

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

FCC ID: 2APMJBV9900E

Product: Smart Phone

Trade Mark: Blackview

Model Number: BV9900E

Family Model: BV9900

Report No.: STR201106002005E

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen DOKE Electronic Co., Ltd
Address : 13th Floor, Weidonglong commercial building B, Meilong avenue, Longhua New District, Shenzhen, China
Manufacturer's Name : Shenzhen DOKE Electronic Co.,Ltd
Address : 8th floor, building 3, hanhaida science and technology innovation park, yulv village, guangming new district, shenzhen city, guangdong province
Product name : Smart Phone
Model and/or type reference : BV9900E
Family Model: BV9900
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 : 06 Nov. 2020 ~15 Dec, 2020
Date of Issue : 15 Dec, 2020

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:	Smart Phone
Trade Mark	Blackview
Model Name	BV9900E
Family Model	BV9900
Model Difference	All models are the same circuit and RF module, except the Model
FCC ID:	2APMJBV9900E
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:	0.5dBi
Power Supply:	DC 3.8V/4380mAh from battery or DC 5V from Adapter.
Adapter:	Model: HJ-FC018K7-US Input: 100-240V~50/60Hz 0.6A Output: 5V---2000mA 7V---2000mA 9V---2000mA
Extreme Vol. Limits:	DC 3.4V to DC 4.4V (Nominal DC 3.8V) (Note 1)
HW Version	S990-MBA2-BOM5
SW Version	BV9900E_NEU_S900AA_V1.0_20200919V02_user_20200919
** Note1: The High Voltage 4.4V 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: 2APMJBV9900E** 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 C63.46:2015.

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% ($U = 2U_c(y)$)	2.5dB

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, 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	
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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

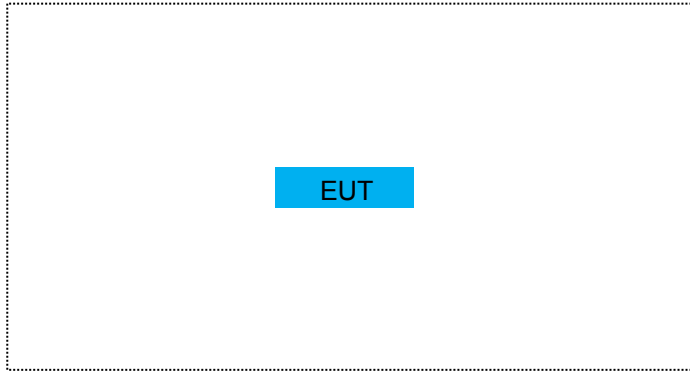
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	BV9900E	FCC ID: 2APMJBV9900E	EUT

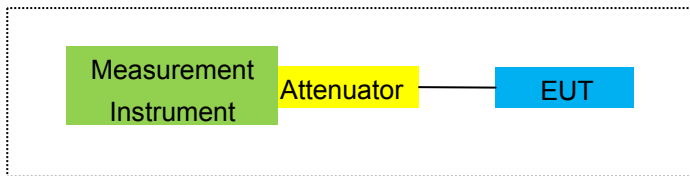
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

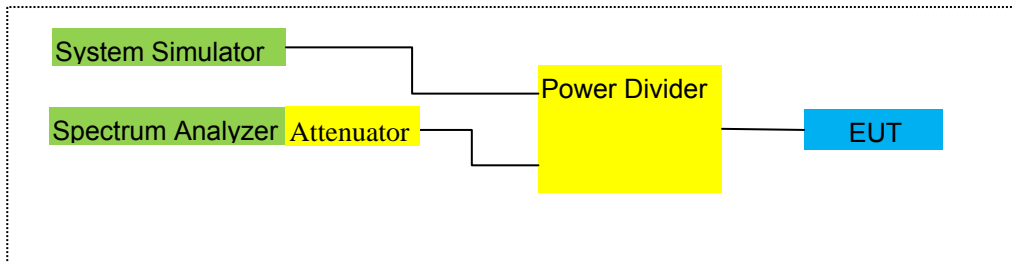
For Radiated Test Cases



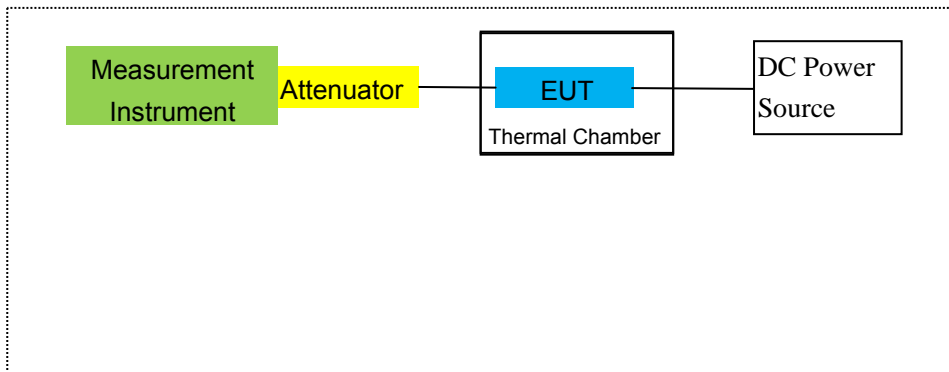
For Conducted Output Power



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 Band 2
- 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.

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

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

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

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

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

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

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

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

For each out of band emissions measurement:

Set display line

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

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

22.913(a) (2)- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232 (c) Mobile and portable stations are limited to 2 watts EIRP.
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
27.50 (h)(2) Mobile and other user stations in the 2500–2570 MHz and 2620–2690 MHz bands. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 7
LTE Band 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	1850.7	-0.21	3.76	28.24	24.27	267.301	Horizontal
		1880	1880	0.98	3.91	28.22	25.29	338.065	Horizontal
		1909.3	1909.3	-0.36	3.93	28.20	23.91	246.037	Horizontal
3.0MHz Band QPSK	1/#Mid	1851.5	1851.5	0.84	3.77	28.23	25.30	338.844	Horizontal
		1880	1880	0.73	3.91	28.24	25.06	320.627	Horizontal
		1908.5	1908.5	0.33	3.94	28.25	24.64	291.072	Horizontal
5.0MHz Band QPSK	1/#Mid	1852.5	1852.5	-0.21	3.77	28.31	24.33	271.019	Horizontal
		1880	1880	0.22	3.91	28.22	24.53	283.792	Horizontal
		1907.5	1907.5	1.09	3.94	28.20	25.35	342.768	Horizontal
10.0MHz Band QPSK	1/#Mid	1855	1855	0.42	3.79	28.33	24.96	313.329	Horizontal
		1880	1880	0.55	3.95	28.22	24.82	303.389	Horizontal
		1905	1905	1.14	3.97	28.19	25.36	343.558	Horizontal
15.0MHz Band QPSK	1/#Mid	1857.5	1857.5	-0.31	3.79	28.34	24.24	265.461	Horizontal
		1880	1880	1.17	3.95	28.22	25.44	349.945	Horizontal
		1902.5	1902.5	1.34	3.97	28.18	25.55	358.922	Horizontal
20.0MHz Band QPSK	1/#Mid	1860	1860	0.85	3.81	28.35	25.39	345.939	Horizontal
		1880	1880	-0.18	3.96	28.22	24.08	255.859	Horizontal
		1900	1900	0.80	4.00	28.16	24.96	313.329	Horizontal
1.4MHz Band QPSK	1/#Mid	1850.7	1850.7	0.41	3.76	28.24	24.89	308.319	Vertical
		1880	1880	1.31	3.91	28.22	25.62	364.754	Vertical
		1909.3	1909.3	0.57	3.93	28.20	24.84	304.789	Vertical
3.0MHz Band QPSK	1/#Mid	1851.5	1851.5	0.11	3.77	28.23	24.57	286.418	Vertical
		1880	1880	0.66	3.91	28.24	24.99	315.500	Vertical
		1908.5	1908.5	1.26	3.94	28.25	25.57	360.579	Vertical
5.0MHz Band QPSK	1/#Mid	1852.5	1852.5	0.88	3.77	28.31	25.42	348.337	Vertical
		1880	1880	1.39	3.91	28.22	25.70	371.535	Vertical
		1907.5	1907.5	1.22	3.94	28.20	25.48	353.183	Vertical
10.0MHz Band QPSK	1/#Mid	1855	1855	0.26	3.79	28.33	24.80	301.995	Vertical
		1880	1880	-0.10	3.95	28.22	24.17	261.216	Vertical
		1905	1905	-0.64	3.97	28.19	23.58	228.034	Vertical
15.0MHz	1/#Mid	1857.5	1857.5	-0.54	3.79	28.34	24.01	251.768	Vertical

Band		1880	1880	0.56	3.95	28.22	24.83	304.089	Vertical
QPSK		1902.5	1902.5	0.21	3.97	28.18	24.42	276.694	Vertical
20.0MHz	1/#Mid	1860	1860	-0.32	3.81	28.35	24.22	264.241	Vertical
Band		1880	1880	-0.31	3.96	28.22	23.95	248.313	Vertical
QPSK		1900	1900	1.76	4.00	28.16	25.92	390.841	Vertical

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	1850.7	-0.68	3.76	28.24	23.80	239.883	Horizontal
		1880	1880	-0.39	3.91	28.22	23.92	246.604	Horizontal
		1909.3	1909.3	0.09	3.93	28.20	24.36	272.898	Horizontal
3.0MHz Band 16 QAM	1/#Mid	1851.5	1851.5	-0.94	3.77	28.23	23.52	224.905	Horizontal
		1880	1880	-0.15	3.91	28.24	24.18	261.818	Horizontal
		1908.5	1908.5	-0.44	3.94	28.25	23.87	243.781	Horizontal
5.0MHz Band 16 QAM	1/#Mid	1852.5	1852.5	-0.65	3.77	28.31	23.89	244.906	Horizontal
		1880	1880	-0.59	3.91	28.22	23.72	235.505	Horizontal
		1907.5	1907.5	0.08	3.94	28.20	24.34	271.644	Horizontal
10.0MHz Band 16 QAM	1/#Mid	1855	1855	-0.64	3.79	28.33	23.90	245.471	Horizontal
		1880	1880	-0.48	3.95	28.22	23.79	239.332	Horizontal
		1905	1905	0.12	3.97	28.19	24.34	271.644	Horizontal
15.0MHz Band 16 QAM	1/#Mid	1857.5	1857.5	-0.77	3.79	28.34	23.78	238.781	Horizontal
		1880	1880	-0.30	3.95	28.22	23.97	249.459	Horizontal
		1902.5	1902.5	-0.37	3.97	28.18	23.84	242.103	Horizontal
20.0MHz Band 16 QAM	1/#Mid	1860	1860	-0.60	3.81	28.35	23.94	247.742	Horizontal
		1880	1880	0.08	3.96	28.22	24.34	271.644	Horizontal
		1900	1900	0.01	4.00	28.16	24.17	261.216	Horizontal
1.4MHz Band 16 QAM	1/#Mid	1850.7	1850.7	-0.77	3.76	28.24	23.71	234.963	Vertical
		1880	1880	0.17	3.91	28.22	24.48	280.543	Vertical
		1909.3	1909.3	0.03	3.93	28.20	24.30	269.153	Vertical
3.0MHz Band 16 QAM	1/#Mid	1851.5	1851.5	-0.59	3.77	28.23	23.87	243.781	Vertical
		1880	1880	-0.64	3.91	28.24	23.69	233.884	Vertical
		1908.5	1908.5	-0.18	3.94	28.25	24.13	258.821	Vertical
5.0MHz Band 16 QAM	1/#Mid	1852.5	1852.5	-0.14	3.77	28.31	24.40	275.423	Vertical
		1880	1880	-0.72	3.91	28.22	23.59	228.560	Vertical
		1907.5	1907.5	0.02	3.94	28.20	24.28	267.917	Vertical
10.0MHz Band 16 QAM	1/#Mid	1855	1855	-0.36	3.79	28.33	24.18	261.818	Vertical
		1880	1880	-0.45	3.95	28.22	23.82	240.991	Vertical
		1905	1905	-0.45	3.97	28.19	23.77	238.232	Vertical
15.0MHz Band 16 QAM	1/#Mid	1857.5	1857.5	-0.29	3.79	28.34	24.26	266.686	Vertical
		1880	1880	-1.10	3.95	28.22	23.17	207.491	Vertical
		1902.5	1902.5	0.05	3.97	28.18	24.26	266.686	Vertical

20.0MHz		1860	1860	0.05	3.81	28.35	24.59	287.740	Vertical
Band 16	1/#Mid	1880	1880	0.07	3.96	28.22	24.33	271.019	Vertical
QAM		1900	1900	0.06	4.00	28.16	24.22	264.241	Vertical

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	0.45	3.12	27.58	24.91	309.742	Horizontal	Pass
		1732.5	0.87	3.27	27.61	25.21	331.894	Horizontal	Pass
		1754.3	0.47	3.29	27.63	24.81	302.691	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.73	3.13	27.61	23.75	237.137	Horizontal	Pass
		1732.5	-0.93	3.27	27.61	23.41	219.280	Horizontal	Pass
		1753.5	-1.18	3.30	27.62	23.14	206.063	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	0.01	3.13	27.63	24.51	282.488	Horizontal	Pass
		1732.5	-1.26	3.27	27.61	23.08	203.236	Horizontal	Pass
		1752.5	0.89	3.30	27.60	25.19	330.370	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.02	3.15	27.64	24.47	279.898	Horizontal	Pass
		1732.5	0.56	3.31	27.61	24.86	306.196	Horizontal	Pass
		1750	0.88	3.33	27.59	25.14	326.588	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.52	3.15	27.65	23.98	250.035	Horizontal	Pass
		1732.5	0.73	3.31	27.61	25.03	318.420	Horizontal	Pass
		1747.5	0.60	3.33	27.57	24.84	304.789	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.69	3.17	27.66	23.80	239.883	Horizontal	Pass
		1732.5	0.76	3.32	27.61	25.05	319.890	Horizontal	Pass
		1745	0.33	3.36	27.56	24.53	283.792	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	0.77	3.12	27.58	25.23	333.426	Vertical	Pass
		1732.5	-0.44	3.27	27.61	23.90	245.471	Vertical	Pass
		1754.3	-0.62	3.29	27.63	23.72	235.505	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	0.65	3.13	27.61	25.13	325.837	Vertical	Pass
		1732.5	0.72	3.27	27.61	25.06	320.627	Vertical	Pass
		1753.5	0.69	3.30	27.62	25.01	316.957	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.64	3.13	27.63	23.86	243.220	Vertical	Pass
		1732.5	0.17	3.27	27.61	24.51	282.488	Vertical	Pass
		1752.5	-0.67	3.30	27.60	23.63	230.675	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.52	3.15	27.64	23.97	249.459	Vertical	Pass
		1732.5	-0.70	3.31	27.61	23.60	229.087	Vertical	Pass
		1750	0.69	3.33	27.59	24.95	312.608	Vertical	Pass

15.0MHz	Band QPSK	1/#Mid	1717.5	-0.45	3.15	27.65	24.05	254.097	Vertical	Pass
			1732.5	0.03	3.31	27.61	24.33	271.019	Vertical	Pass
			1747.5	-0.29	3.33	27.57	23.95	248.313	Vertical	Pass
20.0MHz	Band QPSK	1/#Mid	1720	0.22	3.17	27.66	24.71	295.801	Vertical	Pass
			1732.5	0.96	3.32	27.61	25.25	334.965	Vertical	Pass
			1745	1.03	3.36	27.56	25.23	333.426	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	-0.56	3.12	27.58	23.90	245.471	Horizontal	Pass
		1732.5	-0.74	3.27	27.61	23.60	229.087	Horizontal	Pass
		1754.3	-0.75	3.29	27.63	23.59	228.560	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.76	3.13	27.61	23.72	235.505	Horizontal	Pass
		1732.5	-1.77	3.27	27.61	22.57	180.717	Horizontal	Pass
		1753.5	-0.67	3.30	27.62	23.65	231.739	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.72	3.13	27.63	23.78	238.781	Horizontal	Pass
		1732.5	-0.95	3.27	27.61	23.39	218.273	Horizontal	Pass
		1752.5	-0.18	3.30	27.60	24.12	258.226	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-0.63	3.15	27.64	23.86	243.220	Horizontal	Pass
		1732.5	-0.79	3.31	27.61	23.51	224.388	Horizontal	Pass
		1750	-1.06	3.33	27.59	23.20	208.930	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.89	3.15	27.65	23.61	229.615	Horizontal	Pass
		1732.5	-0.67	3.31	27.61	23.63	230.675	Horizontal	Pass
		1747.5	-0.42	3.33	27.57	23.82	240.991	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-0.75	3.17	27.66	23.74	236.592	Horizontal	Pass
		1732.5	0.10	3.32	27.61	24.39	274.789	Horizontal	Pass
		1745	-0.64	3.36	27.56	23.56	226.986	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.29	3.12	27.58	24.17	261.216	Vertical	Pass
		1732.5	0.00	3.27	27.61	24.34	271.644	Vertical	Pass
		1754.3	-0.77	3.29	27.63	23.57	227.510	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.83	3.13	27.61	23.65	231.739	Vertical	Pass
		1732.5	-1.71	3.27	27.61	22.63	183.231	Vertical	Pass
		1753.5	-0.79	3.30	27.62	23.53	225.424	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.83	3.13	27.63	23.67	232.809	Vertical	Pass
		1732.5	-0.68	3.27	27.61	23.66	232.274	Vertical	Pass
		1752.5	-0.92	3.30	27.60	23.38	217.771	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-0.33	3.15	27.64	24.16	260.615	Vertical	Pass
		1732.5	-0.70	3.31	27.61	23.60	229.087	Vertical	Pass
		1750	-0.08	3.33	27.59	24.18	261.818	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.19	3.15	27.65	24.31	269.774	Vertical	Pass
		1732.5	-0.78	3.31	27.61	23.52	224.905	Vertical	Pass
		1747.5	0.01	3.33	27.57	24.25	266.073	Vertical	Pass

20.0MHz		1720	0.11	3.17	27.66	24.60	288.403	Vertical	Pass
Band 16	1/#Mid	1732.5	-0.44	3.32	27.61	23.85	242.661	Vertical	Pass
QAM		1745	0.05	3.36	27.56	24.25	266.073	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	9.48	2.01	19.68	2.15	25.00	316.228	Horizontal	Pass
		836.5	9.09	2.01	19.77	2.15	24.70	295.121	Horizontal	Pass
		848.3	9.45	2.02	19.82	2.15	25.10	323.594	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	9.06	2.01	19.70	2.15	24.60	288.403	Horizontal	Pass
		836.5	9.05	2.01	19.77	2.15	24.66	292.415	Horizontal	Pass
		847.5	9.34	2.02	19.81	2.15	24.98	314.775	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	9.11	2.01	19.71	2.15	24.66	292.415	Horizontal	Pass
		836.5	9.50	2.01	19.77	2.15	25.11	324.340	Horizontal	Pass
		846.5	8.98	2.02	19.79	2.15	24.60	288.403	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	9.30	2.01	19.73	2.15	24.87	306.902	Horizontal	Pass
		836.5	9.52	2.01	19.77	2.15	25.13	325.837	Horizontal	Pass
		844	9.49	2.02	19.78	2.15	25.10	323.594	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	9.71	2.01	19.68	2.15	25.23	333.426	Vertical	Pass
		836.5	8.96	2.01	19.77	2.15	24.57	286.418	Vertical	Pass
		848.3	9.34	2.02	19.82	2.15	24.99	315.500	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	9.02	2.01	19.70	2.15	24.56	285.759	Vertical	Pass
		836.5	9.09	2.01	19.77	2.15	24.70	295.121	Vertical	Pass
		847.5	8.96	2.02	19.81	2.15	24.60	288.403	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	9.79	2.01	19.71	2.15	25.34	341.979	Vertical	Pass
		836.5	8.75	2.01	19.77	2.15	24.36	272.898	Vertical	Pass
		846.5	9.86	2.02	19.79	2.15	25.48	353.183	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	9.63	2.01	19.73	2.15	25.20	331.131	Vertical	Pass
		836.5	9.88	2.01	19.77	2.15	25.49	353.997	Vertical	Pass
		844	9.41	2.02	19.78	2.15	25.02	317.687	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	8.34	2.01	19.68	2.15	23.86	243.220	Horizontal	Pass
		836.5	7.82	2.01	19.77	2.15	23.43	220.293	Horizontal	Pass
		848.3	7.83	2.02	19.82	2.15	23.48	222.844	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.63	2.01	19.70	2.15	23.17	207.491	Horizontal	Pass
		836.5	7.97	2.01	19.77	2.15	23.58	228.034	Horizontal	Pass
		847.5	8.07	2.02	19.81	2.15	23.71	234.963	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.49	2.01	19.71	2.15	23.04	201.372	Horizontal	Pass
		836.5	7.61	2.01	19.77	2.15	23.22	209.894	Horizontal	Pass
		846.5	7.87	2.02	19.79	2.15	23.49	223.357	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.88	2.01	19.73	2.15	23.45	221.309	Horizontal	Pass
		836.5	7.42	2.01	19.77	2.15	23.03	200.909	Horizontal	Pass
		844	7.25	2.02	19.78	2.15	22.86	193.197	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	7.85	2.01	19.68	2.15	23.37	217.270	Vertical	Pass
		836.5	6.90	2.01	19.77	2.15	22.51	178.238	Vertical	Pass
		848.3	7.18	2.02	19.82	2.15	22.83	191.867	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.02	2.01	19.70	2.15	22.56	180.302	Vertical	Pass
		836.5	7.61	2.01	19.77	2.15	23.22	209.894	Vertical	Pass
		847.5	7.42	2.02	19.81	2.15	23.06	202.302	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	6.84	2.01	19.71	2.15	22.39	173.380	Vertical	Pass
		836.5	7.73	2.01	19.77	2.15	23.34	215.774	Vertical	Pass
		846.5	7.73	2.02	19.79	2.15	23.35	216.272	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.54	2.01	19.73	2.15	23.11	204.644	Vertical	Pass
		836.5	8.42	2.01	19.77	2.15	24.03	252.930	Vertical	Pass
		844	7.31	2.02	19.78	2.15	22.92	195.884	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	2.27	4.54	27.75	25.48	353.183	Horizontal	Pass
		2535	2.73	4.69	27.72	25.76	376.704	Horizontal	Pass
		2567.5	2.60	4.71	27.71	25.60	363.078	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	2.23	4.55	27.76	25.44	349.945	Horizontal	Pass
		2535	1.49	4.69	27.72	24.52	283.139	Horizontal	Pass
		2565	1.82	4.72	27.70	24.80	301.995	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	2.54	4.55	27.77	25.76	376.704	Horizontal	Pass
		2535	2.51	4.69	27.72	25.54	358.096	Horizontal	Pass
		2562.5	1.99	4.72	27.69	24.96	313.329	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.62	4.57	27.78	24.83	304.089	Horizontal	Pass
		2535	1.72	4.73	27.72	24.71	295.801	Horizontal	Pass
		2560	2.87	4.75	27.68	25.80	380.189	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	2.02	4.54	27.75	25.23	333.426	Vertical	Pass
		2535	1.69	4.69	27.72	24.72	296.483	Vertical	Pass
		2567.5	1.23	4.71	27.71	24.23	264.850	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	2.25	4.55	27.76	25.46	351.560	Vertical	Pass
		2535	2.26	4.69	27.72	25.29	338.065	Vertical	Pass
		2565	1.31	4.72	27.70	24.29	268.534	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	2.07	4.55	27.77	25.29	338.065	Vertical	Pass
		2535	1.79	4.69	27.72	24.82	303.389	Vertical	Pass
		2562.5	2.03	4.72	27.69	25.00	316.228	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	2.32	4.57	27.78	25.53	357.273	Vertical	Pass
		2535	2.78	4.73	27.72	25.77	377.572	Vertical	Pass
		2560	3.00	4.75	27.68	25.93	391.742	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	1.02	4.54	27.75	24.23	264.850	Horizontal	Pass
		2535	1.72	4.69	27.72	24.75	298.538	Horizontal	Pass
		2567.5	2.09	4.71	27.71	25.09	322.849	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	2.00	4.55	27.76	25.21	331.894	Horizontal	Pass
		2535	1.97	4.69	27.72	25.00	316.228	Horizontal	Pass
		2565	1.80	4.72	27.70	24.78	300.608	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	1.88	4.55	27.77	25.10	323.594	Horizontal	Pass
		2535	1.87	4.69	27.72	24.90	309.030	Horizontal	Pass
		2562.5	2.15	4.72	27.69	25.12	325.087	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	2.17	4.57	27.78	25.38	345.144	Horizontal	Pass
		2535	2.09	4.73	27.72	25.08	322.107	Horizontal	Pass
		2560	1.14	4.75	27.68	24.07	255.270	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	1.35	4.54	27.75	24.56	285.759	Vertical	Pass
		2535	1.77	4.69	27.72	24.80	301.995	Vertical	Pass
		2567.5	1.44	4.71	27.71	24.44	277.971	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	1.20	4.55	27.76	24.41	276.058	Vertical	Pass
		2535	0.70	4.69	27.72	23.73	236.048	Vertical	Pass
		2565	2.22	4.72	27.70	25.20	331.131	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	1.92	4.55	27.77	25.14	326.588	Vertical	Pass
		2535	2.25	4.69	27.72	25.28	337.287	Vertical	Pass
		2562.5	1.84	4.72	27.69	24.81	302.691	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	2.33	4.57	27.78	25.54	358.096	Vertical	Pass
		2535	2.24	4.73	27.72	25.23	333.426	Vertical	Pass
		2560	1.96	4.75	27.68	24.89	308.319	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	10.58	1.91	19.21	2.15	25.73	374.111	Vertical
		707.5	9.46	1.91	19.26	2.15	24.66	292.415	Vertical
		715.3	8.81	1.93	19.34	2.15	24.07	255.270	Vertical
3.0MHz Band QPSK	1/#Mid	700.5	10.10	1.91	19.21	2.15	25.25	334.965	Vertical
		707.5	9.65	1.91	19.26	2.15	24.85	305.492	Vertical
		714.5	8.87	1.93	19.34	2.15	24.13	258.821	Vertical
5.0MHz Band QPSK	1/#Mid	701.5	9.41	1.91	19.23	2.15	24.58	287.078	Vertical
		707.5	10.23	1.91	19.26	2.15	25.43	349.140	Vertical
		713.5	9.00	1.92	19.33	2.15	24.26	266.686	Vertical
10.0MHz Band QPSK	1/#Mid	704	9.99	1.91	19.25	2.15	25.18	329.610	Vertical
		707.5	10.16	1.91	19.26	2.15	25.36	343.558	Vertical
		711	9.94	1.92	19.32	2.15	25.19	330.370	Vertical
1.4MHz Band QPSK	1/#Mid	699.7	9.95	1.91	19.21	2.15	25.10	323.594	Horizontal
		707.5	9.54	1.91	19.26	2.15	24.74	297.852	Horizontal
		715.3	9.62	1.93	19.34	2.15	24.88	307.610	Horizontal
3.0MHz Band QPSK	1/#Mid	700.5	9.80	1.91	19.21	2.15	24.95	312.608	Horizontal
		707.5	9.85	1.91	19.26	2.15	25.05	319.890	Horizontal
		714.5	9.70	1.93	19.34	2.15	24.96	313.329	Horizontal
5.0MHz Band QPSK	1/#Mid	701.5	10.12	1.91	19.23	2.15	25.29	338.065	Horizontal
		707.5	10.27	1.91	19.26	2.15	25.47	352.371	Horizontal
		713.5	10.13	1.92	19.33	2.15	25.39	345.939	Horizontal
10.0MHz Band QPSK	1/#Mid	704	10.56	1.91	19.25	2.15	25.75	375.837	Horizontal
		707.5	9.05	1.91	19.26	2.15	24.25	266.073	Horizontal
		711	9.35	1.92	19.32	2.15	24.60	288.403	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	8.48	1.91	19.21	2.15	23.63	230.675	Vertical	Pass
		707.5	7.90	1.91	19.26	2.15	23.10	204.174	Vertical	Pass
		715.3	7.21	1.93	19.34	2.15	22.47	176.604	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	8.45	1.91	19.21	2.15	23.60	229.087	Vertical	Pass
		707.5	8.59	1.91	19.26	2.15	23.79	239.332	Vertical	Pass
		714.5	7.88	1.93	19.34	2.15	23.14	206.063	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	8.37	1.91	19.23	2.15	23.54	225.944	Vertical	Pass
		707.5	8.51	1.91	19.26	2.15	23.71	234.963	Vertical	Pass
		713.5	8.41	1.92	19.33	2.15	23.67	232.809	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	8.72	1.91	19.25	2.15	23.91	246.037	Vertical	Pass
		707.5	8.40	1.91	19.26	2.15	23.60	229.087	Vertical	Pass
		711	8.90	1.92	19.32	2.15	24.15	260.016	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	8.39	1.91	19.21	2.15	23.54	225.944	Horizontal	Pass
		707.5	8.70	1.91	19.26	2.15	23.90	245.471	Horizontal	Pass
		715.3	8.51	1.93	19.34	2.15	23.77	238.232	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	8.76	1.91	19.21	2.15	23.91	246.037	Horizontal	Pass
		707.5	8.76	1.91	19.26	2.15	23.96	248.886	Horizontal	Pass
		714.5	8.82	1.93	19.34	2.15	24.08	255.859	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	8.59	1.91	19.23	2.15	23.76	237.684	Horizontal	Pass
		707.5	8.41	1.91	19.26	2.15	23.61	229.615	Horizontal	Pass
		713.5	7.56	1.92	19.33	2.15	22.82	191.426	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	8.17	1.91	19.25	2.15	23.36	216.770	Horizontal	Pass
		707.5	9.00	1.91	19.26	2.15	24.20	263.027	Horizontal	Pass
		711	8.75	1.92	19.32	2.15	24.00	251.189	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							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correct ion (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	706.5	8.92	1.91	19.23	2.15	24.09	256.448	Vertical	Pass
		710	9.57	1.91	19.26	2.15	24.77	299.916	Vertical	Pass
		713.5	9.97	1.92	19.33	2.15	25.23	333.426	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	7.97	1.91	19.25	2.15	23.16	207.014	Vertical	Pass
		710	9.39	1.91	19.26	2.15	24.59	287.740	Vertical	Pass
		711	10.49	1.92	19.32	2.15	25.74	374.973	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	9.81	1.91	19.23	2.15	24.98	314.775	Horizontal	Pass
		710	10.26	1.91	19.26	2.15	25.46	351.560	Horizontal	Pass
		713.5	9.37	1.92	19.33	2.15	24.63	290.402	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	10.00	1.91	19.25	2.15	25.19	330.370	Horizontal	Pass
		710	9.89	1.91	19.26	2.15	25.09	322.849	Horizontal	Pass
		711	10.09	1.92	19.32	2.15	25.34	341.979	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/ RB Positi on	Freque ncy	Result							Concl usion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correct ion (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mi d	706.5	8.71	1.91	19.23	2.15	23.88	244.343	Vertical	Pass
		710	9.16	1.91	19.26	2.15	24.36	272.898	Vertical	Pass
		713.5	8.74	1.92	19.33	2.15	24.00	251.189	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mi d	709	8.58	1.91	19.25	2.15	23.77	238.232	Vertical	Pass
		710	7.76	1.91	19.26	2.15	22.96	197.697	Vertical	Pass
		711	8.78	1.92	19.32	2.15	24.03	252.930	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mi d	706.5	7.71	1.91	19.23	2.15	22.88	194.089	Horizontal	Pass
		710	8.86	1.91	19.26	2.15	24.06	254.683	Horizontal	Pass
		713.5	8.55	1.92	19.33	2.15	23.81	240.436	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mi d	709	8.49	1.91	19.25	2.15	23.68	233.346	Horizontal	Pass
		710	9.37	1.91	19.26	2.15	24.57	286.418	Horizontal	Pass
		711	9.16	1.92	19.32	2.15	24.41	276.058	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 Band 2
- 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	-51.21	4.04	33.51	-21.74	-13	-8.74	Horizontal
3701.4	-50.02	4.04	33.51	-20.55	-13	-7.55	Vertical
5552.1	-55.93	5.24	35.84	-25.33	-13	-12.33	Vertical
5552.1	-52.84	5.24	35.84	-22.24	-13	-9.24	Horizontal
153.7	-39.07	1.73	16.42	-24.38	-13	-11.38	Vertical
82.4	-38.54	1.73	16.49	-23.78	-13	-10.78	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.34	4.04	33.56	-19.82	-13	-6.82	Horizontal
3760.0	-50.20	4.04	33.56	-20.68	-13	-7.68	Vertical
5640.0	-48.43	5.24	35.91	-17.76	-13	-4.76	Vertical
5640.0	-53.25	5.24	35.91	-22.58	-13	-9.58	Horizontal
145.6	-47.28	1.62	17.42	-31.48	-13	-18.48	Vertical
172.3	-38.66	1.41	15.83	-24.24	-13	-11.24	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-52.46	4.04	34.00	-22.50	-13	-9.50	Horizontal
3818.6	-52.36	4.04	34.00	-22.40	-13	-9.40	Vertical
5727.9	-57.31	5.24	36.04	-26.51	-13	-13.51	Vertical
5727.9	-57.56	5.24	36.04	-26.76	-13	-13.76	Horizontal
265.2	-45.78	1.56	15.50	-31.84	-13	-18.84	Vertical
151.5	-39.94	1.70	15.13	-26.51	-13	-13.51	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	-50.21	4.07	33.54	-20.74	-13	-7.74	Horizontal
3720.0	-56.11	4.07	33.54	-26.64	-13	-13.64	Vertical
5580.0	-48.75	5.28	35.86	-18.17	-13	-5.17	Vertical
5580.0	-51.36	5.28	35.86	-20.78	-13	-7.78	Horizontal
191.5	-41.73	1.31	16.95	-26.09	-13	-13.09	Vertical
162.0	-41.31	1.73	16.16	-26.88	-13	-13.88	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.72	4.04	33.56	-19.20	-13	-6.20	Horizontal
3760.0	-53.60	4.04	33.56	-24.08	-13	-11.08	Vertical
5640.0	-50.35	5.24	35.91	-19.68	-13	-6.68	Vertical
5640.0	-53.05	5.24	35.91	-22.38	-13	-9.38	Horizontal
267.5	-37.61	1.55	15.18	-23.98	-13	-10.98	Vertical
273.2	-47.35	1.72	17.77	-31.30	-13	-18.30	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.22	4.04	34.00	-22.26	-13	-9.26	Horizontal
3800.0	-51.87	4.04	34.00	-21.91	-13	-8.91	Vertical
5700.0	-54.82	5.24	36.04	-24.02	-13	-11.02	Vertical
5700.0	-51.34	5.24	36.04	-20.54	-13	-7.54	Horizontal
177.5	-43.64	1.79	16.60	-28.83	-13	-15.83	Vertical
163.6	-40.99	1.70	16.67	-26.02	-13	-13.02	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	-49.16	4.02	29.80	-23.38	-13	-10.38	Horizontal
3421.4	-49.75	4.02	29.80	-23.97	-13	-10.97	Vertical
5132.1	-55.28	5.24	35.84	-24.68	-13	-11.68	Vertical
5132.1	-48.02	5.24	35.84	-17.42	-13	-4.42	Horizontal
102.7	-40.92	1.72	17.67	-24.97	-13	-11.97	Vertical
126.6	-43.38	1.35	16.16	-28.57	-13	-15.57	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-52.68	4.03	30.00	-26.71	-13	-13.71	Horizontal
3465.0	-50.45	4.03	30.00	-24.48	-13	-11.48	Vertical
5197.5	-55.71	5.25	35.86	-25.10	-13	-12.10	Vertical
5197.5	-51.45	5.25	35.86	-20.84	-13	-7.84	Horizontal
257.5	-41.29	1.54	17.99	-24.84	-13	-11.84	Vertical
153.4	-43.92	1.53	17.78	-27.67	-13	-14.67	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.68	4.05	30.01	-23.72	-13	-10.72	Horizontal
3508.6	-54.66	4.05	30.01	-28.70	-13	-15.70	Vertical
5262.9	-51.24	5.26	35.86	-20.64	-13	-7.64	Vertical
5262.9	-55.47	5.26	35.86	-24.87	-13	-11.87	Horizontal
109.2	-41.69	1.51	16.56	-26.64	-13	-13.64	Vertical
98.0	-48.12	1.38	17.80	-31.70	-13	-18.70	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	-49.04	4.02	29.80	-23.26	-13	-10.26	Horizontal
3440.0	-47.44	4.02	29.80	-21.66	-13	-8.66	Vertical
5160.0	-48.69	5.24	35.84	-18.09	-13	-5.09	Vertical
5160.0	-51.32	5.24	35.84	-20.72	-13	-7.72	Horizontal
214.4	-43.44	1.67	16.19	-28.92	-13	-15.92	Vertical
248.6	-40.81	1.67	16.47	-26.01	-13	-13.01	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.64	4.03	30.00	-24.67	-13	-11.67	Horizontal
3465.0	-49.71	4.03	30.00	-23.74	-13	-10.74	Vertical
5197.5	-48.11	5.25	35.86	-17.50	-13	-4.50	Vertical
5197.5	-53.04	5.25	35.86	-22.43	-13	-9.43	Horizontal
278.8	-39.43	1.74	15.42	-25.75	-13	-12.75	Vertical
157.2	-46.20	1.36	16.92	-30.64	-13	-17.64	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.18	2.91	27.68	-28.41	-13	-15.41	Horizontal
3490.0	-56.88	2.91	27.68	-32.11	-13	-19.11	Vertical
5235.0	-57.14	5.26	35.86	-26.54	-13	-13.54	Vertical
5235.0	-57.62	5.26	35.86	-27.02	-13	-14.02	Horizontal
276.2	-42.43	1.58	15.87	-28.14	-13	-15.14	Vertical
214.8	-44.41	1.32	17.23	-28.50	-13	-15.50	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	-55.65	2.78	27.50	-30.93	-13	-17.93	Horizontal
1649.4	-45.97	2.78	27.50	-21.25	-13	-8.25	Vertical
2474.1	-43.31	2.90	27.80	-18.41	-13	-5.41	Vertical
2474.1	-45.16	2.90	27.80	-20.26	-13	-7.26	Horizontal
153.5	-41.86	1.40	17.50	-25.76	-13	-12.76	Vertical
201.9	-39.45	1.45	15.57	-25.33	-13	-12.33	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-44.13	2.80	27.48	-19.45	-13	-6.45	Horizontal
1673.0	-50.92	2.80	27.48	-26.24	-13	-13.24	Vertical
2509.5	-47.39	2.91	27.70	-22.60	-13	-9.60	Vertical
2509.5	-48.34	2.91	27.70	-23.55	-13	-10.55	Horizontal
239.5	-45.05	1.38	17.48	-28.95	-13	-15.95	Vertical
277.9	-44.32	1.67	15.60	-30.39	-13	-17.39	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-45.90	2.82	27.43	-21.29	-13	-8.29	Horizontal
1696.6	-47.00	2.82	27.43	-22.39	-13	-9.39	Vertical
2544.9	-44.91	2.92	27.74	-20.09	-13	-7.09	Vertical
2544.9	-46.66	2.92	27.74	-21.84	-13	-8.84	Horizontal
278.4	-43.22	1.33	16.68	-27.87	-13	-14.87	Vertical
266.0	-45.63	1.66	16.98	-30.31	-13	-17.31	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	-49.94	2.78	27.50	-25.22	-13	-12.22	Horizontal
1658.0	-47.55	2.78	27.50	-22.83	-13	-9.83	Vertical
2487.0	-44.48	2.90	27.80	-19.58	-13	-6.58	Vertical
2487.0	-44.12	2.90	27.80	-19.22	-13	-6.22	Horizontal
128.1	-38.64	1.78	15.45	-24.97	-13	-11.97	Vertical
101.1	-38.73	1.53	15.99	-24.27	-13	-11.27	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-47.81	2.80	27.48	-23.13	-13	-10.13	Horizontal
1673.0	-49.92	2.80	27.48	-25.24	-13	-12.24	Vertical
2509.5	-47.05	2.91	27.70	-22.26	-13	-9.26	Vertical
2509.5	-46.10	2.91	27.70	-21.31	-13	-8.31	Horizontal
212.4	-39.44	1.50	17.87	-23.07	-13	-10.07	Vertical
141.7	-43.05	1.80	17.69	-27.16	-13	-14.16	Horizontal
Test Results for High Channel 844MHz							
1688.0	-50.04	2.82	27.43	-25.43	-13	-12.43	Horizontal
1688.0	-40.75	2.82	27.43	-16.14	-13	-3.14	Vertical
2532.0	-43.51	2.92	27.74	-18.69	-13	-5.69	Vertical
2532.0	-45.93	2.92	27.74	-21.11	-13	-8.11	Horizontal
271.1	-44.45	1.64	15.40	-30.69	-13	-17.69	Vertical
231.8	-46.40	1.70	15.93	-32.17	-13	-19.17	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	-68.75	5.23	35.81	-38.17	-25	-13.17	Horizontal
5005.0	-65.48	5.23	35.81	-34.90	-25	-9.90	Vertical
7507.5	-71.43	5.67	36.85	-40.25	-25	-15.25	Vertical
7507.5	-62.58	5.67	36.85	-31.40	-25	-6.40	Horizontal
231.1	-56.90	1.31	16.38	-41.83	-25	-16.83	Vertical
292.8	-54.86	1.69	15.25	-41.30	-25	-16.30	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.28	5.23	35.82	-32.69	-25	-7.69	Horizontal
5070.0	-65.26	5.23	35.82	-34.67	-25	-9.67	Vertical
7605.0	-65.28	5.67	36.85	-34.10	-25	-9.10	Vertical
7605.0	-64.24	5.67	36.85	-33.06	-25	-8.06	Horizontal
521.5	-49.97	1.44	16.16	-35.25	-25	-10.25	Vertical
208.0	-51.55	1.30	17.36	-35.49	-25	-10.49	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-67.38	5.24	35.83	-36.79	-25	-11.79	Horizontal
5135.0	-66.66	5.24	35.83	-36.07	-25	-11.07	Vertical
7702.5	-65.25	5.68	36.87	-34.06	-25	-9.06	Vertical
7702.5	-67.24	5.68	36.87	-36.05	-25	-11.05	Horizontal
381.0	-54.68	1.78	16.13	-40.33	-25	-15.33	Vertical
311.8	-51.62	1.63	15.33	-37.92	-25	-12.92	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	-64.69	5.23	35.82	-34.10	-25	-9.10	Horizontal
5020.0	-70.03	5.23	35.82	-39.44	-25	-14.44	Vertical
7530.0	-70.63	5.67	36.86	-39.44	-25	-14.44	Vertical
7530.0	-69.99	5.67	36.86	-38.80	-25	-13.80	Horizontal
258.6	-55.74	1.63	17.97	-39.40	-25	-14.40	Vertical
396.5	-53.15	1.56	16.27	-38.44	-25	-13.44	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.99	5.23	35.82	-33.40	-25	-8.40	Horizontal
5070.0	-69.94	5.23	35.82	-39.35	-25	-14.35	Vertical
7605.0	-71.49	5.67	36.85	-40.31	-25	-15.31	Vertical
7605.0	-64.11	5.67	36.85	-32.93	-25	-7.93	Horizontal
379.6	-54.58	1.75	18.00	-38.33	-25	-13.33	Vertical
392.9	-58.88	1.36	15.78	-44.46	-25	-19.46	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-67.08	5.24	35.83	-36.49	-25	-11.49	Horizontal
5120.0	-68.57	5.24	35.83	-37.98	-25	-12.98	Vertical
7680.0	-71.60	5.70	36.88	-40.42	-25	-15.42	Vertical
7680.0	-64.46	5.70	36.88	-33.28	-25	-8.28	Horizontal
409.4	-55.52	1.45	17.34	-39.63	-25	-14.63	Vertical
216.3	-53.66	1.52	17.02	-38.16	-25	-13.16	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	-47.28	2.60	27.20	-22.68	-13	-9.68	Horizontal
1399.4	-52.54	2.60	27.20	-27.94	-13	-14.94	Vertical
2099.1	-51.64	2.85	27.54	-26.95	-13	-13.95	Vertical
2099.1	-53.48	2.85	27.54	-28.79	-13	-15.79	Horizontal
172.6	-48.69	1.61	17.97	-32.33	-13	-19.33	Vertical
120.0	-43.21	1.78	16.20	-28.79	-13	-15.79	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.76	2.61	27.28	-20.09	-13	-7.09	Horizontal
1415.0	-49.56	2.61	27.28	-24.89	-13	-11.89	Vertical
2122.5	-48.03	2.87	27.59	-23.31	-13	-10.31	Vertical
2122.5	-46.15	2.87	27.59	-21.43	-13	-8.43	Horizontal
209.3	-46.66	1.55	17.74	-30.47	-13	-17.47	Vertical
243.6	-46.92	1.73	16.99	-31.66	-13	-18.66	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-42.82	2.63	27.28	-18.17	-13	-5.17	Horizontal
1430.6	-45.82	2.63	27.28	-21.17	-13	-8.17	Vertical
2145.9	-53.36	2.88	27.60	-28.64	-13	-15.64	Vertical
2145.9	-47.02	2.88	27.60	-22.30	-13	-9.30	Horizontal
81.5	-45.37	1.63	15.25	-31.75	-13	-18.75	Vertical
200.7	-39.26	1.33	15.19	-25.40	-13	-12.40	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	-45.20	2.61	27.26	-20.55	-13	-7.55	Horizontal
1408.0	-49.26	2.61	27.26	-24.61	-13	-11.61	Vertical
2112.0	-53.45	2.87	27.58	-28.74	-13	-15.74	Vertical
2112.0	-48.45	2.87	27.58	-23.74	-13	-10.74	Horizontal
98.2	-45.76	1.45	15.23	-31.98	-13	-18.98	Vertical
231.9	-44.57	1.50	17.61	-28.46	-13	-15.46	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-50.30	2.61	27.28	-25.63	-13	-12.63	Horizontal
1415.0	-45.91	2.61	27.28	-21.24	-13	-8.24	Vertical
2122.5	-48.46	2.87	27.59	-23.74	-13	-10.74	Vertical
2122.5	-46.83	2.87	27.59	-22.11	-13	-9.11	Horizontal
102.5	-39.46	1.79	17.94	-23.31	-13	-10.31	Vertical
265.0	-43.84	1.53	17.59	-27.78	-13	-14.78	Horizontal
Test Results for High Channel 711MHz							
1422.0	-42.58	2.62	27.28	-17.92	-13	-4.92	Horizontal
1422.0	-43.84	2.62	27.28	-19.18	-13	-6.18	Vertical
2133.0	-44.86	2.87	27.60	-20.13	-13	-7.13	Vertical
2133.0	-50.97	2.87	27.60	-26.24	-13	-13.24	Horizontal
245.2	-39.20	1.64	17.79	-23.05	-13	-10.05	Vertical
206.4	-41.34	1.54	17.73	-25.15	-13	-12.15	Horizontal

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

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

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

9.6 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-45.73	2.61	27.28	-21.06	-13	-8.06	Horizontal
1413.0	-49.92	2.61	27.28	-25.25	-13	-12.25	Vertical
2119.5	-47.93	2.87	27.59	-23.21	-13	-10.21	Vertical
2119.5	-46.48	2.87	27.59	-21.76	-13	-8.76	Horizontal
231.2	-47.70	1.75	18.00	-31.45	-13	-18.45	Vertical
144.0	-43.72	1.79	15.94	-29.57	-13	-16.57	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-49.14	2.62	27.30	-24.46	-13	-11.46	Horizontal
1420.0	-47.00	2.62	27.30	-22.32	-13	-9.32	Vertical
2130.0	-41.55	2.87	27.62	-16.80	-13	-3.80	Vertical
2130.0	-41.45	2.87	27.62	-16.70	-13	-3.70	Horizontal
83.5	-41.30	1.31	15.03	-27.58	-13	-14.58	Vertical
193.3	-39.17	1.75	17.39	-23.53	-13	-10.53	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-46.88	2.66	27.28	-22.26	-13	-9.26	Horizontal
1427.0	-47.75	2.66	27.28	-23.13	-13	-10.13	Vertical
2140.5	-43.36	2.88	27.60	-18.64	-13	-5.64	Vertical
2140.5	-52.88	2.88	27.60	-28.16	-13	-15.16	Horizontal
221.0	-48.23	1.37	17.42	-32.18	-13	-19.18	Vertical
163.2	-43.27	1.31	17.77	-26.81	-13	-13.81	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	-50.02	2.62	27.30	-25.34	-13	-12.34	Horizontal
1418.0	-53.63	2.62	27.30	-28.95	-13	-15.95	Vertical
2127.0	-54.38	2.87	27.62	-29.63	-13	-16.63	Vertical
2127.0	-53.99	2.87	27.62	-29.24	-13	-16.24	Horizontal
97.7	-42.99	1.43	15.67	-28.75	-13	-15.75	Vertical
184.6	-41.66	1.36	15.65	-27.37	-13	-14.37	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-46.99	2.62	27.30	-22.31	-13	-9.31	Horizontal
1420.0	-50.58	2.62	27.30	-25.90	-13	-12.90	Vertical
2130.0	-47.90	2.87	27.62	-23.15	-13	-10.15	Vertical
2130.0	-49.46	2.87	27.62	-24.71	-13	-11.71	Horizontal
155.0	-38.69	1.78	15.56	-24.91	-13	-11.91	Vertical
136.4	-45.88	1.69	16.07	-31.50	-13	-18.50	Horizontal
Test Results for High Channel 711MHz							
1422.0	-49.85	2.62	27.30	-25.17	-13	-12.17	Horizontal
1422.0	-47.85	2.62	27.30	-23.17	-13	-10.17	Vertical
2133.0	-54.64	2.87	27.62	-29.89	-13	-16.89	Vertical
2133.0	-49.74	2.87	27.62	-24.99	-13	-11.99	Horizontal
203.4	-46.16	1.37	17.29	-30.24	-13	-17.24	Vertical
129.8	-45.22	1.59	15.73	-31.08	-13	-18.08	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 3.4V, 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	4.3	0.002282	2.5
3.8	1880	23.2	0.012351	2.5
4.4	1880	16.1	0.008574	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	-8.1	-0.004282	2.5
Extreme (50C)	1880	-27.3	-0.014500	2.5
Extreme (40C)	1880	-18.0	-0.009596	2.5
Extreme (30C)	1880	-14.5	-0.007723	2.5
Extreme (10C)	1880	14.7	0.007814	2.5
Extreme (0C)	1880	15.4	0.008176	2.5
Extreme (-10C)	1880	16.2	0.008601	2.5
Extreme (-20C)	1880	-9.0	-0.004782	2.5
Extreme (-30C)	1880	25.0	0.013287	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	-5.9	-0.003117	2.5
3.8	1880	-20.3	-0.010819	2.5
4.4	1880	15.8	0.008383	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	12.8	0.006782	2.5
Extreme (50C)	1880	13.0	0.006899	2.5
Extreme (40C)	1880	-8.5	-0.004510638	2.5
Extreme (30C)	1880	4.3	0.002303191	2.5
Extreme (10C)	1880	-4.5	-0.002393617	2.5
Extreme (0C)	1880	1.3	0.000691489	2.5
Extreme (-10C)	1880	-23.0	-0.012218085	2.5
Extreme (-20C)	1880	23.2	0.012329787	2.5
Extreme (-30C)	1880	17.3	0.009212766	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	-9.0	-0.005166	2.5
3.8	1732.5	9.7	0.005593	2.5
4.4	1732.5	-15.9	-0.009160	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	19.2	0.011053	2.5
Extreme (50C)	1732.5	28.6	0.016514	2.5
Extreme (40C)	1732.5	25.9	0.014944	2.5
Extreme (30C)	1732.5	-23.2	-0.013380	2.5
Extreme (10C)	1732.5	-0.6	-0.000323	2.5
Extreme (0C)	1732.5	2.9	0.001691	2.5
Extreme (-10C)	1732.5	19.8	0.011452	2.5
Extreme (-20C)	1732.5	14.0	0.008087	2.5
Extreme (-30C)	1732.5	-13.4	-0.007711	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	26.5	0.015273	2.5
3.8	1732.5	14.7	0.008456	2.5
4.4	1732.5	-7.2	-0.004139	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	-12.2	-0.007048	2.5
Extreme (50C)	1732.5	7.1	0.004075	2.5
Extreme (40C)	1732.5	-16.1	-0.009316	2.5
Extreme (30C)	1732.5	-7.8	-0.004473	2.5
Extreme (10C)	1732.5	-19.0	-0.010949	2.5
Extreme (0C)	1732.5	15.3	0.008808	2.5
Extreme (-10C)	1732.5	12.7	0.007336	2.5
Extreme (-20C)	1732.5	10.8	0.006245	2.5
Extreme (-30C)	1732.5	19.3	0.011146	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	27.9	0.033401	2.5
3.8	836.5	11.8	0.014094	2.5
4.4	836.5	19.4	0.023192	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	30.2	0.036043	2.5
Extreme (50C)	836.5	25.0	0.029934	2.5
Extreme (40C)	836.5	-12.4	-0.014836	2.5
Extreme (30C)	836.5	-21.5	-0.025702	2.5
Extreme (10C)	836.5	-23.9	-0.028548	2.5
Extreme (0C)	836.5	14.6	0.017442	2.5
Extreme (-10C)	836.5	-14.9	-0.017776	2.5
Extreme (-20C)	836.5	-24.0	-0.028631	2.5
Extreme (-30C)	836.5	-23.3	-0.027902	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	30.6	0.036593	2.5
3.8	836.5	-5.2	-0.006204	2.5
4.4	836.5	-21.9	-0.026169	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	-12.2	-0.014537	2.5
Extreme (50C)	836.5	20.1	0.024029	2.5
Extreme (40C)	836.5	5.3	0.006324	2.5
Extreme (30C)	836.5	34.0	0.040622	2.5
Extreme (10C)	836.5	-11.0	-0.013186	2.5
Extreme (0C)	836.5	22.0	0.026312	2.5
Extreme (-10C)	836.5	18.4	0.021937	2.5
Extreme (-20C)	836.5	5.0	0.006025	2.5
Extreme (-30C)	836.5	11.8	0.014094	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	19.9	0.007838	2.5
3.8	2535	9.0	0.003566	2.5
4.4	2535	-19.1	-0.007531	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	14.4	0.005692	2.5
Extreme (50C)	2535	25.9	0.010229	2.5
Extreme (40C)	2535	14.9	0.005893	2.5
Extreme (30C)	2535	8.8	0.003487	2.5
Extreme (10C)	2535	-21.4	-0.008454	2.5
Extreme (0C)	2535	14.4	0.005696	2.5
Extreme (-10C)	2535	-19.4	-0.007657	2.5
Extreme (-20C)	2535	22.6	0.008915	2.5
Extreme (-30C)	2535	3.5	0.001385	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	26.3	0.010371	2.5
3.85	2535	-1.8	-0.000722	2.5
4.4	2535	33.9	0.013389	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	8.4	0.003298	2.5
Extreme (50C)	2535	2.4	0.000927	2.5
Extreme (40C)	2535	0.5	0.000197	2.5
Extreme (30C)	2535	-20.7	-0.008170	2.5
Extreme (10C)	2535	13.6	0.005353	2.5
Extreme (0C)	2535	-21.4	-0.008450	2.5
Extreme (-10C)	2535	9.6	0.003767	2.5
Extreme (-20C)	2535	29.0	0.011428	2.5
Extreme (-30C)	2535	-0.3	-0.000107	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	-18.5	-0.026134	2.5
3.8	707.5	24.4	0.034502	2.5
4.4	707.5	-2.6	-0.003703	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	-9.9	-0.014049	2.5
Extreme (50C)	707.5	16.0	0.022671	2.5
Extreme (40C)	707.5	-11.1	-0.015647	2.5
Extreme (30C)	707.5	-2.0	-0.002841	2.5
Extreme (10C)	707.5	-17.1	-0.024184	2.5
Extreme (0C)	707.5	17.4	0.024594	2.5
Extreme (-10C)	707.5	16.6	0.023463	2.5
Extreme (-20C)	707.5	-2.7	-0.003873	2.5
Extreme (-30C)	707.5	-16.2	-0.022855	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	14.0	0.019802	2.5
3.8	707.5	-17.2	-0.024254	2.5
4.4	707.5	14.5	0.020537	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	6.6	0.009258	2.5
Extreme (50C)	707.5	-15.8	-0.022304	2.5
Extreme (40C)	707.5	25.8	0.036452	2.5
Extreme (30C)	707.5	24.5	0.034671	2.5
Extreme (10C)	707.5	6.1	0.008678	2.5
Extreme (0C)	707.5	17.6	0.024933	2.5
Extreme (-10C)	707.5	18.9	0.026728	2.5
Extreme (-20C)	707.5	-17.0	-0.024028	2.5
Extreme (-30C)	707.5	27.4	0.038756	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	-26.0	-0.036606	2.5
3.8	710.0	-27.8	-0.039211	2.5
4.4	710.0	17.5	0.024606	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	18.3	0.025831	2.5
Extreme (50C)	710.0	18.6	0.026225	2.5
Extreme (40C)	710.0	18.0	0.025380	2.5
Extreme (30C)	710.0	9.2	0.013000	2.5
Extreme (10C)	710.0	-4.8	-0.006704	2.5
Extreme (0C)	710.0	15.8	0.022254	2.5
Extreme (-10C)	710.0	-18.9	-0.026648	2.5
Extreme (-20C)	710.0	-13.4	-0.018803	2.5
Extreme (-30C)	710.0	24.2	0.034014	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	29.6	0.041676	2.5
3.8	710.0	2.8	0.003944	2.5
4.4	710.0	19.3	0.027141	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	25.1	0.035394	2.5
Extreme (50C)	710.0	-14.1	-0.019789	2.5
Extreme (40C)	710.0	-19.9	-0.028085	2.5
Extreme (30C)	710.0	26.2	0.036930	2.5
Extreme (10C)	710.0	-10.2	-0.014408	2.5
Extreme (0C)	710.0	-21.8	-0.030648	2.5
Extreme (-10C)	710.0	28.7	0.040437	2.5
Extreme (-20C)	710.0	-0.6	-0.000803	2.5
Extreme (-30C)	710.0	12.1	0.017042	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

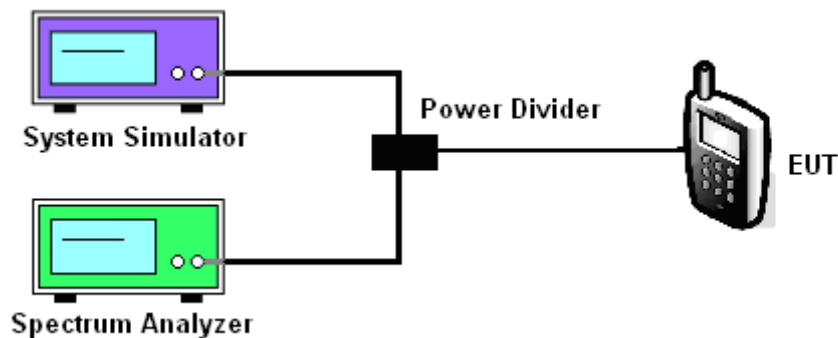
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

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

Test data reference attachment.

----END OF REPORT----