

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT FCC ID: 2AT6G-TERACUBE2S

Product: Smartphone

Trade Mark: Teracube

Model No.: Teracube 2s

Family Model: N/A

Report No.: S24111807306006

Issue Date: Jan. 07, 2025

Prepared for

Teracube Inc

16625 Redmond Way, Ste M-175 Redmond, WA 98052 USA

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan
District, Shenzhen, Guangdong, People's Republic of China

Tel. 0755-23200050 Website: <http://www.ntek.org.cn>

TEST RESULT CERTIFICATION

Applicant's name : Teracube Inc

Address..... : 16625 Redmond Way, Ste M-175 Redmond, WA 98052 USA

Manufacturer's Name..... : Teracube Inc

Address.....: 16625 Redmond Way, Ste M-175 Redmond, WA 98052 USA

Product name.....: Smartphone

Model and/or type reference ..: Teracube 2s

Trade Mark.....: Teracube

Family Model..... : N/A

Test Sample Number : S241118073006

Date of Test.....: Nov. 20, 2024 ~ Jan. 07, 2025

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

Prepared By : Joe Yan
Joe Yan
(Project Engineer)

Reviewed By : Aaron Cheng
Aaron Cheng
(Supervisor)

Approved By : Alex Li
Alex Li
(Manager)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smartphone
Trade Mark	Teracube
Model Name	Teracube 2s
Family Model	N/A
Model Difference	N/A
FCC ID:	2AT6G-TERACUBE2S
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5, 7,12,17,66
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; LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM CARD	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 2: 0.78 dBi, Band 4: 0.61 dBi, Band 5: -0.98 dBi, B7:0.67dBi, Band 12: -1.07 dBi, Band 17: -1.07 dBi, Band 66: 0.61 dBi
Adapter	N/A
Battery	DC 3.85V, 4000mAh, 15.40Wh
Power Rating	DC 3.85V from battery or DC 5V from USB port
Extreme Vol. Limits:	DC 3.27V to DC 4.43V (Nominal DC 3.85V) (Note 1)
HW Version	YK673-MB-V6.0 2020.06.17
SW Version	N/A
** Note1: The High Voltage DC 4.43V and Low Voltage 3.27V 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: 2AT6G-TERACUBE2S** 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.

No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of 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 2/4/5/12/17/66

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	Smartphone	Teracube 2s	FCC ID: 2AT6G-TERACUBE2S	EUT

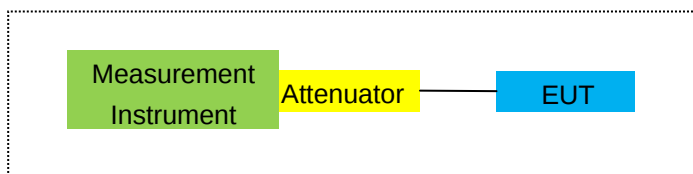
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

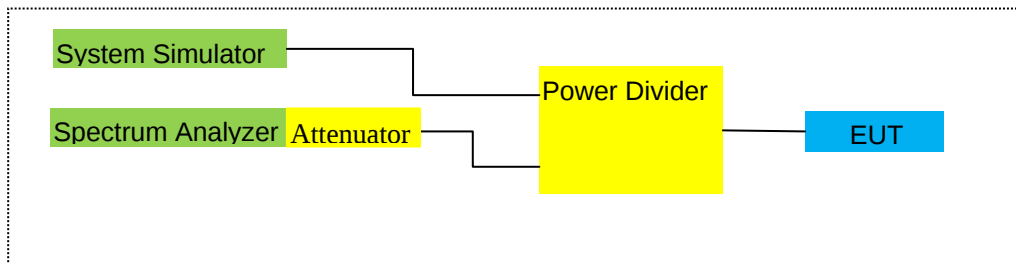
For Radiated Test Cases



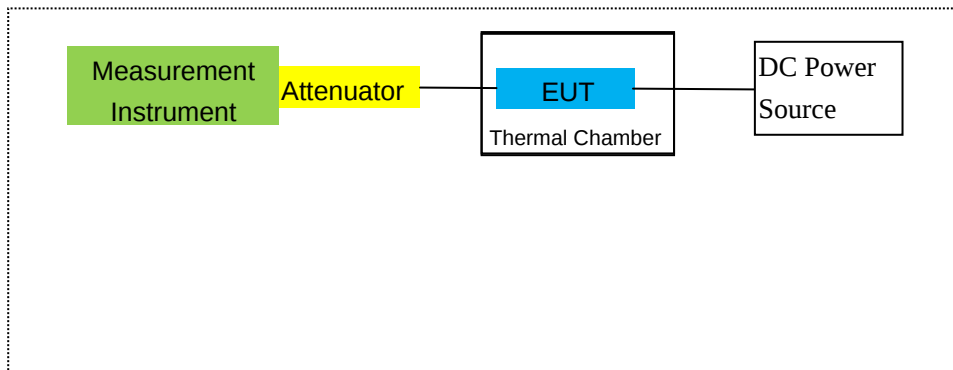
For Conducted Output Power



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	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	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	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	2025.03.11	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
23	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
24	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year

26	DC Power Source	N/A	PS-6005D	2017040292 3	2024.04.25	2027.04.24	3 year
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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.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

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 2/4/5/7/12/17/66

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

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;

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 2/4/5/7/12/17/66

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

Band 2/4/5/7/12/17/66

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

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 2/4/5/7/12/17/66

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)	Antenna Gain (dBi)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1850.7	-2.13	3.76	28.24	22.35	171.791	Horizontal	Pass
		1880	-2.18	3.91	28.22	22.13	163.305	Horizontal	Pass
		1909.3	-3.81	3.93	28.20	20.46	111.173	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	-3.59	3.77	28.23	20.87	122.180	Horizontal	Pass
		1880	-2.26	3.91	28.24	22.07	161.065	Horizontal	Pass
		1908.5	-2.85	3.94	28.25	21.46	139.959	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	-2.21	3.77	28.31	22.33	171.002	Horizontal	Pass
		1880	-2.47	3.91	28.22	21.84	152.757	Horizontal	Pass
		1907.5	-2.03	3.94	28.20	22.23	167.109	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	-3.55	3.79	28.33	20.99	125.603	Horizontal	Pass
		1880	-2.88	3.95	28.22	21.39	137.721	Horizontal	Pass
		1905	-2.06	3.97	28.19	22.16	164.437	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	-2.78	3.79	28.34	21.77	150.314	Horizontal	Pass
		1880	-1.45	3.95	28.22	22.82	191.426	Horizontal	Pass
		1902.5	-2.83	3.97	28.18	21.38	137.404	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	-3.58	3.81	28.35	20.96	124.738	Horizontal	Pass
		1880	-2.16	3.96	28.22	22.10	162.181	Horizontal	Pass
		1900	-2.18	4.00	28.16	21.98	157.761	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	-3.88	3.76	28.24	20.60	114.815	Vertical	Pass
		1880	-3.47	3.91	28.22	20.84	121.339	Vertical	Pass
		1909.3	-3.18	3.93	28.20	21.09	128.529	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	-4.78	3.77	28.23	19.68	92.897	Vertical	Pass
		1880	-3.89	3.91	28.24	20.44	110.662	Vertical	Pass
		1908.5	-3.01	3.94	28.25	21.30	134.896	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	-3.90	3.77	28.31	20.64	115.878	Vertical	Pass
		1880	-2.50	3.91	28.22	21.81	151.705	Vertical	Pass
		1907.5	-4.28	3.94	28.20	19.98	99.541	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	-2.59	3.79	28.33	21.95	156.675	Vertical	Pass
		1880	-3.02	3.95	28.22	21.25	133.352	Vertical	Pass
		1905	-2.59	3.97	28.19	21.63	145.546	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	-2.36	3.79	28.34	22.19	165.577	Vertical	Pass
		1880	-3.26	3.95	28.22	21.01	126.183	Vertical	Pass
		1902.5	-3.47	3.97	28.18	20.74	118.577	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	-3.90	3.81	28.35	20.64	115.878	Vertical	Pass
		1880	-3.88	3.96	28.22	20.38	109.144	Vertical	Pass
		1900	-3.78	4.00	28.16	20.38	109.144	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1850.7	-3.82	3.76	28.24	20.66	116.413	Horizontal	Pass
		1880	-3.97	3.91	28.22	20.34	108.143	Horizontal	Pass
		1909.3	-2.65	3.93	28.20	21.62	145.211	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-2.30	3.77	28.23	22.16	164.437	Horizontal	Pass
		1880	-2.53	3.91	28.24	21.80	151.356	Horizontal	Pass
		1908.5	-3.55	3.94	28.25	20.76	119.124	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-2.69	3.77	28.31	21.85	153.109	Horizontal	Pass
		1880	-3.85	3.91	28.22	20.46	111.173	Horizontal	Pass
		1907.5	-3.59	3.94	28.20	20.67	116.681	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	-2.85	3.79	28.33	21.69	147.571	Horizontal	Pass
		1880	-2.20	3.95	28.22	22.07	161.065	Horizontal	Pass
		1905	-3.07	3.97	28.19	21.15	130.317	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-3.37	3.79	28.34	21.18	131.220	Horizontal	Pass
		1880	-3.56	3.95	28.22	20.71	117.761	Horizontal	Pass
		1902.5	-3.24	3.97	28.18	20.97	125.026	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	-2.27	3.81	28.35	22.27	168.655	Horizontal	Pass
		1880	-2.69	3.96	28.22	21.57	143.549	Horizontal	Pass
		1900	-2.24	4.00	28.16	21.92	155.597	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-4.24	3.76	28.24	20.24	105.682	Vertical	Pass
		1880	-4.32	3.91	28.22	19.99	99.770	Vertical	Pass
		1909.3	-4.39	3.93	28.20	19.88	97.275	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-4.29	3.77	28.23	20.17	103.992	Vertical	Pass
		1880	-4.60	3.91	28.24	19.73	93.972	Vertical	Pass
		1908.5	-4.79	3.94	28.25	19.52	89.536	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-5.05	3.77	28.31	19.49	88.920	Vertical	Pass
		1880	-5.64	3.91	28.22	18.67	73.621	Vertical	Pass
		1907.5	-5.64	3.94	28.20	18.62	72.778	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	-4.76	3.79	28.33	19.78	95.060	Vertical	Pass
		1880	-5.42	3.95	28.22	18.85	76.736	Vertical	Pass
		1905	-3.50	3.97	28.19	20.72	118.032	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-2.48	3.79	28.34	22.07	161.065	Vertical	Pass
		1880	-3.97	3.95	28.22	20.30	107.152	Vertical	Pass
		1902.5	-3.21	3.97	28.18	21.00	125.893	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	-3.33	3.81	28.35	21.21	132.130	Vertical	Pass
		1880	-3.88	3.96	28.22	20.38	109.144	Vertical	Pass
		1900	-3.19	4.00	28.16	20.97	125.026	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 (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-2.60	3.12	27.58	21.86	153.462	Horizontal	Pass
		1732.5	-2.15	3.27	27.61	22.19	165.577	Horizontal	Pass
		1754.3	-2.83	3.29	27.63	21.51	141.579	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.81	3.13	27.61	21.67	146.893	Horizontal	Pass
		1732.5	-2.97	3.27	27.61	21.37	137.088	Horizontal	Pass
		1753.5	-3.58	3.30	27.62	20.74	118.577	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-2.82	3.13	27.63	21.68	147.231	Horizontal	Pass
		1732.5	-2.15	3.27	27.61	22.19	165.577	Horizontal	Pass
		1752.5	-2.81	3.30	27.60	21.49	140.929	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-3.56	3.15	27.64	20.93	123.880	Horizontal	Pass
		1732.5	-1.79	3.31	27.61	22.51	178.238	Horizontal	Pass
		1750	-2.44	3.33	27.59	21.82	152.055	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-2.57	3.15	27.65	21.93	155.955	Horizontal	Pass
		1732.5	-2.28	3.31	27.61	22.02	159.221	Horizontal	Pass
		1747.5	-2.90	3.33	27.57	21.34	136.144	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	-3.24	3.17	27.66	21.25	133.352	Horizontal	Pass
		1732.5	-1.39	3.32	27.61	22.90	194.984	Horizontal	Pass
		1745	-2.13	3.36	27.56	22.07	161.065	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	-3.41	3.12	27.58	21.05	127.350	Vertical	Pass
		1732.5	-2.80	3.27	27.61	21.54	142.561	Vertical	Pass
		1754.3	-2.50	3.29	27.63	21.84	152.757	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.13	3.13	27.61	22.35	171.791	Vertical	Pass
		1732.5	-2.86	3.27	27.61	21.48	140.605	Vertical	Pass
		1753.5	-2.21	3.30	27.62	22.11	162.555	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-2.76	3.13	27.63	21.74	149.279	Vertical	Pass
		1732.5	-2.06	3.27	27.61	22.28	169.044	Vertical	Pass
		1752.5	-2.59	3.30	27.60	21.71	148.252	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-2.67	3.15	27.64	21.82	152.055	Vertical	Pass
		1732.5	-2.03	3.31	27.61	22.27	168.655	Vertical	Pass
		1750	-1.27	3.33	27.59	22.99	199.067	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	-3.64	3.15	27.65	20.86	121.899	Vertical	Pass
		1732.5	-3.67	3.31	27.61	20.63	115.611	Vertical	Pass
		1747.5	-2.66	3.33	27.57	21.58	143.880	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	-2.51	3.17	27.66	21.98	157.761	Vertical	Pass
		1732.5	-3.60	3.32	27.61	20.69	117.220	Vertical	Pass
		1745	-3.27	3.36	27.56	20.93	123.880	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	-2.16	3.12	27.58	22.30	169.824	Horizontal	Pass
		1732.5	-2.54	3.27	27.61	21.80	151.356	Horizontal	Pass
		1754.3	-2.55	3.29	27.63	21.79	151.008	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.21	3.13	27.61	22.27	168.655	Horizontal	Pass
		1732.5	-2.02	3.27	27.61	22.32	170.608	Horizontal	Pass
		1753.5	-3.38	3.30	27.62	20.94	124.165	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-3.59	3.13	27.63	20.91	123.310	Horizontal	Pass
		1732.5	-3.33	3.27	27.61	21.01	126.183	Horizontal	Pass
		1752.5	-2.62	3.30	27.60	21.68	147.231	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-2.99	3.15	27.64	21.50	141.254	Horizontal	Pass
		1732.5	-3.29	3.31	27.61	21.01	126.183	Horizontal	Pass
		1750	-2.72	3.33	27.59	21.54	142.561	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-4.50	3.15	27.65	20.00	100.000	Horizontal	Pass
		1732.5	-2.30	3.31	27.61	22.00	158.489	Horizontal	Pass
		1747.5	-3.81	3.33	27.57	20.43	110.408	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-2.66	3.17	27.66	21.83	152.405	Horizontal	Pass
		1732.5	-2.49	3.32	27.61	21.80	151.356	Horizontal	Pass
		1745	-1.62	3.36	27.56	22.58	181.134	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-3.93	3.12	27.58	20.53	112.980	Vertical	Pass
		1732.5	-3.53	3.27	27.61	20.81	120.504	Vertical	Pass
		1754.3	-3.21	3.29	27.63	21.13	129.718	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-4.70	3.13	27.61	19.78	95.060	Vertical	Pass
		1732.5	-4.08	3.27	27.61	20.26	106.170	Vertical	Pass
		1753.5	-4.86	3.30	27.62	19.46	88.308	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-4.22	3.13	27.63	20.28	106.660	Vertical	Pass
		1732.5	-3.67	3.27	27.61	20.67	116.681	Vertical	Pass
		1752.5	-4.61	3.30	27.60	19.69	93.111	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-3.92	3.15	27.64	20.57	114.025	Vertical	Pass
		1732.5	-3.97	3.31	27.61	20.33	107.895	Vertical	Pass
		1750	-4.44	3.33	27.59	19.82	95.940	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-4.87	3.15	27.65	19.63	91.833	Vertical	Pass
		1732.5	-4.96	3.31	27.61	19.34	85.901	Vertical	Pass
		1747.5	-3.53	3.33	27.57	20.71	117.761	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	-3.12	3.17	27.66	21.37	137.088	Vertical	Pass
		1732.5	-3.45	3.32	27.61	20.84	121.339	Vertical	Pass
		1745	-2.24	3.36	27.56	21.96	157.036	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 (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	7.32	2.01	19.68	2.15	22.84	192.309	Horizontal	Pass
		836.5	7.81	2.01	19.77	2.15	23.42	219.786	Horizontal	Pass
		848.3	7.57	2.02	19.82	2.15	23.22	209.894	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	7.23	2.01	19.70	2.15	22.77	189.234	Horizontal	Pass
		836.5	7.20	2.01	19.77	2.15	22.81	190.985	Horizontal	Pass
		847.5	7.47	2.02	19.81	2.15	23.11	204.644	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	7.30	2.01	19.71	2.15	22.85	192.752	Horizontal	Pass
		836.5	7.65	2.01	19.77	2.15	23.26	211.836	Horizontal	Pass
		846.5	6.04	2.02	19.79	2.15	21.66	146.555	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	7.43	2.01	19.73	2.15	23.00	199.526	Horizontal	Pass
		836.5	7.18	2.01	19.77	2.15	22.79	190.108	Horizontal	Pass
		844	7.11	2.02	19.78	2.15	22.72	187.068	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	6.06	2.01	19.68	2.15	21.58	143.880	Vertical	Pass
		836.5	6.67	2.01	19.77	2.15	22.28	169.044	Vertical	Pass
		848.3	6.91	2.02	19.82	2.15	22.56	180.302	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	6.60	2.01	19.70	2.15	22.14	163.682	Vertical	Pass
		836.5	5.68	2.01	19.77	2.15	21.29	134.586	Vertical	Pass
		847.5	6.82	2.02	19.81	2.15	22.46	176.198	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	6.23	2.01	19.71	2.15	21.78	150.661	Vertical	Pass
		836.5	6.33	2.01	19.77	2.15	21.94	156.315	Vertical	Pass
		846.5	6.24	2.02	19.79	2.15	21.86	153.462	Vertical	Pass
10.0MHz Band QPSK	50/0	829	5.58	2.01	19.73	2.15	21.15	130.317	Vertical	Pass
		836.5	6.93	2.01	19.77	2.15	22.54	179.473	Vertical	Pass
		844	6.92	2.02	19.78	2.15	22.53	179.061	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	824.7	6.91	2.01	19.68	2.15	22.43	174.985	Horizontal	Pass
		836.5	6.89	2.01	19.77	2.15	22.50	177.828	Horizontal	Pass
		848.3	6.50	2.02	19.82	2.15	22.15	164.059	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	7.52	2.01	19.70	2.15	23.06	202.302	Horizontal	Pass
		836.5	6.42	2.01	19.77	2.15	22.03	159.588	Horizontal	Pass
		847.5	5.48	2.02	19.81	2.15	21.12	129.420	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	7.75	2.01	19.71	2.15	23.30	213.796	Horizontal	Pass
		836.5	6.79	2.01	19.77	2.15	22.40	173.780	Horizontal	Pass
		846.5	7.52	2.02	19.79	2.15	23.14	206.063	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	6.49	2.01	19.73	2.15	22.06	160.694	Horizontal	Pass
		836.5	7.01	2.01	19.77	2.15	22.62	182.810	Horizontal	Pass
		844	7.53	2.02	19.78	2.15	23.14	206.063	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	5.39	2.01	19.68	2.15	20.91	123.310	Vertical	Pass
		836.5	6.25	2.01	19.77	2.15	21.86	153.462	Vertical	Pass
		848.3	5.87	2.02	19.82	2.15	21.52	141.906	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	5.28	2.01	19.70	2.15	20.82	120.781	Vertical	Pass
		836.5	5.30	2.01	19.77	2.15	20.91	123.310	Vertical	Pass
		847.5	6.09	2.02	19.81	2.15	21.73	148.936	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	7.11	2.01	19.71	2.15	22.66	184.502	Vertical	Pass
		836.5	6.26	2.01	19.77	2.15	21.87	153.815	Vertical	Pass
		846.5	6.67	2.02	19.79	2.15	22.29	169.434	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	4.67	2.01	19.73	2.15	20.24	105.682	Vertical	Pass
		836.5	5.04	2.01	19.77	2.15	20.65	116.145	Vertical	Pass
		844	6.08	2.02	19.78	2.15	21.69	147.571	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(dBm)=EIRP-2.15

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 Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	-0.39	4.54	27.75	22.82	191.426	Horizontal	Pass
		2535	-0.62	4.69	27.72	22.41	174.181	Horizontal	Pass
		2567.5	-0.86	4.71	27.71	22.14	163.682	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.69	4.55	27.76	22.52	178.649	Horizontal	Pass
		2535	-0.53	4.69	27.72	22.50	177.828	Horizontal	Pass
		2565	-1.39	4.72	27.70	21.59	144.212	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.83	4.55	27.77	22.39	173.380	Horizontal	Pass
		2535	-1.50	4.69	27.72	21.53	142.233	Horizontal	Pass
		2562.5	-0.81	4.72	27.69	22.16	164.437	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.54	4.57	27.78	22.67	184.927	Horizontal	Pass
		2535	-0.11	4.73	27.72	22.88	194.089	Horizontal	Pass
		2560	-1.60	4.75	27.68	21.33	135.831	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-1.96	4.54	27.75	21.25	133.352	Vertical	Pass
		2535	-1.14	4.69	27.72	21.89	154.525	Vertical	Pass
		2567.5	-2.25	4.71	27.71	20.75	118.850	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.99	4.55	27.76	19.22	83.560	Vertical	Pass
		2535	-2.35	4.69	27.72	20.68	116.950	Vertical	Pass
		2565	-2.37	4.72	27.70	20.61	115.080	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.27	4.55	27.77	21.95	156.675	Vertical	Pass
		2535	-1.43	4.69	27.72	21.60	144.544	Vertical	Pass
		2562.5	-1.04	4.72	27.69	21.93	155.955	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.41	4.57	27.78	20.80	120.226	Vertical	Pass
		2535	-1.33	4.73	27.72	21.66	146.555	Vertical	Pass
		2560	-2.13	4.75	27.68	20.80	120.226	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-2.80	4.54	27.75	20.41	109.901	Horizontal	Pass
		2535	-1.61	4.69	27.72	21.42	138.676	Horizontal	Pass
		2567.5	-1.87	4.71	27.71	21.13	129.718	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.78	4.55	27.76	21.43	138.995	Horizontal	Pass
		2535	-0.62	4.69	27.72	22.41	174.181	Horizontal	Pass
		2565	-0.87	4.72	27.70	22.11	162.555	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.68	4.55	27.77	20.54	113.240	Horizontal	Pass
		2535	-2.95	4.69	27.72	20.08	101.859	Horizontal	Pass
		2562.5	-2.49	4.72	27.69	20.48	111.686	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.46	4.57	27.78	20.75	118.850	Horizontal	Pass
		2535	-1.75	4.73	27.72	21.24	133.045	Horizontal	Pass
		2560	-1.83	4.75	27.68	21.10	128.825	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-2.18	4.54	27.75	21.03	126.765	Vertical	Pass
		2535	-3.09	4.69	27.72	19.94	98.628	Vertical	Pass
		2567.5	-2.73	4.71	27.71	20.27	106.414	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.53	4.55	27.76	20.68	116.950	Vertical	Pass
		2535	-1.96	4.69	27.72	21.07	127.938	Vertical	Pass
		2565	-1.56	4.72	27.70	21.42	138.676	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.40	4.55	27.77	21.82	152.055	Vertical	Pass
		2535	-2.87	4.69	27.72	20.16	103.753	Vertical	Pass
		2562.5	-3.27	4.72	27.69	19.70	93.325	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.52	4.57	27.78	19.69	93.111	Vertical	Pass
		2535	-2.78	4.73	27.72	20.21	104.954	Vertical	Pass
		2560	-2.64	4.75	27.68	20.29	106.905	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	7.55	1.91	19.21	2.15	22.70	186.209	Vertical	Pass
		707.5	7.51	1.91	19.26	2.15	22.71	186.638	Vertical	Pass
		715.3	7.94	1.93	19.34	2.15	23.20	208.930	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	7.22	1.91	19.21	2.15	22.37	172.584	Vertical	Pass
		707.5	7.24	1.91	19.26	2.15	22.44	175.388	Vertical	Pass
		714.5	7.70	1.93	19.34	2.15	22.96	197.697	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	7.06	1.91	19.23	2.15	22.23	167.109	Vertical	Pass
		707.5	7.37	1.91	19.26	2.15	22.57	180.717	Vertical	Pass
		713.5	6.52	1.92	19.33	2.15	21.78	150.661	Vertical	Pass
10.0MHz Band QPSK	50/0	704	7.34	1.91	19.25	2.15	22.53	179.061	Vertical	Pass
		707.5	7.27	1.91	19.26	2.15	22.47	176.604	Vertical	Pass
		711	7.07	1.92	19.32	2.15	22.32	170.608	Vertical	Pass
1.4MHz Band QPSK	6/0	699.7	6.20	1.91	19.21	2.15	21.35	136.458	Horizontal	Pass
		707.5	6.51	1.91	19.26	2.15	21.71	148.252	Horizontal	Pass
		715.3	6.03	1.93	19.34	2.15	21.29	134.586	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	6.43	1.91	19.21	2.15	21.58	143.880	Horizontal	Pass
		707.5	6.09	1.91	19.26	2.15	21.29	134.586	Horizontal	Pass
		714.5	5.19	1.93	19.34	2.15	20.45	110.917	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	7.65	1.91	19.23	2.15	22.82	191.426	Horizontal	Pass
		707.5	6.90	1.91	19.26	2.15	22.10	162.181	Horizontal	Pass
		713.5	6.63	1.92	19.33	2.15	21.89	154.525	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	5.22	1.91	19.25	2.15	20.41	109.901	Horizontal	Pass
		707.5	6.89	1.91	19.26	2.15	22.09	161.808	Horizontal	Pass
		711	6.64	1.92	19.32	2.15	21.89	154.525	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	699.7	7.92	1.91	19.21	2.15	23.07	202.768	Vertical	Pass
		707.5	6.67	1.91	19.26	2.15	21.87	153.815	Vertical	Pass
		715.3	6.87	1.93	19.34	2.15	22.13	163.305	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	6.20	1.91	19.21	2.15	21.35	136.458	Vertical	Pass
		707.5	6.29	1.91	19.26	2.15	21.49	140.929	Vertical	Pass
		714.5	7.45	1.93	19.34	2.15	22.71	186.638	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	7.21	1.91	19.23	2.15	22.38	172.982	Vertical	Pass
		707.5	7.36	1.91	19.26	2.15	22.56	180.302	Vertical	Pass
		713.5	6.08	1.92	19.33	2.15	21.34	136.144	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	7.08	1.91	19.25	2.15	22.27	168.655	Vertical	Pass
		707.5	8.59	1.91	19.26	2.15	23.79	239.332	Vertical	Pass
		711	7.85	1.92	19.32	2.15	23.10	204.174	Vertical	Pass
1.4MHz Band 16 QAM	6/0	699.7	7.48	1.91	19.21	2.15	22.63	183.231	Horizontal	Pass
		707.5	7.61	1.91	19.26	2.15	22.81	190.985	Horizontal	Pass
		715.3	6.58	1.93	19.34	2.15	21.84	152.757	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	7.34	1.91	19.21	2.15	22.49	177.419	Horizontal	Pass
		707.5	6.40	1.91	19.26	2.15	21.60	144.544	Horizontal	Pass
		714.5	6.21	1.93	19.34	2.15	21.47	140.281	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	7.50	1.91	19.23	2.15	22.67	184.927	Horizontal	Pass
		707.5	7.36	1.91	19.26	2.15	22.56	180.302	Horizontal	Pass
		713.5	6.97	1.92	19.33	2.15	22.23	167.109	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	5.11	1.91	19.25	2.15	20.30	107.152	Horizontal	Pass
		707.5	7.96	1.91	19.26	2.15	23.16	207.014	Horizontal	Pass
		711	6.23	1.92	19.32	2.15	21.48	140.605	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(dBm)=EIRP-2.15

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	8.24	1.91	19.23	2.15	23.41	219.280	Vertical	Pass
		710	8.54	1.91	19.26	2.15	23.74	236.592	Vertical	Pass
		713.5	7.53	1.92	19.33	2.15	22.79	190.108	Vertical	Pass
10.0MHz Band QPSK	50/0	709	8.92	1.91	19.25	2.15	24.11	257.632	Vertical	Pass
		710	7.75	1.91	19.26	2.15	22.95	197.242	Vertical	Pass
		711	7.56	1.92	19.32	2.15	22.81	190.985	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	7.69	1.91	19.23	2.15	22.86	193.197	Horizontal	Pass
		710	6.85	1.91	19.26	2.15	22.05	160.325	Horizontal	Pass
		713.5	7.44	1.92	19.33	2.15	22.70	186.209	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	7.23	1.91	19.25	2.15	22.42	174.582	Horizontal	Pass
		710	6.16	1.91	19.26	2.15	21.36	136.773	Horizontal	Pass
		711	5.56	1.92	19.32	2.15	20.81	120.504	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	706.5	7.26	1.91	19.23	2.15	22.43	174.985	Vertical	Pass
		710	7.98	1.91	19.26	2.15	23.18	207.970	Vertical	Pass
		713.5	7.28	1.92	19.33	2.15	22.54	179.473	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	7.60	1.91	19.25	2.15	22.79	190.108	Vertical	Pass
		710	7.12	1.91	19.26	2.15	22.32	170.608	Vertical	Pass
		711	6.64	1.92	19.32	2.15	21.89	154.525	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	6.12	1.91	19.23	2.15	21.29	134.586	Horizontal	Pass
		710	5.75	1.91	19.26	2.15	20.95	124.451	Horizontal	Pass
		713.5	6.68	1.92	19.33	2.15	21.94	156.315	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	6.96	1.91	19.25	2.15	22.15	164.059	Horizontal	Pass
		710	6.26	1.91	19.26	2.15	21.46	139.959	Horizontal	Pass
		711	6.61	1.92	19.32	2.15	21.86	153.462	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-2.15

8.8 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-1.45	3.76	28.24	23.03	200.909	Horizontal	Pass
		1745	-2.61	3.91	28.22	21.70	147.911	Horizontal	Pass
		1779.3	-2.93	3.93	28.2	21.34	136.144	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.82	3.77	28.23	21.64	145.881	Horizontal	Pass
		1745	-1.77	3.91	28.24	22.56	180.302	Horizontal	Pass
		1778.5	-1.17	3.94	28.25	23.14	206.063	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-1.16	3.77	28.31	23.38	217.771	Horizontal	Pass
		1745	-2.60	3.91	28.22	21.71	148.252	Horizontal	Pass
		1777.5	-2.41	3.94	28.2	21.85	153.109	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-2.64	3.79	28.33	21.90	154.882	Horizontal	Pass
		1745	-1.18	3.95	28.22	23.09	203.704	Horizontal	Pass
		1775	-1.72	3.97	28.19	22.50	177.828	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-1.23	3.79	28.34	23.32	214.783	Horizontal	Pass
		1745	-1.84	3.95	28.22	22.43	174.985	Horizontal	Pass
		1772.5	-1.38	3.97	28.18	22.83	191.867	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	-2.59	3.81	28.35	21.95	156.675	Horizontal	Pass
		1745	-1.80	3.96	28.22	22.46	176.198	Horizontal	Pass
		1770	-1.36	4	28.16	22.80	190.546	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	-2.67	3.76	28.24	21.81	151.705	Vertical	Pass
		1745	-2.53	3.91	28.22	21.78	150.661	Vertical	Pass
		1779.3	-1.98	3.93	28.2	22.29	169.434	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-1.49	3.77	28.23	22.97	198.153	Vertical	Pass
		1745	-2.06	3.91	28.24	22.27	168.655	Vertical	Pass
		1778.5	-1.67	3.94	28.25	22.64	183.654	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-1.72	3.77	28.31	22.82	191.426	Vertical	Pass
		1745	-1.08	3.91	28.22	23.23	210.378	Vertical	Pass
		1777.5	-1.19	3.94	28.2	23.07	202.768	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-1.40	3.79	28.34	23.15	206.538	Vertical	Pass
		1745	-1.51	3.95	28.22	22.76	188.799	Vertical	Pass
		1775	-1.10	3.97	28.18	23.11	204.644	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	-2.90	3.81	28.35	21.64	145.881	Vertical	Pass
		1745	-1.57	3.96	28.22	22.69	185.780	Vertical	Pass
		1772.5	-1.39	4	28.16	22.77	189.234	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	-2.87	3.79	28.34	21.68	147.231	Vertical	Pass
		1745	-1.70	3.95	28.22	22.57	180.717	Vertical	Pass
		1770	-1.74	3.97	28.18	22.47	176.604	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	-3.04	3.76	28.24	21.44	139.316	Horizontal	Pass
		1745	-2.53	3.91	28.22	21.78	150.661	Horizontal	Pass
		1779.3	-3.82	3.93	28.2	20.45	110.917	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.21	3.77	28.23	22.25	167.880	Horizontal	Pass
		1745	-3.50	3.91	28.24	20.83	121.060	Horizontal	Pass
		1778.5	-3.57	3.94	28.25	20.74	118.577	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-2.75	3.77	28.31	21.79	151.008	Horizontal	Pass
		1745	-2.61	3.91	28.22	21.70	147.911	Horizontal	Pass
		1777.5	-3.85	3.94	28.2	20.41	109.901	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-3.95	3.79	28.33	20.59	114.551	Horizontal	Pass
		1745	-3.62	3.95	28.22	20.65	116.145	Horizontal	Pass
		1775	-3.65	3.97	28.19	20.57	114.025	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-2.24	3.79	28.34	22.31	170.216	Horizontal	Pass
		1745	-2.70	3.95	28.22	21.57	143.549	Horizontal	Pass
		1772.5	-2.34	3.97	28.18	21.87	153.815	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-2.84	3.81	28.35	21.70	147.911	Horizontal	Pass
		1745	-2.12	3.96	28.22	22.14	163.682	Horizontal	Pass
		1770	-2.56	4	28.16	21.60	144.544	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-2.07	3.76	28.24	22.41	174.181	Vertical	Pass
		1745	-2.41	3.91	28.22	21.90	154.882	Vertical	Pass
		1779.3	-2.99	3.93	28.2	21.28	134.276	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.79	3.77	28.23	21.67	146.893	Vertical	Pass
		1745	-3.89	3.91	28.24	20.44	110.662	Vertical	Pass
		1778.5	-3.65	3.94	28.25	20.66	116.413	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-3.71	3.77	28.31	20.83	121.060	Vertical	Pass
		1745	-2.56	3.91	28.22	21.75	149.624	Vertical	Pass
		1777.5	-2.80	3.94	28.2	21.46	139.959	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-3.41	3.79	28.34	21.14	130.017	Vertical	Pass
		1745	-2.48	3.95	28.22	21.79	151.008	Vertical	Pass
		1775	-2.61	3.97	28.18	21.60	144.544	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-2.23	3.81	28.35	22.31	170.216	Vertical	Pass
		1745	-2.57	3.96	28.22	21.69	147.571	Vertical	Pass
		1772.5	-2.30	4	28.16	21.86	153.462	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	-3.92	3.79	28.34	20.63	115.611	Vertical	Pass
		1745	-2.10	3.95	28.22	22.17	164.816	Vertical	Pass
		1770	-3.77	3.97	28.18	20.44	110.662	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)

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 2/4/5/7/12/17/66

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	-48.06	4.04	33.51	-18.59	-13	-5.59	Horizontal
3701.4	-50.68	4.04	33.51	-21.21	-13	-8.21	Vertical
5552.1	-46.67	5.24	35.84	-16.07	-13	-3.07	Vertical
5552.1	-49.11	5.24	35.84	-18.51	-13	-5.51	Horizontal
185.1	-39.81	1.43	16.02	-25.22	-13	-12.22	Vertical
453.7	-32.42	1.30	17.99	-15.73	-13	-2.73	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.47	4.04	33.56	-16.95	-13	-3.95	Horizontal
3760.0	-50.96	4.04	33.56	-21.44	-13	-8.44	Vertical
5640.0	-48.47	5.24	35.91	-17.80	-13	-4.80	Vertical
5640.0	-50.06	5.24	35.91	-19.39	-13	-6.39	Horizontal
183.5	-34.87	1.62	16.97	-19.52	-13	-6.52	Vertical
289.4	-34.52	1.74	15.98	-20.29	-13	-7.29	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-46.67	4.04	34.00	-16.71	-13	-3.71	Horizontal
3818.6	-46.03	4.04	34.00	-16.07	-13	-3.07	Vertical
5727.9	-50.47	5.24	36.04	-19.67	-13	-6.67	Vertical
5727.9	-48.03	5.24	36.04	-17.23	-13	-4.23	Horizontal
193.8	-40.62	1.42	17.29	-24.75	-13	-11.75	Vertical
342.6	-34.22	1.50	17.90	-17.81	-13	-4.81	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	-45.64	4.07	33.54	-16.17	-13	-3.17	Horizontal
3720.0	-48.64	4.07	33.54	-19.17	-13	-6.17	Vertical
5580.0	-46.87	5.28	35.86	-16.29	-13	-3.29	Vertical
5580.0	-49.63	5.28	35.86	-19.05	-13	-6.05	Horizontal
208.5	-37.38	1.58	16.89	-22.06	-13	-9.06	Vertical
357.0	-41.03	1.76	17.26	-25.53	-13	-12.53	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-46.02	4.04	33.56	-16.50	-13	-3.50	Horizontal
3760.0	-45.53	4.04	33.56	-16.01	-13	-3.01	Vertical
5640.0	-50.12	5.24	35.91	-19.45	-13	-6.45	Vertical
5640.0	-50.61	5.24	35.91	-19.94	-13	-6.94	Horizontal
200.6	-43.49	1.46	16.27	-28.68	-13	-15.68	Vertical
344.7	-38.45	1.59	15.15	-24.89	-13	-11.89	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-48.76	4.04	34.00	-18.80	-13	-5.80	Horizontal
3800.0	-46.42	4.04	34.00	-16.46	-13	-3.46	Vertical
5700.0	-47.71	5.24	36.04	-16.91	-13	-3.91	Vertical
5700.0	-49.85	5.24	36.04	-19.05	-13	-6.05	Horizontal
212.0	-33.74	1.36	17.39	-17.70	-13	-4.70	Vertical
312.7	-40.20	1.66	15.39	-26.47	-13	-13.47	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	-48.93	4.02	29.80	-23.15	-13	-10.15	Horizontal
3421.4	-46.13	4.02	29.80	-20.35	-13	-7.35	Vertical
5132.1	-50.39	5.24	35.84	-19.79	-13	-6.79	Vertical
5132.1	-49.98	5.24	35.84	-19.38	-13	-6.38	Horizontal
197.8	-40.62	1.68	16.04	-26.26	-13	-13.26	Vertical
454.4	-33.73	1.78	17.74	-17.77	-13	-4.77	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.44	4.03	30.00	-22.47	-13	-9.47	Horizontal
3465.0	-42.19	4.03	30.00	-16.22	-13	-3.22	Vertical
5197.5	-47.31	5.25	35.86	-16.70	-13	-3.70	Vertical
5197.5	-47.93	5.25	35.86	-17.32	-13	-4.32	Horizontal
207.5	-40.71	1.72	17.69	-24.74	-13	-11.74	Vertical
345.7	-42.08	1.62	16.02	-27.67	-13	-14.67	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-47.77	4.05	30.01	-21.81	-13	-8.81	Horizontal
3508.6	-45.65	4.05	30.01	-19.69	-13	-6.69	Vertical
5262.9	-48.56	5.26	35.86	-17.96	-13	-4.96	Vertical
5262.9	-48.94	5.26	35.86	-18.34	-13	-5.34	Horizontal
182.9	-31.87	1.80	16.69	-16.98	-13	-3.98	Vertical
332.1	-39.12	1.75	16.66	-24.22	-13	-11.22	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	-47.63	4.02	29.80	-21.85	-13	-8.85	Horizontal
3440.0	-47.49	4.02	29.80	-21.71	-13	-8.71	Vertical
5160.0	-50.56	5.24	35.84	-19.96	-13	-6.96	Vertical
5160.0	-49.49	5.24	35.84	-18.89	-13	-5.89	Horizontal
182.5	-38.42	1.57	17.26	-22.73	-13	-9.73	Vertical
310.2	-34.47	1.78	16.35	-19.90	-13	-6.90	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.81	4.03	30.00	-22.84	-13	-9.84	Horizontal
3465.0	-49.59	4.03	30.00	-23.62	-13	-10.62	Vertical
5197.5	-47.09	5.25	35.86	-16.48	-13	-3.48	Vertical
5197.5	-47.70	5.25	35.86	-17.09	-13	-4.09	Horizontal
208.7	-39.90	1.44	17.95	-23.39	-13	-10.39	Vertical
269.5	-31.49	1.65	16.09	-17.05	-13	-4.05	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-44.38	2.91	27.68	-19.61	-13	-6.61	Horizontal
3490.0	-44.25	2.91	27.68	-19.48	-13	-6.48	Vertical
5235.0	-47.44	5.26	35.86	-16.84	-13	-3.84	Vertical
5235.0	-51.81	5.26	35.86	-21.21	-13	-8.21	Horizontal
184.8	-39.67	1.61	16.85	-24.43	-13	-11.43	Vertical
290.8	-39.58	1.61	15.19	-26.00	-13	-13.00	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-45.70	2.78	27.50	-20.98	-13	-7.98	Horizontal
1649.4	-49.43	2.78	27.50	-24.71	-13	-11.71	Vertical
2474.1	-44.53	2.90	27.80	-19.63	-13	-6.63	Vertical
2474.1	-51.03	2.90	27.80	-26.13	-13	-13.13	Horizontal
179.0	-35.94	1.76	17.59	-20.11	-13	-7.11	Vertical
460.3	-38.91	1.63	15.87	-24.67	-13	-11.67	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-45.30	2.80	27.48	-20.62	-13	-7.62	Horizontal
1673.0	-44.59	2.80	27.48	-19.91	-13	-6.91	Vertical
2509.5	-42.77	2.91	27.70	-17.98	-13	-4.98	Vertical
2509.5	-48.86	2.91	27.70	-24.07	-13	-11.07	Horizontal
212.9	-40.03	1.61	15.68	-25.96	-13	-12.96	Vertical
431.5	-35.98	1.59	17.52	-20.06	-13	-7.06	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-47.35	2.82	27.43	-22.74	-13	-9.74	Horizontal
1696.6	-49.81	2.82	27.43	-25.20	-13	-12.20	Vertical
2544.9	-42.62	2.92	27.74	-17.80	-13	-4.80	Vertical
2544.9	-50.39	2.92	27.74	-25.57	-13	-12.57	Horizontal
192.7	-33.45	1.69	16.67	-18.46	-13	-5.46	Vertical
366.5	-33.91	1.70	17.18	-18.43	-13	-5.43	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ 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
1658.0	-50.66	2.78	27.50	-25.94	-13	-12.94	Horizontal
1658.0	-41.52	2.78	27.50	-16.80	-13	-3.80	Vertical
2487.0	-52.30	2.90	27.80	-27.40	-13	-14.40	Vertical
2487.0	-48.06	2.90	27.80	-23.16	-13	-10.16	Horizontal
199.8	-41.82	1.71	15.57	-27.96	-13	-14.96	Vertical
363.9	-31.39	1.34	16.40	-16.33	-13	-3.33	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-40.81	2.80	27.48	-16.13	-13	-3.13	Horizontal
1673.0	-42.34	2.80	27.48	-17.66	-13	-4.66	Vertical
2509.5	-49.70	2.91	27.70	-24.91	-13	-11.91	Vertical
2509.5	-46.85	2.91	27.70	-22.06	-13	-9.06	Horizontal
212.0	-32.43	1.44	17.04	-16.83	-13	-3.83	Vertical
343.3	-41.61	1.76	17.62	-25.75	-13	-12.75	Horizontal
Test Results for High Channel 848.3MHz							
1688.0	-45.22	2.82	27.43	-20.61	-13	-7.61	Horizontal
1688.0	-46.70	2.82	27.43	-22.09	-13	-9.09	Vertical
2532.0	-49.52	2.92	27.74	-24.70	-13	-11.70	Vertical
2532.0	-47.03	2.92	27.74	-22.21	-13	-9.21	Horizontal
205.3	-34.31	1.74	17.70	-18.35	-13	-5.35	Vertical
393.0	-34.13	1.41	17.46	-18.07	-13	-5.07	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	-63.26	5.23	35.81	-32.68	-25	-7.68	Horizontal
5005.0	-62.03	5.23	35.81	-31.45	-25	-6.45	Vertical
7507.5	-61.98	5.67	36.85	-30.80	-25	-5.80	Vertical
7507.5	-61.29	5.67	36.85	-30.11	-25	-5.11	Horizontal
202.7	-50.15	1.73	17.97	-33.91	-25	-8.91	Vertical
450.7	-48.83	1.38	15.11	-35.10	-25	-10.10	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-58.25	5.23	35.82	-27.66	-25	-2.66	Horizontal
5070.0	-63.06	5.23	35.82	-32.47	-25	-7.47	Vertical
7605.0	-60.72	5.67	36.85	-29.54	-25	-4.54	Vertical
7605.0	-61.74	5.67	36.85	-30.56	-25	-5.56	Horizontal
210.9	-42.21	1.77	16.17	-27.80	-25	-2.80	Vertical
232.7	-48.56	1.63	15.21	-34.98	-25	-9.98	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-58.55	5.24	35.83	-27.96	-25	-2.96	Horizontal
5135.0	-58.97	5.24	35.83	-28.38	-25	-3.38	Vertical
7702.5	-60.44	5.68	36.87	-29.25	-25	-4.25	Vertical
7702.5	-59.54	5.68	36.87	-28.35	-25	-3.35	Horizontal
186.4	-43.84	1.58	17.56	-27.86	-25	-2.86	Vertical
263.7	-48.06	1.45	16.58	-32.93	-25	-7.93	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	-57.91	5.23	35.82	-27.32	-25	-2.32	Horizontal
5020.0	-60.83	5.23	35.82	-30.24	-25	-5.24	Vertical
7530.0	-59.59	5.67	36.86	-28.40	-25	-3.40	Vertical
7530.0	-58.67	5.67	36.86	-27.48	-25	-2.48	Horizontal
192.6	-47.99	1.63	15.76	-33.86	-25	-8.86	Vertical
379.3	-50.06	1.71	15.44	-36.33	-25	-11.33	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.19	5.23	35.82	-29.60	-25	-4.60	Horizontal
5070.0	-59.23	5.23	35.82	-28.64	-25	-3.64	Vertical
7605.0	-58.96	5.67	36.85	-27.78	-25	-2.78	Vertical
7605.0	-59.71	5.67	36.85	-28.53	-25	-3.53	Horizontal
198.7	-44.74	1.79	16.84	-29.68	-25	-4.68	Vertical
346.1	-44.05	1.71	17.64	-28.12	-25	-3.12	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.33	5.24	35.83	-28.74	-25	-3.74	Horizontal
5120.0	-60.07	5.24	35.83	-29.48	-25	-4.48	Vertical
7680.0	-58.94	5.70	36.88	-27.76	-25	-2.76	Vertical
7680.0	-60.51	5.70	36.88	-29.33	-25	-4.33	Horizontal
193.4	-44.03	1.79	16.84	-28.97	-25	-3.97	Vertical
349.4	-43.82	1.71	17.64	-27.89	-25	-2.89	Horizontal

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	-42.43	2.60	27.20	-17.83	-13	-4.83	Horizontal
1399.4	-42.89	2.60	27.20	-18.29	-13	-5.29	Vertical
2099.1	-49.02	2.85	27.54	-24.33	-13	-11.33	Vertical
2099.1	-47.79	2.85	27.54	-23.10	-13	-10.10	Horizontal
211.7	-35.89	1.49	17.78	-19.60	-13	-6.60	Vertical
386.4	-39.12	1.36	17.33	-23.15	-13	-10.15	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.55	2.61	27.28	-19.88	-13	-6.88	Horizontal
1415.0	-43.21	2.61	27.28	-18.54	-13	-5.54	Vertical
2122.5	-49.61	2.87	27.59	-24.89	-13	-11.89	Vertical
2122.5	-48.51	2.87	27.59	-23.79	-13	-10.79	Horizontal
207.5	-38.23	1.73	15.74	-24.22	-13	-11.22	Vertical
384.6	-32.21	1.62	15.79	-18.04	-13	-5.04	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-50.70	2.63	27.28	-26.05	-13	-13.05	Horizontal
1430.6	-46.19	2.63	27.28	-21.54	-13	-8.54	Vertical
2145.9	-43.57	2.88	27.60	-18.85	-13	-5.85	Vertical
2145.9	-47.51	2.88	27.60	-22.79	-13	-9.79	Horizontal
186.4	-33.45	1.61	18.00	-17.06	-13	-4.06	Vertical
280.4	-34.58	1.45	15.49	-20.55	-13	-7.55	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	-51.69	2.61	27.26	-27.04	-13	-14.04	Horizontal
1408.0	-45.60	2.61	27.26	-20.95	-13	-7.95	Vertical
2112.0	-47.35	2.87	27.58	-22.64	-13	-9.64	Vertical
2112.0	-50.33	2.87	27.58	-25.62	-13	-12.62	Horizontal
197.3	-39.80	1.31	16.97	-24.14	-13	-11.14	Vertical
468.6	-41.51	1.65	16.70	-26.46	-13	-13.46	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-43.57	2.61	27.28	-18.90	-13	-5.90	Horizontal
1415.0	-50.55	2.61	27.28	-25.88	-13	-12.88	Vertical
2122.5	-50.67	2.87	27.59	-25.95	-13	-12.95	Vertical
2122.5	-49.98	2.87	27.59	-25.26	-13	-12.26	Horizontal
175.4	-35.32	1.72	17.99	-19.05	-13	-6.05	Vertical
362.7	-38.81	1.73	17.94	-22.60	-13	-9.60	Horizontal
Test Results for High Channel 711MHz							
1422.0	-46.72	2.62	27.28	-22.06	-13	-9.06	Horizontal
1422.0	-41.84	2.62	27.28	-17.18	-13	-4.18	Vertical
2133.0	-51.14	2.87	27.60	-26.41	-13	-13.41	Vertical
2133.0	-48.27	2.87	27.60	-23.54	-13	-10.54	Horizontal
209.0	-35.58	1.58	15.93	-21.23	-13	-8.23	Vertical
360.9	-31.75	1.36	15.59	-17.52	-13	-4.52	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	-48.67	2.61	27.28	-24.00	-13	-11.00	Horizontal
1413.0	-43.78	2.61	27.28	-19.11	-13	-6.11	Vertical
2119.5	-49.90	2.87	27.59	-25.18	-13	-12.18	Vertical
2119.5	-47.89	2.87	27.59	-23.17	-13	-10.17	Horizontal
209.6	-33.56	1.71	16.15	-19.12	-13	-6.12	Vertical
420.5	-43.45	1.41	17.32	-27.54	-13	-14.54	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-43.94	2.62	27.30	-19.26	-13	-6.26	Horizontal
1420.0	-46.13	2.62	27.30	-21.45	-13	-8.45	Vertical
2130.0	-42.66	2.87	27.62	-17.91	-13	-4.91	Vertical
2130.0	-48.72	2.87	27.62	-23.97	-13	-10.97	Horizontal
201.1	-35.83	1.42	15.25	-22.01	-13	-9.01	Vertical
320.8	-39.81	1.36	17.19	-23.98	-13	-10.98	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-49.61	2.66	27.28	-24.99	-13	-11.99	Horizontal
1427.0	-44.20	2.66	27.28	-19.58	-13	-6.58	Vertical
2140.5	-43.46	2.88	27.60	-18.74	-13	-5.74	Vertical
2140.5	-50.20	2.88	27.60	-25.48	-13	-12.48	Horizontal
175.6	-39.82	1.32	17.29	-23.85	-13	-10.85	Vertical
445.7	-36.45	1.72	16.89	-21.28	-13	-8.28	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	-47.88	2.62	27.30	-23.20	-13	-10.20	Horizontal
1418.0	-50.12	2.62	27.30	-25.44	-13	-12.44	Vertical
2127.0	-47.22	2.87	27.62	-22.47	-13	-9.47	Vertical
2127.0	-47.63	2.87	27.62	-22.88	-13	-9.88	Horizontal
196.4	-32.72	1.35	16.91	-17.16	-13	-4.16	Vertical
269.0	-40.96	1.62	16.31	-26.27	-13	-13.27	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-43.09	2.62	27.30	-18.41	-13	-5.41	Horizontal
1420.0	-42.11	2.62	27.30	-17.43	-13	-4.43	Vertical
2130.0	-45.67	2.87	27.62	-20.92	-13	-7.92	Vertical
2130.0	-49.25	2.87	27.62	-24.50	-13	-11.50	Horizontal
202.1	-42.91	1.51	17.14	-27.28	-13	-14.28	Vertical
398.2	-38.01	1.77	16.88	-22.90	-13	-9.90	Horizontal
Test Results for High Channel 711MHz							
1422.0	-45.41	2.62	27.30	-20.73	-13	-7.73	Horizontal
1422.0	-51.21	2.62	27.30	-26.53	-13	-13.53	Vertical
2133.0	-42.92	2.87	27.62	-18.17	-13	-5.17	Vertical
2133.0	-42.57	2.87	27.62	-17.82	-13	-4.82	Horizontal
201.8	-36.49	1.78	15.95	-22.32	-13	-9.32	Vertical
411.8	-35.43	1.34	17.95	-18.83	-13	-5.83	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.

9.7 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-57.08	3.84	35.81	-25.11	-13	-12.11	Horizontal
3421.4	-60.60	3.84	35.81	-28.63	-13	-15.63	Vertical
5132.1	-61.09	5.18	36.85	-29.42	-13	-16.42	Vertical
5132.1	-60.69	5.18	36.85	-29.02	-13	-16.02	Horizontal
203.9	-48.12	1.56	17.97	-31.71	-13	-18.71	Vertical
305.7	-51.09	1.33	15.11	-37.31	-13	-24.31	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-60.81	3.85	35.82	-28.84	-13	-15.84	Horizontal
3490.0	-60.66	3.85	35.82	-28.69	-13	-15.69	Vertical
5235.0	-59.22	5.21	36.85	-27.58	-13	-14.58	Vertical
5235.0	-60.98	5.21	36.85	-29.34	-13	-16.34	Horizontal
187.3	-47.30	1.77	16.17	-32.89	-13	-19.89	Vertical
390.0	-47.81	1.63	15.21	-34.23	-13	-21.23	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-57.85	3.86	35.83	-25.88	-13	-12.88	Horizontal
3558.6	-57.05	3.86	35.83	-25.08	-13	-12.08	Vertical
5337.9	-57.12	5.24	36.87	-25.49	-13	-12.49	Vertical
5337.9	-59.50	5.24	36.87	-27.87	-13	-14.87	Horizontal
198.1	-45.36	1.58	17.56	-29.38	-13	-16.38	Vertical
268.4	-49.79	1.45	16.58	-34.66	-13	-21.66	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (20MHZ 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	-61.50	3.84	35.82	-29.52	-13	-16.52	Horizontal
3440.0	-61.88	3.84	35.82	-29.90	-13	-16.90	Vertical
5160.0	-59.22	5.18	36.86	-27.54	-13	-14.54	Vertical
5160.0	-62.83	5.18	36.86	-31.15	-13	-18.15	Horizontal
180.4	-49.90	1.56	15.76	-35.70	-13	-22.70	Vertical
323.5	-45.43	1.33	15.44	-31.32	-13	-18.32	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-58.13	3.85	35.82	-26.16	-13	-13.16	Horizontal
3490.0	-60.79	3.85	35.82	-28.82	-13	-15.82	Vertical
5235.0	-61.82	5.21	36.85	-30.18	-13	-17.18	Vertical
5235.0	-56.83	5.21	36.85	-25.19	-13	-12.19	Horizontal
182.6	-45.06	1.77	16.84	-29.98	-13	-16.98	Vertical
251.6	-51.78	1.63	17.64	-35.77	-13	-22.77	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-57.45	3.86	35.83	-25.48	-13	-12.48	Horizontal
3540.0	-59.93	3.86	35.83	-27.96	-13	-14.96	Vertical
5310.0	-58.84	5.24	36.88	-27.20	-13	-14.20	Vertical
5310.0	-57.48	5.24	36.88	-25.84	-13	-12.84	Horizontal
182.3	-46.47	1.58	16.84	-31.20	-13	-18.20	Vertical
310.2	-47.70	1.45	17.64	-31.51	-13	-18.51	Horizontal

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

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

We test both H direction and V direction, recorded worst case direction.

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 3.29V, Normal, DC 3.85V and High voltage, DC 4.45V.

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 2/4/5/7/12/17/66

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]
3.27	1880	8.9	0.004734	2.5
3.85	1880	10.9	0.005798	2.5
4.43	1880	8.2	0.004362	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	14.3	0.007606	2.5
Extreme (50C)	1880	12.6	0.006702	2.5
Extreme (40C)	1880	11.8	0.006277	2.5
Extreme (30C)	1880	13.6	0.007234	2.5
Extreme (10C)	1880	3.5	0.001862	2.5
Extreme (0C)	1880	11.2	0.005957	2.5
Extreme (-10C)	1880	12.9	0.006862	2.5
Extreme (-20C)	1880	15.2	0.008085	2.5
Extreme (-30C)	1880	14.7	0.007819	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]
3.27	1880	13.5	0.007181	2.5
3.85	1880	10.6	0.005638	2.5
4.43	1880	16.7	0.008883	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13.6	0.007234	2.5
Extreme (50C)	1880	12.2	0.006489	2.5
Extreme (40C)	1880	11.5	0.006117	2.5
Extreme (30C)	1880	12.9	0.006862	2.5
Extreme (10C)	1880	14.8	0.007872	2.5
Extreme (0C)	1880	12.9	0.006862	2.5
Extreme (-10C)	1880	15.4	0.008191	2.5
Extreme (-20C)	1880	14.9	0.007926	2.5
Extreme (-30C)	1880	11.2	0.005957	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]
3.27	1732.5	11.9	0.006869	2.5
3.85	1732.5	10.8	0.006234	2.5
4.43	1732.5	9.6	0.005541	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	13.8	0.007965	2.5
Extreme (50C)	1732.5	7.8	0.004502	2.5
Extreme (40C)	1732.5	14.9	0.008600	2.5
Extreme (30C)	1732.5	12.1	0.006984	2.5
Extreme (10C)	1732.5	10.5	0.006061	2.5
Extreme (0C)	1732.5	13.6	0.007850	2.5
Extreme (-10C)	1732.5	12.7	0.007330	2.5
Extreme (-20C)	1732.5	8.6	0.004964	2.5
Extreme (-30C)	1732.5	14.4	0.008312	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]
3.27	1732.5	10.2	0.005887	2.5
3.85	1732.5	14.1	0.008139	2.5
4.43	1732.5	13.9	0.008023	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	13.4	0.007734	2.5
Extreme (50C)	1732.5	14.2	0.008196	2.5
Extreme (40C)	1732.5	6.6	0.003810	2.5
Extreme (30C)	1732.5	11.5	0.006638	2.5
Extreme (10C)	1732.5	12.4	0.007157	2.5
Extreme (0C)	1732.5	8.2	0.004733	2.5
Extreme (-10C)	1732.5	11.5	0.006638	2.5
Extreme (-20C)	1732.5	13.5	0.007792	2.5
Extreme (-30C)	1732.5	13.1	0.007561	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]
3.27	836.5	15.7	0.018769	2.5
3.85	836.5	8.6	0.010281	2.5
4.43	836.5	12.6	0.015063	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	13.2	0.015780	2.5
Extreme (50C)	836.5	12.9	0.015421	2.5
Extreme (40C)	836.5	5.9	0.007053	2.5
Extreme (30C)	836.5	11.5	0.013748	2.5
Extreme (10C)	836.5	6.9	0.008249	2.5
Extreme (0C)	836.5	11.9	0.014226	2.5
Extreme (-10C)	836.5	11.8	0.014106	2.5
Extreme (-20C)	836.5	15.8	0.018888	2.5
Extreme (-30C)	836.5	14.7	0.017573	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]
3.27	836.5	11.6	0.013867	2.5
3.85	836.5	13.5	0.016139	2.5
4.43	836.5	6.3	0.007531	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	14.2	0.016975	2.5
Extreme (50C)	836.5	6.6	0.007890	2.5
Extreme (40C)	836.5	12.9	0.015421	2.5
Extreme (30C)	836.5	9.6	0.011476	2.5
Extreme (10C)	836.5	9.2	0.010998	2.5
Extreme (0C)	836.5	14.1	0.016856	2.5
Extreme (-10C)	836.5	15.6	0.018649	2.5
Extreme (-20C)	836.5	10.6	0.012672	2.5
Extreme (-30C)	836.5	10.2	0.012194	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]
3.27	2535	14.6	0.005759	2.5
3.85	2535	10.7	0.004221	2.5
4.43	2535	5.6	0.002209	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	13.1	0.005168	2.5
Extreme (50C)	2535	15.1	0.005957	2.5
Extreme (40C)	2535	13.5	0.005325	2.5
Extreme (30C)	2535	14.7	0.005799	2.5
Extreme (10C)	2535	10.6	0.004181	2.5
Extreme (0C)	2535	12.2	0.004813	2.5
Extreme (-10C)	2535	8.6	0.003393	2.5
Extreme (-20C)	2535	15.9	0.006272	2.5
Extreme (-30C)	2535	11.7	0.004615	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.27	2535	10.8	0.004260	2.5
3.85	2535	13.2	0.005207	2.5
4.43	2535	11.9	0.004694	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	14.7	0.005799	2.5
Extreme (50C)	2535	6.6	0.002604	2.5
Extreme (40C)	2535	14.7	0.005799	2.5
Extreme (30C)	2535	11.5	0.004536	2.5
Extreme (10C)	2535	6.9	0.002722	2.5
Extreme (0C)	2535	15.2	0.005996	2.5
Extreme (-10C)	2535	13.8	0.005444	2.5
Extreme (-20C)	2535	15.8	0.006233	2.5
Extreme (-30C)	2535	7.7	0.003037	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]
3.27	707.5	10.9	0.015406	2.5
3.85	707.5	12.8	0.018092	2.5
4.43	707.5	14.3	0.020212	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	10.5	0.014841	2.5
Extreme (50C)	707.5	14.6	0.020636	2.5
Extreme (40C)	707.5	13.1	0.018516	2.5
Extreme (30C)	707.5	11.9	0.016820	2.5
Extreme (10C)	707.5	14.6	0.020636	2.5
Extreme (0C)	707.5	13.5	0.019081	2.5
Extreme (-10C)	707.5	12.7	0.017951	2.5
Extreme (-20C)	707.5	13.8	0.019505	2.5
Extreme (-30C)	707.5	14.9	0.021060	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]
3.27	707.5	12.2	0.017244	2.5
3.85	707.5	12.9	0.018233	2.5
4.43	707.5	14.7	0.020777	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	14.7	0.020777	2.5
Extreme (50C)	707.5	11.2	0.015830	2.5
Extreme (40C)	707.5	14.9	0.021060	2.5
Extreme (30C)	707.5	11.1	0.015689	2.5
Extreme (10C)	707.5	11.2	0.015830	2.5
Extreme (0C)	707.5	10.6	0.014982	2.5
Extreme (-10C)	707.5	16.2	0.022898	2.5
Extreme (-20C)	707.5	15.5	0.021908	2.5
Extreme (-30C)	707.5	5.2	0.007350	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]
3.27	710	14.5	0.020423	2.5
3.85	710	13.9	0.019577	2.5
4.43	710	14.6	0.020563	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	6.5	0.009155	2.5
Extreme (50C)	710	13.8	0.019437	2.5
Extreme (40C)	710	14.7	0.020704	2.5
Extreme (30C)	710	7.9	0.011127	2.5
Extreme (10C)	710	15.8	0.022254	2.5
Extreme (0C)	710	12.6	0.017746	2.5
Extreme (-10C)	710	12.4	0.017465	2.5
Extreme (-20C)	710	13.8	0.019437	2.5
Extreme (-30C)	710	14.6	0.020563	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]
3.27	710	8.1	0.011408	2.5
3.85	710	14.3	0.020141	2.5
4.43	710	13.9	0.019577	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	11.8	0.016620	2.5
Extreme (50C)	710	11.2	0.015775	2.5
Extreme (40C)	710	8.2	0.011549	2.5
Extreme (30C)	710	10.2	0.014366	2.5
Extreme (10C)	710	12.6	0.017746	2.5
Extreme (0C)	710	8.8	0.012394	2.5
Extreme (-10C)	710	8.5	0.011972	2.5
Extreme (-20C)	710	10.5	0.014789	2.5
Extreme (-30C)	710	10.7	0.015070	2.5

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

10.7 LTE BAND 66

Band 66 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]
3.27	1745	6.8	0.003897	2.5
3.85	1745	7.7	0.004413	2.5
4.43	1745	5.9	0.003381	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	5.2	0.002980	2.5
Extreme (50C)	1745	8.4	0.004814	2.5
Extreme (40C)	1745	6.6	0.003782	2.5
Extreme (30C)	1745	5.7	0.003266	2.5
Extreme (10C)	1745	11.4	0.006533	2.5
Extreme (0C)	1745	10.8	0.006189	2.5
Extreme (-10C)	1745	6.6	0.003782	2.5
Extreme (-20C)	1745	8.2	0.004699	2.5
Extreme (-30C)	1745	9.8	0.005616	2.5

Band 66 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]
3.27	1745	7.3	0.004183	2.5
3.85	1745	6.7	0.003840	2.5
4.43	1745	8.2	0.004699	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	8.8	0.005043	2.5
Extreme (50C)	1745	7.8	0.004470	2.5
Extreme (40C)	1745	8.2	0.004699	2.5
Extreme (30C)	1745	9.8	0.005616	2.5
Extreme (10C)	1745	10.4	0.005960	2.5
Extreme (0C)	1745	6.2	0.003553	2.5
Extreme (-10C)	1745	7.7	0.004413	2.5
Extreme (-20C)	1745	8.9	0.005100	2.5
Extreme (-30C)	1745	4.8	0.002751	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.

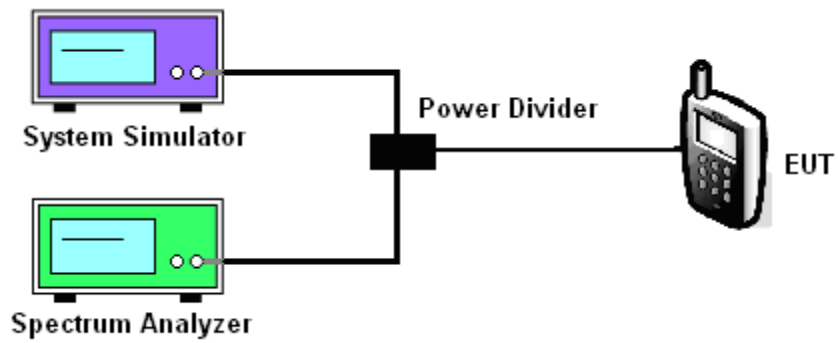
11.2 Measuring Instruments

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 2/4/5/7/12/17/66

Test data reference attachment.

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