

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

FCC ID: O551001923

Product: 4G Tablet

Trade Mark: LOGIC, ISWAG, UNONU

Model No.: T10L PLUS

Family Model: Grad, Slate

Report No.: STR230329003006E

Issue Date: May 26, 2023

Prepared for

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	4G Tablet
Trade Mark	LOGIC, ISWAG, UNONU
Model Name	T10L PLUS
Family Model	Grad, Slate
Model Difference	All the model are the same circuit and RF module,except the model names.
FCC ID:	O551001923
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,17
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.55 dBi, Band 4: 0.52 dBi, Band 5: 0.67 dBi, Band 7: 0.61 dBi, Band 12: 0.62 dBi, Band 17: 0.62 dBi
Adapter	Model: LY-JX058-08U0502000 Input: AC 100-240V, 50-60Hz 0.3A Output: DC 5.0V---2000mA
Battery	DC 3.8V, 5000mAh, 19Wh
Power supply	DC 3.8V from battery or DC 5V from Adapter.
Extreme Vol. Limits:	DC 3.23V to DC 4.37V (Nominal DC 3.8V) (Note 1)
HW Version	S30DL_V1.1X
SW Version	LOGIC_LT10L_PLUS_TIGO_GT_V1.0
** Note1: The High Voltage DC 4.37V and Low Voltage 3.23V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: O551001923** filing to comply with the FCC Part 22H&24E&27&90S.

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 2/4/5/7/12/17

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

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	4G Tablet	T10L PLUS	FCC ID: O551001923	EUT

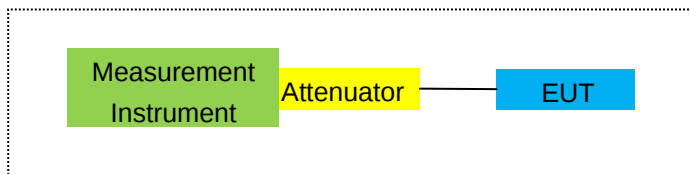
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

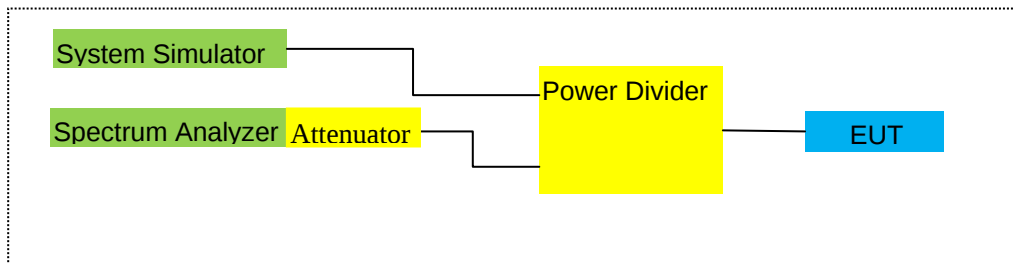
For Radiated Test Cases



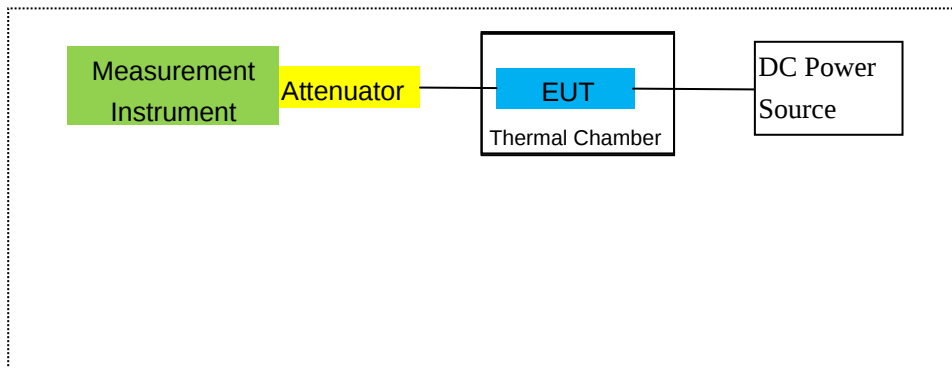
For Conducted Output Power



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	2022.06.16	2023.06.15	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16	2024.03.15	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2025.03.30	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2023.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2022.06.17	2023.06.16	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.11.04	2023.11.05	1 year
9	Power Meter	R&S	NRVS	100696	2022.06.17	2023.06.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2022.06.17	2023.06.16	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11 2023.05.06	2023.05.10 2026.05.05	3 year
22	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27	2024.03.26	1 year
23	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	1 year

24	Communication Tester	R&S	CMU200	A0304247	2022.06.16	2023.06.15	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27	2024.03.26	1 year
26	DC Power Source	N/A	PS-6005D	20170402923	2020.05.11 2023.05.06	2023.05.10 2026.05.05	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
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

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

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

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

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

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

☐

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

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, and §90.691

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

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

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 and §90.691

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

- ☐ Band 2/4/5/7/12/17
- ☐

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

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

☐ Band 2/4/5/7/12/17

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-2.07	3.76	28.24	22.41	174.181	Horizontal	Pass
		1880	-1.78	3.91	28.22	22.53	179.061	Horizontal	Pass
		1909.3	-1.83	3.93	28.20	22.44	175.388	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-2.03	3.77	28.23	22.43	174.985	Horizontal	Pass
		1880	-1.86	3.91	28.24	22.47	176.604	Horizontal	Pass
		1908.5	-1.88	3.94	28.25	22.43	174.985	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.08	3.77	28.31	22.46	176.198	Horizontal	Pass
		1880	-1.76	3.91	28.22	22.55	179.887	Horizontal	Pass
		1907.5	-1.73	3.94	28.20	22.53	179.061	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-2.00	3.79	28.33	22.54	179.473	Horizontal	Pass
		1880	-1.81	3.95	28.22	22.46	176.198	Horizontal	Pass
		1905	-1.73	3.97	28.19	22.49	177.419	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-2.01	3.79	28.34	22.54	179.473	Horizontal	Pass
		1880	-1.77	3.95	28.22	22.50	177.828	Horizontal	Pass
		1902.5	-1.76	3.97	28.18	22.45	175.792	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-2.12	3.81	28.35	22.42	174.582	Horizontal	Pass
		1880	-1.86	3.96	28.22	22.40	173.780	Horizontal	Pass
		1900	-1.74	4.00	28.16	22.42	174.582	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-1.95	3.76	28.24	22.53	179.061	Vertical	Pass
		1880	-1.90	3.91	28.22	22.41	174.181	Vertical	Pass
		1909.3	-1.81	3.93	28.20	22.46	176.198	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-1.97	3.77	28.23	22.49	177.419	Vertical	Pass
		1880	-1.83	3.91	28.24	22.50	177.828	Vertical	Pass
		1908.5	-1.89	3.94	28.25	22.42	174.582	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.06	3.77	28.31	22.48	177.011	Vertical	Pass
		1880	-1.91	3.91	28.22	22.40	173.780	Vertical	Pass
		1907.5	-1.80	3.94	28.20	22.46	176.198	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-2.01	3.79	28.33	22.53	179.061	Vertical	Pass
		1880	-1.80	3.95	28.22	22.47	176.604	Vertical	Pass
		1905	-1.79	3.97	28.19	22.43	174.985	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-2.03	3.79	28.34	22.52	178.649	Vertical	Pass
Band		1880	-1.73	3.95	28.22	22.54	179.473	Vertical	Pass
QPSK		1902.5	-1.68	3.97	28.18	22.53	179.061	Vertical	Pass
20.0MHz	1/#Mid	1860	-1.96	3.81	28.35	22.58	181.134	Vertical	Pass
Band		1880	-1.68	3.96	28.22	22.58	181.134	Vertical	Pass
QPSK		1900	-1.58	4.00	28.16	22.58	181.134	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-2.84	3.76	28.24	21.64	145.881	Horizontal	Pass
		1880	-2.57	3.91	28.22	21.74	149.279	Horizontal	Pass
		1909.3	-2.63	3.93	28.20	21.64	145.881	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-2.73	3.77	28.23	21.73	148.936	Horizontal	Pass
		1880	-2.71	3.91	28.24	21.62	145.211	Horizontal	Pass
		1908.5	-2.66	3.94	28.25	21.65	146.218	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-2.83	3.77	28.31	21.71	148.252	Horizontal	Pass
		1880	-2.72	3.91	28.22	21.59	144.212	Horizontal	Pass
		1907.5	-2.57	3.94	28.20	21.69	147.571	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-2.86	3.79	28.33	21.68	147.231	Horizontal	Pass
		1880	-2.64	3.95	28.22	21.63	145.546	Horizontal	Pass
		1905	-2.52	3.97	28.19	21.70	147.911	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-2.92	3.79	28.34	21.63	145.546	Horizontal	Pass
		1880	-2.60	3.95	28.22	21.67	146.893	Horizontal	Pass
		1902.5	-2.49	3.97	28.18	21.72	148.594	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-2.84	3.81	28.35	21.70	147.911	Horizontal	Pass
		1880	-2.56	3.96	28.22	21.70	147.911	Horizontal	Pass
		1900	-2.55	4.00	28.16	21.61	144.877	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-2.85	3.76	28.24	21.63	145.546	Vertical	Pass
		1880	-2.62	3.91	28.22	21.69	147.571	Vertical	Pass
		1909.3	-2.63	3.93	28.20	21.64	145.881	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-2.73	3.77	28.23	21.73	148.936	Vertical	Pass
		1880	-2.64	3.91	28.24	21.69	147.571	Vertical	Pass
		1908.5	-2.62	3.94	28.25	21.69	147.571	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-2.94	3.77	28.31	21.60	144.544	Vertical	Pass

Band 16		1880	-2.73	3.91	28.22	21.58	143.880	Vertical	Pass
QAM		1907.5	-2.68	3.94	28.20	21.58	143.880	Vertical	Pass
10.0MHz	1/#Mid	1855	-2.89	3.79	28.33	21.65	146.218	Vertical	Pass
Band 16		1880	-2.59	3.95	28.22	21.68	147.231	Vertical	Pass
QAM		1905	-2.60	3.97	28.19	21.62	145.211	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-2.92	3.79	28.34	21.63	145.546	Vertical	Pass
Band 16		1880	-2.57	3.95	28.22	21.70	147.911	Vertical	Pass
QAM		1902.5	-2.54	3.97	28.18	21.67	146.893	Vertical	Pass
20.0MHz	1/#Mid	1860	-2.75	3.81	28.35	21.79	151.008	Vertical	Pass
Band 16		1880	-2.48	3.96	28.22	21.78	150.661	Vertical	Pass
QAM		1900	-2.41	4.00	28.16	21.75	149.624	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)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-2.95	3.12	27.58	21.51	141.579	Horizontal	Pass
		1732.5	-2.80	3.27	27.61	21.54	142.561	Horizontal	Pass
		1754.3	-2.72	3.29	27.63	21.62	145.211	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.99	3.13	27.61	21.49	140.929	Horizontal	Pass
		1732.5	-2.72	3.27	27.61	21.62	145.211	Horizontal	Pass
		1753.5	-2.83	3.30	27.62	21.49	140.929	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.94	3.13	27.63	21.56	143.219	Horizontal	Pass
		1732.5	-2.77	3.27	27.61	21.57	143.549	Horizontal	Pass
		1752.5	-2.69	3.30	27.60	21.61	144.877	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.90	3.15	27.64	21.59	144.212	Horizontal	Pass
		1732.5	-2.69	3.31	27.61	21.61	144.877	Horizontal	Pass
		1750	-2.76	3.33	27.59	21.50	141.254	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-2.89	3.15	27.65	21.61	144.877	Horizontal	Pass
		1732.5	-2.77	3.31	27.61	21.53	142.233	Horizontal	Pass
		1747.5	-2.71	3.33	27.57	21.53	142.233	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.02	3.17	27.66	21.47	140.281	Horizontal	Pass
		1732.5	-2.72	3.32	27.61	21.57	143.549	Horizontal	Pass
		1745	-2.69	3.36	27.56	21.51	141.579	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.96	3.12	27.58	21.50	141.254	Vertical	Pass
		1732.5	-2.84	3.27	27.61	21.50	141.254	Vertical	Pass
		1754.3	-2.85	3.29	27.63	21.49	140.929	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-3.01	3.13	27.61	21.47	140.281	Vertical	Pass
		1732.5	-2.87	3.27	27.61	21.47	140.281	Vertical	Pass
		1753.5	-2.74	3.30	27.62	21.58	143.880	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.92	3.13	27.63	21.58	143.880	Vertical	Pass
		1732.5	-2.78	3.27	27.61	21.56	143.219	Vertical	Pass
		1752.5	-2.77	3.30	27.60	21.53	142.233	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.90	3.15	27.64	21.59	144.212	Vertical	Pass
		1732.5	-2.78	3.31	27.61	21.52	141.906	Vertical	Pass
		1750	-2.65	3.33	27.59	21.61	144.877	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-2.90	3.15	27.65	21.60	144.544	Vertical	Pass
		1732.5	-2.72	3.31	27.61	21.58	143.880	Vertical	Pass
		1747.5	-2.65	3.33	27.57	21.59	144.212	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.83	3.17	27.66	21.66	146.555	Vertical	Pass
		1732.5	-2.65	3.32	27.61	21.64	145.881	Vertical	Pass
		1745	-2.57	3.36	27.56	21.63	145.546	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.60	3.12	27.58	20.86	121.899	Horizontal	Pass
		1732.5	-3.46	3.27	27.61	20.88	122.462	Horizontal	Pass
		1754.3	-3.53	3.29	27.63	20.81	120.504	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.63	3.13	27.61	20.85	121.619	Horizontal	Pass
		1732.5	-3.46	3.27	27.61	20.88	122.462	Horizontal	Pass
		1753.5	-3.55	3.30	27.62	20.77	119.399	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.70	3.13	27.63	20.80	120.226	Horizontal	Pass
		1732.5	-3.52	3.27	27.61	20.82	120.781	Horizontal	Pass
		1752.5	-3.52	3.30	27.60	20.78	119.674	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.61	3.15	27.64	20.88	122.462	Horizontal	Pass
		1732.5	-3.40	3.31	27.61	20.90	123.027	Horizontal	Pass
		1750	-3.46	3.33	27.59	20.80	120.226	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.65	3.15	27.65	20.85	121.619	Horizontal	Pass
		1732.5	-3.39	3.31	27.61	20.91	123.310	Horizontal	Pass
		1747.5	-3.38	3.33	27.57	20.86	121.899	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.72	3.17	27.66	20.77	119.399	Horizontal	Pass
		1732.5	-3.50	3.32	27.61	20.79	119.950	Horizontal	Pass
		1745	-3.44	3.36	27.56	20.76	119.124	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.60	3.12	27.58	20.86	121.899	Vertical	Pass
		1732.5	-3.49	3.27	27.61	20.85	121.619	Vertical	Pass
		1754.3	-3.46	3.29	27.63	20.88	122.462	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.65	3.13	27.61	20.83	121.060	Vertical	Pass
		1732.5	-3.45	3.27	27.61	20.89	122.744	Vertical	Pass
		1753.5	-3.44	3.30	27.62	20.88	122.462	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-3.62	3.13	27.63	20.88	122.462	Vertical	Pass

Band 16 QAM		1732.5	-3.45	3.27	27.61	20.89	122.744	Vertical	Pass
		1752.5	-3.48	3.30	27.60	20.82	120.781	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.65	3.15	27.64	20.84	121.339	Vertical	Pass
		1732.5	-3.44	3.31	27.61	20.86	121.899	Vertical	Pass
		1750	-3.48	3.33	27.59	20.78	119.674	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-3.66	3.15	27.65	20.84	121.339	Vertical	Pass
		1732.5	-3.50	3.31	27.61	20.80	120.226	Vertical	Pass
		1747.5	-3.38	3.33	27.57	20.86	121.899	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-3.53	3.17	27.66	20.96	124.738	Vertical	Pass
		1732.5	-3.32	3.32	27.61	20.97	125.026	Vertical	Pass
		1745	-3.27	3.36	27.56	20.93	123.880	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							Conclusi on
			SG	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	824.7	6.30	2.01	19.68	2.15	21.82	152.055	Horizontal	Pass
		836.5	6.27	2.01	19.77	2.15	21.88	154.170	Horizontal	Pass
		848.3	6.23	2.02	19.82	2.15	21.88	154.170	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.42	2.01	19.70	2.15	21.96	157.036	Horizontal	Pass
		836.5	6.35	2.01	19.77	2.15	21.96	157.036	Horizontal	Pass
		847.5	6.29	2.02	19.81	2.15	21.93	155.955	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.24	2.01	19.71	2.15	21.79	151.008	Horizontal	Pass
		836.5	6.30	2.01	19.77	2.15	21.91	155.239	Horizontal	Pass
		846.5	6.31	2.02	19.79	2.15	21.93	155.955	Horizontal	Pass
10.0MH z Band QPSK	1/#Mid	829	6.38	2.01	19.73	2.15	21.95	156.675	Horizontal	Pass
		836.5	6.19	2.01	19.77	2.15	21.80	151.356	Horizontal	Pass
		844	6.30	2.02	19.78	2.15	21.91	155.239	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	6.33	2.01	19.68	2.15	21.85	153.109	Vertical	Pass
		836.5	6.24	2.01	19.77	2.15	21.85	153.109	Vertical	Pass
		848.3	6.22	2.02	19.82	2.15	21.87	153.815	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.35	2.01	19.70	2.15	21.89	154.525	Vertical	Pass
		836.5	6.27	2.01	19.77	2.15	21.88	154.170	Vertical	Pass
		847.5	6.21	2.02	19.81	2.15	21.85	153.109	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.34	2.01	19.71	2.15	21.89	154.525	Vertical	Pass
		836.5	6.32	2.01	19.77	2.15	21.93	155.955	Vertical	Pass
		846.5	6.22	2.02	19.79	2.15	21.84	152.757	Vertical	Pass
10.0MH z Band QPSK	1/#Mid	829	6.40	2.01	19.73	2.15	21.97	157.398	Vertical	Pass
		836.5	6.39	2.01	19.77	2.15	22.00	158.489	Vertical	Pass
		844	6.38	2.02	19.78	2.15	21.99	158.125	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclu sion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	824.7	5.81	2.01	19.68	2.15	21.33	135.831	Horizontal	Pass
		836.5	5.71	2.01	19.77	2.15	21.32	135.519	Horizontal	Pass
		848.3	5.60	2.02	19.82	2.15	21.25	133.352	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.73	2.01	19.70	2.15	21.27	133.968	Horizontal	Pass
		836.5	5.67	2.01	19.77	2.15	21.28	134.276	Horizontal	Pass
		847.5	5.66	2.02	19.81	2.15	21.30	134.896	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.67	2.01	19.71	2.15	21.22	132.434	Horizontal	Pass
		836.5	5.58	2.01	19.77	2.15	21.19	131.522	Horizontal	Pass
		846.5	5.69	2.02	19.79	2.15	21.31	135.207	Horizontal	Pass
10.0MH z Band 16 QAM	1/#Mid	829	5.74	2.01	19.73	2.15	21.31	135.207	Horizontal	Pass
		836.5	5.72	2.01	19.77	2.15	21.33	135.831	Horizontal	Pass
		844	5.66	2.02	19.78	2.15	21.27	133.968	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	5.72	2.01	19.68	2.15	21.24	133.045	Vertical	Pass
		836.5	5.63	2.01	19.77	2.15	21.24	133.045	Vertical	Pass
		848.3	5.62	2.02	19.82	2.15	21.27	133.968	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.70	2.01	19.70	2.15	21.24	133.045	Vertical	Pass
		836.5	5.64	2.01	19.77	2.15	21.25	133.352	Vertical	Pass
		847.5	5.66	2.02	19.81	2.15	21.30	134.896	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.77	2.01	19.71	2.15	21.32	135.519	Vertical	Pass
		836.5	5.66	2.01	19.77	2.15	21.27	133.968	Vertical	Pass
		846.5	5.58	2.02	19.79	2.15	21.20	131.826	Vertical	Pass
10.0MH z Band 16 QAM	1/#Mid	829	5.85	2.01	19.73	2.15	21.42	138.676	Vertical	Pass
		836.5	5.79	2.01	19.77	2.15	21.40	138.038	Vertical	Pass
		844	5.81	2.02	19.78	2.15	21.42	138.676	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)

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	-1.88	4.54	27.75	21.33	135.831	Horizontal	Pass
		2535	-1.70	4.69	27.72	21.33	135.831	Horizontal	Pass
		2567.5	-1.69	4.71	27.71	21.31	135.207	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.81	4.55	27.76	21.40	138.038	Horizontal	Pass
		2535	-1.75	4.69	27.72	21.28	134.276	Horizontal	Pass
		2565	-1.63	4.72	27.70	21.35	136.458	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.94	4.55	27.77	21.28	134.276	Horizontal	Pass
		2535	-1.79	4.69	27.72	21.24	133.045	Horizontal	Pass
		2562.5	-1.65	4.72	27.69	21.32	135.519	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.94	4.57	27.78	21.27	133.968	Horizontal	Pass
		2535	-1.70	4.73	27.72	21.29	134.586	Horizontal	Pass
		2560	-1.52	4.75	27.68	21.41	138.357	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-1.93	4.54	27.75	21.28	134.276	Vertical	Pass
		2535	-1.77	4.69	27.72	21.26	133.660	Vertical	Pass
		2567.5	-1.65	4.71	27.71	21.35	136.458	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.81	4.55	27.76	21.40	138.038	Vertical	Pass
		2535	-1.75	4.69	27.72	21.28	134.276	Vertical	Pass
		2565	-1.63	4.72	27.70	21.35	136.458	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.98	4.55	27.77	21.24	133.045	Vertical	Pass
		2535	-1.64	4.69	27.72	21.39	137.721	Vertical	Pass
		2562.5	-1.71	4.72	27.69	21.26	133.660	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.75	4.57	27.78	21.46	139.959	Vertical	Pass
		2535	-1.55	4.73	27.72	21.44	139.316	Vertical	Pass
		2560	-1.49	4.75	27.68	21.44	139.316	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	Average	Average	Of Max. ERP	
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-2.45	4.54	27.75	20.76	119.124	Horizontal	Pass
		2535	-2.23	4.69	27.72	20.80	120.226	Horizontal	Pass
		2567.5	-2.28	4.71	27.71	20.72	118.032	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.42	4.55	27.76	20.79	119.950	Horizontal	Pass
		2535	-2.26	4.69	27.72	20.77	119.399	Horizontal	Pass
		2565	-2.29	4.72	27.70	20.69	117.220	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.52	4.55	27.77	20.70	117.490	Horizontal	Pass
		2535	-2.39	4.69	27.72	20.64	115.878	Horizontal	Pass
		2562.5	-2.25	4.72	27.69	20.72	118.032	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.43	4.57	27.78	20.78	119.674	Horizontal	Pass
		2535	-2.21	4.73	27.72	20.78	119.674	Horizontal	Pass
		2560	-2.24	4.75	27.68	20.69	117.220	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-2.51	4.54	27.75	20.70	117.490	Vertical	Pass
		2535	-2.30	4.69	27.72	20.73	118.304	Vertical	Pass
		2567.5	-2.27	4.71	27.71	20.73	118.304	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.43	4.55	27.76	20.78	119.674	Vertical	Pass
		2535	-2.34	4.69	27.72	20.69	117.220	Vertical	Pass
		2565	-2.31	4.72	27.70	20.67	116.681	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.52	4.55	27.77	20.70	117.490	Vertical	Pass
		2535	-2.28	4.69	27.72	20.75	118.850	Vertical	Pass
		2562.5	-2.17	4.72	27.69	20.80	120.226	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.37	4.57	27.78	20.84	121.339	Vertical	Pass
		2535	-2.16	4.73	27.72	20.83	121.060	Vertical	Pass
		2560	-2.10	4.75	27.68	20.83	121.060	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusi on
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. EPR	Max. EPR	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	699.7	6.97	1.91	19.21	2.15	22.12	162.930	Vertical	Pass
		707.5	6.97	1.91	19.26	2.15	22.17	164.816	Vertical	Pass
		715.3	6.90	1.93	19.34	2.15	22.16	164.437	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	7.02	1.91	19.21	2.15	22.17	164.816	Vertical	Pass
		707.5	6.87	1.91	19.26	2.15	22.07	161.065	Vertical	Pass
		714.5	6.83	1.93	19.34	2.15	22.09	161.808	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	6.93	1.91	19.23	2.15	22.10	162.181	Vertical	Pass
		707.5	6.90	1.91	19.26	2.15	22.10	162.181	Vertical	Pass
		713.5	6.80	1.92	19.33	2.15	22.06	160.694	Vertical	Pass
10.0Hz Band QPSK	1/#Mid	704	6.96	1.91	19.25	2.15	22.15	164.059	Vertical	Pass
		707.5	6.88	1.91	19.26	2.15	22.08	161.436	Vertical	Pass
		711	6.96	1.92	19.32	2.15	22.21	166.341	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	7.06	1.91	19.21	2.15	22.21	166.341	Horizontal	Pass
		707.5	6.96	1.91	19.26	2.15	22.16	164.437	Horizontal	Pass
		715.3	6.83	1.93	19.34	2.15	22.09	161.808	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	6.96	1.91	19.21	2.15	22.11	162.555	Horizontal	Pass
		707.5	6.99	1.91	19.26	2.15	22.19	165.577	Horizontal	Pass
		714.5	6.82	1.93	19.34	2.15	22.08	161.436	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	6.99	1.91	19.23	2.15	22.16	164.437	Horizontal	Pass
		707.5	7.00	1.91	19.26	2.15	22.20	165.959	Horizontal	Pass
		713.5	6.91	1.92	19.33	2.15	22.17	164.816	Horizontal	Pass
10.0Hz Band QPSK	1/#Mid	704	7.05	1.91	19.25	2.15	22.24	167.494	Horizontal	Pass
		707.5	7.05	1.91	19.26	2.15	22.25	167.880	Horizontal	Pass
		711	7.01	1.92	19.32	2.15	22.26	168.267	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Factor (dB)	Correction	Max. EPR	Max. EPR	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	699.7	5.91	1.91	19.21	2.15	21.06	127.644	Vertical	Pass
		707.5	5.82	1.91	19.26	2.15	21.02	126.474	Vertical	Pass
		715.3	5.77	1.93	19.34	2.15	21.03	126.765	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	5.95	1.91	19.21	2.15	21.10	128.825	Vertical	Pass
		707.5	5.80	1.91	19.26	2.15	21.00	125.893	Vertical	Pass
		714.5	5.86	1.93	19.34	2.15	21.12	129.420	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	5.94	1.91	19.23	2.15	21.11	129.122	Vertical	Pass
		707.5	5.77	1.91	19.26	2.15	20.97	125.026	Vertical	Pass
		713.5	5.75	1.92	19.33	2.15	21.01	126.183	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	5.78	1.91	19.25	2.15	20.97	125.026	Vertical	Pass
		707.5	5.81	1.91	19.26	2.15	21.01	126.183	Vertical	Pass
		711	5.76	1.92	19.32	2.15	21.01	126.183	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	5.90	1.91	19.21	2.15	21.05	127.350	Horizontal	Pass
		707.5	5.80	1.91	19.26	2.15	21.00	125.893	Horizontal	Pass
		715.3	5.84	1.93	19.34	2.15	21.10	128.825	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	5.86	1.91	19.21	2.15	21.01	126.183	Horizontal	Pass
		707.5	5.79	1.91	19.26	2.15	20.99	125.603	Horizontal	Pass
		714.5	5.78	1.93	19.34	2.15	21.04	127.057	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	5.86	1.91	19.23	2.15	21.03	126.765	Horizontal	Pass
		707.5	5.91	1.91	19.26	2.15	21.11	129.122	Horizontal	Pass
		713.5	5.69	1.92	19.33	2.15	20.95	124.451	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	5.96	1.91	19.25	2.15	21.15	130.317	Horizontal	Pass
		707.5	5.94	1.91	19.26	2.15	21.14	130.017	Horizontal	Pass
		711	5.88	1.92	19.32	2.15	21.13	129.718	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)

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Factor	Correction	Max.	Max.	Polarization	
			Level	Loss	(dB)		EPR	EPR	Of Max.	
			(dBm)	(dBm)			Average	Average	ERP	
						(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	706.5	2.93	1.91	19.23	2.15	18.10	64.565	Vertical	Pass
		710	2.97	1.91	19.26	2.15	18.17	65.615	Vertical	Pass
		713.5	2.88	1.92	19.33	2.15	18.14	65.163	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	2.99	1.91	19.25	2.15	18.18	65.766	Vertical	Pass
		710	2.97	1.91	19.26	2.15	18.17	65.615	Vertical	Pass
		711	2.83	1.92	19.32	2.15	18.08	64.269	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	2.89	1.91	19.23	2.15	18.06	63.973	Horizontal	Pass
		710	3.00	1.91	19.26	2.15	18.20	66.069	Horizontal	Pass
		713.5	2.91	1.92	19.33	2.15	18.17	65.615	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	3.04	1.91	19.25	2.15	18.23	66.527	Horizontal	Pass
		710	3.01	1.91	19.26	2.15	18.21	66.222	Horizontal	Pass
		711	2.98	1.92	19.32	2.15	18.23	66.527	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Factor	Correction	Max. EPR	Max. EPR	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	706.5	2.67	1.91	19.23	2.15	17.84	60.814	Vertical	Pass
		710	2.69	1.91	19.26	2.15	17.89	61.518	Vertical	Pass
		713.5	2.58	1.92	19.33	2.15	17.84	60.814	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	2.66	1.91	19.25	2.15	17.85	60.954	Vertical	Pass
		710	2.57	1.91	19.26	2.15	17.77	59.841	Vertical	Pass
		711	2.48	1.92	19.32	2.15	17.73	59.293	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	2.70	1.91	19.23	2.15	17.87	61.235	Horizontal	Pass
		710	2.55	1.91	19.26	2.15	17.75	59.566	Horizontal	Pass
		713.5	2.59	1.92	19.33	2.15	17.85	60.954	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	2.72	1.91	19.25	2.15	17.91	61.802	Horizontal	Pass
		710	2.72	1.91	19.26	2.15	17.92	61.944	Horizontal	Pass
		711	2.69	1.92	19.32	2.15	17.94	62.230	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

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 2/4/5/7/12/17

RESULTS

PASS

9.1 LTE BAND 2

QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.40	4.04	33.51	-18.93	-13	-5.93	Horizontal
3701.4	-51.53	4.04	33.51	-22.06	-13	-9.06	Vertical
5552.1	-50.04	5.24	35.84	-19.44	-13	-6.44	Vertical
5552.1	-53.96	5.24	35.84	-23.36	-13	-10.36	Horizontal
179.3	-44.62	1.43	16.02	-30.03	-13	-17.03	Vertical
404.1	-44.27	1.30	17.99	-27.58	-13	-14.58	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.30	4.04	33.56	-16.78	-13	-3.78	Horizontal
3760.0	-51.85	4.04	33.56	-22.33	-13	-9.33	Vertical
5640.0	-50.00	5.24	35.91	-19.33	-13	-6.33	Vertical
5640.0	-50.11	5.24	35.91	-19.44	-13	-6.44	Horizontal
176.0	-42.99	1.62	16.97	-27.64	-13	-14.64	Vertical
249.7	-43.00	1.74	15.98	-28.77	-13	-15.77	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-45.20	4.04	34.00	-15.24	-13	-2.24	Horizontal
3818.6	-51.72	4.04	34.00	-21.76	-13	-8.76	Vertical
5727.9	-47.32	5.24	36.04	-16.52	-13	-3.52	Vertical
5727.9	-53.61	5.24	36.04	-22.81	-13	-9.81	Horizontal
191.6	-37.62	1.42	17.29	-21.75	-13	-8.75	Vertical
465.2	-37.86	1.50	17.90	-21.45	-13	-8.45	Horizontal

QPSK EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-45.08	4.07	33.54	-15.61	-13	-2.61	Horizontal
3720.0	-50.03	4.07	33.54	-20.56	-13	-7.56	Vertical
5580.0	-52.22	5.28	35.86	-21.64	-13	-8.64	Vertical
5580.0	-52.67	5.28	35.86	-22.09	-13	-9.09	Horizontal
190.4	-43.26	1.58	16.89	-27.94	-13	-14.94	Vertical
404.3	-44.13	1.76	17.26	-28.63	-13	-15.63	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.73	4.04	33.56	-23.21	-13	-10.21	Horizontal
3760.0	-53.02	4.04	33.56	-23.50	-13	-10.50	Vertical
5640.0	-50.13	5.24	35.91	-19.46	-13	-6.46	Vertical
5640.0	-49.10	5.24	35.91	-18.43	-13	-5.43	Horizontal
209.0	-43.46	1.46	16.27	-28.65	-13	-15.65	Vertical
468.5	-44.84	1.59	15.15	-31.28	-13	-18.28	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.50	4.04	34.00	-22.54	-13	-9.54	Horizontal
3800.0	-50.81	4.04	34.00	-20.85	-13	-7.85	Vertical
5700.0	-51.98	5.24	36.04	-21.18	-13	-8.18	Vertical
5700.0	-49.12	5.24	36.04	-18.32	-13	-5.32	Horizontal
200.8	-35.13	1.36	17.39	-19.09	-13	-6.09	Vertical
409.0	-40.93	1.66	15.39	-27.20	-13	-14.20	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.

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-47.17	4.02	29.80	-21.39	-13	-8.39	Horizontal
3421.4	-45.03	4.02	29.80	-19.25	-13	-6.25	Vertical
5132.1	-49.06	5.24	35.84	-18.46	-13	-5.46	Vertical
5132.1	-52.59	5.24	35.84	-21.99	-13	-8.99	Horizontal
195.1	-44.74	1.68	16.04	-30.38	-13	-17.38	Vertical
287.3	-41.55	1.78	17.74	-25.59	-13	-12.59	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.20	4.03	30.00	-19.23	-13	-6.23	Horizontal
3465.0	-50.22	4.03	30.00	-24.25	-13	-11.25	Vertical
5197.5	-48.76	5.25	35.86	-18.15	-13	-5.15	Vertical
5197.5	-53.93	5.25	35.86	-23.32	-13	-10.32	Horizontal
183.0	-39.69	1.72	17.69	-23.72	-13	-10.72	Vertical
234.6	-38.07	1.62	16.02	-23.66	-13	-10.66	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-48.54	4.05	30.01	-22.58	-13	-9.58	Horizontal
3508.6	-46.31	4.05	30.01	-20.35	-13	-7.35	Vertical
5262.9	-46.15	5.26	35.86	-15.55	-13	-2.55	Vertical
5262.9	-49.07	5.26	35.86	-18.47	-13	-5.47	Horizontal
200.0	-41.23	1.80	16.69	-26.34	-13	-13.34	Vertical
394.9	-42.61	1.75	16.66	-27.71	-13	-14.71	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	-48.26	4.02	29.80	-22.48	-13	-9.48	Horizontal
3440.0	-49.57	4.02	29.80	-23.79	-13	-10.79	Vertical
5160.0	-46.89	5.24	35.84	-16.29	-13	-3.29	Vertical
5160.0	-53.36	5.24	35.84	-22.76	-13	-9.76	Horizontal
196.6	-38.28	1.57	17.26	-22.59	-13	-9.59	Vertical
419.0	-41.72	1.78	16.35	-27.15	-13	-14.15	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.96	4.03	30.00	-23.99	-13	-10.99	Horizontal
3465.0	-46.22	4.03	30.00	-20.25	-13	-7.25	Vertical
5197.5	-47.32	5.25	35.86	-16.71	-13	-3.71	Vertical
5197.5	-50.02	5.25	35.86	-19.41	-13	-6.41	Horizontal
201.2	-35.29	1.44	17.95	-18.78	-13	-5.78	Vertical
345.0	-43.05	1.65	16.09	-28.61	-13	-15.61	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-52.19	4.05	27.68	-28.56	-13	-15.56	Horizontal
3490.0	-46.62	4.05	27.68	-22.99	-13	-9.99	Vertical
5235.0	-51.02	5.26	35.86	-20.42	-13	-7.42	Vertical
5235.0	-53.01	5.26	35.86	-22.41	-13	-9.41	Horizontal
180.7	-38.95	1.61	16.85	-23.71	-13	-10.71	Vertical
420.4	-35.37	1.61	15.19	-21.79	-13	-8.79	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	-44.75	2.78	27.50	-20.03	-13	-7.03	Horizontal
1649.4	-53.26	2.78	27.50	-28.54	-13	-15.54	Vertical
2474.1	-45.31	2.90	27.80	-20.41	-13	-7.41	Vertical
2474.1	-52.99	2.90	27.80	-28.09	-13	-15.09	Horizontal
195.2	-44.28	1.76	17.59	-28.45	-13	-15.45	Vertical
394.0	-36.47	1.63	15.87	-22.23	-13	-9.23	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-53.16	2.80	27.48	-28.48	-13	-15.48	Horizontal
1673.0	-45.54	2.80	27.48	-20.86	-13	-7.86	Vertical
2509.5	-48.93	2.91	27.70	-24.14	-13	-11.14	Vertical
2509.5	-53.78	2.91	27.70	-28.99	-13	-15.99	Horizontal
179.6	-44.07	1.61	15.68	-30.00	-13	-17.00	Vertical
251.6	-40.94	1.59	17.52	-25.02	-13	-12.02	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.01	2.82	27.43	-21.40	-13	-8.40	Horizontal
1696.6	-44.61	2.82	27.43	-20.00	-13	-7.00	Vertical
2544.9	-50.69	2.92	27.74	-25.87	-13	-12.87	Vertical
2544.9	-50.77	2.92	27.74	-25.95	-13	-12.95	Horizontal
210.0	-44.07	1.69	16.67	-29.08	-13	-16.08	Vertical
239.2	-44.25	1.70	17.18	-28.77	-13	-15.77	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	-45.47	2.78	27.50	-20.75	-13	-7.75	Horizontal
1658.0	-47.58	2.78	27.50	-22.86	-13	-9.86	Vertical
2487.0	-49.10	2.90	27.80	-24.20	-13	-11.20	Vertical
2487.0	-52.78	2.90	27.80	-27.88	-13	-14.88	Horizontal
205.5	-44.51	1.71	15.57	-30.65	-13	-17.65	Vertical
463.0	-42.17	1.34	16.40	-27.11	-13	-14.11	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-45.45	2.80	27.48	-20.77	-13	-7.77	Horizontal
1673.0	-48.03	2.80	27.48	-23.35	-13	-10.35	Vertical
2509.5	-45.85	2.91	27.70	-21.06	-13	-8.06	Vertical
2509.5	-50.94	2.91	27.70	-26.15	-13	-13.15	Horizontal
189.9	-43.50	1.44	17.04	-27.90	-13	-14.90	Vertical
279.1	-44.22	1.76	17.62	-28.36	-13	-15.36	Horizontal
Test Results for High Channel 844MHz							
1688.0	-50.96	2.82	27.43	-26.35	-13	-13.35	Horizontal
1688.0	-48.79	2.82	27.43	-24.18	-13	-11.18	Vertical
2532.0	-44.91	2.92	27.74	-20.09	-13	-7.09	Vertical
2532.0	-51.08	2.92	27.74	-26.26	-13	-13.26	Horizontal
180.9	-44.38	1.74	17.70	-28.42	-13	-15.42	Vertical
383.5	-39.49	1.41	17.46	-23.43	-13	-10.43	Horizontal

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

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

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

9.4 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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-63.85	5.23	35.81	-33.27	-25	-8.27	Horizontal
5005.0	-64.29	5.23	35.81	-33.71	-25	-8.71	Vertical
7507.5	-60.12	5.67	36.85	-28.94	-25	-3.94	Vertical
7507.5	-59.36	5.67	36.85	-28.18	-25	-3.18	Horizontal
205.2	-44.65	1.73	17.97	-28.41	-25	-3.41	Vertical
458.7	-45.55	1.38	15.11	-31.82	-25	-6.82	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.23	5.23	35.82	-32.64	-25	-7.64	Horizontal
5070.0	-60.97	5.23	35.82	-30.38	-25	-5.38	Vertical
7605.0	-62.87	5.67	36.85	-31.69	-25	-6.69	Vertical
7605.0	-59.22	5.67	36.85	-28.04	-25	-3.04	Horizontal
195.3	-50.28	1.77	16.17	-35.87	-25	-10.87	Vertical
398.4	-47.14	1.63	15.21	-33.56	-25	-8.56	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-61.98	5.24	35.83	-31.39	-25	-6.39	Horizontal
5135.0	-59.04	5.24	35.83	-28.45	-25	-3.45	Vertical
7702.5	-64.25	5.68	36.87	-33.06	-25	-8.06	Vertical
7702.5	-63.14	5.68	36.87	-31.95	-25	-6.95	Horizontal
199.0	-44.75	1.58	17.56	-28.77	-25	-3.77	Vertical
437.6	-49.82	1.45	16.58	-34.69	-25	-9.69	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-63.32	5.23	35.82	-32.73	-25	-7.73	Horizontal
5020.0	-60.75	5.23	35.82	-30.16	-25	-5.16	Vertical
7530.0	-59.03	5.67	36.86	-27.84	-25	-2.84	Vertical
7530.0	-61.13	5.67	36.86	-29.94	-25	-4.94	Horizontal
188.6	-44.74	1.63	15.76	-30.61	-25	-5.61	Vertical
314.5	-54.70	1.71	15.44	-40.97	-25	-15.97	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.97	5.23	35.82	-31.38	-25	-6.38	Horizontal
5070.0	-62.88	5.23	35.82	-32.29	-25	-7.29	Vertical
7605.0	-62.25	5.67	36.85	-31.07	-25	-6.07	Vertical
7605.0	-62.46	5.67	36.85	-31.28	-25	-6.28	Horizontal
208.1	-52.86	1.79	16.84	-37.80	-25	-12.80	Vertical
373.7	-49.98	1.71	17.64	-34.05	-25	-9.05	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-64.58	5.24	35.83	-33.99	-25	-8.99	Horizontal
5120.0	-60.51	5.24	35.83	-29.92	-25	-4.92	Vertical
7680.0	-64.89	5.70	36.88	-33.71	-25	-8.71	Vertical
7680.0	-61.23	5.70	36.88	-30.05	-25	-5.05	Horizontal
182.1	-46.95	1.79	16.84	-31.89	-25	-6.89	Vertical
280.0	-45.77	1.71	17.64	-29.84	-25	-4.84	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-51.14	2.60	27.20	-26.54	-13	-13.54	Horizontal
1399.4	-49.66	2.60	27.20	-25.06	-13	-12.06	Vertical
2099.1	-50.51	2.85	27.54	-25.82	-13	-12.82	Vertical
2099.1	-50.41	2.85	27.54	-25.72	-13	-12.72	Horizontal
192.7	-37.62	1.49	17.78	-21.33	-13	-8.33	Vertical
455.2	-42.40	1.36	17.33	-26.43	-13	-13.43	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-49.66	2.61	27.28	-24.99	-13	-11.99	Horizontal
1415.0	-44.98	2.61	27.28	-20.31	-13	-7.31	Vertical
2122.5	-46.33	2.87	27.59	-21.61	-13	-8.61	Vertical
2122.5	-53.17	2.87	27.59	-28.45	-13	-15.45	Horizontal
187.5	-35.81	1.73	15.74	-21.80	-13	-8.80	Vertical
390.5	-43.26	1.62	15.79	-29.09	-13	-16.09	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-51.91	2.63	27.28	-27.26	-13	-14.26	Horizontal
1430.6	-53.65	2.63	27.28	-29.00	-13	-16.00	Vertical
2145.9	-50.80	2.88	27.60	-26.08	-13	-13.08	Vertical
2145.9	-53.65	2.88	27.60	-28.93	-13	-15.93	Horizontal
179.9	-38.21	1.61	18.00	-21.82	-13	-8.82	Vertical
281.0	-42.30	1.45	15.49	-28.27	-13	-15.27	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	-47.56	2.61	27.26	-22.91	-13	-9.91	Horizontal
1408.0	-47.97	2.61	27.26	-23.32	-13	-10.32	Vertical
2112.0	-46.36	2.87	27.58	-21.65	-13	-8.65	Vertical
2112.0	-52.46	2.87	27.58	-27.75	-13	-14.75	Horizontal
206.1	-39.28	1.31	16.97	-23.62	-13	-10.62	Vertical
341.7	-40.98	1.65	16.70	-25.93	-13	-12.93	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-53.58	2.61	27.28	-28.91	-13	-15.91	Horizontal
1415.0	-45.17	2.61	27.28	-20.50	-13	-7.50	Vertical
2122.5	-46.30	2.87	27.59	-21.58	-13	-8.58	Vertical
2122.5	-53.71	2.87	27.59	-28.99	-13	-15.99	Horizontal
197.5	-42.19	1.72	17.99	-25.92	-13	-12.92	Vertical
314.5	-36.21	1.73	17.94	-20.00	-13	-7.00	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.29	2.62	27.28	-25.63	-13	-12.63	Horizontal
1422.0	-44.45	2.62	27.28	-19.79	-13	-6.79	Vertical
2133.0	-45.77	2.87	27.60	-21.04	-13	-8.04	Vertical
2133.0	-51.56	2.87	27.60	-26.83	-13	-13.83	Horizontal
181.8	-40.43	1.58	15.93	-26.08	-13	-13.08	Vertical
348.2	-43.38	1.36	15.59	-29.15	-13	-16.15	Horizontal

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

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

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

9.6 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-48.82	2.61	27.28	-24.15	-13	-11.15	Horizontal
1413.0	-46.67	2.61	27.28	-22.00	-13	-9.00	Vertical
2119.5	-51.81	2.87	27.59	-27.09	-13	-14.09	Vertical
2119.5	-52.17	2.87	27.59	-27.45	-13	-14.45	Horizontal
183.8	-43.96	1.71	16.15	-29.52	-13	-16.52	Vertical
405.6	-43.30	1.41	17.32	-27.39	-13	-14.39	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-52.51	2.62	27.30	-27.83	-13	-14.83	Horizontal
1420.0	-45.74	2.62	27.30	-21.06	-13	-8.06	Vertical
2130.0	-46.59	2.87	27.62	-21.84	-13	-8.84	Vertical
2130.0	-53.15	2.87	27.62	-28.40	-13	-15.40	Horizontal
201.6	-41.93	1.42	15.25	-28.11	-13	-15.11	Vertical
384.0	-43.08	1.36	17.19	-27.25	-13	-14.25	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-44.03	2.66	27.28	-19.41	-13	-6.41	Horizontal
1427.0	-44.42	2.66	27.28	-19.80	-13	-6.80	Vertical
2140.5	-53.12	2.88	27.60	-28.40	-13	-15.40	Vertical
2140.5	-49.28	2.88	27.60	-24.56	-13	-11.56	Horizontal
209.6	-38.09	1.32	17.29	-22.12	-13	-9.12	Vertical
374.5	-43.77	1.72	16.89	-28.60	-13	-15.60	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-49.12	2.62	27.30	-24.44	-13	-11.44	Horizontal
1418.0	-49.54	2.62	27.30	-24.86	-13	-11.86	Vertical
2127.0	-51.09	2.87	27.62	-26.34	-13	-13.34	Vertical
2127.0	-51.72	2.87	27.62	-26.97	-13	-13.97	Horizontal
209.3	-36.70	1.35	16.91	-21.14	-13	-8.14	Vertical
405.3	-35.79	1.62	16.31	-21.10	-13	-8.10	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-53.49	2.62	27.30	-28.81	-13	-15.81	Horizontal
1420.0	-45.45	2.62	27.30	-20.77	-13	-7.77	Vertical
2130.0	-46.29	2.87	27.62	-21.54	-13	-8.54	Vertical
2130.0	-52.82	2.87	27.62	-28.07	-13	-15.07	Horizontal
198.0	-38.73	1.51	17.14	-23.10	-13	-10.10	Vertical
327.0	-42.26	1.77	16.88	-27.15	-13	-14.15	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.68	2.62	27.30	-21.00	-13	-8.00	Horizontal
1422.0	-46.08	2.62	27.30	-21.40	-13	-8.40	Vertical
2133.0	-53.98	2.87	27.62	-29.23	-13	-16.23	Vertical
2133.0	-52.02	2.87	27.62	-27.27	-13	-14.27	Horizontal
177.9	-35.10	1.78	15.95	-20.93	-13	-7.93	Vertical
375.5	-42.35	1.34	17.95	-25.75	-13	-12.75	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74
 . Margin = Spurious Emission Level - Limit
 . Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.3V, Normal, DC 3.8V and High voltage, DC 4.37V.

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 2/4/5/7/12/17

RESULTS

See the following pages.

10.1 LTE BAND 2

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1880	12.5	0.006650	2.5
3.8	1880	14.0	0.007469	2.5
4.37	1880	13.2	0.007016	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.6	0.006703	2.5
Extreme (50C)	1880	11.7	0.006225	2.5
Extreme (40C)	1880	13.3	0.007058	2.5
Extreme (30C)	1880	13.6	0.007245	2.5
Extreme (10C)	1880	13.7	0.007296	2.5
Extreme (0C)	1880	12.3	0.006516	2.5
Extreme (-10C)	1880	12.5	0.006657	2.5
Extreme (-20C)	1880	14.3	0.007624	2.5
Extreme (-30C)	1880	14.9	0.007922	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1880	9.9	0.005288	2.5
3.8	1880	9.0	0.004780	2.5
4.37	1880	7.8	0.004154	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.2	0.004889	2.5
Extreme (50C)	1880	9.0	0.004769	2.5
Extreme (40C)	1880	8.5	0.004534734	2.5
Extreme (30C)	1880	9.4	0.004995086	2.5
Extreme (10C)	1880	8.7	0.004632376	2.5
Extreme (0C)	1880	8.1	0.004303335	2.5
Extreme (-10C)	1880	9.5	0.00503933	2.5
Extreme (-20C)	1880	9.1	0.004856537	2.5
Extreme (-30C)	1880	8.0	0.004275147	2.5

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

10.2 LTE BAND 4

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1732.5	8.9	0.005116	2.5
3.8	1732.5	9.3	0.005358	2.5
4.37	1732.5	8.3	0.004804	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.0	0.004615	2.5
Extreme (50C)	1732.5	9.1	0.005269	2.5
Extreme (40C)	1732.5	7.2	0.004162	2.5
Extreme (30C)	1732.5	6.0	0.003436	2.5
Extreme (10C)	1732.5	6.9	0.003963	2.5
Extreme (0C)	1732.5	9.8	0.005643	2.5
Extreme (-10C)	1732.5	8.3	0.004814	2.5
Extreme (-20C)	1732.5	6.8	0.003901	2.5
Extreme (-30C)	1732.5	8.8	0.005065	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1732.5	9.6	0.005557	2.5
3.8	1732.5	9.2	0.005335	2.5
4.37	1732.5	8.1	0.004659	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.0	0.005744	2.5
Extreme (50C)	1732.5	9.4	0.005408	2.5
Extreme (40C)	1732.5	8.4	0.004841	2.5
Extreme (30C)	1732.5	8.8	0.005099	2.5
Extreme (10C)	1732.5	9.1	0.005244	2.5
Extreme (0C)	1732.5	7.8	0.004498	2.5
Extreme (-10C)	1732.5	9.3	0.005387	2.5
Extreme (-20C)	1732.5	8.6	0.004969	2.5
Extreme (-30C)	1732.5	8.5	0.004906	2.5

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

10.3 LTE BAND 5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	836.5	6.2	0.007396	2.5
3.8	836.5	6.6	0.007881	2.5
4.37	836.5	5.1	0.006115	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.0	0.007221	2.5
Extreme (50C)	836.5	5.5	0.006620	2.5
Extreme (40C)	836.5	6.5	0.007775	2.5
Extreme (30C)	836.5	6.5	0.007782	2.5
Extreme (10C)	836.5	5.7	0.006800	2.5
Extreme (0C)	836.5	5.0	0.005930	2.5
Extreme (-10C)	836.5	5.4	0.006500	2.5
Extreme (-20C)	836.5	5.7	0.006867	2.5
Extreme (-30C)	836.5	5.9	0.007063	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	836.5	5.5	0.006572	2.5
3.8	836.5	7.2	0.008571	2.5
4.37	836.5	5.2	0.006204	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.4	0.007661	2.5
Extreme (50C)	836.5	6.0	0.007121	2.5
Extreme (40C)	836.5	6.6	0.007833	2.5
Extreme (30C)	836.5	6.1	0.007272	2.5
Extreme (10C)	836.5	5.3	0.006367	2.5
Extreme (0C)	836.5	5.7	0.006787	2.5
Extreme (-10C)	836.5	5.7	0.006773	2.5
Extreme (-20C)	836.5	5.9	0.007074	2.5
Extreme (-30C)	836.5	5.9	0.007010	2.5

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

10.4 LTE BAND 7

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2535	9.7	0.003809	2.5
3.8	2535	8.4	0.003332	2.5
4.37	2535	8.5	0.003353	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.6	0.003771	2.5
Extreme (50C)	2535	8.7	0.003425	2.5
Extreme (40C)	2535	8.2	0.003225	2.5
Extreme (30C)	2535	9.2	0.003611	2.5
Extreme (10C)	2535	7.8	0.003083	2.5
Extreme (0C)	2535	8.6	0.003391	2.5
Extreme (-10C)	2535	9.8	0.003850	2.5
Extreme (-20C)	2535	8.9	0.003522	2.5
Extreme (-30C)	2535	8.1	0.003200	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2535	6.9	0.002722	2.5
3.8	2535	5.9	0.002343	2.5
4.37	2535	5.8	0.002274	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.9	0.002327	2.5
Extreme (40C)	2535	5.9	0.002310	2.5
Extreme (30C)	2535	6.3	0.002499	2.5
Extreme (10C)	2535	5.8	0.002274	2.5
Extreme (0C)	2535	4.8	0.001879	2.5
Extreme (-10C)	2535	4.8	0.001880	2.5
Extreme (-20C)	2535	6.1	0.002387	2.5
Extreme (-30C)	2535	5.4	0.002137	2.5

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

10.5 LTE BAND 12

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	707.5	8.4	0.011909	2.5
3.8	707.5	10.0	0.014077	2.5
4.37	707.5	8.9	0.012597	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.9	0.012533	2.5
Extreme (50C)	707.5	7.9	0.011183	2.5
Extreme (40C)	707.5	7.8	0.010963	2.5
Extreme (30C)	707.5	7.9	0.011122	2.5
Extreme (10C)	707.5	7.9	0.011129	2.5
Extreme (0C)	707.5	9.1	0.012800	2.5
Extreme (-10C)	707.5	8.2	0.011622	2.5
Extreme (-20C)	707.5	8.6	0.012173	2.5
Extreme (-30C)	707.5	7.5	0.010625	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	707.5	7.2	0.010195	2.5
3.8	707.5	8.1	0.011462	2.5
4.37	707.5	7.0	0.009941	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.3	0.013172	2.5
Extreme (50C)	707.5	8.6	0.012144	2.5
Extreme (40C)	707.5	8.5	0.011999	2.5
Extreme (30C)	707.5	8.2	0.011563	2.5
Extreme (10C)	707.5	8.8	0.012441	2.5
Extreme (0C)	707.5	7.3	0.010353	2.5
Extreme (-10C)	707.5	7.0	0.009884	2.5
Extreme (-20C)	707.5	8.6	0.012182	2.5
Extreme (-30C)	707.5	7.9	0.011189	2.5

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

10.6 LTE BAND 17

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	710.0	10.0	0.014039	2.5
3.8	710.0	8.6	0.012135	2.5
4.37	710.0	8.4	0.011892	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.9	0.013924	2.5
Extreme (50C)	710.0	9.3	0.013078	2.5
Extreme (40C)	710.0	7.7	0.010858	2.5
Extreme (30C)	710.0	8.7	0.012301	2.5
Extreme (10C)	710.0	9.0	0.012713	2.5
Extreme (0C)	710.0	8.2	0.011531	2.5
Extreme (-10C)	710.0	9.4	0.013308	2.5
Extreme (-20C)	710.0	8.7	0.012287	2.5
Extreme (-30C)	710.0	8.4	0.011820	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	710.0	10.5	0.014729	2.5
3.8	710.0	9.1	0.012771	2.5
4.37	710.0	8.2	0.011576	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.5	0.013450	2.5
Extreme (50C)	710.0	8.8	0.012349	2.5
Extreme (40C)	710.0	8.0	0.011205	2.5
Extreme (30C)	710.0	9.3	0.013122	2.5
Extreme (10C)	710.0	8.4	0.011816	2.5
Extreme (0C)	710.0	8.8	0.012444	2.5
Extreme (-10C)	710.0	9.2	0.012994	2.5
Extreme (-20C)	710.0	9.1	0.012794	2.5
Extreme (-30C)	710.0	8.7	0.012249	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

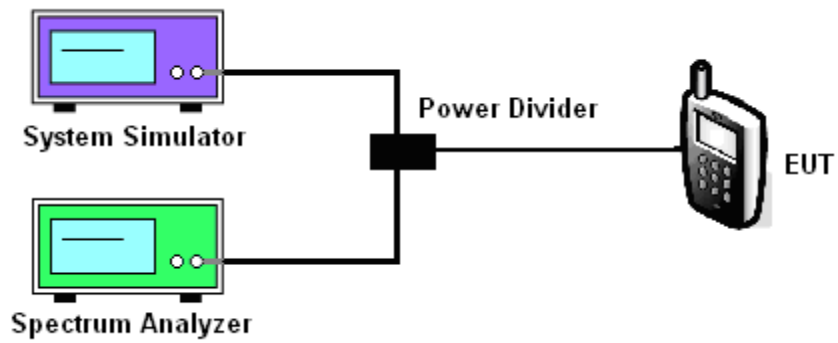
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

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

11.4 Test Setup



MODES TESTED

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

Test data reference attachment.

-----END OF REPORT-----