FCC CFR47 PART 24E, 27
CERTIFICATION TEST REPORT
FCC ID: O550182723

Product: 4G DESK PHONE

Trade Mark: LOGIC

Model No.: FIXO 800L

Family Model: N/A

Report No.: STR230329001002E

Issue Date: Jun 27, 2023

Prepared for

SWAGTEK

10205 NW 19th Street STE101Miami, FL 33172

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	SWAGTEK
Address	:	10205 NW 19th Street STE101Miami, FL 33172
Manufacturer's Name	:	SWAGTEK
Address	:	10205 NW 19th Street STE101Miami, FL 33172
Product name	:	4G DESK PHONE
Model and/or type reference	:	FIXO 800L
Trade Mark	:	LOGIC
Family Model	:	N/A
Test Sample Number		T230329001R003
Standards	:	FCC CFR 47, 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..... Apr 10, 2023 ~ Jun 27, 2023

Date of Issue..... Jun 27, 2023

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

Testing Engineer : 

(Allen Liu)

Authorized Signatory : 

(Alex Li)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	4G DESK PHONE
Trade Mark	LOGIC
Model Name	FIXO 800L
Family Model	N/A
Model Difference	N/A
FCC ID:	O550182723
Frequency Bands:	U.S. Bands: ☒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/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	3.5 dBi
Adapter	MODEL: XH005W050100USCD INPUT: 100-240V~50/60Hz 0.2A OUTPUT: 5V⎓1A
Battery	N/A
Power supply	DC 5V from adapter
Extreme Vol. Limits:	DC 4.5V to DC 5.5V (Nominal DC 5V)（Note 1）
HW Version	KL1701_HWV01
SW Version	LOGIC_FIXO 800L_CLARO_DR
** Note1: The High Voltage DC 5.5V and Low Voltage DC 4.5V 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: O550182723** filing to comply with the FCC Part 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 24, Part 27, ANSI C63.26:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

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

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

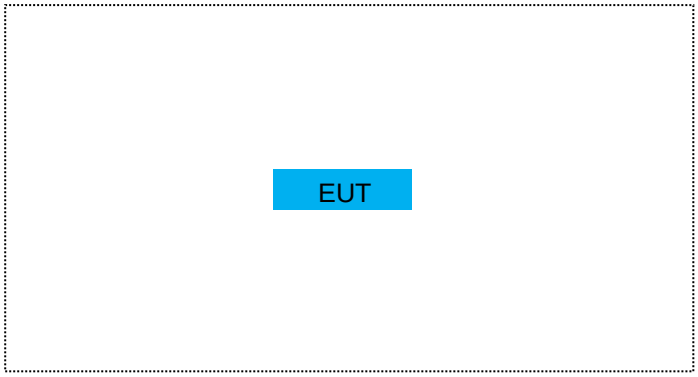
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	4G DESK PHONE	FIXO 800L	FCC ID: O550182723	EUT

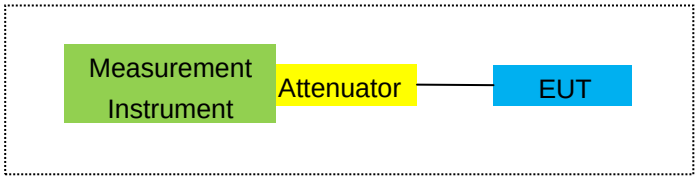
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

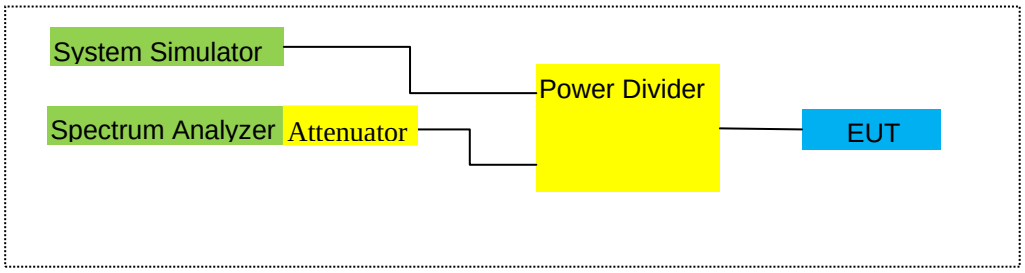
For Radiated Test Cases



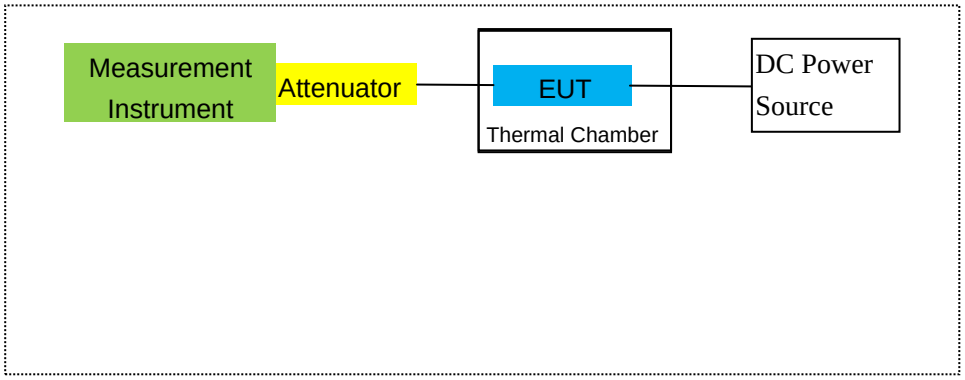
For Conducted Output Power



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



For Frequency Stability



3.TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2022.06.17 2023.06.15	2023.06.16 2024.06.14	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	2020.05.11 2023.05.06	2023.05.10 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	2022.06.17 2023.06.15	2023.06.16 2024.06.14	1 year
7	Amplifier	EM	EM-30180	060538	2022.06.17 2023.06.15	2023.06.16 2024.06.14	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	2022.06.17 2023.06.15	2023.06.16 2024.06.14	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	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11 2023.05.06	2023.05.10 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	2022.06.17 2023.06.15	2023.06.16 2024.06.14	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	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2022.06.17 2023.06.15	2023.06.16 2024.06.14	1 year
29	Communication Tester	R&S	CMW500	148500	2022.06.17 2023.06.15	2023.06.16 2024.06.14	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	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 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	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	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 2/4/7

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §24.238, §27.53

LIMITS

FCC: §24.238, §27.53

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/4/7

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051,§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 2/4/7

□

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, §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 2/4/7

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 Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-2.68	3.76	28.24	21.80	151.356	Horizontal	Pass
		1880	-2.49	3.91	28.22	21.82	152.055	Horizontal	Pass
		1909.3	-2.40	3.93	28.20	21.87	153.815	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-2.74	3.77	28.23	21.72	148.594	Horizontal	Pass
		1880	-2.59	3.91	28.24	21.74	149.279	Horizontal	Pass
		1908.5	-2.46	3.94	28.25	21.85	153.109	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.63	3.77	28.31	21.91	155.239	Horizontal	Pass
		1880	-2.25	3.91	28.22	22.06	160.694	Horizontal	Pass
		1907.5	-2.18	3.94	28.20	22.08	161.436	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-2.49	3.79	28.33	22.05	160.325	Horizontal	Pass
		1880	-2.19	3.95	28.22	22.08	161.436	Horizontal	Pass
		1905	-2.08	3.97	28.19	22.14	163.682	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-2.45	3.79	28.34	22.10	162.181	Horizontal	Pass
		1880	-2.24	3.95	28.22	22.03	159.588	Horizontal	Pass
		1902.5	-2.10	3.97	28.18	22.11	162.555	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-2.44	3.81	28.35	22.10	162.181	Horizontal	Pass
		1880	-2.11	3.96	28.22	**22.15**	164.059	Horizontal	Pass
		1900	-2.05	4.00	28.16	22.11	162.555	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-3.87	3.76	28.24	20.61	115.080	Vertical	Pass
		1880	-3.08	3.91	28.22	21.23	132.739	Vertical	Pass
		1909.3	-3.71	3.93	28.20	20.56	113.763	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.66	3.77	28.23	20.80	120.226	Vertical	Pass
		1880	-3.49	3.91	28.24	20.84	121.339	Vertical	Pass
		1908.5	-3.42	3.94	28.25	20.89	122.744	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.65	3.77	28.31	20.89	122.744	Vertical	Pass
		1880	-3.48	3.91	28.22	20.83	121.060	Vertical	Pass
		1907.5	-3.72	3.94	28.20	20.54	113.240	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.06	3.79	28.33	21.48	140.605	Vertical	Pass
		1880	-3.67	3.95	28.22	20.60	114.815	Vertical	Pass
		1905	-3.44	3.97	28.19	20.78	119.674	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-3.23	3.79	28.34	21.32	135.519	Vertical	Pass

Band		1880	-2.94	3.95	28.22	21.33	135.831	Vertical	Pass
QPSK		1902.5	-2.89	3.97	28.18	21.32	135.519	Vertical	Pass
20.0MHz		1860	-3.12	3.81	28.35	21.42	138.676	Vertical	Pass
Band	1/#Mid	1880	-3.59	3.96	28.22	20.67	116.681	Vertical	Pass
QPSK		1900	-2.75	4.00	28.16	21.41	138.357	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 Average (mW)	Polarization Of Max. ERP	
1.4MHz		1850.7	-3.80	3.76	28.24	20.68	116.950	Horizontal	Pass
Band 16	1/#Mid	1880	-3.27	3.91	28.22	21.04	127.057	Horizontal	Pass
QAM		1909.3	-3.20	3.93	28.20	21.07	127.938	Horizontal	Pass
3.0MHz		1851.5	-3.30	3.77	28.23	21.16	130.617	Horizontal	Pass
Band 16	1/#Mid	1880	-3.38	3.91	28.24	20.95	124.451	Horizontal	Pass
QAM		1908.5	-3.59	3.94	28.25	20.72	118.032	Horizontal	Pass
5.0MHz		1852.5	-3.24	3.77	28.31	21.30	134.896	Horizontal	Pass
Band 16	1/#Mid	1880	-3.15	3.91	28.22	21.16	130.617	Horizontal	Pass
QAM		1907.5	-2.83	3.94	28.20	21.43	138.995	Horizontal	Pass
10.0MHz		1855	-3.29	3.79	28.33	21.25	133.352	Horizontal	Pass
Band 16	1/#Mid	1880	-3.28	3.95	28.22	20.99	125.603	Horizontal	Pass
QAM		1905	-2.75	3.97	28.19	21.47	140.281	Horizontal	Pass
15.0MHz		1857.5	-3.27	3.79	28.34	21.28	134.276	Horizontal	Pass
Band 16	1/#Mid	1880	-3.06	3.95	28.22	21.21	132.130	Horizontal	Pass
QAM		1902.5	-3.02	3.97	28.18	21.19	131.522	Horizontal	Pass
20.0MHz		1860	-3.16	3.81	28.35	21.38	137.404	Horizontal	Pass
Band 16	1/#Mid	1880	-2.86	3.96	28.22	21.40	138.038	Horizontal	Pass
QAM		1900	-2.68	4.00	28.16	**21.48**	140.605	Horizontal	Pass
1.4MHz		1850.7	-4.60	3.76	28.24	19.88	97.275	Vertical	Pass
Band 16	1/#Mid	1880	-4.39	3.91	28.22	19.92	98.175	Vertical	Pass
QAM		1909.3	-4.15	3.93	28.20	20.12	102.802	Vertical	Pass
3.0MHz		1851.5	-4.75	3.77	28.23	19.71	93.541	Vertical	Pass
Band 16	1/#Mid	1880	-4.21	3.91	28.24	20.12	102.802	Vertical	Pass
QAM		1908.5	-4.30	3.94	28.25	20.01	100.231	Vertical	Pass
5.0MHz		1852.5	-4.19	3.77	28.31	20.35	108.393	Vertical	Pass
Band 16	1/#Mid	1880	-4.52	3.91	28.22	19.79	95.280	Vertical	Pass
QAM		1907.5	-3.82	3.94	28.20	20.44	110.662	Vertical	Pass
10.0MHz		1855	-4.51	3.79	28.33	20.03	100.693	Vertical	Pass
Band 16	1/#Mid	1880	-3.80	3.95	28.22	20.47	111.429	Vertical	Pass
QAM		1905	-4.49	3.97	28.19	19.73	93.972	Vertical	Pass
15.0MHz		1857.5	-4.92	3.79	28.34	19.63	91.833	Vertical	Pass
Band 16	1/#Mid	1880	-4.54	3.95	28.22	19.73	93.972	Vertical	Pass
QAM		1902.5	-3.76	3.97	28.18	20.45	110.917	Vertical	Pass

20.0MHz	1/#Mid	1860	-4.62	3.81	28.35	19.92	98.175	Vertical	Pass
Band 16		1880	-4.04	3.96	28.22	20.22	105.196	Vertical	Pass
QAM		1900	-4.61	4.00	28.16	19.55	90.157	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)
Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-2.59	3.12	27.58	21.87	153.815	Horizontal	Pass
		1732.5	-2.58	3.27	27.61	21.76	149.968	Horizontal	Pass
		1754.3	-2.56	3.29	27.63	21.78	150.661	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.76	3.13	27.61	21.72	148.594	Horizontal	Pass
		1732.5	-2.68	3.27	27.61	21.66	146.555	Horizontal	Pass
		1753.5	-2.60	3.30	27.62	21.72	148.594	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.53	3.13	27.63	21.97	157.398	Horizontal	Pass
		1732.5	-2.43	3.27	27.61	21.91	155.239	Horizontal	Pass
		1752.5	-2.31	3.30	27.60	21.99	158.125	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.47	3.15	27.64	22.02	159.221	Horizontal	Pass
		1732.5	-2.24	3.31	27.61	22.06	160.694	Horizontal	Pass
		1750	-2.26	3.33	27.59	22.00	158.489	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-2.48	3.15	27.65	22.02	159.221	Horizontal	Pass
		1732.5	-2.32	3.31	27.61	21.98	157.761	Horizontal	Pass
		1747.5	-2.26	3.33	27.57	21.98	157.761	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.42	3.17	27.66	**22.07**	161.065	Horizontal	Pass
		1732.5	-2.25	3.32	27.61	22.04	159.956	Horizontal	Pass
		1745	-2.19	3.36	27.56	22.01	158.855	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-3.90	3.12	27.58	20.56	113.763	Vertical	Pass
		1732.5	-3.45	3.27	27.61	20.89	122.744	Vertical	Pass
		1754.3	-3.61	3.29	27.63	20.73	118.304	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.94	3.13	27.61	20.54	113.240	Vertical	Pass
		1732.5	-3.45	3.27	27.61	20.89	122.744	Vertical	Pass
		1753.5	-2.82	3.30	27.62	21.50	141.254	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.33	3.13	27.63	21.17	130.918	Vertical	Pass
		1732.5	-3.26	3.27	27.61	21.08	128.233	Vertical	Pass
		1752.5	-3.14	3.30	27.60	21.16	130.617	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.32	3.15	27.64	21.17	130.918	Vertical	Pass
		1732.5	-3.32	3.31	27.61	20.98	125.314	Vertical	Pass
		1750	-3.15	3.33	27.59	21.11	129.122	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-3.07	3.15	27.65	21.43	138.995	Vertical	Pass

Band		1732.5	-3.49	3.31	27.61	20.81	120.504	Vertical	Pass
QPSK		1747.5	-3.26	3.33	27.57	20.98	125.314	Vertical	Pass
20.0MHz		1720	-3.09	3.17	27.66	21.40	138.038	Vertical	Pass
Band	1/#Mid	1732.5	-3.37	3.32	27.61	20.92	123.595	Vertical	Pass
QPSK		1745	-3.56	3.36	27.56	20.64	115.878	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.40	3.12	27.58	21.06	127.644	Horizontal	Pass
		1732.5	-3.25	3.27	27.61	21.09	128.529	Horizontal	Pass
		1754.3	-3.25	3.29	27.63	21.09	128.529	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.34	3.13	27.61	21.14	130.017	Horizontal	Pass
		1732.5	-3.47	3.27	27.61	20.87	122.180	Horizontal	Pass
		1753.5	-3.69	3.30	27.62	20.63	115.611	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.17	3.13	27.63	21.33	135.831	Horizontal	Pass
		1732.5	-3.13	3.27	27.61	21.21	132.130	Horizontal	Pass
		1752.5	-2.82	3.30	27.60	21.48	140.605	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.24	3.15	27.64	21.25	133.352	Horizontal	Pass
		1732.5	-3.43	3.31	27.61	20.87	122.180	Horizontal	Pass
		1750	-2.81	3.33	27.59	21.45	139.637	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.04	3.15	27.65	21.46	139.959	Horizontal	Pass
		1732.5	-3.10	3.31	27.61	21.20	131.826	Horizontal	Pass
		1747.5	-3.12	3.33	27.57	21.12	129.420	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-2.99	3.17	27.66	**21.50**	141.254	Horizontal	Pass
		1732.5	-3.00	3.32	27.61	21.29	134.586	Horizontal	Pass
		1745	-2.81	3.36	27.56	21.39	137.721	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.27	3.12	27.58	20.19	104.472	Vertical	Pass
		1732.5	-4.80	3.27	27.61	19.54	89.950	Vertical	Pass
		1754.3	-4.10	3.29	27.63	20.24	105.682	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.41	3.13	27.61	20.07	101.625	Vertical	Pass
		1732.5	-4.18	3.27	27.61	20.16	103.753	Vertical	Pass
		1753.5	-4.53	3.30	27.62	19.79	95.280	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.75	3.13	27.63	19.75	94.406	Vertical	Pass
		1732.5	-4.52	3.27	27.61	19.82	95.940	Vertical	Pass
		1752.5	-4.62	3.30	27.60	19.68	92.897	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.15	3.15	27.64	20.34	108.143	Vertical	Pass
		1732.5	-4.74	3.31	27.61	19.56	90.365	Vertical	Pass
		1750	-4.16	3.33	27.59	20.10	102.329	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.23	3.15	27.65	20.27	106.414	Vertical	Pass
		1732.5	-3.93	3.31	27.61	20.37	108.893	Vertical	Pass
		1747.5	-3.73	3.33	27.57	20.51	112.460	Vertical	Pass

20.0MHz	1/#Mid	1720	-4.52	3.17	27.66	19.97	99.312	Vertical	Pass
Band 16		1732.5	-4.09	3.32	27.61	20.20	104.713	Vertical	Pass
QAM		1745	-4.40	3.36	27.56	19.80	95.499	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)
Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

8.4 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz	1/#Mid	2502.5	-0.87	4.54	27.75	22.34	171.396	Horizontal	Pass
Band		2535	-0.70	4.69	27.72	22.33	171.002	Horizontal	Pass
QPSK		2567.5	-0.63	4.71	27.71	22.37	172.584	Horizontal	Pass
10.0MHz	1/#Mid	2505	-0.80	4.55	27.76	22.41	174.181	Horizontal	Pass
Band		2535	-0.61	4.69	27.72	22.42	174.582	Horizontal	Pass
QPSK		2565	-0.53	4.72	27.70	22.45	175.792	Horizontal	Pass
15.0MHz	1/#Mid	2507.5	-0.81	4.55	27.77	22.41	174.181	Horizontal	Pass
Band		2535	-0.67	4.69	27.72	22.36	172.187	Horizontal	Pass
QPSK		2562.5	-0.57	4.72	27.69	22.40	173.780	Horizontal	Pass
20.0MHz	1/#Mid	2510	-0.75	4.57	27.78	**22.46**	176.198	Horizontal	Pass
Band		2535	-0.57	4.73	27.72	22.42	174.582	Horizontal	Pass
QPSK		2560	-0.53	4.75	27.68	22.40	173.780	Horizontal	Pass
5.0MHz	1/#Mid	2502.5	-1.91	4.54	27.75	21.30	134.896	Vertical	Pass
Band		2535	-2.10	4.69	27.72	20.93	123.880	Vertical	Pass
QPSK		2567.5	-2.38	4.71	27.71	20.62	115.345	Vertical	Pass
10.0MHz	1/#Mid	2505	-2.08	4.55	27.76	21.13	129.718	Vertical	Pass
Band		2535	-1.74	4.69	27.72	21.29	134.586	Vertical	Pass
QPSK		2565	-1.88	4.72	27.70	21.10	128.825	Vertical	Pass
15.0MHz	1/#Mid	2507.5	-2.43	4.55	27.77	20.79	119.950	Vertical	Pass
Band		2535	-2.37	4.69	27.72	20.66	116.413	Vertical	Pass
QPSK		2562.5	-2.18	4.72	27.69	20.79	119.950	Vertical	Pass
20.0MHz	1/#Mid	2510	-2.28	4.57	27.78	20.93	123.880	Vertical	Pass
Band		2535	-1.72	4.73	27.72	21.27	133.968	Vertical	Pass
QPSK		2560	-1.95	4.75	27.68	20.98	125.314	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.56	4.54	27.75	21.65	146.218	Horizontal	Pass
		2535	-1.25	4.69	27.72	21.78	150.661	Horizontal	Pass
		2567.5	-1.33	4.71	27.71	21.67	146.893	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.45	4.55	27.76	21.76	149.968	Horizontal	Pass
		2535	-1.46	4.69	27.72	21.57	143.549	Horizontal	Pass
		2565	-1.73	4.72	27.70	21.25	133.352	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.63	4.55	27.77	21.59	144.212	Horizontal	Pass
		2535	-1.60	4.69	27.72	21.43	138.995	Horizontal	Pass
		2562.5	-1.21	4.72	27.69	21.76	149.968	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.51	4.57	27.78	21.70	147.911	Horizontal	Pass
		2535	-1.18	4.73	27.72	**21.81**	151.705	Horizontal	Pass
		2560	-1.28	4.75	27.68	21.65	146.218	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-3.48	4.54	27.75	19.73	93.972	Vertical	Pass
		2535	-2.37	4.69	27.72	20.66	116.413	Vertical	Pass
		2567.5	-3.12	4.71	27.71	19.88	97.275	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.08	4.55	27.76	21.13	129.718	Vertical	Pass
		2535	-2.15	4.69	27.72	20.88	122.462	Vertical	Pass
		2565	-2.32	4.72	27.70	20.66	116.413	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.97	4.55	27.77	21.25	133.352	Vertical	Pass
		2535	-3.20	4.69	27.72	19.83	96.161	Vertical	Pass
		2562.5	-2.20	4.72	27.69	20.77	119.399	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.90	4.57	27.78	20.31	107.399	Vertical	Pass
		2535	-2.23	4.73	27.72	20.76	119.124	Vertical	Pass
		2560	-1.46	4.75	27.68	21.47	140.281	Vertical	Pass

Note:

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053,§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 log10(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 Log10 (p), dB; and
b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (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 2/4/7

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	-48.31	4.04	33.51	-18.84	-13	-5.84	Horizontal
3701.4	-49.91	4.04	33.51	-20.44	-13	-7.44	Vertical
5552.1	-52.97	5.24	35.84	-22.37	-13	-9.37	Vertical
5552.1	-50.54	5.24	35.84	-19.94	-13	-6.94	Horizontal
187.8	-39.09	1.43	16.02	-24.50	-13	-11.50	Vertical
429.9	-35.31	1.30	17.99	-18.62	-13	-5.62	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.33	4.04	33.56	-16.81	-13	-3.81	Horizontal
3760.0	-48.44	4.04	33.56	-18.92	-13	-5.92	Vertical
5640.0	-53.07	5.24	35.91	-22.40	-13	-9.40	Vertical
5640.0	-52.78	5.24	35.91	-22.11	-13	-9.11	Horizontal
197.7	-42.34	1.62	16.97	-26.99	-13	-13.99	Vertical
441.4	-37.92	1.74	15.98	-23.69	-13	-10.69	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-50.41	4.04	34.00	-20.45	-13	-7.45	Horizontal
3818.6	-49.82	4.04	34.00	-19.86	-13	-6.86	Vertical
5727.9	-50.72	5.24	36.04	-19.92	-13	-6.92	Vertical
5727.9	-52.02	5.24	36.04	-21.22	-13	-8.22	Horizontal
192.0	-34.40	1.42	17.29	-18.53	-13	-5.53	Vertical
330.0	-34.51	1.50	17.90	-18.10	-13	-5.10	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	-52.02	4.07	33.54	-22.55	-13	-9.55	Horizontal
3720.0	-51.89	4.07	33.54	-22.42	-13	-9.42	Vertical
5580.0	-48.73	5.28	35.86	-18.15	-13	-5.15	Vertical
5580.0	-54.00	5.28	35.86	-23.42	-13	-10.42	Horizontal
210.9	-40.59	1.58	16.89	-25.27	-13	-12.27	Vertical
439.8	-42.29	1.76	17.26	-26.79	-13	-13.79	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.73	4.04	33.56	-19.21	-13	-6.21	Horizontal
3760.0	-49.15	4.04	33.56	-19.63	-13	-6.63	Vertical
5640.0	-51.35	5.24	35.91	-20.68	-13	-7.68	Vertical
5640.0	-49.42	5.24	35.91	-18.75	-13	-5.75	Horizontal
177.5	-40.48	1.46	16.27	-25.67	-13	-12.67	Vertical
465.8	-40.76	1.59	15.15	-27.20	-13	-14.20	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-49.72	4.04	34.00	-19.76	-13	-6.76	Horizontal
3800.0	-50.78	4.04	34.00	-20.82	-13	-7.82	Vertical
5700.0	-53.49	5.24	36.04	-22.69	-13	-9.69	Vertical
5700.0	-51.21	5.24	36.04	-20.41	-13	-7.41	Horizontal
210.3	-39.94	1.36	17.39	-23.90	-13	-10.90	Vertical
404.7	-44.76	1.66	15.39	-31.03	-13	-18.03	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(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	-49.98	4.02	29.80	-24.20	-13	-11.20	Horizontal
3421.4	-53.29	4.02	29.80	-27.51	-13	-14.51	Vertical
5132.1	-47.10	5.24	35.84	-16.50	-13	-3.50	Vertical
5132.1	-52.48	5.24	35.84	-21.88	-13	-8.88	Horizontal
205.4	-40.18	1.68	16.04	-25.82	-13	-12.82	Vertical
251.0	-42.76	1.78	17.74	-26.80	-13	-13.80	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.83	4.03	30.00	-22.86	-13	-9.86	Horizontal
3465.0	-53.74	4.03	30.00	-27.77	-13	-14.77	Vertical
5197.5	-50.27	5.25	35.86	-19.66	-13	-6.66	Vertical
5197.5	-51.40	5.25	35.86	-20.79	-13	-7.79	Horizontal
204.0	-41.81	1.72	17.69	-25.84	-13	-12.84	Vertical
442.9	-41.20	1.62	16.02	-26.79	-13	-13.79	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-51.55	4.05	30.01	-25.59	-13	-12.59	Horizontal
3508.6	-51.94	4.05	30.01	-25.98	-13	-12.98	Vertical
5262.9	-49.07	5.26	35.86	-18.47	-13	-5.47	Vertical
5262.9	-51.12	5.26	35.86	-20.52	-13	-7.52	Horizontal
178.6	-36.86	1.80	16.69	-21.97	-13	-8.97	Vertical
425.6	-44.60	1.75	16.66	-29.70	-13	-16.70	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	-51.70	4.02	29.80	-25.92	-13	-12.92	Horizontal
3440.0	-53.50	4.02	29.80	-27.72	-13	-14.72	Vertical
5160.0	-51.90	5.24	35.84	-21.30	-13	-8.30	Vertical
5160.0	-50.35	5.24	35.84	-19.75	-13	-6.75	Horizontal
208.3	-43.95	1.57	17.26	-28.26	-13	-15.26	Vertical
296.6	-38.99	1.78	16.35	-24.42	-13	-11.42	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.32	4.03	30.00	-27.35	-13	-14.35	Horizontal
3465.0	-50.22	4.03	30.00	-24.25	-13	-11.25	Vertical
5197.5	-51.51	5.25	35.86	-20.90	-13	-7.90	Vertical
5197.5	-51.86	5.25	35.86	-21.25	-13	-8.25	Horizontal
183.1	-38.50	1.44	17.95	-21.99	-13	-8.99	Vertical
403.1	-38.53	1.65	16.09	-24.09	-13	-11.09	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-45.20	2.91	27.68	-20.43	-13	-7.43	Horizontal
3490.0	-45.82	2.91	27.68	-21.05	-13	-8.05	Vertical
5235.0	-52.02	5.26	35.86	-21.42	-13	-8.42	Vertical
5235.0	-51.02	5.26	35.86	-20.42	-13	-7.42	Horizontal
188.1	-40.63	1.61	16.85	-25.39	-13	-12.39	Vertical
307.9	-44.57	1.61	15.19	-30.99	-13	-17.99	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(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 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	-59.23	5.23	35.81	-28.65	-25	-3.65	Horizontal
5005.0	-60.84	5.23	35.81	-30.26	-25	-5.26	Vertical
7507.5	-64.17	5.67	36.85	-32.99	-25	-7.99	Vertical
7507.5	-59.82	5.67	36.85	-28.64	-25	-3.64	Horizontal
188.7	-49.19	1.73	17.97	-32.95	-25	-7.95	Vertical
366.6	-53.54	1.38	15.11	-39.81	-25	-14.81	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.56	5.23	35.82	-28.97	-25	-3.97	Horizontal
5070.0	-61.59	5.23	35.82	-31.00	-25	-6.00	Vertical
7605.0	-62.96	5.67	36.85	-31.78	-25	-6.78	Vertical
7605.0	-60.88	5.67	36.85	-29.70	-25	-4.70	Horizontal
194.4	-47.19	1.77	16.17	-32.78	-25	-7.78	Vertical
401.3	-46.01	1.63	15.21	-32.43	-25	-7.43	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.34	5.24	35.83	-28.75	-25	-3.75	Horizontal
5135.0	-63.45	5.24	35.83	-32.86	-25	-7.86	Vertical
7702.5	-61.31	5.68	36.87	-30.12	-25	-5.12	Vertical
7702.5	-59.58	5.68	36.87	-28.39	-25	-3.39	Horizontal
212.2	-49.35	1.58	17.56	-33.37	-25	-8.37	Vertical
448.1	-51.09	1.45	16.58	-35.96	-25	-10.96	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 Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020.0	-60.46	5.23	35.82	-29.87	-25	-4.87	Horizontal
5020.0	-60.13	5.23	35.82	-29.54	-25	-4.54	Vertical
7530.0	-62.85	5.67	36.86	-31.66	-25	-6.66	Vertical
7530.0	-60.55	5.67	36.86	-29.36	-25	-4.36	Horizontal
211.8	-51.95	1.63	15.76	-37.82	-25	-12.82	Vertical
370.5	-50.50	1.71	15.44	-36.77	-25	-11.77	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.40	5.23	35.82	-30.81	-25	-5.81	Horizontal
5070.0	-59.11	5.23	35.82	-28.52	-25	-3.52	Vertical
7605.0	-59.24	5.67	36.85	-28.06	-25	-3.06	Vertical
7605.0	-64.80	5.67	36.85	-33.62	-25	-8.62	Horizontal
195.5	-51.96	1.79	16.84	-36.90	-25	-11.90	Vertical
241.9	-53.86	1.71	17.64	-37.93	-25	-12.93	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-64.69	5.24	35.83	-34.10	-25	-9.10	Horizontal
5120.0	-62.11	5.24	35.83	-31.52	-25	-6.52	Vertical
7680.0	-60.10	5.70	36.88	-28.92	-25	-3.92	Vertical
7680.0	-60.62	5.70	36.88	-29.44	-25	-4.44	Horizontal
186.3	-47.13	1.79	16.84	-32.07	-25	-7.07	Vertical
424.0	-49.94	1.71	17.64	-34.01	-25	-9.01	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §24.235, §27.54

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±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° to +50°C
- Voltage =low voltage,DC 4.5V, Normal, DC 5V and High voltage, DC 5.5V.

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to -30ºC 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 +50ºC is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2/4/7

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]
4.5	1880	12.5	0.006646	2.5
5	1880	13.6	0.007256	2.5
5.5	1880	13.2	0.007022	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.7	0.006780	2.5
Extreme (50C)	1880	11.3	0.006027	2.5
Extreme (40C)	1880	13.9	0.007402	2.5
Extreme (30C)	1880	13.6	0.007215	2.5
Extreme (10C)	1880	14.0	0.007424	2.5
Extreme (0C)	1880	12.6	0.006688	2.5
Extreme (-10C)	1880	13.3	0.007095	2.5
Extreme (-20C)	1880	14.2	0.007560	2.5
Extreme (-30C)	1880	15.1	0.008010	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]
4.5	1880	9.3	0.004953	2.5
5	1880	9.2	0.004912	2.5
5.5	1880	7.6	0.004064	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.7	0.005138	2.5
Extreme (50C)	1880	8.9	0.004729	2.5
Extreme (40C)	1880	7.7	0.004069	2.5
Extreme (30C)	1880	9.1	0.004828	2.5
Extreme (10C)	1880	8.6	0.004592	2.5
Extreme (0C)	1880	7.6	0.004048	2.5
Extreme (-10C)	1880	9.4	0.005015	2.5
Extreme (-20C)	1880	8.8	0.004658	2.5
Extreme (-30C)	1880	7.6	0.004055	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]
4.5	1732.5	8.8	0.005064	2.5
5	1732.5	8.9	0.005135	2.5
5.5	1732.5	8.5	0.004934	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.3	0.004791	2.5
Extreme (50C)	1732.5	8.7	0.004997	2.5
Extreme (40C)	1732.5	7.1	0.004125	2.5
Extreme (30C)	1732.5	6.4	0.003685	2.5
Extreme (10C)	1732.5	6.9	0.003988	2.5
Extreme (0C)	1732.5	9.7	0.005617	2.5
Extreme (-10C)	1732.5	8.8	0.005070	2.5
Extreme (-20C)	1732.5	7.3	0.004196	2.5
Extreme (-30C)	1732.5	8.7	0.005022	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]
4.5	1732.5	9.6	0.005563	2.5
5	1732.5	8.6	0.004936	2.5
5.5	1732.5	8.3	0.004799	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.9	0.005706	2.5
Extreme (50C)	1732.5	9.3	0.005365	2.5
Extreme (40C)	1732.5	7.9	0.004564	2.5
Extreme (30C)	1732.5	9.1	0.005274	2.5
Extreme (10C)	1732.5	8.9	0.005151	2.5
Extreme (0C)	1732.5	8.0	0.004596	2.5
Extreme (-10C)	1732.5	9.1	0.005253	2.5
Extreme (-20C)	1732.5	9.0	0.005186	2.5
Extreme (-30C)	1732.5	8.2	0.004746	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

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]
4.5	2535	9.9	0.003912	2.5
5	2535	8.5	0.003340	2.5
5.5	2535	8.0	0.003171	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.2	0.003640	2.5
Extreme (50C)	2535	9.0	0.003535	2.5
Extreme (40C)	2535	8.5	0.003364	2.5
Extreme (30C)	2535	8.9	0.003513	2.5
Extreme (10C)	2535	8.1	0.003192	2.5
Extreme (0C)	2535	8.0	0.003168	2.5
Extreme (-10C)	2535	9.3	0.003676	2.5
Extreme (-20C)	2535	9.2	0.003627	2.5
Extreme (-30C)	2535	8.5	0.003335	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]
4.5	2535	6.4	0.002529	2.5
5	2535	6.7	0.002629	2.5
5.5	2535	5.4	0.002136	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.1	0.002789	2.5
Extreme (50C)	2535	5.8	0.002271	2.5
Extreme (40C)	2535	5.0	0.001970	2.5
Extreme (30C)	2535	6.2	0.002463	2.5
Extreme (10C)	2535	5.2	0.002053	2.5
Extreme (0C)	2535	4.8	0.001882	2.5
Extreme (-10C)	2535	5.2	0.002049	2.5
Extreme (-20C)	2535	5.8	0.002286	2.5
Extreme (-30C)	2535	6.2	0.002439	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.

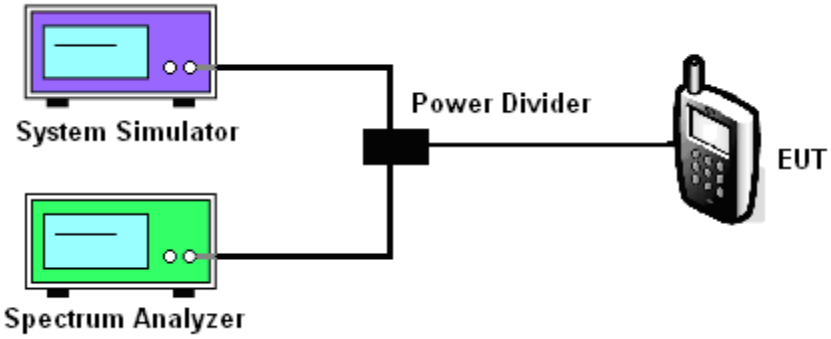
11.2 Measuring Instruments

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 2/4/7

Test data reference attachment.

----END OF REPORT----