

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT FCC ID: 2BKDT-UBS1

Product: Smartphone

Trade Mark: Universal Phone

Model No.: UBS1

Family Model: N/A

Report No.: S24080902801005

Issue Date: Sept. 03, 2024

Prepared for

Oysterworld INC

651 N Broad St, Suite 201 Middletown 19709, Delaware

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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

Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090

Website: <http://www.ntek.org.cn>

TEST RESULT CERTIFICATION

Applicant's name	Oysterworld INC
Address.....	651 N Broad St, Suite 201 Middletown 19709, Delaware
Manufacturer's Name	Oysterworld INC
Address.....	651 N Broad St, Suite 201 Middletown 19709, Delaware
Product name.....	Smartphone
Model and/or type reference ..	UBS1
Trade Mark.....	Universal Phone
Family Model.....	N/A
Test Sample Number.....	S240809028002
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..... Aug. 09, 2024 ~ Sept. 03, 2024

Date of Issue Sept. 03, 2024

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

Prepared By: Allen Liu
(Project Engineer)

Reviewed By : Aaron Cheng
Aaron Cheng
(Supervisor)

Approved By : Alex Li
Alex Li
(Manager)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smartphone
Trade Mark	Universal Phone
Model Name	UBS1
Family Model	N/A
Model Difference	N/A
FCC ID:	2BKDT-UBS1
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,17 LTE TDD Band 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE TDD Band 41 Uplink& Downlink: 2535MHz-2655MHz,
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	Band 2:1.2dBi; Band 4:-0.72dBi; Band 5:-2.69dBi; Band 7:-1.33dBi Band 12:-2.37dBi; Band 17:-2.37dBi; Band 41:-1.33dBi
Adapter	Model: HJ-0502000W2-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A 10.0W
Battery	DC 3.87V, 5100mAh, 19.737Wh
Power supply	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V) (Note 1)
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage DC 4.45V and Low Voltage DC 3.29V 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: 2BKDT-UBS1** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

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

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

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

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smartphone	UBS1	FCC ID: 2BKDT-UBS1	EUT

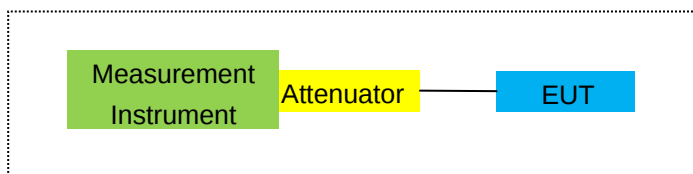
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

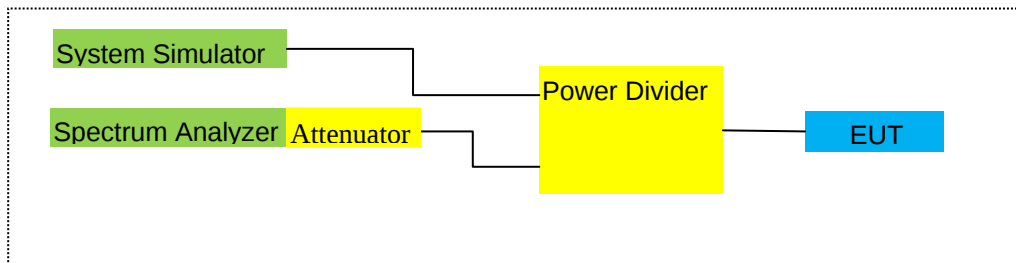
For Radiated Test Cases



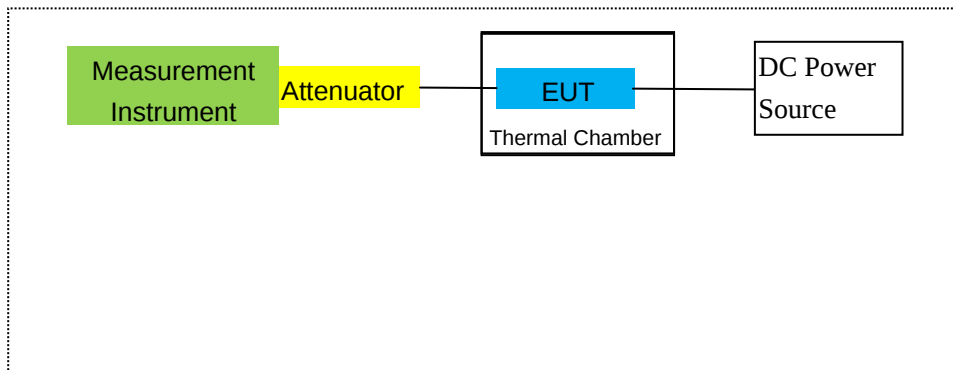
For Conducted Output Power



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



For Frequency Stability



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

3.TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	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	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	2025.03.11	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2024.03.12	2025.03.11	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	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.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest

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

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

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

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- ☐ Band 2/4/5/7/12/17/41
- ☐

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

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

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

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

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

☐ Band 2/4/5/7/12/17/41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-4.97	3.76	28.24	19.51	89.331	Horizontal	Pass
		1880	-4.78	3.91	28.22	19.53	89.743	Horizontal	Pass
		1909.3	-4.69	3.93	28.20	19.58	90.782	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.03	3.77	28.23	19.43	87.700	Horizontal	Pass
		1880	-4.88	3.91	28.24	19.45	88.105	Horizontal	Pass
		1908.5	-4.75	3.94	28.25	19.56	90.365	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.92	3.77	28.31	19.62	91.622	Horizontal	Pass
		1880	-4.54	3.91	28.22	19.77	94.842	Horizontal	Pass
		1907.5	-4.47	3.94	28.20	19.79	95.280	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-4.78	3.79	28.33	19.76	94.624	Horizontal	Pass
		1880	-4.48	3.95	28.22	19.79	95.280	Horizontal	Pass
		1905	-4.37	3.97	28.19	19.85	96.605	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-4.74	3.79	28.34	19.81	95.719	Horizontal	Pass
		1880	-4.53	3.95	28.22	19.74	94.189	Horizontal	Pass
		1902.5	-4.39	3.97	28.18	19.82	95.940	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.73	3.81	28.35	19.81	95.719	Horizontal	Pass
		1880	-4.40	3.96	28.22	19.86	96.828	Horizontal	Pass
		1900	-4.34	4.00	28.16	19.82	95.940	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-6.14	3.76	28.24	18.34	68.234	Vertical	Pass
		1880	-5.60	3.91	28.22	18.71	74.302	Vertical	Pass
		1909.3	-5.80	3.93	28.20	18.47	70.307	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.32	3.77	28.23	19.14	82.035	Vertical	Pass
		1880	-5.38	3.91	28.24	18.95	78.524	Vertical	Pass
		1908.5	-5.86	3.94	28.25	18.45	69.984	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-6.10	3.77	28.31	18.44	69.823	Vertical	Pass
		1880	-5.56	3.91	28.22	18.75	74.989	Vertical	Pass
		1907.5	-5.51	3.94	28.20	18.75	74.989	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-6.26	3.79	28.33	18.28	67.298	Vertical	Pass
		1880	-5.30	3.95	28.22	18.97	78.886	Vertical	Pass
		1905	-5.14	3.97	28.19	19.08	80.910	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-6.00	3.79	28.34	18.55	71.614	Vertical	Pass
		1880	-5.94	3.95	28.22	18.33	68.077	Vertical	Pass
		1902.5	-5.90	3.97	28.18	18.31	67.764	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-5.34	3.81	28.35	19.20	83.176	Vertical	Pass
		1880	-5.86	3.96	28.22	18.40	69.183	Vertical	Pass
		1900	-5.75	4.00	28.16	18.41	69.343	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.09	3.76	28.24	18.39	69.024	Horizontal	Pass
		1880	-5.56	3.91	28.22	18.75	74.989	Horizontal	Pass
		1909.3	-5.49	3.93	28.20	18.78	75.509	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.59	3.77	28.23	18.87	77.090	Horizontal	Pass
		1880	-5.67	3.91	28.24	18.66	73.451	Horizontal	Pass
		1908.5	-5.88	3.94	28.25	18.43	69.663	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.53	3.77	28.31	19.01	79.616	Horizontal	Pass
		1880	-5.44	3.91	28.22	18.87	77.090	Horizontal	Pass
		1907.5	-5.12	3.94	28.20	19.14	82.035	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-5.58	3.79	28.33	18.96	78.705	Horizontal	Pass
		1880	-5.57	3.95	28.22	18.70	74.131	Horizontal	Pass
		1905	-5.04	3.97	28.19	19.18	82.794	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-5.56	3.79	28.34	18.99	79.250	Horizontal	Pass
		1880	-5.35	3.95	28.22	18.92	77.983	Horizontal	Pass
		1902.5	-5.31	3.97	28.18	18.90	77.625	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-5.45	3.81	28.35	19.09	81.096	Horizontal	Pass
		1880	-5.15	3.96	28.22	19.11	81.470	Horizontal	Pass
		1900	-4.97	4.00	28.16	19.19	82.985	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.66	3.76	28.24	17.82	60.534	Vertical	Pass
		1880	-6.58	3.91	28.22	17.73	59.293	Vertical	Pass
		1909.3	-6.37	3.93	28.20	17.90	61.660	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-6.50	3.77	28.23	17.96	62.517	Vertical	Pass
		1880	-6.21	3.91	28.24	18.12	64.863	Vertical	Pass
		1908.5	-6.83	3.94	28.25	17.48	55.976	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-6.44	3.77	28.31	18.10	64.565	Vertical	Pass
		1880	-6.26	3.91	28.22	18.05	63.826	Vertical	Pass
		1907.5	-6.81	3.94	28.20	17.45	55.590	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.84	3.79	28.33	17.70	58.884	Vertical	Pass
		1880	-6.71	3.95	28.22	17.56	57.016	Vertical	Pass
		1905	-6.71	3.97	28.19	17.51	56.364	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-7.20	3.79	28.34	17.35	54.325	Vertical	Pass
		1880	-6.83	3.95	28.22	17.44	55.463	Vertical	Pass
		1902.5	-6.78	3.97	28.18	17.43	55.335	Vertical	Pass
20.0MHz	1/#Mid	1860	-6.75	3.81	28.35	17.79	60.117	Vertical	Pass

Band 16		1880	-6.70	3.96	28.22	17.56	57.016	Vertical	Pass
QAM		1900	-6.38	4.00	28.16	17.78	59.979	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	-4.88	3.12	27.58	19.58	90.782	Horizontal	Pass
		1732.5	-4.87	3.27	27.61	19.47	88.512	Horizontal	Pass
		1754.3	-4.85	3.29	27.63	19.49	88.920	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.05	3.13	27.61	19.43	87.700	Horizontal	Pass
		1732.5	-4.97	3.27	27.61	19.37	86.497	Horizontal	Pass
		1753.5	-4.89	3.30	27.62	19.43	87.700	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.82	3.13	27.63	19.68	92.897	Horizontal	Pass
		1732.5	-4.72	3.27	27.61	19.62	91.622	Horizontal	Pass
		1752.5	-4.60	3.30	27.60	19.70	93.325	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.76	3.15	27.64	19.73	93.972	Horizontal	Pass
		1732.5	-4.53	3.31	27.61	19.77	94.842	Horizontal	Pass
		1750	-4.55	3.33	27.59	19.71	93.541	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.77	3.15	27.65	19.73	93.972	Horizontal	Pass
		1732.5	-4.61	3.31	27.61	19.69	93.111	Horizontal	Pass
		1747.5	-4.55	3.33	27.57	19.69	93.111	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.71	3.17	27.66	19.78	95.060	Horizontal	Pass
		1732.5	-4.54	3.32	27.61	19.75	94.406	Horizontal	Pass
		1745	-4.48	3.36	27.56	19.72	93.756	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-5.68	3.12	27.58	18.78	75.509	Vertical	Pass
		1732.5	-6.06	3.27	27.61	18.28	67.298	Vertical	Pass
		1754.3	-5.66	3.29	27.63	18.68	73.790	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.58	3.13	27.61	18.90	77.625	Vertical	Pass
		1732.5	-5.11	3.27	27.61	19.23	83.753	Vertical	Pass
		1753.5	-5.95	3.30	27.62	18.37	68.707	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-5.44	3.13	27.63	19.06	80.538	Vertical	Pass
		1732.5	-5.28	3.27	27.61	19.06	80.538	Vertical	Pass
		1752.5	-5.51	3.30	27.60	18.79	75.683	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-6.01	3.15	27.64	18.48	70.469	Vertical	Pass
		1732.5	-5.50	3.31	27.61	18.80	75.858	Vertical	Pass

QPSK		1750	-5.68	3.33	27.59	18.58	72.111	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-6.21	3.15	27.65	18.29	67.453	Vertical	Pass
Band		1732.5	-5.78	3.31	27.61	18.52	71.121	Vertical	Pass
QPSK		1747.5	-5.94	3.33	27.57	18.30	67.608	Vertical	Pass
20.0MHz	1/#Mid	1720	-6.17	3.17	27.66	18.32	67.920	Vertical	Pass
Band		1732.5	-5.12	3.32	27.61	19.17	82.604	Vertical	Pass
QPSK		1745	-5.73	3.36	27.56	18.47	70.307	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	-5.69	3.12	27.58	18.77	75.336	Horizontal	Pass
		1732.5	-5.54	3.27	27.61	18.80	75.858	Horizontal	Pass
		1754.3	-5.54	3.29	27.63	18.80	75.858	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.63	3.13	27.61	18.85	76.736	Horizontal	Pass
		1732.5	-5.76	3.27	27.61	18.58	72.111	Horizontal	Pass
		1753.5	-5.98	3.30	27.62	18.34	68.234	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.46	3.13	27.63	19.04	80.168	Horizontal	Pass
		1732.5	-5.42	3.27	27.61	18.92	77.983	Horizontal	Pass
		1752.5	-5.11	3.30	27.60	19.19	82.985	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-5.53	3.15	27.64	18.96	78.705	Horizontal	Pass
		1732.5	-5.72	3.31	27.61	18.58	72.111	Horizontal	Pass
		1750	-5.10	3.33	27.59	19.16	82.414	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-5.33	3.15	27.65	19.17	82.604	Horizontal	Pass
		1732.5	-5.39	3.31	27.61	18.91	77.804	Horizontal	Pass
		1747.5	-5.41	3.33	27.57	18.83	76.384	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-5.28	3.17	27.66	19.21	83.368	Horizontal	Pass
		1732.5	-5.29	3.32	27.61	19.00	79.433	Horizontal	Pass
		1745	-5.10	3.36	27.56	19.10	81.283	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-6.33	3.12	27.58	18.13	65.013	Vertical	Pass
		1732.5	-6.59	3.27	27.61	17.75	59.566	Vertical	Pass
		1754.3	-6.83	3.29	27.63	17.51	56.364	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-6.52	3.13	27.61	17.96	62.517	Vertical	Pass
		1732.5	-6.42	3.27	27.61	17.92	61.944	Vertical	Pass
		1753.5	-6.46	3.30	27.62	17.86	61.094	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-7.08	3.13	27.63	17.42	55.208	Vertical	Pass
		1732.5	-6.79	3.27	27.61	17.55	56.885	Vertical	Pass
		1752.5	-6.40	3.30	27.60	17.90	61.660	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-7.21	3.15	27.64	17.28	53.456	Vertical	Pass
		1732.5	-6.55	3.31	27.61	17.75	59.566	Vertical	Pass
		1750	-6.68	3.33	27.59	17.58	57.280	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-7.11	3.15	27.65	17.39	54.828	Vertical	Pass
		1732.5	-7.03	3.31	27.61	17.27	53.333	Vertical	Pass
		1747.5	-7.00	3.33	27.57	17.24	52.966	Vertical	Pass
20.0MHz	1/#Mid	1720	-6.57	3.17	27.66	17.92	61.944	Vertical	Pass

Band 16 QAM		1732.5	-6.75	3.32	27.61	17.54	56.754	Vertical	Pass
		1745	-6.41	3.36	27.56	17.79	60.117	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	3/#Mid	824.7	4.42	2.01	19.68	2.15	19.94	98.628	Horizontal	Pass
		836.5	4.30	2.01	19.77	2.15	19.91	97.949	Horizontal	Pass
		848.3	4.10	2.02	19.82	2.15	19.75	94.406	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.19	2.01	19.70	2.15	19.73	93.972	Horizontal	Pass
		836.5	4.09	2.01	19.77	2.15	19.70	93.325	Horizontal	Pass
		847.5	3.96	2.02	19.81	2.15	19.60	91.201	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	4.47	2.01	19.71	2.15	20.02	100.462	Horizontal	Pass
		836.5	4.35	2.01	19.77	2.15	19.96	99.083	Horizontal	Pass
		846.5	4.19	2.02	19.79	2.15	19.81	95.719	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	4.49	2.01	19.73	2.15	20.06	101.391	Horizontal	Pass
		836.5	4.44	2.01	19.77	2.15	20.05	101.158	Horizontal	Pass
		844	4.34	2.02	19.78	2.15	19.95	98.855	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	3.01	2.01	19.68	2.15	18.53	71.285	Vertical	Pass
		836.5	3.05	2.01	19.77	2.15	18.66	73.451	Vertical	Pass
		848.3	3.38	2.02	19.82	2.15	19.03	79.983	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	3.69	2.01	19.70	2.15	19.23	83.753	Vertical	Pass
		836.5	3.18	2.01	19.77	2.15	18.79	75.683	Vertical	Pass
		847.5	3.20	2.02	19.81	2.15	18.84	76.560	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	2.93	2.01	19.71	2.15	18.48	70.469	Vertical	Pass
		836.5	3.13	2.01	19.77	2.15	18.74	74.817	Vertical	Pass
		846.5	3.20	2.02	19.79	2.15	18.82	76.208	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	2.79	2.01	19.73	2.15	18.36	68.549	Vertical	Pass
		836.5	3.37	2.01	19.77	2.15	18.98	79.068	Vertical	Pass
		844	3.60	2.02	19.78	2.15	19.21	83.368	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	3/#Mid	824.7	3.57	2.01	19.68	2.15	19.09	81.096	Horizontal	Pass
		836.5	3.50	2.01	19.77	2.15	19.11	81.470	Horizontal	Pass
		848.3	3.34	2.02	19.82	2.15	18.99	79.250	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	3.65	2.01	19.70	2.15	19.19	82.985	Horizontal	Pass
		836.5	3.36	2.01	19.77	2.15	18.97	78.886	Horizontal	Pass
		847.5	2.84	2.02	19.81	2.15	18.48	70.469	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	3.97	2.01	19.71	2.15	19.52	89.536	Horizontal	Pass
		836.5	3.74	2.01	19.77	2.15	19.35	86.099	Horizontal	Pass
		846.5	3.49	2.02	19.79	2.15	19.11	81.470	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	3.97	2.01	19.73	2.15	19.54	89.950	Horizontal	Pass
		836.5	3.69	2.01	19.77	2.15	19.30	85.114	Horizontal	Pass
		844	3.23	2.02	19.78	2.15	18.84	76.560	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	2.71	2.01	19.68	2.15	18.23	66.527	Vertical	Pass
		836.5	3.62	2.01	19.77	2.15	19.23	83.753	Vertical	Pass
		848.3	3.14	2.02	19.82	2.15	18.79	75.683	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	3.02	2.01	19.70	2.15	18.56	71.779	Vertical	Pass
		836.5	1.96	2.01	19.77	2.15	17.57	57.148	Vertical	Pass
		847.5	2.63	2.02	19.81	2.15	18.27	67.143	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	2.67	2.01	19.71	2.15	18.22	66.374	Vertical	Pass
		836.5	2.21	2.01	19.77	2.15	17.82	60.534	Vertical	Pass
		846.5	1.63	2.02	19.79	2.15	17.25	53.088	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	2.18	2.01	19.73	2.15	17.75	59.566	Vertical	Pass
		836.5	2.05	2.01	19.77	2.15	17.66	58.345	Vertical	Pass
		844	2.45	2.02	19.78	2.15	18.06	63.973	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	-3.16	4.54	27.75	20.05	101.158	Horizontal	Pass
		2535	-2.99	4.69	27.72	20.04	100.925	Horizontal	Pass
		2567.5	-2.92	4.71	27.71	20.08	101.859	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.09	4.55	27.76	20.12	102.802	Horizontal	Pass
		2535	-2.90	4.69	27.72	20.13	103.039	Horizontal	Pass
		2565	-2.82	4.72	27.70	20.16	103.753	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.10	4.55	27.77	20.12	102.802	Horizontal	Pass
		2535	-2.96	4.69	27.72	20.07	101.625	Horizontal	Pass
		2562.5	-2.86	4.72	27.69	20.11	102.565	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-3.04	4.57	27.78	20.17	103.992	Horizontal	Pass
		2535	-2.86	4.73	27.72	20.13	103.039	Horizontal	Pass
		2560	-2.82	4.75	27.68	20.11	102.565	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-4.96	4.54	27.75	18.25	66.834	Vertical	Pass
		2535	-4.73	4.69	27.72	18.30	67.608	Vertical	Pass
		2567.5	-4.08	4.71	27.71	18.92	77.983	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-4.36	4.55	27.76	18.85	76.736	Vertical	Pass
		2535	-4.02	4.69	27.72	19.01	79.616	Vertical	Pass
		2565	-4.63	4.72	27.70	18.35	68.391	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-4.26	4.55	27.77	18.96	78.705	Vertical	Pass
		2535	-3.96	4.69	27.72	19.07	80.724	Vertical	Pass
		2562.5	-4.74	4.72	27.69	18.23	66.527	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-4.05	4.57	27.78	19.16	82.414	Vertical	Pass
		2535	-4.51	4.73	27.72	18.48	70.469	Vertical	Pass
		2560	-4.69	4.75	27.68	18.24	66.681	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	-3.85	4.54	27.75	19.36	86.298	Horizontal	Pass
		2535	-3.54	4.69	27.72	19.49	88.920	Horizontal	Pass
		2567.5	-3.62	4.71	27.71	19.38	86.696	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.74	4.55	27.76	19.47	88.512	Horizontal	Pass
		2535	-3.75	4.69	27.72	19.28	84.723	Horizontal	Pass
		2565	-4.02	4.72	27.70	18.96	78.705	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.92	4.55	27.77	19.30	85.114	Horizontal	Pass
		2535	-3.89	4.69	27.72	19.14	82.035	Horizontal	Pass
		2562.5	-3.50	4.72	27.69	19.47	88.512	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.80	4.57	27.78	19.41	87.297	Horizontal	Pass
		2535	-3.47	4.73	27.72	19.52	89.536	Horizontal	Pass
		2560	-3.57	4.75	27.68	19.36	86.298	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-5.22	4.54	27.75	17.99	62.951	Vertical	Pass
		2535	-5.30	4.69	27.72	17.73	59.293	Vertical	Pass
		2567.5	-4.00	4.71	27.71	19.00	79.433	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-4.11	4.55	27.76	19.10	81.283	Vertical	Pass
		2535	-4.55	4.69	27.72	18.48	70.469	Vertical	Pass
		2565	-4.59	4.72	27.70	18.39	69.024	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-4.49	4.55	27.77	18.73	74.645	Vertical	Pass
		2535	-4.75	4.69	27.72	18.28	67.298	Vertical	Pass
		2562.5	-4.93	4.72	27.69	18.04	63.680	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-5.48	4.57	27.78	17.73	59.293	Vertical	Pass
		2535	-5.23	4.73	27.72	17.76	59.704	Vertical	Pass
		2560	-4.34	4.75	27.68	18.59	72.277	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	699.7	4.79	1.91	19.21	2.15	19.94	98.628	Vertical	Pass
		707.5	4.71	1.91	19.26	2.15	19.91	97.949	Vertical	Pass
		715.3	4.49	1.93	19.34	2.15	19.75	94.406	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	4.58	1.91	19.21	2.15	19.73	93.972	Vertical	Pass
		707.5	4.50	1.91	19.26	2.15	19.70	93.325	Vertical	Pass
		714.5	4.34	1.93	19.34	2.15	19.60	91.201	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	4.85	1.91	19.23	2.15	20.02	100.462	Vertical	Pass
		707.5	4.76	1.91	19.26	2.15	19.96	99.083	Vertical	Pass
		713.5	4.55	1.92	19.33	2.15	19.81	95.719	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	704	4.87	1.91	19.25	2.15	20.06	101.391	Vertical	Pass
		707.5	4.85	1.91	19.26	2.15	20.05	101.158	Vertical	Pass
		711	4.70	1.92	19.32	2.15	19.95	98.855	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	3.71	1.91	19.21	2.15	18.86	76.913	Horizontal	Pass
		707.5	4.02	1.91	19.26	2.15	19.22	83.560	Horizontal	Pass
		715.3	3.86	1.93	19.34	2.15	19.12	81.658	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	3.09	1.91	19.21	2.15	18.24	66.681	Horizontal	Pass
		707.5	3.13	1.91	19.26	2.15	18.33	68.077	Horizontal	Pass
		714.5	3.27	1.93	19.34	2.15	18.53	71.285	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	3.64	1.91	19.23	2.15	18.81	76.033	Horizontal	Pass
		707.5	3.32	1.91	19.26	2.15	18.52	71.121	Horizontal	Pass
		713.5	3.65	1.92	19.33	2.15	18.91	77.804	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	704	3.87	1.91	19.25	2.15	19.06	80.538	Horizontal	Pass
		707.5	3.54	1.91	19.26	2.15	18.74	74.817	Horizontal	Pass
		711	3.73	1.92	19.32	2.15	18.98	79.068	Horizontal	Pass

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Conclusion	
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP	Max. ERP	Polarization Of Max. ERP		
											(dBm)
1.4MHz Band 16 QAM	1/#Mid	699.7	4.67	1.91	19.21	2.15	19.82	95.940	Vertical	Pass	
		707.5	4.59	1.91	19.26	2.15	19.79	95.280	Vertical	Pass	
		715.3	4.37	1.93	19.34	2.15	19.63	91.833	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	4.46	1.91	19.21	2.15	19.61	91.411	Vertical	Pass	
		707.5	4.38	1.91	19.26	2.15	19.58	90.782	Vertical	Pass	
		714.5	4.22	1.93	19.34	2.15	19.48	88.716	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	4.73	1.91	19.23	2.15	19.90	97.724	Vertical	Pass	
		707.5	4.64	1.91	19.26	2.15	19.84	96.383	Vertical	Pass	
		713.5	4.43	1.92	19.33	2.15	19.69	93.111	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	4.75	1.91	19.25	2.15	19.94	98.628	Vertical	Pass	
		707.5	4.73	1.91	19.26	2.15	19.93	98.401	Vertical	Pass	
		711	4.58	1.92	19.32	2.15	19.83	96.161	Vertical	Pass	
1.4MHz Band 16 QAM	1/#Mid	699.7	3.31	1.91	19.21	2.15	18.46	70.146	Horizontal	Pass	
		707.5	3.33	1.91	19.26	2.15	18.53	71.285	Horizontal	Pass	
		715.3	3.38	1.93	19.34	2.15	18.64	73.114	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	3.37	1.91	19.21	2.15	18.52	71.121	Horizontal	Pass	
		707.5	3.48	1.91	19.26	2.15	18.68	73.790	Horizontal	Pass	
		714.5	3.21	1.93	19.34	2.15	18.47	70.307	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	3.71	1.91	19.23	2.15	18.88	77.268	Horizontal	Pass	
		707.5	3.55	1.91	19.26	2.15	18.75	74.989	Horizontal	Pass	
		713.5	3.71	1.92	19.33	2.15	18.97	78.886	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	3.19	1.91	19.25	2.15	18.38	68.865	Horizontal	Pass	
		707.5	2.96	1.91	19.26	2.15	18.16	65.464	Horizontal	Pass	
		711	3.12	1.92	19.32	2.15	18.37	68.707	Horizontal	Pass	

Note:

SG Level= Signal generator output

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

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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	706.5	5.25	1.91	19.23	2.15	20.42	110.154	Vertical	Pass
		710	5.11	1.91	19.26	2.15	20.31	107.399	Vertical	Pass
		713.5	5.01	1.92	19.33	2.15	20.27	106.414	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	5.26	1.91	19.25	2.15	20.45	110.917	Vertical	Pass
		710	5.21	1.91	19.26	2.15	20.41	109.901	Vertical	Pass
		711	5.17	1.92	19.32	2.15	20.42	110.154	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	3.82	1.91	19.23	2.15	18.99	79.250	Horizontal	Pass
		710	3.64	1.91	19.26	2.15	18.84	76.560	Horizontal	Pass
		713.5	4.05	1.92	19.33	2.15	19.31	85.310	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	4.86	1.91	19.25	2.15	20.05	101.158	Horizontal	Pass
		710	4.52	1.91	19.26	2.15	19.72	93.756	Horizontal	Pass
		711	3.61	1.92	19.32	2.15	18.86	76.913	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	706.5	4.48	1.91	19.23	2.15	19.65	92.257	Vertical	Pass
		710	4.39	1.91	19.26	2.15	19.59	90.991	Vertical	Pass
		713.5	4.19	1.92	19.33	2.15	19.45	88.105	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	4.02	1.91	19.25	2.15	19.21	83.368	Vertical	Pass
		710	4.55	1.91	19.26	2.15	19.75	94.406	Vertical	Pass
		711	4.28	1.92	19.32	2.15	19.53	89.743	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	3.57	1.91	19.23	2.15	18.74	74.817	Horizontal	Pass
		710	3.43	1.91	19.26	2.15	18.63	72.946	Horizontal	Pass
		713.5	3.02	1.92	19.33	2.15	18.28	67.298	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	3.12	1.91	19.25	2.15	18.31	67.764	Horizontal	Pass
		710	2.92	1.91	19.26	2.15	18.12	64.863	Horizontal	Pass
		711	3.16	1.92	19.32	2.15	18.41	69.343	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2537.5	-3.46	4.54	27.75	19.75	94.406	Horizontal	Pass
		2595	-3.31	4.69	27.72	19.72	93.756	Horizontal	Pass
		2652.5	-3.19	4.71	27.71	19.81	95.719	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2540	-3.54	4.55	27.76	19.67	92.683	Horizontal	Pass
		2595	-3.40	4.69	27.72	19.63	91.833	Horizontal	Pass
		2650	-3.39	4.72	27.70	19.59	90.991	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2542.5	-3.37	4.55	27.77	19.85	96.605	Horizontal	Pass
		2595	-3.09	4.69	27.72	19.94	98.628	Horizontal	Pass
		2647.5	-3.14	4.72	27.69	19.83	96.161	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2545	-2.98	4.57	27.78	20.23	105.439	Horizontal	Pass
		2595	-3.03	4.73	27.72	19.96	99.083	Horizontal	Pass
		2645	-3.03	4.75	27.68	19.90	97.724	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2537.5	-3.26	4.54	27.75	19.95	98.855	Vertical	Pass
		2595	-3.17	4.69	27.72	19.86	96.828	Vertical	Pass
		2652.5	-3.15	4.71	27.71	19.85	96.605	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2540	-3.24	4.55	27.76	19.97	99.312	Vertical	Pass
		2595	-3.08	4.69	27.72	19.95	98.855	Vertical	Pass
		2650	-3.15	4.72	27.70	19.83	96.161	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2542.5	-4.69	4.55	27.77	18.53	71.285	Vertical	Pass
		2595	-4.00	4.69	27.72	19.03	79.983	Vertical	Pass
		2647.5	-4.45	4.72	27.69	18.52	71.121	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2545	-4.78	4.57	27.78	18.43	69.663	Vertical	Pass
		2595	-4.29	4.73	27.72	18.70	74.131	Vertical	Pass
		2645	-4.00	4.75	27.68	18.93	78.163	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz	1/#Mid	2537.5	-3.58	4.54	27.75	19.63	91.833	Horizontal	Pass
Band 16		2595	-3.43	4.69	27.72	19.60	91.201	Horizontal	Pass
QAM		2652.5	-3.31	4.71	27.71	19.69	93.111	Horizontal	Pass
10.0MHz	1/#Mid	2540	-3.66	4.55	27.76	19.55	90.157	Horizontal	Pass
Band 16		2595	-3.52	4.69	27.72	19.51	89.331	Horizontal	Pass
QAM		2650	-3.51	4.72	27.70	19.47	88.512	Horizontal	Pass
15.0MHz	1/#Mid	2542.5	-3.49	4.55	27.77	19.73	93.972	Horizontal	Pass
Band 16		2595	-3.21	4.69	27.72	19.82	95.940	Horizontal	Pass
QAM		2647.5	-3.26	4.72	27.69	19.71	93.541	Horizontal	Pass
20.0MHz	1/#Mid	2545	-3.21	4.57	27.78	20.00	100.000	Horizontal	Pass
Band 16		2595	-3.15	4.73	27.72	19.84	96.383	Horizontal	Pass
QAM		2645	-3.15	4.75	27.68	19.78	95.060	Horizontal	Pass
5.0MHz	1/#Mid	2537.5	-3.38	4.54	27.75	19.83	96.161	Vertical	Pass
Band 16		2595	-3.29	4.69	27.72	19.74	94.189	Vertical	Pass
QAM		2652.5	-3.27	4.71	27.71	19.73	93.972	Vertical	Pass
10.0MHz	1/#Mid	2540	-3.36	4.55	27.76	19.85	96.605	Vertical	Pass
Band 16		2595	-3.20	4.69	27.72	19.83	96.161	Vertical	Pass
QAM		2650	-3.27	4.72	27.70	19.71	93.541	Vertical	Pass
15.0MHz	1/#Mid	2542.5	-4.86	4.55	27.77	18.36	68.549	Vertical	Pass
Band 16		2595	-4.87	4.69	27.72	18.16	65.464	Vertical	Pass
QAM		2647.5	-3.87	4.72	27.69	19.10	81.283	Vertical	Pass
20.0MHz	1/#Mid	2545	-4.31	4.57	27.78	18.90	77.625	Vertical	Pass
Band 16		2595	-4.13	4.73	27.72	18.86	76.913	Vertical	Pass
QAM		2645	-4.46	4.75	27.68	18.47	70.307	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

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

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

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

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

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

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-47.80	4.04	33.51	-18.33	-13	-5.33	Horizontal
3701.4	-51.55	4.04	33.51	-22.08	-13	-9.08	Vertical
5552.1	-49.05	5.24	35.84	-18.45	-13	-5.45	Vertical
5552.1	-52.50	5.24	35.84	-21.90	-13	-8.90	Horizontal
190.4	-44.71	1.43	16.02	-30.12	-13	-17.12	Vertical
341.4	-44.54	1.30	17.99	-27.85	-13	-14.85	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.08	4.04	33.56	-18.56	-13	-5.56	Horizontal
3760.0	-52.00	4.04	33.56	-22.48	-13	-9.48	Vertical
5640.0	-49.28	5.24	35.91	-18.61	-13	-5.61	Vertical
5640.0	-52.17	5.24	35.91	-21.50	-13	-8.50	Horizontal
189.3	-38.95	1.62	16.97	-23.60	-13	-10.60	Vertical
432.3	-41.61	1.74	15.98	-27.38	-13	-14.38	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.10	4.04	34.00	-17.14	-13	-4.14	Horizontal
3818.6	-47.77	4.04	34.00	-17.81	-13	-4.81	Vertical
5727.9	-47.82	5.24	36.04	-17.02	-13	-4.02	Vertical
5727.9	-49.85	5.24	36.04	-19.05	-13	-6.05	Horizontal
201.2	-43.72	1.42	17.29	-27.85	-13	-14.85	Vertical
413.0	-40.47	1.50	17.90	-24.06	-13	-11.06	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-50.59	4.07	33.54	-21.12	-13	-8.12	Horizontal
3720.0	-53.24	4.07	33.54	-23.77	-13	-10.77	Vertical
5580.0	-45.89	5.28	35.86	-15.31	-13	-2.31	Vertical
5580.0	-49.14	5.28	35.86	-18.56	-13	-5.56	Horizontal
212.4	-44.79	1.58	16.89	-29.47	-13	-16.47	Vertical
273.6	-42.98	1.76	17.26	-27.48	-13	-14.48	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-50.92	4.04	33.56	-21.40	-13	-8.40	Horizontal
3760.0	-44.88	4.04	33.56	-15.36	-13	-2.36	Vertical
5640.0	-52.61	5.24	35.91	-21.94	-13	-8.94	Vertical
5640.0	-49.56	5.24	35.91	-18.89	-13	-5.89	Horizontal
204.6	-42.78	1.46	16.27	-27.97	-13	-14.97	Vertical
437.3	-40.89	1.59	15.15	-27.33	-13	-14.33	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.37	4.04	34.00	-20.41	-13	-7.41	Horizontal
3800.0	-52.47	4.04	34.00	-22.51	-13	-9.51	Vertical
5700.0	-50.66	5.24	36.04	-19.86	-13	-6.86	Vertical
5700.0	-53.62	5.24	36.04	-22.82	-13	-9.82	Horizontal
195.3	-37.82	1.36	17.39	-21.78	-13	-8.78	Vertical
447.2	-41.53	1.66	15.39	-27.80	-13	-14.80	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-51.44	4.02	29.80	-25.66	-13	-12.66	Horizontal
3421.4	-51.39	4.02	29.80	-25.61	-13	-12.61	Vertical
5132.1	-52.58	5.24	35.84	-21.98	-13	-8.98	Vertical
5132.1	-50.59	5.24	35.84	-19.99	-13	-6.99	Horizontal
200.2	-34.69	1.68	16.04	-20.33	-13	-7.33	Vertical
433.1	-43.83	1.78	17.74	-27.87	-13	-14.87	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.87	4.03	30.00	-19.90	-13	-6.90	Horizontal
3465.0	-52.57	4.03	30.00	-26.60	-13	-13.60	Vertical
5197.5	-48.43	5.25	35.86	-17.82	-13	-4.82	Vertical
5197.5	-52.27	5.25	35.86	-21.66	-13	-8.66	Horizontal
180.4	-40.80	1.72	17.69	-24.83	-13	-11.83	Vertical
283.9	-38.11	1.62	16.02	-23.70	-13	-10.70	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-46.34	4.05	30.01	-20.38	-13	-7.38	Horizontal
3508.6	-45.20	4.05	30.01	-19.24	-13	-6.24	Vertical
5262.9	-53.22	5.26	35.86	-22.62	-13	-9.62	Vertical
5262.9	-51.65	5.26	35.86	-21.05	-13	-8.05	Horizontal
194.1	-38.08	1.80	16.69	-23.19	-13	-10.19	Vertical
433.8	-34.46	1.75	16.66	-19.56	-13	-6.56	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	-53.17	4.02	29.80	-27.39	-13	-14.39	Horizontal
3440.0	-52.20	4.02	29.80	-26.42	-13	-13.42	Vertical
5160.0	-47.08	5.24	35.84	-16.48	-13	-3.48	Vertical
5160.0	-53.69	5.24	35.84	-23.09	-13	-10.09	Horizontal
207.4	-34.21	1.57	17.26	-18.52	-13	-5.52	Vertical
399.4	-40.73	1.78	16.35	-26.16	-13	-13.16	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.93	4.03	30.00	-27.96	-13	-14.96	Horizontal
3465.0	-53.86	4.03	30.00	-27.89	-13	-14.89	Vertical
5197.5	-55.36	5.25	35.86	-24.75	-13	-11.75	Vertical
5197.5	-49.54	5.25	35.86	-18.93	-13	-5.93	Horizontal
176.4	-40.84	1.44	17.95	-24.33	-13	-11.33	Vertical
325.3	-34.15	1.65	16.09	-19.71	-13	-6.71	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-48.83	2.91	27.68	-24.06	-13	-11.06	Horizontal
3490.0	-48.48	2.91	27.68	-23.71	-13	-10.71	Vertical
5235.0	-46.52	5.26	35.86	-15.92	-13	-2.92	Vertical
5235.0	-52.73	5.26	35.86	-22.13	-13	-9.13	Horizontal
191.6	-36.20	1.61	16.85	-20.96	-13	-7.96	Vertical
301.7	-44.95	1.61	15.19	-31.37	-13	-18.37	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-45.94	2.78	27.50	-21.22	-13	-8.22	Horizontal
1649.4	-53.34	2.78	27.50	-28.62	-13	-15.62	Vertical
2474.1	-52.78	2.90	27.80	-27.88	-13	-14.88	Vertical
2474.1	-51.53	2.90	27.80	-26.63	-13	-13.63	Horizontal
181.3	-41.70	1.76	17.59	-25.87	-13	-12.87	Vertical
438.8	-37.92	1.63	15.87	-23.68	-13	-10.68	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-52.75	2.80	27.48	-28.07	-13	-15.07	Horizontal
1673.0	-51.55	2.80	27.48	-26.87	-13	-13.87	Vertical
2509.5	-46.77	2.91	27.70	-21.98	-13	-8.98	Vertical
2509.5	-51.32	2.91	27.70	-26.53	-13	-13.53	Horizontal
210.2	-44.86	1.61	15.68	-30.79	-13	-17.79	Vertical
421.6	-43.64	1.59	17.52	-27.72	-13	-14.72	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-44.99	2.82	27.43	-20.38	-13	-7.38	Horizontal
1696.6	-47.23	2.82	27.43	-22.62	-13	-9.62	Vertical
2544.9	-51.93	2.92	27.74	-27.11	-13	-14.11	Vertical
2544.9	-52.36	2.92	27.74	-27.54	-13	-14.54	Horizontal
181.1	-41.73	1.69	16.67	-26.74	-13	-13.74	Vertical
364.3	-41.31	1.70	17.18	-25.83	-13	-12.83	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-46.05	2.78	27.50	-21.33	-13	-8.33	Horizontal
1658.0	-45.03	2.78	27.50	-20.31	-13	-7.31	Vertical
2487.0	-44.22	2.90	27.80	-19.32	-13	-6.32	Vertical
2487.0	-49.73	2.90	27.80	-24.83	-13	-11.83	Horizontal
209.1	-41.88	1.71	15.57	-28.02	-13	-15.02	Vertical
358.2	-37.47	1.34	16.40	-22.41	-13	-9.41	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-52.80	2.80	27.48	-28.12	-13	-15.12	Horizontal
1673.0	-45.69	2.80	27.48	-21.01	-13	-8.01	Vertical
2509.5	-47.14	2.91	27.70	-22.35	-13	-9.35	Vertical
2509.5	-49.61	2.91	27.70	-24.82	-13	-11.82	Horizontal
193.2	-41.39	1.44	17.04	-25.79	-13	-12.79	Vertical
378.7	-38.76	1.76	17.62	-22.90	-13	-9.90	Horizontal
Test Results for High Channel 844MHz							
1688.0	-53.77	2.82	27.43	-29.16	-13	-16.16	Horizontal
1688.0	-45.17	2.82	27.43	-20.56	-13	-7.56	Vertical
2532.0	-44.35	2.92	27.74	-19.53	-13	-6.53	Vertical
2532.0	-50.91	2.92	27.74	-26.09	-13	-13.09	Horizontal
212.2	-38.10	1.74	17.70	-22.14	-13	-9.14	Vertical
399.8	-34.67	1.41	17.46	-18.61	-13	-5.61	Horizontal

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

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

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

9.4 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-60.68	5.23	35.81	-30.10	-25	-5.10	Horizontal
5005.0	-61.20	5.23	35.81	-30.62	-25	-5.62	Vertical
7507.5	-61.66	5.67	36.85	-30.48	-25	-5.48	Vertical
7507.5	-64.19	5.67	36.85	-33.01	-25	-8.01	Horizontal
208.8	-51.75	1.73	17.97	-35.51	-25	-10.51	Vertical
238.3	-48.13	1.38	15.11	-34.40	-25	-9.40	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.72	5.23	35.82	-33.13	-25	-8.13	Horizontal
5070.0	-62.92	5.23	35.82	-32.33	-25	-7.33	Vertical
7605.0	-61.63	5.67	36.85	-30.45	-25	-5.45	Vertical
7605.0	-63.77	5.67	36.85	-32.59	-25	-7.59	Horizontal
191.0	-52.29	1.77	16.17	-37.88	-25	-12.88	Vertical
417.8	-47.82	1.63	15.21	-34.24	-25	-9.24	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.92	5.24	35.83	-33.33	-25	-8.33	Horizontal
5135.0	-60.02	5.24	35.83	-29.43	-25	-4.43	Vertical
7702.5	-63.62	5.68	36.87	-32.43	-25	-7.43	Vertical
7702.5	-59.70	5.68	36.87	-28.51	-25	-3.51	Horizontal
195.9	-51.58	1.58	17.56	-35.60	-25	-10.60	Vertical
324.7	-53.01	1.45	16.58	-37.88	-25	-12.88	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	-62.38	5.23	35.82	-31.79	-25	-6.79	Horizontal
5020.0	-64.62	5.23	35.82	-34.03	-25	-9.03	Vertical
7530.0	-61.28	5.67	36.86	-30.09	-25	-5.09	Vertical
7530.0	-59.83	5.67	36.86	-28.64	-25	-3.64	Horizontal
182.6	-46.78	1.63	15.76	-32.65	-25	-7.65	Vertical
264.3	-52.19	1.71	15.44	-38.46	-25	-13.46	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.50	5.23	35.82	-29.91	-25	-4.91	Horizontal
5070.0	-63.40	5.23	35.82	-32.81	-25	-7.81	Vertical
7605.0	-61.93	5.67	36.85	-30.75	-25	-5.75	Vertical
7605.0	-59.76	5.67	36.85	-28.58	-25	-3.58	Horizontal
203.4	-48.00	1.79	16.84	-32.94	-25	-7.94	Vertical
430.2	-51.03	1.71	17.64	-35.10	-25	-10.10	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.53	5.24	35.83	-29.94	-25	-4.94	Horizontal
5120.0	-63.89	5.24	35.83	-33.30	-25	-8.30	Vertical
7680.0	-64.91	5.70	36.88	-33.73	-25	-8.73	Vertical
7680.0	-62.20	5.70	36.88	-31.02	-25	-6.02	Horizontal
175.3	-46.53	1.79	16.84	-31.47	-25	-6.47	Vertical
357.3	-48.43	1.71	17.64	-32.50	-25	-7.50	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-51.04	2.60	27.20	-26.44	-13	-13.44	Horizontal
1399.4	-50.68	2.60	27.20	-26.08	-13	-13.08	Vertical
2099.1	-44.68	2.85	27.54	-19.99	-13	-6.99	Vertical
2099.1	-49.00	2.85	27.54	-24.31	-13	-11.31	Horizontal
210.6	-43.43	1.49	17.78	-27.14	-13	-14.14	Vertical
256.0	-42.01	1.36	17.33	-26.04	-13	-13.04	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-52.77	2.61	27.28	-28.10	-13	-15.10	Horizontal
1415.0	-52.23	2.61	27.28	-27.56	-13	-14.56	Vertical
2122.5	-46.34	2.87	27.59	-21.62	-13	-8.62	Vertical
2122.5	-51.00	2.87	27.59	-26.28	-13	-13.28	Horizontal
180.0	-41.84	1.73	15.74	-27.83	-13	-14.83	Vertical
279.1	-37.81	1.62	15.79	-23.64	-13	-10.64	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-44.02	2.63	27.28	-19.37	-13	-6.37	Horizontal
1430.6	-53.07	2.63	27.28	-28.42	-13	-15.42	Vertical
2145.9	-46.08	2.88	27.60	-21.36	-13	-8.36	Vertical
2145.9	-50.01	2.88	27.60	-25.29	-13	-12.29	Horizontal
193.6	-43.24	1.61	18.00	-26.85	-13	-13.85	Vertical
306.0	-40.80	1.45	15.49	-26.77	-13	-13.77	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-48.87	2.61	27.26	-24.22	-13	-11.22	Horizontal
1408.0	-52.68	2.61	27.26	-28.03	-13	-15.03	Vertical
2112.0	-53.95	2.87	27.58	-29.24	-13	-16.24	Vertical
2112.0	-52.25	2.87	27.58	-27.54	-13	-14.54	Horizontal
201.5	-40.87	1.31	16.97	-25.21	-13	-12.21	Vertical
389.2	-35.48	1.65	16.70	-20.43	-13	-7.43	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-51.03	2.61	27.28	-26.36	-13	-13.36	Horizontal
1415.0	-50.45	2.61	27.28	-25.78	-13	-12.78	Vertical
2122.5	-50.38	2.87	27.59	-25.66	-13	-12.66	Vertical
2122.5	-51.92	2.87	27.59	-27.20	-13	-14.20	Horizontal
189.9	-39.75	1.72	17.99	-23.48	-13	-10.48	Vertical
274.2	-38.19	1.73	17.94	-21.98	-13	-8.98	Horizontal
Test Results for High Channel 711MHz							
1422.0	-46.63	2.62	27.28	-21.97	-13	-8.97	Horizontal
1422.0	-44.89	2.62	27.28	-20.23	-13	-7.23	Vertical
2133.0	-45.47	2.87	27.60	-20.74	-13	-7.74	Vertical
2133.0	-49.74	2.87	27.60	-25.01	-13	-12.01	Horizontal
201.5	-35.46	1.58	15.93	-21.11	-13	-8.11	Vertical
253.6	-34.27	1.36	15.59	-20.04	-13	-7.04	Horizontal

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

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

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

9.6 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-53.63	2.61	27.28	-28.96	-13	-15.96	Horizontal
1413.0	-51.82	2.61	27.28	-27.15	-13	-14.15	Vertical
2119.5	-48.88	2.87	27.59	-24.16	-13	-11.16	Vertical
2119.5	-52.67	2.87	27.59	-27.95	-13	-14.95	Horizontal
202.4	-40.29	1.71	16.15	-25.85	-13	-12.85	Vertical
346.0	-35.78	1.41	17.32	-19.87	-13	-6.87	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-45.92	2.62	27.30	-21.24	-13	-8.24	Horizontal
1420.0	-50.12	2.62	27.30	-25.44	-13	-12.44	Vertical
2130.0	-46.68	2.87	27.62	-21.93	-13	-8.93	Vertical
2130.0	-53.45	2.87	27.62	-28.70	-13	-15.70	Horizontal
200.3	-43.88	1.42	15.25	-30.06	-13	-17.06	Vertical
339.3	-37.17	1.36	17.19	-21.34	-13	-8.34	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-44.92	2.66	27.28	-20.30	-13	-7.30	Horizontal
1427.0	-53.17	2.66	27.28	-28.55	-13	-15.55	Vertical
2140.5	-48.70	2.88	27.60	-23.98	-13	-10.98	Vertical
2140.5	-53.64	2.88	27.60	-28.92	-13	-15.92	Horizontal
196.9	-42.44	1.32	17.29	-26.47	-13	-13.47	Vertical
257.4	-39.72	1.72	16.89	-24.55	-13	-11.55	Horizontal

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

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-47.51	2.62	27.30	-22.83	-13	-9.83	Horizontal
1418.0	-46.07	2.62	27.30	-21.39	-13	-8.39	Vertical
2127.0	-49.78	2.87	27.62	-25.03	-13	-12.03	Vertical
2127.0	-51.72	2.87	27.62	-26.97	-13	-13.97	Horizontal
193.9	-43.77	1.35	16.91	-28.21	-13	-15.21	Vertical
354.1	-43.22	1.62	16.31	-28.53	-13	-15.53	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-49.65	2.62	27.30	-24.97	-13	-11.97	Horizontal
1420.0	-49.92	2.62	27.30	-25.24	-13	-12.24	Vertical
2130.0	-53.86	2.87	27.62	-29.11	-13	-16.11	Vertical
2130.0	-50.15	2.87	27.62	-25.40	-13	-12.40	Horizontal
195.4	-42.31	1.51	17.14	-26.68	-13	-13.68	Vertical
351.9	-41.37	1.77	16.88	-26.26	-13	-13.26	Horizontal
Test Results for High Channel 711MHz							
1422.0	-48.90	2.62	27.30	-24.22	-13	-11.22	Horizontal
1422.0	-44.74	2.62	27.30	-20.06	-13	-7.06	Vertical
2133.0	-51.62	2.87	27.62	-26.87	-13	-13.87	Vertical
2133.0	-53.19	2.87	27.62	-28.44	-13	-15.44	Horizontal
191.4	-39.08	1.78	15.95	-24.91	-13	-11.91	Vertical
251.4	-37.07	1.34	17.95	-20.47	-13	-7.47	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

9.7 LTE BAND 41

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

Test Results for Low Channel 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5075.0	-60.70	5.23	35.81	-30.12	-25	-5.12	Horizontal
5075.0	-59.10	5.23	35.81	-28.52	-25	-3.52	Vertical
7612.5	-64.87	5.67	36.85	-33.69	-25	-8.69	Vertical
7612.5	-64.27	5.67	36.85	-33.09	-25	-8.09	Horizontal
435.3	-44.72	1.38	15.98	-30.12	-25	-5.12	Vertical
465.8	-47.24	1.62	15.66	-33.20	-25	-8.20	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-64.83	5.23	35.82	-34.24	-25	-9.24	Horizontal
5190.0	-61.41	5.23	35.82	-30.82	-25	-5.82	Vertical
7785.0	-64.47	5.67	36.85	-33.29	-25	-8.29	Vertical
7785.0	-59.44	5.67	36.85	-28.26	-25	-3.26	Horizontal
510.4	-47.90	1.62	16.17	-33.35	-25	-8.35	Vertical
562.9	-49.74	1.74	17.63	-33.85	-25	-8.85	Horizontal
Test Results for High Channel 2652.5MHz							
5305.0	-64.48	5.24	35.83	-33.89	-25	-8.89	Horizontal
5305.0	-59.52	5.24	35.83	-28.93	-25	-3.93	Vertical
7957.5	-63.98	5.68	36.87	-32.79	-25	-7.79	Vertical
7957.5	-61.20	5.68	36.87	-30.01	-25	-5.01	Horizontal
197.6	-47.90	1.55	15.84	-33.61	-25	-8.61	Vertical
353.1	-48.64	1.51	17.06	-33.09	-25	-8.09	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5090.0	-59.04	5.23	35.82	-28.45	-25	-3.45	Horizontal
5090.0	-61.87	5.23	35.82	-31.28	-25	-6.28	Vertical
7635.0	-59.05	5.67	36.86	-27.86	-25	-2.86	Vertical
7635.0	-64.76	5.67	36.86	-33.57	-25	-8.57	Horizontal
128.9	-46.64	1.43	15.51	-32.56	-25	-7.56	Vertical
344.8	-48.21	1.40	16.97	-32.64	-25	-7.64	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-64.64	5.23	35.82	-34.05	-25	-9.05	Horizontal
5190.0	-60.82	5.23	35.82	-30.23	-25	-5.23	Vertical
7785.0	-62.69	5.67	36.85	-31.51	-25	-6.51	Vertical
7785.0	-61.11	5.67	36.85	-29.93	-25	-4.93	Horizontal
100.8	-46.17	1.77	16.72	-31.22	-25	-6.22	Vertical
263.5	-44.55	1.31	16.99	-28.87	-25	-3.87	Horizontal
Test Results for High Channel 2645MHz							
5290.0	-63.63	5.24	35.83	-33.04	-25	-8.04	Horizontal
5290.0	-61.06	5.24	35.83	-30.47	-25	-5.47	Vertical
7935.0	-62.30	5.70	36.88	-31.12	-25	-6.12	Vertical
7935.0	-62.52	5.70	36.88	-31.34	-25	-6.34	Horizontal
349.9	-49.20	1.70	15.73	-35.17	-25	-10.17	Vertical
110.3	-47.03	1.75	17.33	-31.45	-25	-6.45	Horizontal

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

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

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

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

10. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 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 $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

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

RESULTS

See the following pages.

10.1 LTE BAND 2

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	12.3	0.006533	2.5
3.87	1880	14.1	0.007486	2.5
4.45	1880	13.1	0.006945	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.9	0.006869	2.5
Extreme (50C)	1880	11.6	0.006162	2.5
Extreme (40C)	1880	14.1	0.007495	2.5
Extreme (30C)	1880	13.5	0.007162	2.5
Extreme (10C)	1880	13.6	0.007243	2.5
Extreme (0C)	1880	11.8	0.006267	2.5
Extreme (-10C)	1880	13.3	0.007077	2.5
Extreme (-20C)	1880	14.0	0.007423	2.5
Extreme (-30C)	1880	14.4	0.007678	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	10.2	0.005433	2.5
3.87	1880	9.0	0.004765	2.5
4.45	1880	7.7	0.004114	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.2	0.004888	2.5
Extreme (50C)	1880	8.8	0.004668	2.5
Extreme (40C)	1880	7.9	0.004180	2.5
Extreme (30C)	1880	9.2	0.004876	2.5
Extreme (10C)	1880	8.8	0.004655	2.5
Extreme (0C)	1880	7.9	0.004224	2.5
Extreme (-10C)	1880	9.2	0.004911	2.5
Extreme (-20C)	1880	8.6	0.004592	2.5
Extreme (-30C)	1880	8.4	0.004443	2.5

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

10.2 LTE BAND 4

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1732.5	8.6	0.004968	2.5
3.87	1732.5	8.5	0.004915	2.5
4.45	1732.5	8.5	0.004911	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.6	0.004950	2.5
Extreme (50C)	1732.5	9.4	0.005402	2.5
Extreme (40C)	1732.5	7.6	0.004363	2.5
Extreme (30C)	1732.5	5.4	0.003122	2.5
Extreme (10C)	1732.5	7.2	0.004183	2.5
Extreme (0C)	1732.5	8.9	0.005152	2.5
Extreme (-10C)	1732.5	8.2	0.004738	2.5
Extreme (-20C)	1732.5	6.7	0.003883	2.5
Extreme (-30C)	1732.5	8.9	0.005118	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1732.5	10.1	0.005822	2.5
3.87	1732.5	9.3	0.005372	2.5
4.45	1732.5	8.0	0.004589	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.0	0.005792	2.5
Extreme (50C)	1732.5	8.9	0.005122	2.5
Extreme (40C)	1732.5	7.6	0.004397	2.5
Extreme (30C)	1732.5	8.7	0.005021	2.5
Extreme (10C)	1732.5	8.9	0.005121	2.5
Extreme (0C)	1732.5	7.9	0.004580	2.5
Extreme (-10C)	1732.5	9.1	0.005250	2.5
Extreme (-20C)	1732.5	8.8	0.005082	2.5
Extreme (-30C)	1732.5	8.6	0.004945	2.5

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

10.3 LTE BAND 5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	5.9	0.007009	2.5
3.87	836.5	6.6	0.007917	2.5
4.45	836.5	4.8	0.005760	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.007385	2.5
Extreme (50C)	836.5	5.9	0.007023	2.5
Extreme (40C)	836.5	6.4	0.007671	2.5
Extreme (30C)	836.5	6.3	0.007535	2.5
Extreme (10C)	836.5	4.9	0.005892	2.5
Extreme (0C)	836.5	5.0	0.006015	2.5
Extreme (-10C)	836.5	5.4	0.006464	2.5
Extreme (-20C)	836.5	6.3	0.007540	2.5
Extreme (-30C)	836.5	5.9	0.007013	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	5.6	0.006663	2.5
3.87	836.5	6.5	0.007715	2.5
4.45	836.5	4.6	0.005512	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.0	0.007164	2.5
Extreme (50C)	836.5	6.0	0.007182	2.5
Extreme (40C)	836.5	5.7	0.006861	2.5
Extreme (30C)	836.5	6.1	0.007324	2.5
Extreme (10C)	836.5	5.0	0.006017	2.5
Extreme (0C)	836.5	5.2	0.006236	2.5
Extreme (-10C)	836.5	5.6	0.006660	2.5
Extreme (-20C)	836.5	5.9	0.007107	2.5
Extreme (-30C)	836.5	6.3	0.007553	2.5

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

10.4 LTE BAND 7

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	10.3	0.004062	2.5
3.87	2535	8.9	0.003514	2.5
4.45	2535	8.2	0.003236	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.6	0.003795	2.5
Extreme (50C)	2535	9.4	0.003707	2.5
Extreme (40C)	2535	8.1	0.003210	2.5
Extreme (30C)	2535	8.7	0.003438	2.5
Extreme (10C)	2535	8.2	0.003217	2.5
Extreme (0C)	2535	8.6	0.003393	2.5
Extreme (-10C)	2535	9.1	0.003584	2.5
Extreme (-20C)	2535	8.7	0.003449	2.5
Extreme (-30C)	2535	8.2	0.003228	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	7.1	0.002791	2.5
3.87	2535	6.2	0.002426	2.5
4.45	2535	5.4	0.002119	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.8	0.002670	2.5
Extreme (50C)	2535	5.9	0.002333	2.5
Extreme (40C)	2535	5.0	0.001969	2.5
Extreme (30C)	2535	6.7	0.002634	2.5
Extreme (10C)	2535	5.3	0.002096	2.5
Extreme (0C)	2535	4.8	0.001893	2.5
Extreme (-10C)	2535	5.5	0.002170	2.5
Extreme (-20C)	2535	6.4	0.002516	2.5
Extreme (-30C)	2535	5.2	0.002059	2.5

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

10.5 LTE BAND 12

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	9.1	0.012873	2.5
3.87	707.5	9.8	0.013847	2.5
4.45	707.5	8.3	0.011699	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.2	0.013005	2.5
Extreme (50C)	707.5	7.6	0.010790	2.5
Extreme (40C)	707.5	7.7	0.010837	2.5
Extreme (30C)	707.5	8.5	0.012012	2.5
Extreme (10C)	707.5	7.5	0.010626	2.5
Extreme (0C)	707.5	8.6	0.012102	2.5
Extreme (-10C)	707.5	8.5	0.012019	2.5
Extreme (-20C)	707.5	8.6	0.012143	2.5
Extreme (-30C)	707.5	7.5	0.010576	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	7.5	0.010589	2.5
3.87	707.5	7.9	0.011234	2.5
4.45	707.5	7.6	0.010763	2.5

Frequency error vs. Temperature

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

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

10.6 LTE BAND 17

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	710.0	9.8	0.013786	2.5
3.87	710.0	8.9	0.012522	2.5
4.45	710.0	8.0	0.011256	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.9	0.013889	2.5
Extreme (50C)	710.0	8.5	0.011951	2.5
Extreme (40C)	710.0	7.6	0.010743	2.5
Extreme (30C)	710.0	9.4	0.013199	2.5
Extreme (10C)	710.0	8.9	0.012601	2.5
Extreme (0C)	710.0	8.1	0.011350	2.5
Extreme (-10C)	710.0	8.8	0.012417	2.5
Extreme (-20C)	710.0	8.8	0.012413	2.5
Extreme (-30C)	710.0	7.6	0.010738	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	710.0	10.2	0.014391	2.5
3.87	710.0	8.8	0.012412	2.5
4.45	710.0	8.7	0.012224	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.6	0.013486	2.5
Extreme (50C)	710.0	9.2	0.012931	2.5
Extreme (40C)	710.0	8.1	0.011468	2.5
Extreme (30C)	710.0	9.2	0.013015	2.5
Extreme (10C)	710.0	7.9	0.011175	2.5
Extreme (0C)	710.0	8.4	0.011889	2.5
Extreme (-10C)	710.0	9.0	0.012714	2.5
Extreme (-20C)	710.0	8.4	0.011889	2.5
Extreme (-30C)	710.0	8.3	0.011621	2.5

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

10.7 LTE BAND 41

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2595	8.3	0.003213	2.5
3.87	2595	6.3	0.002422	2.5
4.45	2595	8.0	0.003084	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.6	0.002920	2.5
Extreme (50C)	2595	4.8	0.001842	2.5
Extreme (40C)	2595	5.7	0.002201	2.5
Extreme (30C)	2595	4.3	0.001649	2.5
Extreme (10C)	2595	6.0	0.002305	2.5
Extreme (0C)	2595	5.2	0.001999	2.5
Extreme (-10C)	2595	9.3	0.003587	2.5
Extreme (-20C)	2595	10.4	0.004020	2.5
Extreme (-30C)	2595	6.3	0.002445	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2595	8.3	0.003219	2.5
3.87	2595	6.9	0.002651	2.5
4.45	2595	6.2	0.002396	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.4	0.002849	2.5
Extreme (50C)	2595	4.9	0.001889	2.5
Extreme (40C)	2595	5.8	0.002227	2.5
Extreme (30C)	2595	5.2	0.002019	2.5
Extreme (10C)	2595	6.4	0.002457	2.5
Extreme (0C)	2595	5.1	0.001959	2.5
Extreme (-10C)	2595	9.7	0.003724	2.5
Extreme (-20C)	2595	10.7	0.004122	2.5
Extreme (-30C)	2595	5.8	0.002234	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

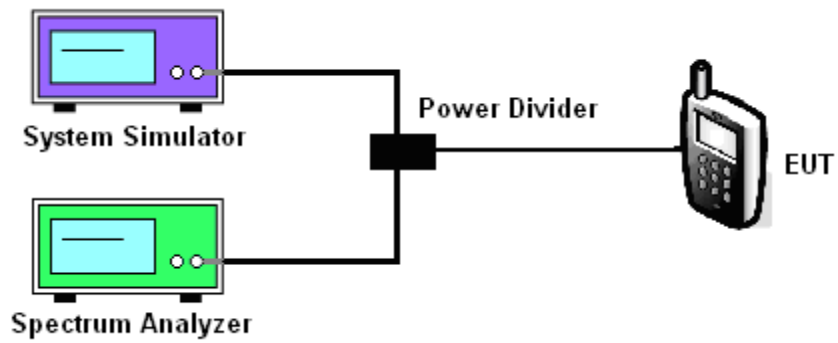
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

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

Test data reference attachment.

-----END OF REPORT-----