

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

FCC ID: 2A332-P8

Product: Data Processing Unit
Trade Mark: EKEMP
Model Number: P8
Family Model: M8,T80
Report No.: S21120301002006

Prepared for

EKEMP TECHNOLOGY (SHENZHEN) CO.,LTD.
9/F,A Tower ,Central Building,Xi'xiang Avenue, Bao'anDistrict,Shenzhen
518102,China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
1/F, Building E, Fenda Science Park, Sanwei Community,
Xixiang Street Bao'an District, Shenzhen 518126 P.R. China
Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090
Website: <http://www.ntek.org.cn>

TEST RESULT CERTIFICATION

Applicant's name : EKEMP TECHNOLOGY (SHENZHEN) CO.,LTD.

Address..... : 9/F,A Tower ,Central Building,Xi'xiang Avenue,
Bao'anDistrict,Shenzhen 518102,China

Manufacturer's Name..... : EKEMP TECHNOLOGY (SHENZHEN) CO.,LTD.

Address..... : 9/F,A Tower ,Central Building,Xi'xiang Avenue,
Bao'anDistrict,Shenzhen 518102,China

Product name..... : Data Processing Unit

Model and/or type reference .. : P8

Family Model: M8,T80

Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27

Test procedure : ANSI C63.26:2015

ANSI/TIA-603-E-2016

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

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

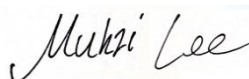
Date of Test

Date (s) of performance of tests..... Dec 03. 2021 ~Jan 07, 2022

Date of Issue Jan 07, 2022

Test Result..... **Pass**

Testing Engineer :



(Mukzi Lee)

Authorized Signatory :



(Alex Li)

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	5
1. GENERAL INFORMATION.....	5
1.1 PRODUCT DESCRIPTION	5
1.2 RELATED SUBMITTAL(S) / GRANT (S)	6
1.3 TEST METHODOLOGY.....	6
1.4 TEST FACILITY.....	6
MEASUREMENT UNCERTAINTY	6
1.5 SPECIAL ACCESSORIES.....	6
1.6 WORST-CASE CONFIGURATION AND MODE.....	6
1.7 SUMMARY OF TEST RESULTS	7
2. SYSTEM TEST CONFIGURATION	8
2.1 EUT CONFIGURATION.....	8
2.2 EUT EXERCISE	8
2.3 CONFIGURATION OF EUT SYSTEM.....	8
2.4 TEST SETUP	9
3.TEST AND MEASUREMENT EQUIPMENT	10
4. OUTPUT POWER.....	11
4.1 OUTPUT POWER MEASUREMENT	11
6. BANDEDGE AND EMISSION MASK	14
7. OUT OF BAND EMISSIONS	16
7.1 MEASUREMENT METHOD	16
8. RADIATED MEASUREMENT	17
8.1. RADIATED POWER (ERP & EIRP).....	17

8.2 LTE BAND 2.....	18
8.3 LTE BAND 4.....	22
8.4 LTE BAND 5.....	26
8.5 LTE BAND 7.....	28
8.6 LTE BAND 12	30
8.7 LTE BAND 17	32
9. SPURIOUS RADIATION EMISSION	34
9.1 LTE BAND 2.....	36
9.2 LTE BAND 4.....	38
9.3 LTE BAND 5.....	40
9.4 LTE BAND 7.....	42
9.5 LTE BAND 12	44
9.6 LTE BAND 17	46
10. FREQUENCY STABILITY	48
10.1 LTE BAND 2	49
10.2 LTE BAND 4	51
10.3 LTE BAND 5	53
10.4 LTE BAND 7	55
10.5 LTE BAND 12	57
10.6 LTE BAND 17	59
11. PEAK-TO-AVERAGE RATIO.....	61
11.1 Description of the PAR Measurement.....	61
11.2 Measuring Instruments	61
11.3 Test Procedures.....	61
11.4 Test Setup.....	62

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Data Processing Unit
Trade Mark	EKEMP
Model Name	P8
Family Model	M8,T80
Model Difference	All the model are the same circuit and RF module,the model of M8 and T80 has no printer.
FCC ID:	2A332-P8
Frequency Bands:	U.S. Bands: ☒ 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:	FPCB Antenna
Antenna gain:	LTE FDD Band 2 3.51dBi;LTE FDD Band 4 2.99dBi; LTE FDD Band 5 -2.57dBi;LTE-FDD Band 7 2.53dBi; LTE FDD Band 12 2.52dBi;LTE FDD Band 17 2.52dBi
Adapter	Moel: HJ-0503000K7-US Input: AC 100-240V~50/60Hz, 0.6A Output: DC 5.0V---3.0A, 15.0W
Battery	DC 3.8V, 10000mAh, 38Wh
Power supply	DC 3.8V from battery or DC 5V from Adapter.
Extreme Vol. Limits:	DC 3.23V to DC 4.37V (Nominal DC 3.8V) (Note 1)
HW Version	EKEMP P8T_V2.2
SW Version	N/A

** Note1: The High Voltage DC 4.37V and Low Voltage 3.23V 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: 2A332-P8** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.7 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27 KDB 971168 D01 Power Meas License Digital Systems v03r01			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50 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 KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50 KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50 KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 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(a) 24.238(a) 27.53 KDB 971168 D01 Clause 6	Conducted Emission	PASS	
Remark: 1. "N/A" denotes test is not applicable in this Test Report. 2. All test items were verified and recorded according to the standards and without any deviation during the test. 3. No modifications are made to the EUT during all test items.			

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Data Processing Unit	P8	FCC ID: 2A332-P8	EUT

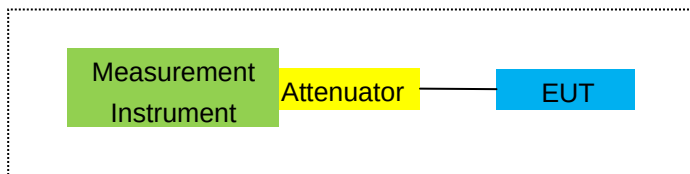
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

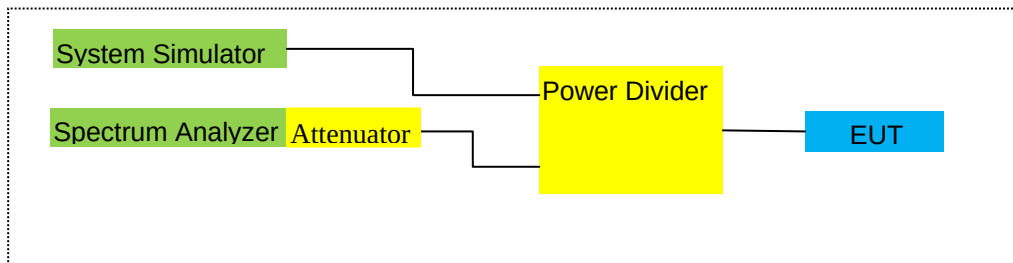
For Radiated Test Cases



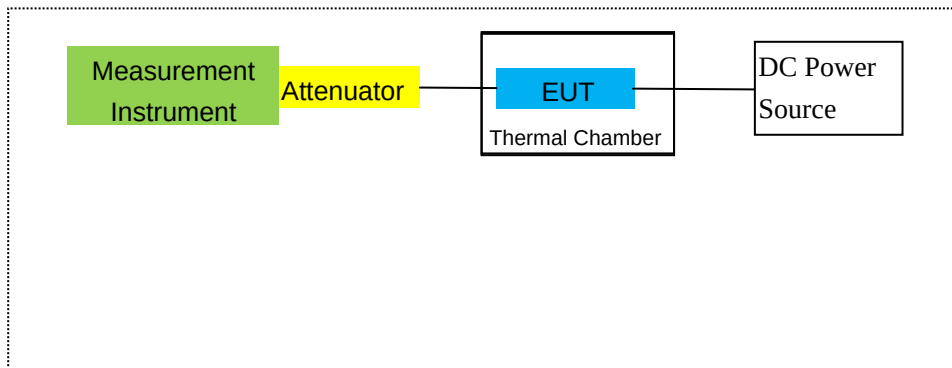
For Conducted Output Power



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



For Frequency Stability



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

3.TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2021.07.01	2022.06.30	1 year
2	Test Receiver	R&S	ESPI	101318	2021.04.27	2022.04.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2021.07.01	2022.06.30	1 year
7	Amplifier	EM	EM-30180	060538	2021.07.01	2022.06.30	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2021.04.27	2022.04.26	1 year
9	Power Meter	R&S	NRVS	100696	2021.07.01	2022.06.30	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2021.04.27	2022.04.26	1 year
11	Test Cable	N/A	R-01	N/A	2019.08.06	2022.08.05	3 year
12	Test Cable	N/A	R-02	N/A	2019.08.06	2022.08.05	3 year
13	Test Cable	N/A	R-03	N/A	2019.08.06	2022.08.05	3 year
14	Test Receiver	R&S	ESCI	101160	2021.04.27	2022.04.26	1 year
15	LISN	R&S	ENV216	101313	2021.04.27	2022.04.26	1 year
16	LISN	EMCO	3816/2	00042990	2021.04.27	2022.04.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2021.04.27	2022.04.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.05.11	2023.05.10	3 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Spectrum Analyzer	agilent	e4440a	us44300399	2021.04.27	2022.04.26	1 year
23	test receiver	R&S	ESCI	a0304218	2021.04.27	2022.04.26	1 year
24	Communication Tester	R&S	CMU200	A0304247	2021.04.27	2022.04.26	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2021.04.27	2022.04.26	1 year
26	DC Power Source	N/A	PS-6005D	20170402923	2020.05.11	2023.05.10	3 year

27	Communication Tester	R&S	CMW500	148500	2021.07.01	2022.06.30	1 year
----	----------------------	-----	--------	--------	------------	------------	--------

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

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

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

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

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

- ☐ 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, §22.901, §22.917, §24.238, §27.53, and FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

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

(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

- ☐ LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

1. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log (P)$ dB.

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/17
- ☐

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.

For LTE B7: The amplitude of spurious emissions from 26.5GHz~40GHz is attenuated by more than 20dB below the permissible limit, so it has no need to be reported

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/17

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	0.09	3.76	28.24	24.57	286.418	Horizontal	Pass
		1880	0.39	3.91	28.22	24.70	295.121	Horizontal	Pass
		1909.3	0.41	3.93	28.20	24.68	293.765	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	0.11	3.77	28.23	24.57	286.418	Horizontal	Pass
		1880	0.35	3.91	28.24	24.68	293.765	Horizontal	Pass
		1908.5	0.35	3.94	28.25	24.66	292.415	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	0.10	3.77	28.31	24.64	291.072	Horizontal	Pass
		1880	0.39	3.91	28.22	24.70	295.121	Horizontal	Pass
		1907.5	0.36	3.94	28.20	24.62	289.734	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	0.04	3.79	28.33	24.58	287.078	Horizontal	Pass
		1880	0.29	3.95	28.22	24.56	285.759	Horizontal	Pass
		1905	0.37	3.97	28.19	24.59	287.740	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	0.03	3.79	28.34	24.58	287.078	Horizontal	Pass
		1880	0.32	3.95	28.22	24.59	287.740	Horizontal	Pass
		1902.5	0.36	3.97	28.18	24.57	286.418	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	0.02	3.81	28.35	24.56	285.759	Horizontal	Pass
		1880	0.33	3.96	28.22	24.59	287.740	Horizontal	Pass
		1900	0.43	4.00	28.16	24.59	287.740	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	0.21	3.76	28.24	24.69	294.442	Vertical	Pass
		1880	0.37	3.91	28.22	24.68	293.765	Vertical	Pass
		1909.3	0.30	3.93	28.20	24.57	286.418	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	0.19	3.77	28.23	24.65	291.743	Vertical	Pass
		1880	0.26	3.91	28.24	24.59	287.740	Vertical	Pass
		1908.5	0.28	3.94	28.25	24.59	287.740	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	0.10	3.77	28.31	24.64	291.072	Vertical	Pass
		1880	0.28	3.91	28.22	24.59	287.740	Vertical	Pass
		1907.5	0.42	3.94	28.20	24.68	293.765	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	0.09	3.79	28.33	24.63	290.402	Vertical	Pass
		1880	0.43	3.95	28.22	24.70	295.121	Vertical	Pass
		1905	0.39	3.97	28.19	24.61	289.068	Vertical	Pass

15.0MHz	1/#Mid	1857.5	0.14	3.79	28.34	24.69	294.442	Vertical	Pass
Band		1880	0.30	3.95	28.22	24.57	286.418	Vertical	Pass
QPSK		1902.5	0.46	3.97	28.18	24.67	293.089	Vertical	Pass
20.0MHz	1/#Mid	1860	0.20	3.81	28.35	24.74	297.852	Vertical	Pass
Band		1880	0.48	3.96	28.22	24.74	297.852	Vertical	Pass
QPSK		1900	0.55	4.00	28.16	24.71	295.801	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

EIRP=ERP+2.15

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average		
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.87	3.76	28.24	23.61	229.615	Horizontal	Pass
		1880	-0.73	3.91	28.22	23.58	228.034	Horizontal	Pass
		1909.3	-0.69	3.93	28.20	23.58	228.034	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.80	3.77	28.23	23.66	232.274	Horizontal	Pass
		1880	-0.69	3.91	28.24	23.64	231.206	Horizontal	Pass
		1908.5	-0.65	3.94	28.25	23.66	232.274	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-0.89	3.77	28.31	23.65	231.739	Horizontal	Pass
		1880	-0.71	3.91	28.22	23.60	229.087	Horizontal	Pass
		1907.5	-0.66	3.94	28.20	23.60	229.087	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.89	3.79	28.33	23.65	231.739	Horizontal	Pass
		1880	-0.67	3.95	28.22	23.60	229.087	Horizontal	Pass
		1905	-0.51	3.97	28.19	23.71	234.963	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-0.97	3.79	28.34	23.58	228.034	Horizontal	Pass
		1880	-0.70	3.95	28.22	23.57	227.510	Horizontal	Pass
		1902.5	-0.64	3.97	28.18	23.57	227.510	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-0.85	3.81	28.35	23.69	233.884	Horizontal	Pass
		1880	-0.65	3.96	28.22	23.61	229.615	Horizontal	Pass
		1900	-0.46	4.00	28.16	23.70	234.423	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.91	3.76	28.24	23.57	227.510	Vertical	Pass
		1880	-0.70	3.91	28.22	23.61	229.615	Vertical	Pass
		1909.3	-0.61	3.93	28.20	23.66	232.274	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.90	3.77	28.23	23.56	226.986	Vertical	Pass
		1880	-0.64	3.91	28.24	23.69	233.884	Vertical	Pass
		1908.5	-0.72	3.94	28.25	23.59	228.560	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-0.98	3.77	28.31	23.56	226.986	Vertical	Pass
		1880	-0.65	3.91	28.22	23.66	232.274	Vertical	Pass
		1907.5	-0.72	3.94	28.20	23.54	225.944	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.86	3.79	28.33	23.68	233.346	Vertical	Pass
		1880	-0.68	3.95	28.22	23.59	228.560	Vertical	Pass
		1905	-0.63	3.97	28.19	23.59	228.560	Vertical	Pass
15.0MHz Band 16	1/#Mid	1857.5	-0.96	3.79	28.34	23.59	228.560	Vertical	Pass
		1880	-0.56	3.95	28.22	23.71	234.963	Vertical	Pass

QAM		1902.5	-0.54	3.97	28.18	23.67	232.809	Vertical	Pass
20.0MHz	1/#Mid	1860	-0.79	3.81	28.35	23.75	237.137	Vertical	Pass
Band 16		1880	-0.50	3.96	28.22	23.76	237.684	Vertical	Pass
QAM		1900	-0.44	4.00	28.16	23.72	235.505	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-0.91	3.12	27.58	23.55	226.464	Horizontal	Pass
		1732.5	-0.67	3.27	27.61	23.67	232.809	Horizontal	Pass
		1754.3	-0.78	3.29	27.63	23.56	226.986	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.82	3.13	27.61	23.66	232.274	Horizontal	Pass
		1732.5	-0.79	3.27	27.61	23.55	226.464	Horizontal	Pass
		1753.5	-0.66	3.30	27.62	23.66	232.274	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.97	3.13	27.63	23.53	225.424	Horizontal	Pass
		1732.5	-0.67	3.27	27.61	23.67	232.809	Horizontal	Pass
		1752.5	-0.64	3.30	27.60	23.66	232.274	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.85	3.15	27.64	23.64	231.206	Horizontal	Pass
		1732.5	-0.76	3.31	27.61	23.54	225.944	Horizontal	Pass
		1750	-0.66	3.33	27.59	23.60	229.087	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.81	3.15	27.65	23.69	233.884	Horizontal	Pass
		1732.5	-0.70	3.31	27.61	23.60	229.087	Horizontal	Pass
		1747.5	-0.67	3.33	27.57	23.57	227.510	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.98	3.17	27.66	23.51	224.388	Horizontal	Pass
		1732.5	-0.65	3.32	27.61	23.64	231.206	Horizontal	Pass
		1745	-0.52	3.36	27.56	23.68	233.346	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-0.86	3.12	27.58	23.60	229.087	Vertical	Pass
		1732.5	-0.77	3.27	27.61	23.57	227.510	Vertical	Pass
		1754.3	-0.71	3.29	27.63	23.63	230.675	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.91	3.13	27.61	23.57	227.510	Vertical	Pass
		1732.5	-0.80	3.27	27.61	23.54	225.944	Vertical	Pass
		1753.5	-0.70	3.30	27.62	23.62	230.144	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.97	3.13	27.63	23.53	225.424	Vertical	Pass
		1732.5	-0.82	3.27	27.61	23.52	224.905	Vertical	Pass
		1752.5	-0.74	3.30	27.60	23.56	226.986	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.88	3.15	27.64	23.61	229.615	Vertical	Pass
		1732.5	-0.70	3.31	27.61	23.60	229.087	Vertical	Pass
		1750	-0.64	3.33	27.59	23.62	230.144	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-0.96	3.15	27.65	23.54	225.944	Vertical	Pass
		1732.5	-0.71	3.31	27.61	23.59	228.560	Vertical	Pass
		1747.5	-0.66	3.33	27.57	23.58	228.034	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.78	3.17	27.66	23.71	234.963	Vertical	Pass
		1732.5	-0.57	3.32	27.61	23.72	235.505	Vertical	Pass
		1745	-0.48	3.36	27.56	23.72	235.505	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

EIRP=ERP+2.15

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-2.03	3.12	27.58	22.43	174.985	Horizontal	Pass
		1732.5	-1.92	3.27	27.61	22.42	174.582	Horizontal	Pass
		1754.3	-1.96	3.29	27.63	22.38	172.982	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.11	3.13	27.61	22.37	172.584	Horizontal	Pass
		1732.5	-1.99	3.27	27.61	22.35	171.791	Horizontal	Pass
		1753.5	-1.84	3.30	27.62	22.48	177.011	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-2.18	3.13	27.63	22.32	170.608	Horizontal	Pass
		1732.5	-1.98	3.27	27.61	22.36	172.187	Horizontal	Pass
		1752.5	-1.95	3.30	27.60	22.35	171.791	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-2.13	3.15	27.64	22.36	172.187	Horizontal	Pass
		1732.5	-1.90	3.31	27.61	22.40	173.780	Horizontal	Pass
		1750	-1.78	3.33	27.59	22.48	177.011	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.03	3.15	27.65	22.47	176.604	Horizontal	Pass
		1732.5	-1.91	3.31	27.61	22.39	173.380	Horizontal	Pass
		1747.5	-1.84	3.33	27.57	22.40	173.780	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-2.07	3.17	27.66	22.42	174.582	Horizontal	Pass
		1732.5	-1.97	3.32	27.61	22.32	170.608	Horizontal	Pass
		1745	-1.71	3.36	27.56	22.49	177.419	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-1.98	3.12	27.58	22.48	177.011	Vertical	Pass
		1732.5	-2.00	3.27	27.61	22.34	171.396	Vertical	Pass
		1754.3	-1.89	3.29	27.63	22.45	175.792	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.11	3.13	27.61	22.37	172.584	Vertical	Pass
		1732.5	-1.89	3.27	27.61	22.45	175.792	Vertical	Pass
		1753.5	-1.99	3.30	27.62	22.33	171.002	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-2.02	3.13	27.63	22.48	177.011	Vertical	Pass
		1732.5	-1.91	3.27	27.61	22.43	174.985	Vertical	Pass
		1752.5	-1.89	3.30	27.60	22.41	174.181	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-2.02	3.15	27.64	22.47	176.604	Vertical	Pass
		1732.5	-1.85	3.31	27.61	22.45	175.792	Vertical	Pass
		1750	-1.89	3.33	27.59	22.37	172.584	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.04	3.15	27.65	22.46	176.198	Vertical	Pass
		1732.5	-1.87	3.31	27.61	22.43	174.985	Vertical	Pass
		1747.5	-1.85	3.33	27.57	22.39	173.380	Vertical	Pass

20.0MHz	1/#Mid	1720	-1.98	3.17	27.66	22.51	178.238	Vertical	Pass
Band 16		1732.5	-1.78	3.32	27.61	22.51	178.238	Vertical	Pass
QAM		1745	-1.70	3.36	27.56	22.50	177.828	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	824.7	2.45	2.01	19.68	2.15	17.97	62.661	Horizontal	Pass
		836.5	2.41	2.01	19.77	2.15	18.02	63.387	Horizontal	Pass
		848.3	2.28	2.02	19.82	2.15	17.93	62.087	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	2.45	2.01	19.70	2.15	17.99	62.951	Horizontal	Pass
		836.5	2.40	2.01	19.77	2.15	18.01	63.241	Horizontal	Pass
		847.5	2.29	2.02	19.81	2.15	17.93	62.087	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	2.43	2.01	19.71	2.15	17.98	62.806	Horizontal	Pass
		836.5	2.28	2.01	19.77	2.15	17.89	61.518	Horizontal	Pass
		846.5	2.26	2.02	19.79	2.15	17.88	61.376	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	2.39	2.01	19.73	2.15	17.96	62.517	Horizontal	Pass
		836.5	2.40	2.01	19.77	2.15	18.01	63.241	Horizontal	Pass
		844	2.31	2.02	19.78	2.15	17.92	61.944	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	2.38	2.01	19.68	2.15	17.90	61.660	Vertical	Pass
		836.5	2.42	2.01	19.77	2.15	18.03	63.533	Vertical	Pass
		848.3	2.32	2.02	19.82	2.15	17.97	62.661	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	2.48	2.01	19.70	2.15	18.02	63.387	Vertical	Pass
		836.5	2.40	2.01	19.77	2.15	18.01	63.241	Vertical	Pass
		847.5	2.37	2.02	19.81	2.15	18.01	63.241	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	2.47	2.01	19.71	2.15	18.02	63.387	Vertical	Pass
		836.5	2.27	2.01	19.77	2.15	17.88	61.376	Vertical	Pass
		846.5	2.39	2.02	19.79	2.15	18.01	63.241	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	2.47	2.01	19.73	2.15	18.04	63.680	Vertical	Pass
		836.5	2.45	2.01	19.77	2.15	18.06	63.973	Vertical	Pass
		844	2.42	2.02	19.78	2.15	18.03	63.533	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (ERP) for Band 5										
Mode	RB/R B SIZE	Frequenc y	Result							Conclus ion
			SG Level	Cable Loss (dBm)	Antenn a Gain (dB)	Correctio n	Max. ERP	Max. ERP	Polarizatio n Of Max. ERP	
						(dB)	Averag e	Average		
								(dBm)		
1.4MHz Band 16QAM	1/#Mid	824.7	1.38	2.01	19.68	2.15	16.90	48.978	Horizontal	Pass
		836.5	1.18	2.01	19.77	2.15	16.79	47.753	Horizontal	Pass
		848.3	1.25	2.02	19.82	2.15	16.90	48.978	Horizontal	Pass
3.0MHz Band 16QAM	1/#Mid	825.5	1.36	2.01	19.70	2.15	16.90	48.978	Horizontal	Pass
		836.5	1.25	2.01	19.77	2.15	16.86	48.529	Horizontal	Pass
		847.5	1.21	2.02	19.81	2.15	16.85	48.417	Horizontal	Pass
5.0MHz Band 16QAM	1/#Mid	826.5	1.30	2.01	19.71	2.15	16.85	48.417	Horizontal	Pass
		836.5	1.15	2.01	19.77	2.15	16.76	47.424	Horizontal	Pass
		846.5	1.25	2.02	19.79	2.15	16.87	48.641	Horizontal	Pass
10.0Hz Band 16QAM	1/#Mid	829	1.22	2.01	19.73	2.15	16.79	47.753	Horizontal	Pass
		836.5	1.25	2.01	19.77	2.15	16.86	48.529	Horizontal	Pass
		844	1.22	2.02	19.78	2.15	16.83	48.195	Horizontal	Pass
1.4MHz Band 16QAM	1/#Mid	824.7	1.30	2.01	19.68	2.15	16.82	48.084	Vertical	Pass
		836.5	1.30	2.01	19.77	2.15	16.91	49.091	Vertical	Pass
		848.3	1.21	2.02	19.82	2.15	16.86	48.529	Vertical	Pass
3.0MHz Band 16QAM	1/#Mid	825.5	1.39	2.01	19.70	2.15	16.93	49.317	Vertical	Pass
		836.5	1.31	2.01	19.77	2.15	16.92	49.204	Vertical	Pass
		847.5	1.24	2.02	19.81	2.15	16.88	48.753	Vertical	Pass
5.0MHz Band 16QAM	1/#Mid	826.5	1.27	2.01	19.71	2.15	16.82	48.084	Vertical	Pass
		836.5	1.19	2.01	19.77	2.15	16.80	47.863	Vertical	Pass
		846.5	1.19	2.02	19.79	2.15	16.81	47.973	Vertical	Pass
10.0Hz Band 16QAM	1/#Mid	829	1.37	2.01	19.73	2.15	16.94	49.431	Vertical	Pass
		836.5	1.32	2.01	19.77	2.15	16.93	49.317	Vertical	Pass
		844	1.34	2.02	19.78	2.15	16.95	49.545	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP=EIRP-1.15

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	0.99	4.54	27.75	24.20	263.027	Horizontal	Pass
		2535	1.25	4.69	27.72	24.28	267.917	Horizontal	Pass
		2567.5	1.22	4.71	27.71	24.22	264.241	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	1.08	4.55	27.76	24.29	268.534	Horizontal	Pass
		2535	1.19	4.69	27.72	24.22	264.241	Horizontal	Pass
		2565	1.25	4.72	27.70	24.23	264.850	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.09	4.55	27.77	24.31	269.774	Horizontal	Pass
		2535	1.20	4.69	27.72	24.23	264.850	Horizontal	Pass
		2562.5	1.30	4.72	27.69	24.27	267.301	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.05	4.57	27.78	24.26	266.686	Horizontal	Pass
		2535	1.23	4.73	27.72	24.22	264.241	Horizontal	Pass
		2560	1.37	4.75	27.68	24.30	269.153	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	1.02	4.54	27.75	24.23	264.850	Vertical	Pass
		2535	1.23	4.69	27.72	24.26	266.686	Vertical	Pass
		2567.5	1.27	4.71	27.71	24.27	267.301	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	1.10	4.55	27.76	24.31	269.774	Vertical	Pass
		2535	1.19	4.69	27.72	24.22	264.241	Vertical	Pass
		2565	1.21	4.72	27.70	24.19	262.422	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.05	4.55	27.77	24.27	267.301	Vertical	Pass
		2535	1.18	4.69	27.72	24.21	263.633	Vertical	Pass
		2562.5	1.23	4.72	27.69	24.20	263.027	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.14	4.57	27.78	24.35	272.270	Vertical	Pass
		2535	1.38	4.73	27.72	24.37	273.527	Vertical	Pass
		2560	1.45	4.75	27.68	24.38	274.157	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	0.31	4.54	27.75	23.52	224.905	Horizontal	Pass
		2535	0.38	4.69	27.72	23.41	219.280	Horizontal	Pass
		2567.5	0.40	4.71	27.71	23.40	218.776	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	0.19	4.55	27.76	23.40	218.776	Horizontal	Pass
		2535	0.47	4.69	27.72	23.50	223.872	Horizontal	Pass
		2565	0.51	4.72	27.70	23.49	223.357	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.31	4.55	27.77	23.53	225.424	Horizontal	Pass
		2535	0.49	4.69	27.72	23.52	224.905	Horizontal	Pass
		2562.5	0.47	4.72	27.69	23.44	220.800	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.23	4.57	27.78	23.44	220.800	Horizontal	Pass
		2535	0.43	4.73	27.72	23.42	219.786	Horizontal	Pass
		2560	0.54	4.75	27.68	23.47	222.331	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	0.22	4.54	27.75	23.43	220.293	Vertical	Pass
		2535	0.46	4.69	27.72	23.49	223.357	Vertical	Pass
		2567.5	0.44	4.71	27.71	23.44	220.800	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	0.27	4.55	27.76	23.48	222.844	Vertical	Pass
		2535	0.40	4.69	27.72	23.43	220.293	Vertical	Pass
		2565	0.48	4.72	27.70	23.46	221.820	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.26	4.55	27.77	23.48	222.844	Vertical	Pass
		2535	0.34	4.69	27.72	23.37	217.270	Vertical	Pass
		2562.5	0.40	4.72	27.69	23.37	217.270	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.34	4.57	27.78	23.55	226.464	Vertical	Pass
		2535	0.58	4.73	27.72	23.57	227.510	Vertical	Pass
		2560	0.62	4.75	27.68	23.55	226.464	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

EIRP=ERP+2.15

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	699.7	8.86	1.91	19.21	2.15	24.01	251.768	Vertical	Pass
		707.5	8.80	1.91	19.26	2.15	24.00	251.189	Vertical	Pass
		715.3	8.71	1.93	19.34	2.15	23.97	249.459	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	8.85	1.91	19.21	2.15	24.00	251.189	Vertical	Pass
		707.5	8.80	1.91	19.26	2.15	24.00	251.189	Vertical	Pass
		714.5	8.65	1.93	19.34	2.15	23.91	246.037	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	8.76	1.91	19.23	2.15	23.93	247.172	Vertical	Pass
		707.5	8.66	1.91	19.26	2.15	23.86	243.220	Vertical	Pass
		713.5	8.74	1.92	19.33	2.15	24.00	251.189	Vertical	Pass
10.0Hz Band QPSK	1/#Mid	704	8.73	1.91	19.25	2.15	23.92	246.604	Vertical	Pass
		707.5	8.82	1.91	19.26	2.15	24.02	252.348	Vertical	Pass
		711	8.75	1.92	19.32	2.15	24.00	251.189	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	8.81	1.91	19.21	2.15	23.96	248.886	Horizontal	Pass
		707.5	8.81	1.91	19.26	2.15	24.01	251.768	Horizontal	Pass
		715.3	8.68	1.93	19.34	2.15	23.94	247.742	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	8.85	1.91	19.21	2.15	24.00	251.189	Horizontal	Pass
		707.5	8.70	1.91	19.26	2.15	23.90	245.471	Horizontal	Pass
		714.5	8.69	1.93	19.34	2.15	23.95	248.313	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	8.70	1.91	19.23	2.15	23.87	243.781	Horizontal	Pass
		707.5	8.66	1.91	19.26	2.15	23.86	243.220	Horizontal	Pass
		713.5	8.68	1.92	19.33	2.15	23.94	247.742	Horizontal	Pass
10.0Hz Band QPSK	1/#Mid	704	8.85	1.91	19.25	2.15	24.04	253.513	Horizontal	Pass
		707.5	8.85	1.91	19.26	2.15	24.05	254.097	Horizontal	Pass
		711	8.79	1.92	19.32	2.15	24.04	253.513	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16QAM	1/#Mid	699.7	7.84	1.91	19.21	2.15	22.99	199.067	Vertical	Pass
		707.5	7.73	1.91	19.26	2.15	22.93	196.336	Vertical	Pass
		715.3	7.68	1.93	19.34	2.15	22.94	196.789	Vertical	Pass
3.0MHz Band 16QAM	1/#Mid	700.5	7.85	1.91	19.21	2.15	23.00	199.526	Vertical	Pass
		707.5	7.79	1.91	19.26	2.15	22.99	199.067	Vertical	Pass
		714.5	7.70	1.93	19.34	2.15	22.96	197.697	Vertical	Pass
5.0MHz Band 16QAM	1/#Mid	701.5	7.73	1.91	19.23	2.15	22.90	194.984	Vertical	Pass
		707.5	7.80	1.91	19.26	2.15	23.00	199.526	Vertical	Pass
		713.5	7.71	1.92	19.33	2.15	22.97	198.153	Vertical	Pass
10.0MHz Band 16QAM	1/#Mid	704	7.78	1.91	19.25	2.15	22.97	198.153	Vertical	Pass
		707.5	7.70	1.91	19.26	2.15	22.90	194.984	Vertical	Pass
		711	7.61	1.92	19.32	2.15	22.86	193.197	Vertical	Pass
1.4MHz Band 16QAM	1/#Mid	699.7	7.84	1.91	19.21	2.15	22.99	199.067	Horizontal	Pass
		707.5	7.71	1.91	19.26	2.15	22.91	195.434	Horizontal	Pass
		715.3	7.76	1.93	19.34	2.15	23.02	200.447	Horizontal	Pass
3.0MHz Band 16QAM	1/#Mid	700.5	7.83	1.91	19.21	2.15	22.98	198.609	Horizontal	Pass
		707.5	7.75	1.91	19.26	2.15	22.95	197.242	Horizontal	Pass
		714.5	7.68	1.93	19.34	2.15	22.94	196.789	Horizontal	Pass
5.0MHz Band 16QAM	1/#Mid	701.5	7.82	1.91	19.23	2.15	22.99	199.067	Horizontal	Pass
		707.5	7.71	1.91	19.26	2.15	22.91	195.434	Horizontal	Pass
		713.5	7.61	1.92	19.33	2.15	22.87	193.642	Horizontal	Pass
10.0Hz Band 16QAM	1/#Mid	704	7.85	1.91	19.25	2.15	23.04	201.372	Horizontal	Pass
		707.5	7.86	1.91	19.26	2.15	23.06	202.302	Horizontal	Pass
		711	7.80	1.92	19.32	2.15	23.05	201.837	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

ERP=EIRP-1.15

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor Gain	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
5.0MHz Band QPSK	25/0	706.5	8.84	1.91	19.23	2.15	24.01	251.768	Vertical	Pass
		710	8.82	1.91	19.26	2.15	24.02	252.348	Vertical	Pass
		713.5	8.69	1.92	19.33	2.15	23.95	248.313	Vertical	Pass
10.0MHz Band QPSK	50/0	709	8.74	1.91	19.25	2.15	23.93	247.172	Vertical	Pass
		710	8.81	1.91	19.26	2.15	24.01	251.768	Vertical	Pass
		711	8.70	1.92	19.32	2.15	23.95	248.313	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	8.82	1.91	19.23	2.15	23.99	250.611	Horizontal	Pass
		710	8.78	1.91	19.26	2.15	23.98	250.035	Horizontal	Pass
		713.5	8.69	1.92	19.33	2.15	23.95	248.313	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	8.84	1.91	19.25	2.15	24.03	252.930	Horizontal	Pass
		710	8.83	1.91	19.26	2.15	24.03	252.930	Horizontal	Pass
		711	8.78	1.92	19.32	2.15	24.03	252.930	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor Gain	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
						(dB)	(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	706.5	7.71	1.91	19.23	2.15	22.88	194.089	Vertical	Pass
		710	7.80	1.91	19.26	2.15	23.00	199.526	Vertical	Pass
		713.5	7.67	1.92	19.33	2.15	22.93	196.336	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	7.75	1.91	19.25	2.15	22.94	196.789	Vertical	Pass
		710	7.67	1.91	19.26	2.15	22.87	193.642	Vertical	Pass
		711	7.72	1.92	19.32	2.15	22.97	198.153	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	7.76	1.91	19.23	2.15	22.93	196.336	Horizontal	Pass
		710	7.81	1.91	19.26	2.15	23.01	199.986	Horizontal	Pass
		713.5	7.63	1.92	19.33	2.15	22.89	194.536	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	7.86	1.91	19.25	2.15	23.05	201.837	Horizontal	Pass
		710	7.84	1.91	19.26	2.15	23.04	201.372	Horizontal	Pass
		711	7.81	1.92	19.32	2.15	23.06	202.302	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

ERP=EIRP-1.15

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

§22.917 (e) and §24.238 and §90.691 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

TEST PROCEDURE

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

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ 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	-53.94	4.04	33.51	-24.47	-13	-11.47	Horizontal
3701.4	-47.86	4.04	33.51	-18.39	-13	-5.39	Vertical
5552.1	-49.89	5.24	35.84	-19.29	-13	-6.29	Vertical
5552.1	-49.07	5.24	35.84	-18.47	-13	-5.47	Horizontal
183.0	-38.15	1.43	16.02	-23.56	-13	-10.56	Vertical
444.6	-37.41	1.30	17.99	-20.72	-13	-7.72	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.44	4.04	33.56	-18.92	-13	-5.92	Horizontal
3760.0	-47.46	4.04	33.56	-17.94	-13	-4.94	Vertical
5640.0	-53.83	5.24	35.91	-23.16	-13	-10.16	Vertical
5640.0	-50.76	5.24	35.91	-20.09	-13	-7.09	Horizontal
191.2	-43.15	1.62	16.97	-27.80	-13	-14.80	Vertical
300.9	-41.46	1.74	15.98	-27.23	-13	-14.23	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-53.83	4.04	34.00	-23.87	-13	-10.87	Horizontal
3818.6	-46.09	4.04	34.00	-16.13	-13	-3.13	Vertical
5727.9	-49.04	5.24	36.04	-18.24	-13	-5.24	Vertical
5727.9	-49.44	5.24	36.04	-18.64	-13	-5.64	Horizontal
200.4	-39.39	1.42	17.29	-23.52	-13	-10.52	Vertical
411.8	-42.93	1.50	17.90	-26.52	-13	-13.52	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	-45.09	4.07	33.54	-15.62	-13	-2.62	Horizontal
3720.0	-44.19	4.07	33.54	-14.72	-13	-1.72	Vertical
5580.0	-46.29	5.28	35.86	-15.71	-13	-2.71	Vertical
5580.0	-49.57	5.28	35.86	-18.99	-13	-5.99	Horizontal
175.4	-43.48	1.58	16.89	-28.16	-13	-15.16	Vertical
321.2	-36.11	1.76	17.26	-20.61	-13	-7.61	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.90	4.04	33.56	-19.38	-13	-6.38	Horizontal
3760.0	-48.52	4.04	33.56	-19.00	-13	-6.00	Vertical
5640.0	-50.72	5.24	35.91	-20.05	-13	-7.05	Vertical
5640.0	-50.33	5.24	35.91	-19.66	-13	-6.66	Horizontal
177.2	-38.07	1.46	16.27	-23.26	-13	-10.26	Vertical
283.4	-39.85	1.59	15.15	-26.29	-13	-13.29	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-48.56	4.04	34.00	-18.60	-13	-5.60	Horizontal
3800.0	-45.74	4.04	34.00	-15.78	-13	-2.78	Vertical
5700.0	-46.84	5.24	36.04	-16.04	-13	-3.04	Vertical
5700.0	-53.80	5.24	36.04	-23.00	-13	-10.00	Horizontal
176.2	-38.28	1.36	17.39	-22.24	-13	-9.24	Vertical
247.3	-42.16	1.66	15.39	-28.43	-13	-15.43	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-50.29	4.02	29.80	-24.51	-13	-11.51	Horizontal
3421.4	-44.12	4.02	29.80	-18.34	-13	-5.34	Vertical
5132.1	-52.71	5.24	35.84	-22.11	-13	-9.11	Vertical
5132.1	-53.35	5.24	35.84	-22.75	-13	-9.75	Horizontal
190.9	-44.54	1.68	16.04	-30.18	-13	-17.18	Vertical
449.5	-40.15	1.78	17.74	-24.19	-13	-11.19	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.48	4.03	30.00	-22.51	-13	-9.51	Horizontal
3465.0	-50.72	4.03	30.00	-24.75	-13	-11.75	Vertical
5197.5	-52.89	5.25	35.86	-22.28	-13	-9.28	Vertical
5197.5	-50.88	5.25	35.86	-20.27	-13	-7.27	Horizontal
198.7	-36.62	1.72	17.69	-20.65	-13	-7.65	Vertical
352.0	-40.81	1.62	16.02	-26.40	-13	-13.40	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.30	4.05	30.01	-23.34	-13	-10.34	Horizontal
3508.6	-45.00	4.05	30.01	-19.04	-13	-6.04	Vertical
5262.9	-52.88	5.26	35.86	-22.28	-13	-9.28	Vertical
5262.9	-51.76	5.26	35.86	-21.16	-13	-8.16	Horizontal
202.0	-44.36	1.80	16.69	-29.47	-13	-16.47	Vertical
370.2	-44.56	1.75	16.66	-29.66	-13	-16.66	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-51.52	4.02	29.80	-25.74	-13	-12.74	Horizontal
3440.0	-46.89	4.02	29.80	-21.11	-13	-8.11	Vertical
5160.0	-53.07	5.24	35.84	-22.47	-13	-9.47	Vertical
5160.0	-50.49	5.24	35.84	-19.89	-13	-6.89	Horizontal
208.4	-34.59	1.57	17.26	-18.90	-13	-5.90	Vertical
301.6	-43.78	1.78	16.35	-29.21	-13	-16.21	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.49	4.03	30.00	-27.52	-13	-14.52	Horizontal
3465.0	-49.26	4.03	30.00	-23.29	-13	-10.29	Vertical
5197.5	-51.01	5.25	35.86	-20.40	-13	-7.40	Vertical
5197.5	-53.86	5.25	35.86	-23.25	-13	-10.25	Horizontal
198.8	-41.61	1.44	17.95	-25.10	-13	-12.10	Vertical
461.9	-34.03	1.65	16.09	-19.59	-13	-6.59	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-52.89	4.05	27.68	-29.26	-13	-16.26	Horizontal
3490.0	-44.36	4.05	27.68	-20.73	-13	-7.73	Vertical
5235.0	-47.16	5.26	35.86	-16.56	-13	-3.56	Vertical
5235.0	-49.28	5.26	35.86	-18.68	-13	-5.68	Horizontal
196.1	-42.89	1.61	16.85	-27.65	-13	-14.65	Vertical
253.1	-36.84	1.61	15.19	-23.26	-13	-10.26	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-45.44	2.78	27.50	-20.72	-13	-7.72	Horizontal
1649.4	-50.87	2.78	27.50	-26.15	-13	-13.15	Vertical
2474.1	-52.24	2.90	27.80	-27.34	-13	-14.34	Vertical
2474.1	-50.13	2.90	27.80	-25.23	-13	-12.23	Horizontal
193.0	-42.72	1.76	17.59	-26.89	-13	-13.89	Vertical
325.0	-39.03	1.63	15.87	-24.79	-13	-11.79	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-48.49	2.80	27.48	-23.81	-13	-10.81	Horizontal
1673.0	-53.96	2.80	27.48	-29.28	-13	-16.28	Vertical
2509.5	-44.88	2.91	27.70	-20.09	-13	-7.09	Vertical
2509.5	-50.63	2.91	27.70	-25.84	-13	-12.84	Horizontal
181.2	-42.72	1.61	15.68	-28.65	-13	-15.65	Vertical
290.5	-43.65	1.59	17.52	-27.73	-13	-14.73	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.43	2.82	27.43	-27.82	-13	-14.82	Horizontal
1696.6	-45.40	2.82	27.43	-20.79	-13	-7.79	Vertical
2544.9	-45.45	2.92	27.74	-20.63	-13	-7.63	Vertical
2544.9	-49.24	2.92	27.74	-24.42	-13	-11.42	Horizontal
179.1	-38.75	1.69	16.67	-23.76	-13	-10.76	Vertical
297.0	-35.33	1.70	17.18	-19.85	-13	-6.85	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	-44.71	2.78	27.50	-19.99	-13	-6.99	Horizontal
1658.0	-44.42	2.78	27.50	-19.70	-13	-6.70	Vertical
2487.0	-49.52	2.90	27.80	-24.62	-13	-11.62	Vertical
2487.0	-50.57	2.90	27.80	-25.67	-13	-12.67	Horizontal
201.8	-43.01	1.71	15.57	-29.15	-13	-16.15	Vertical
414.0	-37.80	1.34	16.40	-22.74	-13	-9.74	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-50.38	2.80	27.48	-25.70	-13	-12.70	Horizontal
1673.0	-53.04	2.80	27.48	-28.36	-13	-15.36	Vertical
2509.5	-47.47	2.91	27.70	-22.68	-13	-9.68	Vertical
2509.5	-49.93	2.91	27.70	-25.14	-13	-12.14	Horizontal
183.9	-38.27	1.44	17.04	-22.67	-13	-9.67	Vertical
278.6	-36.67	1.76	17.62	-20.81	-13	-7.81	Horizontal
Test Results for High Channel 844MHz							
1688.0	-52.15	2.82	27.43	-27.54	-13	-14.54	Horizontal
1688.0	-48.05	2.82	27.43	-23.44	-13	-10.44	Vertical
2532.0	-51.45	2.92	27.74	-26.63	-13	-13.63	Vertical
2532.0	-49.43	2.92	27.74	-24.61	-13	-11.61	Horizontal
197.5	-37.46	1.74	17.70	-21.50	-13	-8.50	Vertical
390.7	-42.94	1.41	17.46	-26.88	-13	-13.88	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.

9.4 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	-59.92	5.23	35.81	-29.34	-25	-4.34	Horizontal
5005.0	-61.04	5.23	35.81	-30.46	-25	-5.46	Vertical
7507.5	-60.52	5.67	36.85	-29.34	-25	-4.34	Vertical
7507.5	-62.31	5.67	36.85	-31.13	-25	-6.13	Horizontal
211.7	-50.74	1.73	17.97	-34.50	-25	-9.50	Vertical
450.8	-44.66	1.38	15.11	-30.93	-25	-5.93	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.31	5.23	35.82	-33.72	-25	-8.72	Horizontal
5070.0	-59.46	5.23	35.82	-28.87	-25	-3.87	Vertical
7605.0	-60.64	5.67	36.85	-29.46	-25	-4.46	Vertical
7605.0	-59.16	5.67	36.85	-27.98	-25	-2.98	Horizontal
183.9	-48.26	1.77	16.17	-33.85	-25	-8.85	Vertical
410.2	-51.93	1.63	15.21	-38.35	-25	-13.35	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.58	5.24	35.83	-28.99	-25	-3.99	Horizontal
5135.0	-63.64	5.24	35.83	-33.05	-25	-8.05	Vertical
7702.5	-64.95	5.68	36.87	-33.76	-25	-8.76	Vertical
7702.5	-64.26	5.68	36.87	-33.07	-25	-8.07	Horizontal
195.5	-44.20	1.58	17.56	-28.22	-25	-3.22	Vertical
389.7	-47.80	1.45	16.58	-32.67	-25	-7.67	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	-59.62	5.23	35.82	-29.03	-25	-4.03	Horizontal
5020.0	-60.32	5.23	35.82	-29.73	-25	-4.73	Vertical
7530.0	-59.08	5.67	36.86	-27.89	-25	-2.89	Vertical
7530.0	-62.69	5.67	36.86	-31.50	-25	-6.50	Horizontal
203.0	-54.92	1.63	15.76	-40.79	-25	-15.79	Vertical
325.1	-51.40	1.71	15.44	-37.67	-25	-12.67	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.09	5.23	35.82	-30.50	-25	-5.50	Horizontal
5070.0	-59.30	5.23	35.82	-28.71	-25	-3.71	Vertical
7605.0	-64.08	5.67	36.85	-32.90	-25	-7.90	Vertical
7605.0	-59.56	5.67	36.85	-28.38	-25	-3.38	Horizontal
182.3	-54.04	1.79	16.84	-38.98	-25	-13.98	Vertical
372.3	-51.63	1.71	17.64	-35.70	-25	-10.70	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-62.01	5.24	35.83	-31.42	-25	-6.42	Horizontal
5120.0	-64.02	5.24	35.83	-33.43	-25	-8.43	Vertical
7680.0	-64.15	5.70	36.88	-32.97	-25	-7.97	Vertical
7680.0	-63.62	5.70	36.88	-32.44	-25	-7.44	Horizontal
187.9	-46.88	1.79	16.84	-31.82	-25	-6.82	Vertical
341.5	-44.01	1.71	17.64	-28.08	-25	-3.08	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	-44.15	2.60	27.20	-19.55	-13	-6.55	Horizontal
1399.4	-44.91	2.60	27.20	-20.31	-13	-7.31	Vertical
2099.1	-46.28	2.85	27.54	-21.59	-13	-8.59	Vertical
2099.1	-51.25	2.85	27.54	-26.56	-13	-13.56	Horizontal
204.6	-42.28	1.49	17.78	-25.99	-13	-12.99	Vertical
352.1	-41.60	1.36	17.33	-25.63	-13	-12.63	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-45.05	2.61	27.28	-20.38	-13	-7.38	Horizontal
1415.0	-51.81	2.61	27.28	-27.14	-13	-14.14	Vertical
2122.5	-52.42	2.87	27.59	-27.70	-13	-14.70	Vertical
2122.5	-49.30	2.87	27.59	-24.58	-13	-11.58	Horizontal
188.3	-34.76	1.73	15.74	-20.75	-13	-7.75	Vertical
369.6	-35.49	1.62	15.79	-21.32	-13	-8.32	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-53.38	2.63	27.28	-28.73	-13	-15.73	Horizontal
1430.6	-51.33	2.63	27.28	-26.68	-13	-13.68	Vertical
2145.9	-47.67	2.88	27.60	-22.95	-13	-9.95	Vertical
2145.9	-51.63	2.88	27.60	-26.91	-13	-13.91	Horizontal
179.4	-37.46	1.61	18.00	-21.07	-13	-8.07	Vertical
379.7	-36.40	1.45	15.49	-22.37	-13	-9.37	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	-46.11	2.61	27.26	-21.46	-13	-8.46	Horizontal
1408.0	-50.17	2.61	27.26	-25.52	-13	-12.52	Vertical
2112.0	-51.88	2.87	27.58	-27.17	-13	-14.17	Vertical
2112.0	-49.87	2.87	27.58	-25.16	-13	-12.16	Horizontal
210.1	-40.09	1.31	16.97	-24.43	-13	-11.43	Vertical
320.0	-40.68	1.65	16.70	-25.63	-13	-12.63	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-48.01	2.61	27.28	-23.34	-13	-10.34	Horizontal
1415.0	-47.77	2.61	27.28	-23.10	-13	-10.10	Vertical
2122.5	-49.44	2.87	27.59	-24.72	-13	-11.72	Vertical
2122.5	-52.50	2.87	27.59	-27.78	-13	-14.78	Horizontal
205.3	-35.77	1.72	17.99	-19.50	-13	-6.50	Vertical
440.7	-34.53	1.73	17.94	-18.32	-13	-5.32	Horizontal
Test Results for High Channel 711MHz							
1422.0	-51.54	2.62	27.28	-26.88	-13	-13.88	Horizontal
1422.0	-46.18	2.62	27.28	-21.52	-13	-8.52	Vertical
2133.0	-46.85	2.87	27.60	-22.12	-13	-9.12	Vertical
2133.0	-50.33	2.87	27.60	-25.60	-13	-12.60	Horizontal
187.6	-42.83	1.58	15.93	-28.48	-13	-15.48	Vertical
368.3	-35.39	1.36	15.59	-21.16	-13	-8.16	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.

9.6 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	-53.39	2.61	27.28	-28.72	-13	-15.72	Horizontal
1413.0	-44.33	2.61	27.28	-19.66	-13	-6.66	Vertical
2119.5	-44.77	2.87	27.59	-20.05	-13	-7.05	Vertical
2119.5	-49.01	2.87	27.59	-24.29	-13	-11.29	Horizontal
182.5	-39.83	1.71	16.15	-25.39	-13	-12.39	Vertical
463.9	-43.29	1.41	17.32	-27.38	-13	-14.38	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-45.61	2.62	27.30	-20.93	-13	-7.93	Horizontal
1420.0	-50.77	2.62	27.30	-26.09	-13	-13.09	Vertical
2130.0	-50.44	2.87	27.62	-25.69	-13	-12.69	Vertical
2130.0	-49.71	2.87	27.62	-24.96	-13	-11.96	Horizontal
203.1	-35.78	1.42	15.25	-21.96	-13	-8.96	Vertical
296.4	-44.61	1.36	17.19	-28.78	-13	-15.78	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-50.02	2.66	27.28	-25.40	-13	-12.40	Horizontal
1427.0	-47.09	2.66	27.28	-22.47	-13	-9.47	Vertical
2140.5	-51.93	2.88	27.60	-27.21	-13	-14.21	Vertical
2140.5	-52.19	2.88	27.60	-27.47	-13	-14.47	Horizontal
181.9	-39.28	1.32	17.29	-23.31	-13	-10.31	Vertical
318.5	-43.98	1.72	16.89	-28.81	-13	-15.81	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	-45.63	2.62	27.30	-20.95	-13	-7.95	Horizontal
1418.0	-46.49	2.62	27.30	-21.81	-13	-8.81	Vertical
2127.0	-44.37	2.87	27.62	-19.62	-13	-6.62	Vertical
2127.0	-51.10	2.87	27.62	-26.35	-13	-13.35	Horizontal
186.6	-39.28	1.35	16.91	-23.72	-13	-10.72	Vertical
330.7	-37.07	1.62	16.31	-22.38	-13	-9.38	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-47.20	2.62	27.30	-22.52	-13	-9.52	Horizontal
1420.0	-44.54	2.62	27.30	-19.86	-13	-6.86	Vertical
2130.0	-46.54	2.87	27.62	-21.79	-13	-8.79	Vertical
2130.0	-53.27	2.87	27.62	-28.52	-13	-15.52	Horizontal
185.8	-38.67	1.51	17.14	-23.04	-13	-10.04	Vertical
428.7	-35.52	1.77	16.88	-20.41	-13	-7.41	Horizontal
Test Results for High Channel 711MHz							
1422.0	-47.47	2.62	27.30	-22.79	-13	-9.79	Horizontal
1422.0	-46.06	2.62	27.30	-21.38	-13	-8.38	Vertical
2133.0	-45.04	2.87	27.62	-20.29	-13	-7.29	Vertical
2133.0	-49.84	2.87	27.62	-25.09	-13	-12.09	Horizontal
183.3	-34.65	1.78	15.95	-20.48	-13	-7.48	Vertical
241.7	-42.29	1.34	17.95	-25.69	-13	-12.69	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 9.44V, Normal, DC 3.8V and High voltage, DC 12.77V.

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)				
3.23	1880	12.8	0.006819	2.5
3.8	1880	14.2	0.007576	2.5
4.37	1880	13.4	0.007154	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	12.9	0.006842	2.5
Extreme (50C)	1880	11.7	0.006228	2.5
Extreme (40C)	1880	13.4	0.007108	2.5
Extreme (30C)	1880	13.7	0.007270	2.5
Extreme (10C)	1880	13.8	0.007347	2.5
Extreme (0C)	1880	11.8	0.006276	2.5
Extreme (-10C)	1880	13.3	0.007063	2.5
Extreme (-20C)	1880	14.3	0.007623	2.5
Extreme (-30C)	1880	14.9	0.007925	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)				
3.23	1880	10.1	0.005372	2.5
3.8	1880	8.6	0.004561	2.5
4.37	1880	8.1	0.004332	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	9.5	0.005032	2.5
Extreme (50C)	1880	8.9	0.004717	2.5
Extreme (40C)	1880	8.0	0.004240386	2.5
Extreme (30C)	1880	9.5	0.005033315	2.5
Extreme (10C)	1880	9.0	0.00476494	2.5
Extreme (0C)	1880	7.7	0.004090139	2.5
Extreme (-10C)	1880	9.4	0.004999154	2.5
Extreme (-20C)	1880	8.9	0.004725748	2.5
Extreme (-30C)	1880	7.8	0.004142758	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)				
3.23	1732.5	8.8	0.005102	2.5
3.8	1732.5	9.1	0.005258	2.5
4.37	1732.5	8.3	0.004797	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	8.1	0.004650	2.5
Extreme (50C)	1732.5	9.1	0.005247	2.5
Extreme (40C)	1732.5	7.4	0.004289	2.5
Extreme (30C)	1732.5	5.7	0.003313	2.5
Extreme (10C)	1732.5	7.4	0.004283	2.5
Extreme (0C)	1732.5	9.0	0.005181	2.5
Extreme (-10C)	1732.5	8.9	0.005113	2.5
Extreme (-20C)	1732.5	6.5	0.003775	2.5
Extreme (-30C)	1732.5	8.4	0.004858	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)				
3.23	1732.5	9.9	0.005686	2.5
3.8	1732.5	9.0	0.005213	2.5
4.37	1732.5	7.9	0.004538	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	9.6	0.005553	2.5
Extreme (50C)	1732.5	9.1	0.005227	2.5
Extreme (40C)	1732.5	7.6	0.004411	2.5
Extreme (30C)	1732.5	9.3	0.005372	2.5
Extreme (10C)	1732.5	8.5	0.004896	2.5
Extreme (0C)	1732.5	8.5	0.004880	2.5
Extreme (-10C)	1732.5	8.6	0.004941	2.5
Extreme (-20C)	1732.5	8.5	0.004909	2.5
Extreme (-30C)	1732.5	8.1	0.004690	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)				
3.23	836.5	5.4	0.006503	2.5
3.8	836.5	6.9	0.008287	2.5
4.37	836.5	4.4	0.005218	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	5.9	0.007004	2.5
Extreme (50C)	836.5	6.4	0.007596	2.5
Extreme (40C)	836.5	6.2	0.007468	2.5
Extreme (30C)	836.5	6.8	0.008081	2.5
Extreme (10C)	836.5	5.6	0.006724	2.5
Extreme (0C)	836.5	5.3	0.006298	2.5
Extreme (-10C)	836.5	5.4	0.006500	2.5
Extreme (-20C)	836.5	6.3	0.007589	2.5
Extreme (-30C)	836.5	6.0	0.007141	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)				
3.23	836.5	6.2	0.007356	2.5
3.8	836.5	6.8	0.008159	2.5
4.37	836.5	5.3	0.006330	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	5.6	0.006747	2.5
Extreme (50C)	836.5	6.3	0.007492	2.5
Extreme (40C)	836.5	5.9	0.007077	2.5
Extreme (30C)	836.5	6.4	0.007615	2.5
Extreme (10C)	836.5	5.0	0.006007	2.5
Extreme (0C)	836.5	5.7	0.006865	2.5
Extreme (-10C)	836.5	5.7	0.006800	2.5
Extreme (-20C)	836.5	6.5	0.007780	2.5
Extreme (-30C)	836.5	6.2	0.007424	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)				
3.23	2535	9.9	0.003919	2.5
3.8	2535	8.8	0.003459	2.5
4.37	2535	8.9	0.003510	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	9.1	0.003588	2.5
Extreme (50C)	2535	9.2	0.003618	2.5
Extreme (40C)	2535	8.3	0.003274	2.5
Extreme (30C)	2535	8.6	0.003400	2.5
Extreme (10C)	2535	8.3	0.003260	2.5
Extreme (0C)	2535	8.5	0.003369	2.5
Extreme (-10C)	2535	9.4	0.003690	2.5
Extreme (-20C)	2535	8.9	0.003522	2.5
Extreme (-30C)	2535	8.2	0.003236	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)				
3.23	2535	6.9	0.002722	2.5
3.8	2535	6.1	0.002400	2.5
4.37	2535	5.8	0.002298	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	6.9	0.002722	2.5
Extreme (50C)	2535	5.6	0.002200	2.5
Extreme (40C)	2535	5.7	0.002245	2.5
Extreme (30C)	2535	7.0	0.002745	2.5
Extreme (10C)	2535	5.8	0.002284	2.5
Extreme (0C)	2535	4.9	0.001938	2.5
Extreme (-10C)	2535	4.9	0.001952	2.5
Extreme (-20C)	2535	6.2	0.002444	2.5
Extreme (-30C)	2535	5.8	0.002281	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)				
3.23	707.5	8.6	0.012135	2.5
3.8	707.5	10.4	0.014703	2.5
4.37	707.5	8.7	0.012284	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	8.7	0.012350	2.5
Extreme (50C)	707.5	7.4	0.010513	2.5
Extreme (40C)	707.5	7.9	0.011164	2.5
Extreme (30C)	707.5	8.6	0.012176	2.5
Extreme (10C)	707.5	7.5	0.010670	2.5
Extreme (0C)	707.5	8.7	0.012261	2.5
Extreme (-10C)	707.5	8.0	0.011305	2.5
Extreme (-20C)	707.5	8.9	0.012616	2.5
Extreme (-30C)	707.5	7.3	0.010387	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)				
3.23	707.5	7.3	0.010380	2.5
3.8	707.5	8.5	0.012001	2.5
4.37	707.5	7.7	0.010928	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	8.6	0.012088	2.5
Extreme (50C)	707.5	8.7	0.012232	2.5
Extreme (40C)	707.5	8.6	0.012161	2.5
Extreme (30C)	707.5	7.9	0.011107	2.5
Extreme (10C)	707.5	8.6	0.012098	2.5
Extreme (0C)	707.5	7.7	0.010927	2.5
Extreme (-10C)	707.5	7.7	0.010945	2.5
Extreme (-20C)	707.5	9.3	0.013167	2.5
Extreme (-30C)	707.5	8.5	0.012072	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)				
3.23	710.0	9.7	0.013605	2.5
3.8	710.0	8.8	0.012349	2.5
4.37	710.0	7.6	0.010747	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	10.1	0.014237	2.5
Extreme (50C)	710.0	8.8	0.012350	2.5
Extreme (40C)	710.0	7.8	0.010933	2.5
Extreme (30C)	710.0	9.3	0.013159	2.5
Extreme (10C)	710.0	9.1	0.012849	2.5
Extreme (0C)	710.0	8.3	0.011648	2.5
Extreme (-10C)	710.0	9.4	0.013277	2.5
Extreme (-20C)	710.0	8.6	0.012045	2.5
Extreme (-30C)	710.0	8.0	0.011333	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)				
3.23	710.0	10.0	0.014085	2.5
3.8	710.0	8.9	0.012529	2.5
4.37	710.0	8.7	0.012265	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	9.4	0.013170	2.5
Extreme (50C)	710.0	8.8	0.012343	2.5
Extreme (40C)	710.0	8.0	0.011212	2.5
Extreme (30C)	710.0	8.9	0.012488	2.5
Extreme (10C)	710.0	7.9	0.011082	2.5
Extreme (0C)	710.0	8.2	0.011534	2.5
Extreme (-10C)	710.0	9.0	0.012674	2.5
Extreme (-20C)	710.0	9.4	0.013211	2.5
Extreme (-30C)	710.0	7.9	0.011182	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

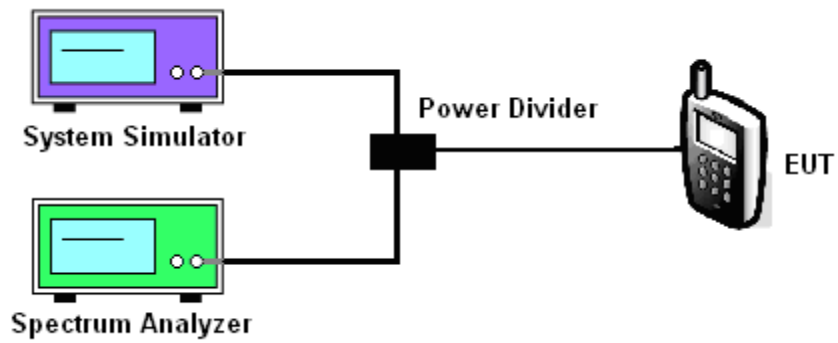
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

- ☐ LTE Band 2
- LTE Band 4
- ☐ LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

Test data reference attachment.

----END OF REPORT----