

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT

FCC ID: ZSW-30-133

Product: Mobile Phone

Trade Mark: Bmobile

Model Number: BL61 PRO

Family Model: N/A

Report No.: S23111603501005

Prepared for

b mobile HK Limited

Flat 18; 14/F Block 1; Golden Industrial Building; 16-26 Kwai Tak Street;
Kwai Chung; New Territories; Hong Kong, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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

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

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

TEST RESULT CERTIFICATION

Applicant's name..... : b mobile HK Limited
Address : Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong, China
Manufacturer's Name..... : b mobile HK Limited
Address : Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong, China
Product name : Mobile Phone
Model and/or type reference : BL61 PRO
Family Model: N/A
Test sample number S231116035001
Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.26:2015
ANSI/TIA-603-E-2016

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

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

Date of Test
Date (s) of performance of tests Dec 18, 2023 ~ Jan 31, 2024
Date of Issue Jan 31, 2024
Test Result..... Pass

Prepared By: Allen Liu (Project Engineer)

Reviewed By: Aaron Cheng (Supervisor)

Approved By: Alex Li (Manager)

TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION	5
1.2 RELATED SUBMITTAL(S) / GRANT (S).....	6
1.3 TEST METHODOLOGY	6
1.4 TEST FACILITY	6
MEASUREMENT UNCERTAINTY	6
1.5 SPECIAL ACCESSORIES	6
1.6 WORST-CASE CONFIGURATION AND MODE.....	6
1.6 SUMMARY OF TEST RESULTS.....	7
2. SYSTEM TEST CONFIGURATION	9
2.1 EUT CONFIGURATION	9
2.2 EUT EXERCISE.....	9
2.3 CONFIGURATION OF EUT SYSTEM	9
2.4 TEST SETUP	10
3. TEST AND MEASUREMENT EQUIPMENT	11
4. OUTPUT POWER	13
4.1 OUTPUT POWER MEASUREMENT	13
6. BANDEDGE AND EMISSION MASK	16
7. OUT OF BAND EMISSIONS	17
7.1 MEASUREMENT METHOD	18
8. RADIATED MEASUREMENT	19
8.1. RADIATED POWER (ERP & EIRP)	19
8.2 LTE BAND 2	20
8.3 LTE BAND 4	24
8.4 LTE BAND 5	28

8.5 LTE BAND 7	30
8.7 LTE BAND 38	32
8.8 LTE BAND 66	34
Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)	37
9. SPURIOUS RADIATION EMISSION	38
9.1 LTE BAND 2	40
9.2 LTE BAND 4	42
9.3 LTE BAND 5	44
9.4 LTE BAND 7	46
9.6 LTE BAND 38	48
9.7 LTE BAND 66	50
10. FREQUENCY STABILITY	52
10.1 LTE BAND 2	53
10.2 LTE BAND 4	55
10.3 LTE BAND 5	57
10.4 LTE BAND 7	59
10.6 LTE BAND 38	61
10.7 LTE BAND 66	63
11. PEAK-TO-AVERAGE RATIO.....	65
11.1 Description of the PAR Measurement.....	65
11.2 Measuring Instruments.....	65
11.3 Test Procedures	65
11.4 Test Setup	65

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	Bmobile
Model Name	BL61 PRO
Family Model	N/A
Model Difference	N/A
FCC ID:	ZSW-30-133
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2, 4, 5, 7, 38, 66
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; TDD Band 38: Uplink & Downlink: 2570 MHz to 2620 MHz LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.36dBi, Band 4: -2.43dBi, Band 5: -3.62dBi, Band 7: 1.1dBi, Band 38: 0.8dBi, Band 66: -2.43dBi,
Power Supply:	DC 3.8V/3000mAh from battery or DC 5V from Adapter.
Adapter:	INPUT: AC 100-240V~50-60Hz 0.2A OUTPUT: DC 5.0V---1A
Extreme Vol. Limits:	DC 3.4V to DC 4.35V (Nominal DC 3.8V) (Note 1)
HW Version	Bmobile_BL61Pro_TIGO_LATAM_V002
SW Version	Bmobile_BL61Pro_HW_V1.0
** Note1: The High Voltage 4.35V and Low Voltage 3.4V 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: ZSW-30-133** 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,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 5, Band 7, Band 38, Band 66.

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.

1.6 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(c), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	

2.1051 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
--	--------------------	------	--

Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. No modifications are made to the EUT during all test items.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	BL61 PRO	FCC ID: ZSW-30-133	EUT

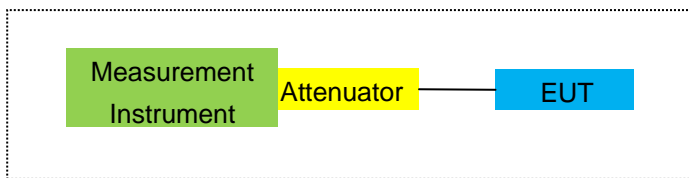
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

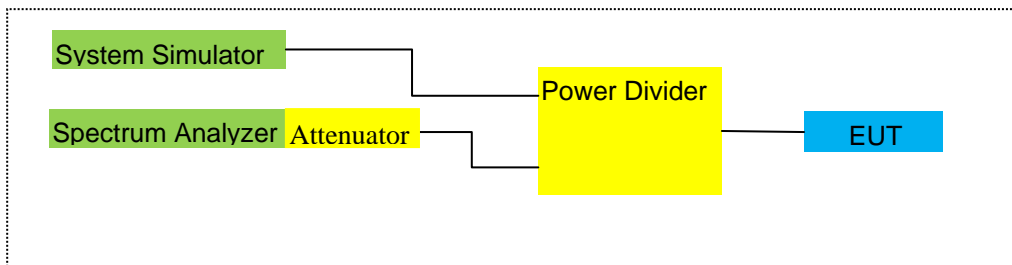
For Radiated Test Cases



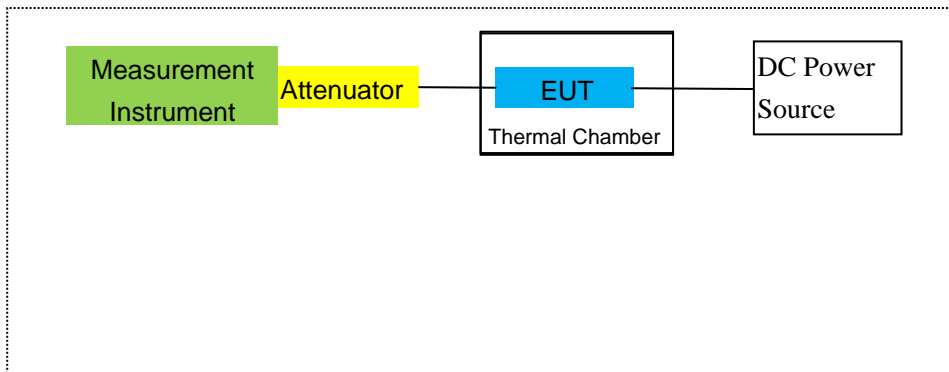
For Conducted Output Power



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



For Frequency Stability



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

3. TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.27	2024.03.26	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2023.05.06	2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2023.03.27	2024.03.26	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2023.05.29	2024.05.28	1 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2023.03.27	2024.03.26	1 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.03.27	2024.03.26	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2023.03.27	2024.03.26	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
24	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	1 year
25	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27	2024.03.26	1 year
27	DC Power Source	N/A	PS-6005D	2017040292 3	2023.05.06	2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2023.05.29	2024.05.28	1 year
29	Communication Tester	R&S	CMW500	148500	2023.05.29	2024.05.28	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".3

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 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

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 38
- LTE Band 66

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

FCC: §2.1046, §22.913, §24.232

LIMITS

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test 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 display line

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

MODES TESTED

- LTE Band2/4/5/7/38/66

RESULTS

Test data reference attachment.

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

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

LIMITS

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 38
- LTE Band 66

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.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913(a)(2), §24.232(c) and §27.50 (h)(2), (b)(10), (c)(10), (d)(4)

LIMITS:

22.913(a) (2)- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232 (c) Mobile and portable stations are limited to 2 watts EIRP.
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 in the 2500–2570 MHz and 2620–2690 MHz bands. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 38
- LTE Band 66

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)		
							Of Max. ERP			
1.4MHz Band QPSK	1/#Mid	1850.7	-3.21	3.76	28.24	21.27	133.968	Horizontal	Pass	
		1880	-3.02	3.91	28.22	21.29	134.586	Horizontal	Pass	
		1909.3	-2.93	3.93	28.20	21.34	136.144	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-3.27	3.77	28.23	21.19	131.522	Horizontal	Pass	
		1880	-3.12	3.91	28.24	21.21	132.130	Horizontal	Pass	
		1908.5	-2.99	3.94	28.25	21.32	135.519	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-3.16	3.77	28.31	21.38	137.404	Horizontal	Pass	
		1880	-2.78	3.91	28.22	21.53	142.233	Horizontal	Pass	
		1907.5	-2.71	3.94	28.20	21.55	142.889	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-3.02	3.79	28.33	21.52	141.906	Horizontal	Pass	
		1880	-2.72	3.95	28.22	21.55	142.889	Horizontal	Pass	
		1905	-2.61	3.97	28.19	21.61	144.877	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	1857.5	-2.98	3.79	28.34	21.57	143.549	Horizontal	Pass	
		1880	-2.77	3.95	28.22	21.50	141.254	Horizontal	Pass	
		1902.5	-2.63	3.97	28.18	21.58	143.880	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	1860	-2.97	3.81	28.35	21.57	143.549	Horizontal	Pass	
		1880	-2.64	3.96	28.22	21.62	145.211	Horizontal	Pass	
		1900	-2.58	4.00	28.16	21.58	143.880	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1850.7	-4.32	3.76	28.24	20.16	103.753	Vertical	Pass	
		1880	-4.28	3.91	28.22	20.03	100.693	Vertical	Pass	
		1909.3	-3.52	3.93	28.20	20.75	118.850	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-3.98	3.77	28.23	20.48	111.686	Vertical	Pass	
		1880	-4.22	3.91	28.24	20.11	102.565	Vertical	Pass	
		1908.5	-3.96	3.94	28.25	20.35	108.393	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-3.82	3.77	28.31	20.72	118.032	Vertical	Pass	
		1880	-3.40	3.91	28.22	20.91	123.310	Vertical	Pass	
		1907.5	-4.22	3.94	28.20	20.04	100.925	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-4.26	3.79	28.33	20.28	106.660	Vertical	Pass	
		1880	-3.81	3.95	28.22	20.46	111.173	Vertical	Pass	
		1905	-3.41	3.97	28.19	20.81	120.504	Vertical	Pass	

15.0MHz		1857.5	-3.97	3.79	28.34	20.58	114.288	Vertical	Pass
Band	1/#Mid	1880	-3.83	3.95	28.22	20.44	110.662	Vertical	Pass
QPSK		1902.5	-3.32	3.97	28.18	20.89	122.744	Vertical	Pass
20.0MHz		1860	-4.26	3.81	28.35	20.28	106.660	Vertical	Pass
Band	1/#Mid	1880	-3.54	3.96	28.22	20.72	118.032	Vertical	Pass
QPSK		1900	-3.77	4.00	28.16	20.39	109.396	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.33	3.76	28.24	20.15	103.514	Horizontal	Pass
		1880	-3.80	3.91	28.22	20.51	112.460	Horizontal	Pass
		1909.3	-3.73	3.93	28.20	20.54	113.240	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.83	3.77	28.23	20.63	115.611	Horizontal	Pass
		1880	-3.91	3.91	28.24	20.42	110.154	Horizontal	Pass
		1908.5	-4.12	3.94	28.25	20.19	104.472	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.77	3.77	28.31	20.77	119.399	Horizontal	Pass
		1880	-3.68	3.91	28.22	20.63	115.611	Horizontal	Pass
		1907.5	-3.36	3.94	28.20	20.90	123.027	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-3.82	3.79	28.33	20.72	118.032	Horizontal	Pass
		1880	-3.81	3.95	28.22	20.46	111.173	Horizontal	Pass
		1905	-3.28	3.97	28.19	20.94	124.165	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-3.80	3.79	28.34	20.75	118.850	Horizontal	Pass
		1880	-3.59	3.95	28.22	20.68	116.950	Horizontal	Pass
		1902.5	-3.55	3.97	28.18	20.66	116.413	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-3.69	3.81	28.35	20.85	121.619	Horizontal	Pass
		1880	-3.39	3.96	28.22	20.87	122.180	Horizontal	Pass
		1900	-3.21	4.00	28.16	20.95	124.451	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-5.00	3.76	28.24	19.48	88.716	Vertical	Pass
		1880	-5.09	3.91	28.22	19.22	83.560	Vertical	Pass
		1909.3	-5.18	3.93	28.20	19.09	81.096	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.15	3.77	28.23	19.31	85.310	Vertical	Pass
		1880	-4.97	3.91	28.24	19.36	86.298	Vertical	Pass
		1908.5	-4.67	3.94	28.25	19.64	92.045	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.07	3.77	28.31	19.47	88.512	Vertical	Pass
		1880	-4.49	3.91	28.22	19.82	95.940	Vertical	Pass
		1907.5	-4.50	3.94	28.20	19.76	94.624	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-5.54	3.79	28.33	19.00	79.433	Vertical	Pass
		1880	-4.74	3.95	28.22	19.53	89.743	Vertical	Pass
		1905	-5.07	3.97	28.19	19.15	82.224	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-5.30	3.79	28.34	19.25	84.140	Vertical	Pass
		1880	-4.66	3.95	28.22	19.61	91.411	Vertical	Pass
		1902.5	-4.39	3.97	28.18	19.82	95.940	Vertical	Pass

20.0MHz		1860	-5.42	3.81	28.35	19.12	81.658	Vertical	Pass
Band 16	1/#Mid	1880	-5.19	3.96	28.22	19.07	80.724	Vertical	Pass
QAM		1900	-5.03	4.00	28.16	19.13	81.846	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-3.12	3.12	27.58	21.34	136.144	Horizontal	Pass
		1732.5	-3.11	3.27	27.61	21.23	132.739	Horizontal	Pass
		1754.3	-3.09	3.29	27.63	21.25	133.352	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.29	3.13	27.61	21.19	131.522	Horizontal	Pass
		1732.5	-3.21	3.27	27.61	21.13	129.718	Horizontal	Pass
		1753.5	-3.13	3.30	27.62	21.19	131.522	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.06	3.13	27.63	21.44	139.316	Horizontal	Pass
		1732.5	-2.96	3.27	27.61	21.38	137.404	Horizontal	Pass
		1752.5	-2.84	3.30	27.60	21.46	139.959	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.00	3.15	27.64	21.49	140.929	Horizontal	Pass
		1732.5	-2.77	3.31	27.61	21.53	142.233	Horizontal	Pass
		1750	-2.79	3.33	27.59	21.47	140.281	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.01	3.15	27.65	21.49	140.929	Horizontal	Pass
		1732.5	-2.85	3.31	27.61	21.45	139.637	Horizontal	Pass
		1747.5	-2.79	3.33	27.57	21.45	139.637	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.95	3.17	27.66	21.54	142.561	Horizontal	Pass
		1732.5	-2.78	3.32	27.61	21.51	141.579	Horizontal	Pass
		1745	-2.72	3.36	27.56	21.48	140.605	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.28	3.12	27.58	20.18	104.232	Vertical	Pass
		1732.5	-3.79	3.27	27.61	20.55	113.501	Vertical	Pass
		1754.3	-4.27	3.29	27.63	20.07	101.625	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.18	3.13	27.61	20.30	107.152	Vertical	Pass
		1732.5	-4.30	3.27	27.61	20.04	100.925	Vertical	Pass
		1753.5	-3.60	3.30	27.62	20.72	118.032	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-3.86	3.13	27.63	20.64	115.878	Vertical	Pass
		1732.5	-3.98	3.27	27.61	20.36	108.643	Vertical	Pass
		1752.5	-3.79	3.30	27.60	20.51	112.460	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.61	3.15	27.64	20.88	122.462	Vertical	Pass
		1732.5	-3.79	3.31	27.61	20.51	112.460	Vertical	Pass
		1750	-4.20	3.33	27.59	20.06	101.391	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-4.41	3.15	27.65	20.09	102.094	Vertical	Pass

Band		1732.5	-3.86	3.31	27.61	20.44	110.662	Vertical	Pass
QPSK		1747.5	-3.88	3.33	27.57	20.36	108.643	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.68	3.17	27.66	20.81	120.504	Vertical	Pass
Band		1732.5	-4.23	3.32	27.61	20.06	101.391	Vertical	Pass
QPSK		1745	-4.03	3.36	27.56	20.17	103.992	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (EIRP) for Band 4									
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)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.93	3.12	27.58	20.53	112.980	Horizontal	Pass
		1732.5	-3.78	3.27	27.61	20.56	113.763	Horizontal	Pass
		1754.3	-3.78	3.29	27.63	20.56	113.763	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.87	3.13	27.61	20.61	115.080	Horizontal	Pass
		1732.5	-4.00	3.27	27.61	20.34	108.143	Horizontal	Pass
		1753.5	-4.22	3.30	27.62	20.10	102.329	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.70	3.13	27.63	20.80	120.226	Horizontal	Pass
		1732.5	-3.66	3.27	27.61	20.68	116.950	Horizontal	Pass
		1752.5	-3.35	3.30	27.60	20.95	124.451	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.77	3.15	27.64	20.72	118.032	Horizontal	Pass
		1732.5	-3.96	3.31	27.61	20.34	108.143	Horizontal	Pass
		1750	-3.34	3.33	27.59	20.92	123.595	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.57	3.15	27.65	20.93	123.880	Horizontal	Pass
		1732.5	-3.63	3.31	27.61	20.67	116.681	Horizontal	Pass
		1747.5	-3.65	3.33	27.57	20.59	114.551	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.52	3.17	27.66	20.97	125.026	Horizontal	Pass
		1732.5	-3.53	3.32	27.61	20.76	119.124	Horizontal	Pass
		1745	-3.34	3.36	27.56	20.86	121.899	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.08	3.12	27.58	19.38	86.696	Vertical	Pass
		1732.5	-4.61	3.27	27.61	19.73	93.972	Vertical	Pass
		1754.3	-4.50	3.29	27.63	19.84	96.383	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.08	3.13	27.61	19.40	87.096	Vertical	Pass
		1732.5	-4.54	3.27	27.61	19.80	95.499	Vertical	Pass
		1753.5	-4.73	3.30	27.62	19.59	90.991	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.08	3.13	27.63	19.42	87.498	Vertical	Pass
		1732.5	-5.13	3.27	27.61	19.21	83.368	Vertical	Pass
		1752.5	-4.62	3.30	27.60	19.68	92.897	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.99	3.15	27.64	19.50	89.125	Vertical	Pass
		1732.5	-4.96	3.31	27.61	19.34	85.901	Vertical	Pass
		1750	-4.57	3.33	27.59	19.69	93.111	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.79	3.15	27.65	19.71	93.541	Vertical	Pass
		1732.5	-5.31	3.31	27.61	18.99	79.250	Vertical	Pass
		1747.5	-4.64	3.33	27.57	19.60	91.201	Vertical	Pass

20.0MHz		1720	-5.35	3.17	27.66	19.14	82.035	Vertical	Pass
Band 16	1/#Mid	1732.5	-4.30	3.32	27.61	19.99	99.770	Vertical	Pass
QAM		1745	-4.43	3.36	27.56	19.77	94.842	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Factor 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	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band QPSK	3/#Mid	824.7	6.18	2.01	19.68	2.15	21.70	147.911	Horizontal	Pass
		836.5	6.06	2.01	19.77	2.15	21.67	146.893	Horizontal	Pass
		848.3	5.86	2.02	19.82	2.15	21.51	141.579	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	5.95	2.01	19.70	2.15	21.49	140.929	Horizontal	Pass
		836.5	5.85	2.01	19.77	2.15	21.46	139.959	Horizontal	Pass
		847.5	5.72	2.02	19.81	2.15	21.36	136.773	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.23	2.01	19.71	2.15	21.78	150.661	Horizontal	Pass
		836.5	6.11	2.01	19.77	2.15	21.72	148.594	Horizontal	Pass
		846.5	5.95	2.02	19.79	2.15	21.57	143.549	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	6.25	2.01	19.73	2.15	21.82	152.055	Horizontal	Pass
		836.5	6.20	2.01	19.77	2.15	21.81	151.705	Horizontal	Pass
		844	6.10	2.02	19.78	2.15	21.71	148.252	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	4.70	2.01	19.68	2.15	20.22	105.196	Vertical	Pass
		836.5	5.33	2.01	19.77	2.15	20.94	124.165	Vertical	Pass
		848.3	5.24	2.02	19.82	2.15	20.89	122.744	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.75	2.01	19.70	2.15	20.29	106.905	Vertical	Pass
		836.5	5.36	2.01	19.77	2.15	20.97	125.026	Vertical	Pass
		847.5	4.71	2.02	19.81	2.15	20.35	108.393	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	5.44	2.01	19.71	2.15	20.99	125.603	Vertical	Pass
		836.5	5.20	2.01	19.77	2.15	20.81	120.504	Vertical	Pass
		846.5	4.44	2.02	19.79	2.15	20.06	101.391	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	5.02	2.01	19.73	2.15	20.59	114.551	Vertical	Pass
		836.5	4.95	2.01	19.77	2.15	20.56	113.763	Vertical	Pass
		844	4.98	2.02	19.78	2.15	20.59	114.551	Vertical	Pass

Radiated Power (ERP) for Band 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band 16 QAM	3/#Mid	824.7	5.33	2.01	19.68	2.15	20.85	121.619	Horizontal	Pass
		836.5	5.26	2.01	19.77	2.15	20.87	122.180	Horizontal	Pass
		848.3	5.10	2.02	19.82	2.15	20.75	118.850	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.41	2.01	19.70	2.15	20.95	124.451	Horizontal	Pass
		836.5	5.12	2.01	19.77	2.15	20.73	118.304	Horizontal	Pass
		847.5	4.60	2.02	19.81	2.15	20.24	105.682	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.73	2.01	19.71	2.15	21.28	134.276	Horizontal	Pass
		836.5	5.50	2.01	19.77	2.15	21.11	129.122	Horizontal	Pass
		846.5	5.25	2.02	19.79	2.15	20.87	122.180	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	5.73	2.01	19.73	2.15	21.30	134.896	Horizontal	Pass
		836.5	5.45	2.01	19.77	2.15	21.06	127.644	Horizontal	Pass
		844	4.99	2.02	19.78	2.15	20.60	114.815	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	3.70	2.01	19.68	2.15	19.22	83.560	Vertical	Pass
		836.5	5.30	2.01	19.77	2.15	20.91	123.310	Vertical	Pass
		848.3	4.82	2.02	19.82	2.15	20.47	111.429	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.40	2.01	19.70	2.15	20.94	124.165	Vertical	Pass
		836.5	4.28	2.01	19.77	2.15	19.89	97.499	Vertical	Pass
		847.5	4.33	2.02	19.81	2.15	19.97	99.312	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	4.56	2.01	19.71	2.15	20.11	102.565	Vertical	Pass
		836.5	4.89	2.01	19.77	2.15	20.50	112.202	Vertical	Pass
		846.5	5.00	2.02	19.79	2.15	20.62	115.345	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	3.81	2.01	19.73	2.15	19.38	86.696	Vertical	Pass
		836.5	3.86	2.01	19.77	2.15	19.47	88.512	Vertical	Pass
		844	4.66	2.02	19.78	2.15	20.27	106.414	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-1.40	4.54	27.75	21.81	151.705	Horizontal	Pass
		2535	-1.23	4.69	27.72	21.80	151.356	Horizontal	Pass
		2567.5	-1.16	4.71	27.71	21.84	152.757	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.33	4.55	27.76	21.88	154.170	Horizontal	Pass
		2535	-1.14	4.69	27.72	21.89	154.525	Horizontal	Pass
		2565	-1.06	4.72	27.70	21.92	155.597	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.34	4.55	27.77	21.88	154.170	Horizontal	Pass
		2535	-1.20	4.69	27.72	21.83	152.405	Horizontal	Pass
		2562.5	-1.10	4.72	27.69	21.87	153.815	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.28	4.57	27.78	21.93	155.955	Horizontal	Pass
		2535	-1.10	4.73	27.72	21.89	154.525	Horizontal	Pass
		2560	-1.06	4.75	27.68	21.87	153.815	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-3.00	4.54	27.75	20.21	104.954	Vertical	Pass
		2535	-2.81	4.69	27.72	20.22	105.196	Vertical	Pass
		2567.5	-2.72	4.71	27.71	20.28	106.660	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.82	4.55	27.76	20.39	109.396	Vertical	Pass
		2535	-2.39	4.69	27.72	20.64	115.878	Vertical	Pass
		2565	-2.72	4.72	27.70	20.26	106.170	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.50	4.55	27.77	20.72	118.032	Vertical	Pass
		2535	-2.63	4.69	27.72	20.40	109.648	Vertical	Pass
		2562.5	-2.59	4.72	27.69	20.38	109.144	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.84	4.57	27.78	20.37	108.893	Vertical	Pass
		2535	-2.76	4.73	27.72	20.23	105.439	Vertical	Pass
		2560	-2.16	4.75	27.68	20.77	119.399	Vertical	Pass

Radiated Power (EIRP) for Band 7									
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 16 QAM	1/#Mid	2502.5	-2.09	4.54	27.75	21.12	129.420	Horizontal	Pass
		2535	-1.78	4.69	27.72	21.25	133.352	Horizontal	Pass
		2567.5	-1.86	4.71	27.71	21.14	130.017	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.98	4.55	27.76	21.23	132.739	Horizontal	Pass
		2535	-1.99	4.69	27.72	21.04	127.057	Horizontal	Pass
		2565	-2.26	4.72	27.70	20.72	118.032	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.16	4.55	27.77	21.06	127.644	Horizontal	Pass
		2535	-2.13	4.69	27.72	20.90	123.027	Horizontal	Pass
		2562.5	-1.74	4.72	27.69	21.23	132.739	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.04	4.57	27.78	21.17	130.918	Horizontal	Pass
		2535	-1.71	4.73	27.72	21.28	134.276	Horizontal	Pass
		2560	-1.81	4.75	27.68	21.12	129.420	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-3.85	4.54	27.75	19.36	86.298	Vertical	Pass
		2535	-2.51	4.69	27.72	20.52	112.720	Vertical	Pass
		2567.5	-2.97	4.71	27.71	20.03	100.693	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.23	4.55	27.76	20.98	125.314	Vertical	Pass
		2535	-3.62	4.69	27.72	19.41	87.297	Vertical	Pass
		2565	-3.52	4.72	27.70	19.46	88.308	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.61	4.55	27.77	19.61	91.411	Vertical	Pass
		2535	-3.00	4.69	27.72	20.03	100.693	Vertical	Pass
		2562.5	-3.65	4.72	27.69	19.32	85.507	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.77	4.57	27.78	20.44	110.662	Vertical	Pass
		2535	-3.46	4.73	27.72	19.53	89.743	Vertical	Pass
		2560	-2.87	4.75	27.68	20.06	101.391	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.7 LTE BAND 38

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Gain	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2572.5	-2.12	4.95	27.79	20.01	100.231	Vertical	Pass
		2595	-2.64	4.88	27.71	20.02	100.462	Vertical	Pass
		2617.5	-2.58	4.93	27.95	20.28	106.660	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	20.81	120.504	Vertical	Pass
		2595	-2.47	4.95	27.81	20.19	104.472	Vertical	Pass
		2617.5	-2.59	5.03	27.69	20.18	104.232	Vertical	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	20.82	120.781	Vertical	Pass
		2595	-2.6	5	27.65	20.51	112.460	Vertical	Pass
		2615	-2.67	4.87	27.89	20.54	113.240	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	20.33	107.895	Vertical	Pass
		2595	-2.38	4.87	27.87	20.57	114.025	Vertical	Pass
		2615	-2.56	4.94	27.77	20.80	120.226	Vertical	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.9	4.89	27.88	19.99	99.770	Vertical	Pass
		2595	-2.32	4.87	27.84	20.79	119.950	Vertical	Pass
		2612.5	-2.52	4.92	27.93	20.72	118.032	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	20.05	101.158	Vertical	Pass
		2595	-2.53	4.98	27.82	20.47	111.429	Vertical	Pass
		2612.5	-2.6	4.95	27.83	20.28	106.660	Vertical	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.8	20.90	123.027	Vertical	Pass
		2595	-2.37	4.79	27.83	21.59	144.212	Vertical	Pass
		2610	-2.68	4.89	27.87	20.12	102.802	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	20.53	112.980	Vertical	Pass
		2595	-2.88	4.91	27.71	20.04	100.925	Vertical	Pass
		2610	-2.81	4.96	27.92	20.97	125.026	Vertical	Pass

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP		
			(dBm)	(dBm)	(dB)	Average (dBm)	Average (mW)		
5.0MHz Band QPSK	25/0	2572.5	-2.12	4.95	27.79	20.30	107.152	Horizontal	Pass
		2595	-2.64	4.88	27.71	20.31	107.399	Horizontal	Pass
		2617.5	-2.58	4.93	27.95	20.17	103.992	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	20.41	109.901	Horizontal	Pass
		2595	-2.47	4.95	27.81	20.76	119.124	Horizontal	Pass
		2617.5	-2.59	5.03	27.69	20.03	100.693	Horizontal	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	20.16	103.753	Horizontal	Pass
		2595	-2.6	5	27.65	20.52	112.720	Horizontal	Pass
		2615	-2.67	4.87	27.89	20.13	103.039	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	20.21	104.954	Horizontal	Pass
		2595	-2.38	4.87	27.87	20.14	103.276	Horizontal	Pass
		2615	-2.56	4.94	27.77	20.80	120.226	Horizontal	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.9	4.89	27.88	20.10	102.329	Horizontal	Pass
		2595	-2.32	4.87	27.84	20.04	100.925	Horizontal	Pass
		2612.5	-2.52	4.92	27.93	20.10	102.329	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	20.13	103.039	Horizontal	Pass
		2595	-2.53	4.98	27.82	20.19	104.472	Horizontal	Pass
		2612.5	-2.6	4.95	27.83	20.08	101.859	Horizontal	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.8	20.20	104.713	Horizontal	Pass
		2595	-2.37	4.79	27.83	21.45	139.637	Horizontal	Pass
		2610	-2.68	4.89	27.87	20.82	120.781	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	20.62	115.345	Horizontal	Pass
		2595	-2.88	4.91	27.71	21.55	142.889	Horizontal	Pass
		2610	-2.81	4.96	27.92	20.16	103.753	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

8.8 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-2.97	3.76	28.24	21.51	141.579	Horizontal	Pass
		1745	-2.83	3.91	28.22	21.48	140.605	Horizontal	Pass
		1779.3	-2.70	3.93	28.2	21.57	143.549	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.03	3.77	28.23	21.43	138.995	Horizontal	Pass
		1745	-2.94	3.91	28.24	21.39	137.721	Horizontal	Pass
		1778.5	-2.96	3.94	28.25	21.35	136.458	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.93	3.77	28.31	21.61	144.877	Horizontal	Pass
		1745	-2.61	3.91	28.22	21.70	147.911	Horizontal	Pass
		1777.5	-2.67	3.94	28.2	21.59	144.212	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.82	3.79	28.33	21.72	148.594	Horizontal	Pass
		1745	-2.55	3.95	28.22	21.72	148.594	Horizontal	Pass
		1775	-2.56	3.97	28.19	21.66	146.555	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-2.84	3.79	28.34	21.71	148.252	Horizontal	Pass
		1745	-2.65	3.95	28.22	21.62	145.211	Horizontal	Pass
		1772.5	-2.60	3.97	28.18	21.61	144.877	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.81	3.81	28.35	21.73	148.936	Horizontal	Pass
		1745	-2.55	3.96	28.22	21.71	148.252	Horizontal	Pass
		1770	-2.57	4	28.16	21.59	144.212	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.22	3.76	28.24	20.26	106.170	Vertical	Pass
		1745	-4.13	3.91	28.22	20.18	104.232	Vertical	Pass
		1779.3	-3.75	3.93	28.2	20.52	112.720	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.88	3.77	28.23	20.58	114.288	Vertical	Pass
		1745	-4.20	3.91	28.24	20.13	103.039	Vertical	Pass
		1778.5	-4.18	3.94	28.25	20.13	103.039	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.52	3.77	28.31	20.02	100.462	Vertical	Pass
		1745	-3.63	3.91	28.22	20.68	116.950	Vertical	Pass
		1777.5	-3.53	3.94	28.2	20.73	118.304	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.53	3.79	28.34	20.02	100.462	Vertical	Pass
		1745	-3.42	3.95	28.22	20.85	121.619	Vertical	Pass
		1775	-3.90	3.97	28.18	20.31	107.399	Vertical	Pass

15.0MHz		1717.5	-4.19	3.81	28.35	20.35	108.393	Vertical	Pass
Band	1/#Mid	1745	-3.67	3.96	28.22	20.59	114.551	Vertical	Pass
QPSK		1772.5	-3.46	4	28.16	20.70	117.490	Vertical	Pass
20.0MHz		1720	-3.63	3.79	28.34	20.92	123.595	Vertical	Pass
Band	1/#Mid	1745	-4.01	3.95	28.22	20.26	106.170	Vertical	Pass
QPSK		1770	-3.75	3.97	28.18	20.46	111.173	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.80	3.76	28.24	20.68	116.950	Horizontal	Pass
		1745	-3.41	3.91	28.22	20.90	123.027	Horizontal	Pass
		1779.3	-3.59	3.93	28.2	20.68	116.950	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.19	3.77	28.23	20.27	106.414	Horizontal	Pass
		1745	-3.44	3.91	28.24	20.89	122.744	Horizontal	Pass
		1778.5	-3.73	3.94	28.25	20.58	114.288	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.61	3.77	28.31	20.93	123.880	Horizontal	Pass
		1745	-3.67	3.91	28.22	20.64	115.878	Horizontal	Pass
		1777.5	-3.34	3.94	28.2	20.92	123.595	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.66	3.79	28.33	20.88	122.462	Horizontal	Pass
		1745	-3.32	3.95	28.22	20.95	124.451	Horizontal	Pass
		1775	-3.64	3.97	28.19	20.58	114.288	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.65	3.79	28.34	20.90	123.027	Horizontal	Pass
		1745	-3.47	3.95	28.22	20.80	120.226	Horizontal	Pass
		1772.5	-3.26	3.97	28.18	20.95	124.451	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.48	3.81	28.35	21.06	127.644	Horizontal	Pass
		1745	-3.26	3.96	28.22	21.00	125.893	Horizontal	Pass
		1770	-3.20	4	28.16	20.96	124.738	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.55	3.76	28.24	20.93	123.880	Vertical	Pass
		1745	-3.61	3.91	28.22	20.70	117.490	Vertical	Pass
		1779.3	-4.32	3.93	28.2	19.95	98.855	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.35	3.77	28.23	19.11	81.470	Vertical	Pass
		1745	-4.07	3.91	28.24	20.26	106.170	Vertical	Pass
		1778.5	-4.03	3.94	28.25	20.28	106.660	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.86	3.77	28.31	19.68	92.897	Vertical	Pass
		1745	-5.09	3.91	28.22	19.22	83.560	Vertical	Pass
		1777.5	-3.74	3.94	28.2	20.52	112.720	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.33	3.79	28.34	20.22	105.196	Vertical	Pass
		1745	-4.57	3.95	28.22	19.70	93.325	Vertical	Pass
		1775	-4.06	3.97	28.18	20.15	103.514	Vertical	Pass
15.0MHz Band 16	1/#Mid	1717.5	-4.66	3.81	28.35	19.88	97.275	Vertical	Pass
		1745	-3.86	3.96	28.22	20.40	109.648	Vertical	Pass

QAM		1772.5	-4.05	4	28.16	20.11	102.565	Vertical	Pass
20.0MHz	1/#Mid	1720	-4.41	3.79	28.34	20.14	103.276	Vertical	Pass
Band 16		1745	-3.60	3.95	28.22	20.67	116.681	Vertical	Pass
QAM		1770	-4.24	3.97	28.18	19.97	99.312	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: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

LIMIT

For Band 7, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P)$ [Watts].

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P)$ [Watts], where P is the transmitter power in Watts.

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 38
- LTE Band 66

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	-53.30	4.04	33.51	-23.83	-13	-10.83	Horizontal
3701.4	-52.59	4.04	33.51	-23.12	-13	-10.12	Vertical
5552.1	-53.41	5.24	35.84	-22.81	-13	-9.81	Vertical
5552.1	-53.88	5.24	35.84	-23.28	-13	-10.28	Horizontal
201.9	-39.47	1.43	16.02	-24.88	-13	-11.88	Vertical
433.5	-40.08	1.30	17.99	-23.39	-13	-10.39	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.07	4.04	33.56	-22.55	-13	-9.55	Horizontal
3760.0	-52.27	4.04	33.56	-22.75	-13	-9.75	Vertical
5640.0	-52.17	5.24	35.91	-21.50	-13	-8.50	Vertical
5640.0	-52.36	5.24	35.91	-21.69	-13	-8.69	Horizontal
211.3	-36.65	1.62	16.97	-21.30	-13	-8.30	Vertical
277.4	-38.11	1.74	15.98	-23.88	-13	-10.88	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-48.68	4.04	34.00	-18.72	-13	-5.72	Horizontal
3818.6	-52.20	4.04	34.00	-22.24	-13	-9.24	Vertical
5727.9	-54.02	5.24	36.04	-23.22	-13	-10.22	Vertical
5727.9	-52.27	5.24	36.04	-21.47	-13	-8.47	Horizontal
186.5	-35.41	1.42	17.29	-19.54	-13	-6.54	Vertical
432.2	-38.62	1.50	17.90	-22.21	-13	-9.21	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	-49.87	4.07	33.54	-20.40	-13	-7.40	Horizontal
3720.0	-51.90	4.07	33.54	-22.43	-13	-9.43	Vertical
5580.0	-50.85	5.28	35.86	-20.27	-13	-7.27	Vertical
5580.0	-52.61	5.28	35.86	-22.03	-13	-9.03	Horizontal
189.1	-38.44	1.58	16.89	-23.12	-13	-10.12	Vertical
355.5	-37.11	1.76	17.26	-21.61	-13	-8.61	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-53.60	4.04	33.56	-24.08	-13	-11.08	Horizontal
3760.0	-52.64	4.04	33.56	-23.12	-13	-10.12	Vertical
5640.0	-52.50	5.24	35.91	-21.83	-13	-8.83	Vertical
5640.0	-51.89	5.24	35.91	-21.22	-13	-8.22	Horizontal
196.6	-40.17	1.46	16.27	-25.36	-13	-12.36	Vertical
410.9	-38.67	1.59	15.15	-25.11	-13	-12.11	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-49.57	4.04	34.00	-19.61	-13	-6.61	Horizontal
3800.0	-53.81	4.04	34.00	-23.85	-13	-10.85	Vertical
5700.0	-50.25	5.24	36.04	-19.45	-13	-6.45	Vertical
5700.0	-50.47	5.24	36.04	-19.67	-13	-6.67	Horizontal
196.4	-39.99	1.36	17.39	-23.95	-13	-10.95	Vertical
391.0	-41.43	1.66	15.39	-27.70	-13	-14.70	Horizontal

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	-47.39	4.02	29.80	-21.61	-13	-8.61	Horizontal
3421.4	-48.20	4.02	29.80	-22.42	-13	-9.42	Vertical
5132.1	-51.90	5.24	35.84	-21.30	-13	-8.30	Vertical
5132.1	-52.25	5.24	35.84	-21.65	-13	-8.65	Horizontal
179.3	-42.74	1.68	16.04	-28.38	-13	-15.38	Vertical
413.9	-37.73	1.78	17.74	-21.77	-13	-8.77	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.25	4.03	30.00	-22.28	-13	-9.28	Horizontal
3465.0	-48.76	4.03	30.00	-22.79	-13	-9.79	Vertical
5197.5	-49.64	5.25	35.86	-19.03	-13	-6.03	Vertical
5197.5	-53.54	5.25	35.86	-22.93	-13	-9.93	Horizontal
200.5	-34.75	1.72	17.69	-18.78	-13	-5.78	Vertical
333.1	-43.57	1.62	16.02	-29.16	-13	-16.16	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-48.58	4.05	30.01	-22.62	-13	-9.62	Horizontal
3508.6	-53.30	4.05	30.01	-27.34	-13	-14.34	Vertical
5262.9	-52.40	5.26	35.86	-21.80	-13	-8.80	Vertical
5262.9	-53.76	5.26	35.86	-23.16	-13	-10.16	Horizontal
208.2	-39.68	1.80	16.69	-24.79	-13	-11.79	Vertical
260.7	-44.65	1.75	16.66	-29.75	-13	-16.75	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	-47.34	4.02	29.80	-21.56	-13	-8.56	Horizontal
3440.0	-46.18	4.02	29.80	-20.40	-13	-7.40	Vertical
5160.0	-52.01	5.24	35.84	-21.41	-13	-8.41	Vertical
5160.0	-50.11	5.24	35.84	-19.51	-13	-6.51	Horizontal
176.7	-37.04	1.57	17.26	-21.35	-13	-8.35	Vertical
294.0	-34.91	1.78	16.35	-20.34	-13	-7.34	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.23	4.03	30.00	-24.26	-13	-11.26	Horizontal
3465.0	-48.44	4.03	30.00	-22.47	-13	-9.47	Vertical
5197.5	-51.16	5.25	35.86	-20.55	-13	-7.55	Vertical
5197.5	-53.37	5.25	35.86	-22.76	-13	-9.76	Horizontal
191.6	-39.48	1.44	17.95	-22.97	-13	-9.97	Vertical
395.1	-38.36	1.65	16.09	-23.92	-13	-10.92	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-47.50	2.91	27.68	-22.73	-13	-9.73	Horizontal
3490.0	-46.10	2.91	27.68	-21.33	-13	-8.33	Vertical
5235.0	-55.12	5.26	35.86	-24.52	-13	-11.52	Vertical
5235.0	-53.79	5.26	35.86	-23.19	-13	-10.19	Horizontal
198.0	-41.40	1.61	16.85	-26.16	-13	-13.16	Vertical
398.7	-36.67	1.61	15.19	-23.09	-13	-10.09	Horizontal

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	-44.13	2.78	27.50	-19.41	-13	-6.41	Horizontal
1649.4	-46.60	2.78	27.50	-21.88	-13	-8.88	Vertical
2474.1	-45.34	2.90	27.80	-20.44	-13	-7.44	Vertical
2474.1	-49.21	2.90	27.80	-24.31	-13	-11.31	Horizontal
206.7	-38.35	1.76	17.59	-22.52	-13	-9.52	Vertical
237.8	-37.29	1.63	15.87	-23.05	-13	-10.05	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-50.67	2.80	27.48	-25.99	-13	-12.99	Horizontal
1673.0	-46.79	2.80	27.48	-22.11	-13	-9.11	Vertical
2509.5	-48.44	2.91	27.70	-23.65	-13	-10.65	Vertical
2509.5	-50.16	2.91	27.70	-25.37	-13	-12.37	Horizontal
194.3	-41.31	1.61	15.68	-27.24	-13	-14.24	Vertical
297.0	-41.94	1.59	17.52	-26.02	-13	-13.02	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-49.75	2.82	27.43	-25.14	-13	-12.14	Horizontal
1696.6	-46.47	2.82	27.43	-21.86	-13	-8.86	Vertical
2544.9	-44.38	2.92	27.74	-19.56	-13	-6.56	Vertical
2544.9	-50.06	2.92	27.74	-25.24	-13	-12.24	Horizontal
189.6	-43.98	1.69	16.67	-28.99	-13	-15.99	Vertical
454.2	-42.30	1.70	17.18	-26.82	-13	-13.82	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	-52.60	2.78	27.50	-27.88	-13	-14.88	Horizontal
1658.0	-51.47	2.78	27.50	-26.75	-13	-13.75	Vertical
2487.0	-44.81	2.90	27.80	-19.91	-13	-6.91	Vertical
2487.0	-50.20	2.90	27.80	-25.30	-13	-12.30	Horizontal
185.0	-36.36	1.71	15.57	-22.50	-13	-9.50	Vertical
304.0	-35.84	1.34	16.40	-20.78	-13	-7.78	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-47.49	2.80	27.48	-22.81	-13	-9.81	Horizontal
1673.0	-49.19	2.80	27.48	-24.51	-13	-11.51	Vertical
2509.5	-52.89	2.91	27.70	-28.10	-13	-15.10	Vertical
2509.5	-49.45	2.91	27.70	-24.66	-13	-11.66	Horizontal
186.5	-43.32	1.44	17.04	-27.72	-13	-14.72	Vertical
314.5	-36.95	1.76	17.62	-21.09	-13	-8.09	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.68	2.82	27.43	-22.07	-13	-9.07	Horizontal
1688.0	-45.64	2.82	27.43	-21.03	-13	-8.03	Vertical
2532.0	-51.34	2.92	27.74	-26.52	-13	-13.52	Vertical
2532.0	-53.24	2.92	27.74	-28.42	-13	-15.42	Horizontal
195.6	-38.89	1.74	17.70	-22.93	-13	-9.93	Vertical
457.8	-43.14	1.41	17.46	-27.08	-13	-14.08	Horizontal

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	-68.80	5.23	35.81	-38.22	-25	-13.22	Horizontal
5005.0	-69.30	5.23	35.81	-38.72	-25	-13.72	Vertical
7507.5	-68.50	5.67	36.85	-37.32	-25	-12.32	Vertical
7507.5	-64.30	5.67	36.85	-33.12	-25	-8.12	Horizontal
180.7	-60.30	1.73	17.97	-44.06	-25	-19.06	Vertical
345.0	-49.85	1.38	15.11	-36.12	-25	-11.12	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-69.23	5.23	35.82	-38.64	-25	-13.64	Horizontal
5070.0	-71.50	5.23	35.82	-40.91	-25	-15.91	Vertical
7605.0	-67.66	5.67	36.85	-36.48	-25	-11.48	Vertical
7605.0	-71.30	5.67	36.85	-40.12	-25	-15.12	Horizontal
203.0	-55.66	1.77	16.17	-41.25	-25	-16.25	Vertical
438.9	-54.42	1.63	15.21	-40.84	-25	-15.84	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-68.54	5.24	35.83	-37.95	-25	-12.95	Horizontal
5135.0	-66.37	5.24	35.83	-35.78	-25	-10.78	Vertical
7702.5	-66.12	5.68	36.87	-34.93	-25	-9.93	Vertical
7702.5	-68.71	5.68	36.87	-37.52	-25	-12.52	Horizontal
180.0	-54.77	1.58	17.56	-38.79	-25	-13.79	Vertical
314.6	-54.32	1.45	16.58	-39.19	-25	-14.19	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	-67.45	5.23	35.82	-36.86	-25	-11.86	Horizontal
5020.0	-69.60	5.23	35.82	-39.01	-25	-14.01	Vertical
7530.0	-66.64	5.67	36.86	-35.45	-25	-10.45	Vertical
7530.0	-70.47	5.67	36.86	-39.28	-25	-14.28	Horizontal
206.8	-58.51	1.63	15.76	-44.38	-25	-19.38	Vertical
333.2	-52.15	1.71	15.44	-38.42	-25	-13.42	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-71.22	5.23	35.82	-40.63	-25	-15.63	Horizontal
5070.0	-69.97	5.23	35.82	-39.38	-25	-14.38	Vertical
7605.0	-66.90	5.67	36.85	-35.72	-25	-10.72	Vertical
7605.0	-68.66	5.67	36.85	-37.48	-25	-12.48	Horizontal
200.7	-53.20	1.79	16.84	-38.14	-25	-13.14	Vertical
310.3	-59.87	1.71	17.64	-43.94	-25	-18.94	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-69.45	5.24	35.83	-38.86	-25	-13.86	Horizontal
5120.0	-67.50	5.24	35.83	-36.91	-25	-11.91	Vertical
7680.0	-68.50	5.70	36.88	-37.32	-25	-12.32	Vertical
7680.0	-71.82	5.70	36.88	-40.64	-25	-15.64	Horizontal
193.9	-53.64	1.79	16.84	-38.58	-25	-13.58	Vertical
294.1	-51.15	1.71	17.64	-35.22	-25	-10.22	Horizontal

9.6 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	-65.43	4.01	27.5	-41.94	-25	-16.94	Horizontal
5145	-62.59	4.01	27.5	-39.10	-25	-14.10	Vertical
7717.5	-60.47	5.09	27.8	-37.76	-25	-12.76	Vertical
7717.5	-60.44	5.09	27.8	-37.73	-25	-12.73	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-62.10	4.1	27.48	-38.72	-25	-13.72	Horizontal
5190	-60.78	4.1	27.48	-37.40	-25	-12.40	Vertical
7785	-65.30	5.42	27.7	-43.02	-25	-18.02	Vertical
7785	-64.55	5.42	27.7	-42.27	-25	-17.27	Horizontal
Test Results for High Channel 2617.5MHz							
5234	-64.54	4.11	27.43	-41.22	-25	-16.22	Horizontal
5234	-60.93	4.11	27.43	-37.61	-25	-12.61	Vertical
7851	-64.87	5.31	27.74	-42.44	-25	-17.44	Vertical
7851	-61.18	5.31	27.74	-38.75	-25	-13.75	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	-63.27	3.89	27.5	-39.66	-25	-14.66	Horizontal
5160	-61.62	3.89	27.5	-38.01	-25	-13.01	Vertical
7740	-64.47	5.33	27.8	-42.00	-25	-17.00	Vertical
7740	-63.96	5.33	27.8	-41.49	-25	-16.49	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-60.13	4.1	27.48	-36.75	-25	-11.75	Horizontal
5190	-64.89	4.1	27.48	-41.51	-25	-16.51	Vertical
7785	-61.53	5.42	27.7	-39.25	-25	-14.25	Vertical
7785	-60.82	5.42	27.7	-38.54	-25	-13.54	Horizontal
Test Results for High Channel 2610MHz							
5220	-65.98	4.01	27.43	-42.56	-25	-17.56	Horizontal
5220	-61.19	4.01	27.43	-37.77	-25	-12.77	Vertical
7830	-65.61	5.34	27.74	-43.21	-25	-18.21	Vertical
7830	-60.47	5.34	27.74	-38.07	-25	-13.07	Horizontal

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

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.

9.7 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (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	-50.94	4.02	29.80	-25.16	-13	-12.16	Horizontal
3421.4	-48.96	4.02	29.80	-23.18	-13	-10.18	Vertical
5132.1	-53.73	5.24	35.84	-23.13	-13	-10.13	Vertical
5132.1	-54.82	5.24	35.84	-24.22	-13	-11.22	Horizontal
112.6	-50.43	1.52	15.57	-36.38	-13	-23.38	Vertical
220.5	-50.35	1.33	17.14	-34.54	-13	-21.54	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-51.39	4.03	30.00	-25.42	-13	-12.42	Horizontal
3490.0	-49.29	4.03	30.00	-23.32	-13	-10.32	Vertical
5235.0	-56.49	5.25	35.86	-25.88	-13	-12.88	Vertical
5235.0	-55.86	5.25	35.86	-25.25	-13	-12.25	Horizontal
157.3	-52.14	1.53	17.13	-36.54	-13	-23.54	Vertical
213.1	-51.19	1.41	15.95	-36.65	-13	-23.65	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-52.09	4.05	30.01	-26.13	-13	-13.13	Horizontal
3558.6	-54.16	4.05	30.01	-28.20	-13	-15.20	Vertical
5337.9	-56.28	5.26	35.86	-25.68	-13	-12.68	Vertical
5337.9	-56.31	5.26	35.86	-25.71	-13	-12.71	Horizontal
170.6	-44.75	1.44	15.51	-30.68	-13	-17.68	Vertical
169.0	-53.08	1.78	15.76	-39.10	-13	-26.10	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (20MHZ 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	-48.51	4.02	29.80	-22.73	-13	-9.73	Horizontal
3440.0	-49.71	4.02	29.80	-23.93	-13	-10.93	Vertical
5160.0	-51.87	5.24	35.84	-21.27	-13	-8.27	Vertical
5160.0	-56.30	5.24	35.84	-25.70	-13	-12.70	Horizontal
268.8	-45.74	1.62	17.02	-30.34	-13	-17.34	Vertical
161.4	-52.73	1.32	17.31	-36.74	-13	-23.74	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-47.24	4.03	30.00	-21.27	-13	-8.27	Horizontal
3490.0	-53.63	4.03	30.00	-27.66	-13	-14.66	Vertical
5235.0	-51.48	5.25	35.86	-20.87	-13	-7.87	Vertical
5235.0	-55.20	5.25	35.86	-24.59	-13	-11.59	Horizontal
159.9	-46.73	1.45	15.17	-33.01	-13	-20.01	Vertical
172.1	-49.67	1.48	17.82	-33.33	-13	-20.33	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-47.65	2.91	27.68	-22.88	-13	-9.88	Horizontal
3540.0	-45.97	2.91	27.68	-21.20	-13	-8.20	Vertical
5310.0	-54.65	5.26	35.86	-24.05	-13	-11.05	Vertical
5310.0	-52.43	5.26	35.86	-21.83	-13	-8.83	Horizontal
197.3	-53.97	1.76	16.38	-39.35	-13	-26.35	Vertical
158.5	-52.46	1.43	17.13	-36.76	-13	-23.76	Horizontal

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

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 3.4V, Normal, DC 3.8V and High voltage, DC 4.35V.

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
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 38
- LTE Band 66

RESULTS

See the following pages.

10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	13.1	0.006974	2.5
3.8	1880	13.7	0.007268	2.5
4.35	1880	13.3	0.007090	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	13.1	0.006989	2.5
Extreme (50C)	1880	11.5	0.006140	2.5
Extreme (40C)	1880	14.0	0.007464	2.5
Extreme (30C)	1880	13.1	0.006967	2.5
Extreme (10C)	1880	13.6	0.007255	2.5
Extreme (0C)	1880	12.0	0.006357	2.5
Extreme (-10C)	1880	12.8	0.006821	2.5
Extreme (-20C)	1880	13.9	0.007376	2.5
Extreme (-30C)	1880	15.0	0.007969	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	9.8	0.005212	2.5
3.8	1880	8.7	0.004639	2.5
4.35	1880	8.5	0.004516	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	9.9	0.005283	2.5
Extreme (50C)	1880	9.0	0.004786	2.5
Extreme (40C)	1880	7.8	0.004162	2.5
Extreme (30C)	1880	9.4	0.005009	2.5
Extreme (10C)	1880	9.2	0.004890	2.5
Extreme (0C)	1880	8.4	0.004451	2.5
Extreme (-10C)	1880	9.4	0.004979	2.5
Extreme (-20C)	1880	8.8	0.004661	2.5
Extreme (-30C)	1880	8.3	0.004390	2.5

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

10.2 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	8.8	0.005087	2.5
3.8	1732.5	8.9	0.005149	2.5
4.35	1732.5	8.5	0.004905	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	8.6	0.004937	2.5
Extreme (50C)	1732.5	9.2	0.005287	2.5
Extreme (40C)	1732.5	7.8	0.004479	2.5
Extreme (30C)	1732.5	5.6	0.003233	2.5
Extreme (10C)	1732.5	7.0	0.004048	2.5
Extreme (0C)	1732.5	9.0	0.005211	2.5
Extreme (-10C)	1732.5	8.3	0.004781	2.5
Extreme (-20C)	1732.5	7.1	0.004117	2.5
Extreme (-30C)	1732.5	8.8	0.005052	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	9.5	0.005490	2.5
3.8	1732.5	8.4	0.004855	2.5
4.35	1732.5	7.9	0.004550	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	9.2	0.005316	2.5
Extreme (50C)	1732.5	8.8	0.005099	2.5
Extreme (40C)	1732.5	8.1	0.004677	2.5
Extreme (30C)	1732.5	8.5	0.004914	2.5
Extreme (10C)	1732.5	9.0	0.005171	2.5
Extreme (0C)	1732.5	8.4	0.004833	2.5
Extreme (-10C)	1732.5	8.7	0.005015	2.5
Extreme (-20C)	1732.5	8.9	0.005151	2.5
Extreme (-30C)	1732.5	7.8	0.004493	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	5.9	0.007113	2.5
3.8	836.5	7.0	0.008352	2.5
4.35	836.5	5.0	0.005938	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	5.9	0.007041	2.5
Extreme (50C)	836.5	5.9	0.007061	2.5
Extreme (40C)	836.5	5.9	0.007004	2.5
Extreme (30C)	836.5	6.6	0.007861	2.5
Extreme (10C)	836.5	5.4	0.006467	2.5
Extreme (0C)	836.5	5.2	0.006182	2.5
Extreme (-10C)	836.5	5.8	0.006940	2.5
Extreme (-20C)	836.5	6.1	0.007284	2.5
Extreme (-30C)	836.5	6.0	0.007207	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	5.8	0.006912	2.5
3.8	836.5	6.8	0.008171	2.5
4.35	836.5	5.1	0.006052	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	6.4	0.007619	2.5
Extreme (50C)	836.5	6.0	0.007163	2.5
Extreme (40C)	836.5	5.8	0.006881	2.5
Extreme (30C)	836.5	6.2	0.007455	2.5
Extreme (10C)	836.5	5.8	0.006923	2.5
Extreme (0C)	836.5	5.0	0.005921	2.5
Extreme (-10C)	836.5	5.6	0.006730	2.5
Extreme (-20C)	836.5	5.7	0.006845	2.5
Extreme (-30C)	836.5	6.2	0.007360	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

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	9.7	0.003812	2.5
3.8	2535	8.7	0.003442	2.5
4.35	2535	8.7	0.003440	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	9.2	0.003615	2.5
Extreme (50C)	2535	8.4	0.003318	2.5
Extreme (40C)	2535	7.9	0.003121	2.5
Extreme (30C)	2535	8.6	0.003386	2.5
Extreme (10C)	2535	7.8	0.003086	2.5
Extreme (0C)	2535	8.6	0.003391	2.5
Extreme (-10C)	2535	9.6	0.003770	2.5
Extreme (-20C)	2535	8.7	0.003416	2.5
Extreme (-30C)	2535	7.9	0.003121	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	6.7	0.002632	2.5
3.8	2535	6.7	0.002648	2.5
4.35	2535	5.4	0.002136	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	7.0	0.002753	2.5
Extreme (50C)	2535	5.5	0.002164	2.5
Extreme (40C)	2535	5.6	0.002202	2.5
Extreme (30C)	2535	6.5	0.002569	2.5
Extreme (10C)	2535	6.1	0.002406	2.5
Extreme (0C)	2535	4.9	0.001923	2.5
Extreme (-10C)	2535	5.4	0.002126	2.5
Extreme (-20C)	2535	5.7	0.002246	2.5
Extreme (-30C)	2535	5.4	0.002123	2.5

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

10.6 LTE BAND 38

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 QPSK, (CH 37850 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2595	8.3	0.003181	2.5
3.8	2595	6.2	0.002371	2.5
4.35	2595	7.8	0.002994	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 QPSK, (CH 37850 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2595	7.2	0.002794	2.5
Extreme (50C)	2595	5.0	0.001913	2.5
Extreme (40C)	2595	5.9	0.002272	2.5
Extreme (30C)	2595	4.3	0.001654	2.5
Extreme (10C)	2595	6.5	0.002520	2.5
Extreme (0C)	2595	4.7	0.001811	2.5
Extreme (-10C)	2595	9.0	0.003479	2.5
Extreme (-20C)	2595	10.9	0.004215	2.5
Extreme (-30C)	2595	5.9	0.002292	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 16QAM, (CH 37850 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2595	8.6	0.003323	2.5
3.8	2595	6.6	0.002554	2.5
4.35	2595	6.3	0.002418	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 16QAM, (CH 37850 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2595	7.3	0.002801	2.5
Extreme (50C)	2595	4.8	0.001838	2.5
Extreme (40C)	2595	5.0	0.001946	2.5
Extreme (30C)	2595	5.0	0.001908	2.5
Extreme (10C)	2595	6.5	0.002520	2.5
Extreme (0C)	2595	4.7	0.001798	2.5
Extreme (-10C)	2595	10.0	0.003847	2.5
Extreme (-20C)	2595	11.2	0.004313	2.5
Extreme (-30C)	2595	6.6	0.002532	2.5

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

10.7 LTE BAND 66

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1745	13.0	0.00745	2.5
3.8	1745	13.6	0.00781	2.5
4.35	1745	13.1	0.00749	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 QPSK, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1745	7.6	0.004379	2.5
Extreme (50C)	1745	5.0	0.002871	2.5
Extreme (40C)	1745	5.3	0.003065	2.5
Extreme (30C)	1745	4.6	0.002659	2.5
Extreme (10C)	1745	6.7	0.003856	2.5
Extreme (0C)	1745	5.2	0.002970	2.5
Extreme (-10C)	1745	9.5	0.005437	2.5
Extreme (-20C)	1745	10.4	0.005948	2.5
Extreme (-30C)	1745	6.3	0.003587	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 16QAM, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1745	13.0	0.007422	2.5
3.8	1745	13.9	0.007971	2.5
4.35	1745	13.4	0.007688	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 66 16QAM, (CH 132322 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1745	7.0	0.004030	2.5
Extreme (50C)	1745	4.7	0.002674	2.5
Extreme (40C)	1745	5.0	0.002855	2.5
Extreme (30C)	1745	4.4	0.002521	2.5
Extreme (10C)	1745	6.8	0.003887	2.5
Extreme (0C)	1745	4.5	0.002555	2.5
Extreme (-10C)	1745	9.4	0.005391	2.5
Extreme (-20C)	1745	10.5	0.005989	2.5
Extreme (-30C)	1745	6.6	0.003772	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

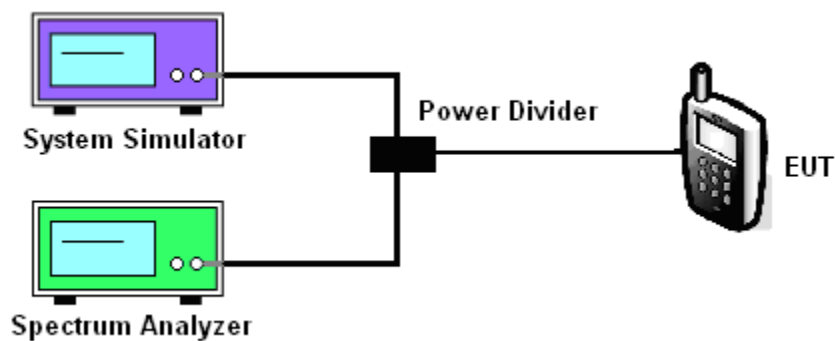
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

- LTE Band2/4/5/7/38/66
-

Test data reference attachment.

----END OF REPORT----