

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

FCC ID: 2A332-T12

Product: Data Processing Machine
Trade Mark: EKEMP
Model Number: T12
Family Model: EVM1200
Report No.: S21110302602006

Prepared for

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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 Machine

Model and/or type reference .. : T12

Family Model: EVM1200

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

Test procedure : ANSI C63.26:2015

ANSI/TIA-603-E-2016

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

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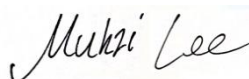
Date of Test

Date (s) of performance of tests..... Nov 15. 2021 ~Dec 22, 2021

Date of Issue Dec 22, 2021

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

Testing Engineer :



(Mukzi Lee)

Authorized Signatory :



(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:	Data Processing Machine
Trade Mark	EKEMP
Model Name	T12
Family Model	EVM1200
Model Difference	All the model are the same circuit and RF module,except the model name.
FCC ID:	2A332-T12
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,13,17,25,41
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 13 Uplink: 777MHz-787MHz, Downlink: 746MHz-756MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 25 Uplink: 1850MHz-1915MHz, Downlink: 1930MHz-1995MHz; LTE TDD Band 41 Uplink&Downlink: 2555MHz-2655MHz(Note ₁)
Type of Modulation:	QPSK/16QAM
Antenna:	FPC Antenna
Antenna gain:	LTE FDD Band 2 1.0dBi;LTE FDD Band 4 0.8dBi; LTE FDD Band 5 0.3dBi;LTE-FDD Band 7 1.8dBi; LTE FDD Band 12 0.2dBi;LTE FDD Band 13 0.2dBi; LTE FDD Band 17 0.2dBi;LTE FDD Band 25 0.3dBi; LTE TDD Band 41 1.5dBi;
Adapter	Moel: SZXYUT60A-1500400 Input: AC 100-240V~50/60Hz 1.8A Output: DC 15V---4A
Battery	DC 11.1V, 13000mAh, 144.3Wh

Power supply	DC 11.1V from battery or DC 15V from Adapter.
Extreme Vol. Limits:	DC 9.44V to DC 12.77V (Nominal DC 11.1V) (Note 1)
HW Version	EKEMP-T12-GT-V22
FW Version	msm8953_64-userdebug 10 QKQ1.210528.001 1638952488 release-keys
SW Version	msm8953_64-userdebug 10 QKQ1.210528.001 1638952488 release-keys
** Note1: The High Voltage DC 12.77V and Low Voltage 9.44V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

Note₁ :

B41		Frequency	Channel
5.0MHz	Low	2557.5	40265
	Mid	2593	40620
	High	2652.5	41215
10.0MHz	Low	2560	40290
	Mid	2593	40620
	High	2650	41190
15.0MHz	Low	2562.5	40315
	Mid	2593	40620
	High	2647.5	41165
20.0MHz	Low	2565	40340
	Mid	2593	40620
	High	2645	41140

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2A332-T12** 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 13, Band 17, Band 25, Band 41

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 Machine	T12	FCC ID: 2A332-T12	EUT

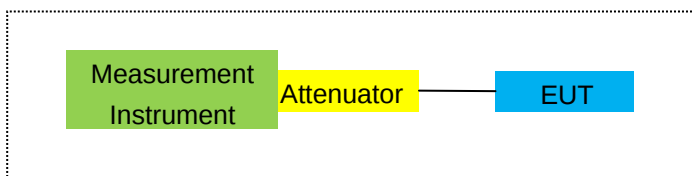
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

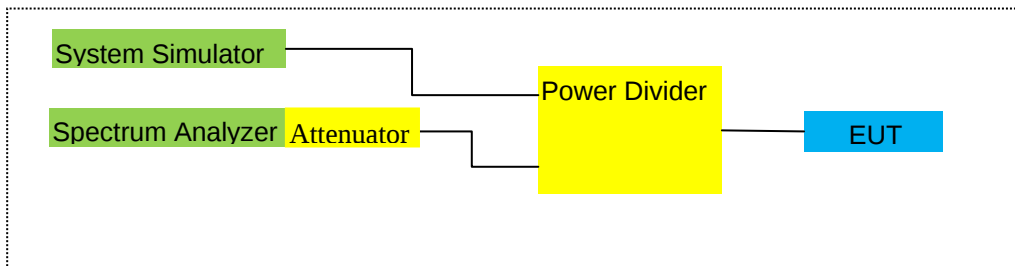
For Radiated Test Cases



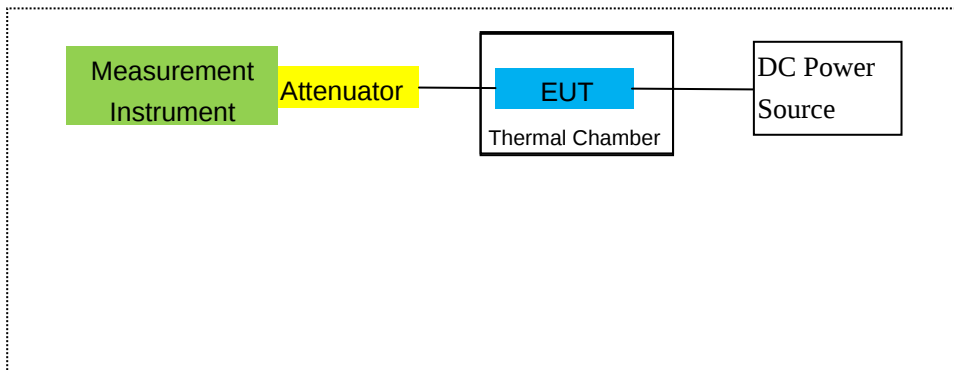
For Conducted Output Power



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

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
64 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 13
- LTE Band 17
- LTE Band 25,
- LTE Band 41

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 13
- LTE Band 17
- LTE Band 25,
- LTE Band 41

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 2/4/5/7/12/13/17/25/41
- ☐

7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

Test data reference attachment.

NOTE: The 10GHz-40GHz amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit 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 2/4/5/7/12/13/17/25/41

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	-2.94	3.76	28.24	21.54	142.561	Horizontal	Pass
		1880	-2.79	3.91	28.22	21.52	141.906	Horizontal	Pass
		1909.3	-2.79	3.93	28.20	21.48	140.605	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-2.99	3.77	28.23	21.47	140.281	Horizontal	Pass
		1880	-2.81	3.91	28.24	21.52	141.906	Horizontal	Pass
		1908.5	-2.77	3.94	28.25	21.54	142.561	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.98	3.77	28.31	21.56	143.219	Horizontal	Pass
		1880	-2.75	3.91	28.22	21.56	143.219	Horizontal	Pass
		1907.5	-2.71	3.94	28.20	21.55	142.889	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.07	3.79	28.33	21.47	140.281	Horizontal	Pass
		1880	-2.79	3.95	28.22	21.48	140.605	Horizontal	Pass
		1905	-2.74	3.97	28.19	21.48	140.605	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.06	3.79	28.34	21.49	140.929	Horizontal	Pass
		1880	-2.79	3.95	28.22	21.48	140.605	Horizontal	Pass
		1902.5	-2.64	3.97	28.18	21.57	143.549	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.06	3.81	28.35	21.48	140.605	Horizontal	Pass
		1880	-2.75	3.96	28.22	21.51	141.579	Horizontal	Pass
		1900	-2.72	4.00	28.16	21.44	139.316	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-2.94	3.76	28.24	21.54	142.561	Vertical	Pass
		1880	-2.79	3.91	28.22	21.52	141.906	Vertical	Pass
		1909.3	-2.75	3.93	28.20	21.52	141.906	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-2.98	3.77	28.23	21.48	140.605	Vertical	Pass
		1880	-2.78	3.91	28.24	21.55	142.889	Vertical	Pass
		1908.5	-2.84	3.94	28.25	21.47	140.281	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.97	3.77	28.31	21.57	143.549	Vertical	Pass
		1880	-2.73	3.91	28.22	21.58	143.880	Vertical	Pass
		1907.5	-2.76	3.94	28.20	21.50	141.254	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-2.98	3.79	28.33	21.56	143.219	Vertical	Pass
		1880	-2.74	3.95	28.22	21.53	142.233	Vertical	Pass
		1905	-2.66	3.97	28.19	21.56	143.219	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-2.96	3.79	28.34	21.59	144.212	Vertical	Pass
Band		1880	-2.68	3.95	28.22	21.59	144.212	Vertical	Pass
QPSK		1902.5	-2.74	3.97	28.18	21.47	140.281	Vertical	Pass
20.0MHz	1/#Mid	1860	-2.91	3.81	28.35	21.63	145.546	Vertical	Pass
Band		1880	-2.66	3.96	28.22	21.60	144.544	Vertical	Pass
QPSK		1900	-2.54	4.00	28.16	21.62	145.211	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	-4.10	3.76	28.24	20.38	109.144	Horizontal	Pass
		1880	-3.94	3.91	28.22	20.37	108.893	Horizontal	Pass
		1909.3	-3.88	3.93	28.20	20.39	109.396	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.99	3.77	28.23	20.47	111.429	Horizontal	Pass
		1880	-3.92	3.91	28.24	20.41	109.901	Horizontal	Pass
		1908.5	-3.88	3.94	28.25	20.43	110.408	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.06	3.77	28.31	20.48	111.686	Horizontal	Pass
		1880	-3.92	3.91	28.22	20.39	109.396	Horizontal	Pass
		1907.5	-3.84	3.94	28.20	20.42	110.154	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.12	3.79	28.33	20.42	110.154	Horizontal	Pass
		1880	-3.90	3.95	28.22	20.37	108.893	Horizontal	Pass
		1905	-3.86	3.97	28.19	20.36	108.643	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.06	3.79	28.34	20.49	111.944	Horizontal	Pass
		1880	-3.78	3.95	28.22	20.49	111.944	Horizontal	Pass
		1902.5	-3.80	3.97	28.18	20.41	109.901	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.15	3.81	28.35	20.39	109.396	Horizontal	Pass
		1880	-3.86	3.96	28.22	20.40	109.648	Horizontal	Pass
		1900	-3.67	4.00	28.16	20.49	111.944	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.13	3.76	28.24	20.35	108.393	Vertical	Pass
		1880	-3.90	3.91	28.22	20.41	109.901	Vertical	Pass
		1909.3	-3.86	3.93	28.20	20.41	109.901	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.09	3.77	28.23	20.37	108.893	Vertical	Pass
		1880	-3.97	3.91	28.24	20.36	108.643	Vertical	Pass
		1908.5	-3.88	3.94	28.25	20.43	110.408	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.17	3.77	28.31	20.37	108.893	Vertical	Pass
		1880	-3.83	3.91	28.22	20.48	111.686	Vertical	Pass
		1907.5	-3.90	3.94	28.20	20.36	108.643	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.04	3.79	28.33	20.50	112.202	Vertical	Pass
		1880	-3.77	3.95	28.22	20.50	112.202	Vertical	Pass
		1905	-3.82	3.97	28.19	20.40	109.648	Vertical	Pass
15.0MHz Band 16	1/#Mid	1857.5	-4.10	3.79	28.34	20.45	110.917	Vertical	Pass
		1880	-3.92	3.95	28.22	20.35	108.393	Vertical	Pass

QAM		1902.5	-3.86	3.97	28.18	20.35	108.393	Vertical	Pass
20.0MHz	1/#Mid	1860	-4.01	3.81	28.35	20.53	112.980	Vertical	Pass
Band 16		1880	-3.73	3.96	28.22	20.53	112.980	Vertical	Pass
QAM		1900	-3.64	4.00	28.16	20.52	112.720	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	-2.54	3.12	27.58	21.92	155.597	Horizontal	Pass
		1732.5	-2.39	3.27	27.61	21.95	156.675	Horizontal	Pass
		1754.3	-2.40	3.29	27.63	21.94	156.315	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.55	3.13	27.61	21.93	155.955	Horizontal	Pass
		1732.5	-2.40	3.27	27.61	21.94	156.315	Horizontal	Pass
		1753.5	-2.48	3.30	27.62	21.84	152.757	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.64	3.13	27.63	21.86	153.462	Horizontal	Pass
		1732.5	-2.34	3.27	27.61	22.00	158.489	Horizontal	Pass
		1752.5	-2.37	3.30	27.60	21.93	155.955	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.54	3.15	27.64	21.95	156.675	Horizontal	Pass
		1732.5	-2.42	3.31	27.61	21.88	154.170	Horizontal	Pass
		1750	-2.37	3.33	27.59	21.89	154.525	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-2.65	3.15	27.65	21.85	153.109	Horizontal	Pass
		1732.5	-2.42	3.31	27.61	21.88	154.170	Horizontal	Pass
		1747.5	-2.27	3.33	27.57	21.97	157.398	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.60	3.17	27.66	21.89	154.525	Horizontal	Pass
		1732.5	-2.31	3.32	27.61	21.98	157.761	Horizontal	Pass
		1745	-2.35	3.36	27.56	21.85	153.109	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.55	3.12	27.58	21.91	155.239	Vertical	Pass
		1732.5	-2.43	3.27	27.61	21.91	155.239	Vertical	Pass
		1754.3	-2.46	3.29	27.63	21.88	154.170	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.62	3.13	27.61	21.86	153.462	Vertical	Pass
		1732.5	-2.37	3.27	27.61	21.97	157.398	Vertical	Pass
		1753.5	-2.34	3.30	27.62	21.98	157.761	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.56	3.13	27.63	21.94	156.315	Vertical	Pass
		1732.5	-2.35	3.27	27.61	21.99	158.125	Vertical	Pass
		1752.5	-2.36	3.30	27.60	21.94	156.315	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.50	3.15	27.64	21.99	158.125	Vertical	Pass
		1732.5	-2.34	3.31	27.61	21.96	157.036	Vertical	Pass
		1750	-2.29	3.33	27.59	21.97	157.398	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-2.56	3.15	27.65	21.94	156.315	Vertical	Pass
		1732.5	-2.42	3.31	27.61	21.88	154.170	Vertical	Pass
		1747.5	-2.33	3.33	27.57	21.91	155.239	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.46	3.17	27.66	22.03	159.588	Vertical	Pass
		1732.5	-2.28	3.32	27.61	22.01	158.855	Vertical	Pass
		1745	-2.16	3.36	27.56	22.04	159.956	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	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/##Mid	1710.7	-3.70	3.12	27.58	20.76	119.124	Horizontal	Pass
		1732.5	-3.66	3.27	27.61	20.68	116.950	Horizontal	Pass
		1754.3	-3.63	3.29	27.63	20.71	117.761	Horizontal	Pass
3.0MHz Band 16 QAM	1/##Mid	1711.5	-3.77	3.13	27.61	20.71	117.761	Horizontal	Pass
		1732.5	-3.64	3.27	27.61	20.70	117.490	Horizontal	Pass
		1753.5	-3.68	3.30	27.62	20.64	115.878	Horizontal	Pass
5.0MHz Band 16 QAM	1/##Mid	1712.5	-3.77	3.13	27.63	20.73	118.304	Horizontal	Pass
		1732.5	-3.70	3.27	27.61	20.64	115.878	Horizontal	Pass
		1752.5	-3.60	3.30	27.60	20.70	117.490	Horizontal	Pass
10.0MHz Band 16 QAM	1/##Mid	1715	-3.74	3.15	27.64	20.75	118.850	Horizontal	Pass
		1732.5	-3.55	3.31	27.61	20.75	118.850	Horizontal	Pass
		1750	-3.59	3.33	27.59	20.67	116.681	Horizontal	Pass
15.0MHz Band 16 QAM	1/##Mid	1717.5	-3.80	3.15	27.65	20.70	117.490	Horizontal	Pass
		1732.5	-3.57	3.31	27.61	20.73	118.304	Horizontal	Pass
		1747.5	-3.49	3.33	27.57	20.75	118.850	Horizontal	Pass
20.0MHz Band 16 QAM	1/##Mid	1720	-3.82	3.17	27.66	20.67	116.681	Horizontal	Pass
		1732.5	-3.66	3.32	27.61	20.63	115.611	Horizontal	Pass
		1745	-3.45	3.36	27.56	20.75	118.850	Horizontal	Pass
1.4MHz Band 16 QAM	1/##Mid	1710.7	-3.70	3.12	27.58	20.76	119.124	Vertical	Pass
		1732.5	-3.57	3.27	27.61	20.77	119.399	Vertical	Pass
		1754.3	-3.58	3.29	27.63	20.76	119.124	Vertical	Pass
3.0MHz Band 16 QAM	1/##Mid	1711.5	-3.75	3.13	27.61	20.73	118.304	Vertical	Pass
		1732.5	-3.63	3.27	27.61	20.71	117.761	Vertical	Pass
		1753.5	-3.58	3.30	27.62	20.74	118.577	Vertical	Pass
5.0MHz Band 16 QAM	1/##Mid	1712.5	-3.81	3.13	27.63	20.69	117.220	Vertical	Pass
		1732.5	-3.69	3.27	27.61	20.65	116.145	Vertical	Pass
		1752.5	-3.51	3.30	27.60	20.79	119.950	Vertical	Pass
10.0MHz Band 16 QAM	1/##Mid	1715	-3.82	3.15	27.64	20.67	116.681	Vertical	Pass
		1732.5	-3.52	3.31	27.61	20.78	119.674	Vertical	Pass
		1750	-3.48	3.33	27.59	20.78	119.674	Vertical	Pass
15.0MHz Band 16 QAM	1/##Mid	1717.5	-3.82	3.15	27.65	20.68	116.950	Vertical	Pass
		1732.5	-3.61	3.31	27.61	20.69	117.220	Vertical	Pass
		1747.5	-3.50	3.33	27.57	20.74	118.577	Vertical	Pass

20.0MHz	1/#Mid	1720	-3.66	3.17	27.66	20.83	121.060	Vertical	Pass
Band 16		1732.5	-3.49	3.32	27.61	20.80	120.226	Vertical	Pass
QAM		1745	-3.39	3.36	27.56	20.81	120.504	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	6.58	2.01	19.68	2.15	22.10	162.181	Horizontal	Pass
		836.5	6.44	2.01	19.77	2.15	22.05	160.325	Horizontal	Pass
		848.3	6.44	2.02	19.82	2.15	22.09	161.808	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.49	2.01	19.70	2.15	22.03	159.588	Horizontal	Pass
		836.5	6.47	2.01	19.77	2.15	22.08	161.436	Horizontal	Pass
		847.5	6.37	2.02	19.81	2.15	22.01	158.855	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.52	2.01	19.71	2.15	22.07	161.065	Horizontal	Pass
		836.5	6.46	2.01	19.77	2.15	22.07	161.065	Horizontal	Pass
		846.5	6.44	2.02	19.79	2.15	22.06	160.694	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	6.36	2.01	19.73	2.15	21.93	155.955	Horizontal	Pass
		836.5	6.34	2.01	19.77	2.15	21.95	156.675	Horizontal	Pass
		844	6.44	2.02	19.78	2.15	22.05	160.325	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	6.57	2.01	19.68	2.15	22.09	161.808	Vertical	Pass
		836.5	6.46	2.01	19.77	2.15	22.07	161.065	Vertical	Pass
		848.3	6.45	2.02	19.82	2.15	22.10	162.181	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.44	2.01	19.70	2.15	21.98	157.761	Vertical	Pass
		836.5	6.36	2.01	19.77	2.15	21.97	157.398	Vertical	Pass
		847.5	6.41	2.02	19.81	2.15	22.05	160.325	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.51	2.01	19.71	2.15	22.06	160.694	Vertical	Pass
		836.5	6.48	2.01	19.77	2.15	22.09	161.808	Vertical	Pass
		846.5	6.36	2.02	19.79	2.15	21.98	157.761	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	6.54	2.01	19.73	2.15	22.11	162.555	Vertical	Pass
		836.5	6.49	2.01	19.77	2.15	22.10	162.181	Vertical	Pass
		824.7	6.49	2.02	19.78	2.15	22.10	162.181	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)

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	
			(dBm)			(dB)	Averag e	Average		
							(dBm)	(mW)		
1.4MHz Band 16QAM	1/#Mid	824.7	5.45	2.01	19.68	2.15	20.97	125.026	Horizontal	Pass
		836.5	5.44	2.01	19.77	2.15	21.05	127.350	Horizontal	Pass
		848.3	5.36	2.02	19.82	2.15	21.01	126.183	Horizontal	Pass
3.0MHz Band 16QAM	1/#Mid	825.5	5.44	2.01	19.70	2.15	20.98	125.314	Horizontal	Pass
		836.5	5.45	2.01	19.77	2.15	21.06	127.644	Horizontal	Pass
		847.5	5.39	2.02	19.81	2.15	21.03	126.765	Horizontal	Pass
5.0MHz Band 16QAM	1/#Mid	826.5	5.43	2.01	19.71	2.15	20.98	125.314	Horizontal	Pass
		836.5	5.47	2.01	19.77	2.15	21.08	128.233	Horizontal	Pass
		846.5	5.31	2.02	19.79	2.15	20.93	123.880	Horizontal	Pass
10.0Hz Band 16QAM	1/#Mid	829	5.39	2.01	19.73	2.15	20.96	124.738	Horizontal	Pass
		836.5	5.44	2.01	19.77	2.15	21.05	127.350	Horizontal	Pass
		844	5.37	2.02	19.78	2.15	20.98	125.314	Horizontal	Pass
1.4MHz Band 16QAM	1/#Mid	824.7	5.55	2.01	19.68	2.15	21.07	127.938	Vertical	Pass
		836.5	5.48	2.01	19.77	2.15	21.09	128.529	Vertical	Pass
		848.3	5.43	2.02	19.82	2.15	21.08	128.233	Vertical	Pass
3.0MHz Band 16QAM	1/#Mid	825.5	5.53	2.01	19.70	2.15	21.07	127.938	Vertical	Pass
		836.5	5.36	2.01	19.77	2.15	20.97	125.026	Vertical	Pass
		847.5	5.44	2.02	19.81	2.15	21.08	128.233	Vertical	Pass
5.0MHz Band 16QAM	1/#Mid	826.5	5.49	2.01	19.71	2.15	21.04	127.057	Vertical	Pass
		836.5	5.46	2.01	19.77	2.15	21.07	127.938	Vertical	Pass
		846.5	5.47	2.02	19.79	2.15	21.09	128.529	Vertical	Pass
10.0Hz Band 16QAM	1/#Mid	829	5.56	2.01	19.73	2.15	21.13	129.718	Vertical	Pass
		836.5	5.51	2.01	19.77	2.15	21.12	129.420	Vertical	Pass
		844	5.50	2.02	19.78	2.15	21.11	129.122	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	1.06	4.54	27.75	24.27	267.301	Horizontal	Pass
		2535	1.13	4.69	27.72	24.16	260.615	Horizontal	Pass
		2567.5	1.29	4.71	27.71	24.29	268.534	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.94	4.55	27.76	24.15	260.016	Horizontal	Pass
		2535	1.20	4.69	27.72	24.23	264.850	Horizontal	Pass
		2565	1.21	4.72	27.70	24.19	262.422	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.00	4.55	27.77	24.22	264.241	Horizontal	Pass
		2535	1.12	4.69	27.72	24.15	260.016	Horizontal	Pass
		2562.5	1.23	4.72	27.69	24.20	263.027	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.08	4.57	27.78	24.29	268.534	Horizontal	Pass
		2535	1.23	4.73	27.72	24.22	264.241	Horizontal	Pass
		2560	1.26	4.75	27.68	24.19	262.422	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	1.07	4.54	27.75	24.28	267.917	Vertical	Pass
		2535	1.22	4.69	27.72	24.25	266.073	Vertical	Pass
		2567.5	1.15	4.71	27.71	24.15	260.016	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.95	4.55	27.76	24.16	260.615	Vertical	Pass
		2535	1.20	4.69	27.72	24.23	264.850	Vertical	Pass
		2565	1.29	4.72	27.70	24.27	267.301	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.04	4.55	27.77	24.26	266.686	Vertical	Pass
		2535	1.15	4.69	27.72	24.18	261.818	Vertical	Pass
		2562.5	1.19	4.72	27.69	24.16	260.615	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.10	4.57	27.78	24.31	269.774	Vertical	Pass
		2535	1.36	4.73	27.72	24.35	272.270	Vertical	Pass
		2560	1.40	4.75	27.68	24.33	271.019	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					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP		
						Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.03	4.54	27.75	23.18	207.970	Horizontal	Pass
		2535	0.13	4.69	27.72	23.16	207.014	Horizontal	Pass
		2567.5	0.18	4.71	27.71	23.18	207.970	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.03	4.55	27.76	23.18	207.970	Horizontal	Pass
		2535	0.14	4.69	27.72	23.17	207.491	Horizontal	Pass
		2565	0.25	4.72	27.70	23.23	210.378	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.04	4.55	27.77	23.26	211.836	Horizontal	Pass
		2535	0.22	4.69	27.72	23.25	211.349	Horizontal	Pass
		2562.5	0.32	4.72	27.69	23.29	213.304	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.06	4.57	27.78	23.27	212.324	Horizontal	Pass
		2535	0.20	4.73	27.72	23.19	208.449	Horizontal	Pass
		2560	0.32	4.75	27.68	23.25	211.349	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.05	4.54	27.75	23.16	207.014	Vertical	Pass
		2535	0.22	4.69	27.72	23.25	211.349	Vertical	Pass
		2567.5	0.27	4.71	27.71	23.27	212.324	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.04	4.55	27.76	23.17	207.491	Vertical	Pass
		2535	0.17	4.69	27.72	23.20	208.930	Vertical	Pass
		2565	0.27	4.72	27.70	23.25	211.349	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.03	4.55	27.77	23.25	211.349	Vertical	Pass
		2535	0.09	4.69	27.72	23.12	205.116	Vertical	Pass
		2562.5	0.21	4.72	27.69	23.18	207.970	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.12	4.57	27.78	23.33	215.278	Vertical	Pass
		2535	0.33	4.73	27.72	23.32	214.783	Vertical	Pass
		2560	0.38	4.75	27.68	23.31	214.289	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	6.44	1.91	19.21	2.15	21.59	144.212	Vertical	Pass
		707.5	6.40	1.91	19.26	2.15	21.60	144.544	Vertical	Pass
		715.3	6.36	1.93	19.34	2.15	21.62	145.211	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	6.47	1.91	19.21	2.15	21.62	145.211	Vertical	Pass
		707.5	6.38	1.91	19.26	2.15	21.58	143.880	Vertical	Pass
		714.5	6.30	1.93	19.34	2.15	21.56	143.219	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	6.36	1.91	19.23	2.15	21.53	142.233	Vertical	Pass
		707.5	6.40	1.91	19.26	2.15	21.60	144.544	Vertical	Pass
		713.5	6.37	1.92	19.33	2.15	21.63	145.546	Vertical	Pass
10.0Hz Band QPSK	1/#Mid	704	6.45	1.91	19.25	2.15	21.64	145.881	Vertical	Pass
		707.5	6.47	1.91	19.26	2.15	21.67	146.893	Vertical	Pass
		711	6.40	1.92	19.32	2.15	21.65	146.218	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	6.47	1.91	19.21	2.15	21.62	145.211	Horizontal	Pass
		707.5	6.44	1.91	19.26	2.15	21.64	145.881	Horizontal	Pass
		715.3	6.35	1.93	19.34	2.15	21.61	144.877	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	6.45	1.91	19.21	2.15	21.60	144.544	Horizontal	Pass
		707.5	6.37	1.91	19.26	2.15	21.57	143.549	Horizontal	Pass
		714.5	6.32	1.93	19.34	2.15	21.58	143.880	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	6.51	1.91	19.23	2.15	21.68	147.231	Horizontal	Pass
		707.5	6.48	1.91	19.26	2.15	21.68	147.231	Horizontal	Pass
		713.5	6.37	1.92	19.33	2.15	21.63	145.546	Horizontal	Pass
10.0Hz Band QPSK	1/#Mid	704	6.52	1.91	19.25	2.15	21.71	148.252	Horizontal	Pass
		707.5	6.53	1.91	19.26	2.15	21.73	148.936	Horizontal	Pass
		711	6.49	1.92	19.32	2.15	21.74	149.279	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	5.13	1.91	19.21	2.15	20.28	106.660	Vertical	Pass
		707.5	5.13	1.91	19.26	2.15	20.33	107.895	Vertical	Pass
		715.3	5.03	1.93	19.34	2.15	20.29	106.905	Vertical	Pass
3.0MHz Band 16QAM	1/#Mid	700.5	5.16	1.91	19.21	2.15	20.31	107.399	Vertical	Pass
		707.5	5.08	1.91	19.26	2.15	20.28	106.660	Vertical	Pass
		714.5	5.03	1.93	19.34	2.15	20.29	106.905	Vertical	Pass
5.0MHz Band 16QAM	1/#Mid	701.5	5.18	1.91	19.23	2.15	20.35	108.393	Vertical	Pass
		707.5	5.18	1.91	19.26	2.15	20.38	109.144	Vertical	Pass
		713.5	5.04	1.92	19.33	2.15	20.30	107.152	Vertical	Pass
10.0MHz Band 16QAM	1/#Mid	704	5.13	1.91	19.25	2.15	20.32	107.647	Vertical	Pass
		707.5	5.16	1.91	19.26	2.15	20.36	108.643	Vertical	Pass
		711	5.09	1.92	19.32	2.15	20.34	108.143	Vertical	Pass
1.4MHz Band 16QAM	1/#Mid	699.7	5.25	1.91	19.21	2.15	20.40	109.648	Horizontal	Pass
		707.5	5.12	1.91	19.26	2.15	20.32	107.647	Horizontal	Pass
		715.3	5.09	1.93	19.34	2.15	20.35	108.393	Horizontal	Pass
3.0MHz Band 16QAM	1/#Mid	700.5	5.23	1.91	19.21	2.15	20.38	109.144	Horizontal	Pass
		707.5	5.16	1.91	19.26	2.15	20.36	108.643	Horizontal	Pass
		714.5	5.10	1.93	19.34	2.15	20.36	108.643	Horizontal	Pass
5.0MHz Band 16QAM	1/#Mid	701.5	5.20	1.91	19.23	2.15	20.37	108.893	Horizontal	Pass
		707.5	5.11	1.91	19.26	2.15	20.31	107.399	Horizontal	Pass
		713.5	5.08	1.92	19.33	2.15	20.34	108.143	Horizontal	Pass
10.0Hz Band 16QAM	1/#Mid	704	5.21	1.91	19.25	2.15	20.40	109.648	Horizontal	Pass
		707.5	5.21	1.91	19.26	2.15	20.41	109.901	Horizontal	Pass
		711	5.20	1.92	19.32	2.15	20.45	110.917	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 13

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequ ency	Result							Conclus ion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correc tion (dB)	Max. ERP	Max. ERP	Polarizatio n Of Max. ERP	
			(dBm)				Averag e	Average		
							(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	779.5	6.75	1.95	19.23	2.15	21.88	154.170	Vertical	Pass
		782	6.70	1.95	19.26	2.15	21.86	153.462	Vertical	Pass
		784.5	6.58	1.96	19.33	2.15	21.80	151.356	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	782	6.62	1.95	19.25	2.15	21.77	150.314	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	779.5	6.73	1.95	19.23	2.15	21.86	153.462	Horizontal	Pass
		782	6.65	1.95	19.26	2.15	21.81	151.705	Horizontal	Pass
		784.5	6.56	1.96	19.33	2.15	21.78	150.661	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	782	6.77	1.95	19.25	2.15	21.92	155.597	Horizontal	Pass

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequen cy	Result							Conclusi on
			SG Level	Cable Loss (dBm)	Antenn a Gain (dB)	Correctio n	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
							(dB)	(dBm)		
5.0MHz Band 16 QAM	1/#Mid	779.5	5.67	1.95	19.23	2.15	20.80	120.226	Vertical	Pass
		782	5.63	1.95	19.26	2.15	20.79	119.950	Vertical	Pass
		784.5	5.63	1.96	19.33	2.15	20.85	121.619	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	782	5.7	1.95	19.25	2.15	20.85	121.619	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	779.5	5.68	1.95	19.23	2.15	20.81	120.504	Horizontal	Pass
		782	5.73	1.95	19.26	2.15	20.89	122.744	Horizontal	Pass
		784.5	5.62	1.96	19.33	2.15	20.84	121.339	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	782	5.77	1.95	19.25	2.15	20.92	123.595	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

8.8 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	6.32	1.91	19.23	2.15	21.49	140.929	Vertical	Pass
		710	6.39	1.91	19.26	2.15	21.59	144.212	Vertical	Pass
		713.5	6.20	1.92	19.33	2.15	21.46	139.959	Vertical	Pass
10.0MHz Band QPSK	50/0	709	6.24	1.91	19.25	2.15	21.43	138.995	Vertical	Pass
		710	6.38	1.91	19.26	2.15	21.58	143.880	Vertical	Pass
		711	6.19	1.92	19.32	2.15	21.44	139.316	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	6.35	1.91	19.23	2.15	21.52	141.906	Horizontal	Pass
		710	6.39	1.91	19.26	2.15	21.59	144.212	Horizontal	Pass
		713.5	6.26	1.92	19.33	2.15	21.52	141.906	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	6.45	1.91	19.25	2.15	21.64	145.881	Horizontal	Pass
		710	6.44	1.91	19.26	2.15	21.64	145.881	Horizontal	Pass
		711	6.37	1.92	19.32	2.15	21.62	145.211	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	5.65	1.91	19.23	2.15	20.82	120.781	Vertical	Pass
		710	5.67	1.91	19.26	2.15	20.87	122.180	Vertical	Pass
		713.5	5.55	1.92	19.33	2.15	20.81	120.504	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	5.60	1.91	19.25	2.15	20.79	119.950	Vertical	Pass
		710	5.55	1.91	19.26	2.15	20.75	118.850	Vertical	Pass
		711	5.52	1.92	19.32	2.15	20.77	119.399	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	5.61	1.91	19.23	2.15	20.78	119.674	Horizontal	Pass
		710	5.67	1.91	19.26	2.15	20.87	122.180	Horizontal	Pass
		713.5	5.62	1.92	19.33	2.15	20.88	122.462	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	5.73	1.91	19.25	2.15	20.92	123.595	Horizontal	Pass
		710	5.75	1.91	19.26	2.15	20.95	124.451	Horizontal	Pass
		711	5.69	1.92	19.32	2.15	20.94	124.165	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

8.9 LTE BAND 25

Radiated Power (EIRP) for Band 25									
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 QPSK	1/##Mid	1850.7	-3.07	3.12	27.58	21.39	137.721	Horizontal	Pass
		1882.5	-3.01	3.27	27.61	21.33	135.831	Horizontal	Pass
		1914.3	-2.95	3.29	27.63	21.39	137.721	Horizontal	Pass
3.0MHz Band QPSK	1/##Mid	1851.5	-3.12	3.13	27.61	21.36	136.773	Horizontal	Pass
		1882.5	-3.00	3.27	27.61	21.34	136.144	Horizontal	Pass
		1753.5	-3.05	3.30	27.62	21.27	133.968	Horizontal	Pass
5.0MHz Band QPSK	1/##Mid	1852.5	-3.22	3.13	27.63	21.28	134.276	Horizontal	Pass
		1882.5	-2.97	3.27	27.61	21.37	137.088	Horizontal	Pass
		1912.5	-2.97	3.30	27.60	21.33	135.831	Horizontal	Pass
10.0MHz Band QPSK	1/##Mid	1855	-3.13	3.15	27.64	21.36	136.773	Horizontal	Pass
		1882.5	-2.98	3.31	27.61	21.32	135.519	Horizontal	Pass
		1910	-2.86	3.33	27.59	21.40	138.038	Horizontal	Pass
15.0MHz Band QPSK	1/##Mid	1857.5	-3.25	3.15	27.65	21.25	133.352	Horizontal	Pass
		1882.5	-2.99	3.31	27.61	21.31	135.207	Horizontal	Pass
		1907.5	-2.91	3.33	27.57	21.33	135.831	Horizontal	Pass
20.0MHz Band QPSK	1/##Mid	1860	-3.18	3.17	27.66	21.31	135.207	Horizontal	Pass
		1882.5	-3.02	3.32	27.61	21.27	133.968	Horizontal	Pass
		1905	-2.86	3.36	27.56	21.34	136.144	Horizontal	Pass
1.4MHz Band QPSK	1/##Mid	1850.7	-3.13	3.12	27.58	21.33	135.831	Vertical	Pass
		1882.5	-2.97	3.27	27.61	21.37	137.088	Vertical	Pass
		1914.3	-2.95	3.29	27.63	21.39	137.721	Vertical	Pass
3.0MHz Band QPSK	1/##Mid	1851.5	-3.22	3.13	27.61	21.26	133.660	Vertical	Pass
		1882.5	-2.95	3.27	27.61	21.39	137.721	Vertical	Pass
		1753.5	-2.94	3.30	27.62	21.38	137.404	Vertical	Pass
5.0MHz Band QPSK	1/##Mid	1852.5	-3.15	3.13	27.63	21.35	136.458	Vertical	Pass
		1882.5	-3.04	3.27	27.61	21.30	134.896	Vertical	Pass
		1912.5	-2.94	3.30	27.60	21.36	136.773	Vertical	Pass
10.0MHz Band QPSK	1/##Mid	1855	-3.19	3.15	27.64	21.30	134.896	Vertical	Pass
		1882.5	-3.04	3.31	27.61	21.26	133.660	Vertical	Pass
		1910	-2.92	3.33	27.59	21.34	136.144	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-3.23	3.15	27.65	21.27	133.968	Vertical	Pass
		1882.5	-3.05	3.31	27.61	21.25	133.352	Vertical	Pass
		1907.5	-2.94	3.33	27.57	21.30	134.896	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.09	3.17	27.66	21.40	138.038	Vertical	Pass
		1882.5	-2.86	3.32	27.61	21.43	138.995	Vertical	Pass
		1905	-2.80	3.36	27.56	21.40	138.038	Vertical	Pass

Radiated Power (EIRP) for Band 25									
Mode	RB/R B 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/##Mi d	1850.7	-3.81	3.12	27.58	20.65	116.145	Horizontal	Pass
		1882.5	-3.64	3.27	27.61	20.70	117.490	Horizontal	Pass
		1914.3	-3.63	3.29	27.63	20.71	117.761	Horizontal	Pass
3.0MHz Band 16 QAM	1/##Mi d	1851.5	-3.76	3.13	27.61	20.72	118.032	Horizontal	Pass
		1882.5	-3.66	3.27	27.61	20.68	116.950	Horizontal	Pass
		1753.5	-3.61	3.30	27.62	20.71	117.761	Horizontal	Pass
5.0MHz Band 16 QAM	1/##Mi d	1852.5	-3.86	3.13	27.63	20.64	115.878	Horizontal	Pass
		1882.5	-3.55	3.27	27.61	20.79	119.950	Horizontal	Pass
		1912.5	-3.62	3.30	27.60	20.68	116.950	Horizontal	Pass
10.0MHz Band 16 QAM	1/##Mi d	1855	-3.79	3.15	27.64	20.70	117.490	Horizontal	Pass
		1882.5	-3.52	3.31	27.61	20.78	119.674	Horizontal	Pass
		1910	-3.49	3.33	27.59	20.77	119.399	Horizontal	Pass
15.0MHz Band 16 QAM	1/##Mi d	1857.5	-3.74	3.15	27.65	20.76	119.124	Horizontal	Pass
		1882.5	-3.61	3.31	27.61	20.69	117.220	Horizontal	Pass
		1907.5	-3.52	3.33	27.57	20.72	118.032	Horizontal	Pass
20.0MHz Band 16 QAM	1/##Mi d	1860	-3.84	3.17	27.66	20.65	116.145	Horizontal	Pass
		1882.5	-3.60	3.32	27.61	20.69	117.220	Horizontal	Pass
		1905	-3.53	3.36	27.56	20.67	116.681	Horizontal	Pass
1.4MHz Band 16 QAM	1/##Mi d	1850.7	-3.70	3.12	27.58	20.76	119.124	Vertical	Pass
		1882.5	-3.60	3.27	27.61	20.74	118.577	Vertical	Pass
		1914.3	-3.56	3.29	27.63	20.78	119.674	Vertical	Pass
3.0MHz Band 16 QAM	1/##Mi d	1851.5	-3.75	3.13	27.61	20.73	118.304	Vertical	Pass
		1882.5	-3.55	3.27	27.61	20.79	119.950	Vertical	Pass
		1753.5	-3.56	3.30	27.62	20.76	119.124	Vertical	Pass
5.0MHz Band 16 QAM	1/##Mi d	1852.5	-3.87	3.13	27.63	20.63	115.611	Vertical	Pass
		1882.5	-3.67	3.27	27.61	20.67	116.681	Vertical	Pass
		1912.5	-3.67	3.30	27.60	20.63	115.611	Vertical	Pass
10.0MHz Band 16 QAM	1/##Mi d	1855	-3.74	3.15	27.64	20.75	118.850	Vertical	Pass
		1882.5	-3.52	3.31	27.61	20.78	119.674	Vertical	Pass
		1910	-3.48	3.33	27.59	20.78	119.674	Vertical	Pass
15.0MHz Band 16 QAM	1/##Mi d	1857.5	-3.77	3.15	27.65	20.73	118.304	Vertical	Pass
		1882.5	-3.55	3.31	27.61	20.75	118.850	Vertical	Pass
		1907.5	-3.59	3.33	27.57	20.65	116.145	Vertical	Pass

20.0MHz Band 16 QAM	1/#Mi d	1860	-3.68	3.17	27.66	20.81	120.504	Vertical	Pass
		1882.5	-3.46	3.32	27.61	20.83	121.060	Vertical	Pass
		1905	-3.40	3.36	27.56	20.80	120.226	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

8.10 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable Loss (dBm)	Antenna Gain (dB)	Max.	Max.	Polarization Of Max. ERP	
			Level			EIRP	EIRP		
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2557.5	0.24	4.54	27.75	23.45	221.309	Horizontal	Pass
		2593	0.40	4.69	27.72	23.43	220.293	Horizontal	Pass
		2652.5	0.41	4.71	27.71	23.41	219.280	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2560	0.29	4.55	27.76	23.50	223.872	Horizontal	Pass
		2593	0.45	4.69	27.72	23.48	222.844	Horizontal	Pass
		2650	0.48	4.72	27.70	23.46	221.820	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	0.12	4.55	27.77	23.34	215.774	Horizontal	Pass
		2593	0.30	4.69	27.72	23.33	215.278	Horizontal	Pass
		2647.5	0.46	4.72	27.69	23.43	220.293	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2565	0.23	4.57	27.78	23.44	220.800	Horizontal	Pass
		2593	0.41	4.73	27.72	23.40	218.776	Horizontal	Pass
		2645	0.56	4.75	27.68	23.49	223.357	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2557.5	0.23	4.54	27.75	23.44	220.800	Vertical	Pass
		2593	0.46	4.69	27.72	23.49	223.357	Vertical	Pass
		2652.5	0.47	4.71	27.71	23.47	222.331	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2560	0.22	4.55	27.76	23.43	220.293	Vertical	Pass
		2593	0.35	4.69	27.72	23.38	217.771	Vertical	Pass
		2650	0.42	4.72	27.70	23.40	218.776	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	0.17	4.55	27.77	23.39	218.273	Vertical	Pass
		2593	0.40	4.69	27.72	23.43	220.293	Vertical	Pass
		2647.5	0.35	4.72	27.69	23.32	214.783	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2565	0.32	4.57	27.78	23.53	225.424	Vertical	Pass
		2593	0.54	4.73	27.72	23.53	225.424	Vertical	Pass
		2645	0.61	4.75	27.68	23.54	225.944	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP		
						Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	1/#Mid	2557.5	2498.5	4.54	27.75	22.42	174.582	Horizontal	Pass
		2593	2593	4.69	27.72	22.40	173.780	Horizontal	Pass
		2652.5	2687.5	4.71	27.71	22.44	175.388	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	2501	4.55	27.76	22.42	174.582	Horizontal	Pass
		2593	2593	4.69	27.72	22.49	177.419	Horizontal	Pass
		2650	2685	4.72	27.70	22.35	171.791	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	2503.5	4.55	27.77	22.42	174.582	Horizontal	Pass
		2593	2593	4.69	27.72	22.39	173.380	Horizontal	Pass
		2647.5	2682.5	4.72	27.69	22.46	176.198	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	2506	4.57	27.78	22.39	173.380	Horizontal	Pass
		2593	2593	4.73	27.72	22.35	171.791	Horizontal	Pass
		2645	2680	4.75	27.68	22.46	176.198	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2557.5	2498.5	4.54	27.75	22.47	176.604	Vertical	Pass
		2593	2593	4.69	27.72	22.50	177.828	Vertical	Pass
		2652.5	2687.5	4.71	27.71	22.43	174.985	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	2501	4.55	27.76	22.41	174.181	Vertical	Pass
		2593	2593	4.69	27.72	22.46	176.198	Vertical	Pass
		2650	2685	4.72	27.70	22.38	172.982	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	2503.5	4.55	27.77	22.48	177.011	Vertical	Pass
		2593	2593	4.69	27.72	22.42	174.582	Vertical	Pass
		2647.5	2682.5	4.72	27.69	22.36	172.187	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	2506	4.57	27.78	22.50	177.828	Vertical	Pass
		2593	2593	4.73	27.72	22.51	178.238	Vertical	Pass
		2645	2680	4.75	27.68	22.51	178.238	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

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 13
LTE Band 17
LTE Band 25,
LTE Band 41,

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	-48.67	4.04	33.51	-19.20	-13	-6.20	Horizontal
3701.4	-48.23	4.04	33.51	-18.76	-13	-5.76	Vertical
5552.1	-50.54	5.24	35.84	-19.94	-13	-6.94	Vertical
5552.1	-51.69	5.24	35.84	-21.09	-13	-8.09	Horizontal
183.2	-35.37	1.43	16.02	-20.78	-13	-7.78	Vertical
391.8	-43.63	1.30	17.99	-26.94	-13	-13.94	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.56	4.04	33.56	-17.04	-13	-4.04	Horizontal
3760.0	-45.92	4.04	33.56	-16.40	-13	-3.40	Vertical
5640.0	-50.66	5.24	35.91	-19.99	-13	-6.99	Vertical
5640.0	-53.48	5.24	35.91	-22.81	-13	-9.81	Horizontal
175.9	-39.94	1.62	16.97	-24.59	-13	-11.59	Vertical
456.9	-36.01	1.74	15.98	-21.78	-13	-8.78	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-44.60	4.04	34.00	-14.64	-13	-1.64	Horizontal
3818.6	-53.29	4.04	34.00	-23.33	-13	-10.33	Vertical
5727.9	-47.62	5.24	36.04	-16.82	-13	-3.82	Vertical
5727.9	-49.82	5.24	36.04	-19.02	-13	-6.02	Horizontal
192.3	-43.60	1.42	17.29	-27.73	-13	-14.73	Vertical
387.3	-43.58	1.50	17.90	-27.17	-13	-14.17	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	-49.60	4.07	33.54	-20.13	-13	-7.13	Horizontal
3720.0	-47.05	4.07	33.54	-17.58	-13	-4.58	Vertical
5580.0	-48.41	5.28	35.86	-17.83	-13	-4.83	Vertical
5580.0	-49.96	5.28	35.86	-19.38	-13	-6.38	Horizontal
211.0	-41.09	1.58	16.89	-25.77	-13	-12.77	Vertical
314.5	-35.93	1.76	17.26	-20.43	-13	-7.43	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.29	4.04	33.56	-22.77	-13	-9.77	Horizontal
3760.0	-47.19	4.04	33.56	-17.67	-13	-4.67	Vertical
5640.0	-48.62	5.24	35.91	-17.95	-13	-4.95	Vertical
5640.0	-52.30	5.24	35.91	-21.63	-13	-8.63	Horizontal
177.7	-37.29	1.46	16.27	-22.48	-13	-9.48	Vertical
342.0	-34.00	1.59	15.15	-20.44	-13	-7.44	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-47.58	4.04	34.00	-17.62	-13	-4.62	Horizontal
3800.0	-48.66	4.04	34.00	-18.70	-13	-5.70	Vertical
5700.0	-53.04	5.24	36.04	-22.24	-13	-9.24	Vertical
5700.0	-51.41	5.24	36.04	-20.61	-13	-7.61	Horizontal
184.6	-40.19	1.36	17.39	-24.15	-13	-11.15	Vertical
277.1	-41.45	1.66	15.39	-27.72	-13	-14.72	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	-52.12	4.02	29.80	-26.34	-13	-13.34	Horizontal
3421.4	-44.35	4.02	29.80	-18.57	-13	-5.57	Vertical
5132.1	-52.96	5.24	35.84	-22.36	-13	-9.36	Vertical
5132.1	-53.06	5.24	35.84	-22.46	-13	-9.46	Horizontal
197.7	-36.06	1.68	16.04	-21.70	-13	-8.70	Vertical
355.9	-44.55	1.78	17.74	-28.59	-13	-15.59	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.87	4.03	30.00	-19.90	-13	-6.90	Horizontal
3465.0	-52.03	4.03	30.00	-26.06	-13	-13.06	Vertical
5197.5	-45.10	5.25	35.86	-14.49	-13	-1.49	Vertical
5197.5	-52.29	5.25	35.86	-21.68	-13	-8.68	Horizontal
181.6	-39.71	1.72	17.69	-23.74	-13	-10.74	Vertical
449.6	-40.74	1.62	16.02	-26.33	-13	-13.33	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-51.42	4.05	30.01	-25.46	-13	-12.46	Horizontal
3508.6	-47.82	4.05	30.01	-21.86	-13	-8.86	Vertical
5262.9	-53.89	5.26	35.86	-23.29	-13	-10.29	Vertical
5262.9	-52.06	5.26	35.86	-21.46	-13	-8.46	Horizontal
198.2	-41.80	1.80	16.69	-26.91	-13	-13.91	Vertical
301.3	-36.95	1.75	16.66	-22.05	-13	-9.05	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	-45.49	4.02	29.80	-19.71	-13	-6.71	Horizontal
3440.0	-48.94	4.02	29.80	-23.16	-13	-10.16	Vertical
5160.0	-49.76	5.24	35.84	-19.16	-13	-6.16	Vertical
5160.0	-53.02	5.24	35.84	-22.42	-13	-9.42	Horizontal
202.3	-36.43	1.57	17.26	-20.74	-13	-7.74	Vertical
259.3	-41.91	1.78	16.35	-27.34	-13	-14.34	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.59	4.03	30.00	-24.62	-13	-11.62	Horizontal
3465.0	-51.82	4.03	30.00	-25.85	-13	-12.85	Vertical
5197.5	-48.47	5.25	35.86	-17.86	-13	-4.86	Vertical
5197.5	-52.59	5.25	35.86	-21.98	-13	-8.98	Horizontal
204.0	-34.68	1.44	17.95	-18.17	-13	-5.17	Vertical
261.0	-34.71	1.65	16.09	-20.27	-13	-7.27	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-45.76	4.05	27.68	-22.13	-13	-9.13	Horizontal
3490.0	-52.42	4.05	27.68	-28.79	-13	-15.79	Vertical
5235.0	-49.43	5.26	35.86	-18.83	-13	-5.83	Vertical
5235.0	-50.20	5.26	35.86	-19.60	-13	-6.60	Horizontal
184.3	-37.30	1.61	16.85	-22.06	-13	-9.06	Vertical
280.5	-36.87	1.61	15.19	-23.29	-13	-10.29	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	-44.02	2.78	27.50	-19.30	-13	-6.30	Horizontal
1649.4	-44.92	2.78	27.50	-20.20	-13	-7.20	Vertical
2474.1	-50.35	2.90	27.80	-25.45	-13	-12.45	Vertical
2474.1	-51.17	2.90	27.80	-26.27	-13	-13.27	Horizontal
179.4	-38.80	1.76	17.59	-22.97	-13	-9.97	Vertical
410.8	-43.54	1.63	15.87	-29.30	-13	-16.30	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-49.88	2.80	27.48	-25.20	-13	-12.20	Horizontal
1673.0	-50.81	2.80	27.48	-26.13	-13	-13.13	Vertical
2509.5	-49.15	2.91	27.70	-24.36	-13	-11.36	Vertical
2509.5	-52.97	2.91	27.70	-28.18	-13	-15.18	Horizontal
205.1	-44.15	1.61	15.68	-30.08	-13	-17.08	Vertical
323.9	-34.96	1.59	17.52	-19.04	-13	-6.04	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-53.61	2.82	27.43	-29.00	-13	-16.00	Horizontal
1696.6	-44.51	2.82	27.43	-19.90	-13	-6.90	Vertical
2544.9	-48.50	2.92	27.74	-23.68	-13	-10.68	Vertical
2544.9	-49.57	2.92	27.74	-24.75	-13	-11.75	Horizontal
194.1	-38.94	1.69	16.67	-23.95	-13	-10.95	Vertical
379.4	-43.88	1.70	17.18	-28.40	-13	-15.40	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	-49.52	2.78	27.50	-24.80	-13	-11.80	Horizontal
1658.0	-52.91	2.78	27.50	-28.19	-13	-15.19	Vertical
2487.0	-53.05	2.90	27.80	-28.15	-13	-15.15	Vertical
2487.0	-50.94	2.90	27.80	-26.04	-13	-13.04	Horizontal
205.9	-34.72	1.71	15.57	-20.86	-13	-7.86	Vertical
395.5	-40.62	1.34	16.40	-25.56	-13	-12.56	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.93	2.80	27.48	-25.25	-13	-12.25	Horizontal
1673.0	-44.68	2.80	27.48	-20.00	-13	-7.00	Vertical
2509.5	-53.29	2.91	27.70	-28.50	-13	-15.50	Vertical
2509.5	-49.87	2.91	27.70	-25.08	-13	-12.08	Horizontal
210.8	-36.32	1.44	17.04	-20.72	-13	-7.72	Vertical
231.9	-43.45	1.76	17.62	-27.59	-13	-14.59	Horizontal
Test Results for High Channel 844MHz							
1688.0	-49.57	2.82	27.43	-24.96	-13	-11.96	Horizontal
1688.0	-51.81	2.82	27.43	-27.20	-13	-14.20	Vertical
2532.0	-53.64	2.92	27.74	-28.82	-13	-15.82	Vertical
2532.0	-49.69	2.92	27.74	-24.87	-13	-11.87	Horizontal
196.8	-36.90	1.74	17.70	-20.94	-13	-7.94	Vertical
390.7	-34.35	1.41	17.46	-18.29	-13	-5.29	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	-60.37	5.23	35.81	-29.79	-25	-4.79	Horizontal
5005.0	-64.41	5.23	35.81	-33.83	-25	-8.83	Vertical
7507.5	-59.75	5.67	36.85	-28.57	-25	-3.57	Vertical
7507.5	-63.93	5.67	36.85	-32.75	-25	-7.75	Horizontal
187.4	-54.40	1.73	17.97	-38.16	-25	-13.16	Vertical
248.7	-48.53	1.38	15.11	-34.80	-25	-9.80	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.81	5.23	35.82	-34.22	-25	-9.22	Horizontal
5070.0	-60.89	5.23	35.82	-30.30	-25	-5.30	Vertical
7605.0	-62.83	5.67	36.85	-31.65	-25	-6.65	Vertical
7605.0	-60.15	5.67	36.85	-28.97	-25	-3.97	Horizontal
212.9	-44.23	1.77	16.17	-29.82	-25	-4.82	Vertical
370.5	-54.96	1.63	15.21	-41.38	-25	-16.38	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-60.57	5.24	35.83	-29.98	-25	-4.98	Horizontal
5135.0	-60.08	5.24	35.83	-29.49	-25	-4.49	Vertical
7702.5	-59.38	5.68	36.87	-28.19	-25	-3.19	Vertical
7702.5	-64.74	5.68	36.87	-33.55	-25	-8.55	Horizontal
190.7	-53.54	1.58	17.56	-37.56	-25	-12.56	Vertical
389.6	-51.95	1.45	16.58	-36.82	-25	-11.82	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	-63.02	5.23	35.82	-32.43	-25	-7.43	Horizontal
5020.0	-60.26	5.23	35.82	-29.67	-25	-4.67	Vertical
7530.0	-64.29	5.67	36.86	-33.10	-25	-8.10	Vertical
7530.0	-60.27	5.67	36.86	-29.08	-25	-4.08	Horizontal
185.8	-48.71	1.63	15.76	-34.58	-25	-9.58	Vertical
349.6	-48.96	1.71	15.44	-35.23	-25	-10.23	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.57	5.23	35.82	-30.98	-25	-5.98	Horizontal
5070.0	-64.53	5.23	35.82	-33.94	-25	-8.94	Vertical
7605.0	-60.56	5.67	36.85	-29.38	-25	-4.38	Vertical
7605.0	-63.33	5.67	36.85	-32.15	-25	-7.15	Horizontal
208.5	-44.79	1.79	16.84	-29.73	-25	-4.73	Vertical
377.8	-53.57	1.71	17.64	-37.64	-25	-12.64	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-64.38	5.24	35.83	-33.79	-25	-8.79	Horizontal
5120.0	-59.59	5.24	35.83	-29.00	-25	-4.00	Vertical
7680.0	-63.52	5.70	36.88	-32.34	-25	-7.34	Vertical
7680.0	-63.03	5.70	36.88	-31.85	-25	-6.85	Horizontal
186.4	-45.51	1.79	16.84	-30.45	-25	-5.45	Vertical
329.8	-47.71	1.71	17.64	-31.78	-25	-6.78	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	-44.24	2.60	27.20	-19.64	-13	-6.64	Horizontal
1399.4	-45.82	2.60	27.20	-21.22	-13	-8.22	Vertical
2099.1	-51.80	2.85	27.54	-27.11	-13	-14.11	Vertical
2099.1	-51.36	2.85	27.54	-26.67	-13	-13.67	Horizontal
190.0	-37.13	1.49	17.78	-20.84	-13	-7.84	Vertical
308.3	-39.48	1.36	17.33	-23.51	-13	-10.51	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-53.31	2.61	27.28	-28.64	-13	-15.64	Horizontal
1415.0	-53.84	2.61	27.28	-29.17	-13	-16.17	Vertical
2122.5	-51.46	2.87	27.59	-26.74	-13	-13.74	Vertical
2122.5	-49.37	2.87	27.59	-24.65	-13	-11.65	Horizontal
180.1	-37.25	1.73	15.74	-23.24	-13	-10.24	Vertical
250.0	-42.77	1.62	15.79	-28.60	-13	-15.60	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-51.05	2.63	27.28	-26.40	-13	-13.40	Horizontal
1430.6	-46.58	2.63	27.28	-21.93	-13	-8.93	Vertical
2145.9	-47.45	2.88	27.60	-22.73	-13	-9.73	Vertical
2145.9	-51.95	2.88	27.60	-27.23	-13	-14.23	Horizontal
193.4	-43.18	1.61	18.00	-26.79	-13	-13.79	Vertical
266.9	-36.62	1.45	15.49	-22.59	-13	-9.59	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	-52.76	2.61	27.26	-28.11	-13	-15.11	Horizontal
1408.0	-53.74	2.61	27.26	-29.09	-13	-16.09	Vertical
2112.0	-45.98	2.87	27.58	-21.27	-13	-8.27	Vertical
2112.0	-50.07	2.87	27.58	-25.36	-13	-12.36	Horizontal
203.6	-37.00	1.31	16.97	-21.34	-13	-8.34	Vertical
241.5	-36.56	1.65	16.70	-21.51	-13	-8.51	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-54.00	2.61	27.28	-29.33	-13	-16.33	Horizontal
1415.0	-44.50	2.61	27.28	-19.83	-13	-6.83	Vertical
2122.5	-44.21	2.87	27.59	-19.49	-13	-6.49	Vertical
2122.5	-53.95	2.87	27.59	-29.23	-13	-16.23	Horizontal
203.3	-35.46	1.72	17.99	-19.19	-13	-6.19	Vertical
361.5	-40.60	1.73	17.94	-24.39	-13	-11.39	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.16	2.62	27.28	-20.50	-13	-7.50	Horizontal
1422.0	-51.91	2.62	27.28	-27.25	-13	-14.25	Vertical
2133.0	-50.39	2.87	27.60	-25.66	-13	-12.66	Vertical
2133.0	-50.98	2.87	27.60	-26.25	-13	-13.25	Horizontal
178.7	-42.15	1.58	15.93	-27.80	-13	-14.80	Vertical
328.9	-38.43	1.36	15.59	-24.20	-13	-11.20	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 13

QPSK EIRP POWER FOR LTE BAND 13 (5MHZ BANDWIDTH)

Test Results for Low Channel 779.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1559.0	-73.36	2.61	27.28	-48.69	-40	-8.69	Horizontal
1559.0	-73.00	2.61	27.28	-48.33	-40	-8.33	Vertical
2338.5	-73.62	2.87	27.59	-48.90	-13	-35.90	Vertical
2338.5	-74.52	2.87	27.59	-49.80	-13	-36.80	Horizontal
186.2	-74.52	1.71	16.15	-60.08	-13	-47.08	Vertical
377.4	-69.99	1.41	17.32	-54.08	-13	-41.08	Horizontal
Test Results for Mid Channel 782MHz							
1564.0	-74.80	2.62	27.30	-50.12	-40	-10.12	Horizontal
1564.0	-70.13	2.62	27.30	-45.45	-40	-5.45	Vertical
2346.0	-72.65	2.87	27.62	-47.90	-13	-34.90	Vertical
2346.0	-67.93	2.87	27.62	-43.18	-13	-30.18	Horizontal
185.3	-72.08	1.42	15.25	-58.26	-13	-45.26	Vertical
275.7	-69.40	1.36	17.19	-53.57	-13	-40.57	Horizontal
Test Results for High Channel 784.5MHz							
1569.0	-69.73	2.66	27.28	-45.11	-40	-5.11	Horizontal
1569.0	-73.59	2.66	27.28	-48.97	-40	-8.97	Vertical
2353.5	-67.16	2.88	27.60	-42.44	-13	-29.44	Vertical
2353.5	-68.59	2.88	27.60	-43.87	-13	-30.87	Horizontal
184.3	-70.17	1.32	17.29	-54.20	-13	-41.20	Vertical
297.4	-69.86	1.72	16.89	-54.69	-13	-41.69	Horizontal

QPSK EIRP POWER FOR LTE BAND 13 (10MHZ BANDWIDTH)

Test Results For Mid Channel 782MHz							
1564.0	-67.92	2.62	27.30	-43.24	-40	-3.24	Horizontal
1564.0	-67.51	2.62	27.30	-42.83	-40	-2.83	Vertical
2346.0	-73.54	2.87	27.62	-48.79	-13	-35.79	Vertical
2346.0	-74.63	2.87	27.62	-49.88	-13	-36.88	Horizontal
206.2	-74.25	1.35	16.91	-58.69	-13	-45.69	Vertical
463.1	-72.80	1.62	16.31	-58.11	-13	-45.11	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.

9.7 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	-50.74	2.61	27.28	-26.07	-13	-13.07	Horizontal
1413.0	-48.73	2.61	27.28	-24.06	-13	-11.06	Vertical
2119.5	-53.66	2.87	27.59	-28.94	-13	-15.94	Vertical
2119.5	-49.38	2.87	27.59	-24.66	-13	-11.66	Horizontal
198.1	-44.42	1.71	16.15	-29.98	-13	-16.98	Vertical
433.2	-35.45	1.41	17.32	-19.54	-13	-6.54	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-45.63	2.62	27.30	-20.95	-13	-7.95	Horizontal
1420.0	-52.93	2.62	27.30	-28.25	-13	-15.25	Vertical
2130.0	-49.26	2.87	27.62	-24.51	-13	-11.51	Vertical
2130.0	-49.28	2.87	27.62	-24.53	-13	-11.53	Horizontal
196.5	-40.27	1.42	15.25	-26.45	-13	-13.45	Vertical
408.0	-41.89	1.36	17.19	-26.06	-13	-13.06	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-47.31	2.66	27.28	-22.69	-13	-9.69	Horizontal
1427.0	-45.88	2.66	27.28	-21.26	-13	-8.26	Vertical
2140.5	-50.35	2.88	27.60	-25.63	-13	-12.63	Vertical
2140.5	-52.48	2.88	27.60	-27.76	-13	-14.76	Horizontal
193.7	-41.77	1.32	17.29	-25.80	-13	-12.80	Vertical
394.4	-36.06	1.72	16.89	-20.89	-13	-7.89	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	-49.84	2.62	27.30	-25.16	-13	-12.16	Horizontal
1418.0	-48.81	2.62	27.30	-24.13	-13	-11.13	Vertical
2127.0	-48.28	2.87	27.62	-23.53	-13	-10.53	Vertical
2127.0	-52.09	2.87	27.62	-27.34	-13	-14.34	Horizontal
195.7	-34.81	1.35	16.91	-19.25	-13	-6.25	Vertical
311.6	-38.71	1.62	16.31	-24.02	-13	-11.02	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-50.82	2.62	27.30	-26.14	-13	-13.14	Horizontal
1420.0	-50.35	2.62	27.30	-25.67	-13	-12.67	Vertical
2130.0	-47.08	2.87	27.62	-22.33	-13	-9.33	Vertical
2130.0	-52.66	2.87	27.62	-27.91	-13	-14.91	Horizontal
202.3	-38.25	1.51	17.14	-22.62	-13	-9.62	Vertical
346.5	-37.00	1.77	16.88	-21.89	-13	-8.89	Horizontal
Test Results for High Channel 711MHz							
1422.0	-47.14	2.62	27.30	-22.46	-13	-9.46	Horizontal
1422.0	-53.41	2.62	27.30	-28.73	-13	-15.73	Vertical
2133.0	-44.50	2.87	27.62	-19.75	-13	-6.75	Vertical
2133.0	-52.00	2.87	27.62	-27.25	-13	-14.25	Horizontal
203.1	-41.05	1.78	15.95	-26.88	-13	-13.88	Vertical
292.1	-41.98	1.34	17.95	-25.38	-13	-12.38	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.

9.8 LTE BAND 25

QPSK EIRP POWER FOR LTE BAND 25 (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	-49.51	4.26	29.80	-23.97	-13	-10.97	Horizontal
3701.4	-48.38	4.26	29.80	-22.84	-13	-9.84	Vertical
5552.1	-49.33	5.36	35.84	-18.85	-13	-5.85	Vertical
5552.1	-50.66	5.36	35.84	-20.18	-13	-7.18	Horizontal
183.2	-41.52	1.68	16.04	-27.16	-13	-14.16	Vertical
395.3	-40.33	1.78	17.74	-24.37	-13	-11.37	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765.0	-44.67	4.28	30.00	-18.95	-13	-5.95	Horizontal
3765.0	-44.73	4.28	30.00	-19.01	-13	-6.01	Vertical
5647.5	-44.83	5.41	35.86	-14.38	-13	-1.38	Vertical
5647.5	-53.63	5.41	35.86	-23.18	-13	-10.18	Horizontal
177.5	-39.73	1.72	17.69	-23.76	-13	-10.76	Vertical
319.3	-39.96	1.62	16.02	-25.55	-13	-12.55	Horizontal
Test Results for High Channel 1914.3MHz							
3828.6	-45.95	4.31	30.01	-20.25	-13	-7.25	Horizontal
3828.6	-46.08	4.31	30.01	-20.38	-13	-7.38	Vertical
5742.9	-45.27	5.43	35.86	-14.84	-13	-1.84	Vertical
5742.9	-50.28	5.43	35.86	-19.85	-13	-6.85	Horizontal
176.7	-41.84	1.80	16.69	-26.95	-13	-13.95	Vertical
365.9	-42.02	1.75	16.66	-27.12	-13	-14.12	Horizontal

QPSK EIRP POWER FOR LTE BAND 25 (20MHZ 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	-47.94	4.29	29.80	-22.43	-13	-9.43	Horizontal
3720.0	-45.28	4.29	29.80	-19.77	-13	-6.77	Vertical
5580.0	-46.97	5.38	35.84	-16.51	-13	-3.51	Vertical
5580.0	-51.97	5.38	35.84	-21.51	-13	-8.51	Horizontal
208.9	-44.30	1.57	17.26	-28.61	-13	-15.61	Vertical
326.5	-44.53	1.78	16.35	-29.96	-13	-16.96	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765.0	-51.92	4.28	30.00	-26.20	-13	-13.20	Horizontal
3765.0	-50.49	4.28	30.00	-24.77	-13	-11.77	Vertical
5647.5	-47.96	5.41	35.86	-17.51	-13	-4.51	Vertical
5647.5	-51.22	5.41	35.86	-20.77	-13	-7.77	Horizontal
185.9	-42.37	1.44	17.95	-25.86	-13	-12.86	Vertical
403.9	-36.67	1.65	16.09	-22.23	-13	-9.23	Horizontal
Test Results for High Channel 1905MHz							
3810.0	-51.07	4.35	27.68	-27.74	-13	-14.74	Horizontal
3810.0	-51.25	4.35	27.68	-27.92	-13	-14.92	Vertical
5715.0	-48.89	5.42	35.86	-18.45	-13	-5.45	Vertical
5715.0	-50.74	5.42	35.86	-20.30	-13	-7.30	Horizontal
196.1	-37.77	1.61	16.85	-22.53	-13	-9.53	Vertical
417.8	-34.04	1.61	15.19	-20.46	-13	-7.46	Horizontal

9.9 LTE BAND 41

QPSK EIRP POWER FOR LTE BAND 41 (5MHZ BANDWIDTH)

Test Results for Low Channel 2557.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997.0	-64.39	5.13	35.81	-33.71	-25	-8.71	Horizontal
4997.0	-64.38	5.13	35.81	-33.70	-25	-8.70	Vertical
7495.5	-60.28	5.42	36.85	-28.85	-25	-3.85	Vertical
7495.5	-62.38	5.42	36.85	-30.95	-25	-5.95	Horizontal
203.8	-48.76	1.56	17.97	-32.35	-25	-7.35	Vertical
327.3	-49.94	1.33	15.11	-36.16	-25	-11.16	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-64.21	5.16	35.82	-33.55	-25	-8.55	Horizontal
5186.0	-63.76	5.16	35.82	-33.10	-25	-8.10	Vertical
7779.0	-59.75	5.53	36.85	-28.43	-25	-3.43	Vertical
7779.0	-59.61	5.53	36.85	-28.29	-25	-3.29	Horizontal
187.1	-47.70	1.77	16.17	-33.29	-25	-8.29	Vertical
337.9	-48.34	1.63	15.21	-34.76	-25	-9.76	Horizontal
Test Results for High Channel 2652.5MHz							
5375.0	-61.37	5.23	35.83	-30.77	-25	-5.77	Horizontal
5375.0	-60.16	5.23	35.83	-29.56	-25	-4.56	Vertical
8062.5	-64.58	5.62	36.87	-33.33	-25	-8.33	Vertical
8062.5	-61.49	5.62	36.87	-30.24	-25	-5.24	Horizontal
178.9	-53.54	1.58	17.56	-37.56	-25	-12.56	Vertical
318.6	-44.51	1.45	16.58	-29.38	-25	-4.38	Horizontal

QPSK EIRP POWER FOR LTE BAND 41 (20MHZ BANDWIDTH)

Test Results for Low Channel 2565MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012.0	-62.18	5.23	35.82	-31.59	-25	-6.59	Horizontal
5012.0	-63.33	5.23	35.82	-32.74	-25	-7.74	Vertical
7518.0	-59.27	5.67	36.86	-28.08	-25	-3.08	Vertical
7518.0	-62.55	5.67	36.86	-31.36	-25	-6.36	Horizontal
209.8	-53.14	1.55	15.76	-38.93	-25	-13.93	Vertical
411.5	-45.82	1.62	15.44	-32.00	-25	-7.00	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-60.96	5.16	35.82	-30.30	-25	-5.30	Horizontal
5186.0	-59.55	5.16	35.82	-28.89	-25	-3.89	Vertical
7779.0	-59.18	5.53	36.85	-27.86	-25	-2.86	Vertical
7779.0	-59.00	5.53	36.85	-27.68	-25	-2.68	Horizontal
186.2	-54.06	1.58	16.84	-38.80	-25	-13.80	Vertical
440.9	-50.72	1.61	17.64	-34.69	-25	-9.69	Horizontal
Test Results for High Channel 2645MHz							
5360.0	-61.81	5.24	35.83	-31.22	-25	-6.22	Horizontal
5360.0	-61.00	5.24	35.83	-30.41	-25	-5.41	Vertical
8040.0	-62.34	5.70	36.88	-31.16	-25	-6.16	Vertical
8040.0	-60.42	5.70	36.88	-29.24	-25	-4.24	Horizontal
189.4	-46.97	1.48	16.84	-31.61	-25	-6.61	Vertical
276.3	-44.63	1.59	17.64	-28.58	-25	-3.58	Horizontal

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 11.1V 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 13
LTE Band 17
LTE Band 25,
LTE Band 41,

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)				
9.44	1880	13.1	0.006944	2.5
11.10	1880	13.4	0.007151	2.5
12.77	1880	13.3	0.007065	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	12.8	0.006813	2.5
Extreme (50C)	1880	11.9	0.006318	2.5
Extreme (40C)	1880	14.0	0.007441	2.5
Extreme (30C)	1880	13.9	0.007398	2.5
Extreme (10C)	1880	14.1	0.007501	2.5
Extreme (0C)	1880	11.7	0.006212	2.5
Extreme (-10C)	1880	12.9	0.006840	2.5
Extreme (-20C)	1880	14.4	0.007657	2.5
Extreme (-30C)	1880	14.6	0.007781	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)				
9.44	1880	9.6	0.005113	2.5
11.10	1880	9.1	0.004815	2.5
12.77	1880	8.2	0.004366	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	9.9	0.005266	2.5
Extreme (50C)	1880	9.0	0.004766	2.5
Extreme (40C)	1880	7.9	0.00419044	2.5
Extreme (30C)	1880	8.9	0.004750534	2.5
Extreme (10C)	1880	9.4	0.00499347	2.5
Extreme (0C)	1880	8.4	0.004477404	2.5
Extreme (-10C)	1880	9.4	0.005001533	2.5
Extreme (-20C)	1880	8.7	0.004619943	2.5
Extreme (-30C)	1880	8.2	0.004338394	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)				
9.44	1732.5	9.2	0.005297	2.5
11.10	1732.5	9.3	0.005391	2.5
12.77	1732.5	8.0	0.004596	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	7.9	0.004571	2.5
Extreme (50C)	1732.5	9.1	0.005230	2.5
Extreme (40C)	1732.5	7.5	0.004333	2.5
Extreme (30C)	1732.5	6.3	0.003646	2.5
Extreme (10C)	1732.5	7.4	0.004262	2.5
Extreme (0C)	1732.5	9.1	0.005238	2.5
Extreme (-10C)	1732.5	8.1	0.004684	2.5
Extreme (-20C)	1732.5	6.8	0.003921	2.5
Extreme (-30C)	1732.5	8.8	0.005088	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)				
9.44	1732.5	10.0	0.005756	2.5
11.10	1732.5	9.3	0.005344	2.5
12.77	1732.5	8.4	0.004871	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	9.3	0.005358	2.5
Extreme (50C)	1732.5	9.1	0.005258	2.5
Extreme (40C)	1732.5	8.0	0.004624	2.5
Extreme (30C)	1732.5	8.5	0.004922	2.5
Extreme (10C)	1732.5	8.7	0.005020	2.5
Extreme (0C)	1732.5	7.8	0.004501	2.5
Extreme (-10C)	1732.5	8.5	0.004935	2.5
Extreme (-20C)	1732.5	8.5	0.004921	2.5
Extreme (-30C)	1732.5	8.0	0.004625	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)				
9.44	836.5	5.6	0.006659	2.5
11.10	836.5	7.0	0.008335	2.5
12.77	836.5	4.7	0.005650	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	6.1	0.007295	2.5
Extreme (50C)	836.5	5.6	0.006677	2.5
Extreme (40C)	836.5	5.7	0.006810	2.5
Extreme (30C)	836.5	6.0	0.007216	2.5
Extreme (10C)	836.5	5.7	0.006847	2.5
Extreme (0C)	836.5	4.9	0.005851	2.5
Extreme (-10C)	836.5	6.0	0.007185	2.5
Extreme (-20C)	836.5	6.1	0.007294	2.5
Extreme (-30C)	836.5	6.2	0.007449	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)				
9.44	836.5	5.8	0.006940	2.5
11.10	836.5	6.9	0.008273	2.5
12.77	836.5	5.3	0.006312	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	6.6	0.007856	2.5
Extreme (50C)	836.5	6.1	0.007330	2.5
Extreme (40C)	836.5	5.8	0.006960	2.5
Extreme (30C)	836.5	6.8	0.008083	2.5
Extreme (10C)	836.5	4.9	0.005892	2.5
Extreme (0C)	836.5	5.0	0.005996	2.5
Extreme (-10C)	836.5	5.9	0.007070	2.5
Extreme (-20C)	836.5	6.0	0.007137	2.5
Extreme (-30C)	836.5	6.1	0.007253	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)				
9.44	2535	9.6	0.003778	2.5
11.10	2535	8.8	0.003468	2.5
12.77	2535	8.7	0.003419	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	9.9	0.003899	2.5
Extreme (50C)	2535	9.2	0.003611	2.5
Extreme (40C)	2535	8.6	0.003397	2.5
Extreme (30C)	2535	8.8	0.003469	2.5
Extreme (10C)	2535	8.2	0.003228	2.5
Extreme (0C)	2535	8.3	0.003272	2.5
Extreme (-10C)	2535	9.4	0.003721	2.5
Extreme (-20C)	2535	9.3	0.003649	2.5
Extreme (-30C)	2535	8.6	0.003388	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)				
9.44	2535	6.9	0.002722	2.5
11.10	2535	6.8	0.002683	2.5
12.77	2535	6.2	0.002436	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	5.7	0.002267	2.5
Extreme (40C)	2535	5.4	0.002141	2.5
Extreme (30C)	2535	6.9	0.002733	2.5
Extreme (10C)	2535	6.0	0.002371	2.5
Extreme (0C)	2535	4.9	0.001943	2.5
Extreme (-10C)	2535	5.3	0.002110	2.5
Extreme (-20C)	2535	6.3	0.002477	2.5
Extreme (-30C)	2535	5.8	0.002269	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)				
9.44	707.5	9.2	0.012978	2.5
11.10	707.5	10.3	0.014546	2.5
12.77	707.5	8.3	0.011800	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	0.012135	2.5
Extreme (50C)	707.5	7.7	0.010943	2.5
Extreme (40C)	707.5	7.2	0.010170	2.5
Extreme (30C)	707.5	8.2	0.011657	2.5
Extreme (10C)	707.5	7.4	0.010405	2.5
Extreme (0C)	707.5	8.7	0.012315	2.5
Extreme (-10C)	707.5	8.0	0.011286	2.5
Extreme (-20C)	707.5	8.8	0.012475	2.5
Extreme (-30C)	707.5	7.5	0.010607	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)				
9.44	707.5	7.8	0.011086	2.5
11.10	707.5	8.3	0.011762	2.5
12.77	707.5	7.0	0.009915	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	8.9	0.012546	2.5
Extreme (50C)	707.5	8.8	0.012481	2.5
Extreme (40C)	707.5	8.7	0.012260	2.5
Extreme (30C)	707.5	7.5	0.010644	2.5
Extreme (10C)	707.5	8.9	0.012547	2.5
Extreme (0C)	707.5	7.8	0.011084	2.5
Extreme (-10C)	707.5	7.4	0.010530	2.5
Extreme (-20C)	707.5	8.6	0.012129	2.5
Extreme (-30C)	707.5	8.9	0.012540	2.5

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

10.6 LTE BAND 13

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
9.44	782.0	12.3	0.015706	2.5
11.10	782.0	14.3	0.018274	2.5
12.77	782.0	13.7	0.017513	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	782.0	14.2	0.018130	2.5
Extreme (50C)	782.0	14.0	0.017925	2.5
Extreme (40C)	782.0	15.5	0.019841	2.5
Extreme (30C)	782.0	14.0	0.017875	2.5
Extreme (10C)	782.0	13.5	0.017319	2.5
Extreme (0C)	782.0	14.6	0.018614	2.5
Extreme (-10C)	782.0	14.1	0.018032	2.5
Extreme (-20C)	782.0	14.0	0.017867	2.5
Extreme (-30C)	782.0	13.9	0.017769	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 16QAM, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
9.44	782.0	12.9	0.016527	2.5
11.10	782.0	13.5	0.017324	2.5
12.77	782.0	13.6	0.017447	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	782.0	12.3	0.015726	2.5
Extreme (50C)	782.0	11.6	0.014882	2.5
Extreme (40C)	782.0	13.4	0.017178	2.5
Extreme (30C)	782.0	13.2	0.016918	2.5
Extreme (10C)	782.0	14.2	0.018204	2.5
Extreme (0C)	782.0	11.9	0.015258	2.5
Extreme (-10C)	782.0	13.0	0.016616	2.5
Extreme (-20C)	782.0	14.4	0.018457	2.5
Extreme (-30C)	782.0	15.1	0.019273	2.5

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

10.7 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)				
9.44	710.0	10.0	0.014020	2.5
11.10	710.0	8.9	0.012484	2.5
12.77	710.0	7.6	0.010750	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	0.013201	2.5
Extreme (50C)	710.0	8.4	0.011832	2.5
Extreme (40C)	710.0	7.9	0.011073	2.5
Extreme (30C)	710.0	8.5	0.011986	2.5
Extreme (10C)	710.0	8.5	0.011925	2.5
Extreme (0C)	710.0	7.8	0.010958	2.5
Extreme (-10C)	710.0	9.2	0.013020	2.5
Extreme (-20C)	710.0	8.9	0.012506	2.5
Extreme (-30C)	710.0	7.8	0.010985	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)				
9.44	710.0	9.7	0.013728	2.5
11.10	710.0	9.4	0.013193	2.5
12.77	710.0	8.6	0.012126	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	9.2	0.012963	2.5
Extreme (50C)	710.0	9.0	0.012698	2.5
Extreme (40C)	710.0	8.0	0.011282	2.5
Extreme (30C)	710.0	8.9	0.012468	2.5
Extreme (10C)	710.0	8.6	0.012104	2.5
Extreme (0C)	710.0	8.3	0.011669	2.5
Extreme (-10C)	710.0	9.7	0.013723	2.5
Extreme (-20C)	710.0	8.8	0.012451	2.5
Extreme (-30C)	710.0	8.4	0.011763	2.5

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

10.7 LTE BAND 25

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 25 QPSK, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
9.44	1882.5	9.8	0.005229	2.5
11.10	1882.5	9.2	0.004907	2.5
12.77	1882.5	8.7	0.004619	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 25 QPSK, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1882.5	9.3	0.004952	2.5
Extreme (50C)	1882.5	8.8	0.004662	2.5
Extreme (40C)	1882.5	8.6	0.004553	2.5
Extreme (30C)	1882.5	8.5	0.004538	2.5
Extreme (10C)	1882.5	7.8	0.004155	2.5
Extreme (0C)	1882.5	8.4	0.004450	2.5
Extreme (-10C)	1882.5	9.3	0.004918	2.5
Extreme (-20C)	1882.5	8.5	0.004503	2.5
Extreme (-30C)	1882.5	8.9	0.004707	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 25 16QAM, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
9.44	1882.5	6.9	0.003665	2.5
11.10	1882.5	6.9	0.003660	2.5
12.77	1882.5	5.8	0.003075	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 25 16QAM, (CH 26365 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1882.5	6.9	0.003665	2.5
Extreme (50C)	1882.5	5.6	0.002981	2.5
Extreme (40C)	1882.5	5.0	0.002652	2.5
Extreme (30C)	1882.5	6.8	0.003601	2.5
Extreme (10C)	1882.5	5.9	0.003115	2.5
Extreme (0C)	1882.5	5.6	0.002958	2.5
Extreme (-10C)	1882.5	4.7	0.002518	2.5
Extreme (-20C)	1882.5	5.6	0.002957	2.5
Extreme (-30C)	1882.5	5.5	0.002941	2.5

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

10.8 LTE BAND 41

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40640 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
9.44	2593	10.4	0.004017	2.5
11.10	2593	9.4	0.003608	2.5
12.77	2593	8.6	0.003307	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40640 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593	9.1	0.003519	2.5
Extreme (50C)	2593	9.3	0.003602	2.5
Extreme (40C)	2593	8.5	0.003266	2.5
Extreme (30C)	2593	8.7	0.003338	2.5
Extreme (10C)	2593	8.0	0.003095	2.5
Extreme (0C)	2593	8.4	0.003257	2.5
Extreme (-10C)	2593	9.4	0.003630	2.5
Extreme (-20C)	2593	8.6	0.003325	2.5
Extreme (-30C)	2593	8.1	0.003121	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40640 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
9.44	2593	6.9	0.002661	2.5
11.10	2593	6.4	0.002483	2.5
12.77	2593	6.1	0.002347	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40640 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593	6.9	0.002661	2.5
Extreme (50C)	2593	5.2	0.002013	2.5
Extreme (40C)	2593	5.0	0.001926	2.5
Extreme (30C)	2593	6.4	0.002479	2.5
Extreme (10C)	2593	6.1	0.002353	2.5
Extreme (0C)	2593	4.7	0.001819	2.5
Extreme (-10C)	2593	5.4	0.002086	2.5
Extreme (-20C)	2593	5.9	0.002294	2.5
Extreme (-30C)	2593	6.2	0.002384	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.

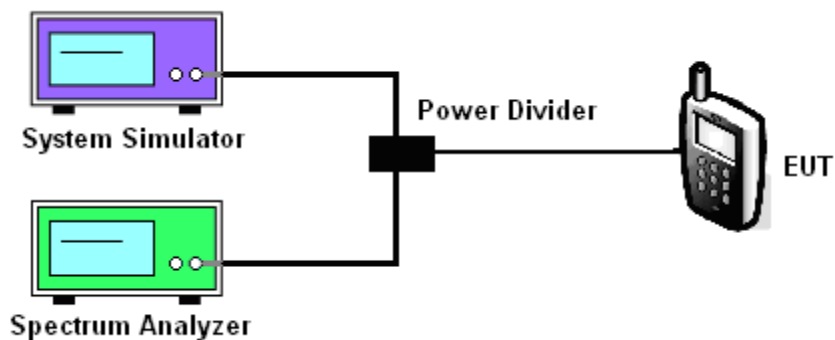
11.2 Measuring Instruments

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 13
- LTE Band 17
- LTE Band 25,
- LTE Band 41,

Test data reference attachment.

----END OF REPORT----