

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

FCC ID: 2AOWK3095

Product: Mobile Phone

Trade Mark: ulefone

Model Number: GQ3095

Family Model: Note 11P, Note 11, Note 11T, Note 11E,
Note 11S, Note 11X, Note 11 Pro,
Note 11 Lite, Note 11 Plus

Report No.: STR201207002004E

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: 518, 5F, R&D building, Tsinghua Hi-Tech park, Nanshan district, Shenzhen 518057 P.R.China
Product name: Mobile Phone
Model and/or type reference : GQ3095
Family Model: Note 11P, Note 11, Note 11T, Note 11E, Note 11S, Note 11X, Note 11 Pro, Note 11 Lite, Note 11 Plus
Standards: FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.46:2015
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: Dec 07. 2020 ~ Jan 07. 2021
Date of Issue : Jan 07. 2021
Test Result : Pass

Testing Engineer : Cheng Jiawen (Cheng Jiawen)
Technical Manager : Jason Chen (Jason Chen)
Authorized Signatory : Alex (Alex Li)

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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	GQ3095
Family Model	Note 11P, Note 11, Note 11T, Note 11E, Note 11S, Note 11X, Note 11 Pro, Note 11 Lite, Note 11 Plus
Model Difference	All the model are the same circuit and RF module, except the Model names.
FCC ID:	2AOWK3095
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
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.9dBi; Band 4: 0.8dBi; Band 5: 0.6dBi; Band 7: 0.7dBi; Band 12: 0.5dBi; Band 17: 0.5dBi;
Power Supply:	DC 3.85V/4400mAh from battery or DC 5V from Adapter
Adapter:	Model:HJ-0502000W2-US Input: 100-240V~50/60Hz 0.3A Output: 5V---2000mA
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)
HW Version	G2062U-PT-V1.0
SW Version	Note 11P_RH1_V01
** Note1: The High Voltage 4.2V 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: 2AOWK3095** 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 C63.46:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, 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 24.232 27.50 KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917 24.238 KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917 24.238 27.53 KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913 27.50 KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232 27.50 KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917 24.238 27.53 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 24.238 27.53 KDB 971168 D01 Clause 6	Conducted Emission	PASS	
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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

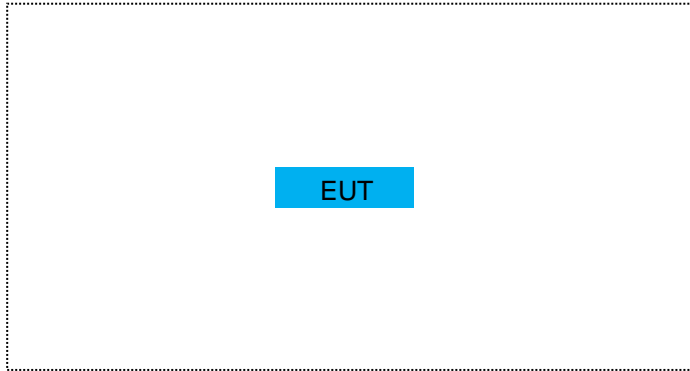
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	GQ3095	FCC ID: 2AOWK3095	EUT

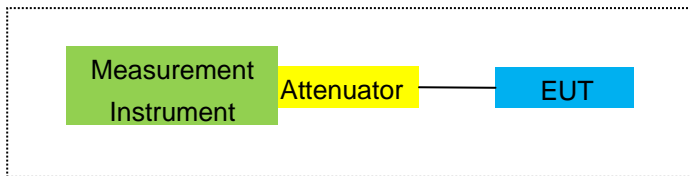
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

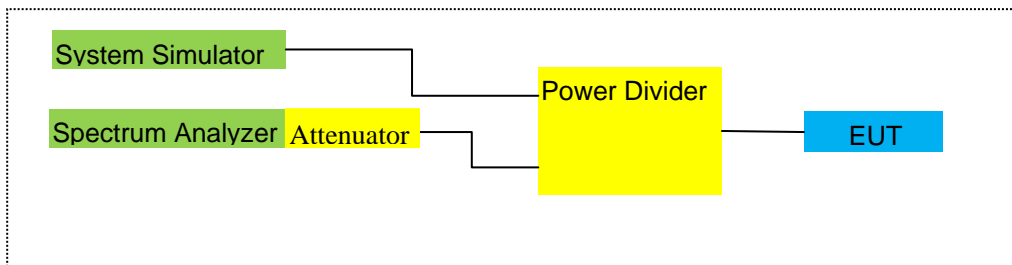
For Radiated Test Cases



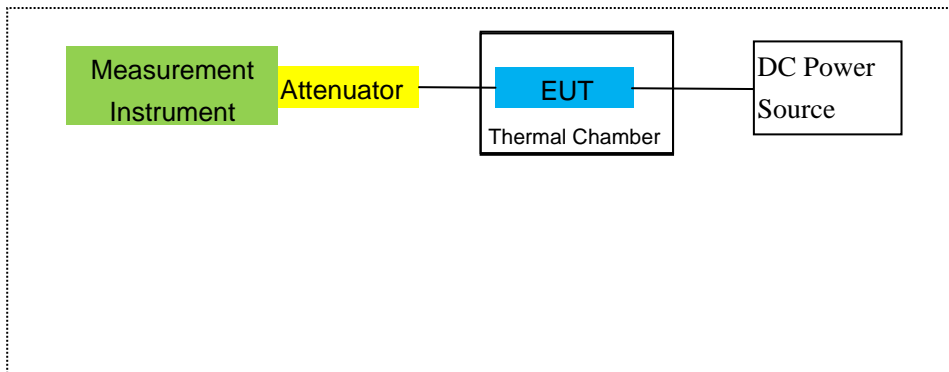
For Conducted Output Power



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	2020.07.13	2021.07.12	1 year
2	Test Receiver	R&S	ESPI	101318	2020.05.11	2021.05.10	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2020.04.11	2021.04.10	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	2020.04.11	2021.04.10	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.07.13	2021.07.12	1 year
7	Amplifier	EM	EM-30180	060538	2020.07.13	2021.07.12	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2020.05.11	2021.05.10	1 year
9	Power Meter	R&S	NRVS	100696	2020.07.13	2021.07.12	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2020.05.11	2021.05.10	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	2020.07.13	2021.07.12	1 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	2020.05.11	2021.05.10	1 year
15	LISN	R&S	ENV216	101313	2020.05.11	2021.05.10	1 year
16	LISN	EMCO	3816/2	00042990	2020.05.11	2021.05.10	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2020.05.11	2021.05.10	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.04.11	2021.04.10	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	2021.05.10	1 year
22	Attenuator	MCE	24-10-34	BN9258	2020.05.11	2021.05.10	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2020.05.11	2021.05.10	1 year
24	test receiver	R&S	ESCI	a0304218	2020.05.11	2021.05.10	1 year
25	Communication Tester	R&S	CMU200	A0304247	2020.07.13	2021.07.12	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2020.05.11	2021.05.10	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.07.13	2021.07.12	1 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2020.07.13	2021.07.12	1 year
29	Communication Tester	R&S	CMW500	148500	2020.05.11	2021.05.10	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 CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

Set 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.

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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-0.79	3.76	28.24	23.69	233.884	Horizontal	Pass
		1880	0.14	3.91	28.22	24.45	278.612	Horizontal	Pass
		1909.3	-1.07	3.93	28.20	23.20	208.930	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	0.31	3.77	28.23	24.77	299.916	Horizontal	Pass
		1880	0.06	3.91	28.24	24.39	274.789	Horizontal	Pass
		1908.5	-0.18	3.94	28.25	24.13	258.821	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-0.74	3.77	28.31	23.80	239.883	Horizontal	Pass
		1880	-0.57	3.91	28.22	23.74	236.592	Horizontal	Pass
		1907.5	0.47	3.94	28.20	24.73	297.167	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-0.28	3.79	28.33	24.26	266.686	Horizontal	Pass
		1880	-0.15	3.95	28.22	24.12	258.226	Horizontal	Pass
		1905	0.32	3.97	28.19	24.54	284.446	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-0.83	3.79	28.34	23.72	235.505	Horizontal	Pass
		1880	0.38	3.95	28.22	24.65	291.743	Horizontal	Pass
		1902.5	0.70	3.97	28.18	24.91	309.742	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	0.35	3.81	28.35	24.89	308.319	Horizontal	Pass
		1880	-0.97	3.96	28.22	23.29	213.304	Horizontal	Pass
		1900	-0.04	4.00	28.16	24.12	258.226	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-0.25	3.76	28.24	24.23	264.850	Vertical	Pass
		1880	0.71	3.91	28.22	25.02	317.687	Vertical	Pass
		1909.3	0.00	3.93	28.20	24.27	267.301	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.42	3.77	28.23	24.04	253.513	Vertical	Pass
		1880	-0.07	3.91	28.24	24.26	266.686	Vertical	Pass
		1908.5	0.60	3.94	28.25	24.91	309.742	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	0.07	3.77	28.31	24.61	289.068	Vertical	Pass
		1880	0.85	3.91	28.22	25.16	328.095	Vertical	Pass
		1907.5	0.45	3.94	28.20	24.71	295.801	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-0.55	3.79	28.33	23.99	250.611	Vertical	Pass
		1880	-0.76	3.95	28.22	23.51	224.388	Vertical	Pass
		1905	-1.23	3.97	28.19	22.99	199.067	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-1.12	3.79	28.34	23.43	220.293	Vertical	Pass

Band		1880	-0.03	3.95	28.22	24.24	265.461	Vertical	Pass
QPSK		1902.5	-0.45	3.97	28.18	23.76	237.684	Vertical	Pass
20.0MHz	1/#Mid	1860	-1.11	3.81	28.35	23.43	220.293	Vertical	Pass
Band		1880	-0.81	3.96	28.22	23.45	221.309	Vertical	Pass
QPSK		1900	1.17	4.00	28.16	25.33	341.193	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.72	3.76	28.24	23.76	237.684	Horizontal	Pass
		1880	-0.52	3.91	28.22	23.79	239.332	Horizontal	Pass
		1909.3	-0.10	3.93	28.20	24.17	261.216	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-1.18	3.77	28.23	23.28	212.814	Horizontal	Pass
		1880	-0.38	3.91	28.24	23.95	248.313	Horizontal	Pass
		1908.5	-0.69	3.94	28.25	23.62	230.144	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-0.99	3.77	28.31	23.55	226.464	Horizontal	Pass
		1880	-0.60	3.91	28.22	23.71	234.963	Horizontal	Pass
		1907.5	-0.21	3.94	28.20	24.05	254.097	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.84	3.79	28.33	23.70	234.423	Horizontal	Pass
		1880	-0.58	3.95	28.22	23.69	233.884	Horizontal	Pass
		1905	-0.05	3.97	28.19	24.17	261.216	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.11	3.79	28.34	23.44	220.800	Horizontal	Pass
		1880	-0.45	3.95	28.22	23.82	240.991	Horizontal	Pass
		1902.5	-0.59	3.97	28.18	23.62	230.144	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-0.64	3.81	28.35	23.90	245.471	Horizontal	Pass
		1880	0.03	3.96	28.22	24.29	268.534	Horizontal	Pass
		1900	-0.10	4.00	28.16	24.06	254.683	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.82	3.76	28.24	23.66	232.274	Vertical	Pass
		1880	-0.12	3.91	28.22	24.19	262.422	Vertical	Pass
		1909.3	-0.02	3.93	28.20	24.25	266.073	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.63	3.77	28.23	23.83	241.546	Vertical	Pass
		1880	-0.79	3.91	28.24	23.54	225.944	Vertical	Pass
		1908.5	-0.43	3.94	28.25	23.88	244.343	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-0.37	3.77	28.31	24.17	261.216	Vertical	Pass
		1880	-0.86	3.91	28.22	23.45	221.309	Vertical	Pass
		1907.5	-0.26	3.94	28.20	24.00	251.189	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.37	3.79	28.33	24.17	261.216	Vertical	Pass
		1880	-0.69	3.95	28.22	23.58	228.034	Vertical	Pass
		1905	-0.74	3.97	28.19	23.48	222.844	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-0.55	3.79	28.34	24.00	251.189	Vertical	Pass
		1880	-1.24	3.95	28.22	23.03	200.909	Vertical	Pass
		1902.5	-0.21	3.97	28.18	24.00	251.189	Vertical	Pass

20.0MHz Band 16 QAM	1/#Mid	1860	0.03	3.81	28.35	24.57	286.418	Vertical	Pass
		1880	0.05	3.96	28.22	24.31	269.774	Vertical	Pass
		1900	-0.24	4.00	28.16	23.92	246.604	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	0.19	3.12	27.58	24.65	291.743	Horizontal	Pass
		1732.5	0.76	3.27	27.61	25.10	323.594	Horizontal	Pass
		1754.3	0.24	3.29	27.63	24.58	287.078	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.80	3.13	27.61	23.68	233.346	Horizontal	Pass
		1732.5	-1.23	3.27	27.61	23.11	204.644	Horizontal	Pass
		1753.5	-1.22	3.30	27.62	23.10	204.174	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.07	3.13	27.63	24.43	277.332	Horizontal	Pass
		1732.5	-1.36	3.27	27.61	22.98	198.609	Horizontal	Pass
		1752.5	0.70	3.30	27.60	25.00	316.228	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.09	3.15	27.64	24.40	275.423	Horizontal	Pass
		1732.5	0.39	3.31	27.61	24.69	294.442	Horizontal	Pass
		1750	0.70	3.33	27.59	24.96	313.329	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.72	3.15	27.65	23.78	238.781	Horizontal	Pass
		1732.5	0.51	3.31	27.61	24.81	302.691	Horizontal	Pass
		1747.5	0.31	3.33	27.57	24.55	285.102	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.71	3.17	27.66	23.78	238.781	Horizontal	Pass
		1732.5	0.66	3.32	27.61	24.95	312.608	Horizontal	Pass
		1745	0.06	3.36	27.56	24.26	266.686	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	0.69	3.12	27.58	25.15	327.341	Vertical	Pass
		1732.5	-0.55	3.27	27.61	23.79	239.332	Vertical	Pass
		1754.3	-0.77	3.29	27.63	23.57	227.510	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	0.50	3.13	27.61	24.98	314.775	Vertical	Pass
		1732.5	0.59	3.27	27.61	24.93	311.172	Vertical	Pass
		1753.5	0.55	3.30	27.62	24.87	306.902	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.79	3.13	27.63	23.71	234.963	Vertical	Pass
		1732.5	-0.11	3.27	27.61	24.23	264.850	Vertical	Pass
		1752.5	-0.78	3.30	27.60	23.52	224.905	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.69	3.15	27.64	23.80	239.883	Vertical	Pass
		1732.5	-0.72	3.31	27.61	23.58	228.034	Vertical	Pass
		1750	0.44	3.33	27.59	24.70	295.121	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-0.51	3.15	27.65	23.99	250.611	Vertical	Pass
		1732.5	-0.22	3.31	27.61	24.08	255.859	Vertical	Pass
		1747.5	-0.52	3.33	27.57	23.72	235.505	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	0.03	3.17	27.66	24.52	283.139	Vertical	Pass
		1732.5	0.91	3.32	27.61	25.20	331.131	Vertical	Pass
		1745	0.89	3.36	27.56	25.09	322.849	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.67	3.12	27.58	23.79	239.332	Horizontal	Pass
		1732.5	-0.90	3.27	27.61	23.44	220.800	Horizontal	Pass
		1754.3	-0.86	3.29	27.63	23.48	222.844	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-1.11	3.13	27.61	23.37	217.270	Horizontal	Pass
		1732.5	-1.98	3.27	27.61	22.36	172.187	Horizontal	Pass
		1753.5	-0.97	3.30	27.62	23.35	216.272	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.81	3.13	27.63	23.69	233.884	Horizontal	Pass
		1732.5	-1.14	3.27	27.61	23.20	208.930	Horizontal	Pass
		1752.5	-0.37	3.30	27.60	23.93	247.172	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-0.95	3.15	27.64	23.54	225.944	Horizontal	Pass
		1732.5	-0.81	3.31	27.61	23.49	223.357	Horizontal	Pass
		1750	-1.32	3.33	27.59	22.94	196.789	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.23	3.15	27.65	23.27	212.324	Horizontal	Pass
		1732.5	-0.77	3.31	27.61	23.53	225.424	Horizontal	Pass
		1747.5	-0.53	3.33	27.57	23.71	234.963	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-0.98	3.17	27.66	23.51	224.388	Horizontal	Pass
		1732.5	0.09	3.32	27.61	24.38	274.157	Horizontal	Pass
		1745	-0.70	3.36	27.56	23.50	223.872	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.35	3.12	27.58	24.11	257.632	Vertical	Pass
		1732.5	-0.05	3.27	27.61	24.29	268.534	Vertical	Pass
		1754.3	-0.78	3.29	27.63	23.56	226.986	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.99	3.13	27.61	23.49	223.357	Vertical	Pass
		1732.5	-2.03	3.27	27.61	22.31	170.216	Vertical	Pass
		1753.5	-1.14	3.30	27.62	23.18	207.970	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.87	3.13	27.63	23.63	230.675	Vertical	Pass
		1732.5	-0.83	3.27	27.61	23.51	224.388	Vertical	Pass
		1752.5	-1.09	3.30	27.60	23.21	209.411	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-0.44	3.15	27.64	24.05	254.097	Vertical	Pass
		1732.5	-0.72	3.31	27.61	23.58	228.034	Vertical	Pass
		1750	-0.26	3.33	27.59	24.00	251.189	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.47	3.15	27.65	24.03	252.930	Vertical	Pass
		1732.5	-0.91	3.31	27.61	23.39	218.273	Vertical	Pass
		1747.5	-0.32	3.33	27.57	23.92	246.604	Vertical	Pass

20.0MHz		1720	-0.07	3.17	27.66	24.42	276.694	Vertical	Pass
Band 16	1/#Mid	1732.5	-0.54	3.32	27.61	23.75	237.137	Vertical	Pass
QAM		1745	-0.26	3.36	27.56	23.94	247.742	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 Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	824.7	8.41	2.01	19.68	2.15	23.93	247.172	Horizontal	Pass
		836.5	8.07	2.01	19.77	2.15	23.68	233.346	Horizontal	Pass
		848.3	8.27	2.02	19.82	2.15	23.92	246.604	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.96	2.01	19.70	2.15	23.50	223.872	Horizontal	Pass
		836.5	7.93	2.01	19.77	2.15	23.54	225.944	Horizontal	Pass
		847.5	8.10	2.02	19.81	2.15	23.74	236.592	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	7.83	2.01	19.71	2.15	23.38	217.771	Horizontal	Pass
		836.5	8.44	2.01	19.77	2.15	24.05	254.097	Horizontal	Pass
		846.5	7.65	2.02	19.79	2.15	23.27	212.324	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	8.09	2.01	19.73	2.15	23.66	232.274	Horizontal	Pass
		836.5	8.44	2.01	19.77	2.15	24.05	254.097	Horizontal	Pass
		844	8.39	2.02	19.78	2.15	24.00	251.189	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	8.62	2.01	19.68	2.15	24.14	259.418	Vertical	Pass
		836.5	7.83	2.01	19.77	2.15	23.44	220.800	Vertical	Pass
		848.3	8.29	2.02	19.82	2.15	23.94	247.742	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.79	2.01	19.70	2.15	23.33	215.278	Vertical	Pass
		836.5	7.93	2.01	19.77	2.15	23.54	225.944	Vertical	Pass
		847.5	7.65	2.02	19.81	2.15	23.29	213.304	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.65	2.01	19.71	2.15	24.20	263.027	Vertical	Pass
		836.5	7.64	2.01	19.77	2.15	23.25	211.349	Vertical	Pass
		846.5	8.51	2.02	19.79	2.15	24.13	258.821	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	8.49	2.01	19.73	2.15	24.06	254.683	Vertical	Pass
		836.5	8.75	2.01	19.77	2.15	24.36	272.898	Vertical	Pass
		844	8.24	2.02	19.78	2.15	23.85	242.661	Vertical	Pass

Radiated Power (ERP) for Band 5

Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	824.7	6.55	2.01	19.68	2.15	22.07	161.065	Horizontal	Pass
		836.5	6.02	2.01	19.77	2.15	21.63	145.546	Horizontal	Pass
		848.3	6.08	2.02	19.82	2.15	21.73	148.936	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	6.02	2.01	19.70	2.15	21.56	143.219	Horizontal	Pass
		836.5	6.26	2.01	19.77	2.15	21.87	153.815	Horizontal	Pass
		847.5	6.54	2.02	19.81	2.15	22.18	165.196	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.79	2.01	19.71	2.15	21.34	136.144	Horizontal	Pass
		836.5	5.78	2.01	19.77	2.15	21.39	137.721	Horizontal	Pass
		846.5	6.15	2.02	19.79	2.15	21.77	150.314	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	6.14	2.01	19.73	2.15	21.71	148.252	Horizontal	Pass
		836.5	5.90	2.01	19.77	2.15	21.51	141.579	Horizontal	Pass
		844	5.67	2.02	19.78	2.15	21.28	134.276	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	6.18	2.01	19.68	2.15	21.70	147.911	Vertical	Pass
		836.5	5.13	2.01	19.77	2.15	20.74	118.577	Vertical	Pass
		848.3	5.43	2.02	19.82	2.15	21.08	128.233	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.30	2.01	19.70	2.15	20.84	121.339	Vertical	Pass
		836.5	6.05	2.01	19.77	2.15	21.66	146.555	Vertical	Pass
		847.5	5.79	2.02	19.81	2.15	21.43	138.995	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.22	2.01	19.71	2.15	20.77	119.399	Vertical	Pass
		836.5	6.01	2.01	19.77	2.15	21.62	145.211	Vertical	Pass
		846.5	6.12	2.02	19.79	2.15	21.74	149.279	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	5.87	2.01	19.73	2.15	21.44	139.316	Vertical	Pass
		836.5	6.65	2.01	19.77	2.15	22.26	168.267	Vertical	Pass
		844	5.46	2.02	19.78	2.15	21.07	127.938	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	0.97	4.54	27.75	24.18	261.818	Horizontal	Pass
		2535	1.60	4.69	27.72	24.63	290.402	Horizontal	Pass
		2567.5	1.32	4.71	27.71	24.32	270.396	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	1.07	4.55	27.76	24.28	267.917	Horizontal	Pass
		2535	0.20	4.69	27.72	23.23	210.378	Horizontal	Pass
		2565	0.56	4.72	27.70	23.54	225.944	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.46	4.55	27.77	24.68	293.765	Horizontal	Pass
		2535	1.44	4.69	27.72	24.47	279.898	Horizontal	Pass
		2562.5	0.66	4.72	27.69	23.63	230.675	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.34	4.57	27.78	23.55	226.464	Horizontal	Pass
		2535	0.45	4.73	27.72	23.44	220.800	Horizontal	Pass
		2560	1.65	4.75	27.68	24.58	287.078	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	0.69	4.54	27.75	23.90	245.471	Vertical	Pass
		2535	0.66	4.69	27.72	23.69	233.884	Vertical	Pass
		2567.5	0.18	4.71	27.71	23.18	207.970	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.94	4.55	27.76	24.15	260.016	Vertical	Pass
		2535	1.19	4.69	27.72	24.22	264.241	Vertical	Pass
		2565	0.21	4.72	27.70	23.19	208.449	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.02	4.55	27.77	24.24	265.461	Vertical	Pass
		2535	0.45	4.69	27.72	23.48	222.844	Vertical	Pass
		2562.5	0.78	4.72	27.69	23.75	237.137	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.98	4.57	27.78	24.19	262.422	Vertical	Pass
		2535	1.61	4.73	27.72	24.60	288.403	Vertical	Pass
		2560	1.89	4.75	27.68	24.82	303.389	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.34	4.54	27.75	21.87	153.815	Horizontal	Pass
		2535	-0.63	4.69	27.72	22.40	173.780	Horizontal	Pass
		2567.5	-0.27	4.71	27.71	22.73	187.499	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.06	4.55	27.76	23.15	206.538	Horizontal	Pass
		2535	-0.40	4.69	27.72	22.63	183.231	Horizontal	Pass
		2565	-0.52	4.72	27.70	22.46	176.198	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.45	4.55	27.77	22.77	189.234	Horizontal	Pass
		2535	-0.30	4.69	27.72	22.73	187.499	Horizontal	Pass
		2562.5	-0.19	4.72	27.69	22.78	189.671	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.11	4.57	27.78	23.10	204.174	Horizontal	Pass
		2535	-0.41	4.73	27.72	22.58	181.134	Horizontal	Pass
		2560	-1.02	4.75	27.68	21.91	155.239	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.91	4.54	27.75	22.30	169.824	Vertical	Pass
		2535	-0.58	4.69	27.72	22.45	175.792	Vertical	Pass
		2567.5	-0.60	4.71	27.71	22.40	173.780	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.11	4.55	27.76	22.10	162.181	Vertical	Pass
		2535	-1.52	4.69	27.72	21.51	141.579	Vertical	Pass
		2565	0.06	4.72	27.70	23.04	201.372	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.34	4.55	27.77	22.88	194.089	Vertical	Pass
		2535	-0.12	4.69	27.72	22.91	195.434	Vertical	Pass
		2562.5	-0.45	4.72	27.69	22.52	178.649	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.09	4.57	27.78	23.12	205.116	Vertical	Pass
		2535	0.30	4.73	27.72	23.29	213.304	Vertical	Pass
		2560	-0.25	4.75	27.68	22.68	185.353	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)

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	699.7	8.88	1.91	19.21	2.15	24.03	252.930	Vertical
		707.5	8.28	1.91	19.26	2.15	23.48	222.844	Vertical
		715.3	7.48	1.93	19.34	2.15	22.74	187.932	Vertical
3.0MHz Band QPSK	1/#Mid	700.5	9.04	1.91	19.21	2.15	24.19	262.422	Vertical
		707.5	8.62	1.91	19.26	2.15	23.82	240.991	Vertical
		714.5	7.73	1.93	19.34	2.15	22.99	199.067	Vertical
5.0MHz Band QPSK	1/#Mid	701.5	8.14	1.91	19.23	2.15	23.31	214.289	Vertical
		707.5	9.17	1.91	19.26	2.15	24.37	273.527	Vertical
		713.5	7.75	1.92	19.33	2.15	23.01	199.986	Vertical
10.0MHz Band QPSK	1/#Mid	704	8.67	1.91	19.25	2.15	23.86	243.220	Vertical
		707.5	9.01	1.91	19.26	2.15	24.21	263.633	Vertical
		711	8.91	1.92	19.32	2.15	24.16	260.615	Vertical
1.4MHz Band QPSK	1/#Mid	699.7	8.64	1.91	19.21	2.15	23.79	239.332	Horizontal
		707.5	8.36	1.91	19.26	2.15	23.56	226.986	Horizontal
		715.3	8.55	1.93	19.34	2.15	23.81	240.436	Horizontal
3.0MHz Band QPSK	1/#Mid	700.5	8.66	1.91	19.21	2.15	23.81	240.436	Horizontal
		707.5	8.61	1.91	19.26	2.15	23.81	240.436	Horizontal
		714.5	8.68	1.93	19.34	2.15	23.94	247.742	Horizontal
5.0MHz Band QPSK	1/#Mid	701.5	8.88	1.91	19.23	2.15	24.05	254.097	Horizontal
		707.5	9.02	1.91	19.26	2.15	24.22	264.241	Horizontal
		713.5	8.89	1.92	19.33	2.15	24.15	260.016	Horizontal
10.0MHz Band QPSK	1/#Mid	704	9.26	1.91	19.25	2.15	24.45	278.612	Horizontal
		707.5	7.70	1.91	19.26	2.15	22.90	194.984	Horizontal
		711	8.15	1.92	19.32	2.15	23.40	218.776	Horizontal

Radiated Power (EIRP) for Band 12										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	699.7	7.33	1.91	19.21	2.15	22.48	177.011	Vertical	Pass
		707.5	6.68	1.91	19.26	2.15	21.88	154.170	Vertical	Pass
		715.3	6.02	1.93	19.34	2.15	21.28	134.276	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	7.40	1.91	19.21	2.15	22.55	179.887	Vertical	Pass
		707.5	7.25	1.91	19.26	2.15	22.45	175.792	Vertical	Pass
		714.5	6.81	1.93	19.34	2.15	22.07	161.065	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	7.25	1.91	19.23	2.15	22.42	174.582	Vertical	Pass
		707.5	7.35	1.91	19.26	2.15	22.55	179.887	Vertical	Pass
		713.5	7.13	1.92	19.33	2.15	22.39	173.380	Vertical	Pass
10.0MHz z Band 16 QAM	1/#Mid	704	7.70	1.91	19.25	2.15	22.89	194.536	Vertical	Pass
		707.5	7.06	1.91	19.26	2.15	22.26	168.267	Vertical	Pass
		711	7.56	1.92	19.32	2.15	22.81	190.985	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	7.11	1.91	19.21	2.15	22.26	168.267	Horizontal	Pass
		707.5	7.40	1.91	19.26	2.15	22.60	181.970	Horizontal	Pass
		715.3	7.50	1.93	19.34	2.15	22.76	188.799	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	7.74	1.91	19.21	2.15	22.89	194.536	Horizontal	Pass
		707.5	7.74	1.91	19.26	2.15	22.94	196.789	Horizontal	Pass
		714.5	7.75	1.93	19.34	2.15	23.01	199.986	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	7.27	1.91	19.23	2.15	22.44	175.388	Horizontal	Pass
		707.5	7.08	1.91	19.26	2.15	22.28	169.044	Horizontal	Pass
		713.5	6.40	1.92	19.33	2.15	21.66	146.555	Horizontal	Pass
10.0MHz z Band 16 QAM	1/#Mid	704	6.98	1.91	19.25	2.15	22.17	164.816	Horizontal	Pass
		707.5	7.95	1.91	19.26	2.15	23.15	206.538	Horizontal	Pass
		711	7.43	1.92	19.32	2.15	22.68	185.353	Horizontal	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)

8.6 LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/ RB Position	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correct ion (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)			
5.0MHz Band QPSK	1/#Mid	706.5	7.74	1.91	19.23	2.15	22.91	195.434	Vertical	Pass	
		710	8.52	1.91	19.26	2.15	23.72	235.505	Vertical	Pass	
		713.5	8.90	1.92	19.33	2.15	24.16	260.615	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	709	6.66	1.91	19.25	2.15	21.85	153.109	Vertical	Pass	
		710	8.20	1.91	19.26	2.15	23.40	218.776	Vertical	Pass	
		711	9.33	1.92	19.32	2.15	24.58	287.078	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	706.5	8.78	1.91	19.23	2.15	23.95	248.313	Horizontal	Pass	
		710	9.25	1.91	19.26	2.15	24.45	278.612	Horizontal	Pass	
		713.5	8.10	1.92	19.33	2.15	23.36	216.770	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	709	8.65	1.91	19.25	2.15	23.84	242.103	Horizontal	Pass	
		710	8.57	1.91	19.26	2.15	23.77	238.232	Horizontal	Pass	
		711	9.04	1.92	19.32	2.15	24.29	268.534	Horizontal	Pass	

Radiated Power (ERP) for Band 17										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Midd	706.5	7.56	1.91	19.23	2.15	22.73	187.499	Vertical	Pass
		710	8.06	1.91	19.26	2.15	23.26	211.836	Vertical	Pass
		713.5	7.41	1.92	19.33	2.15	22.67	184.927	Vertical	Pass
10.0MHz Band 16 QAM	1/#Midd	709	7.56	1.91	19.25	2.15	22.75	188.365	Vertical	Pass
		710	6.52	1.91	19.26	2.15	21.72	148.594	Vertical	Pass
		711	7.49	1.92	19.32	2.15	22.74	187.932	Vertical	Pass
5.0MHz Band 16 QAM	1/#Midd	706.5	6.70	1.91	19.23	2.15	21.87	153.815	Horizontal	Pass
		710	7.61	1.91	19.26	2.15	22.81	190.985	Horizontal	Pass
		713.5	7.50	1.92	19.33	2.15	22.76	188.799	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Midd	709	7.15	1.91	19.25	2.15	22.34	171.396	Horizontal	Pass
		710	8.25	1.91	19.26	2.15	23.45	221.309	Horizontal	Pass
		711	7.93	1.92	19.32	2.15	23.18	207.970	Horizontal	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)

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	-53.88	4.04	33.51	-24.41	-13	-11.41	Horizontal
3701.4	-54.35	4.04	33.51	-24.88	-13	-11.88	Vertical
5552.1	-48.08	5.24	35.84	-17.48	-13	-4.48	Vertical
5552.1	-55.35	5.24	35.84	-24.75	-13	-11.75	Horizontal
234.4	-47.64	1.49	17.53	-31.60	-13	-18.60	Vertical
245.1	-44.96	1.43	17.11	-29.28	-13	-16.28	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-50.41	4.04	33.56	-20.89	-13	-7.89	Horizontal
3760.0	-49.87	4.04	33.56	-20.35	-13	-7.35	Vertical
5640.0	-46.16	5.24	35.91	-15.49	-13	-2.49	Vertical
5640.0	-59.37	5.24	35.91	-28.70	-13	-15.70	Horizontal
153.6	-42.68	1.47	16.53	-27.62	-13	-14.62	Vertical
205.1	-38.30	1.42	15.05	-24.67	-13	-11.67	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.23	4.04	34.00	-19.27	-13	-6.27	Horizontal
3818.6	-58.49	4.04	34.00	-28.53	-13	-15.53	Vertical
5727.9	-54.63	5.24	36.04	-23.83	-13	-10.83	Vertical
5727.9	-56.76	5.24	36.04	-25.96	-13	-12.96	Horizontal
199.1	-41.98	1.56	17.97	-25.57	-13	-12.57	Vertical
266.8	-47.99	1.48	17.70	-31.77	-13	-18.77	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	-50.71	4.07	33.54	-21.24	-13	-8.24	Horizontal
3720.0	-49.74	4.07	33.54	-20.27	-13	-7.27	Vertical
5580.0	-53.81	5.28	35.86	-23.23	-13	-10.23	Vertical
5580.0	-53.55	5.28	35.86	-22.97	-13	-9.97	Horizontal
223.0	-44.77	1.78	16.56	-29.99	-13	-16.99	Vertical
100.4	-42.25	1.70	15.45	-28.50	-13	-15.50	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.17	4.04	33.56	-21.65	-13	-8.65	Horizontal
3760.0	-52.77	4.04	33.56	-23.25	-13	-10.25	Vertical
5640.0	-57.14	5.24	35.91	-26.47	-13	-13.47	Vertical
5640.0	-55.04	5.24	35.91	-24.37	-13	-11.37	Horizontal
156.1	-40.28	1.70	17.60	-24.38	-13	-11.38	Vertical
194.6	-43.10	1.66	17.75	-27.01	-13	-14.01	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.14	4.04	34.00	-22.18	-13	-9.18	Horizontal
3800.0	-54.32	4.04	34.00	-24.36	-13	-11.36	Vertical
5700.0	-55.43	5.24	36.04	-24.63	-13	-11.63	Vertical
5700.0	-57.05	5.24	36.04	-26.25	-13	-13.25	Horizontal
122.1	-43.62	1.51	15.39	-29.74	-13	-16.74	Vertical
242.8	-40.63	1.46	16.67	-25.42	-13	-12.42	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.

9.2 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	-48.29	4.02	29.80	-22.51	-13	-9.51	Horizontal
3421.4	-53.96	4.02	29.80	-28.18	-13	-15.18	Vertical
5132.1	-50.10	5.24	35.84	-19.50	-13	-6.50	Vertical
5132.1	-47.65	5.24	35.84	-17.05	-13	-4.05	Horizontal
245.0	-45.40	1.69	16.77	-30.32	-13	-17.32	Vertical
243.5	-43.72	1.33	16.73	-28.32	-13	-15.32	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.37	4.03	30.00	-27.40	-13	-14.40	Horizontal
3465.0	-49.11	4.03	30.00	-23.14	-13	-10.14	Vertical
5197.5	-52.13	5.25	35.86	-21.52	-13	-8.52	Vertical
5197.5	-48.01	5.25	35.86	-17.40	-13	-4.40	Horizontal
165.2	-37.04	1.70	15.29	-23.45	-13	-10.45	Vertical
251.3	-42.82	1.30	16.07	-28.05	-13	-15.05	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-56.43	4.05	30.01	-30.47	-13	-17.47	Horizontal
3508.6	-50.02	4.05	30.01	-24.06	-13	-11.06	Vertical
5262.9	-51.83	5.26	35.86	-21.23	-13	-8.23	Vertical
5262.9	-51.65	5.26	35.86	-21.05	-13	-8.05	Horizontal
91.2	-44.51	1.46	16.58	-29.39	-13	-16.39	Vertical
157.0	-44.44	1.79	15.06	-31.17	-13	-18.17	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	-49.70	4.02	29.80	-23.92	-13	-10.92	Horizontal
3440.0	-46.51	4.02	29.80	-20.73	-13	-7.73	Vertical
5160.0	-53.19	5.24	35.84	-22.59	-13	-9.59	Vertical
5160.0	-47.88	5.24	35.84	-17.28	-13	-4.28	Horizontal
140.5	-45.11	1.54	15.04	-31.61	-13	-18.61	Vertical
244.0	-38.83	1.51	16.92	-23.42	-13	-10.42	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.16	4.03	30.00	-24.19	-13	-11.19	Horizontal
3465.0	-54.78	4.03	30.00	-28.81	-13	-15.81	Vertical
5197.5	-47.48	5.25	35.86	-16.87	-13	-3.87	Vertical
5197.5	-47.79	5.25	35.86	-17.18	-13	-4.18	Horizontal
267.0	-42.96	1.49	15.14	-29.31	-13	-16.31	Vertical
102.0	-46.91	1.56	15.81	-32.66	-13	-19.66	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-49.22	2.91	27.68	-24.45	-13	-11.45	Horizontal
3490.0	-48.32	2.91	27.68	-23.55	-13	-10.55	Vertical
5235.0	-57.41	5.26	35.86	-26.81	-13	-13.81	Vertical
5235.0	-53.48	5.26	35.86	-22.88	-13	-9.88	Horizontal
200.4	-39.52	1.48	16.52	-24.48	-13	-11.48	Vertical
93.6	-43.86	1.76	16.92	-28.70	-13	-15.70	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.

9.3 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	-55.54	2.78	27.50	-30.82	-13	-17.82	Horizontal
1649.4	-46.94	2.78	27.50	-22.22	-13	-9.22	Vertical
2474.1	-47.34	2.90	27.80	-22.44	-13	-9.44	Vertical
2474.1	-45.71	2.90	27.80	-20.81	-13	-7.81	Horizontal
223.9	-42.98	1.61	16.16	-28.43	-13	-15.43	Vertical
196.5	-38.95	1.45	15.96	-24.44	-13	-11.44	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-47.12	2.80	27.48	-22.44	-13	-9.44	Horizontal
1673.0	-43.96	2.80	27.48	-19.28	-13	-6.28	Vertical
2509.5	-47.05	2.91	27.70	-22.26	-13	-9.26	Vertical
2509.5	-42.91	2.91	27.70	-18.12	-13	-5.12	Horizontal
156.6	-46.07	1.44	15.08	-32.43	-13	-19.43	Vertical
228.1	-43.34	1.49	17.31	-27.52	-13	-14.52	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-43.78	2.82	27.43	-19.17	-13	-6.17	Horizontal
1696.6	-42.41	2.82	27.43	-17.80	-13	-4.80	Vertical
2544.9	-52.18	2.92	27.74	-27.36	-13	-14.36	Vertical
2544.9	-42.01	2.92	27.74	-17.19	-13	-4.19	Horizontal
163.8	-47.97	1.62	16.96	-32.63	-13	-19.63	Vertical
228.9	-43.37	1.80	16.01	-29.16	-13	-16.16	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	-46.02	2.78	27.50	-21.30	-13	-8.30	Horizontal
1658.0	-47.35	2.78	27.50	-22.63	-13	-9.63	Vertical
2487.0	-49.81	2.90	27.80	-24.91	-13	-11.91	Vertical
2487.0	-47.77	2.90	27.80	-22.87	-13	-9.87	Horizontal
163.6	-42.95	1.52	17.41	-27.06	-13	-14.06	Vertical
243.6	-45.48	1.51	16.55	-30.44	-13	-17.44	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.45	2.80	27.48	-24.77	-13	-11.77	Horizontal
1673.0	-44.59	2.80	27.48	-19.91	-13	-6.91	Vertical
2509.5	-50.80	2.91	27.70	-26.01	-13	-13.01	Vertical
2509.5	-49.48	2.91	27.70	-24.69	-13	-11.69	Horizontal
184.9	-48.86	1.72	17.77	-32.81	-13	-19.81	Vertical
98.2	-38.11	1.58	16.66	-23.03	-13	-10.03	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.34	2.82	27.43	-21.73	-13	-8.73	Horizontal
1688.0	-46.62	2.82	27.43	-22.01	-13	-9.01	Vertical
2532.0	-49.48	2.92	27.74	-24.66	-13	-11.66	Vertical
2532.0	-44.80	2.92	27.74	-19.98	-13	-6.98	Horizontal
213.8	-44.86	1.43	17.47	-28.82	-13	-15.82	Vertical
234.4	-46.84	1.77	17.82	-30.79	-13	-17.79	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	-63.83	5.23	35.81	-33.25	-25	-8.25	Horizontal
5005.0	-62.31	5.23	35.81	-31.73	-25	-6.73	Vertical
7507.5	-66.68	5.67	36.85	-35.50	-25	-10.50	Vertical
7507.5	-60.50	5.67	36.85	-29.32	-25	-4.32	Horizontal
477.3	-49.67	1.71	16.03	-35.35	-25	-10.35	Vertical
386.9	-51.92	1.73	17.97	-35.68	-25	-10.68	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-69.55	5.23	35.82	-38.96	-25	-13.96	Horizontal
5070.0	-63.87	5.23	35.82	-33.28	-25	-8.28	Vertical
7605.0	-67.72	5.67	36.85	-36.54	-25	-11.54	Vertical
7605.0	-62.88	5.67	36.85	-31.70	-25	-6.70	Horizontal
123.6	-56.81	1.63	16.70	-41.74	-25	-16.74	Vertical
412.4	-54.87	1.52	15.37	-41.02	-25	-16.02	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-65.17	5.24	35.83	-34.58	-25	-9.58	Horizontal
5135.0	-67.48	5.24	35.83	-36.89	-25	-11.89	Vertical
7702.5	-66.74	5.68	36.87	-35.55	-25	-10.55	Vertical
7702.5	-65.52	5.68	36.87	-34.33	-25	-9.33	Horizontal
175.5	-57.69	1.35	16.98	-42.06	-25	-17.06	Vertical
334.8	-54.28	1.56	17.83	-38.01	-25	-13.01	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	-69.14	5.23	35.82	-38.55	-25	-13.55	Horizontal
5020.0	-70.16	5.23	35.82	-39.57	-25	-14.57	Vertical
7530.0	-68.78	5.67	36.86	-37.59	-25	-12.59	Vertical
7530.0	-72.24	5.67	36.86	-41.05	-25	-16.05	Horizontal
510.9	-57.09	1.58	16.48	-42.19	-25	-17.19	Vertical
441.5	-52.10	1.72	17.85	-35.97	-25	-10.97	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-66.20	5.23	35.82	-35.61	-25	-10.61	Horizontal
5070.0	-66.51	5.23	35.82	-35.92	-25	-10.92	Vertical
7605.0	-68.04	5.67	36.85	-36.86	-25	-11.86	Vertical
7605.0	-70.50	5.67	36.85	-39.32	-25	-14.32	Horizontal
192.1	-51.64	1.71	17.49	-35.86	-25	-10.86	Vertical
267.6	-53.36	1.67	17.61	-37.42	-25	-12.42	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.02	5.24	35.83	-29.43	-25	-4.43	Horizontal
5120.0	-65.15	5.24	35.83	-34.56	-25	-9.56	Vertical
7680.0	-64.85	5.70	36.88	-33.67	-25	-8.67	Vertical
7680.0	-69.20	5.70	36.88	-38.02	-25	-13.02	Horizontal
460.4	-55.38	1.54	16.54	-40.38	-25	-15.38	Vertical
250.7	-51.48	1.60	17.32	-35.76	-25	-10.76	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.

9.5 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	-46.18	2.60	27.20	-21.58	-13	-8.58	Horizontal
1399.4	-46.13	2.60	27.20	-21.53	-13	-8.53	Vertical
2099.1	-49.17	2.85	27.54	-24.48	-13	-11.48	Vertical
2099.1	-46.70	2.85	27.54	-22.01	-13	-9.01	Horizontal
224.0	-41.46	1.72	15.47	-27.71	-13	-14.71	Vertical
131.3	-42.38	1.39	17.12	-26.65	-13	-13.65	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-47.85	2.61	27.28	-23.18	-13	-10.18	Horizontal
1415.0	-46.85	2.61	27.28	-22.18	-13	-9.18	Vertical
2122.5	-46.85	2.87	27.59	-22.13	-13	-9.13	Vertical
2122.5	-53.41	2.87	27.59	-28.69	-13	-15.69	Horizontal
196.5	-41.17	1.34	17.07	-25.44	-13	-12.44	Vertical
90.3	-44.24	1.63	17.77	-28.10	-13	-15.10	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-44.21	2.63	27.28	-19.56	-13	-6.56	Horizontal
1430.6	-42.82	2.63	27.28	-18.17	-13	-5.17	Vertical
2145.9	-49.49	2.88	27.60	-24.77	-13	-11.77	Vertical
2145.9	-49.83	2.88	27.60	-25.11	-13	-12.11	Horizontal
182.2	-46.27	1.65	17.01	-30.91	-13	-17.91	Vertical
267.1	-42.61	1.79	15.92	-28.48	-13	-15.48	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	-45.07	2.61	27.26	-20.42	-13	-7.42	Horizontal
1408.0	-45.59	2.61	27.26	-20.94	-13	-7.94	Vertical
2112.0	-47.82	2.87	27.58	-23.11	-13	-10.11	Vertical
2112.0	-49.01	2.87	27.58	-24.30	-13	-11.30	Horizontal
96.3	-40.50	1.40	15.17	-26.73	-13	-13.73	Vertical
108.2	-38.56	1.50	15.99	-24.07	-13	-11.07	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-44.63	2.61	27.28	-19.96	-13	-6.96	Horizontal
1415.0	-45.21	2.61	27.28	-20.54	-13	-7.54	Vertical
2122.5	-44.01	2.87	27.59	-19.29	-13	-6.29	Vertical
2122.5	-42.07	2.87	27.59	-17.35	-13	-4.35	Horizontal
165.6	-43.64	1.63	17.69	-27.58	-13	-14.58	Vertical
159.2	-42.90	1.49	16.22	-28.17	-13	-15.17	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.09	2.62	27.28	-20.43	-13	-7.43	Horizontal
1422.0	-46.32	2.62	27.28	-21.66	-13	-8.66	Vertical
2133.0	-44.83	2.87	27.60	-20.10	-13	-7.10	Vertical
2133.0	-48.03	2.87	27.60	-23.30	-13	-10.30	Horizontal
257.5	-47.09	1.61	17.10	-31.60	-13	-18.60	Vertical
115.7	-45.17	1.43	17.44	-29.16	-13	-16.16	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	-48.53	2.61	27.28	-23.86	-13	-10.86	Horizontal
1413.0	-46.80	2.61	27.28	-22.13	-13	-9.13	Vertical
2119.5	-53.39	2.87	27.59	-28.67	-13	-15.67	Vertical
2119.5	-46.13	2.87	27.59	-21.41	-13	-8.41	Horizontal
168.5	-44.28	1.68	17.03	-28.93	-13	-15.93	Vertical
244.3	-41.24	1.74	15.58	-27.40	-13	-14.40	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-48.14	2.62	27.30	-23.46	-13	-10.46	Horizontal
1420.0	-45.96	2.62	27.30	-21.28	-13	-8.28	Vertical
2130.0	-48.65	2.87	27.62	-23.90	-13	-10.90	Vertical
2130.0	-44.53	2.87	27.62	-19.78	-13	-6.78	Horizontal
256.3	-39.55	1.55	17.66	-23.44	-13	-10.44	Vertical
213.5	-45.67	1.79	16.94	-30.52	-13	-17.52	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-49.51	2.66	27.28	-24.89	-13	-11.89	Horizontal
1427.0	-50.30	2.66	27.28	-25.68	-13	-12.68	Vertical
2140.5	-46.93	2.88	27.60	-22.21	-13	-9.21	Vertical
2140.5	-48.86	2.88	27.60	-24.14	-13	-11.14	Horizontal
104.5	-45.44	1.63	16.55	-30.52	-13	-17.52	Vertical
230.4	-40.23	1.39	16.30	-25.32	-13	-12.32	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	-53.48	2.62	27.30	-28.80	-13	-15.80	Horizontal
1418.0	-51.34	2.62	27.30	-26.66	-13	-13.66	Vertical
2127.0	-49.62	2.87	27.62	-24.87	-13	-11.87	Vertical
2127.0	-47.71	2.87	27.62	-22.96	-13	-9.96	Horizontal
279.2	-39.51	1.52	15.15	-25.88	-13	-12.88	Vertical
243.0	-41.68	1.33	16.84	-26.17	-13	-13.17	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-46.87	2.62	27.30	-22.19	-13	-9.19	Horizontal
1420.0	-45.71	2.62	27.30	-21.03	-13	-8.03	Vertical
2130.0	-46.85	2.87	27.62	-22.10	-13	-9.10	Vertical
2130.0	-48.70	2.87	27.62	-23.95	-13	-10.95	Horizontal
167.8	-42.40	1.64	17.13	-26.91	-13	-13.91	Vertical
168.3	-42.95	1.65	17.56	-27.04	-13	-14.04	Horizontal
Test Results for High Channel 711MHz							
1422.0	-41.89	2.62	27.30	-17.21	-13	-4.21	Horizontal
1422.0	-48.83	2.62	27.30	-24.15	-13	-11.15	Vertical
2133.0	-54.34	2.87	27.62	-29.59	-13	-16.59	Vertical
2133.0	-45.40	2.87	27.62	-20.65	-13	-7.65	Horizontal
157.5	-46.86	1.53	17.13	-31.26	-13	-18.26	Vertical
262.7	-43.68	1.75	17.13	-28.30	-13	-15.30	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.

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 4.2V.

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

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	-24.6	-0.013101	2.5
3.85	1880	25.8	0.013718	2.5
4.2	1880	3.5	0.001878	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	-23.5	-0.012484	2.5
Extreme (50C)	1880	20.7	0.010995	2.5
Extreme (40C)	1880	-24.8	-0.013170	2.5
Extreme (30C)	1880	27.1	0.014399	2.5
Extreme (10C)	1880	19.4	0.010324	2.5
Extreme (0C)	1880	-10.7	-0.005681	2.5
Extreme (-10C)	1880	-0.7	-0.000351	2.5
Extreme (-20C)	1880	0.5	0.000282	2.5
Extreme (-30C)	1880	-23.7	-0.012590	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	-17.5	-0.009282	2.5
3.85	1880	21.7	0.011559	2.5
4.2	1880	-13.6	-0.007223	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	-23.1	-0.012293	2.5
Extreme (50C)	1880	27.2	0.014457	2.5
Extreme (40C)	1880	-26.3	-0.013968	2.5
Extreme (30C)	1880	-22.0	-0.011691	2.5
Extreme (10C)	1880	18.3	0.009718	2.5
Extreme (0C)	1880	-29.2	-0.015531	2.5
Extreme (-10C)	1880	-34.2	-0.018164	2.5
Extreme (-20C)	1880	-4.9	-0.002622	2.5
Extreme (-30C)	1880	-15.6	-0.008303	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	30.7	0.017703	2.5
3.85	1732.5	20.2	0.011671	2.5
4.2	1732.5	-11.0	-0.006332	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	-23.5	-0.013553	2.5
Extreme (50C)	1732.5	-23.5	-0.013564	2.5
Extreme (40C)	1732.5	-1.7	-0.000952	2.5
Extreme (30C)	1732.5	-25.4	-0.014661	2.5
Extreme (10C)	1732.5	-10.1	-0.005830	2.5
Extreme (0C)	1732.5	2.3	0.001351	2.5
Extreme (-10C)	1732.5	-0.7	-0.000392	2.5
Extreme (-20C)	1732.5	7.8	0.004479	2.5
Extreme (-30C)	1732.5	12.8	0.007359	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	12.3	0.007123	2.5
3.85	1732.5	23.9	0.013812	2.5
4.2	1732.5	-18.4	-0.010592	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	-11.2	-0.006442	2.5
Extreme (50C)	1732.5	27.7	0.016012	2.5
Extreme (40C)	1732.5	20.1	0.011625	2.5
Extreme (30C)	1732.5	-21.4	-0.012341	2.5
Extreme (10C)	1732.5	-7.4	-0.004260	2.5
Extreme (0C)	1732.5	-23.4	-0.013512	2.5
Extreme (-10C)	1732.5	8.8	0.005079	2.5
Extreme (-20C)	1732.5	-17.4	-0.010066	2.5
Extreme (-30C)	1732.5	-20.8	-0.012006	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	-26.4	-0.031536	2.5
3.85	836.5	-26.7	-0.031919	2.5
4.2	836.5	-13.3	-0.015876	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	14.4	0.017203	2.5
Extreme (50C)	836.5	24.1	0.028787	2.5
Extreme (40C)	836.5	-19.2	-0.023001	2.5
Extreme (30C)	836.5	14.4	0.017227	2.5
Extreme (10C)	836.5	2.8	0.003323	2.5
Extreme (0C)	836.5	26.9	0.032146	2.5
Extreme (-10C)	836.5	-0.2	-0.000203	2.5
Extreme (-20C)	836.5	22.4	0.026742	2.5
Extreme (-30C)	836.5	-2.3	-0.002773	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	-24.3	-0.028990	2.5
3.85	836.5	0.0	0.000036	2.5
4.2	836.5	22.6	0.027065	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	10.6	0.012684	2.5
Extreme (50C)	836.5	24.6	0.029348	2.5
Extreme (40C)	836.5	-6.6	-0.007878	2.5
Extreme (30C)	836.5	-13.7	-0.016354	2.5
Extreme (10C)	836.5	10.2	0.012218	2.5
Extreme (0C)	836.5	-6.9	-0.008201	2.5
Extreme (-10C)	836.5	-31.5	-0.037609	2.5
Extreme (-20C)	836.5	-8.6	-0.010281	2.5
Extreme (-30C)	836.5	15.5	0.018553	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	-20.6	-0.008142	2.5
3.85	2535	15.7	0.006201	2.5
4.2	2535	-23.7	-0.009357	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	1.5	0.000584	2.5
Extreme (50C)	2535	-24.3	-0.009582	2.5
Extreme (40C)	2535	-21.7	-0.008552	2.5
Extreme (30C)	2535	-24.2	-0.009542	2.5
Extreme (10C)	2535	26.1	0.010304	2.5
Extreme (0C)	2535	-11.3	-0.004454	2.5
Extreme (-10C)	2535	-17.1	-0.006750	2.5
Extreme (-20C)	2535	-18.4	-0.007258	2.5
Extreme (-30C)	2535	16.8	0.006607	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	1.2	0.000465	2.5
3.85	2535	15.0	0.005917	2.5
4.2	2535	-2.7	-0.001049	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	-16.1	-0.006347	2.5
Extreme (50C)	2535	-18.2	-0.007168	2.5
Extreme (40C)	2535	-11.0	-0.004343	2.5
Extreme (30C)	2535	-12.4	-0.004880	2.5
Extreme (10C)	2535	-13.8	-0.005424	2.5
Extreme (0C)	2535	20.1	0.007937	2.5
Extreme (-10C)	2535	-14.5	-0.005736	2.5
Extreme (-20C)	2535	-1.4	-0.000560	2.5
Extreme (-30C)	2535	19.9	0.007850	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	-22.0	-0.031095	2.5
3.85	707.5	-6.9	-0.009696	2.5
4.2	707.5	-17.9	-0.025329	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-14.0	-0.019788	2.5
Extreme (50C)	707.5	11.4	0.016127	2.5
Extreme (40C)	707.5	-30.4	-0.042898	2.5
Extreme (30C)	707.5	-17.0	-0.024000	2.5
Extreme (10C)	707.5	-1.8	-0.002488	2.5
Extreme (0C)	707.5	-3.9	-0.005555	2.5
Extreme (-10C)	707.5	-24.0	-0.033951	2.5
Extreme (-20C)	707.5	15.5	0.021837	2.5
Extreme (-30C)	707.5	15.1	0.021399	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	15.9	0.022417	2.5
3.85	707.5	-0.5	-0.000721	2.5
4.2	707.5	-5.0	-0.007110	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-6.4	-0.008989	2.5
Extreme (50C)	707.5	-4.5	-0.006290	2.5
Extreme (40C)	707.5	1.7	0.002360	2.5
Extreme (30C)	707.5	31.1	0.043901	2.5
Extreme (10C)	707.5	5.3	0.007449	2.5
Extreme (0C)	707.5	3.3	0.004693	2.5
Extreme (-10C)	707.5	2.0	0.002799	2.5
Extreme (-20C)	707.5	-10.6	-0.015025	2.5
Extreme (-30C)	707.5	21.6	0.030473	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	5.9	0.008310	2.5
3.85	710.0	-7.4	-0.010380	2.5
4.2	710.0	10.3	0.014465	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	24.4	0.034423	2.5
Extreme (50C)	710.0	9.3	0.013070	2.5
Extreme (40C)	710.0	-19.4	-0.027268	2.5
Extreme (30C)	710.0	-21.1	-0.029676	2.5
Extreme (10C)	710.0	5.7	0.008056	2.5
Extreme (0C)	710.0	-13.6	-0.019169	2.5
Extreme (-10C)	710.0	6.9	0.009732	2.5
Extreme (-20C)	710.0	19.0	0.026746	2.5
Extreme (-30C)	710.0	16.1	0.022620	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	-24.0	-0.033803	2.5
3.85	710.0	-14.0	-0.019690	2.5
4.2	710.0	-14.9	-0.020958	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	26.0	0.036563	2.5
Extreme (50C)	710.0	-14.4	-0.020268	2.5
Extreme (40C)	710.0	31.2	0.043915	2.5
Extreme (30C)	710.0	-8.8	-0.012394	2.5
Extreme (10C)	710.0	16.1	0.022676	2.5
Extreme (0C)	710.0	-27.4	-0.038606	2.5
Extreme (-10C)	710.0	-7.2	-0.010113	2.5
Extreme (-20C)	710.0	4.1	0.005803	2.5
Extreme (-30C)	710.0	28.3	0.039817	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.

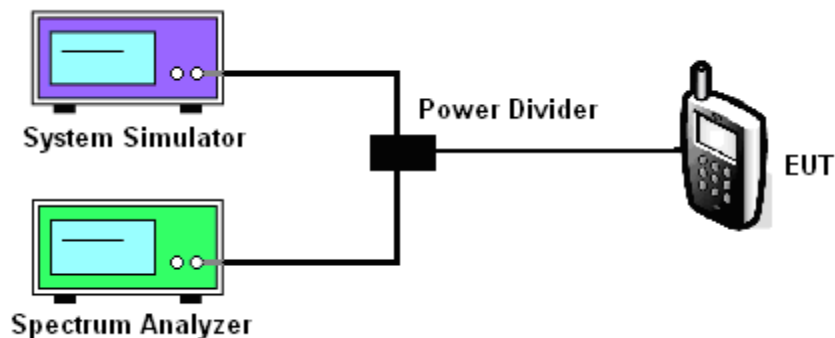
11.2 Measuring Instruments

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

----END OF REPORT----