

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

FCC ID: 2AOWK-3098

Product: Mobile Phone

Trade Mark: ulefone

Model Number: GQ3098

Note 13P, Note 13, Note 13T, Note 13E, Note

Family Model: 13S, Note 13X, Note 13 Pro, Note 13 Lite, Note
13 Plus

Report No.: STR210927002006E

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name	Shenzhen Gotron Electronic CO.,LTD.
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Manufacturer's Name	Shenzhen Gotron Electronic CO.,LTD.
Address.....	7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China
Product name.....	Mobile Phone
Model and/or type reference ..	GQ3098
Family Model:	Note 13P,Note 13, Note 13T, Note 13E, Note 13S, Note 13X, Note 13 Pro, Note 13 Lite, Note 13 Plus
Standards	FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure	ANSI C63.26:2015 ANSI/TIA-603-E-2016

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

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Date of Test	
Date (s) of performance of tests.....	Sep 27. 2021 ~Nov 17, 2021
Date of Issue	Nov 17, 2021
Test Result	Pass

Testing Engineer :

Mukzi Lee

(Mukzi Lee)

Authorized Signatory :

Alex

(Alex Li)

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.....	7
1.6 WORST-CASE CONFIGURATION AND MODE.....	7
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
8.5 LTE BAND 12.....	32
8.6 LTE BAND 17.....	34
9. SPURIOUS RADIATION EMISSION	36
9.1 LTE BAND 2.....	38
9.2 LTE BAND 4.....	40
9.3 LTE BAND 5.....	42
9.4 LTE BAND 7.....	44
9.5 LTE BAND 12.....	46
9.6 LTE BAND 17.....	48
10. FREQUENCY STABILITY	50
10.1 LTE BAND 2.....	51
10.2 LTE BAND 4.....	53
10.3 LTE BAND 5.....	55
10.4 LTE BAND 7.....	57
10.5 LTE BAND 12.....	59
10.6 LTE BAND 17.....	61
11. PEAK-TO-AVERAGE RATIO.....	63
11.1 Description of the PAR Measurement.....	63
11.2 Measuring Instruments.....	63
11.3 Test Procedures.....	63
11.4 Test Setup.....	63

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Trade Mark	ulefone
Model Name	GQ3098
Family Model	Note 13P, Note 13, Note 13T, Note 13E, Note 13S, Note 13X, Note 13 Pro, Note 13 Lite, Note 13 Plus
Model Difference	All the model are the same circuit and RF module, except the exterior and color difference.
FCC ID:	2AOWK-3098
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2, 4, 5, 7, 12, 17
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz;
Type of Modulation:	QPSK/16QAM
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 1.1dBi, Band 4: 0.9dBi, Band 5: 0.4dBi, Band 7: 1.0dBi, Band 12: -1.7dBi, Band 17: -1.7dBi
Adapter	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz 0.3A Output: DC 5V---2000mA
Battery	DC 3.85V, 5180mAh, 19.943Wh
Power supply	DC 3.85V from battery or DC 5V from Adapter.
Extreme Vol. Limits:	DC 3.27V to DC 4.43V (Nominal DC 3.85V) (Note 1)
HW Version	E6_01
SW Version	Note_13P_SF1_EEA_V01

** Note1: The High Voltage 4.43V and Low Voltage 3.27V 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: 2AOWK-3098** filing to comply with the FCC Part 22H&24E &27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5dB
2	Conducted Emission Test	± 1.38 dB
3	RF power, conducted	± 0.16 dB
4	Spurious emissions, conducted	± 0.21 dB
5	All emissions, radiated(<1G)	± 4.68 dB
6	All emissions, radiated(>1G)	± 4.89 dB
7	Temperature	± 0.5 °C
8	Humidity	± 2 %
9	Frequency error, conducted	± 0.19 ppm

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 12, Band 17

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	GQ3098	FCC ID: 2AOWK-3098	EUT

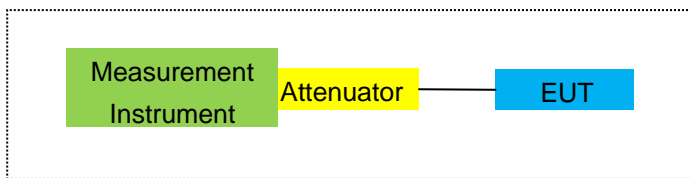
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

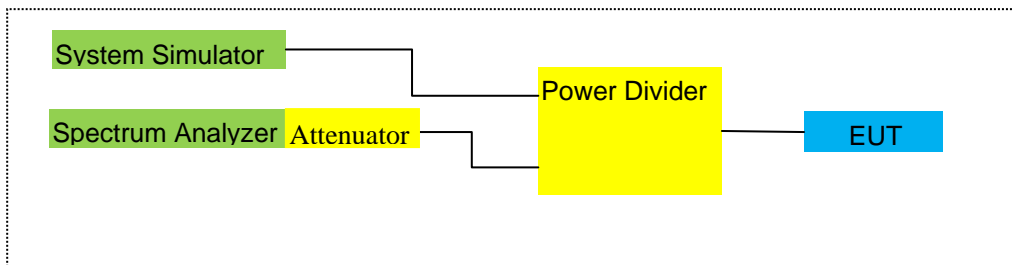
For Radiated Test Cases



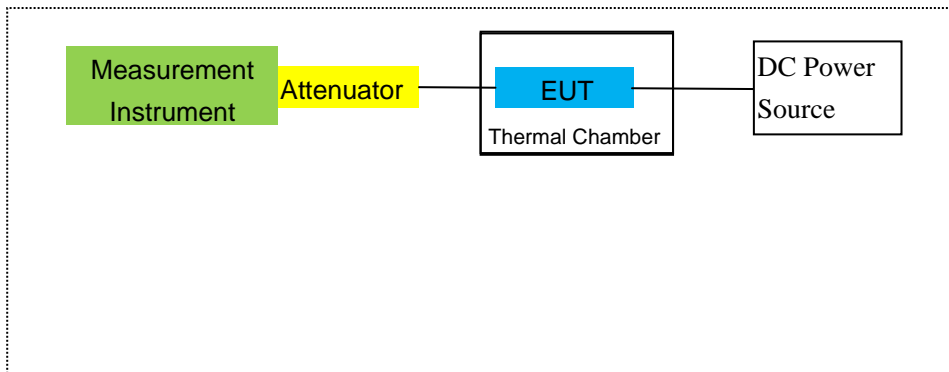
For Conducted Output Power



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	2021.07.01	2022.06.30	1 year
2	Test Receiver	R&S	ESPI	101318	2021.04.27	2022.04.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.11.20	2021.11.19	1 year
7	Amplifier	EM	EM-30180	060538	2021.07.01	2022.06.30	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2021.04.27	2022.04.26	1 year
9	Power Meter	R&S	NRVS	100696	2021.07.01	2022.06.30	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2021.04.27	2022.04.26	1 year
11	Test Cable	N/A	R-01	N/A	2019.08.06	2022.08.05	3 year
12	Test Cable	N/A	R-02	N/A	2019.08.06	2022.08.05	3 year
13	Test Cable	N/A	R-03	N/A	2019.06.28	2022.06.27	3 year
14	Test Receiver	R&S	ESCI	101160	2021.04.27	2022.04.26	1 year
15	LISN	R&S	ENV216	101313	2021.04.27	2022.04.26	1 year
16	LISN	EMCO	3816/2	00042990	2021.04.27	2022.04.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2021.04.27	2022.04.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2021.04.27	2022.04.26	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2020.04.07	2023.04.06	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2021.04.27	2022.04.26	1 year
24	test receiver	R&S	ESCI	a0304218	2021.04.27	2022.04.26	1 year
25	Communication Tester	R&S	CMU200	A0304247	2021.07.01	2022.06.30	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2021.04.27	2022.04.26	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.05.11	2023.05.10	3 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	1 year
29	Communication Tester	R&S	CMW500	148500	2021.07.01	2022.06.30	1 year
30	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	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 Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

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

RESULTS

Test data reference attachment.

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 Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

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: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported (LTE Band 2/4/7: above 10GHz).

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 Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

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 Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	1.59	3.76	28.24	26.07	404.576	Horizontal	Pass
		1880	1.75	3.91	28.22	26.06	403.645	Horizontal	Pass
		1909.3	1.91	3.93	28.20	26.18	414.954	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	1.65	3.77	28.23	26.11	408.319	Horizontal	Pass
		1880	1.75	3.91	28.24	26.08	405.509	Horizontal	Pass
		1908.5	1.87	3.94	28.25	26.18	414.954	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	1.61	3.77	28.31	26.15	412.098	Horizontal	Pass
		1880	1.85	3.91	28.22	26.16	413.048	Horizontal	Pass
		1907.5	1.80	3.94	28.20	26.06	403.645	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	1.61	3.79	28.33	26.15	412.098	Horizontal	Pass
		1880	1.91	3.95	28.22	26.18	414.954	Horizontal	Pass
		1905	1.91	3.97	28.19	26.13	410.204	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	1.50	3.79	28.34	26.05	402.717	Horizontal	Pass
		1880	1.91	3.95	28.22	26.18	414.954	Horizontal	Pass
		1902.5	1.83	3.97	28.18	26.04	401.791	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	1.64	3.81	28.35	26.18	414.954	Horizontal	Pass
		1880	1.84	3.96	28.22	26.10	407.380	Horizontal	Pass
		1900	2.02	4.00	28.16	26.18	414.954	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	1.71	3.76	28.24	26.19	415.911	Vertical	Pass
		1880	1.75	3.91	28.22	26.06	403.645	Vertical	Pass
		1909.3	1.82	3.93	28.20	26.09	406.443	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	1.61	3.77	28.23	26.07	404.576	Vertical	Pass
		1880	1.83	3.91	28.24	26.16	413.048	Vertical	Pass
		1908.5	1.75	3.94	28.25	26.06	403.645	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	1.61	3.77	28.31	26.15	412.098	Vertical	Pass
		1880	1.86	3.91	28.22	26.17	414.000	Vertical	Pass
		1907.5	1.82	3.94	28.20	26.08	405.509	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	1.57	3.79	28.33	26.11	408.319	Vertical	Pass
		1880	1.88	3.95	28.22	26.15	412.098	Vertical	Pass

QPSK		1905	1.96	3.97	28.19	26.18	414.954	Vertical	Pass
15.0MH z Band QPSK	1/#Mid	1857.5	1.55	3.79	28.34	26.10	407.380	Vertical	Pass
		1880	1.82	3.95	28.22	26.09	406.443	Vertical	Pass
		1902.5	1.93	3.97	28.18	26.14	411.150	Vertical	Pass
20.0MH z Band QPSK	1/#Mid	1860	1.61	3.81	28.35	26.15	412.098	Vertical	Pass
		1880	1.79	3.96	28.22	26.05	402.717	Vertical	Pass
		1900	1.89	4.00	28.16	26.05	402.717	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	0.69	3.76	28.24	25.17	328.852	Horizontal	Pass
		1880	0.93	3.91	28.22	25.24	334.195	Horizontal	Pass
		1909.3	0.95	3.93	28.20	25.22	332.660	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	0.70	3.77	28.23	25.16	328.095	Horizontal	Pass
		1880	0.96	3.91	28.24	25.29	338.065	Horizontal	Pass
		1908.5	0.90	3.94	28.25	25.21	331.894	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	0.63	3.77	28.31	25.17	328.852	Horizontal	Pass
		1880	0.86	3.91	28.22	25.17	328.852	Horizontal	Pass
		1907.5	0.89	3.94	28.20	25.15	327.341	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	0.74	3.79	28.33	25.28	337.287	Horizontal	Pass
		1880	1.01	3.95	28.22	25.28	337.287	Horizontal	Pass
		1905	1.06	3.97	28.19	25.28	337.287	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	0.69	3.79	28.34	25.24	334.195	Horizontal	Pass
		1880	1.00	3.95	28.22	25.27	336.512	Horizontal	Pass
		1902.5	0.98	3.97	28.18	25.19	330.370	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	0.67	3.81	28.35	25.21	331.894	Horizontal	Pass
		1880	0.99	3.96	28.22	25.25	334.965	Horizontal	Pass
		1900	0.99	4.00	28.16	25.15	327.341	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	0.71	3.76	28.24	25.19	330.370	Vertical	Pass
		1880	0.86	3.91	28.22	25.17	328.852	Vertical	Pass
		1909.3	1.02	3.93	28.20	25.29	338.065	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	0.75	3.77	28.23	25.21	331.894	Vertical	Pass
		1880	0.89	3.91	28.24	25.22	332.660	Vertical	Pass
		1908.5	0.84	3.94	28.25	25.15	327.341	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	0.58	3.77	28.31	25.12	325.087	Vertical	Pass
		1880	0.89	3.91	28.22	25.20	331.131	Vertical	Pass
		1907.5	1.00	3.94	28.20	25.26	335.738	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	0.61	3.79	28.33	25.15	327.341	Vertical	Pass
		1880	0.94	3.95	28.22	25.21	331.894	Vertical	Pass
		1905	0.94	3.97	28.19	25.16	328.095	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	0.62	3.79	28.34	25.17	328.852	Vertical	Pass
		1880	0.87	3.95	28.22	25.14	326.588	Vertical	Pass
		1902.5	1.03	3.97	28.18	25.24	334.195	Vertical	Pass

20.0MHz		1860	0.70	3.81	28.35	25.24	334.195	Vertical	Pass
Band 16	1/#Mid	1880	1.01	3.96	28.22	25.27	336.512	Vertical	Pass
QAM		1900	1.05	4.00	28.16	25.21	331.894	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP			
						Average (dBm)	Average (mW)			
1.4MHz Band QPSK	1/#Mid	1710.7	0.83	3.12	27.58	25.29	338.065	Horizontal	Pass	
		1732.5	0.81	3.27	27.61	25.15	327.341	Horizontal	Pass	
		1754.3	0.95	3.29	27.63	25.29	338.065	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	0.81	3.13	27.61	25.29	338.065	Horizontal	Pass	
		1732.5	0.84	3.27	27.61	25.18	329.610	Horizontal	Pass	
		1753.5	0.93	3.30	27.62	25.25	334.965	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	0.79	3.13	27.63	25.29	338.065	Horizontal	Pass	
		1732.5	0.96	3.27	27.61	25.30	338.844	Horizontal	Pass	
		1752.5	0.89	3.30	27.60	25.19	330.370	Horizontal	Pass	
10.0MHz z Band QPSK	1/#Mid	1715	0.80	3.15	27.64	25.29	338.065	Horizontal	Pass	
		1732.5	0.89	3.31	27.61	25.19	330.370	Horizontal	Pass	
		1750	0.89	3.33	27.59	25.15	327.341	Horizontal	Pass	
15.0MHz z Band QPSK	1/#Mid	1717.5	0.66	3.15	27.65	25.16	328.095	Horizontal	Pass	
		1732.5	0.88	3.31	27.61	25.18	329.610	Horizontal	Pass	
		1747.5	1.00	3.33	27.57	25.24	334.195	Horizontal	Pass	
20.0MHz z Band QPSK	1/#Mid	1720	0.66	3.17	27.66	25.15	327.341	Horizontal	Pass	
		1732.5	0.94	3.32	27.61	25.23	333.426	Horizontal	Pass	
		1745	1.07	3.36	27.56	25.27	336.512	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1710.7	0.71	3.12	27.58	25.17	328.852	Vertical	Pass	
		1732.5	0.82	3.27	27.61	25.16	328.095	Vertical	Pass	
		1754.3	0.93	3.29	27.63	25.27	336.512	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1711.5	0.78	3.13	27.61	25.26	335.738	Vertical	Pass	
		1732.5	0.92	3.27	27.61	25.26	335.738	Vertical	Pass	
		1753.5	0.98	3.30	27.62	25.30	338.844	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1712.5	0.65	3.13	27.63	25.15	327.341	Vertical	Pass	
		1732.5	0.91	3.27	27.61	25.25	334.965	Vertical	Pass	
		1752.5	0.93	3.30	27.60	25.23	333.426	Vertical	Pass	
10.0MHz z Band	1/#Mid	1715	0.77	3.15	27.64	25.26	335.738	Vertical	Pass	
		1732.5	0.97	3.31	27.61	25.27	336.512	Vertical	Pass	

QPSK		1750	1.03	3.33	27.59	25.29	338.065	Vertical	Pass
15.0MH	1/#Mid	1717.5	0.68	3.15	27.65	25.18	329.610	Vertical	Pass
z Band		1732.5	0.94	3.31	27.61	25.24	334.195	Vertical	Pass
QPSK		1747.5	0.98	3.33	27.57	25.22	332.660	Vertical	Pass
20.0MH	1/#Mid	1720	0.66	3.17	27.66	25.15	327.341	Vertical	Pass
z Band		1732.5	0.97	3.32	27.61	25.26	335.738	Vertical	Pass
QPSK		1745	1.09	3.36	27.56	25.29	338.065	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 4										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP		
			(dBm)			Average (dBm)	Average (mW)			
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.13	3.12	27.58	24.33	271.019	Horizontal	Pass	
		1732.5	0.04	3.27	27.61	24.38	274.157	Horizontal	Pass	
		1754.3	-0.09	3.29	27.63	24.25	266.073	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.16	3.13	27.61	24.32	270.396	Horizontal	Pass	
		1732.5	-0.01	3.27	27.61	24.33	271.019	Horizontal	Pass	
		1753.5	-0.02	3.30	27.62	24.30	269.153	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.11	3.13	27.63	24.39	274.789	Horizontal	Pass	
		1732.5	0.04	3.27	27.61	24.38	274.157	Horizontal	Pass	
		1752.5	-0.01	3.30	27.60	24.29	268.534	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	1715	-0.20	3.15	27.64	24.29	268.534	Horizontal	Pass	
		1732.5	0.00	3.31	27.61	24.30	269.153	Horizontal	Pass	
		1750	0.06	3.33	27.59	24.32	270.396	Horizontal	Pass	
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.14	3.15	27.65	24.36	272.898	Horizontal	Pass	
		1732.5	0.10	3.31	27.61	24.40	275.423	Horizontal	Pass	
		1747.5	0.07	3.33	27.57	24.31	269.774	Horizontal	Pass	
20.0MHz Band 16 QAM	1/#Mid	1720	-0.10	3.17	27.66	24.39	274.789	Horizontal	Pass	
		1732.5	-0.06	3.32	27.61	24.23	264.850	Horizontal	Pass	
		1745	0.12	3.36	27.56	24.32	270.396	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.14	3.12	27.58	24.32	270.396	Vertical	Pass	
		1732.5	-0.08	3.27	27.61	24.26	266.686	Vertical	Pass	
		1754.3	0.03	3.29	27.63	24.37	273.527	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.23	3.13	27.61	24.25	266.073	Vertical	Pass	
		1732.5	0.03	3.27	27.61	24.37	273.527	Vertical	Pass	
		1753.5	-0.08	3.30	27.62	24.24	265.461	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.11	3.13	27.63	24.39	274.789	Vertical	Pass	
		1732.5	0.02	3.27	27.61	24.36	272.898	Vertical	Pass	
		1752.5	-0.07	3.30	27.60	24.23	264.850	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	1715	-0.19	3.15	27.64	24.30	269.153	Vertical	Pass	
		1732.5	0.08	3.31	27.61	24.38	274.157	Vertical	Pass	
		1750	0.07	3.33	27.59	24.33	271.019	Vertical	Pass	
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.15	3.15	27.65	24.35	272.270	Vertical	Pass	
		1732.5	-0.02	3.31	27.61	24.28	267.917	Vertical	Pass	
		1747.5	0.11	3.33	27.57	24.35	272.270	Vertical	Pass	

20.0MHz		1720	-0.13	3.17	27.66	24.36	272.898	Vertical	Pass
Band 16	1/#Mid	1732.5	0.08	3.32	27.61	24.37	273.527	Vertical	Pass
QAM		1745	0.14	3.36	27.56	24.34	271.644	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction	Max. EIRP	Max. EIRP			
			(dBm)			(dB)	Average	Average			
							(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	824.7	3.85	2.01	19.68	2.15	19.37	86.497	Horizontal	Pass	
		836.5	3.77	2.01	19.77	2.15	19.38	86.696	Horizontal	Pass	
		848.3	3.65	2.02	19.82	2.15	19.30	85.114	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	3.83	2.01	19.70	2.15	19.37	86.497	Horizontal	Pass	
		836.5	3.78	2.01	19.77	2.15	19.39	86.896	Horizontal	Pass	
		847.5	3.68	2.02	19.81	2.15	19.32	85.507	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	3.70	2.01	19.71	2.15	19.25	84.140	Horizontal	Pass	
		836.5	3.76	2.01	19.77	2.15	19.37	86.497	Horizontal	Pass	
		846.5	3.68	2.02	19.79	2.15	19.30	85.114	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	829	3.72	2.01	19.73	2.15	19.29	84.918	Horizontal	Pass	
		836.5	3.62	2.01	19.77	2.15	19.23	83.753	Horizontal	Pass	
		844	3.66	2.02	19.78	2.15	19.27	84.528	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	824.7	3.76	2.01	19.68	2.15	19.28	84.723	Vertical	Pass	
		836.5	3.68	2.01	19.77	2.15	19.29	84.918	Vertical	Pass	
		848.3	3.60	2.02	19.82	2.15	19.25	84.140	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	825.5	3.80	2.01	19.70	2.15	19.34	85.901	Vertical	Pass	
		836.5	3.77	2.01	19.77	2.15	19.38	86.696	Vertical	Pass	
		847.5	3.67	2.02	19.81	2.15	19.31	85.310	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	826.5	3.75	2.01	19.71	2.15	19.30	85.114	Vertical	Pass	
		836.5	3.64	2.01	19.77	2.15	19.25	84.140	Vertical	Pass	
		846.5	3.64	2.02	19.79	2.15	19.26	84.333	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	829	3.83	2.01	19.73	2.15	19.40	87.096	Vertical	Pass	
		836.5	3.60	2.01	19.77	2.15	19.21	83.368	Vertical	Pass	
		844	3.65	2.02	19.78	2.15	19.26	84.333	Vertical	Pass	

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP			
			(dBm)				Average (dBm)	Average (mW)			
1.4MHz Band 16 QAM	1/#Mid	824.7	7.23	2.01	19.68	2.15	22.75	188.365	Horizontal	Pass	
		836.5	7.16	2.01	19.77	2.15	22.77	189.234	Horizontal	Pass	
		848.3	7.03	2.02	19.82	2.15	22.68	185.353	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	7.14	2.01	19.70	2.15	22.68	185.353	Horizontal	Pass	
		836.5	7.09	2.01	19.77	2.15	22.70	186.209	Horizontal	Pass	
		847.5	7.08	2.02	19.81	2.15	22.72	187.068	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	7.21	2.01	19.71	2.15	22.76	188.799	Horizontal	Pass	
		836.5	7.06	2.01	19.77	2.15	22.67	184.927	Horizontal	Pass	
		846.5	7.04	2.02	19.79	2.15	22.66	184.502	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	7.15	2.01	19.73	2.15	22.72	187.068	Horizontal	Pass	
		836.5	7.04	2.01	19.77	2.15	22.65	184.077	Horizontal	Pass	
		844	7.04	2.02	19.78	2.15	22.65	184.077	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	824.7	7.25	2.01	19.68	2.15	22.77	189.234	Vertical	Pass	
		836.5	7.11	2.01	19.77	2.15	22.72	187.068	Vertical	Pass	
		848.3	7.02	2.02	19.82	2.15	22.67	184.927	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	825.5	7.13	2.01	19.70	2.15	22.67	184.927	Vertical	Pass	
		836.5	7.14	2.01	19.77	2.15	22.75	188.365	Vertical	Pass	
		847.5	7.11	2.02	19.81	2.15	22.75	188.365	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	826.5	7.19	2.01	19.71	2.15	22.74	187.932	Vertical	Pass	
		836.5	7.09	2.01	19.77	2.15	22.70	186.209	Vertical	Pass	
		846.5	7.10	2.02	19.79	2.15	22.72	187.068	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	829	7.22	2.01	19.73	2.15	22.79	190.108	Vertical	Pass	
		836.5	7.09	2.01	19.77	2.15	22.70	186.209	Vertical	Pass	
		844	7.03	2.02	19.78	2.15	22.64	183.654	Vertical	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP			
			(dBm)			Average	Average			
						(dBm)	(mW)			
5.0MHz Band QPSK	1/#Mid	2502.5	2.79	4.54	27.75	26.00	398.107	Horizontal	Pass	
		2535	2.87	4.69	27.72	25.90	389.045	Horizontal	Pass	
		2567.5	2.96	4.71	27.71	25.96	394.457	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	2505	2.71	4.55	27.76	25.92	390.841	Horizontal	Pass	
		2535	2.87	4.69	27.72	25.90	389.045	Horizontal	Pass	
		2565	3.02	4.72	27.70	26.00	398.107	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	2507.5	2.69	4.55	27.77	25.91	389.942	Horizontal	Pass	
		2535	2.95	4.69	27.72	25.98	396.278	Horizontal	Pass	
		2562.5	2.87	4.72	27.69	25.84	383.707	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	2510	2.64	4.57	27.78	25.85	384.592	Horizontal	Pass	
		2535	2.88	4.73	27.72	25.87	386.367	Horizontal	Pass	
		2560	2.96	4.75	27.68	25.89	388.150	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	2502.5	2.66	4.54	27.75	25.87	386.367	Vertical	Pass	
		2535	2.88	4.69	27.72	25.91	389.942	Vertical	Pass	
		2567.5	2.91	4.71	27.71	25.91	389.942	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	2505	2.74	4.55	27.76	25.95	393.550	Vertical	Pass	
		2535	2.90	4.69	27.72	25.93	391.742	Vertical	Pass	
		2565	2.92	4.72	27.70	25.90	389.045	Vertical	Pass	
15.0MHz Band QPSK	1/#Mid	2507.5	2.63	4.55	27.77	25.85	384.592	Vertical	Pass	
		2535	2.85	4.69	27.72	25.88	387.258	Vertical	Pass	
		2562.5	2.86	4.72	27.69	25.83	382.825	Vertical	Pass	
20.0MHz Band QPSK	1/#Mid	2510	2.75	4.57	27.78	25.96	394.457	Vertical	Pass	
		2535	2.87	4.73	27.72	25.86	385.478	Vertical	Pass	
		2560	3.07	4.75	27.68	26.00	398.107	Vertical	Pass	

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	1.76	4.54	27.75	24.97	314.051		Horizontal
		2535	1.98	4.69	27.72	25.01	316.957	Horizontal	Pass
		2567.5	1.98	4.71	27.71	24.98	314.775	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	1.81	4.55	27.76	25.02	317.687	Horizontal	Pass
		2535	2.02	4.69	27.72	25.05	319.890	Horizontal	Pass
		2565	2.00	4.72	27.70	24.98	314.775	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	1.75	4.55	27.77	24.97	314.051	Horizontal	Pass
		2535	2.03	4.69	27.72	25.06	320.627	Horizontal	Pass
		2562.5	2.12	4.72	27.69	25.09	322.849	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	1.82	4.57	27.78	25.03	318.420	Horizontal	Pass
		2535	1.99	4.73	27.72	24.98	314.775	Horizontal	Pass
		2560	2.03	4.75	27.68	24.96	313.329	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	1.74	4.54	27.75	24.95	312.608	Vertical	Pass
		2535	2.04	4.69	27.72	25.07	321.366	Vertical	Pass
		2567.5	2.00	4.71	27.71	25.00	316.228	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	1.79	4.55	27.76	25.00	316.228	Vertical	Pass
		2535	2.06	4.69	27.72	25.09	322.849	Vertical	Pass
		2565	2.00	4.72	27.70	24.98	314.775	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	1.71	4.55	27.77	24.93	311.172	Vertical	Pass
		2535	1.90	4.69	27.72	24.93	311.172	Vertical	Pass
		2562.5	2.04	4.72	27.69	25.01	316.957	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	1.75	4.57	27.78	24.96	313.329	Vertical	Pass
		2535	2.05	4.73	27.72	25.04	319.154	Vertical	Pass
		2560	2.02	4.75	27.68	24.95	312.608	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction	Max. EIRP	Max. EIRP		
			(dBm)			(dB)	Average	Average		
						(dBm)	(mW)			
1.4MHz Band QPSK	1/#Mid	699.7	3.25	1.91	19.21	2.15	18.40	69.183	Horizontal	Pass
		707.5	3.17	1.91	19.26	2.15	18.37	68.707	Horizontal	Pass
		715.3	3.04	1.93	19.34	2.15	18.30	67.608	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	3.21	1.91	19.21	2.15	18.36	68.549	Horizontal	Pass
		707.5	3.18	1.91	19.26	2.15	18.38	68.865	Horizontal	Pass
		714.5	3.07	1.93	19.34	2.15	18.33	68.077	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	3.12	1.91	19.23	2.15	18.29	67.453	Horizontal	Pass
		707.5	3.14	1.91	19.26	2.15	18.34	68.234	Horizontal	Pass
		713.5	3.08	1.92	19.33	2.15	18.34	68.234	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	704	3.09	1.91	19.25	2.15	18.28	67.298	Horizontal	Pass
		707.5	3.15	1.91	19.26	2.15	18.35	68.391	Horizontal	Pass
		711	3.09	1.92	19.32	2.15	18.34	68.234	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	699.7	3.17	1.91	19.21	2.15	18.32	67.920	Vertical	Pass
		707.5	3.10	1.91	19.26	2.15	18.30	67.608	Vertical	Pass
		715.3	3.02	1.93	19.34	2.15	18.28	67.298	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	3.11	1.91	19.21	2.15	18.26	66.988	Vertical	Pass
		707.5	3.07	1.91	19.26	2.15	18.27	67.143	Vertical	Pass
		714.5	3.07	1.93	19.34	2.15	18.33	68.077	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	3.08	1.91	19.23	2.15	18.25	66.834	Vertical	Pass
		707.5	3.07	1.91	19.26	2.15	18.27	67.143	Vertical	Pass
		713.5	3.06	1.92	19.33	2.15	18.32	67.920	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	704	3.16	1.91	19.25	2.15	18.35	68.391	Vertical	Pass
		707.5	3.05	1.91	19.26	2.15	18.25	66.834	Vertical	Pass
		711	3.05	1.92	19.32	2.15	18.30	67.608	Vertical	Pass

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP			
			(dBm)				Average	Average			
						(dBm)	(mW)				
1.4MHz Band 16 QAM	1/#Mid	699.7	2.12	1.91	19.21	2.15	17.27	53.333	Horizontal	Pass	
		707.5	2.06	1.91	19.26	2.15	17.26	53.211	Horizontal	Pass	
		715.3	2.06	1.93	19.34	2.15	17.32	53.951	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	2.18	1.91	19.21	2.15	17.33	54.075	Horizontal	Pass	
		707.5	2.05	1.91	19.26	2.15	17.25	53.088	Horizontal	Pass	
		714.5	2.05	1.93	19.34	2.15	17.31	53.827	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	2.07	1.91	19.23	2.15	17.24	52.966	Horizontal	Pass	
		707.5	2.20	1.91	19.26	2.15	17.40	54.954	Horizontal	Pass	
		713.5	2.12	1.92	19.33	2.15	17.38	54.702	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	2.20	1.91	19.25	2.15	17.39	54.828	Horizontal	Pass	
		707.5	2.10	1.91	19.26	2.15	17.30	53.703	Horizontal	Pass	
		711	2.14	1.92	19.32	2.15	17.39	54.828	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	699.7	2.17	1.91	19.21	2.15	17.32	53.951	Vertical	Pass	
		707.5	2.07	1.91	19.26	2.15	17.27	53.333	Vertical	Pass	
		715.3	2.02	1.93	19.34	2.15	17.28	53.456	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	700.5	2.18	1.91	19.21	2.15	17.33	54.075	Vertical	Pass	
		707.5	2.09	1.91	19.26	2.15	17.29	53.580	Vertical	Pass	
		714.5	2.14	1.93	19.34	2.15	17.40	54.954	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	701.5	2.21	1.91	19.23	2.15	17.38	54.702	Vertical	Pass	
		707.5	2.17	1.91	19.26	2.15	17.37	54.576	Vertical	Pass	
		713.5	2.00	1.92	19.33	2.15	17.26	53.211	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	704	2.15	1.91	19.25	2.15	17.34	54.200	Vertical	Pass	
		707.5	2.07	1.91	19.26	2.15	17.27	53.333	Vertical	Pass	
		711	2.00	1.92	19.32	2.15	17.25	53.088	Vertical	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.6 LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
5.0MHz Band QPSK	1/#Mid	706.5	4.19	1.91	19.23	2.15	19.36	86.298	Vertical	Pass	
		710	4.18	1.91	19.26	2.15	19.38	86.696	Vertical	Pass	
		713.5	4.22	1.92	19.33	2.15	19.48	88.716	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	709	4.30	1.91	19.25	2.15	19.49	88.920	Vertical	Pass	
		710	4.15	1.91	19.26	2.15	19.35	86.099	Vertical	Pass	
		711	4.17	1.92	19.32	2.15	19.42	87.498	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	706.5	4.28	1.91	19.23	2.15	19.45	88.105	Horizontal	Pass	
		710	4.27	1.91	19.26	2.15	19.47	88.512	Horizontal	Pass	
		713.5	4.22	1.92	19.33	2.15	19.48	88.716	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	709	4.21	1.91	19.25	2.15	19.40	87.096	Horizontal	Pass	
		710	4.29	1.91	19.26	2.15	19.49	88.920	Horizontal	Pass	
		711	4.11	1.92	19.32	2.15	19.36	86.298	Horizontal	Pass	

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP			
							Average (dBm)	Average (mW)			
5.0MHz Band 16 QAM	1/#Mid	706.5	3.65	1.91	19.23	2.15	18.82	76.208	Vertical	Pass	
		710	3.67	1.91	19.26	2.15	18.87	77.090	Vertical	Pass	
		713.5	3.55	1.92	19.33	2.15	18.81	76.033	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	709	3.59	1.91	19.25	2.15	18.78	75.509	Vertical	Pass	
		710	3.54	1.91	19.26	2.15	18.74	74.817	Vertical	Pass	
		711	3.59	1.92	19.32	2.15	18.84	76.560	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	706.5	3.68	1.91	19.23	2.15	18.85	76.736	Horizontal	Pass	
		710	3.66	1.91	19.26	2.15	18.86	76.913	Horizontal	Pass	
		713.5	3.62	1.92	19.33	2.15	18.88	77.268	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	709	3.64	1.91	19.25	2.15	18.83	76.384	Horizontal	Pass	
		710	3.62	1.91	19.26	2.15	18.82	76.208	Horizontal	Pass	
		711	3.61	1.92	19.32	2.15	18.86	76.913	Horizontal	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1051, §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 Band2
LTE Band 4
- LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17

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	-52.27	4.04	33.51	-22.80	-13	-9.80	Horizontal
3701.4	-46.81	4.04	33.51	-17.34	-13	-4.34	Vertical
5552.1	-52.06	5.24	35.84	-21.46	-13	-8.46	Vertical
5552.1	-51.18	5.24	35.84	-20.58	-13	-7.58	Horizontal
208.3	-36.51	1.43	16.02	-21.92	-13	-8.92	Vertical
387.4	-42.58	1.30	17.99	-25.89	-13	-12.89	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-53.16	4.04	33.56	-23.64	-13	-10.64	Horizontal
3760.0	-46.50	4.04	33.56	-16.98	-13	-3.98	Vertical
5640.0	-47.60	5.24	35.91	-16.93	-13	-3.93	Vertical
5640.0	-51.04	5.24	35.91	-20.37	-13	-7.37	Horizontal
211.2	-37.26	1.62	16.97	-21.91	-13	-8.91	Vertical
302.1	-41.62	1.74	15.98	-27.39	-13	-14.39	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.75	4.04	34.00	-19.79	-13	-6.79	Horizontal
3818.6	-44.26	4.04	34.00	-14.30	-13	-1.30	Vertical
5727.9	-50.69	5.24	36.04	-19.89	-13	-6.89	Vertical
5727.9	-51.73	5.24	36.04	-20.93	-13	-7.93	Horizontal
212.1	-36.87	1.42	17.29	-21.00	-13	-8.00	Vertical
375.6	-35.04	1.50	17.90	-18.63	-13	-5.63	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	-46.44	4.07	33.54	-16.97	-13	-3.97	Horizontal
3720.0	-46.46	4.07	33.54	-16.99	-13	-3.99	Vertical
5580.0	-50.40	5.28	35.86	-19.82	-13	-6.82	Vertical
5580.0	-52.25	5.28	35.86	-21.67	-13	-8.67	Horizontal
207.0	-37.08	1.58	16.89	-21.76	-13	-8.76	Vertical
362.7	-44.53	1.76	17.26	-29.03	-13	-16.03	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-50.54	4.04	33.56	-21.02	-13	-8.02	Horizontal
3760.0	-52.00	4.04	33.56	-22.48	-13	-9.48	Vertical
5640.0	-46.55	5.24	35.91	-15.88	-13	-2.88	Vertical
5640.0	-49.51	5.24	35.91	-18.84	-13	-5.84	Horizontal
205.3	-38.13	1.46	16.27	-23.32	-13	-10.32	Vertical
407.6	-43.27	1.59	15.15	-29.71	-13	-16.71	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-48.00	4.04	34.00	-18.04	-13	-5.04	Horizontal
3800.0	-48.45	4.04	34.00	-18.49	-13	-5.49	Vertical
5700.0	-47.38	5.24	36.04	-16.58	-13	-3.58	Vertical
5700.0	-51.36	5.24	36.04	-20.56	-13	-7.56	Horizontal
211.6	-36.39	1.36	17.39	-20.35	-13	-7.35	Vertical
441.0	-40.98	1.66	15.39	-27.25	-13	-14.25	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.42	4.02	29.80	-21.64	-13	-8.64	Horizontal
3421.4	-48.50	4.02	29.80	-22.72	-13	-9.72	Vertical
5132.1	-44.26	5.24	35.84	-13.66	-13	-0.66	Vertical
5132.1	-50.64	5.24	35.84	-20.04	-13	-7.04	Horizontal
189.5	-43.84	1.68	16.04	-29.48	-13	-16.48	Vertical
289.9	-35.35	1.78	17.74	-19.39	-13	-6.39	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.13	4.03	30.00	-27.16	-13	-14.16	Horizontal
3465.0	-46.88	4.03	30.00	-20.91	-13	-7.91	Vertical
5197.5	-52.68	5.25	35.86	-22.07	-13	-9.07	Vertical
5197.5	-51.83	5.25	35.86	-21.22	-13	-8.22	Horizontal
210.1	-36.61	1.72	17.69	-20.64	-13	-7.64	Vertical
365.6	-43.04	1.62	16.02	-28.63	-13	-15.63	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-48.73	4.05	30.01	-22.77	-13	-9.77	Horizontal
3508.6	-53.18	4.05	30.01	-27.22	-13	-14.22	Vertical
5262.9	-52.95	5.26	35.86	-22.35	-13	-9.35	Vertical
5262.9	-53.23	5.26	35.86	-22.63	-13	-9.63	Horizontal
183.6	-44.12	1.80	16.69	-29.23	-13	-16.23	Vertical
458.3	-39.10	1.75	16.66	-24.20	-13	-11.20	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	-51.97	4.02	29.80	-26.19	-13	-13.19	Horizontal
3440.0	-51.77	4.02	29.80	-25.99	-13	-12.99	Vertical
5160.0	-51.84	5.24	35.84	-21.24	-13	-8.24	Vertical
5160.0	-50.35	5.24	35.84	-19.75	-13	-6.75	Horizontal
199.1	-38.74	1.57	17.26	-23.05	-13	-10.05	Vertical
456.1	-40.66	1.78	16.35	-26.09	-13	-13.09	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-51.49	4.03	30.00	-25.52	-13	-12.52	Horizontal
3465.0	-45.41	4.03	30.00	-19.44	-13	-6.44	Vertical
5197.5	-44.60	5.25	35.86	-13.99	-13	-0.99	Vertical
5197.5	-50.30	5.25	35.86	-19.69	-13	-6.69	Horizontal
175.1	-39.65	1.44	17.95	-23.14	-13	-10.14	Vertical
348.9	-44.29	1.65	16.09	-29.85	-13	-16.85	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-44.59	2.91	27.68	-19.82	-13	-6.82	Horizontal
3490.0	-46.04	2.91	27.68	-21.27	-13	-8.27	Vertical
5235.0	-44.15	5.26	35.86	-13.55	-13	-0.55	Vertical
5235.0	-52.19	5.26	35.86	-21.59	-13	-8.59	Horizontal
179.5	-36.47	1.61	16.85	-21.23	-13	-8.23	Vertical
302.8	-36.18	1.61	15.19	-22.60	-13	-9.60	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-53.31	2.78	27.50	-28.59	-13	-15.59	Horizontal
1649.4	-45.56	2.78	27.50	-20.84	-13	-7.84	Vertical
2474.1	-46.10	2.90	27.80	-21.20	-13	-8.20	Vertical
2474.1	-53.74	2.90	27.80	-28.84	-13	-15.84	Horizontal
179.7	-43.08	1.76	17.59	-27.25	-13	-14.25	Vertical
310.8	-34.93	1.63	15.87	-20.69	-13	-7.69	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-52.08	2.80	27.48	-27.40	-13	-14.40	Horizontal
1673.0	-49.47	2.80	27.48	-24.79	-13	-11.79	Vertical
2509.5	-51.82	2.91	27.70	-27.03	-13	-14.03	Vertical
2509.5	-50.68	2.91	27.70	-25.89	-13	-12.89	Horizontal
198.6	-39.78	1.61	15.68	-25.71	-13	-12.71	Vertical
245.0	-37.68	1.59	17.52	-21.76	-13	-8.76	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-51.52	2.82	27.43	-26.91	-13	-13.91	Horizontal
1696.6	-45.96	2.82	27.43	-21.35	-13	-8.35	Vertical
2544.9	-44.08	2.92	27.74	-19.26	-13	-6.26	Vertical
2544.9	-49.66	2.92	27.74	-24.84	-13	-11.84	Horizontal
198.0	-44.58	1.69	16.67	-29.59	-13	-16.59	Vertical
231.8	-44.53	1.70	17.18	-29.05	-13	-16.05	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-47.53	2.78	27.50	-22.81	-13	-9.81	Horizontal
1658.0	-50.87	2.78	27.50	-26.15	-13	-13.15	Vertical
2487.0	-48.54	2.90	27.80	-23.64	-13	-10.64	Vertical
2487.0	-49.66	2.90	27.80	-24.76	-13	-11.76	Horizontal
209.1	-39.57	1.71	15.57	-25.71	-13	-12.71	Vertical
342.4	-41.95	1.34	16.40	-26.89	-13	-13.89	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-48.41	2.80	27.48	-23.73	-13	-10.73	Horizontal
1673.0	-51.57	2.80	27.48	-26.89	-13	-13.89	Vertical
2509.5	-45.22	2.91	27.70	-20.43	-13	-7.43	Vertical
2509.5	-49.87	2.91	27.70	-25.08	-13	-12.08	Horizontal
183.4	-37.40	1.44	17.04	-21.80	-13	-8.80	Vertical
250.5	-37.14	1.76	17.62	-21.28	-13	-8.28	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.02	2.82	27.43	-21.41	-13	-8.41	Horizontal
1688.0	-44.15	2.82	27.43	-19.54	-13	-6.54	Vertical
2532.0	-44.80	2.92	27.74	-19.98	-13	-6.98	Vertical
2532.0	-53.41	2.92	27.74	-28.59	-13	-15.59	Horizontal
180.8	-44.44	1.74	17.70	-28.48	-13	-15.48	Vertical
392.7	-42.36	1.41	17.46	-26.30	-13	-13.30	Horizontal

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

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

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

9.4 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-61.58	5.23	35.81	-31.00	-25	-6.00	Horizontal
5005.0	-60.34	5.23	35.81	-29.76	-25	-4.76	Vertical
7507.5	-63.09	5.67	36.85	-31.91	-25	-6.91	Vertical
7507.5	-62.72	5.67	36.85	-31.54	-25	-6.54	Horizontal
186.9	-49.34	1.73	17.97	-33.10	-25	-8.10	Vertical
296.7	-46.93	1.38	15.11	-33.20	-25	-8.20	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.01	5.23	35.82	-31.42	-25	-6.42	Horizontal
5070.0	-62.22	5.23	35.82	-31.63	-25	-6.63	Vertical
7605.0	-60.67	5.67	36.85	-29.49	-25	-4.49	Vertical
7605.0	-60.64	5.67	36.85	-29.46	-25	-4.46	Horizontal
199.9	-53.79	1.77	16.17	-39.38	-25	-14.38	Vertical
441.3	-48.08	1.63	15.21	-34.50	-25	-9.50	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.94	5.24	35.83	-33.35	-25	-8.35	Horizontal
5135.0	-62.67	5.24	35.83	-32.08	-25	-7.08	Vertical
7702.5	-63.74	5.68	36.87	-32.55	-25	-7.55	Vertical
7702.5	-62.67	5.68	36.87	-31.48	-25	-6.48	Horizontal
181.5	-47.65	1.58	17.56	-31.67	-25	-6.67	Vertical
382.1	-44.30	1.45	16.58	-29.17	-25	-4.17	Horizontal

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

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-64.15	5.23	35.82	-33.56	-25	-8.56	Horizontal
5020.0	-59.15	5.23	35.82	-28.56	-25	-3.56	Vertical
7530.0	-63.14	5.67	36.86	-31.95	-25	-6.95	Vertical
7530.0	-64.14	5.67	36.86	-32.95	-25	-7.95	Horizontal
197.3	-46.74	1.63	15.76	-32.61	-25	-7.61	Vertical
380.9	-53.03	1.71	15.44	-39.30	-25	-14.30	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.11	5.23	35.82	-29.52	-25	-4.52	Horizontal
5070.0	-59.31	5.23	35.82	-28.72	-25	-3.72	Vertical
7605.0	-63.55	5.67	36.85	-32.37	-25	-7.37	Vertical
7605.0	-62.28	5.67	36.85	-31.10	-25	-6.10	Horizontal
191.1	-54.65	1.79	16.84	-39.59	-25	-14.59	Vertical
459.2	-49.72	1.71	17.64	-33.79	-25	-8.79	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.72	5.24	35.83	-30.13	-25	-5.13	Horizontal
5120.0	-59.59	5.24	35.83	-29.00	-25	-4.00	Vertical
7680.0	-59.89	5.70	36.88	-28.71	-25	-3.71	Vertical
7680.0	-64.71	5.70	36.88	-33.53	-25	-8.53	Horizontal
201.2	-47.84	1.79	16.84	-32.78	-25	-7.78	Vertical
237.7	-44.67	1.71	17.64	-28.74	-25	-3.74	Horizontal

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

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

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

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-51.59	2.60	27.20	-26.99	-13	-13.99	Horizontal
1399.4	-44.20	2.60	27.20	-19.60	-13	-6.60	Vertical
2099.1	-48.68	2.85	27.54	-23.99	-13	-10.99	Vertical
2099.1	-53.66	2.85	27.54	-28.97	-13	-15.97	Horizontal
208.5	-38.64	1.49	17.78	-22.35	-13	-9.35	Vertical
362.0	-43.10	1.36	17.33	-27.13	-13	-14.13	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-51.94	2.61	27.28	-27.27	-13	-14.27	Horizontal
1415.0	-47.58	2.61	27.28	-22.91	-13	-9.91	Vertical
2122.5	-53.06	2.87	27.59	-28.34	-13	-15.34	Vertical
2122.5	-53.93	2.87	27.59	-29.21	-13	-16.21	Horizontal
179.5	-36.30	1.73	15.74	-22.29	-13	-9.29	Vertical
252.0	-41.38	1.62	15.79	-27.21	-13	-14.21	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-51.05	2.63	27.28	-26.40	-13	-13.40	Horizontal
1430.6	-51.43	2.63	27.28	-26.78	-13	-13.78	Vertical
2145.9	-49.54	2.88	27.60	-24.82	-13	-11.82	Vertical
2145.9	-50.99	2.88	27.60	-26.27	-13	-13.27	Horizontal
200.1	-44.21	1.61	18.00	-27.82	-13	-14.82	Vertical
251.9	-36.54	1.45	15.49	-22.51	-13	-9.51	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-50.67	2.61	27.26	-26.02	-13	-13.02	Horizontal
1408.0	-45.16	2.61	27.26	-20.51	-13	-7.51	Vertical
2112.0	-47.77	2.87	27.58	-23.06	-13	-10.06	Vertical
2112.0	-50.86	2.87	27.58	-26.15	-13	-13.15	Horizontal
201.0	-34.54	1.31	16.97	-18.88	-13	-5.88	Vertical
454.8	-44.13	1.65	16.70	-29.08	-13	-16.08	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-49.83	2.61	27.28	-25.16	-13	-12.16	Horizontal
1415.0	-53.72	2.61	27.28	-29.05	-13	-16.05	Vertical
2122.5	-47.98	2.87	27.59	-23.26	-13	-10.26	Vertical
2122.5	-52.39	2.87	27.59	-27.67	-13	-14.67	Horizontal
175.1	-41.21	1.72	17.99	-24.94	-13	-11.94	Vertical
305.7	-37.31	1.73	17.94	-21.10	-13	-8.10	Horizontal
Test Results for High Channel 711MHz							
1422.0	-44.89	2.62	27.28	-20.23	-13	-7.23	Horizontal
1422.0	-46.24	2.62	27.28	-21.58	-13	-8.58	Vertical
2133.0	-47.95	2.87	27.60	-23.22	-13	-10.22	Vertical
2133.0	-50.41	2.87	27.60	-25.68	-13	-12.68	Horizontal
210.7	-42.31	1.58	15.93	-27.96	-13	-14.96	Vertical
375.7	-35.60	1.36	15.59	-21.37	-13	-8.37	Horizontal

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

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

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

9.6 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-46.16	2.61	27.28	-21.49	-13	-8.49	Horizontal
1413.0	-44.03	2.61	27.28	-19.36	-13	-6.36	Vertical
2119.5	-44.61	2.87	27.59	-19.89	-13	-6.89	Vertical
2119.5	-49.68	2.87	27.59	-24.96	-13	-11.96	Horizontal
199.0	-43.29	1.71	16.15	-28.85	-13	-15.85	Vertical
414.0	-36.50	1.41	17.32	-20.59	-13	-7.59	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-49.14	2.62	27.30	-24.46	-13	-11.46	Horizontal
1420.0	-47.03	2.62	27.30	-22.35	-13	-9.35	Vertical
2130.0	-45.16	2.87	27.62	-20.41	-13	-7.41	Vertical
2130.0	-52.54	2.87	27.62	-27.79	-13	-14.79	Horizontal
208.1	-43.26	1.42	15.25	-29.44	-13	-16.44	Vertical
314.3	-36.09	1.36	17.19	-20.26	-13	-7.26	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-52.59	2.66	27.28	-27.97	-13	-14.97	Horizontal
1427.0	-53.71	2.66	27.28	-29.09	-13	-16.09	Vertical
2140.5	-46.28	2.88	27.60	-21.56	-13	-8.56	Vertical
2140.5	-52.71	2.88	27.60	-27.99	-13	-14.99	Horizontal
192.9	-43.57	1.32	17.29	-27.60	-13	-14.60	Vertical
387.6	-37.27	1.72	16.89	-22.10	-13	-9.10	Horizontal

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

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-47.73	2.62	27.30	-23.05	-13	-10.05	Horizontal
1418.0	-48.03	2.62	27.30	-23.35	-13	-10.35	Vertical
2127.0	-46.07	2.87	27.62	-21.32	-13	-8.32	Vertical
2127.0	-49.71	2.87	27.62	-24.96	-13	-11.96	Horizontal
210.5	-44.54	1.35	16.91	-28.98	-13	-15.98	Vertical
274.1	-44.15	1.62	16.31	-29.46	-13	-16.46	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-52.60	2.62	27.30	-27.92	-13	-14.92	Horizontal
1420.0	-53.14	2.62	27.30	-28.46	-13	-15.46	Vertical
2130.0	-51.70	2.87	27.62	-26.95	-13	-13.95	Vertical
2130.0	-49.66	2.87	27.62	-24.91	-13	-11.91	Horizontal
185.3	-37.70	1.51	17.14	-22.07	-13	-9.07	Vertical
262.5	-40.71	1.77	16.88	-25.60	-13	-12.60	Horizontal
Test Results for High Channel 711MHz							
1422.0	-52.72	2.62	27.30	-28.04	-13	-15.04	Horizontal
1422.0	-46.81	2.62	27.30	-22.13	-13	-9.13	Vertical
2133.0	-45.30	2.87	27.62	-20.55	-13	-7.55	Vertical
2133.0	-49.76	2.87	27.62	-25.01	-13	-12.01	Horizontal
191.3	-39.96	1.78	15.95	-25.79	-13	-12.79	Vertical
237.3	-34.68	1.34	17.95	-18.08	-13	-5.08	Horizontal

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

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

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

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 3.27V, Normal, DC 3.85V and High voltage, DC 4.43V.

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 12
LTE Band 17

RESULTS

See the following pages.

10.1 LTE BAND 2

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	1880	13.1	0.006973	2.5
3.85	1880	14.1	0.007508	2.5
4.43	1880	13.2	0.007021	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.2	0.006493	2.5
Extreme (50C)	1880	12.1	0.006432	2.5
Extreme (40C)	1880	14.0	0.007455	2.5
Extreme (30C)	1880	13.2	0.007030	2.5
Extreme (10C)	1880	14.0	0.007455	2.5
Extreme (0C)	1880	12.0	0.006377	2.5
Extreme (-10C)	1880	12.6	0.006727	2.5
Extreme (-20C)	1880	13.8	0.007349	2.5
Extreme (-30C)	1880	15.0	0.008001	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	1880	9.5	0.005075	2.5
3.85	1880	9.4	0.005000	2.5
4.43	1880	7.9	0.004176	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.1	0.004861	2.5
Extreme (50C)	1880	9.3	0.004972	2.5
Extreme (40C)	1880	8.1	0.00428919	2.5
Extreme (30C)	1880	9.2	0.00488595	2.5
Extreme (10C)	1880	8.5	0.004540725	2.5
Extreme (0C)	1880	8.4	0.004449696	2.5
Extreme (-10C)	1880	9.5	0.005046258	2.5
Extreme (-20C)	1880	8.9	0.004725001	2.5
Extreme (-30C)	1880	8.2	0.004340691	2.5

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

10.2 LTE BAND 4

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	1732.5	8.8	0.005098	2.5
3.85	1732.5	9.2	0.005324	2.5
4.43	1732.5	8.7	0.005035	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.6	0.004937	2.5
Extreme (50C)	1732.5	8.5	0.004918	2.5
Extreme (40C)	1732.5	7.5	0.004336	2.5
Extreme (30C)	1732.5	6.1	0.003499	2.5
Extreme (10C)	1732.5	7.2	0.004172	2.5
Extreme (0C)	1732.5	9.6	0.005543	2.5
Extreme (-10C)	1732.5	8.1	0.004653	2.5
Extreme (-20C)	1732.5	6.9	0.003966	2.5
Extreme (-30C)	1732.5	8.3	0.004787	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	1732.5	9.6	0.005520	2.5
3.85	1732.5	8.4	0.004866	2.5
4.43	1732.5	8.3	0.004812	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.7	0.005624	2.5
Extreme (50C)	1732.5	8.9	0.005123	2.5
Extreme (40C)	1732.5	8.4	0.004824	2.5
Extreme (30C)	1732.5	9.4	0.005445	2.5
Extreme (10C)	1732.5	8.9	0.005159	2.5
Extreme (0C)	1732.5	7.9	0.004557	2.5
Extreme (-10C)	1732.5	9.4	0.005442	2.5
Extreme (-20C)	1732.5	9.0	0.005192	2.5
Extreme (-30C)	1732.5	8.5	0.004919	2.5

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

10.3 LTE BAND 5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	836.5	5.6	0.006657	2.5
3.85	836.5	6.3	0.007582	2.5
4.43	836.5	4.5	0.005418	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.007390	2.5
Extreme (50C)	836.5	6.1	0.007345	2.5
Extreme (40C)	836.5	6.4	0.007683	2.5
Extreme (30C)	836.5	6.4	0.007650	2.5
Extreme (10C)	836.5	5.1	0.006139	2.5
Extreme (0C)	836.5	5.5	0.006539	2.5
Extreme (-10C)	836.5	5.1	0.006133	2.5
Extreme (-20C)	836.5	5.7	0.006778	2.5
Extreme (-30C)	836.5	5.8	0.006949	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	836.5	5.4	0.006433	2.5
3.85	836.5	6.3	0.007566	2.5
4.43	836.5	5.0	0.005953	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.0	0.007216	2.5
Extreme (50C)	836.5	6.0	0.007163	2.5
Extreme (40C)	836.5	5.9	0.007010	2.5
Extreme (30C)	836.5	6.3	0.007509	2.5
Extreme (10C)	836.5	5.8	0.006909	2.5
Extreme (0C)	836.5	5.6	0.006708	2.5
Extreme (-10C)	836.5	5.6	0.006661	2.5
Extreme (-20C)	836.5	6.2	0.007424	2.5
Extreme (-30C)	836.5	6.0	0.007148	2.5

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

10.4 LTE BAND 7

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	2535	10.1	0.003973	2.5
3.85	2535	8.8	0.003472	2.5
4.43	2535	8.4	0.003300	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.0	0.003532	2.5
Extreme (50C)	2535	8.9	0.003519	2.5
Extreme (40C)	2535	8.2	0.003229	2.5
Extreme (30C)	2535	8.8	0.003466	2.5
Extreme (10C)	2535	8.4	0.003312	2.5
Extreme (0C)	2535	8.4	0.003314	2.5
Extreme (-10C)	2535	9.0	0.003551	2.5
Extreme (-20C)	2535	8.5	0.003348	2.5
Extreme (-30C)	2535	8.9	0.003496	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	2535	6.9	0.002722	2.5
3.85	2535	6.4	0.002506	2.5
4.43	2535	5.8	0.002302	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	5.4	0.002145	2.5
Extreme (40C)	2535	5.8	0.002268	2.5
Extreme (30C)	2535	6.8	0.002692	2.5
Extreme (10C)	2535	5.4	0.002124	2.5
Extreme (0C)	2535	4.6	0.001818	2.5
Extreme (-10C)	2535	4.9	0.001917	2.5
Extreme (-20C)	2535	6.0	0.002358	2.5
Extreme (-30C)	2535	5.6	0.002206	2.5

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

10.5 LTE BAND 12

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	707.5	8.5	0.012009	2.5
3.85	707.5	10.4	0.014695	2.5
4.43	707.5	8.6	0.012122	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.9	0.012563	2.5
Extreme (50C)	707.5	7.8	0.011062	2.5
Extreme (40C)	707.5	7.4	0.010516	2.5
Extreme (30C)	707.5	8.2	0.011555	2.5
Extreme (10C)	707.5	7.4	0.010500	2.5
Extreme (0C)	707.5	8.5	0.012055	2.5
Extreme (-10C)	707.5	8.7	0.012312	2.5
Extreme (-20C)	707.5	9.2	0.013052	2.5
Extreme (-30C)	707.5	8.3	0.011667	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	707.5	7.2	0.010200	2.5
3.85	707.5	8.1	0.011457	2.5
4.43	707.5	7.6	0.010682	2.5

Frequency error vs. Temperature

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

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

10.6 LTE BAND 17

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	710.0	9.8	0.013800	2.5
3.85	710.0	8.9	0.012532	2.5
4.43	710.0	7.7	0.010908	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.6	0.013540	2.5
Extreme (50C)	710.0	8.8	0.012398	2.5
Extreme (40C)	710.0	7.8	0.011019	2.5
Extreme (30C)	710.0	9.3	0.013118	2.5
Extreme (10C)	710.0	9.2	0.012979	2.5
Extreme (0C)	710.0	7.9	0.011103	2.5
Extreme (-10C)	710.0	9.3	0.013139	2.5
Extreme (-20C)	710.0	8.5	0.011935	2.5
Extreme (-30C)	710.0	8.0	0.011306	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.66	710.0	10.2	0.014363	2.5
3.85	710.0	8.9	0.012536	2.5
4.43	710.0	8.4	0.011770	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.3	0.013139	2.5
Extreme (50C)	710.0	9.2	0.012963	2.5
Extreme (40C)	710.0	8.5	0.011978	2.5
Extreme (30C)	710.0	9.0	0.012650	2.5
Extreme (10C)	710.0	8.1	0.011407	2.5
Extreme (0C)	710.0	8.9	0.012475	2.5
Extreme (-10C)	710.0	9.3	0.013150	2.5
Extreme (-20C)	710.0	8.9	0.012493	2.5
Extreme (-30C)	710.0	8.6	0.012125	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

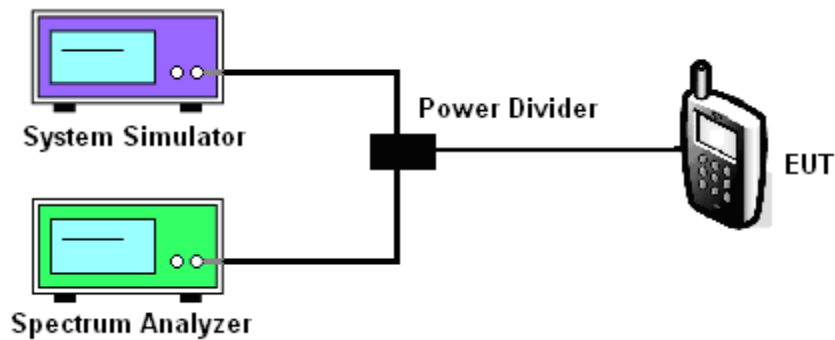
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

- LTE Band 2/4/5/7/12/17
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Test data reference attachment.

----END OF REPORT----