

**FCC CFR47 PART 24E, 27  
CERTIFICATION TEST REPORT  
FCC ID: ZSH6C**

**Product:** Mobile Phone  
**Trade Mark:** KXD, Kenxinda, EL, E&L, Ken mobile  
**Model Number:** 6C  
**Family Model:** N/A  
**Report No.:** STR190909001006E

**Prepared for**

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TEST RESULT CERTIFICATION

Applicant's name : SHENZHEN KENXINDA TECHNOLOGY CO.,LTD
Address : 18TH FLOOR,FUCHUN ORIENT BUILDING, SHENNAN AV 7006, SHENZHEN, China
Manufacturer's Name : SHENZHEN KENXINDA TECHNOLOGY CO.,LTD
Address : 18TH FLOOR,FUCHUN ORIENT BUILDING, SHENNAN AV 7006, SHENZHEN, China
Product name : Mobile Phone
Model and/or type reference : 6C
Family Model : N/A
Standards : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.26:2015
ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test :
Date (s) of performance of tests : 10 Sep. 2019 ~ 23 Sep. 2019
Date of Issue : 25 Sep. 2019
Test Result : Pass

Testing Engineer : (Signature)
(Mary Hu)
Technical Manager : (Signature)
(Jason Chen)
Authorized Signatory : (Signature)
(Sam Chen)

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## 1. GENERAL INFORMATION

### 1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	KXD, Kenxinda, EL, E&L, Ken mobile
Model Name	6C
Family Model	N/A
Model Difference	N/A
FCC ID:	ZSH6C
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2, 4, 7
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 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz;
Type of Modulation:	QPSK/16QAM
SIM Card	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.49dBi; Band 4: 0.38dBi; Band 7: 0.46dBi;
Power Supply:	DC 3.8V/2500mAh from Battery or DC 5V from USB Port.
Adapter:	Model: K12S Input: 100-240V~50/60Hz 0.25A Output: 5V---1A
Extreme Vol. Limits:	DC 3.6V to DC 4.2V (Nominal DC 3.8V) (Note 1)
HW Version	J407_32EMB_D3V1.1
SW Version	J407_kxd_6C_gelunbiya_MZ_V01_09102019
** Note1: The High Voltage DC 4.2V and Low Voltage DC 3.6V 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: ZSH6C** filing to comply with the FCC Part 22H&24E &27.

## 1.3 TEST METHODOLOGY

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

## 1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

## MEASUREMENT UNCERTAINTY

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

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

## 1.5 SPECIAL ACCESSORIES

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

## 1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 7.

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

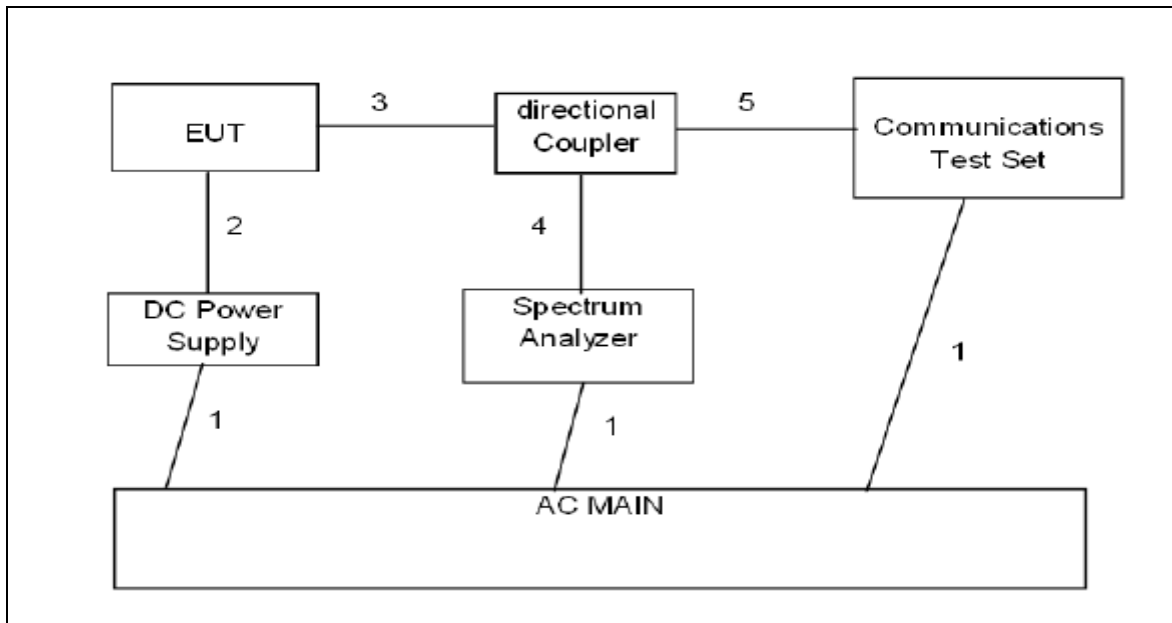
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	6C	FCC ID: ZSH6C	EUT

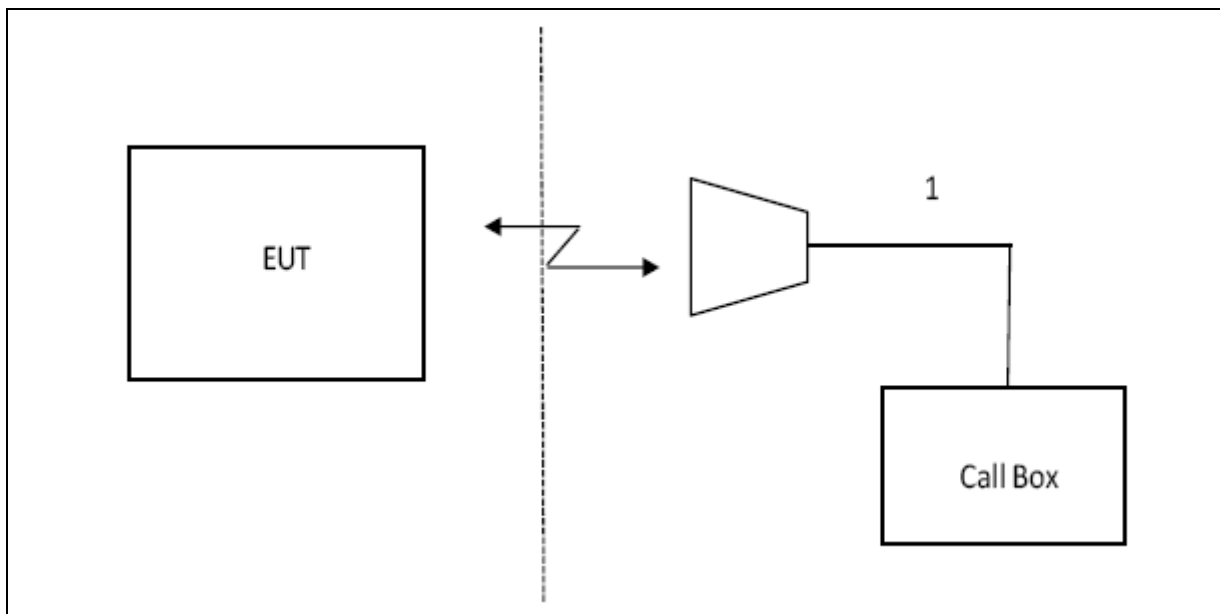
*Note: All the accessories have been used during the test.  
the following “EUT” in setup diagram means EUT system.*

**2.4 TEST SETUP**

**CONDUCTED SETUP DIAGRAM FOR TESTS**



**RADIATED SETUP DIAGRAM FOR TESTS**





### 3. TEST AND MEASUREMENT EQUIPMENT

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

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2020.08.27
TEST RECEIVER	R&S	ESCI	A0304218	2020.05.12
COMMUNICATION TESTER	R&S	CMU200	117858	2020.05.12
COMMUNICATION TESTER	R&S	CMW500	148500	2020.05.12
TEST RECEIVER	R&S	ESPI	101318	2020.05.12
LISN	SCHWARZBECK	NSLK8127	A0304233	2020.05.12
CLIMATE CHAMBER	ALBATROSS	--	--	2020.05.12
Loop Antenna	ARA	PLA-1030/B	1029	2020.05.12
Biological Antenna	TESEQ	CBL6111D	31216	2020.05.12
Horn Antenna	EM	EM-AH-10180	2011071402	2020.05.12
DC Power Source	N/A	PS-6005D	20170402923	2020.05.12

## 4. OUTPUT POWER

### 4.1 OUTPUT POWER MEASUREMENT

#### LTE Measurement Procedure:

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

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

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

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

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

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

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

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

Test data reference attachment.

## 5. OCCUPIED BANDWIDTH

### RULE PART(S)

FCC: §2.1049

### LIMITS

For reporting purposes only

### TEST PROCEDURE

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

### MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 7

### RESULTS

**PASS**

Test data reference attachment.

## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

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

FCC: §22.359

### LIMITS

FCC: §22.359, §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.

### 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 (704, 716, 824, 849, 1710 and 1755, 1850 and 1910MHz)

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

Set display line at -13 dBm

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

### MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 7

### RESULTS

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

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

### LIMITS

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.

### TEST PROCEDURE

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

For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

### **MODES TESTED**

- LTE Band 2
- LTE Band 4
- LTE Band 7

### 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 and §27.50

#### LIMITS:

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

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

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

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

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

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

#### MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 7

#### RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1850.7	0.00	3.76	28.24	24.48	280.772	Vertical	Pass
		1880	0.62	3.91	28.22	24.93	311.030	Vertical	Pass
		1909.3	0.59	3.93	28.20	24.86	305.933	Vertical	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-0.77	3.76	28.24	23.71	234.940	Vertical	Pass
		1880	-0.98	3.91	28.22	23.33	215.097	Vertical	Pass
		1909.3	-0.77	3.93	28.20	23.50	224.067	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	0.29	3.77	28.23	24.75	298.384	Vertical	Pass
		1880	-0.24	3.91	28.24	24.09	256.566	Vertical	Pass
		1908.5	0.61	3.94	28.25	24.92	310.456	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-0.25	3.77	28.23	24.21	263.755	Vertical	Pass
		1880	-0.18	3.91	28.24	24.15	260.186	Vertical	Pass
		1908.5	-0.46	3.94	28.25	23.85	242.866	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	0.24	3.77	28.31	24.78	300.869	Vertical	Pass
		1880	0.52	3.91	28.22	24.83	304.329	Vertical	Pass
		1907.5	0.48	3.94	28.20	24.74	298.167	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-0.88	3.77	28.31	23.66	232.216	Vertical	Pass
		1880	-0.41	3.91	28.22	23.90	245.621	Vertical	Pass
		1907.5	-0.22	3.94	28.20	24.04	253.769	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	-0.24	3.79	28.33	24.30	269.179	Vertical	Pass
		1880	0.22	3.95	28.22	24.49	281.363	Vertical	Pass
		1905	0.70	3.97	28.19	24.92	310.158	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	-0.53	3.79	28.33	24.01	251.499	Vertical	Pass
		1880	-0.56	3.95	28.22	23.71	234.955	Vertical	Pass
		1905	-0.68	3.97	28.19	23.54	225.958	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	-0.29	3.79	28.34	24.26	266.682	Vertical	Pass
		1880	0.64	3.95	28.22	24.91	309.433	Vertical	Pass
		1902.5	0.31	3.97	28.18	24.52	283.060	Vertical	Pass
15.0MHz Band	75/0	1857.5	-1.21	3.79	28.34	23.34	215.900	Vertical	Pass
		1880	-0.13	3.95	28.22	24.14	259.544	Vertical	Pass



16 QAM		1902.5	-0.82	3.97	28.18	23.39	218.462	Vertical	Pass
20.0MHz z Band QPSK	100/0	1860	-0.83	3.81	28.35	23.71	234.792	Vertical	Pass
		1880	0.68	3.96	28.22	24.94	311.850	Vertical	Pass
		1900	0.39	4.00	28.16	24.55	285.034	Vertical	Pass
20.0MHz z Band 16 QAM	100/0	1860	-0.67	3.81	28.35	23.87	243.557	Vertical	Pass
		1880	-0.76	3.96	28.22	23.50	223.829	Vertical	Pass
		1900	0.81	4.00	28.16	24.97	313.751	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1850.7	-0.15	3.76	28.24	24.33	271.141	Horizontal	Pass
		1880	0.75	3.91	28.22	25.06	320.678	Horizontal	Pass
		1909.3	0.11	3.93	28.20	24.38	274.178	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-0.67	3.76	28.24	23.81	240.639	Horizontal	Pass
		1880	-1.15	3.91	28.22	23.16	207.055	Horizontal	Pass
		1909.3	-0.95	3.93	28.20	23.32	214.640	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	0.01	3.77	28.23	24.47	279.903	Horizontal	Pass
		1880	-0.10	3.91	28.24	24.23	265.124	Horizontal	Pass
		1908.5	0.35	3.94	28.25	24.66	292.186	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-0.79	3.77	28.23	23.67	233.052	Horizontal	Pass
		1880	-0.60	3.91	28.24	23.73	236.234	Horizontal	Pass
		1908.5	-1.18	3.94	28.25	23.13	205.536	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	-0.04	3.77	28.31	24.50	282.104	Horizontal	Pass
		1880	0.10	3.91	28.22	24.41	276.215	Horizontal	Pass
		1907.5	0.54	3.94	28.20	24.80	301.663	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-0.95	3.77	28.31	23.59	228.640	Horizontal	Pass
		1880	-0.14	3.91	28.22	24.17	260.919	Horizontal	Pass
		1907.5	-0.94	3.94	28.20	23.32	214.563	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	-0.96	3.79	28.33	23.58	228.087	Horizontal	Pass
		1880	0.41	3.95	28.22	24.68	293.458	Horizontal	Pass
		1905	0.51	3.97	28.19	24.73	297.199	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	-0.99	3.79	28.33	23.55	226.608	Horizontal	Pass
		1880	-0.78	3.95	28.22	23.49	223.272	Horizontal	Pass
		1905	-0.78	3.97	28.19	23.44	221.011	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	-0.27	3.79	28.34	24.28	267.978	Horizontal	Pass
		1880	0.17	3.95	28.22	24.44	277.797	Horizontal	Pass
		1902.5	-0.20	3.97	28.18	24.01	251.814	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-0.97	3.79	28.34	23.58	227.871	Horizontal	Pass
		1880	-1.05	3.95	28.22	23.22	209.738	Horizontal	Pass
		1902.5	-0.85	3.97	28.18	23.36	216.801	Horizontal	Pass
20.0MHz Band	100/0	1860	-1.31	3.81	28.35	23.23	210.300	Horizontal	Pass
		1880	0.93	3.96	28.22	25.19	329.994	Horizontal	Pass

QPSK		1900	-0.46	4.00	28.16	23.70	234.285	Horizontal	Pass
20.0MH	100/0	1860	0.60	3.81	28.35	25.14	326.963	Horizontal	Pass
z Band		1880	0.71	3.96	28.22	24.97	314.261	Horizontal	Pass
16 QAM		1900	-0.04	4.00	28.16	24.12	258.021	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/0	1710.7	-0.98	3.12	27.58	23.48	222.844	Vertical	Pass
		1732.5	-0.62	3.27	27.61	23.72	235.505	Vertical	Pass
		1754.3	-1.07	3.29	27.63	23.27	212.324	Vertical	Pass
1.4MHz Band 16 QAM	1/0	1710.7	-2.31	3.12	27.58	22.15	164.059	Vertical	Pass
		1732.5	-2.22	3.27	27.61	22.12	162.930	Vertical	Pass
		1754.3	-2.14	3.29	27.63	22.2	165.959	Vertical	Pass
3.0MHz Band QPSK	1/0	1711.5	-1.16	3.13	27.61	23.32	214.783	Vertical	Pass
		1732.5	-1.05	3.27	27.61	23.29	213.304	Vertical	Pass
		1753.5	-0.99	3.3	27.62	23.33	215.278	Vertical	Pass
3.0MHz Band 16 QAM	1/0	1711.5	-2.40	3.13	27.61	22.08	161.436	Vertical	Pass
		1732.5	-2.47	3.27	27.61	21.87	153.815	Vertical	Pass
		1753.5	-2.33	3.3	27.62	21.99	158.125	Vertical	Pass
5.0MHz Band QPSK	1/0	1712.5	-1.19	3.13	27.63	23.31	214.289	Vertical	Pass
		1732.5	-0.70	3.27	27.61	23.64	231.206	Vertical	Pass
		1752.5	-1.22	3.3	27.6	23.08	203.236	Vertical	Pass
5.0MHz Band 16 QAM	1/0	1712.5	-2.55	3.13	27.63	21.95	156.675	Vertical	Pass
		1732.5	-2.28	3.27	27.61	22.06	160.694	Vertical	Pass
		1752.5	-2.13	3.3	27.6	22.17	164.816	Vertical	Pass
10.0MHz Band QPSK	1/0	1715	-1.85	3.15	27.64	22.64	183.654	Vertical	Pass
		1732.5	-1.33	3.31	27.61	22.97	198.153	Vertical	Pass
		1750	-1.07	3.33	27.59	23.19	208.449	Vertical	Pass
10.0MHz Band 16 QAM	1/0	1715	-2.38	3.15	27.64	22.11	162.555	Vertical	Pass
		1732.5	-2.28	3.31	27.61	22.02	159.221	Vertical	Pass
		1750	-2.26	3.33	27.59	22	158.489	Vertical	Pass
15.0MHz Band QPSK	1/0	1717.5	-1.15	3.15	27.65	23.35	216.272	Vertical	Pass
		1732.5	-1.71	3.31	27.61	22.59	181.552	Vertical	Pass
		1747.5	-1.54	3.33	27.57	22.7	186.209	Vertical	Pass
15.0MHz Band 16 QAM	1/0	1717.5	-2.48	3.15	27.65	22.02	159.221	Vertical	Pass
		1732.5	-2.40	3.31	27.61	21.9	154.882	Vertical	Pass
		1747.5	-2.34	3.33	27.57	21.9	154.882	Vertical	Pass

20.0MH z Band QPSK	1/0	1720	-1.15	3.17	27.66	23.34	215.774	Vertical	Pass
		1732.5	-0.54	3.32	27.61	23.75	237.137	Vertical	Pass
		1745	-1.12	3.36	27.56	23.08	203.236	Vertical	Pass
20.0MH z Band 16 QAM	1/0	1720	-2.48	3.17	27.66	22.01	158.855	Vertical	Pass
		1732.5	-1.88	3.32	27.61	22.41	174.181	Vertical	Pass
		1745	-2.03	3.36	27.56	22.17	164.816	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/0	1710.7	-1.50	3.12	27.58	22.96	197.697	Horizontal	Pass
		1732.5	-1.46	3.27	27.61	22.88	194.089	Horizontal	Pass
		1754.3	-1.33	3.29	27.63	23.01	199.986	Horizontal	Pass
1.4MHz Band 16 QAM	1/0	1710.7	-2.51	3.12	27.58	21.95	156.675	Horizontal	Pass
		1732.5	-2.72	3.27	27.61	21.62	145.211	Horizontal	Pass
		1754.3	-2.78	3.29	27.63	21.56	143.219	Horizontal	Pass
3.0MHz Band QPSK	1/0	1711.5	-1.71	3.13	27.61	22.77	189.234	Horizontal	Pass
		1732.5	-1.49	3.27	27.61	22.85	192.752	Horizontal	Pass
		1753.5	-1.34	3.3	27.62	22.98	198.609	Horizontal	Pass
3.0MHz Band 16 QAM	1/0	1711.5	-2.87	3.13	27.61	21.61	144.877	Horizontal	Pass
		1732.5	-2.84	3.27	27.61	21.5	141.254	Horizontal	Pass
		1753.5	-2.60	3.3	27.62	21.72	148.594	Horizontal	Pass
5.0MHz Band QPSK	1/0	1712.5	-1.48	3.13	27.63	23.02	200.447	Horizontal	Pass
		1732.5	-1.36	3.27	27.61	22.98	198.609	Horizontal	Pass
		1752.5	-1.70	3.3	27.6	22.6	181.970	Horizontal	Pass
5.0MHz Band 16 QAM	1/0	1712.5	-2.96	3.13	27.63	21.54	142.561	Horizontal	Pass
		1732.5	-2.79	3.27	27.61	21.55	142.889	Horizontal	Pass
		1752.5	-2.64	3.3	27.6	21.66	146.555	Horizontal	Pass
10.0MHz Band QPSK	1/0	1715	-2.12	3.15	27.64	22.37	172.584	Horizontal	Pass
		1732.5	-1.42	3.31	27.61	22.88	194.089	Horizontal	Pass
		1750	-1.36	3.33	27.59	22.9	194.984	Horizontal	Pass
10.0MHz Band 16 QAM	1/0	1715	-2.76	3.15	27.64	21.73	148.936	Horizontal	Pass
		1732.5	-2.25	3.31	27.61	22.05	160.325	Horizontal	Pass
		1750	-2.60	3.33	27.59	21.66	146.555	Horizontal	Pass
15.0MHz Band QPSK	1/0	1717.5	-1.98	3.15	27.65	22.52	178.649	Horizontal	Pass
		1732.5	-1.23	3.31	27.61	23.07	202.768	Horizontal	Pass
		1747.5	-2.11	3.33	27.57	22.13	163.305	Horizontal	Pass
15.0MHz Band 16 QAM	1/0	1717.5	-2.65	3.15	27.65	21.85	153.109	Horizontal	Pass
		1732.5	-2.70	3.31	27.61	21.6	144.544	Horizontal	Pass
		1747.5	-2.56	3.33	27.57	21.68	147.231	Horizontal	Pass
20.0MHz Band	1/0	1720	-1.20	3.17	27.66	23.29	213.304	Horizontal	Pass
		1732.5	-1.66	3.32	27.61	22.63	183.231	Horizontal	Pass

QPSK		1745	-1.54	3.36	27.56	22.66	184.502	Horizontal	Pass
20.0MH	1/0	1720	-2.69	3.17	27.66	21.8	151.356	Horizontal	Pass
z Band		1732.5	-2.72	3.32	27.61	21.57	143.549	Horizontal	Pass
16 QAM		1745	-2.07	3.36	27.56	22.13	163.305	Horizontal	Pass

**Note:**

SG Level= Signal generator output

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

8.4 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm )	Cabl e Loss (dBm )	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	1/0	2502.5	0.91	4.54	27.75	24.12	258.226	Vertical	Pass
		2535	1.00	4.69	27.72	24.03	252.930	Vertical	Pass
		2567.5	1.01	4.71	27.71	24.01	251.768	Vertical	Pass
5.0MHz Band 16 QAM	1/0	2502.5	-0.24	4.54	27.75	22.97	198.153	Vertical	Pass
		2535	0.07	4.69	27.72	23.1	204.174	Vertical	Pass
		2567.5	-0.07	4.71	27.71	22.93	196.336	Vertical	Pass
10.0MH z Band QPSK	1/0	2505	0.97	4.55	27.76	24.18	261.818	Vertical	Pass
		2535	1.30	4.69	27.72	24.33	271.019	Vertical	Pass
		2565	0.85	4.72	27.7	23.83	241.546	Vertical	Pass
10.0MH z Band 16 QAM	1/0	2505	-0.50	4.55	27.76	22.71	186.638	Vertical	Pass
		2535	0.15	4.69	27.72	23.18	207.970	Vertical	Pass
		2565	0.51	4.72	27.7	23.49	223.357	Vertical	Pass
15.0MH z Band QPSK	1/0	2507.5	0.75	4.55	27.77	23.97	249.459	Vertical	Pass
		2535	1.01	4.69	27.72	24.04	253.513	Vertical	Pass
		2562.5	1.00	4.72	27.69	23.97	249.459	Vertical	Pass
15.0MH z Band 16 QAM	1/0	2507.5	-0.03	4.55	27.77	23.19	208.449	Vertical	Pass
		2535	-0.55	4.69	27.72	22.48	177.011	Vertical	Pass
		2562.5	-0.33	4.72	27.69	22.64	183.654	Vertical	Pass
20.0MH z Band QPSK	1/0	2510	-0.29	4.57	27.78	22.92	195.884	Vertical	Pass
		2535	0.78	4.73	27.72	23.77	238.232	Vertical	Pass
		2560	0.82	4.75	27.68	23.75	237.137	Vertical	Pass
20.0MH z Band 16 QAM	1/0	2510	0.54	4.57	27.78	23.75	237.137	Vertical	Pass
		2535	1.07	4.73	27.72	24.06	254.683	Vertical	Pass
		2560	0.76	4.75	27.68	23.69	233.884	Vertical	Pass

Note:

SG Level= Signal generator output

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



Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm )	Cabl e Loss (dBm )	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	1/0	2502.5	0.79	4.54	27.75	24	251.189	Horizontal	Pass
		2535	0.87	4.69	27.72	23.9	245.471	Horizontal	Pass
		2567.5	0.78	4.71	27.71	23.78	238.781	Horizontal	Pass
5.0MHz Band 16 QAM	1/0	2502.5	-0.52	4.54	27.75	22.69	185.780	Horizontal	Pass
		2535	-0.34	4.69	27.72	22.69	185.780	Horizontal	Pass
		2567.5	-0.36	4.71	27.71	22.64	183.654	Horizontal	Pass
10.0MH z Band QPSK	1/0	2505	0.50	4.55	27.76	23.71	234.963	Horizontal	Pass
		2535	0.61	4.69	27.72	23.64	231.206	Horizontal	Pass
		2565	0.64	4.72	27.7	23.62	230.144	Horizontal	Pass
10.0MH z Band 16 QAM	1/0	2505	-0.48	4.55	27.76	22.73	187.499	Horizontal	Pass
		2535	-0.55	4.69	27.72	22.48	177.011	Horizontal	Pass
		2565	-0.38	4.72	27.7	22.6	181.970	Horizontal	Pass
15.0MH z Band QPSK	1/0	2507.5	0.44	4.55	27.77	23.66	232.274	Horizontal	Pass
		2535	0.78	4.69	27.72	23.81	240.436	Horizontal	Pass
		2562.5	0.73	4.72	27.69	23.7	234.423	Horizontal	Pass
15.0MH z Band 16 QAM	1/0	2507.5	-0.75	4.55	27.77	22.47	176.604	Horizontal	Pass
		2535	-0.49	4.69	27.72	22.54	179.473	Horizontal	Pass
		2562.5	-0.33	4.72	27.69	22.64	183.654	Horizontal	Pass
20.0MH z Band QPSK	1/0	2510	-1.86	4.57	27.78	21.35	136.458	Horizontal	Pass
		2535	0.10	4.73	27.72	23.09	203.704	Horizontal	Pass
		2560	0.23	4.75	27.68	23.16	207.014	Horizontal	Pass
20.0MH z Band 16 QAM	1/0	2510	-0.55	4.57	27.78	22.66	184.502	Horizontal	Pass
		2535	-0.51	4.73	27.72	22.48	177.011	Horizontal	Pass
		2560	0.36	4.75	27.68	23.29	213.304	Horizontal	Pass

Note:

SG Level= Signal generator output

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

## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

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

### LIMIT

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

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

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

### TEST PROCEDURE

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

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

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

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

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

**MODES TESTED**

- LTE Band 2
- LTE Band 4
- LTE Band 7

**RESULTS**

PASS

**Below 1G:**

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
109.26	-63.3	1.81	19.2	-45.91	-13	-32.91	Horizontal
225.23	-73.42	1.82	19.31	-55.93	-13	-42.93	Vertical
114.11	-66.31	1.82	19.22	-48.91	-13	-35.91	Vertical
218.36	-63.56	1.91	19.24	-46.23	-13	-33.23	Horizontal
Test Results for Mid Channel 1880MHz							
106.89	-64.36	1.81	18.11	-48.06	-13	-35.06	Horizontal
225.23	-73.42	1.82	19.2	-56.04	-13	-43.04	Vertical
345.81	-76.56	1.91	19.34	-59.13	-13	-46.13	Vertical
538.53	-73.77	1.94	19.21	-56.5	-13	-43.5	Horizontal
Test Results for High Channel 1909.3MHz							
103.5	-62.3	1.81	19.2	-44.91	-13	-31.91	Horizontal
225.23	-73.42	1.82	19.33	-55.91	-13	-42.91	Vertical
372.89	-75.39	1.91	19.22	-58.08	-13	-45.08	Vertical
580.17	-75.39	1.94	19.21	-58.12	-13	-45.12	Horizontal

**Note:**

1. Pre-test tests all modes, only the worst mode data is recorded in the report
2. All other emissions more than 20dB below the limit

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-50.93	4.04	33.51	-21.46	-13	-8.46	Horizontal
3701.4	-49.98	4.04	33.51	-20.51	-13	-7.51	Vertical
5552.1	-52.22	5.24	35.84	-21.62	-13	-8.62	Vertical
5552.1	-54.33	5.24	35.84	-23.73	-13	-10.73	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-53.28	4.04	33.56	-23.76	-13	-10.76	Horizontal
3760	-49.61	4.04	33.56	-20.09	-13	-7.09	Vertical
5640	-51.00	5.24	35.91	-20.33	-13	-7.33	Vertical
5640	-50.59	5.24	35.91	-19.92	-13	-6.92	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-53.28	4.04	34.00	-23.32	-13	-10.32	Horizontal
3818.6	-54.72	4.04	34.00	-24.76	-13	-11.76	Vertical
5727.9	-55.15	5.24	36.04	-24.35	-13	-11.35	Vertical
5727.9	-54.37	5.24	36.04	-23.57	-13	-10.57	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-54.43	4.07	33.54	-24.96	-13	-11.96	Horizontal
3720	-48.32	4.07	33.54	-18.85	-13	-5.85	Vertical
5580	-55.48	5.28	35.86	-24.90	-13	-11.90	Vertical
5580	-54.70	5.28	35.86	-24.12	-13	-11.12	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-52.17	4.04	33.56	-22.65	-13	-9.65	Horizontal
3760	-46.06	4.04	33.56	-16.54	-13	-3.54	Vertical
5640	-53.22	5.24	35.91	-22.55	-13	-9.55	Vertical
5640	-52.44	5.24	35.91	-21.77	-13	-8.77	Horizontal
Test Results for High Channel 1900MHz							
3800	-52.17	4.04	34.00	-22.21	-13	-9.21	Horizontal
3800	-46.06	4.04	34.00	-16.10	-13	-3.10	Vertical
5700	-53.22	5.24	36.04	-22.42	-13	-9.42	Vertical
5700	-52.44	5.24	36.04	-21.64	-13	-8.64	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-52.23	4.02	29.80	-26.45	-13	-13.45	Horizontal
3421.4	-51.36	4.02	29.80	-25.58	-13	-12.58	Vertical
5132.1	-52.19	5.24	35.84	-21.59	-13	-8.59	Vertical
5132.1	-53.32	5.24	35.84	-22.72	-13	-9.72	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-54.33	4.03	30.00	-28.36	-13	-15.36	Horizontal
3465.0	-50.06	4.03	30.00	-24.09	-13	-11.09	Vertical
5197.5	-52.21	5.25	35.86	-21.60	-13	-8.60	Vertical
5197.5	-51.69	5.25	35.86	-21.08	-13	-8.08	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-52.22	4.05	30.01	-26.26	-13	-13.26	Horizontal
3508.6	-55.58	4.05	30.01	-29.62	-13	-16.62	Vertical
5262.9	-54.36	5.26	35.86	-23.76	-13	-10.76	Vertical
5262.9	-51.89	5.26	35.86	-21.29	-13	-8.29	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-50.52	4.02	29.80	-24.74	-13	-11.74	Horizontal
3440.0	-50.57	4.02	29.80	-24.79	-13	-11.79	Vertical
5160.0	-56.81	5.24	35.84	-26.21	-13	-13.21	Vertical
5160.0	-54.67	5.24	35.84	-24.07	-13	-11.07	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.07	4.03	30.00	-23.10	-13	-10.10	Horizontal
3465.0	-51.94	4.03	30.00	-25.97	-13	-12.97	Vertical
5197.5	-53.45	5.25	35.86	-22.84	-13	-9.84	Vertical
5197.5	-51.32	5.25	35.86	-20.71	-13	-7.71	Horizontal
Test Results for High Channel 1745MHz							
2490.0	-49.15	2.91	27.68	-24.38	-13	-11.38	Horizontal
3490.0	-50.47	2.91	27.68	-25.70	-13	-12.70	Vertical
5235.0	-51.24	5.26	35.86	-20.64	-13	-7.64	Vertical
5235.0	-52.41	5.26	35.86	-21.81	-13	-8.81	Horizontal

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

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

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

9.3 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.00	-62.96	5.23	35.81	-32.38	-25	-7.38	Horizontal
5005.00	-60.45	5.23	35.81	-29.87	-25	-4.87	Vertical
7507.50	-63.80	5.67	36.85	-32.62	-25	-7.62	Vertical
7507.50	-63.26	5.67	36.85	-32.08	-25	-7.08	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.08	5.23	35.82	-32.49	-25	-7.49	Horizontal
5070.0	-63.83	5.23	35.82	-33.24	-25	-8.24	Vertical
7605.0	-64.86	5.67	36.85	-33.68	-25	-8.68	Vertical
7605.0	-66.16	5.67	36.85	-34.98	-25	-9.98	Horizontal
Test Results for High Channel 2567.5MHz							
5135.00	-68.31	5.24	35.83	-37.72	-25	-12.72	Horizontal
5135.00	-65.63	5.24	35.83	-35.04	-25	-10.04	Vertical
7702.50	-66.49	5.68	36.87	-35.30	-25	-10.30	Vertical
7702.50	-70.15	5.68	36.87	-38.96	-25	-13.96	Horizontal

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

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020	-66.45	5.23	35.82	-35.86	-25	-10.86	Horizontal
5020	-65.60	5.23	35.82	-35.01	-25	-10.01	Vertical
7530	-65.57	5.67	36.86	-34.38	-25	-9.38	Vertical
7530	-61.81	5.67	36.86	-30.62	-25	-5.62	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-63.18	5.23	35.82	-32.59	-25	-7.59	Horizontal
5070	-63.83	5.23	35.82	-33.24	-25	-8.24	Vertical
7605	-64.07	5.67	36.85	-32.89	-25	-7.89	Vertical
7605	-63.26	5.67	36.85	-32.08	-25	-7.08	Horizontal
Test Results for High Channel 2560MHz							
5120	-66.32	5.24	35.83	-35.73	-25	-10.73	Horizontal
5120	-63.75	5.24	35.83	-33.16	-25	-8.16	Vertical
7680	-67.86	5.70	36.88	-36.68	-25	-11.68	Vertical
7680	-66.30	5.70	36.88	-35.12	-25	-10.12	Horizontal

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

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

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

## 10. FREQUENCY STABILITY

### RULE PART(S)

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

### LIMITS

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

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

### TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
- Voltage = low voltage, DC 3.6V, Normal, DC 3.8V and High voltage, DC 4.2V.

### Frequency Stability vs Temperature:

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

### Frequency Stability vs Voltage:

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

### MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 7

## RESULTS

See the following pages.



10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	1880	9.56	0.005085	2.5
3.8	1880	-9.34	-0.004968	2.5
4.2	1880	12.86	0.006840	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1880	7.76	0.004128	2.5
Extreme (50C)	1880	-3.44	-0.001830	2.5
Extreme (40C)	1880	-4.64	-0.002468	2.5
Extreme (30C)	1880	-3.24	-0.001723	2.5
Extreme (10C)	1880	11.46	0.006096	2.5
Extreme (0C)	1880	14.16	0.007532	2.5
Extreme (-10C)	1880	13.06	0.006947	2.5
Extreme (-20C)	1880	12.56	0.006681	2.5
Extreme (-30C)	1880	-3.74	-0.001989	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	1880	13.36	0.007106	2.5
3.8	1880	8.66	0.004606	2.5
4.2	1880	10.16	0.005404	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1880	-6.84	-0.003638	2.5
Extreme (50C)	1880	7.76	0.004128	2.5
Extreme (40C)	1880	-2.74	-0.001457	2.5
Extreme (30C)	1880	13.06	0.006947	2.5
Extreme (10C)	1880	-8.14	-0.004330	2.5
Extreme (0C)	1880	-6.54	-0.003479	2.5
Extreme (-10C)	1880	-7.44	-0.003957	2.5
Extreme (-20C)	1880	-4.24	-0.002255	2.5
Extreme (-30C)	1880	9.86	0.005245	2.5

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

10.2 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	1732.5	13.66	0.007885	2.5
3.8	1732.5	7.76	0.004479	2.5
4.2	1732.5	9.46	0.005460	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1732.5	12.86	0.007423	2.5
Extreme (50C)	1732.5	8.56	0.004941	2.5
Extreme (40C)	1732.5	9.66	0.005576	2.5
Extreme (30C)	1732.5	9.86	0.005691	2.5
Extreme (10C)	1732.5	11.46	0.006615	2.5
Extreme (0C)	1732.5	13.76	0.007942	2.5
Extreme (-10C)	1732.5	11.46	0.006615	2.5
Extreme (-20C)	1732.5	12.66	0.007307	2.5
Extreme (-30C)	1732.5	7.16	0.004133	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	1732.5	9.96	0.005749	2.5
3.8	1732.5	9.36	0.005403	2.5
4.2	1732.5	7.76	0.004479	2.5

**Frequency error vs. Temperature**

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	1732.5	10.56	0.006095	2.5
Extreme (50C)	1732.5	11.96	0.006903	2.5
Extreme (40C)	1732.5	10.36	0.005980	2.5
Extreme (30C)	1732.5	8.86	0.005114	2.5
Extreme (10C)	1732.5	12.06	0.006961	2.5
Extreme (0C)	1732.5	10.86	0.006268	2.5
Extreme (-10C)	1732.5	11.06	0.006384	2.5
Extreme (-20C)	1732.5	10.46	0.006038	2.5
Extreme (-30C)	1732.5	10.56	0.006095	2.5

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

10.3 LTE BAND 7

QPSK, (20MHz BANDWIDTH)

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	2535	11.36	0.004481	2.5
3.8	2535	9.26	0.003653	2.5
4.2	2535	11.86	0.004679	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	2535	6.06	0.002391	2.5
Extreme (50C)	2535	10.66	0.004205	2.5
Extreme (40C)	2535	13.86	0.005467	2.5
Extreme (30C)	2535	15.86	0.006256	2.5
Extreme (10C)	2535	11.46	0.004521	2.5
Extreme (0C)	2535	8.86	0.003495	2.5
Extreme (-10C)	2535	13.06	0.005152	2.5
Extreme (-20C)	2535	14.96	0.005901	2.5
Extreme (-30C)	2535	11.26	0.004442	2.5

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

**Frequency error vs. Voltage**

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
3.6	2535	12.86	0.005073	2.5
3.8	2535	6.86	0.002706	2.5
4.2	2535	9.46	0.003732	2.5

**Frequency error vs. Temperature**

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
<b>BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)</b>				
Normal (25C)	2535	5.96	0.002351	2.5
Extreme (50C)	2535	9.56	0.003771	2.5
Extreme (40C)	2535	10.36	0.004087	2.5
Extreme (30C)	2535	11.66	0.004600	2.5
Extreme (10C)	2535	14.06	0.005546	2.5
Extreme (0C)	2535	11.36	0.004481	2.5
Extreme (-10C)	2535	11.46	0.004521	2.5
Extreme (-20C)	2535	6.66	0.002627	2.5
Extreme (-30C)	2535	9.06	0.003574	2.5

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

## 11. Peak-to-Average Ratio

### 11.1 Description of the PAR Measurement

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

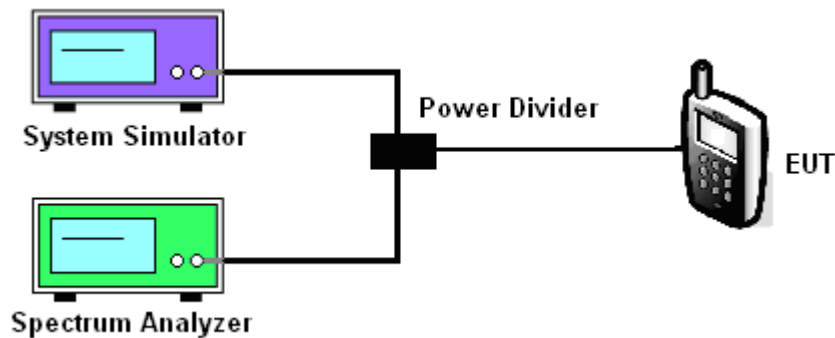
### 11.2 Measuring Instruments

See list of measuring instruments of this test report.

### 11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
  - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
  - b. Set EUT in maximum power output, and triggered the burst signal.
  - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

### 11.4 Test Setup



#### MODES TESTED

- LTE Band2
- LTE Band 4
- LTE Band 7

Test data reference attachment.

----END OF REPORT----