4.40	1732.5	6.2	0.00360	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	-6.7	-0.00386	2.5
Extreme (50C)	1732.5	-3.3	-0.00193	2.5
Extreme (40C)	1732.5	5.7	0.00327	2.5
Extreme (30C)	1732.5	-3.4	-0.00194	2.5
Extreme (10C)	1732.5	6.7	0.00388	2.5
Extreme (0C)	1732.5	4.5	0.00261	2.5
Extreme (-10C)	1732.5	9.8	0.00563	2.5
Extreme (-20C)	1732.5	11.2	0.00648	2.5
Extreme (-30C)	1732.5	6.2	0.00359	2.5

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



### 10.3 LTE BAND 5

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

##### Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	836.5	6.6	0.00788	2.5
3.87	836.5	8.9	0.01067	2.5
4.40	836.5	4.7	0.00565	2.5

##### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.00737	2.5
Extreme (50C)	836.5	8.6	0.01028	2.5
Extreme (40C)	836.5	9.4	0.01126	2.5
Extreme (30C)	836.5	5.3	0.00633	2.5
Extreme (10C)	836.5	6.7	0.00802	2.5
Extreme (0C)	836.5	4.5	0.00533	2.5
Extreme (-10C)	836.5	3.6	0.00436	2.5
Extreme (-20C)	836.5	5.3	0.00633	2.5
Extreme (-30C)	836.5	6.4	0.00771	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	8.4	0.00999	2.5
3.87	836.5	9.9	0.01180	2.5
4.40	836.5	7.6	0.00911	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.1	0.00731	2.5
Extreme (50C)	836.5	5.5	0.00663	2.5
Extreme (40C)	836.5	3.5	0.00415	2.5
Extreme (30C)	836.5	2.0	0.00241	2.5
Extreme (10C)	836.5	6.8	0.00817	2.5
Extreme (0C)	836.5	2.7	0.00322	2.5
Extreme (-10C)	836.5	9.4	0.01124	2.5
Extreme (-20C)	836.5	6.9	0.00826	2.5
Extreme (-30C)	836.5	5.9	0.00704	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	6.7	0.00266	2.5
3.87	2535	5.5	0.00217	2.5
4.40	2535	7.8	0.00307	2.5

##### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.4	0.00293	2.5
Extreme (50C)	2535	7.2	0.00284	2.5
Extreme (40C)	2535	5.9	0.00231	2.5
Extreme (30C)	2535	6.6	0.00260	2.5
Extreme (10C)	2535	6.4	0.00251	2.5
Extreme (0C)	2535	4.6	0.00183	2.5
Extreme (-10C)	2535	10.0	0.00395	2.5
Extreme (-20C)	2535	6.0	0.00235	2.5
Extreme (-30C)	2535	6.2	0.00245	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	6.0	0.00236	2.5
3.87	2535	6.4	0.00251	2.5
4.40	2535	9.6	0.00378	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.7	0.00304	2.5
Extreme (50C)	2535	6.9	0.00273	2.5
Extreme (40C)	2535	5.0	0.00199	2.5
Extreme (30C)	2535	3.4	0.00134	2.5
Extreme (10C)	2535	6.4	0.00251	2.5
Extreme (0C)	2535	5.3	0.00208	2.5
Extreme (-10C)	2535	9.6	0.00377	2.5
Extreme (-20C)	2535	11.3	0.00445	2.5
Extreme (-30C)	2535	5.9	0.00231	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	12.3	0.01745	2.5
3.87	707.5	13.8	0.01946	2.5
4.40	707.5	13.0	0.01835	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	-6.3	-0.00884	2.5
Extreme (50C)	707.5	-3.6	-0.00504	2.5
Extreme (40C)	707.5	5.6	0.00789	2.5
Extreme (30C)	707.5	-3.4	-0.00477	2.5
Extreme (10C)	707.5	6.5	0.00923	2.5
Extreme (0C)	707.5	4.4	0.00618	2.5
Extreme (-10C)	707.5	9.8	0.01379	2.5
Extreme (-20C)	707.5	10.6	0.01499	2.5
Extreme (-30C)	707.5	5.9	0.00840	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	9.4	0.01326	2.5
3.87	707.5	5.8	0.00818	2.5
4.40	707.5	4.7	0.00662	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	5.0	0.00709	2.5
Extreme (50C)	707.5	9.1	0.01280	2.5
Extreme (40C)	707.5	6.9	0.00969	2.5
Extreme (30C)	707.5	7.1	0.01009	2.5
Extreme (10C)	707.5	6.6	0.00927	2.5
Extreme (0C)	707.5	5.6	0.00794	2.5
Extreme (-10C)	707.5	6.8	0.00965	2.5
Extreme (-20C)	707.5	8.3	0.01173	2.5
Extreme (-30C)	707.5	6.7	0.00951	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	6.3	0.00885	2.5
3.87	710.0	4.9	0.00696	2.5
4.40	710.0	7.8	0.01100	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	4.2	0.00598	2.5
Extreme (50C)	710.0	6.0	0.00841	2.5
Extreme (40C)	710.0	6.6	0.00935	2.5
Extreme (30C)	710.0	6.3	0.00887	2.5
Extreme (10C)	710.0	4.4	0.00619	2.5
Extreme (0C)	710.0	8.1	0.01141	2.5
Extreme (-10C)	710.0	5.6	0.00791	2.5
Extreme (-20C)	710.0	5.9	0.00831	2.5
Extreme (-30C)	710.0	5.7	0.00805	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	5.1	0.00723	2.5
3.87	710.0	4.8	0.00677	2.5
4.40	710.0	3.2	0.00449	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	5.8	0.00822	2.5
Extreme (50C)	710.0	4.1	0.00577	2.5
Extreme (40C)	710.0	3.2	0.00452	2.5
Extreme (30C)	710.0	3.6	0.00500	2.5
Extreme (10C)	710.0	6.1	0.00860	2.5
Extreme (0C)	710.0	5.1	0.00713	2.5
Extreme (-10C)	710.0	9.1	0.01281	2.5
Extreme (-20C)	710.0	6.4	0.00903	2.5
Extreme (-30C)	710.0	5.7	0.00803	2.5

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

## 10.7 LTE BAND 41

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

#### Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	2595	8.5	0.00328	2.5
3.87	2595	6.3	0.00243	2.5
4.40	2595	7.8	0.00301	2.5

#### Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.9	0.00304	2.5
Extreme (50C)	2595	4.4	0.00170	2.5
Extreme (40C)	2595	5.8	0.00224	2.5
Extreme (30C)	2595	4.9	0.00188	2.5
Extreme (10C)	2595	6.5	0.00252	2.5
Extreme (0C)	2595	4.7	0.00181	2.5
Extreme (-10C)	2595	9.2	0.00354	2.5
Extreme (-20C)	2595	10.7	0.00414	2.5
Extreme (-30C)	2595	5.7	0.00220	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.40	2595	8.2	0.00316	2.5
3.87	2595	6.9	0.00268	2.5
4.40	2595	6.6	0.00253	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.1	0.00274	2.5
Extreme (50C)	2595	5.0	0.00192	2.5
Extreme (40C)	2595	5.5	0.00212	2.5
Extreme (30C)	2595	5.2	0.00201	2.5
Extreme (10C)	2595	6.0	0.00230	2.5
Extreme (0C)	2595	5.1	0.00195	2.5
Extreme (-10C)	2595	9.4	0.00361	2.5
Extreme (-20C)	2595	10.3	0.00398	2.5
Extreme (-30C)	2595	5.7	0.00220	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.

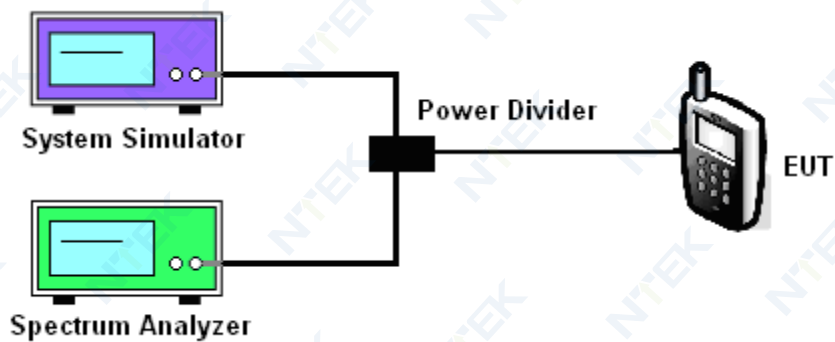
### 11.2 Measuring Instruments

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

Test data reference attachment.

----END OF REPORT----