FCC CFR47 PART 24E, 27
CERTIFICATION TEST REPORT
FCC ID: O552204425

Product: LTE Broadband Router

Trade Mark: LOGIC, UNONU, iSWAG

Model No.: IC-7064

Family Model: UR700

Report No.: S23101706201004

Issue Date: Nov 14, 2023

Prepared for

SWAGTEK

10205 NW 19th Street STE101 Miami, FL 33172,United States

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... :	SWAGTEK
Address..... :	10205 NW 19th Street STE101 Miami, FL 33172,United States
Manufacturer's Name..... :	SWAGTEK
Address..... :	10205 NW 19th Street STE101 Miami, FL 33172,United States
Product name..... :	LTE Broadband Router
Model and/or type reference ..... :	IC-7064
Family Model..... :	UR700
Test Sample number..... :	S231017062002
Date of Test..... :	Oct 17, 2023 ~ Nov 14, 2023
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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Prepared By :	Reviewed By :	Approved By :
Mukzi Lee	Aaron Cheng	Alex Li
(Project Engineer)	(Supervisor)	(Manager)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	LTE Broadband Router
Trade Mark	LOGIC, UNONU, iSWAG
Model Name	IC-7064
Family Model	UR700
Model Difference	All the model are the same circuit and RF module, except the model names.
FCC ID:	O552204425
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 2,4,7, LTE TDD Band 38, 42
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; LTE TDD Band 38 Uplink& Downlink:: 2570MHz-2620MHz, LTE TDD Band 42 Uplink& Downlink:: 3450MHz-3550MHz,
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	FPC Antenna
Antenna gain:	LTE B2: 3.96dBi, B4: 1.10dBi, B7: 2.28dBi, B38: 2.10dBi,B42: 1.50dBi,
Adapter	Model: HJ-1201500 Input: 100-240V~50/60Hz, 0.6A Output: 12.0V⎓1.5A 18.0W
Battery	DC 7.4V, 2000mAh
Power supply	DC 7.4V from battery or DC 12V from Adapter
Extreme Vol. Limits:	DC 6.29V to DC 8.51V (Nominal DC 7.4V)（Note 1）
HW Version	OTX72_MB_V4.1
SW Version	N/A
** Note1: The High Voltage DC 8.51V and Low Voltage 6.29V 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: O552204425** 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 22, Part 24, Part 27, ANSI C63.26:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2/4/7/38/42

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

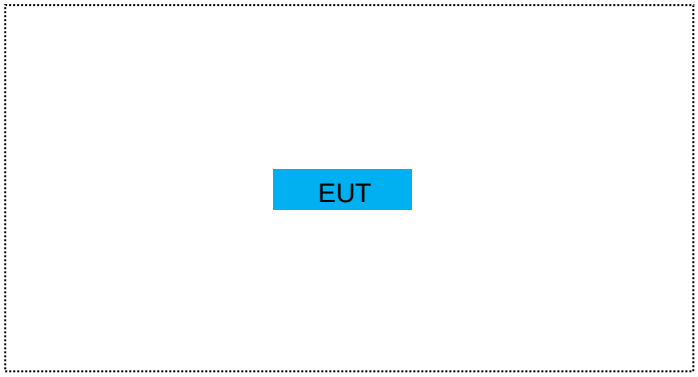
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	LTE Broadband Router	IC-7064	FCC ID: O552204425	EUT

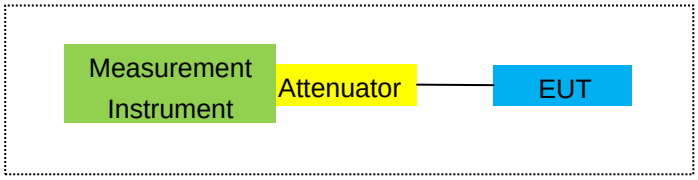
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

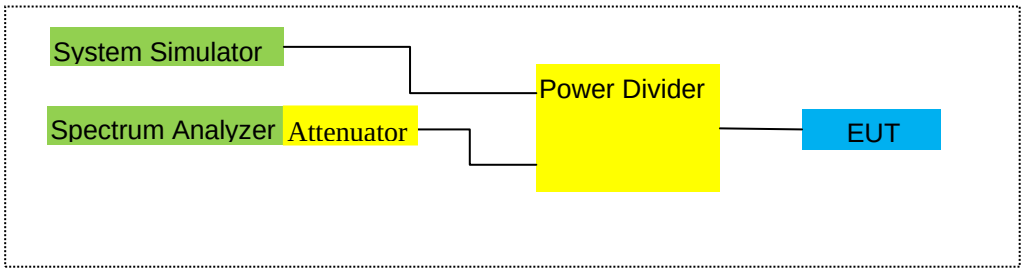
For Radiated Test Cases



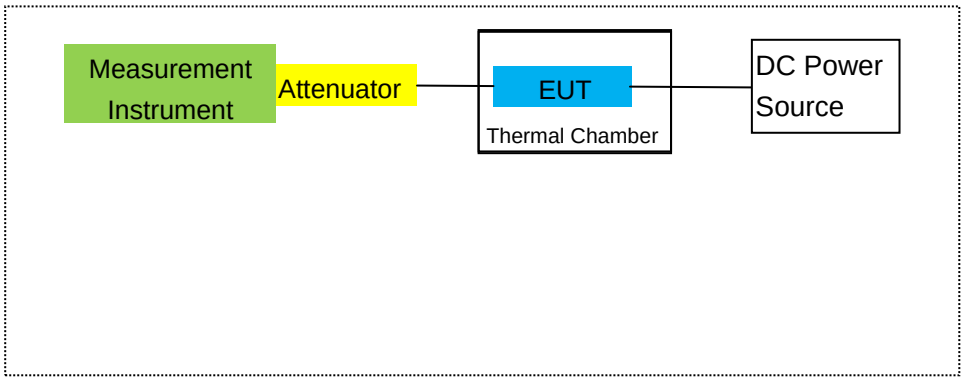
For Conducted Output Power



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



For Frequency Stability



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

3.TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16	2024.03.15	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2023.05.06	2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2025.03.30	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2025.11.06	3 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.11.07	2025.11.06	3 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.05.29	2024.05.28	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
23	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	1 year
24	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27	2024.03.26	1 year

26	DC Power Source	N/A	PS-6005D	20170402923	2023.05.06	2026.05.05	3 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

Certificate #4298.01

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 2/4/7/38/42

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, and §90.691
FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.
(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC: §90.691 Emission mask requirements for EA-based systems.
(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

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 2/4/7/38/42

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

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 measurementbelow 1 GHz, and 1 MHz for the measurement above 1 GHz.

MODES TESTED

□ Band 2/4/7/38/42

□

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 and §90.635

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.
90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

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 2/4/7/38/42

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)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-3.34	3.76	28.24	21.14	130.017	Horizontal	Pass
		1880	-3.11	3.91	28.22	21.20	131.826	Horizontal	Pass
		1909.3	-3.15	3.93	28.20	21.12	129.420	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.32	3.77	28.23	21.14	130.017	Horizontal	Pass
		1880	-3.08	3.91	28.24	21.25	133.352	Horizontal	Pass
		1908.5	-3.06	3.94	28.25	21.25	133.352	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.43	3.77	28.31	21.11	129.122	Horizontal	Pass
		1880	-3.13	3.91	28.22	21.18	131.220	Horizontal	Pass
		1907.5	-3.10	3.94	28.20	21.16	130.617	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.29	3.79	28.33	21.25	133.352	Horizontal	Pass
		1880	-3.07	3.95	28.22	21.20	131.826	Horizontal	Pass
		1905	-3.06	3.97	28.19	21.16	130.617	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.40	3.79	28.34	21.15	130.317	Horizontal	Pass
		1880	-3.05	3.95	28.22	21.22	132.434	Horizontal	Pass
		1902.5	-3.01	3.97	28.18	21.20	131.826	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.45	3.81	28.35	21.09	128.529	Horizontal	Pass
		1880	-3.05	3.96	28.22	21.21	132.130	Horizontal	Pass
		1900	-2.99	4.00	28.16	21.17	130.918	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-3.25	3.76	28.24	21.23	132.739	Vertical	Pass
		1880	-3.16	3.91	28.22	21.15	130.317	Vertical	Pass
		1909.3	-3.04	3.93	28.20	21.23	132.739	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.31	3.77	28.23	21.15	130.317	Vertical	Pass
		1880	-3.14	3.91	28.24	21.19	131.522	Vertical	Pass
		1908.5	-3.18	3.94	28.25	21.13	129.718	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.40	3.77	28.31	21.14	130.017	Vertical	Pass
		1880	-3.08	3.91	28.22	21.23	132.739	Vertical	Pass
		1907.5	-3.06	3.94	28.20	21.20	131.826	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.40	3.79	28.33	21.14	130.017	Vertical	Pass
		1880	-3.10	3.95	28.22	21.17	130.918	Vertical	Pass
		1905	-3.11	3.97	28.19	21.11	129.122	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-3.33	3.79	28.34	21.22	132.434	Vertical	Pass
		1880	-3.16	3.95	28.22	21.11	129.122	Vertical	Pass
		1902.5	-3.06	3.97	28.18	21.15	130.317	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.26	3.81	28.35	21.28	134.276	Vertical	Pass
		1880	-2.95	3.96	28.22	21.31	135.207	Vertical	Pass
		1900	-2.85	4.00	28.16	21.31	135.207	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.03	3.76	28.24	20.45	110.917	Horizontal	Pass
		1880	-3.98	3.91	28.22	20.33	107.895	Horizontal	Pass
		1909.3	-3.90	3.93	28.20	20.37	108.893	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.04	3.77	28.23	20.42	110.154	Horizontal	Pass
		1880	-3.99	3.91	28.24	20.34	108.143	Horizontal	Pass
		1908.5	-4.01	3.94	28.25	20.30	107.152	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.14	3.77	28.31	20.40	109.648	Horizontal	Pass
		1880	-4.03	3.91	28.22	20.28	106.660	Horizontal	Pass
		1907.5	-3.93	3.94	28.20	20.33	107.895	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.15	3.79	28.33	20.39	109.396	Horizontal	Pass
		1880	-3.87	3.95	28.22	20.40	109.648	Horizontal	Pass
		1905	-3.85	3.97	28.19	20.37	108.893	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.10	3.79	28.34	20.45	110.917	Horizontal	Pass
		1880	-3.90	3.95	28.22	20.37	108.893	Horizontal	Pass
		1902.5	-3.83	3.97	28.18	20.38	109.144	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.22	3.81	28.35	20.32	107.647	Horizontal	Pass
		1880	-3.95	3.96	28.22	20.31	107.399	Horizontal	Pass
		1900	-3.75	4.00	28.16	20.41	109.901	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.13	3.76	28.24	20.35	108.393	Vertical	Pass
		1880	-3.90	3.91	28.22	20.41	109.901	Vertical	Pass
		1909.3	-3.94	3.93	28.20	20.33	107.895	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.08	3.77	28.23	20.38	109.144	Vertical	Pass
		1880	-3.97	3.91	28.24	20.36	108.643	Vertical	Pass
		1908.5	-3.93	3.94	28.25	20.38	109.144	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-4.18	3.77	28.31	20.36	108.643	Vertical	Pass

Band 16 QAM		1880	-3.89	3.91	28.22	20.42	110.154	Vertical	Pass
		1907.5	-3.84	3.94	28.20	20.42	110.154	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.16	3.79	28.33	20.38	109.144	Vertical	Pass
		1880	-3.89	3.95	28.22	20.38	109.144	Vertical	Pass
		1905	-3.91	3.97	28.19	20.31	107.399	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.17	3.79	28.34	20.38	109.144	Vertical	Pass
		1880	-3.87	3.95	28.22	20.40	109.648	Vertical	Pass
		1902.5	-3.90	3.97	28.18	20.31	107.399	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.04	3.81	28.35	20.50	112.202	Vertical	Pass
		1880	-3.77	3.96	28.22	20.49	111.944	Vertical	Pass
		1900	-3.68	4.00	28.16	20.48	111.686	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					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-3.90	3.12	27.58	20.56	113.763	Horizontal	Pass
		1732.5	-3.67	3.27	27.61	20.67	116.681	Horizontal	Pass
		1754.3	-3.72	3.29	27.63	20.62	115.345	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.92	3.13	27.61	20.56	113.763	Horizontal	Pass
		1732.5	-3.68	3.27	27.61	20.66	116.413	Horizontal	Pass
		1753.5	-3.75	3.30	27.62	20.57	114.025	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.96	3.13	27.63	20.54	113.240	Horizontal	Pass
		1732.5	-3.78	3.27	27.61	20.56	113.763	Horizontal	Pass
		1752.5	-3.75	3.30	27.60	20.55	113.501	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.90	3.15	27.64	20.59	114.551	Horizontal	Pass
		1732.5	-3.61	3.31	27.61	20.69	117.220	Horizontal	Pass
		1750	-3.70	3.33	27.59	20.56	113.763	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.96	3.15	27.65	20.54	113.240	Horizontal	Pass
		1732.5	-3.75	3.31	27.61	20.55	113.501	Horizontal	Pass
		1747.5	-3.69	3.33	27.57	20.55	113.501	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.94	3.17	27.66	20.55	113.501	Horizontal	Pass
		1732.5	-3.59	3.32	27.61	20.70	117.490	Horizontal	Pass
		1745	-3.53	3.36	27.56	20.67	116.681	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-3.77	3.12	27.58	20.69	117.220	Vertical	Pass
		1732.5	-3.72	3.27	27.61	20.62	115.345	Vertical	Pass
		1754.3	-3.67	3.29	27.63	20.67	116.681	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.91	3.13	27.61	20.57	114.025	Vertical	Pass
		1732.5	-3.70	3.27	27.61	20.64	115.878	Vertical	Pass
		1753.5	-3.76	3.30	27.62	20.56	113.763	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.81	3.13	27.63	20.69	117.220	Vertical	Pass
		1732.5	-3.71	3.27	27.61	20.63	115.611	Vertical	Pass
		1752.5	-3.72	3.30	27.60	20.58	114.288	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.94	3.15	27.64	20.55	113.501	Vertical	Pass
		1732.5	-3.70	3.31	27.61	20.60	114.815	Vertical	Pass
		1750	-3.66	3.33	27.59	20.60	114.815	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-3.88	3.15	27.65	20.62	115.345	Vertical	Pass
		1732.5	-3.69	3.31	27.61	20.61	115.080	Vertical	Pass
		1747.5	-3.55	3.33	27.57	20.69	117.220	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.77	3.17	27.66	20.72	118.032	Vertical	Pass
		1732.5	-3.54	3.32	27.61	20.75	118.850	Vertical	Pass
		1745	-3.49	3.36	27.56	20.71	117.761	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.67	3.12	27.58	19.79	95.280	Horizontal	Pass
		1732.5	-4.53	3.27	27.61	19.81	95.719	Horizontal	Pass
		1754.3	-4.55	3.29	27.63	19.79	95.280	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.66	3.13	27.61	19.82	95.940	Horizontal	Pass
		1732.5	-4.48	3.27	27.61	19.86	96.828	Horizontal	Pass
		1753.5	-4.51	3.30	27.62	19.81	95.719	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.74	3.13	27.63	19.76	94.624	Horizontal	Pass
		1732.5	-4.58	3.27	27.61	19.76	94.624	Horizontal	Pass
		1752.5	-4.43	3.30	27.60	19.87	97.051	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.65	3.15	27.64	19.84	96.383	Horizontal	Pass
		1732.5	-4.46	3.31	27.61	19.84	96.383	Horizontal	Pass
		1750	-4.42	3.33	27.59	19.84	96.383	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.75	3.15	27.65	19.75	94.406	Horizontal	Pass
		1732.5	-4.50	3.31	27.61	19.80	95.499	Horizontal	Pass
		1747.5	-4.43	3.33	27.57	19.81	95.719	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.65	3.17	27.66	19.84	96.383	Horizontal	Pass
		1732.5	-4.55	3.32	27.61	19.74	94.189	Horizontal	Pass
		1745	-4.30	3.36	27.56	19.90	97.724	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.67	3.12	27.58	19.79	95.280	Vertical	Pass
		1732.5	-4.51	3.27	27.61	19.83	96.161	Vertical	Pass
		1754.3	-4.47	3.29	27.63	19.87	97.051	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.61	3.13	27.61	19.87	97.051	Vertical	Pass
		1732.5	-4.49	3.27	27.61	19.85	96.605	Vertical	Pass
		1753.5	-4.57	3.30	27.62	19.75	94.406	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-4.77	3.13	27.63	19.73	93.972	Vertical	Pass

Band 16 QAM		1732.5	-4.44	3.27	27.61	19.90	97.724	Vertical	Pass
		1752.5	-4.47	3.30	27.60	19.83	96.161	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.64	3.15	27.64	19.85	96.605	Vertical	Pass
		1732.5	-4.43	3.31	27.61	19.87	97.051	Vertical	Pass
		1750	-4.46	3.33	27.59	19.80	95.499	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.64	3.15	27.65	19.86	96.828	Vertical	Pass
		1732.5	-4.53	3.31	27.61	19.77	94.842	Vertical	Pass
		1747.5	-4.40	3.33	27.57	19.84	96.383	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.57	3.17	27.66	19.92	98.175	Vertical	Pass
		1732.5	-4.36	3.32	27.61	19.93	98.401	Vertical	Pass
		1745	-4.28	3.36	27.56	19.92	98.175	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)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	0.63	4.54	27.75	23.84	242.103	Horizontal	Pass
		2535	0.76	4.69	27.72	23.79	239.332	Horizontal	Pass
		2567.5	0.85	4.71	27.71	23.85	242.661	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.64	4.55	27.76	23.85	242.661	Horizontal	Pass
		2535	0.70	4.69	27.72	23.73	236.048	Horizontal	Pass
		2565	0.81	4.72	27.70	23.79	239.332	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.51	4.55	27.77	23.73	236.048	Horizontal	Pass
		2535	0.80	4.69	27.72	23.83	241.546	Horizontal	Pass
		2562.5	0.75	4.72	27.69	23.72	235.505	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.64	4.57	27.78	23.85	242.661	Horizontal	Pass
		2535	0.75	4.73	27.72	23.74	236.592	Horizontal	Pass
		2560	0.88	4.75	27.68	23.81	240.436	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	0.61	4.54	27.75	23.82	240.991	Vertical	Pass
		2535	0.83	4.69	27.72	23.86	243.220	Vertical	Pass
		2567.5	0.81	4.71	27.71	23.81	240.436	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.53	4.55	27.76	23.74	236.592	Vertical	Pass
		2535	0.83	4.69	27.72	23.86	243.220	Vertical	Pass
		2565	0.80	4.72	27.70	23.78	238.781	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.53	4.55	27.77	23.75	237.137	Vertical	Pass
		2535	0.75	4.69	27.72	23.78	238.781	Vertical	Pass
		2562.5	0.74	4.72	27.69	23.71	234.963	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.72	4.57	27.78	23.93	247.172	Vertical	Pass
		2535	0.91	4.73	27.72	23.90	245.471	Vertical	Pass
		2560	0.96	4.75	27.68	23.89	244.906	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.24	4.54	27.75	22.97	198.153	Horizontal	Pass
		2535	-0.10	4.69	27.72	22.93	196.336	Horizontal	Pass
		2567.5	-0.08	4.71	27.71	22.92	195.884	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.27	4.55	27.76	22.94	196.789	Horizontal	Pass
		2535	-0.21	4.69	27.72	22.82	191.426	Horizontal	Pass
		2565	0.00	4.72	27.70	22.98	198.609	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.39	4.55	27.77	22.83	191.867	Horizontal	Pass
		2535	-0.07	4.69	27.72	22.96	197.697	Horizontal	Pass
		2562.5	-0.01	4.72	27.69	22.96	197.697	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.31	4.57	27.78	22.90	194.984	Horizontal	Pass
		2535	-0.04	4.73	27.72	22.95	197.242	Horizontal	Pass
		2560	0.03	4.75	27.68	22.96	197.697	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.29	4.54	27.75	22.92	195.884	Vertical	Pass
		2535	-0.07	4.69	27.72	22.96	197.697	Vertical	Pass
		2567.5	-0.05	4.71	27.71	22.95	197.242	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.38	4.55	27.76	22.83	191.867	Vertical	Pass
		2535	-0.11	4.69	27.72	22.92	195.884	Vertical	Pass
		2565	-0.06	4.72	27.70	22.92	195.884	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.30	4.55	27.77	22.92	195.884	Vertical	Pass
		2535	-0.06	4.69	27.72	22.97	198.153	Vertical	Pass
		2562.5	-0.03	4.72	27.69	22.94	196.789	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.18	4.57	27.78	23.03	200.909	Vertical	Pass
		2535	0.00	4.73	27.72	22.99	199.067	Vertical	Pass
		2560	0.06	4.75	27.68	22.99	199.067	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 38

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2572.5	0.20	4.44	27.75	23.51	224.388	Horizontal	Pass
		2595	0.52	4.67	27.72	23.57	227.510	Horizontal	Pass
		2617.5	0.45	4.62	27.71	23.54	225.944	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2575	0.27	4.51	27.76	23.52	224.905	Horizontal	Pass
		2595	0.43	4.60	27.72	23.55	226.464	Horizontal	Pass
		2615	0.45	4.70	27.70	23.45	221.309	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2577.5	0.28	4.47	27.77	23.58	228.034	Horizontal	Pass
		2595	0.45	4.65	27.72	23.52	224.905	Horizontal	Pass
		2612.5	0.48	4.66	27.69	23.51	224.388	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2580	0.31	4.50	27.78	23.59	228.560	Horizontal	Pass
		2595	0.50	4.66	27.72	23.56	226.986	Horizontal	Pass
		2610	0.48	4.68	27.68	23.48	222.844	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2572.5	0.30	4.48	27.75	23.57	227.510	Vertical	Pass
		2595	0.48	4.62	27.72	23.58	228.034	Vertical	Pass
		2617.5	0.51	4.63	27.71	23.59	228.560	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2575	0.21	4.46	27.76	23.51	224.388	Vertical	Pass
		2595	0.50	4.65	27.72	23.57	227.510	Vertical	Pass
		2615	0.52	4.69	27.70	23.53	225.424	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2577.5	0.30	4.47	27.77	23.60	229.087	Vertical	Pass
		2595	0.38	4.65	27.72	23.45	221.309	Vertical	Pass
		2612.5	0.45	4.66	27.69	23.48	222.844	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2580	0.35	4.53	27.78	23.60	229.087	Vertical	Pass
		2595	0.56	4.66	27.72	23.62	230.144	Vertical	Pass
		2610	0.65	4.68	27.68	23.65	231.739	Vertical	Pass

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2572.5	-0.64	4.44	27.75	22.67	184.927	Horizontal	Pass
		2595	-0.44	4.67	27.72	22.61	182.390	Horizontal	Pass
		2617.5	-0.53	4.62	27.71	22.56	180.302	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2575	-0.65	4.51	27.76	22.60	181.970	Horizontal	Pass
		2595	-0.54	4.60	27.72	22.58	181.134	Horizontal	Pass
		2615	-0.38	4.70	27.70	22.62	182.810	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2577.5	-0.77	4.47	27.77	22.53	179.061	Horizontal	Pass
		2595	-0.55	4.65	27.72	22.52	178.649	Horizontal	Pass
		2612.5	-0.50	4.66	27.69	22.53	179.061	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2580	-0.71	4.50	27.78	22.57	180.717	Horizontal	Pass
		2595	-0.39	4.66	27.72	22.67	184.927	Horizontal	Pass
		2610	-0.44	4.68	27.68	22.56	180.302	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2572.5	-0.66	4.48	27.75	22.61	182.390	Vertical	Pass
		2595	-0.54	4.62	27.72	22.56	180.302	Vertical	Pass
		2617.5	-0.51	4.63	27.71	22.57	180.717	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2575	-0.68	4.46	27.76	22.62	182.810	Vertical	Pass
		2595	-0.42	4.65	27.72	22.65	184.077	Vertical	Pass
		2615	-0.39	4.69	27.70	22.62	182.810	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2577.5	-0.76	4.47	27.77	22.54	179.473	Vertical	Pass
		2595	-0.48	4.65	27.72	22.59	181.552	Vertical	Pass
		2612.5	-0.37	4.66	27.69	22.66	184.502	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2580	-0.50	4.53	27.78	22.75	188.365	Vertical	Pass
		2595	-0.32	4.66	27.72	22.74	187.932	Vertical	Pass
		2610	-0.26	4.68	27.68	22.74	187.932	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 42

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	3452.5	1.50	4.54	27.75	24.71	295.801	Horizontal	Pass
		3500	1.68	4.69	27.72	24.71	295.801	Horizontal	Pass
		3547.5	1.74	4.71	27.71	24.74	297.852	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	3455	1.53	4.55	27.76	24.74	297.852	Horizontal	Pass
		3500	1.68	4.69	27.72	24.71	295.801	Horizontal	Pass
		3545	1.69	4.72	27.70	24.67	293.089	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	3457.5	1.52	4.55	27.77	24.74	297.852	Horizontal	Pass
		3500	1.72	4.69	27.72	24.75	298.538	Horizontal	Pass
		3542.5	1.70	4.72	27.69	24.67	293.089	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	3460	1.52	4.57	27.78	24.73	297.167	Horizontal	Pass
		3500	1.71	4.73	27.72	24.70	295.121	Horizontal	Pass
		3540	1.85	4.75	27.68	24.78	300.608	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	3452.5	1.47	4.54	27.75	24.68	293.765	Vertical	Pass
		3500	1.72	4.69	27.72	24.75	298.538	Vertical	Pass
		3547.5	1.66	4.71	27.71	24.66	292.415	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	3455	1.56	4.55	27.76	24.77	299.916	Vertical	Pass
		3500	1.69	4.69	27.72	24.72	296.483	Vertical	Pass
		3545	1.68	4.72	27.70	24.66	292.415	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	3457.5	1.50	4.55	27.77	24.72	296.483	Vertical	Pass
		3500	1.72	4.69	27.72	24.75	298.538	Vertical	Pass
		3542.5	1.75	4.72	27.69	24.72	296.483	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	3460	1.64	4.57	27.78	24.85	305.492	Vertical	Pass
		3500	1.82	4.73	27.72	24.81	302.691	Vertical	Pass
		3540	1.90	4.75	27.68	24.83	304.089	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	3452.5	0.24	4.54	27.75	23.45	221.309	Horizontal	Pass
		3500	0.33	4.69	27.72	23.36	216.770	Horizontal	Pass
		3547.5	0.34	4.71	27.71	23.34	215.774	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	3455	0.10	4.55	27.76	23.31	214.289	Horizontal	Pass
		3500	0.27	4.69	27.72	23.30	213.796	Horizontal	Pass
		3545	0.40	4.72	27.70	23.38	217.771	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	3457.5	0.18	4.55	27.77	23.40	218.776	Horizontal	Pass
		3500	0.32	4.69	27.72	23.35	216.272	Horizontal	Pass
		3542.5	0.42	4.72	27.69	23.39	218.273	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	3460	0.15	4.57	27.78	23.36	216.770	Horizontal	Pass
		3500	0.32	4.73	27.72	23.31	214.289	Horizontal	Pass
		3540	0.43	4.75	27.68	23.36	216.770	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	3452.5	0.23	4.54	27.75	23.44	220.800	Vertical	Pass
		3500	0.34	4.69	27.72	23.37	217.270	Vertical	Pass
		3547.5	0.33	4.71	27.71	23.33	215.278	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	3455	0.15	4.55	27.76	23.36	216.770	Vertical	Pass
		3500	0.29	4.69	27.72	23.32	214.783	Vertical	Pass
		3545	0.31	4.72	27.70	23.29	213.304	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	3457.5	0.23	4.55	27.77	23.45	221.309	Vertical	Pass
		3500	0.42	4.69	27.72	23.45	221.309	Vertical	Pass
		3542.5	0.41	4.72	27.69	23.38	217.771	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	3460	0.24	4.57	27.78	23.45	221.309	Vertical	Pass
		3500	0.49	4.73	27.72	23.48	222.844	Vertical	Pass
		3540	0.52	4.75	27.68	23.45	221.309	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 and §90.691

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 2/4/7/38/42

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 Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3701.4	-49.89	4.04	33.51	-20.42	-13	-7.42	Horizontal
3701.4	-48.15	4.04	33.51	-18.68	-13	-5.68	Vertical
5552.1	-49.32	5.24	35.84	-18.72	-13	-5.72	Vertical
5552.1	-52.35	5.24	35.84	-21.75	-13	-8.75	Horizontal
201.4	-36.19	1.43	16.02	-21.60	-13	-8.60	Vertical
259.4	-44.32	1.30	17.99	-27.63	-13	-14.63	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.26	4.04	33.56	-16.74	-13	-3.74	Horizontal
3760.0	-44.19	4.04	33.56	-14.67	-13	-1.67	Vertical
5640.0	-44.36	5.24	35.91	-13.69	-13	-0.69	Vertical
5640.0	-49.42	5.24	35.91	-18.75	-13	-5.75	Horizontal
195.1	-36.08	1.62	16.97	-20.73	-13	-7.73	Vertical
382.7	-39.38	1.74	15.98	-25.15	-13	-12.15	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.61	4.04	34.00	-17.65	-13	-4.65	Horizontal
3818.6	-49.90	4.04	34.00	-19.94	-13	-6.94	Vertical
5727.9	-52.47	5.24	36.04	-21.67	-13	-8.67	Vertical
5727.9	-52.41	5.24	36.04	-21.61	-13	-8.61	Horizontal
195.4	-37.36	1.42	17.29	-21.49	-13	-8.49	Vertical
333.3	-37.90	1.50	17.90	-21.49	-13	-8.49	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3720.0	-49.18	4.07	33.54	-19.71	-13	-6.71	Horizontal
3720.0	-46.62	4.07	33.54	-17.15	-13	-4.15	Vertical
5580.0	-49.33	5.28	35.86	-18.75	-13	-5.75	Vertical
5580.0	-53.85	5.28	35.86	-23.27	-13	-10.27	Horizontal
197.2	-34.15	1.58	16.89	-18.83	-13	-5.83	Vertical
411.1	-37.43	1.76	17.26	-21.93	-13	-8.93	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-44.47	4.04	33.56	-14.95	-13	-1.95	Horizontal
3760.0	-46.87	4.04	33.56	-17.35	-13	-4.35	Vertical
5640.0	-52.40	5.24	35.91	-21.73	-13	-8.73	Vertical
5640.0	-51.78	5.24	35.91	-21.11	-13	-8.11	Horizontal
211.1	-42.20	1.46	16.27	-27.39	-13	-14.39	Vertical
276.5	-43.46	1.59	15.15	-29.90	-13	-16.90	Horizontal
Test Results for High Channel 1890MHz							
3800.0	-49.19	4.04	34.00	-19.23	-13	-6.23	Horizontal
3800.0	-46.81	4.04	34.00	-16.85	-13	-3.85	Vertical
5700.0	-46.55	5.24	36.04	-15.75	-13	-2.75	Vertical
5700.0	-49.59	5.24	36.04	-18.79	-13	-5.79	Horizontal
186.2	-36.30	1.36	17.39	-20.26	-13	-7.26	Vertical
299.2	-36.15	1.66	15.39	-22.42	-13	-9.42	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 Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-46.08	4.02	29.80	-20.30	-13	-7.30	Horizontal
3421.4	-45.60	4.02	29.80	-19.82	-13	-6.82	Vertical
5132.1	-48.30	5.24	35.84	-17.70	-13	-4.70	Vertical
5132.1	-50.65	5.24	35.84	-20.05	-13	-7.05	Horizontal
185.4	-38.14	1.68	16.04	-23.78	-13	-10.78	Vertical
236.5	-36.19	1.78	17.74	-20.23	-13	-7.23	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-46.42	4.03	30.00	-20.45	-13	-7.45	Horizontal
3465.0	-52.55	4.03	30.00	-26.58	-13	-13.58	Vertical
5197.5	-50.87	5.25	35.86	-20.26	-13	-7.26	Vertical
5197.5	-52.92	5.25	35.86	-22.31	-13	-9.31	Horizontal
187.0	-41.87	1.72	17.69	-25.90	-13	-12.90	Vertical
460.4	-40.76	1.62	16.02	-26.35	-13	-13.35	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.87	4.05	30.01	-23.91	-13	-10.91	Horizontal
3508.6	-45.22	4.05	30.01	-19.26	-13	-6.26	Vertical
5262.9	-48.15	5.26	35.86	-17.55	-13	-4.55	Vertical
5262.9	-52.35	5.26	35.86	-21.75	-13	-8.75	Horizontal
178.0	-37.91	1.80	16.69	-23.02	-13	-10.02	Vertical
403.1	-40.68	1.75	16.66	-25.78	-13	-12.78	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3440.0	-46.48	4.02	29.80	-20.70	-13	-7.70	Horizontal
3440.0	-44.96	4.02	29.80	-19.18	-13	-6.18	Vertical
5160.0	-47.30	5.24	35.84	-16.70	-13	-3.70	Vertical
5160.0	-49.56	5.24	35.84	-18.96	-13	-5.96	Horizontal
176.1	-37.30	1.57	17.26	-21.61	-13	-8.61	Vertical
370.2	-43.56	1.78	16.35	-28.99	-13	-15.99	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.40	4.03	30.00	-23.43	-13	-10.43	Horizontal
3465.0	-49.85	4.03	30.00	-23.88	-13	-10.88	Vertical
5197.5	-53.83	5.25	35.86	-23.22	-13	-10.22	Vertical
5197.5	-50.76	5.25	35.86	-20.15	-13	-7.15	Horizontal
209.2	-43.05	1.44	17.95	-26.54	-13	-13.54	Vertical
248.1	-36.17	1.65	16.09	-21.73	-13	-8.73	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-46.69	4.05	27.68	-23.06	-13	-10.06	Horizontal
3490.0	-48.00	4.05	27.68	-24.37	-13	-11.37	Vertical
5235.0	-53.24	5.26	35.86	-22.64	-13	-9.64	Vertical
5235.0	-49.72	5.26	35.86	-19.12	-13	-6.12	Horizontal
181.9	-35.71	1.61	16.85	-20.47	-13	-7.47	Vertical
329.7	-37.41	1.61	15.19	-23.83	-13	-10.83	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	-60.00	5.23	35.81	-29.42	-25	-4.42	Horizontal
5005.0	-63.90	5.23	35.81	-33.32	-25	-8.32	Vertical
7507.5	-63.49	5.67	36.85	-32.31	-25	-7.31	Vertical
7507.5	-62.45	5.67	36.85	-31.27	-25	-6.27	Horizontal
198.8	-52.47	1.73	17.97	-36.23	-25	-11.23	Vertical
451.7	-49.29	1.38	15.11	-35.56	-25	-10.56	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.34	5.23	35.82	-32.75	-25	-7.75	Horizontal
5070.0	-63.24	5.23	35.82	-32.65	-25	-7.65	Vertical
7605.0	-61.58	5.67	36.85	-30.40	-25	-5.40	Vertical
7605.0	-63.18	5.67	36.85	-32.00	-25	-7.00	Horizontal
196.7	-48.84	1.77	16.17	-34.43	-25	-9.43	Vertical
455.4	-46.40	1.63	15.21	-32.82	-25	-7.82	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-64.28	5.24	35.83	-33.69	-25	-8.69	Horizontal
5135.0	-64.05	5.24	35.83	-33.46	-25	-8.46	Vertical
7702.5	-59.21	5.68	36.87	-28.02	-25	-3.02	Vertical
7702.5	-63.14	5.68	36.87	-31.95	-25	-6.95	Horizontal
196.5	-46.25	1.58	17.56	-30.27	-25	-5.27	Vertical
355.9	-51.06	1.45	16.58	-35.93	-25	-10.93	Horizontal

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

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020.0	-63.16	5.23	35.82	-32.57	-25	-7.57	Horizontal
5020.0	-63.15	5.23	35.82	-32.56	-25	-7.56	Vertical
7530.0	-60.51	5.67	36.86	-29.32	-25	-4.32	Vertical
7530.0	-62.47	5.67	36.86	-31.28	-25	-6.28	Horizontal
179.8	-45.96	1.63	15.76	-31.83	-25	-6.83	Vertical
263.8	-49.36	1.71	15.44	-35.63	-25	-10.63	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.49	5.23	35.82	-31.90	-25	-6.90	Horizontal
5070.0	-62.60	5.23	35.82	-32.01	-25	-7.01	Vertical
7605.0	-60.52	5.67	36.85	-29.34	-25	-4.34	Vertical
7605.0	-59.99	5.67	36.85	-28.81	-25	-3.81	Horizontal
207.5	-49.36	1.79	16.84	-34.30	-25	-9.30	Vertical
356.6	-50.91	1.71	17.64	-34.98	-25	-9.98	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.36	5.24	35.83	-28.77	-25	-3.77	Horizontal
5120.0	-62.79	5.24	35.83	-32.20	-25	-7.20	Vertical
7680.0	-64.97	5.70	36.88	-33.79	-25	-8.79	Vertical
7680.0	-62.10	5.70	36.88	-30.92	-25	-5.92	Horizontal
185.8	-48.07	1.79	16.84	-33.01	-25	-8.01	Vertical
363.3	-44.84	1.71	17.64	-28.91	-25	-3.91	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.

9.4 LTE BAND 38

QPSK EIRP POWER FOR LTE BAND 38 (5MHZ BANDWIDTH)

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5145.0	-59.36	5.13	35.81	-28.68	-25	-3.68	Horizontal
5145.0	-60.58	5.13	35.81	-29.90	-25	-4.90	Vertical
7717.5	-59.48	5.42	36.85	-28.05	-25	-3.05	Vertical
7717.5	-60.35	5.42	36.85	-28.92	-25	-3.92	Horizontal
204.3	-47.06	1.56	17.97	-30.65	-25	-5.65	Vertical
364.0	-47.03	1.33	15.11	-33.25	-25	-8.25	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-60.07	5.16	35.82	-29.41	-25	-4.41	Horizontal
5190.0	-61.98	5.16	35.82	-31.32	-25	-6.32	Vertical
7785.0	-61.24	5.53	36.85	-29.92	-25	-4.92	Vertical
7785.0	-60.38	5.53	36.85	-29.06	-25	-4.06	Horizontal
203.5	-47.43	1.77	16.17	-33.02	-25	-8.02	Vertical
454.9	-46.16	1.63	15.21	-32.58	-25	-7.58	Horizontal
Test Results for High Channel 2617.5MHz							
5235.0	-62.07	5.23	35.83	-31.47	-25	-6.47	Horizontal
5235.0	-60.50	5.23	35.83	-29.90	-25	-4.90	Vertical
7852.5	-61.04	5.62	36.87	-29.79	-25	-4.79	Vertical
7852.5	-60.00	5.62	36.87	-28.75	-25	-3.75	Horizontal
179.8	-47.04	1.58	17.56	-31.06	-25	-6.06	Vertical
455.8	-51.63	1.45	16.58	-36.50	-25	-11.50	Horizontal

QPSK EIRP POWER FOR LTE BAND 38 (20MHZ BANDWIDTH)

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5160.0	-61.34	5.23	35.82	-30.75	-25	-5.75	Horizontal
5160.0	-59.07	5.23	35.82	-28.48	-25	-3.48	Vertical
7740.0	-60.15	5.67	36.86	-28.96	-25	-3.96	Vertical
7740.0	-59.74	5.67	36.86	-28.55	-25	-3.55	Horizontal
206.1	-45.86	1.55	15.76	-31.65	-25	-6.65	Vertical
337.3	-44.31	1.62	15.44	-30.49	-25	-5.49	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-59.45	5.16	35.82	-28.79	-25	-3.79	Horizontal
5190.0	-64.42	5.16	35.82	-33.76	-25	-8.76	Vertical
7785.0	-64.71	5.53	36.85	-33.39	-25	-8.39	Vertical
7785.0	-60.03	5.53	36.85	-28.71	-25	-3.71	Horizontal
203.5	-53.95	1.58	16.84	-38.69	-25	-13.69	Vertical
409.3	-49.21	1.61	17.64	-33.18	-25	-8.18	Horizontal
Test Results for High Channel 2610MHz							
5220.0	-63.13	5.24	35.83	-32.54	-25	-7.54	Horizontal
5220.0	-64.66	5.24	35.83	-34.07	-25	-9.07	Vertical
7830.0	-63.12	5.70	36.88	-31.94	-25	-6.94	Vertical
7830.0	-60.05	5.70	36.88	-28.87	-25	-3.87	Horizontal
176.7	-44.54	1.48	16.84	-29.18	-25	-4.18	Vertical
390.6	-49.63	1.59	17.64	-33.58	-25	-8.58	Horizontal

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

. Over Limit= : PMea(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.

9.5 LTE BAND 42

QPSK EIRP POWER FOR LTE BAND 42 (5MHZ BANDWIDTH)

Test Results for Low Channel 3452.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
6905.0	-64.20	6.17	35.67	-34.70	-25	-9.70	Horizontal
6905.0	-59.20	6.17	35.67	-29.70	-25	-4.70	Vertical
10357.5	-63.10	6.46	36.71	-32.85	-25	-7.85	Vertical
10357.5	-64.63	6.46	36.71	-34.38	-25	-9.38	Horizontal
191.5	-47.20	1.56	17.97	-30.79	-25	-5.79	Vertical
246.6	-47.02	1.33	15.11	-33.24	-25	-8.24	Horizontal
Test Results for Mid Channel 3500MHz							
7000.0	-63.88	6.20	35.68	-34.40	-25	-9.40	Horizontal
7000.0	-62.53	6.20	35.68	-33.05	-25	-8.05	Vertical
10500.0	-63.14	6.57	36.71	-33.00	-25	-8.00	Vertical
10500.0	-61.66	6.57	36.71	-31.52	-25	-6.52	Horizontal
193.2	-45.07	1.77	16.17	-30.66	-25	-5.66	Vertical
277.9	-54.19	1.63	15.21	-40.61	-25	-15.61	Horizontal
Test Results for High Channel 3547.5MHz							
7095.0	-61.31	6.27	35.69	-31.89	-25	-6.89	Horizontal
7095.0	-61.07	6.27	35.69	-31.65	-25	-6.65	Vertical
10642.5	-64.49	6.66	36.73	-34.42	-25	-9.42	Vertical
10642.5	-61.70	6.66	36.73	-31.63	-25	-6.63	Horizontal
211.0	-47.03	1.58	17.56	-31.05	-25	-6.05	Vertical
235.8	-52.34	1.45	16.58	-37.21	-25	-12.21	Horizontal

QPSK EIRP POWER FOR LTE BAND 42 (20MHZ BANDWIDTH)

Test Results for Low Channel 3460MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
6920.0	-59.63	6.27	35.68	-30.22	-25	-5.22	Horizontal
6920.0	-61.03	6.27	35.68	-31.62	-25	-6.62	Vertical
10380.0	-63.85	6.71	36.72	-33.84	-25	-8.84	Vertical
10380.0	-63.13	6.71	36.72	-33.12	-25	-8.12	Horizontal
205.7	-54.77	1.55	15.76	-40.56	-25	-15.56	Vertical
391.5	-47.71	1.62	15.44	-33.89	-25	-8.89	Horizontal
Test Results for Mid Channel 3500MHz							
7000.0	-62.17	6.20	35.68	-32.69	-25	-7.69	Horizontal
7000.0	-62.90	6.20	35.68	-33.42	-25	-8.42	Vertical
10500.0	-59.81	6.57	36.71	-29.67	-25	-4.67	Vertical
10500.0	-59.93	6.57	36.71	-29.79	-25	-4.79	Horizontal
207.3	-54.73	1.58	16.84	-39.47	-25	-14.47	Vertical
426.3	-48.46	1.61	17.64	-32.43	-25	-7.43	Horizontal
Test Results for High Channel 3540MHz							
7080.0	-61.90	6.28	35.69	-32.49	-25	-7.49	Horizontal
7080.0	-63.34	6.28	35.69	-33.93	-25	-8.93	Vertical
10620.0	-62.65	6.74	36.74	-32.65	-25	-7.65	Vertical
10620.0	-60.28	6.74	36.74	-30.28	-25	-5.28	Horizontal
194.3	-44.29	1.48	16.84	-28.93	-25	-3.93	Vertical
249.0	-45.90	1.59	17.64	-29.85	-25	-4.85	Horizontal

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

. Over Limit= : PMea(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, §90.213

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, DC6.29V, Normal, DC 7.4V and High voltage, DC 8.51V.

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 2/4/7/38/42

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]
6.29	1880	12.9	0.006845	2.5
7.4	1880	13.3	0.007097	2.5
8.51	1880	13.5	0.007206	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13.1	0.006959	2.5
Extreme (50C)	1880	11.7	0.006218	2.5
Extreme (40C)	1880	13.6	0.007248	2.5
Extreme (30C)	1880	13.2	0.007037	2.5
Extreme (10C)	1880	14.2	0.007571	2.5
Extreme (0C)	1880	12.4	0.006619	2.5
Extreme (-10C)	1880	13.0	0.006899	2.5
Extreme (-20C)	1880	13.7	0.007294	2.5
Extreme (-30C)	1880	14.3	0.007588	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]
6.29	1880	9.8	0.005225	2.5
7.4	1880	8.9	0.004733	2.5
8.51	1880	8.4	0.004463	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.1	0.004845	2.5
Extreme (50C)	1880	8.7	0.004619	2.5
Extreme (40C)	1880	8.3	0.004416591	2.5
Extreme (30C)	1880	8.8	0.00465818	2.5
Extreme (10C)	1880	9.2	0.004902796	2.5
Extreme (0C)	1880	8.0	0.004230973	2.5
Extreme (-10C)	1880	8.8	0.004677685	2.5
Extreme (-20C)	1880	9.0	0.004808055	2.5
Extreme (-30C)	1880	8.2	0.004350812	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]
6.29	1732.5	8.6	0.004986	2.5
7.4	1732.5	9.2	0.005316	2.5
8.51	1732.5	8.6	0.004942	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.2	0.004712	2.5
Extreme (50C)	1732.5	8.7	0.005019	2.5
Extreme (40C)	1732.5	7.4	0.004249	2.5
Extreme (30C)	1732.5	5.5	0.003182	2.5
Extreme (10C)	1732.5	7.0	0.004033	2.5
Extreme (0C)	1732.5	9.8	0.005657	2.5
Extreme (-10C)	1732.5	8.5	0.004922	2.5
Extreme (-20C)	1732.5	7.2	0.004169	2.5
Extreme (-30C)	1732.5	8.2	0.004744	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]
6.29	1732.5	9.6	0.005545	2.5
7.4	1732.5	9.0	0.005173	2.5
8.51	1732.5	8.5	0.004907	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.7	0.005612	2.5
Extreme (50C)	1732.5	9.4	0.005424	2.5
Extreme (40C)	1732.5	8.4	0.004850	2.5
Extreme (30C)	1732.5	9.5	0.005471	2.5
Extreme (10C)	1732.5	9.1	0.005231	2.5
Extreme (0C)	1732.5	8.1	0.004669	2.5
Extreme (-10C)	1732.5	9.4	0.005399	2.5
Extreme (-20C)	1732.5	8.8	0.005059	2.5
Extreme (-30C)	1732.5	8.0	0.004628	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]
6.29	2535	10.3	0.004072	2.5
7.4	2535	8.8	0.003488	2.5
8.51	2535	8.1	0.003194	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.0	0.003538	2.5
Extreme (50C)	2535	8.9	0.003528	2.5
Extreme (40C)	2535	8.2	0.003216	2.5
Extreme (30C)	2535	9.4	0.003689	2.5
Extreme (10C)	2535	7.8	0.003072	2.5
Extreme (0C)	2535	8.7	0.003431	2.5
Extreme (-10C)	2535	9.1	0.003603	2.5
Extreme (-20C)	2535	8.9	0.003514	2.5
Extreme (-30C)	2535	8.6	0.003392	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]
6.29	2535	6.9	0.002722	2.5
7.4	2535	6.8	0.002688	2.5
8.51	2535	5.5	0.002180	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.2	0.002049	2.5
Extreme (40C)	2535	5.1	0.002015	2.5
Extreme (30C)	2535	6.8	0.002677	2.5
Extreme (10C)	2535	5.3	0.002081	2.5
Extreme (0C)	2535	5.2	0.002065	2.5
Extreme (-10C)	2535	5.1	0.002016	2.5
Extreme (-20C)	2535	6.3	0.002485	2.5
Extreme (-30C)	2535	5.5	0.002152	2.5

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

10.4 LTE BAND 38

Band 38 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]
6.29	2595	9.7	0.003722	2.5
7.4	2595	8.8	0.003386	2.5
8.51	2595	8.8	0.003379	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	9.3	0.003601	2.5
Extreme (50C)	2595	8.5	0.003263	2.5
Extreme (40C)	2595	8.6	0.003319	2.5
Extreme (30C)	2595	8.8	0.003378	2.5
Extreme (10C)	2595	8.0	0.003066	2.5
Extreme (0C)	2595	8.7	0.003335	2.5
Extreme (-10C)	2595	9.6	0.003704	2.5
Extreme (-20C)	2595	8.6	0.003321	2.5
Extreme (-30C)	2595	8.5	0.003276	2.5

Band 38 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]
6.29	2595	6.9	0.002659	2.5
7.4	2595	6.4	0.002468	2.5
8.51	2595	5.6	0.002155	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	6.9	0.002659	2.5
Extreme (50C)	2595	5.6	0.002164	2.5
Extreme (40C)	2595	5.9	0.002263	2.5
Extreme (30C)	2595	6.9	0.002657	2.5
Extreme (10C)	2595	6.0	0.002317	2.5
Extreme (0C)	2595	5.2	0.002010	2.5
Extreme (-10C)	2595	5.3	0.002059	2.5
Extreme (-20C)	2595	6.1	0.002332	2.5
Extreme (-30C)	2595	5.3	0.002048	2.5

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

10.5 LTE BAND 42

Band 42 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]
6.29	3500.0	10.2	0.002912	2.5
7.4	3500.0	8.8	0.002523	2.5
8.51	3500.0	8.0	0.002293	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3500.0	9.4	0.002678	2.5
Extreme (50C)	3500.0	8.9	0.002545	2.5
Extreme (40C)	3500.0	8.0	0.002291	2.5
Extreme (30C)	3500.0	9.0	0.002564	2.5
Extreme (10C)	3500.0	8.7	0.002486	2.5
Extreme (0C)	3500.0	8.1	0.002318	2.5
Extreme (-10C)	3500.0	9.3	0.002671	2.5
Extreme (-20C)	3500.0	9.1	0.002592	2.5
Extreme (-30C)	3500.0	8.3	0.002369	2.5

Band 42 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]
6.29	3500.0	9.8	0.002793	2.5
7.4	3500.0	8.5	0.002429	2.5
8.51	3500.0	8.3	0.002367	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3500.0	9.3	0.002659	2.5
Extreme (50C)	3500.0	8.6	0.002470	2.5
Extreme (40C)	3500.0	8.2	0.002339	2.5
Extreme (30C)	3500.0	9.2	0.002632	2.5
Extreme (10C)	3500.0	8.4	0.002403	2.5
Extreme (0C)	3500.0	8.7	0.002486	2.5
Extreme (-10C)	3500.0	9.6	0.002741	2.5
Extreme (-20C)	3500.0	8.7	0.002484	2.5
Extreme (-30C)	3500.0	8.9	0.002534	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.

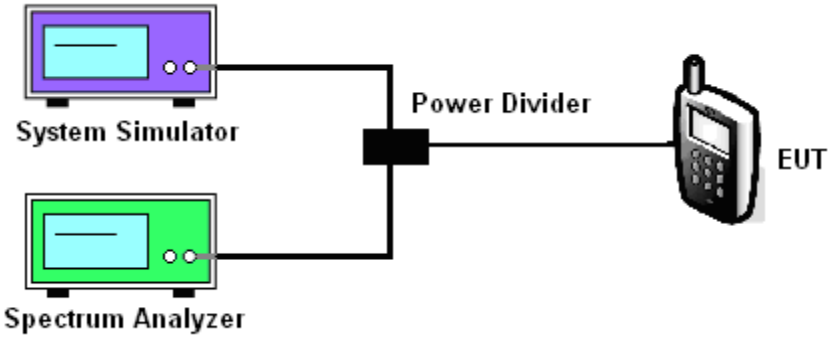
11.2 Measuring Instruments

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 2/4/7/38/42

Test data reference attachment.

----END OF REPORT----