

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

FCC ID: 2AOWK-5003TF

Product: Smart Phone

Trade Mark: ulefone

Model No.: GQ5003

Family Model: Power Armor 19T, Power Armor 19, Power
Armor 19 Pro, Power Armor 19E, Power Armor
19S, Power Armor 19 Plus, Power Armor 19
Lite

Report No.: STR221128003006E

Issue Date: Dec 21, 2022

Prepared for

Shenzhen Gotron Electronic CO.,LTD.
7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,
Shenzhen City, Guangdong Province China

Prepared by

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

TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Gotron Electronic CO.,LTD.

Address..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China

Manufacturer's Name..... : Shenzhen Gotron Electronic CO.,LTD.

Address..... : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China

Product name..... : Smart Phone

Model and/or type reference .. : GQ5003

Trade Mark..... : ulefone

Family Model..... : Power Armor 19T, Power Armor 19, Power Armor 19 Pro, Power Armor 19E, Power Armor 19S, Power Armor 19 Plus, Power Armor 19 Lite

Test Sample Number..... T221128002R002

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

Test procedure : ANSI C63.26:2015
ANSI/TIA-603-E-2016

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

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

Date of Test

Date (s) of performance of tests..... Nov 29, 2022 ~ Dec 21, 2022

Date of Issue Dec 22, 2022

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

Testing Engineer : 

(Allen Liu)

Authorized Signatory : 

(Alex Li)

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	6
1. GENERAL INFORMATION.....	6
1.1 PRODUCT DESCRIPTION	6
1.2 RELATED SUBMITTAL(S) / GRANT (S)	8
1.3 TEST METHODOLOGY	8
1.4 TEST FACILITY	8
MEASUREMENT UNCERTAINTY	8
1.5 SPECIAL ACCESSORIES.....	8
1.6 WORST-CASE CONFIGURATION AND MODE.....	8
2. SYSTEM TEST CONFIGURATION	9
2.1 EUT CONFIGURATION.....	9
2.2 EUT EXERCISE	9
2.3 CONFIGURATION OF EUT SYSTEM.....	9
2.4 TEST SETUP	10
3.TEST AND MEASUREMENT EQUIPMENT	11
4. OUTPUT POWER.....	13
4.1 OUTPUT POWER MEASUREMENT	13
6. BANDEDGE AND EMISSION MASK.....	16
7. OUT OF BAND EMISSIONS	18
7.1 MEASUREMENT METHOD	18
8. RADIATED MEASUREMENT	19
8.1. RADIATED POWER (ERP & EIRP).....	19

8.2 LTE BAND 2.....	20
8.3 LTE BAND 4.....	24
8.4 LTE BAND 5.....	28
8.5 LTE BAND 7.....	30
8.6 LTE BAND 12	32
8.7 LTE BAND 13	34
8.8 LTE BAND 17	36
8.9 LTE BAND 25	38
8.12 LTE BAND 41	42
9. SPURIOUS RADIATION EMISSION	44
9.1 LTE BAND 2.....	46
9.2 LTE BAND 4.....	48
9.3 LTE BAND 5.....	50
9.4 LTE BAND 7.....	52
9.5 LTE BAND 12	54
9.6 LTE BAND 13	56
9.7 LTE BAND 17	58
9.8 LTE BAND 25	60
9.11 LTE BAND 41	62
10. FREQUENCY STABILITY	64
10.1 LTE BAND 2	65
10.2 LTE BAND 4	67
10.3 LTE BAND 5	69
10.4 LTE BAND 7	71
10.5 LTE BAND 12	73
10.6 LTE BAND 13	75
10.7 LTE BAND 17	77
10.8 LTE BAND 25	79
10.11 LTE BAND 41	81

11. PEAK-TO-AVERAGE RATIO.....	83
11.1 Description of the PAR Measurement.....	83
11.2 Measuring Instruments	83
11.3 Test Procedures.....	83
11.4 Test Setup.....	84

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smart Phone
Trade Mark	uifone
Model Name	GQ5003
Family Model	Power Armor 19T, Power Armor 19, Power Armor 19 Pro, Power Armor 19E, Power Armor 19S, Power Armor 19 Plus, Power Armor 19 Lite
Model Difference	All the model are the same circuit and RF module,except the model names.
FCC ID:	2AOWK-5003TF
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7,12,13,17,25,41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 13 Uplink: 777MHz-787MHz, Downlink: 746MHz-756MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 25 Uplink: 1850MHz-1915MHz, Downlink: 1930MHz-1995MHz; LTE FDD Band 41 Uplink: 2496MHz-2690MHz,
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: -1.53 dBi, Band 4: -0.11 dBi, Band 5: -0.43 dBi, Band 7: -1.5 dBi, Band 12: -1.73 dBi, Band 13: -3.59 dBi, Band 17: -1.73 dBi, Band 25: -1.53 dBi;Band 41:1.41 dBi
Adapter	Model: HJ-PD66W-US Input: 100-240V~50/60Hz 1.5A Output: 5.0V---3.0A OR 9.0V---3.0A OR 12.0V---3.0A OR 15.0V---3.0A OR 20.0V---3.25A OR 11.0V---6.0A 66W MAX

Battery	DC 3.87V, 9600mAh
Power Rating	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.87V) (Note 1)
HW Version	M118-MUB-V2
SW Version	Power_Armor_19_TF1_EEA_V10
** Note1: The High Voltage DC 4.2V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AOWK-5003TF** filing to comply with the FCC Part 22H&24E&27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2/4/5/7/12/13/17/25/41

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

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

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	GQ5003	FCC ID: 2AOWK-5003TF	EUT

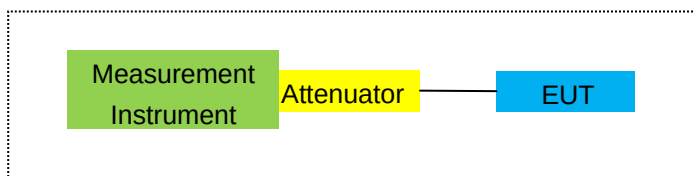
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

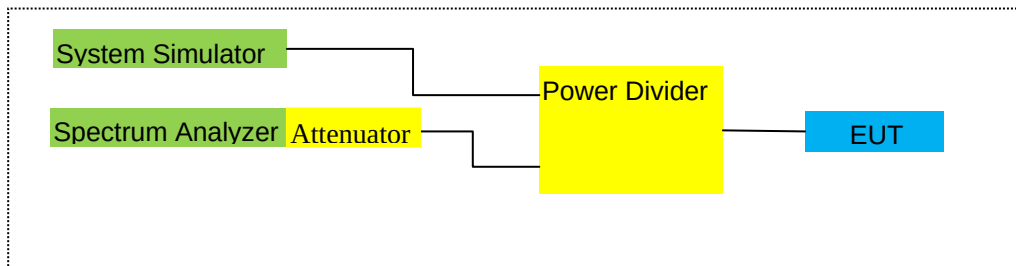
For Radiated Test Cases



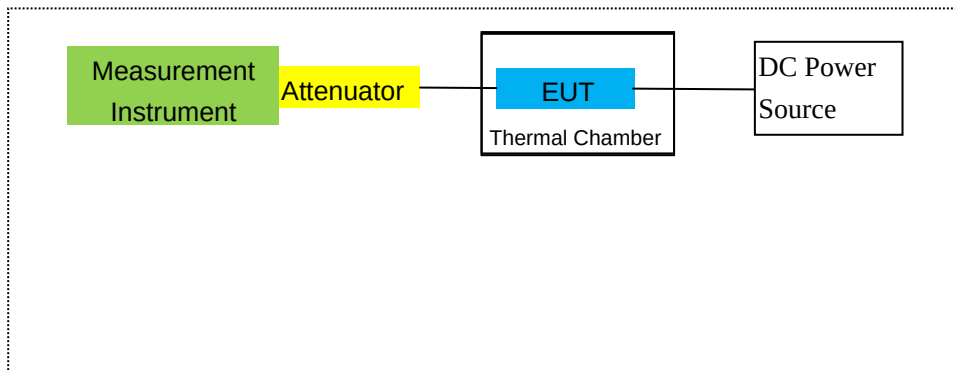
For Conducted Output Power



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	2023.06.17	1 year
2	Test Receiver	R&S	ESPI	101318	2022.04.06	2023.04.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2023.03.30	1 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	2022.04.06	2023.04.05	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	2022.04.06	2023.04.05	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	2022.04.06	2023.04.05	1 year
15	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
16	LISN	EMCO	3816/2	00042990	2022.04.06	2023.04.05	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2022.04.06	2023.04.05	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2022.04.06	2023.04.05	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2022.04.01	2023.03.31	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2022.04.01	2023.03.31	1 year
24	test receiver	R&S	ESCI	a0304218	2022.04.06	2023.04.05	1 year
25	Communication Tester	R&S	CMU200	A0304247	2022.06.16	2023.06.15	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2022.04.06	2023.04.05	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2020.05.11	2023.05.10	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2022.06.16	2023.06.15	1 year
29	Communication Tester	R&S	CMW500	148500	2022.06.16	2023.06.15	1 year

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

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

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

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

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

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

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

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

☐

Band 2/4/5/7/12/13/17/25/41

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

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 2/4/5/7/12/13/17/25/41

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- ☐ Band 2/4/5/7/12/13/17/25/41
- ☐

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

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

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

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

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

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 2/4/5/7/12/13/17/25/41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1850.7	-1.85	3.76	28.24	22.63	183.22	Horizontal	Pass
		1880	-0.91	3.91	28.22	23.40	218.76	Horizontal	Pass
		1909.3	-1.61	3.93	28.20	22.66	184.69	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	-1.21	3.77	28.23	23.25	211.20	Horizontal	Pass
		1880	-2.13	3.91	28.24	22.20	165.98	Horizontal	Pass
		1908.5	-1.39	3.94	28.25	22.92	196.09	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	-1.83	3.77	28.31	22.71	186.52	Horizontal	Pass
		1880	-1.24	3.91	28.22	23.07	202.69	Horizontal	Pass
		1907.5	-1.52	3.94	28.20	22.74	188.12	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	-2.04	3.79	28.33	22.50	177.94	Horizontal	Pass
		1880	-0.75	3.95	28.22	23.52	224.68	Horizontal	Pass
		1905	-1.39	3.97	28.19	22.83	191.86	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	-1.58	3.79	28.34	22.97	198.22	Horizontal	Pass
		1880	-1.40	3.95	28.22	22.87	193.43	Horizontal	Pass
		1902.5	-1.43	3.97	28.18	22.78	189.68	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	-2.43	3.81	28.35	22.11	162.51	Horizontal	Pass
		1880	-1.80	3.96	28.22	22.46	176.34	Horizontal	Pass
		1900	-1.68	4.00	28.16	22.48	176.89	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	-1.89	3.76	28.24	22.59	181.43	Vertical	Pass
		1880	-1.40	3.91	28.22	22.91	195.51	Vertical	Pass
		1909.3	-0.60	3.93	28.20	23.67	232.61	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	-1.11	3.77	28.23	23.35	216.09	Vertical	Pass
		1880	-0.77	3.91	28.24	23.56	227.11	Vertical	Pass
		1908.5	-1.28	3.94	28.25	23.03	200.73	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	-1.16	3.77	28.31	23.38	217.66	Vertical	Pass
		1880	-0.56	3.91	28.22	23.75	237.03	Vertical	Pass
		1907.5	-1.33	3.94	28.20	22.93	196.49	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	-1.43	3.79	28.33	23.11	204.55	Vertical	Pass
		1880	-1.52	3.95	28.22	22.75	188.54	Vertical	Pass
		1905	-0.87	3.97	28.19	23.35	216.27	Vertical	Pass
15.0MHz	75/0	1857.5	-2.07	3.79	28.34	22.48	176.81	Vertical	Pass

Band		1880	-0.96	3.95	28.22	23.31	214.20	Vertical	Pass
QPSK		1902.5	-0.97	3.97	28.18	23.24	210.85	Vertical	Pass
20.0MHz	100/0	1860	-1.85	3.81	28.35	22.69	185.80	Vertical	Pass
Band		1880	-0.48	3.96	28.22	23.78	238.80	Vertical	Pass
QPSK		1900	-0.49	4.00	28.16	23.67	232.85	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz	6/0	1850.7	-2.30	3.76	28.24	22.18	165.37	Horizontal	Pass
Band 16		1880	-1.64	3.91	28.22	22.67	184.95	Horizontal	Pass
QAM		1909.3	-1.86	3.93	28.20	22.41	174.00	Horizontal	Pass
3.0MHz	15/0	1851.5	-2.28	3.77	28.23	22.18	165.34	Horizontal	Pass
Band 16		1880	-2.77	3.91	28.24	21.56	143.13	Horizontal	Pass
QAM		1908.5	-2.84	3.94	28.25	21.47	140.25	Horizontal	Pass
5.0MHz	25/0	1852.5	-2.58	3.77	28.31	21.96	157.11	Horizontal	Pass
Band 16		1880	-2.74	3.91	28.22	21.57	143.50	Horizontal	Pass
QAM		1907.5	-2.29	3.94	28.20	21.97	157.31	Horizontal	Pass
10.0MHz	50/0	1855	-3.27	3.79	28.33	21.27	134.08	Horizontal	Pass
Band 16		1880	-2.57	3.95	28.22	21.70	148.02	Horizontal	Pass
QAM		1905	-1.58	3.97	28.19	22.64	183.65	Horizontal	Pass
15.0MHz	75/0	1857.5	-2.86	3.79	28.34	21.69	147.44	Horizontal	Pass
Band 16		1880	-2.42	3.95	28.22	21.85	153.20	Horizontal	Pass
QAM		1902.5	-1.86	3.97	28.18	22.35	171.86	Horizontal	Pass
20.0MHz	100/0	1860	-3.86	3.81	28.35	20.68	117.02	Horizontal	Pass
Band 16		1880	-2.10	3.96	28.22	22.16	164.47	Horizontal	Pass
QAM		1900	-3.01	4.00	28.16	21.15	130.45	Horizontal	Pass
1.4MHz	6/0	1850.7	-3.21	3.76	28.24	21.27	134.05	Vertical	Pass
Band 16		1880	-2.10	3.91	28.22	22.21	166.21	Vertical	Pass
QAM		1909.3	-1.61	3.93	28.20	22.66	184.53	Vertical	Pass
3.0MHz	15/0	1851.5	-2.34	3.77	28.23	22.12	162.76	Vertical	Pass
Band 16		1880	-1.77	3.91	28.24	22.56	180.31	Vertical	Pass
QAM		1908.5	-2.05	3.94	28.25	22.26	168.27	Vertical	Pass
5.0MHz	25/0	1852.5	-2.39	3.77	28.31	22.15	163.99	Vertical	Pass
Band 16		1880	-2.41	3.91	28.22	21.90	154.86	Vertical	Pass
QAM		1907.5	-2.48	3.94	28.20	21.78	150.49	Vertical	Pass
10.0MHz	50/0	1855	-2.78	3.79	28.33	21.76	149.98	Vertical	Pass
Band 16		1880	-3.05	3.95	28.22	21.22	132.40	Vertical	Pass
QAM		1905	-1.93	3.97	28.19	22.29	169.29	Vertical	Pass
15.0MHz	75/0	1857.5	-3.26	3.79	28.34	21.29	134.64	Vertical	Pass
Band 16		1880	-1.85	3.95	28.22	22.42	174.62	Vertical	Pass
QAM		1902.5	-1.53	3.97	28.18	22.68	185.36	Vertical	Pass

20.0MHz		1860	-3.47	3.81	28.35	21.07	127.83	Vertical	Pass
Band 16	100/0	1880	-1.53	3.96	28.22	22.73	187.46	Vertical	Pass
QAM		1900	-2.04	4.00	28.16	22.12	163.09	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	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1710.7	-2.67	3.12	27.58	21.79	151.03	Horizontal	Pass
		1732.5	-2.00	3.27	27.61	22.34	171.53	Horizontal	Pass
		1754.3	-2.76	3.29	27.63	21.58	144.00	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.85	3.13	27.61	21.63	145.68	Horizontal	Pass
		1732.5	-2.54	3.27	27.61	21.80	151.29	Horizontal	Pass
		1753.5	-2.45	3.30	27.62	21.87	153.84	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-2.58	3.13	27.63	21.92	155.69	Horizontal	Pass
		1732.5	-2.31	3.27	27.61	22.03	159.65	Horizontal	Pass
		1752.5	-2.57	3.30	27.60	21.73	148.78	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-2.79	3.15	27.64	21.70	147.86	Horizontal	Pass
		1732.5	-2.46	3.31	27.61	21.84	152.70	Horizontal	Pass
		1750	-2.62	3.33	27.59	21.64	146.03	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-3.15	3.15	27.65	21.35	136.34	Horizontal	Pass
		1732.5	-2.43	3.31	27.61	21.87	153.87	Horizontal	Pass
		1747.5	-2.47	3.33	27.57	21.77	150.21	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	-4.01	3.17	27.66	20.48	111.73	Horizontal	Pass
		1732.5	-2.29	3.32	27.61	22.00	158.56	Horizontal	Pass
		1745	-2.90	3.36	27.56	21.30	134.91	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	-2.35	3.12	27.58	22.11	162.69	Vertical	Pass
		1732.5	-2.46	3.27	27.61	21.88	154.21	Vertical	Pass
		1754.3	-2.51	3.29	27.63	21.83	152.24	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.75	3.13	27.61	21.73	148.93	Vertical	Pass
		1732.5	-2.44	3.27	27.61	21.90	154.76	Vertical	Pass
		1753.5	-2.18	3.30	27.62	22.14	163.68	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-2.62	3.13	27.63	21.88	154.33	Vertical	Pass
		1732.5	-1.86	3.27	27.61	22.48	177.01	Vertical	Pass
		1752.5	-2.13	3.30	27.60	22.17	164.93	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-2.38	3.15	27.64	22.11	162.40	Vertical	Pass
		1732.5	-2.59	3.31	27.61	21.71	148.10	Vertical	Pass
		1750	-2.08	3.33	27.59	22.18	165.02	Vertical	Pass
15.0MHz	75/0	1717.5	-3.17	3.15	27.65	21.33	135.82	Vertical	Pass

Band		1732.5	-2.51	3.31	27.61	21.79	151.11	Vertical	Pass
QPSK		1747.5	-2.71	3.33	27.57	21.53	142.08	Vertical	Pass
20.0MHz	100/0	1720	-2.79	3.17	27.66	21.70	148.03	Vertical	Pass
Band		1732.5	-1.80	3.32	27.61	22.49	177.44	Vertical	Pass
QPSK		1745	-2.39	3.36	27.56	21.81	151.73	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz	6/0	1710.7	-2.65	3.12	27.58	21.81	151.84	Horizontal	Pass
Band 16		1732.5	-2.39	3.27	27.61	21.95	156.49	Horizontal	Pass
QAM		1754.3	-3.41	3.29	27.63	20.93	123.95	Horizontal	Pass
3.0MHz	15/0	1711.5	-3.82	3.13	27.61	20.66	116.51	Horizontal	Pass
Band 16		1732.5	-2.95	3.27	27.61	21.39	137.73	Horizontal	Pass
QAM		1753.5	-2.52	3.30	27.62	21.80	151.20	Horizontal	Pass
5.0MHz	25/0	1712.5	-3.31	3.13	27.63	21.19	131.60	Horizontal	Pass
Band 16		1732.5	-3.11	3.27	27.61	21.23	132.66	Horizontal	Pass
QAM		1752.5	-3.24	3.30	27.60	21.06	127.61	Horizontal	Pass
10.0MHz	50/0	1715	-2.89	3.15	27.64	21.60	144.58	Horizontal	Pass
Band 16		1732.5	-3.06	3.31	27.61	21.24	132.92	Horizontal	Pass
QAM		1750	-2.50	3.33	27.59	21.76	149.86	Horizontal	Pass
15.0MHz	75/0	1717.5	-3.05	3.15	27.65	21.45	139.70	Horizontal	Pass
Band 16		1732.5	-2.80	3.31	27.61	21.50	141.28	Horizontal	Pass
QAM		1747.5	-3.24	3.33	27.57	21.00	126.00	Horizontal	Pass
20.0MHz	100/0	1720	-5.19	3.17	27.66	19.30	85.17	Horizontal	Pass
Band 16		1732.5	-2.66	3.32	27.61	21.63	145.66	Horizontal	Pass
QAM		1745	-3.55	3.36	27.56	20.65	116.06	Horizontal	Pass
1.4MHz	6/0	1710.7	-3.28	3.12	27.58	21.18	131.19	Vertical	Pass
Band 16		1732.5	-3.01	3.27	27.61	21.33	135.77	Vertical	Pass
QAM		1754.3	-2.90	3.29	27.63	21.44	139.46	Vertical	Pass
3.0MHz	15/0	1711.5	-2.11	3.13	27.61	22.37	172.65	Vertical	Pass
Band 16		1732.5	-1.62	3.27	27.61	22.72	187.11	Vertical	Pass
QAM		1753.5	-2.44	3.30	27.62	21.88	154.02	Vertical	Pass
5.0MHz	25/0	1712.5	-3.05	3.13	27.63	21.45	139.66	Vertical	Pass
Band 16		1732.5	-3.36	3.27	27.61	20.98	125.22	Vertical	Pass
QAM		1752.5	-2.57	3.30	27.60	21.73	148.98	Vertical	Pass
10.0MHz	50/0	1715	-2.73	3.15	27.64	21.76	149.92	Vertical	Pass
Band 16		1732.5	-3.40	3.31	27.61	20.90	122.91	Vertical	Pass
QAM		1750	-3.12	3.33	27.59	21.14	129.96	Vertical	Pass
15.0MHz	75/0	1717.5	-3.83	3.15	27.65	20.67	116.65	Vertical	Pass
Band 16		1732.5	-2.64	3.31	27.61	21.66	146.62	Vertical	Pass
QAM		1747.5	-1.56	3.33	27.57	22.68	185.38	Vertical	Pass

20.0MHz	100/0	1720	-2.92	3.17	27.66	21.57	143.55	Vertical	Pass
Band 16		1732.5	-2.19	3.32	27.61	22.10	162.21	Vertical	Pass
QAM		1745	-1.42	3.36	27.56	22.78	189.67	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	Cable	Antenna	Correction	Max. EIRP	Max.	Polarization	
			Level	Loss	Factor		EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)		Average	Average	ERP	
						(dB)	(dBm)	(mW)		
1.4MHz	6/0	824.7	6.27	2.01	19.68	2.15	21.79	151.01	Horizontal	Pass
Band		836.5	5.39	2.01	19.77	2.15	21.00	126.03	Horizontal	Pass
QPSK		848.3	6.36	2.02	19.82	2.15	22.01	158.85	Horizontal	Pass
3.0MHz	15/0	825.5	5.77	2.01	19.70	2.15	21.31	135.11	Horizontal	Pass
Band		836.5	5.32	2.01	19.77	2.15	20.93	124.01	Horizontal	Pass
QPSK		847.5	6.37	2.02	19.81	2.15	22.01	158.68	Horizontal	Pass
5.0MHz	25/0	826.5	6.48	2.01	19.71	2.15	22.03	159.65	Horizontal	Pass
Band		836.5	4.64	2.01	19.77	2.15	20.25	106.02	Horizontal	Pass
QPSK		846.5	6.64	2.02	19.79	2.15	22.26	168.27	Horizontal	Pass
10.0MHz	50/0	829	6.30	2.01	19.73	2.15	21.87	153.86	Horizontal	Pass
Band		836.5	5.40	2.01	19.77	2.15	21.01	126.24	Horizontal	Pass
QPSK		844	5.35	2.02	19.78	2.15	20.96	124.85	Horizontal	Pass
1.4MHz	6/0	824.7	6.37	2.01	19.68	2.15	21.89	154.51	Vertical	Pass
Band		836.5	6.64	2.01	19.77	2.15	22.25	167.85	Vertical	Pass
QPSK		848.3	6.49	2.02	19.82	2.15	22.14	163.54	Vertical	Pass
3.0MHz	15/0	825.5	6.42	2.01	19.70	2.15	21.96	156.99	Vertical	Pass
Band		836.5	7.15	2.01	19.77	2.15	22.76	188.78	Vertical	Pass
QPSK		847.5	6.24	2.02	19.81	2.15	21.88	154.12	Vertical	Pass
5.0MHz	25/0	826.5	6.00	2.01	19.71	2.15	21.55	142.86	Vertical	Pass
Band		836.5	7.39	2.01	19.77	2.15	23.00	199.37	Vertical	Pass
QPSK		846.5	6.63	2.02	19.79	2.15	22.25	167.72	Vertical	Pass
10.0MHz	50/0	829	5.81	2.01	19.73	2.15	21.38	137.34	Vertical	Pass
Band		836.5	7.02	2.01	19.77	2.15	22.63	183.09	Vertical	Pass
QPSK		844	7.60	2.02	19.78	2.15	23.21	209.31	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max. EIRP	Max. EIRP	Polarization	
			Level	Loss	Factor		Average	Average	Of Max.	
			(dBm)	(dBm)	(dB)		(dBm)	(mW)	ERP	
1.4MHz	6/0	824.7	6.70	2.01	19.68	2.15	22.22	166.72	Horizontal	Pass
Band 16		836.5	7.17	2.01	19.77	2.15	22.78	189.59	Horizontal	Pass
QAM		848.3	5.90	2.02	19.82	2.15	21.55	142.96	Horizontal	Pass
3.0MHz	15/0	825.5	6.80	2.01	19.70	2.15	22.34	171.33	Horizontal	Pass
Band 16		836.5	6.54	2.01	19.77	2.15	22.15	163.94	Horizontal	Pass
QAM		847.5	6.94	2.02	19.81	2.15	22.58	181.04	Horizontal	Pass
5.0MHz	25/0	826.5	6.06	2.01	19.71	2.15	21.61	144.81	Horizontal	Pass
Band 16		836.5	6.05	2.01	19.77	2.15	21.66	146.60	Horizontal	Pass
QAM		846.5	5.91	2.02	19.79	2.15	21.53	142.09	Horizontal	Pass
10.0MHz	50/0	829	5.50	2.01	19.73	2.15	21.07	128.01	Horizontal	Pass
Band 16		836.5	6.53	2.01	19.77	2.15	22.14	163.61	Horizontal	Pass
QAM		844	6.88	2.02	19.78	2.15	22.49	177.27	Horizontal	Pass
1.4MHz	6/0	824.7	6.68	2.01	19.68	2.15	22.20	165.96	Vertical	Pass
Band 16		836.5	6.96	2.01	19.77	2.15	22.57	180.72	Vertical	Pass
QAM		848.3	6.78	2.02	19.82	2.15	22.43	174.92	Vertical	Pass
3.0MHz	15/0	825.5	6.33	2.01	19.70	2.15	21.87	153.79	Vertical	Pass
Band 16		836.5	6.34	2.01	19.77	2.15	21.95	156.57	Vertical	Pass
QAM		847.5	5.80	2.02	19.81	2.15	21.44	139.40	Vertical	Pass
5.0MHz	25/0	826.5	7.19	2.01	19.71	2.15	22.74	187.83	Vertical	Pass
Band 16		836.5	5.02	2.01	19.77	2.15	20.63	115.52	Vertical	Pass
QAM		846.5	6.63	2.02	19.79	2.15	22.25	167.72	Vertical	Pass
10.0MHz	50/0	829	7.36	2.01	19.73	2.15	22.93	196.34	Vertical	Pass
Band 16		836.5	6.38	2.01	19.77	2.15	21.99	158.25	Vertical	Pass
QAM		844	6.69	2.02	19.78	2.15	22.30	169.73	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 (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz	1/#Mid	2502.5	-0.34	4.54	27.75	22.87	193.642	Horizontal	Pass
Band		2535	-0.17	4.69	27.72	22.86	193.197	Horizontal	Pass
QPSK		2567.5	-0.10	4.71	27.71	22.90	194.984	Horizontal	Pass
10.0MHz	1/#Mid	2505	-0.27	4.55	27.76	22.94	196.789	Horizontal	Pass
Band		2535	-0.08	4.69	27.72	22.95	197.242	Horizontal	Pass
QPSK		2565	0.00	4.72	27.70	22.98	198.609	Horizontal	Pass
15.0MHz	1/#Mid	2507.5	-0.28	4.55	27.77	22.94	196.789	Horizontal	Pass
Band		2535	-0.14	4.69	27.72	22.89	194.536	Horizontal	Pass
QPSK		2562.5	-0.04	4.72	27.69	22.93	196.336	Horizontal	Pass
20.0MHz	1/#Mid	2510	-0.22	4.57	27.78	22.99	199.067	Horizontal	Pass
Band		2535	-0.04	4.73	27.72	22.95	197.242	Horizontal	Pass
QPSK		2560	0.00	4.75	27.68	22.93	196.336	Horizontal	Pass
5.0MHz	1/#Mid	2502.5	-1.76	4.54	27.75	21.45	139.637	Vertical	Pass
Band		2535	-1.78	4.69	27.72	21.25	133.352	Vertical	Pass
QPSK		2567.5	-1.69	4.71	27.71	21.31	135.207	Vertical	Pass
10.0MHz	1/#Mid	2505	-1.45	4.55	27.76	21.76	149.968	Vertical	Pass
Band		2535	-1.32	4.69	27.72	21.71	148.252	Vertical	Pass
QPSK		2565	-1.51	4.72	27.70	21.47	140.281	Vertical	Pass
15.0MHz	1/#Mid	2507.5	-1.72	4.55	27.77	21.50	141.254	Vertical	Pass
Band		2535	-1.33	4.69	27.72	21.70	147.911	Vertical	Pass
QPSK		2562.5	-1.22	4.72	27.69	21.75	149.624	Vertical	Pass
20.0MHz	1/#Mid	2510	-1.94	4.57	27.78	21.27	133.968	Vertical	Pass
Band		2535	-1.40	4.73	27.72	21.59	144.212	Vertical	Pass
QPSK		2560	-1.01	4.75	27.68	21.92	155.597	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz	1/#Mid	2502.5	-1.03	4.54	27.75	22.18	165.196	Horizontal	Pass
Band 16		2535	-0.72	4.69	27.72	22.31	170.216	Horizontal	Pass
QAM		2567.5	-0.80	4.71	27.71	22.20	165.959	Horizontal	Pass
10.0MHz	1/#Mid	2505	-0.92	4.55	27.76	22.29	169.434	Horizontal	Pass
Band 16		2535	-0.93	4.69	27.72	22.10	162.181	Horizontal	Pass
QAM		2565	-1.20	4.72	27.70	21.78	150.661	Horizontal	Pass
15.0MHz	1/#Mid	2507.5	-1.10	4.55	27.77	22.12	162.930	Horizontal	Pass
Band 16		2535	-1.07	4.69	27.72	21.96	157.036	Horizontal	Pass
QAM		2562.5	-0.68	4.72	27.69	22.29	169.434	Horizontal	Pass
20.0MHz	1/#Mid	2510	-0.98	4.57	27.78	22.23	167.109	Horizontal	Pass
Band 16		2535	-0.65	4.73	27.72	22.34	171.396	Horizontal	Pass
QAM		2560	-0.75	4.75	27.68	22.18	165.196	Horizontal	Pass
5.0MHz	1/#Mid	2502.5	-1.25	4.54	27.75	21.96	157.036	Vertical	Pass
Band 16		2535	-2.20	4.69	27.72	20.83	121.060	Vertical	Pass
QAM		2567.5	-1.92	4.71	27.71	21.08	128.233	Vertical	Pass
10.0MHz	1/#Mid	2505	-2.84	4.55	27.76	20.37	108.893	Vertical	Pass
Band 16		2535	-2.30	4.69	27.72	20.73	118.304	Vertical	Pass
QAM		2565	-2.19	4.72	27.70	20.79	119.950	Vertical	Pass
15.0MHz	1/#Mid	2507.5	-1.90	4.55	27.77	21.32	135.519	Vertical	Pass
Band 16		2535	-1.16	4.69	27.72	21.87	153.815	Vertical	Pass
QAM		2562.5	-1.37	4.72	27.69	21.60	144.544	Vertical	Pass
20.0MHz	1/#Mid	2510	-1.98	4.57	27.78	21.23	132.739	Vertical	Pass
Band 16		2535	-1.98	4.73	27.72	21.01	126.183	Vertical	Pass
QAM		2560	-2.73	4.75	27.68	20.20	104.713	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							Conclusion
			SG	Cable	Antenna	Correction	Max. EIRP	Max.	Polarization	
			Level	Loss	Factor		EIRP	Of Max.		
			(dBm)	(dBm)	(dB)		Average	Average	ERP	
						(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz	6/0	699.7	8.12	1.91	19.21	2.15	23.27	212.20	Horizontal	Pass
Band		707.5	7.97	1.91	19.26	2.15	23.17	207.62	Horizontal	Pass
QPSK		715.3	7.75	1.93	19.34	2.15	23.01	200.07	Horizontal	Pass
3.0MHz	15/0	700.5	7.80	1.91	19.21	2.15	22.95	197.13	Horizontal	Pass
Band		707.5	7.23	1.91	19.26	2.15	22.43	175.16	Horizontal	Pass
QPSK		714.5	6.56	1.93	19.34	2.15	21.82	152.10	Horizontal	Pass
5.0MHz	25/0	701.5	7.17	1.91	19.23	2.15	22.34	171.43	Horizontal	Pass
Band		707.5	7.56	1.91	19.26	2.15	22.76	188.98	Horizontal	Pass
QPSK		713.5	7.03	1.92	19.33	2.15	22.29	169.36	Horizontal	Pass
10.0MHz	50/0	704	7.17	1.91	19.25	2.15	22.36	172.31	Horizontal	Pass
Band		707.5	7.69	1.91	19.26	2.15	22.89	194.37	Horizontal	Pass
QPSK		711	7.36	1.92	19.32	2.15	22.61	182.19	Horizontal	Pass
1.4MHz	6/0	699.7	8.32	1.91	19.21	2.15	23.47	222.56	Vertical	Pass
Band		707.5	7.89	1.91	19.26	2.15	23.09	203.80	Vertical	Pass
QPSK		715.3	7.38	1.93	19.34	2.15	22.64	183.71	Vertical	Pass
3.0MHz	15/0	700.5	7.46	1.91	19.21	2.15	22.61	182.56	Vertical	Pass
Band		707.5	7.71	1.91	19.26	2.15	22.91	195.61	Vertical	Pass
QPSK		714.5	7.09	1.93	19.34	2.15	22.35	171.96	Vertical	Pass
5.0MHz	25/0	701.5	7.21	1.91	19.23	2.15	22.38	173.14	Vertical	Pass
Band		707.5	6.72	1.91	19.26	2.15	21.92	155.47	Vertical	Pass
QPSK		713.5	7.40	1.92	19.33	2.15	22.66	184.70	Vertical	Pass
10.0MHz	50/0	704	7.94	1.91	19.25	2.15	23.13	205.56	Vertical	Pass
Band		707.5	8.38	1.91	19.26	2.15	23.58	228.10	Vertical	Pass
QPSK		711	8.14	1.92	19.32	2.15	23.39	218.49	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz	6/0	699.7	7.99	1.91	19.21	2.15	23.14	206.09	Horizontal	Pass
Band 16		707.5	7.63	1.91	19.26	2.15	22.83	191.76	Horizontal	Pass
QAM		715.3	7.12	1.93	19.34	2.15	22.38	172.92	Horizontal	Pass
3.0MHz	15/0	700.5	7.15	1.91	19.21	2.15	22.30	169.79	Horizontal	Pass
Band 16		707.5	7.29	1.91	19.26	2.15	22.49	177.28	Horizontal	Pass
QAM		714.5	7.72	1.93	19.34	2.15	22.98	198.45	Horizontal	Pass
5.0MHz	25/0	701.5	7.44	1.91	19.23	2.15	22.61	182.50	Horizontal	Pass
Band 16		707.5	7.03	1.91	19.26	2.15	22.23	167.01	Horizontal	Pass
QAM		713.5	7.43	1.92	19.33	2.15	22.69	185.64	Horizontal	Pass
10.0MHz	50/0	704	7.49	1.91	19.25	2.15	22.68	185.16	Horizontal	Pass
Band 16		707.5	7.61	1.91	19.26	2.15	22.81	190.90	Horizontal	Pass
QAM		711	8.05	1.92	19.32	2.15	23.30	213.65	Horizontal	Pass
1.4MHz	6/0	699.7	7.96	1.91	19.21	2.15	23.11	204.61	Vertical	Pass
Band 16		707.5	7.33	1.91	19.26	2.15	22.53	179.13	Vertical	Pass
QAM		715.3	7.27	1.93	19.34	2.15	22.53	179.08	Vertical	Pass
3.0MHz	15/0	700.5	7.98	1.91	19.21	2.15	23.13	205.68	Vertical	Pass
Band 16		707.5	7.63	1.91	19.26	2.15	22.83	191.87	Vertical	Pass
QAM		714.5	7.80	1.93	19.34	2.15	23.06	202.19	Vertical	Pass
5.0MHz	25/0	701.5	7.35	1.91	19.23	2.15	22.52	178.45	Vertical	Pass
Band 16		707.5	7.73	1.91	19.26	2.15	22.93	196.45	Vertical	Pass
QAM		713.5	7.69	1.92	19.33	2.15	22.95	197.05	Vertical	Pass
10.0MHz	50/0	704	8.14	1.91	19.25	2.15	23.33	215.28	Vertical	Pass
Band 16		707.5	7.24	1.91	19.26	2.15	22.44	175.23	Vertical	Pass
QAM		711	7.36	1.92	19.32	2.15	22.61	182.32	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)

8.7 LTE BAND 13

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna		Max. EIRP	Max.	Polarization	
			Level	Loss	Factor	Correction		EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	ERP	
							(dBm)	(mW)		
5.0MHz Band QPSK	25/0	779.5	5.29	1.91	19.23	2.15	20.46	111.20	Horizontal	Pass
		782	6.24	1.91	19.26	2.15	21.44	139.21	Horizontal	Pass
		784.5	6.03	1.92	19.33	2.15	21.29	134.48	Horizontal	Pass
10.0MHz Band QPSK	50/0	782	5.80	1.91	19.25	2.15	20.99	125.48	Horizontal	Pass
			6.10	1.91	19.26	2.15	21.30	134.89	Horizontal	Pass
			6.35	1.92	19.32	2.15	21.60	144.40	Horizontal	Pass
5.0MHz Band QPSK	25/0	779.5	5.95	1.91	19.23	2.15	21.12	129.30	Vertical	Pass
		782	7.04	1.91	19.26	2.15	22.24	167.65	Vertical	Pass
		784.5	6.45	1.92	19.33	2.15	21.71	148.37	Vertical	Pass
10.0MHz Band QPSK	50/0	782	6.19	1.91	19.25	2.15	21.38	137.54	Vertical	Pass
			7.13	1.91	19.26	2.15	22.33	171.00	Vertical	Pass
			6.44	1.92	19.32	2.15	21.69	147.45	Vertical	Pass

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max. EIRP	Max.	Polarization	
			Level	Loss	Factor		EIRP	Of Max.		
			(dBm)	(dBm)	(dB)		Average	Average	ERP	
						(dB)	(dBm)	(mW)		
5.0MHz	25/0	779.5	7.12	1.91	19.23	2.15	22.29	169.43	Horizontal	Pass
Band 16		782	5.42	1.91	19.26	2.15	20.62	115.27	Horizontal	Pass
QAM		784.5	6.63	1.92	19.33	2.15	21.89	154.51	Horizontal	Pass
10.0MHz	50/0	782	5.38	1.91	19.25	2.15	20.57	114.07	Horizontal	Pass
Band 16			6.46	1.91	19.26	2.15	21.66	146.43	Horizontal	Pass
QAM			7.02	1.92	19.32	2.15	22.27	168.64	Horizontal	Pass
5.0MHz	25/0	779.5	6.24	1.91	19.23	2.15	21.41	138.46	Vertical	Pass
Band 16		782	6.86	1.91	19.26	2.15	22.06	160.86	Vertical	Pass
QAM		784.5	7.03	1.92	19.33	2.15	22.29	169.43	Vertical	Pass
10.0MHz	50/0	782	7.31	1.91	19.25	2.15	22.50	177.99	Vertical	Pass
Band 16			7.09	1.91	19.26	2.15	22.29	169.43	Vertical	Pass
QAM			6.84	1.92	19.32	2.15	22.09	161.67	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)

8.8 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max.	
							(dBm)	(mW)	ERP	
5.0MHz Band QPSK	25/0	706.5	6.24	1.91	19.23	2.15	21.41	138.22	Vertical	Pass
		710	6.13	1.91	19.26	2.15	21.33	135.91	Vertical	Pass
		713.5	6.15	1.92	19.33	2.15	21.41	138.26	Vertical	Pass
10.0MHz Band QPSK	50/0	709	6.37	1.91	19.25	2.15	21.56	143.19	Vertical	Pass
		710	6.41	1.91	19.26	2.15	21.61	144.75	Vertical	Pass
		711	6.13	1.92	19.32	2.15	21.38	137.48	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	6.35	1.91	19.23	2.15	21.52	141.89	Horizontal	Pass
		710	6.19	1.91	19.26	2.15	21.39	137.64	Horizontal	Pass
		713.5	6.20	1.92	19.33	2.15	21.46	139.81	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	6.33	1.91	19.25	2.15	21.52	141.88	Horizontal	Pass
		710	6.44	1.91	19.26	2.15	21.64	145.79	Horizontal	Pass
		711	6.08	1.92	19.32	2.15	21.33	135.74	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz	25/0	706.5	6.14	1.91	19.23	2.15	21.31	135.13	Vertical	Pass
Band 16		710	6.11	1.91	19.26	2.15	21.31	135.29	Vertical	Pass
QAM		713.5	6.05	1.92	19.33	2.15	21.31	135.06	Vertical	Pass
10.0MHz	50/0	709	6.03	1.91	19.25	2.15	21.22	132.54	Vertical	Pass
Band 16		710	5.93	1.91	19.26	2.15	21.13	129.68	Vertical	Pass
QAM		711	5.96	1.92	19.32	2.15	21.21	132.11	Vertical	Pass
5.0MHz	25/0	706.5	6.04	1.91	19.23	2.15	21.21	132.05	Horizontal	Pass
Band 16		710	6.11	1.91	19.26	2.15	21.31	135.26	Horizontal	Pass
QAM		713.5	6.06	1.92	19.33	2.15	21.32	135.46	Horizontal	Pass
10.0MHz	50/0	709	6.01	1.91	19.25	2.15	21.20	131.87	Horizontal	Pass
Band 16		710	6.22	1.91	19.26	2.15	21.42	138.76	Horizontal	Pass
QAM		711	5.89	1.92	19.32	2.15	21.14	130.08	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)

8.9 LTE BAND 25

Radiated Power (EIRP) for Band 25										
Mode	RB/RB SIZE	Frequency	Result						Conclusion	
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP		
							Average			
							(mW)			
1.4MHz	Band QPSK	6/0	1850.7	-3.04	3.12	28.24	22.08	161.49	Horizontal	Pass
1882.5			-3.42	3.27	28.22	21.53	142.17	Horizontal	Pass	
1914.3			-3.07	3.29	28.2	21.84	152.60	Horizontal	Pass	
3.0MHz	Band QPSK	15/0	1851.5	-3.12	3.13	28.23	21.98	157.79	Horizontal	Pass
1882.5			-3.19	3.27	28.24	21.78	150.69	Horizontal	Pass	
1913.5			-3.68	3.30	28.25	21.27	133.82	Horizontal	Pass	
5.0MHz	Band QPSK	25/0	1852.5	-3.86	3.13	28.31	21.32	135.43	Horizontal	Pass
1882.5			-3.30	3.27	28.22	21.65	146.15	Horizontal	Pass	
1912.5			-3.54	3.30	28.2	21.36	136.90	Horizontal	Pass	
10.0MHz	Band QPSK	50/0	1855	-3.77	3.15	28.33	21.41	138.33	Horizontal	Pass
1882.5			-3.09	3.31	28.22	21.82	151.94	Horizontal	Pass	
1910			-3.30	3.33	28.19	21.56	143.06	Horizontal	Pass	
15.0MHz	Band QPSK	75/0	1857.5	-3.15	3.15	28.34	22.04	159.98	Horizontal	Pass
1882.5			-3.55	3.31	28.22	21.36	136.83	Horizontal	Pass	
1907.5			-3.15	3.33	28.18	21.70	147.91	Horizontal	Pass	
20.0MHz	Band QPSK	100/0	1860	-4.60	3.17	28.35	20.58	114.30	Horizontal	Pass
1882.5			-3.26	3.32	28.22	21.64	145.89	Horizontal	Pass	
1905			-3.73	3.36	28.16	21.07	127.98	Horizontal	Pass	
1.4MHz	Band QPSK	6/0	1850.7	-3.08	3.12	28.24	22.04	160.06	Vertical	Pass
1882.5			-3.42	3.27	28.22	21.53	142.36	Vertical	Pass	
1914.3			-3.11	3.29	28.2	21.80	151.44	Vertical	Pass	
3.0MHz	Band QPSK	15/0	1851.5	-3.08	3.13	28.23	22.02	159.13	Vertical	Pass
1882.5			-3.20	3.27	28.24	21.77	150.24	Vertical	Pass	
1913.5			-2.87	3.30	28.25	22.08	161.53	Vertical	Pass	
5.0MHz	Band QPSK	25/0	1852.5	-3.23	3.13	28.31	21.95	156.52	Vertical	Pass
1882.5			-2.96	3.27	28.22	21.99	157.99	Vertical	Pass	
1912.5			-3.75	3.30	28.2	21.15	130.32	Vertical	Pass	
10.0MHz	Band QPSK	50/0	1855	-3.05	3.15	28.33	22.13	163.32	Vertical	Pass
1882.5			-2.86	3.31	28.22	22.05	160.19	Vertical	Pass	
1910			-3.65	3.33	28.19	21.21	132.03	Vertical	Pass	

15.0MHz	75/0	1857.5	-3.76	3.15	28.34	21.43	139.03	Vertical	Pass
Band		1882.5	-3.08	3.31	28.22	21.83	152.39	Vertical	Pass
QPSK		1907.5	-3.50	3.33	28.18	21.35	136.34	Vertical	Pass
20.0MHz	100/0	1860	-4.64	3.17	28.35	20.54	113.26	Vertical	Pass
Band		1882.5	-3.13	3.32	28.22	21.77	150.27	Vertical	Pass
QPSK		1905	-2.66	3.36	28.16	22.14	163.68	Vertical	Pass

Radiated Power (EIRP) for Band 25									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
1.4MHz	6/0	1850.7	-3.62	3.12	28.24	21.50	141.16	Horizontal	Pass
Band 16		1882.5	-3.42	3.27	28.22	21.53	142.29	Horizontal	Pass
QAM		1914.3	-3.47	3.29	28.2	21.44	139.21	Horizontal	Pass
3.0MHz	15/0	1851.5	-3.67	3.13	28.23	21.43	138.84	Horizontal	Pass
Band 16		1882.5	-3.72	3.27	28.24	21.25	133.21	Horizontal	Pass
QAM		1913.5	-3.56	3.30	28.25	21.39	137.72	Horizontal	Pass
5.0MHz	25/0	1852.5	-3.54	3.13	28.31	21.64	146.03	Horizontal	Pass
Band 16		1882.5	-3.46	3.27	28.22	21.49	140.86	Horizontal	Pass
QAM		1912.5	-3.33	3.30	28.2	21.57	143.64	Horizontal	Pass
10.0MHz	50/0	1855	-3.56	3.15	28.33	21.62	145.09	Horizontal	Pass
Band 16		1882.5	-3.63	3.31	28.22	21.28	134.34	Horizontal	Pass
QAM		1910	-3.71	3.33	28.19	21.15	130.40	Horizontal	Pass
15.0MHz	75/0	1857.5	-3.47	3.15	28.34	21.72	148.55	Horizontal	Pass
Band 16		1882.5	-3.70	3.31	28.22	21.21	132.10	Horizontal	Pass
QAM		1907.5	-3.47	3.33	28.18	21.38	137.28	Horizontal	Pass
20.0MHz	100/0	1860	-3.73	3.17	28.35	21.45	139.78	Horizontal	Pass
Band 16		1882.5	-3.59	3.32	28.22	21.31	135.32	Horizontal	Pass
QAM		1905	-3.88	3.36	28.16	20.92	123.70	Horizontal	Pass
1.4MHz	6/0	1850.7	-3.32	3.12	28.24	21.80	151.51	Vertical	Pass
Band 16		1882.5	-3.94	3.27	28.22	21.01	126.05	Vertical	Pass
QAM		1914.3	-3.42	3.29	28.2	21.49	141.06	Vertical	Pass
3.0MHz	15/0	1851.5	-3.73	3.13	28.23	21.37	137.08	Vertical	Pass
Band 16		1882.5	-3.81	3.27	28.24	21.16	130.57	Vertical	Pass
QAM		1913.5	-3.27	3.30	28.25	21.68	147.38	Vertical	Pass
5.0MHz	25/0	1852.5	-3.27	3.13	28.31	21.91	155.37	Vertical	Pass
Band 16		1882.5	-3.77	3.27	28.22	21.18	131.16	Vertical	Pass
QAM		1912.5	-3.32	3.30	28.2	21.58	144.02	Vertical	Pass
10.0MHz	50/0	1855	-3.96	3.15	28.33	21.22	132.34	Vertical	Pass
Band 16		1882.5	-3.34	3.31	28.22	21.57	143.68	Vertical	Pass
QAM		1910	-3.39	3.33	28.19	21.47	140.36	Vertical	Pass
15.0MHz	75/0	1857.5	-3.91	3.15	28.34	21.28	134.33	Vertical	Pass
Band 16		1882.5	-3.34	3.31	28.22	21.57	143.45	Vertical	Pass
QAM		1907.5	-3.20	3.33	28.18	21.65	146.24	Vertical	Pass
20.0MHz	100/0	1860	-3.09	3.17	28.35	22.09	161.62	Vertical	Pass

Band 16		1882.5	-2.78	3.32	28.22	22.12	162.98	Vertical	Pass
QAM		1905	-3.32	3.36	28.16	21.48	140.56	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)

8.10 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2537.5	-1.11	4.54	27.75	22.10	162.02	Horizontal	Pass
		2595	-1.49	4.69	27.72	21.54	142.56	Horizontal	Pass
		2652.5	-0.86	4.71	27.71	22.14	163.52	Horizontal	Pass
10.0MHz Band QPSK	50/0	2540	-1.37	4.55	27.76	21.84	152.65	Horizontal	Pass
		2595	-0.76	4.69	27.72	22.27	168.51	Horizontal	Pass
		2650	-1.00	4.72	27.7	21.98	157.93	Horizontal	Pass
15.0MHz Band QPSK	75/0	2542.5	-0.63	4.55	27.77	22.59	181.40	Horizontal	Pass
		2595	-1.04	4.69	27.72	21.99	158.27	Horizontal	Pass
		2647.5	-1.25	4.72	27.69	21.72	148.56	Horizontal	Pass
20.0MHz Band QPSK	100/0	2545	-1.33	4.57	27.78	21.88	154.32	Horizontal	Pass
		2595	-0.87	4.73	27.72	22.12	163.05	Horizontal	Pass
		2645	-0.73	4.75	27.68	22.20	165.88	Horizontal	Pass
5.0MHz Band QPSK	25/0	2537.5	-0.75	4.54	27.75	22.46	176.08	Vertical	Pass
		2595	-0.99	4.69	27.72	22.04	159.96	Vertical	Pass
		2652.5	-1.13	4.71	27.71	21.87	153.95	Vertical	Pass
10.0MHz Band QPSK	50/0	2540	-1.08	4.55	27.76	22.13	163.14	Vertical	Pass
		2595	-1.04	4.69	27.72	21.99	158.11	Vertical	Pass
		2650	-0.53	4.72	27.7	22.45	175.97	Vertical	Pass
15.0MHz Band QPSK	75/0	2542.5	-0.67	4.55	27.77	22.55	179.85	Vertical	Pass
		2595	-0.96	4.69	27.72	22.07	161.21	Vertical	Pass
		2647.5	-0.89	4.72	27.69	22.08	161.43	Vertical	Pass
20.0MHz Band QPSK	100/0	2545	-1.06	4.57	27.78	22.15	163.95	Vertical	Pass
		2595	-0.71	4.73	27.72	22.28	168.89	Vertical	Pass
		2645	-0.33	4.75	27.68	22.60	181.98	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Factor	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz	25/0	2537.5	-1.15	4.54	27.75	22.06	160.53	Horizontal	Pass
Band 16		2595	-1.53	4.69	27.72	21.50	141.25	Horizontal	Pass
QAM		2652.5	-0.90	4.71	27.71	22.10	162.04	Horizontal	Pass
10.0MHz	50/0	2540	-1.41	4.55	27.76	21.80	151.24	Horizontal	Pass
Band 16		2595	-0.80	4.69	27.72	22.23	166.99	Horizontal	Pass
QAM		2650	-1.04	4.72	27.7	21.94	156.47	Horizontal	Pass
15.0MHz	75/0	2542.5	-0.67	4.55	27.77	22.55	179.72	Horizontal	Pass
Band 16		2595	-1.08	4.69	27.72	21.95	156.79	Horizontal	Pass
QAM		2647.5	-1.29	4.72	27.69	21.68	147.19	Horizontal	Pass
20.0MHz	100/0	2545	-1.37	4.57	27.78	21.84	152.89	Horizontal	Pass
Band 16		2595	-0.91	4.73	27.72	22.08	161.56	Horizontal	Pass
QAM		2645	-0.77	4.75	27.68	22.16	164.36	Horizontal	Pass
5.0MHz	25/0	2537.5	-0.79	4.54	27.75	22.42	174.47	Vertical	Pass
Band 16		2595	-1.03	4.69	27.72	22.00	158.51	Vertical	Pass
QAM		2652.5	-1.17	4.71	27.71	21.83	152.54	Vertical	Pass
10.0MHz	50/0	2540	-1.12	4.55	27.76	22.09	161.63	Vertical	Pass
Band 16		2595	-1.08	4.69	27.72	21.95	156.67	Vertical	Pass
QAM		2650	-0.57	4.72	27.7	22.41	174.34	Vertical	Pass
15.0MHz	75/0	2542.5	-0.71	4.55	27.77	22.51	178.17	Vertical	Pass
Band 16		2595	-1.00	4.69	27.72	22.03	159.74	Vertical	Pass
QAM		2647.5	-0.93	4.72	27.69	22.04	159.96	Vertical	Pass
20.0MHz	100/0	2545	-1.10	4.57	27.78	22.11	162.42	Vertical	Pass
Band 16		2595	-0.75	4.73	27.72	22.24	167.34	Vertical	Pass
QAM		2645	-0.37	4.75	27.68	22.56	180.31	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 2/4/5/7/12/13/17/25/41

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-44.74	4.04	33.51	-15.27	-13	-2.27	Horizontal
3701.4	-48.60	4.04	33.51	-19.13	-13	-6.13	Vertical
5552.1	-44.07	5.24	35.84	-13.47	-13	-0.47	Vertical
5552.1	-53.28	5.24	35.84	-22.68	-13	-9.68	Horizontal
178.1	-41.94	1.43	16.02	-27.35	-13	-14.35	Vertical
301.3	-36.29	1.30	17.99	-19.60	-13	-6.60	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.70	4.04	33.56	-19.18	-13	-6.18	Horizontal
3760.0	-49.34	4.04	33.56	-19.82	-13	-6.82	Vertical
5640.0	-51.87	5.24	35.91	-21.20	-13	-8.20	Vertical
5640.0	-52.84	5.24	35.91	-22.17	-13	-9.17	Horizontal
183.2	-41.22	1.62	16.97	-25.87	-13	-12.87	Vertical
457.1	-40.24	1.74	15.98	-26.01	-13	-13.01	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-53.55	4.04	34.00	-23.59	-13	-10.59	Horizontal
3818.6	-44.13	4.04	34.00	-14.17	-13	-1.17	Vertical
5727.9	-52.23	5.24	36.04	-21.43	-13	-8.43	Vertical
5727.9	-50.51	5.24	36.04	-19.71	-13	-6.71	Horizontal
203.2	-41.37	1.42	17.29	-25.50	-13	-12.50	Vertical
243.4	-39.02	1.50	17.90	-22.61	-13	-9.61	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-53.16	4.07	33.54	-23.69	-13	-10.69	Horizontal
3720.0	-50.64	4.07	33.54	-21.17	-13	-8.17	Vertical
5580.0	-49.20	5.28	35.86	-18.62	-13	-5.62	Vertical
5580.0	-50.76	5.28	35.86	-20.18	-13	-7.18	Horizontal
197.1	-38.21	1.58	16.89	-22.89	-13	-9.89	Vertical
439.8	-38.80	1.76	17.26	-23.30	-13	-10.30	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-53.13	4.04	33.56	-23.61	-13	-10.61	Horizontal
3760.0	-50.39	4.04	33.56	-20.87	-13	-7.87	Vertical
5640.0	-49.98	5.24	35.91	-19.31	-13	-6.31	Vertical
5640.0	-49.89	5.24	35.91	-19.22	-13	-6.22	Horizontal
177.3	-43.51	1.46	16.27	-28.70	-13	-15.70	Vertical
323.6	-35.55	1.59	15.15	-21.99	-13	-8.99	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-48.15	4.04	34.00	-18.19	-13	-5.19	Horizontal
3800.0	-47.19	4.04	34.00	-17.23	-13	-4.23	Vertical
5700.0	-52.50	5.24	36.04	-21.70	-13	-8.70	Vertical
5700.0	-53.47	5.24	36.04	-22.67	-13	-9.67	Horizontal
195.7	-40.93	1.36	17.39	-24.89	-13	-11.89	Vertical
248.4	-39.71	1.66	15.39	-25.98	-13	-12.98	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-50.93	4.02	29.80	-25.15	-13	-12.15	Horizontal
3421.4	-51.63	4.02	29.80	-25.85	-13	-12.85	Vertical
5132.1	-44.42	5.24	35.84	-13.82	-13	-0.82	Vertical
5132.1	-53.62	5.24	35.84	-23.02	-13	-10.02	Horizontal
200.8	-37.75	1.68	16.04	-23.39	-13	-10.39	Vertical
377.7	-37.62	1.78	17.74	-21.66	-13	-8.66	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-52.31	4.03	30.00	-26.34	-13	-13.34	Horizontal
3465.0	-52.02	4.03	30.00	-26.05	-13	-13.05	Vertical
5197.5	-45.58	5.25	35.86	-14.97	-13	-1.97	Vertical
5197.5	-53.66	5.25	35.86	-23.05	-13	-10.05	Horizontal
187.4	-43.06	1.72	17.69	-27.09	-13	-14.09	Vertical
449.7	-42.83	1.62	16.02	-28.42	-13	-15.42	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-50.52	4.05	30.01	-24.56	-13	-11.56	Horizontal
3508.6	-48.03	4.05	30.01	-22.07	-13	-9.07	Vertical
5262.9	-51.32	5.26	35.86	-20.72	-13	-7.72	Vertical
5262.9	-53.31	5.26	35.86	-22.71	-13	-9.71	Horizontal
178.8	-44.46	1.80	16.69	-29.57	-13	-16.57	Vertical
272.1	-41.53	1.75	16.66	-26.63	-13	-13.63	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-45.93	4.02	29.80	-20.15	-13	-7.15	Horizontal
3440.0	-48.47	4.02	29.80	-22.69	-13	-9.69	Vertical
5160.0	-52.33	5.24	35.84	-21.73	-13	-8.73	Vertical
5160.0	-53.59	5.24	35.84	-22.99	-13	-9.99	Horizontal
208.9	-39.09	1.57	17.26	-23.40	-13	-10.40	Vertical
423.1	-42.55	1.78	16.35	-27.98	-13	-14.98	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.73	4.03	30.00	-23.76	-13	-10.76	Horizontal
3465.0	-53.91	4.03	30.00	-27.94	-13	-14.94	Vertical
5197.5	-52.28	5.25	35.86	-21.67	-13	-8.67	Vertical
5197.5	-49.29	5.25	35.86	-18.68	-13	-5.68	Horizontal
184.0	-43.58	1.44	17.95	-27.07	-13	-14.07	Vertical
296.1	-37.44	1.65	16.09	-23.00	-13	-10.00	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-48.78	2.91	27.68	-24.01	-13	-11.01	Horizontal
3490.0	-44.72	2.91	27.68	-19.95	-13	-6.95	Vertical
5235.0	-46.27	5.26	35.86	-15.67	-13	-2.67	Vertical
5235.0	-52.06	5.26	35.86	-21.46	-13	-8.46	Horizontal
203.9	-36.83	1.61	16.85	-21.59	-13	-8.59	Vertical
467.7	-37.53	1.61	15.19	-23.95	-13	-10.95	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-44.27	2.78	27.50	-19.55	-13	-6.55	Horizontal
1649.4	-52.61	2.78	27.50	-27.89	-13	-14.89	Vertical
2474.1	-44.53	2.90	27.80	-19.63	-13	-6.63	Vertical
2474.1	-53.73	2.90	27.80	-28.83	-13	-15.83	Horizontal
190.8	-35.25	1.76	17.59	-19.42	-13	-6.42	Vertical
453.9	-36.60	1.63	15.87	-22.36	-13	-9.36	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-51.47	2.80	27.48	-26.79	-13	-13.79	Horizontal
1673.0	-46.16	2.80	27.48	-21.48	-13	-8.48	Vertical
2509.5	-51.55	2.91	27.70	-26.76	-13	-13.76	Vertical
2509.5	-49.32	2.91	27.70	-24.53	-13	-11.53	Horizontal
203.9	-36.65	1.61	15.68	-22.58	-13	-9.58	Vertical
392.7	-36.16	1.59	17.52	-20.24	-13	-7.24	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-48.76	2.82	27.43	-24.15	-13	-11.15	Horizontal
1696.6	-45.19	2.82	27.43	-20.58	-13	-7.58	Vertical
2544.9	-51.43	2.92	27.74	-26.61	-13	-13.61	Vertical
2544.9	-50.80	2.92	27.74	-25.98	-13	-12.98	Horizontal
204.6	-34.67	1.69	16.67	-19.68	-13	-6.68	Vertical
382.1	-44.31	1.70	17.18	-28.83	-13	-15.83	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-48.52	2.78	27.50	-23.80	-13	-10.80	Horizontal
1658.0	-49.84	2.78	27.50	-25.12	-13	-12.12	Vertical
2487.0	-49.74	2.90	27.80	-24.84	-13	-11.84	Vertical
2487.0	-52.20	2.90	27.80	-27.30	-13	-14.30	Horizontal
187.3	-41.90	1.71	15.57	-28.04	-13	-15.04	Vertical
456.9	-41.57	1.34	16.40	-26.51	-13	-13.51	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-44.23	2.80	27.48	-19.55	-13	-6.55	Horizontal
1673.0	-49.15	2.80	27.48	-24.47	-13	-11.47	Vertical
2509.5	-50.18	2.91	27.70	-25.39	-13	-12.39	Vertical
2509.5	-51.67	2.91	27.70	-26.88	-13	-13.88	Horizontal
185.8	-39.67	1.44	17.04	-24.07	-13	-11.07	Vertical
380.4	-36.05	1.76	17.62	-20.19	-13	-7.19	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.21	2.82	27.43	-21.60	-13	-8.60	Horizontal
1688.0	-46.52	2.82	27.43	-21.91	-13	-8.91	Vertical
2532.0	-52.08	2.92	27.74	-27.26	-13	-14.26	Vertical
2532.0	-50.90	2.92	27.74	-26.08	-13	-13.08	Horizontal
201.3	-44.36	1.74	17.70	-28.40	-13	-15.40	Vertical
357.5	-37.95	1.41	17.46	-21.89	-13	-8.89	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	-60.61	5.23	35.81	-30.03	-25	-5.03	Horizontal
5005.0	-63.63	5.23	35.81	-33.05	-25	-8.05	Vertical
7507.5	-62.85	5.67	36.85	-31.67	-25	-6.67	Vertical
7507.5	-62.06	5.67	36.85	-30.88	-25	-5.88	Horizontal
201.6	-47.58	1.73	17.97	-31.34	-25	-6.34	Vertical
313.4	-47.35	1.38	15.11	-33.62	-25	-8.62	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.26	5.23	35.82	-30.67	-25	-5.67	Horizontal
5070.0	-62.43	5.23	35.82	-31.84	-25	-6.84	Vertical
7605.0	-62.80	5.67	36.85	-31.62	-25	-6.62	Vertical
7605.0	-59.46	5.67	36.85	-28.28	-25	-3.28	Horizontal
188.6	-49.56	1.77	16.17	-35.15	-25	-10.15	Vertical
466.4	-47.65	1.63	15.21	-34.07	-25	-9.07	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-64.83	5.24	35.83	-34.24	-25	-9.24	Horizontal
5135.0	-64.26	5.24	35.83	-33.67	-25	-8.67	Vertical
7702.5	-59.89	5.68	36.87	-28.70	-25	-3.70	Vertical
7702.5	-62.72	5.68	36.87	-31.53	-25	-6.53	Horizontal
195.8	-46.99	1.58	17.56	-31.01	-25	-6.01	Vertical
342.1	-54.02	1.45	16.58	-38.89	-25	-13.89	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	-63.05	5.23	35.82	-32.46	-25	-7.46	Horizontal
5020.0	-61.85	5.23	35.82	-31.26	-25	-6.26	Vertical
7530.0	-62.45	5.67	36.86	-31.26	-25	-6.26	Vertical
7530.0	-63.11	5.67	36.86	-31.92	-25	-6.92	Horizontal
201.5	-48.22	1.63	15.76	-34.09	-25	-9.09	Vertical
324.2	-47.34	1.71	15.44	-33.61	-25	-8.61	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.71	5.23	35.82	-34.12	-25	-9.12	Horizontal
5070.0	-59.80	5.23	35.82	-29.21	-25	-4.21	Vertical
7605.0	-60.80	5.67	36.85	-29.62	-25	-4.62	Vertical
7605.0	-61.33	5.67	36.85	-30.15	-25	-5.15	Horizontal
211.2	-48.90	1.79	16.84	-33.84	-25	-8.84	Vertical
250.4	-48.46	1.71	17.64	-32.53	-25	-7.53	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-63.67	5.24	35.83	-33.08	-25	-8.08	Horizontal
5120.0	-63.03	5.24	35.83	-32.44	-25	-7.44	Vertical
7680.0	-59.52	5.70	36.88	-28.34	-25	-3.34	Vertical
7680.0	-60.56	5.70	36.88	-29.38	-25	-4.38	Horizontal
212.2	-46.39	1.79	16.84	-31.33	-25	-6.33	Vertical
451.2	-46.53	1.71	17.64	-30.60	-25	-5.60	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-46.44	2.60	27.20	-21.84	-13	-8.84	Horizontal
1399.4	-44.23	2.60	27.20	-19.63	-13	-6.63	Vertical
2099.1	-46.96	2.85	27.54	-22.27	-13	-9.27	Vertical
2099.1	-49.40	2.85	27.54	-24.71	-13	-11.71	Horizontal
187.2	-44.83	1.49	17.78	-28.54	-13	-15.54	Vertical
389.1	-44.34	1.36	17.33	-28.37	-13	-15.37	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-52.65	2.61	27.28	-27.98	-13	-14.98	Horizontal
1415.0	-53.38	2.61	27.28	-28.71	-13	-15.71	Vertical
2122.5	-48.14	2.87	27.59	-23.42	-13	-10.42	Vertical
2122.5	-49.14	2.87	27.59	-24.42	-13	-11.42	Horizontal
201.1	-40.43	1.73	15.74	-26.42	-13	-13.42	Vertical
340.8	-38.60	1.62	15.79	-24.43	-13	-11.43	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.19	2.63	27.28	-27.54	-13	-14.54	Horizontal
1430.6	-52.20	2.63	27.28	-27.55	-13	-14.55	Vertical
2145.9	-52.81	2.88	27.60	-28.09	-13	-15.09	Vertical
2145.9	-52.09	2.88	27.60	-27.37	-13	-14.37	Horizontal
207.7	-34.85	1.61	18.00	-18.46	-13	-5.46	Vertical
434.7	-41.43	1.45	15.49	-27.40	-13	-14.40	Horizontal

QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-49.52	2.61	27.26	-24.87	-13	-11.87	Horizontal
1408.0	-50.88	2.61	27.26	-26.23	-13	-13.23	Vertical
2112.0	-51.68	2.87	27.58	-26.97	-13	-13.97	Vertical
2112.0	-50.53	2.87	27.58	-25.82	-13	-12.82	Horizontal
195.8	-43.05	1.31	16.97	-27.39	-13	-14.39	Vertical
291.9	-34.84	1.65	16.70	-19.79	-13	-6.79	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-53.31	2.61	27.28	-28.64	-13	-15.64	Horizontal
1415.0	-48.30	2.61	27.28	-23.63	-13	-10.63	Vertical
2122.5	-52.92	2.87	27.59	-28.20	-13	-15.20	Vertical
2122.5	-49.06	2.87	27.59	-24.34	-13	-11.34	Horizontal
202.1	-36.92	1.72	17.99	-20.65	-13	-7.65	Vertical
426.6	-34.94	1.73	17.94	-18.73	-13	-5.73	Horizontal
Test Results for High Channel 711MHz							
1422.0	-48.99	2.62	27.28	-24.33	-13	-11.33	Horizontal
1422.0	-46.29	2.62	27.28	-21.63	-13	-8.63	Vertical
2133.0	-48.07	2.87	27.60	-23.34	-13	-10.34	Vertical
2133.0	-51.57	2.87	27.60	-26.84	-13	-13.84	Horizontal
176.4	-40.81	1.58	15.93	-26.46	-13	-13.46	Vertical
459.0	-37.80	1.36	15.59	-23.57	-13	-10.57	Horizontal

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

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

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

9.6 LTE BAND 13

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

Test Results for Low Channel 779.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1559.0	-72.50	2.61	27.28	-47.83	-40	-7.83	Horizontal
1559.0	-71.20	2.61	27.28	-46.53	-40	-6.53	Vertical
2338.5	-40.93	2.87	27.59	-16.21	-13	-3.21	Vertical
2338.5	-43.81	2.87	27.59	-19.09	-13	-6.09	Horizontal
120.1	-37.50	1.54	15.61	-23.43	-13	-10.43	Vertical
197.8	-36.23	1.51	15.21	-22.53	-13	-9.53	Horizontal
Test Results For Mid Channel 782MHz							
1564.0	-69.23	2.62	27.30	-44.55	-40	-4.55	Horizontal
1564.0	-74.03	2.62	27.30	-49.35	-40	-9.35	Vertical
2346.0	-40.08	2.87	27.62	-15.33	-13	-2.33	Vertical
2346.0	-44.24	2.87	27.62	-19.49	-13	-6.49	Horizontal
131.2	-36.99	1.65	16.17	-22.47	-13	-9.47	Vertical
267.5	-39.37	1.48	16.88	-23.97	-13	-10.97	Horizontal
Test Results for High Channel 784.5MHz							
1569.0	-74.65	2.66	27.28	-50.03	-40	-10.03	Horizontal
1569.0	-69.01	2.66	27.28	-44.39	-40	-4.39	Vertical
2353.5	-41.76	2.88	27.60	-17.04	-13	-4.04	Vertical
2353.5	-39.52	2.88	27.60	-14.80	-13	-1.80	Horizontal
80.8	-39.11	1.54	16.40	-24.25	-13	-11.25	Vertical
155.6	-39.24	1.43	15.77	-24.90	-13	-11.90	Horizontal

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

Test Results for Channel 782MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1564.0	-70.99	2.62	27.30	-46.31	-40	-6.31	Horizontal
1564.0	-74.76	2.62	27.30	-50.08	-40	-10.08	Vertical
2346.0	-44.37	2.87	27.62	-19.62	-13	-6.62	Vertical
2346.0	-42.06	2.87	27.62	-17.31	-13	-4.31	Horizontal
129.1	-36.36	1.43	17.03	-20.76	-13	-7.76	Vertical
86.9	-39.32	1.62	16.63	-24.31	-13	-11.31	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.

9.7 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-50.03	2.61	27.28	-25.36	-13	-12.36	Horizontal
1413.0	-53.26	2.61	27.28	-28.59	-13	-15.59	Vertical
2119.5	-46.11	2.87	27.59	-21.39	-13	-8.39	Vertical
2119.5	-49.56	2.87	27.59	-24.84	-13	-11.84	Horizontal
206.3	-39.21	1.71	16.15	-24.77	-13	-11.77	Vertical
321.9	-34.79	1.41	17.32	-18.88	-13	-5.88	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-47.95	2.62	27.30	-23.27	-13	-10.27	Horizontal
1420.0	-52.01	2.62	27.30	-27.33	-13	-14.33	Vertical
2130.0	-44.99	2.87	27.62	-20.24	-13	-7.24	Vertical
2130.0	-50.76	2.87	27.62	-26.01	-13	-13.01	Horizontal
211.0	-35.57	1.42	15.25	-21.75	-13	-8.75	Vertical
301.9	-34.86	1.36	17.19	-19.03	-13	-6.03	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-49.19	2.66	27.28	-24.57	-13	-11.57	Horizontal
1427.0	-46.04	2.66	27.28	-21.42	-13	-8.42	Vertical
2140.5	-46.55	2.88	27.60	-21.83	-13	-8.83	Vertical
2140.5	-51.30	2.88	27.60	-26.58	-13	-13.58	Horizontal
192.1	-36.44	1.32	17.29	-20.47	-13	-7.47	Vertical
442.1	-37.11	1.72	16.89	-21.94	-13	-8.94	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	-52.32	2.62	27.30	-27.64	-13	-14.64	Horizontal
1418.0	-52.54	2.62	27.30	-27.86	-13	-14.86	Vertical
2127.0	-53.55	2.87	27.62	-28.80	-13	-15.80	Vertical
2127.0	-49.24	2.87	27.62	-24.49	-13	-11.49	Horizontal
183.2	-39.22	1.35	16.91	-23.66	-13	-10.66	Vertical
269.4	-38.68	1.62	16.31	-23.99	-13	-10.99	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-52.80	2.62	27.30	-28.12	-13	-15.12	Horizontal
1420.0	-50.76	2.62	27.30	-26.08	-13	-13.08	Vertical
2130.0	-46.58	2.87	27.62	-21.83	-13	-8.83	Vertical
2130.0	-51.76	2.87	27.62	-27.01	-13	-14.01	Horizontal
189.1	-36.13	1.51	17.14	-20.50	-13	-7.50	Vertical
375.6	-39.77	1.77	16.88	-24.66	-13	-11.66	Horizontal
Test Results for High Channel 711MHz							
1422.0	-44.95	2.62	27.30	-20.27	-13	-7.27	Horizontal
1422.0	-44.94	2.62	27.30	-20.26	-13	-7.26	Vertical
2133.0	-51.93	2.87	27.62	-27.18	-13	-14.18	Vertical
2133.0	-50.85	2.87	27.62	-26.10	-13	-13.10	Horizontal
196.1	-39.09	1.78	15.95	-24.92	-13	-11.92	Vertical
273.3	-37.42	1.34	17.95	-20.82	-13	-7.82	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.

9.8 LTE BAND 25

QPSK EIRP POWER FOR LTE BAND 25 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.05	4.02	29.80	-22.27	-13	-9.27	Horizontal
3701.4	-49.71	4.02	29.80	-23.93	-13	-10.93	Vertical
5552.1	-49.35	5.24	35.84	-18.75	-13	-5.75	Vertical
5552.1	-47.87	5.24	35.84	-17.27	-13	-4.27	Horizontal
93.9	-34.85	1.59	15.11	-21.33	-13	-8.33	Vertical
119.7	-32.69	1.80	15.61	-18.88	-13	-5.88	Horizontal
Test Results for Mid Channel 1732.5MHz							
3765.0	-48.07	4.03	30.00	-22.10	-13	-9.10	Horizontal
3765.0	-48.64	4.03	30.00	-22.67	-13	-9.67	Vertical
5647.5	-49.36	5.25	35.86	-18.75	-13	-5.75	Vertical
5647.5	-49.15	5.25	35.86	-18.54	-13	-5.54	Horizontal
166.1	-34.21	1.37	15.62	-19.96	-13	-6.96	Vertical
274.4	-33.06	1.55	17.51	-17.10	-13	-4.10	Horizontal
Test Results for High Channel 1754.3MHz							
3828.6	-49.44	4.05	30.01	-23.48	-13	-10.48	Horizontal
3828.6	-47.92	4.05	30.01	-21.96	-13	-8.96	Vertical
5742.9	-46.37	5.26	35.86	-15.77	-13	-2.77	Vertical
5742.9	-49.31	5.26	35.86	-18.71	-13	-5.71	Horizontal
108.6	-32.51	1.66	17.19	-16.98	-13	-3.98	Vertical
138.7	-33.49	1.35	17.94	-16.90	-13	-3.90	Horizontal

QPSK EIRP POWER FOR LTE BAND 25 (20MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-46.18	4.02	29.80	-20.40	-13	-7.40	Horizontal
3720.0	-49.87	4.02	29.80	-24.09	-13	-11.09	Vertical
5580.0	-48.88	5.24	35.84	-18.28	-13	-5.28	Vertical
5580.0	-47.16	5.24	35.84	-16.56	-13	-3.56	Horizontal
146.2	-32.81	1.70	15.24	-19.27	-13	-6.27	Vertical
215.4	-33.28	1.42	16.58	-18.12	-13	-5.12	Horizontal
Test Results for Mid Channel 1732.5MHz							
3765.0	-48.55	4.03	30.00	-22.58	-13	-9.58	Horizontal
3765.0	-42.86	4.03	30.00	-16.89	-13	-3.89	Vertical
5647.5	-49.07	5.25	35.86	-18.46	-13	-5.46	Vertical
5647.5	-49.72	5.25	35.86	-19.11	-13	-6.11	Horizontal
132.2	-34.78	1.64	16.16	-20.26	-13	-7.26	Vertical
133.3	-34.94	1.62	17.37	-19.19	-13	-6.19	Horizontal
Test Results for High Channel 1745MHz							
3810.0	-49.61	2.91	27.68	-24.84	-13	-11.84	Horizontal
3810.0	-47.53	2.91	27.68	-22.76	-13	-9.76	Vertical
5715.0	-46.89	5.26	35.86	-16.29	-13	-3.29	Vertical
5715.0	-46.46	5.26	35.86	-15.86	-13	-2.86	Horizontal
212.6	-34.65	1.49	15.29	-20.85	-13	-7.85	Vertical
275.8	-32.55	1.79	16.42	-17.92	-13	-4.92	Horizontal

9.9 LTE BAND 41

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

Test Results for Low Channel 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5075.0	-61.83	5.23	35.81	-31.25	-25	-6.25	Horizontal
5075.0	-64.62	5.23	35.81	-34.04	-25	-9.04	Vertical
7612.5	-61.78	5.67	36.85	-30.60	-25	-5.60	Vertical
7612.5	-60.70	5.67	36.85	-29.52	-25	-4.52	Horizontal
435.3	-44.23	1.38	15.98	-29.63	-25	-4.63	Vertical
465.8	-44.61	1.62	15.66	-30.57	-25	-5.57	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-64.83	5.23	35.82	-34.24	-25	-9.24	Horizontal
5190.0	-63.52	5.23	35.82	-32.93	-25	-7.93	Vertical
7785.0	-62.67	5.67	36.85	-31.49	-25	-6.49	Vertical
7785.0	-62.13	5.67	36.85	-30.95	-25	-5.95	Horizontal
510.4	-49.19	1.62	16.17	-34.64	-25	-9.64	Vertical
562.9	-47.93	1.74	17.63	-32.04	-25	-7.04	Horizontal
Test Results for High Channel 2652.5MHz							
5305.0	-60.54	5.24	35.83	-29.95	-25	-4.95	Horizontal
5305.0	-59.56	5.24	35.83	-28.97	-25	-3.97	Vertical
7957.5	-63.05	5.68	36.87	-31.86	-25	-6.86	Vertical
7957.5	-64.02	5.68	36.87	-32.83	-25	-7.83	Horizontal
197.6	-45.18	1.55	15.84	-30.89	-25	-5.89	Vertical
353.1	-47.21	1.51	17.06	-31.66	-25	-6.66	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5090.0	-61.37	5.23	35.82	-30.78	-25	-5.78	Horizontal
5090.0	-60.36	5.23	35.82	-29.77	-25	-4.77	Vertical
7635	-60.14	5.67	36.86	-28.95	-25	-3.95	Vertical
7635	-60.37	5.67	36.86	-29.18	-25	-4.18	Horizontal
128.9	-48.07	1.43	15.51	-33.99	-25	-8.99	Vertical
344.8	-49.99	1.40	16.97	-34.42	-25	-9.42	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-59.88	5.23	35.82	-29.29	-25	-4.29	Horizontal
5190.0	-62.16	5.23	35.82	-31.57	-25	-6.57	Vertical
7785.0	-59.42	5.67	36.85	-28.24	-25	-3.24	Vertical
7785.0	-62.72	5.67	36.85	-31.54	-25	-6.54	Horizontal
100.8	-48.22	1.77	16.72	-33.27	-25	-8.27	Vertical
263.5	-45.31	1.31	16.99	-29.63	-25	-4.63	Horizontal
Test Results for High Channel 2645MHz							
5290.0	-63.96	5.24	35.83	-33.37	-25	-8.37	Horizontal
5290.0	-64.72	5.24	35.83	-34.13	-25	-9.13	Vertical
7935.0	-63.47	5.70	36.88	-32.29	-25	-7.29	Vertical
7935.0	-61.14	5.70	36.88	-29.96	-25	-4.96	Horizontal
349.9	-45.83	1.70	15.73	-31.80	-25	-6.80	Vertical
110.3	-47.34	1.75	17.33	-31.76	-25	-6.76	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,

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.4V, Normal, DC 3.87V and High voltage, DC 4.2V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

LTE Band 2/4/5/12/13/25/41

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]
3.40	1880	8.7	0.00465	2.5
3.87	1880	6.4	0.00341	2.5
4.20	1880	5.1	0.00270	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	6.7	0.00354	2.5
Extreme (50C)	1880	6.8	0.00364	2.5
Extreme (40C)	1880	7.8	0.00416	2.5
Extreme (30C)	1880	8.4	0.00446	2.5
Extreme (10C)	1880	8.4	0.00445	2.5
Extreme (0C)	1880	6.8	0.00364	2.5
Extreme (-10C)	1880	8.3	0.00441	2.5
Extreme (-20C)	1880	7.8	0.00416	2.5
Extreme (-30C)	1880	6.0	0.00318	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]
3.40	1880	7.5	0.00397	2.5
3.87	1880	5.7	0.00302	2.5
4.20	1880	6.4	0.00339	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	7.2	0.00380	2.5
Extreme (50C)	1880	6.5	0.00348	2.5
Extreme (40C)	1880	5.1	0.00272	2.5
Extreme (30C)	1880	6.6	0.00351	2.5
Extreme (10C)	1880	6.6	0.00352	2.5
Extreme (0C)	1880	4.5	0.00238	2.5
Extreme (-10C)	1880	9.1	0.00483	2.5
Extreme (-20C)	1880	6.1	0.00325	2.5
Extreme (-30C)	1880	5.7	0.00302	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]
3.40	1732.5	6.1	0.00351	2.5
3.87	1732.5	5.4	0.00310	2.5
4.20	1732.5	6.7	0.00385	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	4.7	0.00273	2.5
Extreme (50C)	1732.5	9.6	0.00555	2.5
Extreme (40C)	1732.5	6.1	0.00353	2.5
Extreme (30C)	1732.5	6.6	0.00381	2.5
Extreme (10C)	1732.5	6.5	0.00378	2.5
Extreme (0C)	1732.5	10.0	0.00578	2.5
Extreme (-10C)	1732.5	6.3	0.00361	2.5
Extreme (-20C)	1732.5	6.1	0.00355	2.5
Extreme (-30C)	1732.5	6.3	0.00365	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]
3.40	1732.5	6.0	0.00348	2.5
3.87	1732.5	6.8	0.00392	2.5
4.20	1732.5	5.9	0.00342	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	-6.5	-0.00377	2.5
Extreme (50C)	1732.5	-3.7	-0.00214	2.5
Extreme (40C)	1732.5	5.8	0.00332	2.5
Extreme (30C)	1732.5	-3.4	-0.00197	2.5
Extreme (10C)	1732.5	6.9	0.00398	2.5
Extreme (0C)	1732.5	5.3	0.00303	2.5
Extreme (-10C)	1732.5	9.6	0.00556	2.5
Extreme (-20C)	1732.5	10.6	0.00613	2.5
Extreme (-30C)	1732.5	5.9	0.00342	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]
3.40	836.5	7.0	0.00836	2.5
3.87	836.5	9.0	0.01071	2.5
4.20	836.5	4.9	0.00585	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	7.0	0.00835	2.5
Extreme (50C)	836.5	8.1	0.00966	2.5
Extreme (40C)	836.5	9.6	0.01145	2.5
Extreme (30C)	836.5	5.3	0.00632	2.5
Extreme (10C)	836.5	6.7	0.00803	2.5
Extreme (0C)	836.5	4.5	0.00544	2.5
Extreme (-10C)	836.5	3.2	0.00388	2.5
Extreme (-20C)	836.5	5.7	0.00683	2.5
Extreme (-30C)	836.5	6.2	0.00739	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]
3.40	836.5	8.7	0.01041	2.5
3.87	836.5	9.1	0.01088	2.5
4.20	836.5	7.7	0.00926	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	7.0	0.00835	2.5
Extreme (50C)	836.5	5.2	0.00627	2.5
Extreme (40C)	836.5	3.3	0.00394	2.5
Extreme (30C)	836.5	2.1	0.00251	2.5
Extreme (10C)	836.5	7.0	0.00831	2.5
Extreme (0C)	836.5	2.0	0.00243	2.5
Extreme (-10C)	836.5	9.2	0.01104	2.5
Extreme (-20C)	836.5	6.2	0.00738	2.5
Extreme (-30C)	836.5	6.0	0.00713	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]
3.40	2535	6.8	0.00267	2.5
3.87	2535	5.1	0.00199	2.5
4.20	2535	7.6	0.00299	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.1	0.00278	2.5
Extreme (50C)	2535	7.2	0.00282	2.5
Extreme (40C)	2535	5.3	0.00208	2.5
Extreme (30C)	2535	6.6	0.00260	2.5
Extreme (10C)	2535	6.5	0.00255	2.5
Extreme (0C)	2535	4.4	0.00175	2.5
Extreme (-10C)	2535	9.8	0.00386	2.5
Extreme (-20C)	2535	6.0	0.00235	2.5
Extreme (-30C)	2535	6.3	0.00247	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]
3.40	2535	5.6	0.00220	2.5
3.87	2535	6.8	0.00269	2.5
4.20	2535	9.5	0.00374	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.6	0.00298	2.5
Extreme (50C)	2535	7.3	0.00288	2.5
Extreme (40C)	2535	5.0	0.00197	2.5
Extreme (30C)	2535	3.9	0.00155	2.5
Extreme (10C)	2535	6.9	0.00273	2.5
Extreme (0C)	2535	4.8	0.00188	2.5
Extreme (-10C)	2535	9.1	0.00360	2.5
Extreme (-20C)	2535	10.7	0.00422	2.5
Extreme (-30C)	2535	5.9	0.00233	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]
3.40	707.5	12.4	0.01754	2.5
3.87	707.5	13.9	0.01963	2.5
4.20	707.5	13.0	0.01835	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	-6.0	-0.00850	2.5
Extreme (50C)	707.5	-3.7	-0.00527	2.5
Extreme (40C)	707.5	5.2	0.00737	2.5
Extreme (30C)	707.5	-3.8	-0.00544	2.5
Extreme (10C)	707.5	6.2	0.00878	2.5
Extreme (0C)	707.5	4.4	0.00619	2.5
Extreme (-10C)	707.5	9.1	0.01287	2.5
Extreme (-20C)	707.5	10.6	0.01495	2.5
Extreme (-30C)	707.5	6.4	0.00901	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]
3.40	707.5	9.6	0.01362	2.5
3.87	707.5	5.3	0.00752	2.5
4.20	707.5	4.2	0.00588	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	5.2	0.00739	2.5
Extreme (50C)	707.5	9.7	0.01369	2.5
Extreme (40C)	707.5	6.9	0.00981	2.5
Extreme (30C)	707.5	7.1	0.01006	2.5
Extreme (10C)	707.5	6.2	0.00872	2.5
Extreme (0C)	707.5	5.4	0.00760	2.5
Extreme (-10C)	707.5	6.1	0.00868	2.5
Extreme (-20C)	707.5	8.6	0.01213	2.5
Extreme (-30C)	707.5	6.1	0.00863	2.5

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

10.6 LTE BAND 13

Band 13 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]
3.40	782.0	5.8	0.00744	2.5
3.87	782.0	6.0	0.00769	2.5
4.20	782.0	4.4	0.00562	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	4.7	0.00597	2.5
Extreme (50C)	782.0	9.8	0.01258	2.5
Extreme (40C)	782.0	7.2	0.00917	2.5
Extreme (30C)	782.0	6.2	0.00792	2.5
Extreme (10C)	782.0	6.1	0.00785	2.5
Extreme (0C)	782.0	4.9	0.00625	2.5
Extreme (-10C)	782.0	9.6	0.01228	2.5
Extreme (-20C)	782.0	8.6	0.01100	2.5
Extreme (-30C)	782.0	5.8	0.00744	2.5

Band 13 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]
3.40	782.0	6.7	0.00851	2.5
3.87	782.0	9.2	0.01173	2.5
4.20	782.0	7.2	0.00925	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	7.6	0.00974	2.5
Extreme (50C)	782.0	6.7	0.00863	2.5
Extreme (40C)	782.0	4.9	0.00631	2.5
Extreme (30C)	782.0	6.7	0.00857	2.5
Extreme (10C)	782.0	5.9	0.00760	2.5
Extreme (0C)	782.0	4.5	0.00581	2.5
Extreme (-10C)	782.0	9.2	0.01178	2.5
Extreme (-20C)	782.0	6.6	0.00841	2.5
Extreme (-30C)	782.0	6.6	0.00848	2.5

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

10.7 LTE BAND 17

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]
3.40	710.0	6.6	0.00931	2.5
3.87	710.0	4.6	0.00649	2.5
4.20	710.0	7.7	0.01086	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	4.0	0.00569	2.5
Extreme (50C)	710.0	6.1	0.00862	2.5
Extreme (40C)	710.0	6.6	0.00933	2.5
Extreme (30C)	710.0	6.0	0.00845	2.5
Extreme (10C)	710.0	4.6	0.00644	2.5
Extreme (0C)	710.0	8.0	0.01130	2.5
Extreme (-10C)	710.0	6.1	0.00858	2.5
Extreme (-20C)	710.0	5.6	0.00795	2.5
Extreme (-30C)	710.0	6.2	0.00868	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]
3.40	710.0	5.1	0.00722	2.5
3.87	710.0	5.0	0.00699	2.5
4.20	710.0	3.7	0.00515	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	5.6	0.00792	2.5
Extreme (50C)	710.0	4.5	0.00638	2.5
Extreme (40C)	710.0	3.5	0.00487	2.5
Extreme (30C)	710.0	3.8	0.00539	2.5
Extreme (10C)	710.0	6.8	0.00964	2.5
Extreme (0C)	710.0	5.2	0.00733	2.5
Extreme (-10C)	710.0	9.0	0.01274	2.5
Extreme (-20C)	710.0	7.0	0.00983	2.5
Extreme (-30C)	710.0	6.3	0.00888	2.5

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

10.8 LTE BAND 25

Band 25 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]
3.40	1882.5	6.5	0.00344	2.5
3.87	1882.5	5.1	0.00270	2.5
4.20	1882.5	6.2	0.00329	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	4.9	0.00259	2.5
Extreme (50C)	1882.5	3.3	0.00176	2.5
Extreme (40C)	1882.5	5.1	0.00270	2.5
Extreme (30C)	1882.5	3.1	0.00163	2.5
Extreme (10C)	1882.5	4.3	0.00230	2.5
Extreme (0C)	1882.5	6.6	0.00353	2.5
Extreme (-10C)	1882.5	6.1	0.00324	2.5
Extreme (-20C)	1882.5	5.6	0.00297	2.5
Extreme (-30C)	1882.5	5.5	0.00293	2.5

Band 25 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]
3.40	1882.5	9.1	0.00483	2.5
3.87	1882.5	6.9	0.00368	2.5
4.20	1882.5	6.1	0.00326	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	7.7	0.00407	2.5
Extreme (50C)	1882.5	4.9	0.00262	2.5
Extreme (40C)	1882.5	5.8	0.00307	2.5
Extreme (30C)	1882.5	5.1	0.00270	2.5
Extreme (10C)	1882.5	6.9	0.00368	2.5
Extreme (0C)	1882.5	4.5	0.00238	2.5
Extreme (-10C)	1882.5	9.2	0.00489	2.5
Extreme (-20C)	1882.5	6.9	0.00364	2.5
Extreme (-30C)	1882.5	5.8	0.00307	2.5

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

10.9 LTE BAND 41

Band 41 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]
3.40	2595	8.7	0.00335	2.5
3.87	2595	6.5	0.00249	2.5
4.20	2595	7.9	0.00303	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.2	0.00277	2.5
Extreme (50C)	2595	4.7	0.00180	2.5
Extreme (40C)	2595	5.3	0.00206	2.5
Extreme (30C)	2595	4.5	0.00173	2.5
Extreme (10C)	2595	6.9	0.00264	2.5
Extreme (0C)	2595	5.1	0.00196	2.5
Extreme (-10C)	2595	10.0	0.00385	2.5
Extreme (-20C)	2595	11.1	0.00429	2.5
Extreme (-30C)	2595	5.8	0.00224	2.5

Band 41 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]
3.40	2595	8.6	0.00331	2.5
3.87	2595	6.8	0.00264	2.5
4.20	2595	7.0	0.00270	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.9	0.00303	2.5
Extreme (50C)	2595	5.0	0.00193	2.5
Extreme (40C)	2595	5.8	0.00225	2.5
Extreme (30C)	2595	4.8	0.00184	2.5
Extreme (10C)	2595	6.3	0.00243	2.5
Extreme (0C)	2595	5.1	0.00196	2.5
Extreme (-10C)	2595	9.7	0.00376	2.5
Extreme (-20C)	2595	11.3	0.00434	2.5
Extreme (-30C)	2595	6.1	0.00235	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.

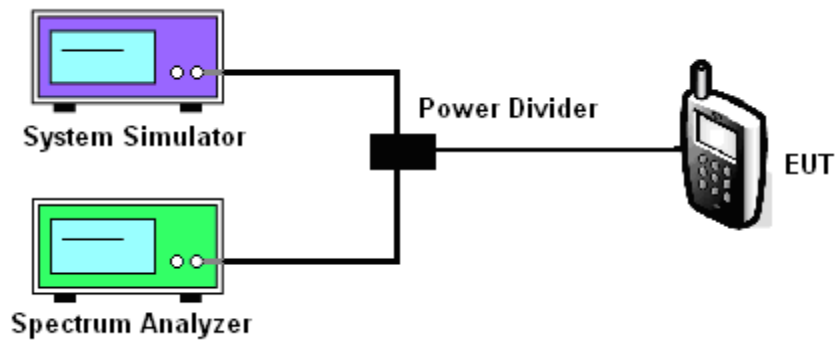
11.2 Measuring Instruments

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 2/4/5/7/12/13/17/25/41

Test data reference attachment.

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