

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

FCC ID: 2BMXO-MP01

Product: Smart Phone

Trade Mark: Minimal Phone

Model No.: MP01

Family Model: N/A

Report No.: S24122308502006

Issue Date: Feb. 14, 2025

Prepared for

The Minimal Company

6044 San Fernando Rd. (USA)

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : The Minimal Company
Address..... : 6044 San Fernando Rd. (USA)
Manufacturer's Name..... : Shenzhen Along Electronics Co.,LTD
Address..... : No.35, Xinyuan Industrial Zone, Gushu Community, Xixiang Street,
 Bao 'an District, Shenzhen City
Product name..... : Smart Phone
Model and/or type reference .. : MP01
Trade Mark..... : Minimal Phone
Family Model..... : N/A
Test Sample Number..... : S241223085003
Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.26:2015
 ANSI/TIA-603-E-2016

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

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Date of Test

Date (s) of performance of tests..... Dec. 23, 2024 ~ Feb. 14, 2025

Date of Issue Feb. 14, 2025

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

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smart Phone
Trade Mark	Minimal Phone
Model Name	MP01
Family Model	N/A
Model Difference	N/A
FCC ID:	2BMXO-MP01
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7, 12 TDD Band 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 TDD Band 41 Uplink& Downlink: 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:	LDS Antenna
Antenna gain:	Band 2: -2.81 dBi, Band 4: -0.84 dBi, Band 5: -2.37 dBi, Band 7: -2.24 dBi, Band 12: -10.24 dBi, Band 41: -2.18 dBi
Adapter	Model: JML-0500200NZ-LW Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2.0A
Battery	DC 3.87V, 3000mAh, 11.61Wh
Power supply	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V) (Note 1)
HW Version	AL_Z10_MB_V12
SW Version	N/A
** Note1: The High Voltage DC 4.45V and Low Voltage 3.29V 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: 2BMXO-MP01** 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.

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

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

FCC Registration No.:463705

IC Registration No.:9270A,

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 2/4/5/7/12/41

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	MP01	FCC ID: 2BMXO-MP01	EUT

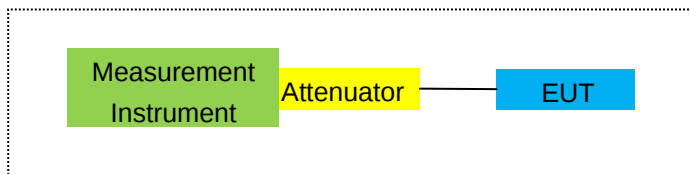
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

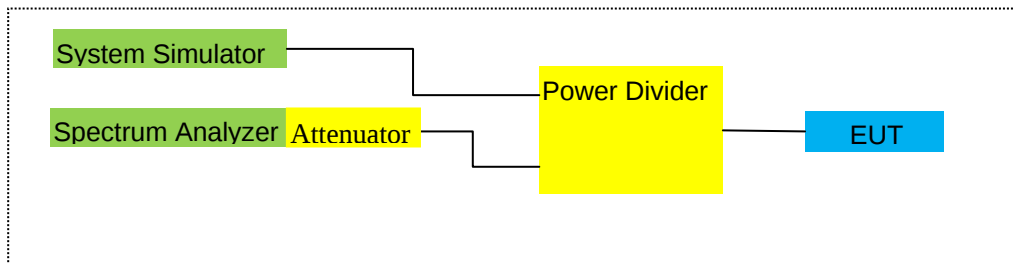
For Radiated Test Cases



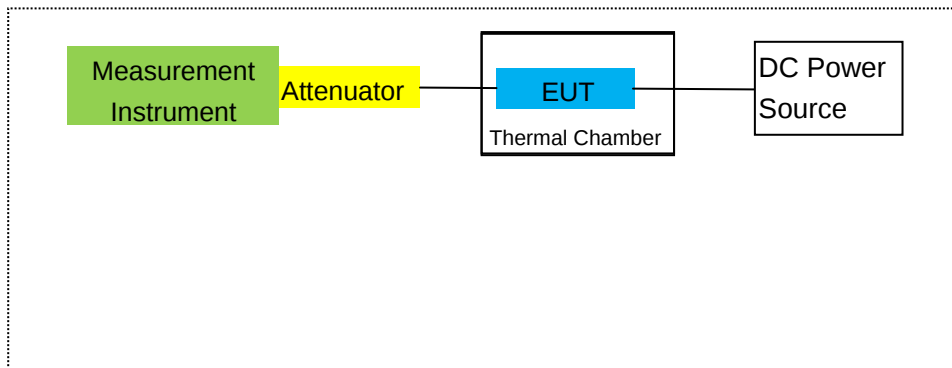
For Conducted Output Power



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



For Frequency Stability



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

3.TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	2025.03.11	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
23	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
24	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year

26	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
27	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
28	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	1 year
29	MXG Vector Signal Generator	Agilent	N5183B	MY57280984	2024.05.30	2025.05.29	1 year
30	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	2024.05.25	2025.05.24	1 year
31	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	2024.05.12	2025.05.11	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.

Measurement Software

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

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

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

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

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

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

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

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

☐

Band 2/4/5/7/12/41

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;

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

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/4/5/7/12/41

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 2/4/5/7/12/41
- ☐

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.

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

☐ Band 2/4/5/7/12/41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-4.18	3.76	28.24	20.30	107.152	Horizontal	Pass
		1880	-3.99	3.91	28.22	20.32	107.647	Horizontal	Pass
		1909.3	-3.90	3.93	28.20	20.37	108.893	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-4.24	3.77	28.23	20.22	105.196	Horizontal	Pass
		1880	-4.09	3.91	28.24	20.24	105.682	Horizontal	Pass
		1908.5	-3.96	3.94	28.25	20.35	108.393	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.13	3.77	28.31	20.41	109.901	Horizontal	Pass
		1880	-3.75	3.91	28.22	20.56	113.763	Horizontal	Pass
		1907.5	-3.68	3.94	28.20	20.58	114.288	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.99	3.79	28.33	20.55	113.501	Horizontal	Pass
		1880	-3.69	3.95	28.22	20.58	114.288	Horizontal	Pass
		1905	-3.58	3.97	28.19	20.64	115.878	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.95	3.79	28.34	20.60	114.815	Horizontal	Pass
		1880	-3.74	3.95	28.22	20.53	112.980	Horizontal	Pass
		1902.5	-3.60	3.97	28.18	20.61	115.080	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.94	3.81	28.35	20.60	114.815	Horizontal	Pass
		1880	-3.61	3.96	28.22	20.65	116.145	Horizontal	Pass
		1900	-3.55	4.00	28.16	20.61	115.080	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-5.35	3.76	28.24	19.13	81.846	Vertical	Pass
		1880	-4.81	3.91	28.22	19.50	89.125	Vertical	Pass
		1909.3	-5.01	3.93	28.20	19.26	84.333	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-4.53	3.77	28.23	19.93	98.401	Vertical	Pass
		1880	-4.59	3.91	28.24	19.74	94.189	Vertical	Pass
		1908.5	-5.07	3.94	28.25	19.24	83.946	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.31	3.77	28.31	19.23	83.753	Vertical	Pass
		1880	-4.77	3.91	28.22	19.54	89.950	Vertical	Pass
		1907.5	-4.72	3.94	28.20	19.54	89.950	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.47	3.79	28.33	19.07	80.724	Vertical	Pass
		1880	-4.51	3.95	28.22	19.76	94.624	Vertical	Pass
		1905	-4.35	3.97	28.19	19.87	97.051	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-5.21	3.79	28.34	19.34	85.901	Vertical	Pass
		1880	-5.15	3.95	28.22	19.12	81.658	Vertical	Pass
		1902.5	-5.11	3.97	28.18	19.10	81.283	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.55	3.81	28.35	19.99	99.770	Vertical	Pass
		1880	-5.07	3.96	28.22	19.19	82.985	Vertical	Pass
		1900	-4.96	4.00	28.16	19.20	83.176	Vertical	Pass

Radiated Power (EIRP) for Band 2									
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 16 QAM	1/#Mid	1850.7	-5.30	3.76	28.24	19.18	82.794	Horizontal	Pass
		1880	-4.77	3.91	28.22	19.54	89.950	Horizontal	Pass
		1909.3	-4.70	3.93	28.20	19.57	90.573	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.80	3.77	28.23	19.66	92.470	Horizontal	Pass
		1880	-4.88	3.91	28.24	19.45	88.105	Horizontal	Pass
		1908.5	-5.09	3.94	28.25	19.22	83.560	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.74	3.77	28.31	19.80	95.499	Horizontal	Pass
		1880	-4.65	3.91	28.22	19.66	92.470	Horizontal	Pass
		1907.5	-4.33	3.94	28.20	19.93	98.401	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.79	3.79	28.33	19.75	94.406	Horizontal	Pass
		1880	-4.78	3.95	28.22	19.49	88.920	Horizontal	Pass
		1905	-4.25	3.97	28.19	19.97	99.312	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.77	3.79	28.34	19.78	95.060	Horizontal	Pass
		1880	-4.56	3.95	28.22	19.71	93.541	Horizontal	Pass
		1902.5	-4.52	3.97	28.18	19.69	93.111	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.66	3.81	28.35	19.88	97.275	Horizontal	Pass
		1880	-4.36	3.96	28.22	19.90	97.724	Horizontal	Pass
		1900	-4.18	4.00	28.16	19.98	99.541	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-5.87	3.76	28.24	18.61	72.611	Vertical	Pass
		1880	-5.79	3.91	28.22	18.52	71.121	Vertical	Pass
		1909.3	-5.58	3.93	28.20	18.69	73.961	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.71	3.77	28.23	18.75	74.989	Vertical	Pass
		1880	-5.42	3.91	28.24	18.91	77.804	Vertical	Pass
		1908.5	-6.04	3.94	28.25	18.27	67.143	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.65	3.77	28.31	18.89	77.446	Vertical	Pass
		1880	-5.47	3.91	28.22	18.84	76.560	Vertical	Pass
		1907.5	-6.02	3.94	28.20	18.24	66.681	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.05	3.79	28.33	18.49	70.632	Vertical	Pass
		1880	-5.92	3.95	28.22	18.35	68.391	Vertical	Pass
		1905	-5.92	3.97	28.19	18.30	67.608	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-6.41	3.79	28.34	18.14	65.163	Vertical	Pass
		1880	-6.04	3.95	28.22	18.23	66.527	Vertical	Pass
		1902.5	-5.99	3.97	28.18	18.22	66.374	Vertical	Pass
20.0MHz	1/#Mid	1860	-5.96	3.81	28.35	18.58	72.111	Vertical	Pass

Band 16 QAM	1880	-5.91	3.96	28.22	18.35	68.391	Vertical	Pass
	1900	-5.59	4.00	28.16	18.57	71.945	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-4.09	3.12	27.58	20.37	108.893	Horizontal	Pass
		1732.5	-4.08	3.27	27.61	20.26	106.170	Horizontal	Pass
		1754.3	-4.06	3.29	27.63	20.28	106.660	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.26	3.13	27.61	20.22	105.196	Horizontal	Pass
		1732.5	-4.18	3.27	27.61	20.16	103.753	Horizontal	Pass
		1753.5	-4.10	3.30	27.62	20.22	105.196	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.03	3.13	27.63	20.47	111.429	Horizontal	Pass
		1732.5	-3.93	3.27	27.61	20.41	109.901	Horizontal	Pass
		1752.5	-3.81	3.30	27.60	20.49	111.944	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-3.97	3.15	27.64	20.52	112.720	Horizontal	Pass
		1732.5	-3.74	3.31	27.61	20.56	113.763	Horizontal	Pass
		1750	-3.76	3.33	27.59	20.50	112.202	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-3.98	3.15	27.65	20.52	112.720	Horizontal	Pass
		1732.5	-3.82	3.31	27.61	20.48	111.686	Horizontal	Pass
		1747.5	-3.76	3.33	27.57	20.48	111.686	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-3.92	3.17	27.66	20.57	114.025	Horizontal	Pass
		1732.5	-3.75	3.32	27.61	20.54	113.240	Horizontal	Pass
		1745	-3.69	3.36	27.56	20.51	112.460	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-4.89	3.12	27.58	19.57	90.573	Vertical	Pass
		1732.5	-5.27	3.27	27.61	19.07	80.724	Vertical	Pass
		1754.3	-4.87	3.29	27.63	19.47	88.512	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.79	3.13	27.61	19.69	93.111	Vertical	Pass
		1732.5	-4.32	3.27	27.61	20.02	100.462	Vertical	Pass
		1753.5	-5.16	3.30	27.62	19.16	82.414	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.65	3.13	27.63	19.85	96.605	Vertical	Pass
		1732.5	-4.49	3.27	27.61	19.85	96.605	Vertical	Pass
		1752.5	-4.72	3.30	27.60	19.58	90.782	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-5.22	3.15	27.64	19.27	84.528	Vertical	Pass
		1732.5	-4.71	3.31	27.61	19.59	90.991	Vertical	Pass

QPSK		1750	-4.89	3.33	27.59	19.37	86.497	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-5.42	3.15	27.65	19.08	80.910	Vertical	Pass
Band		1732.5	-4.99	3.31	27.61	19.31	85.310	Vertical	Pass
QPSK		1747.5	-5.15	3.33	27.57	19.09	81.096	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.38	3.17	27.66	19.11	81.470	Vertical	Pass
Band		1732.5	-4.33	3.32	27.61	19.96	99.083	Vertical	Pass
QPSK		1745	-4.94	3.36	27.56	19.26	84.333	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-4.90	3.12	27.58	19.56	90.365	Horizontal	Pass
		1732.5	-4.75	3.27	27.61	19.59	90.991	Horizontal	Pass
		1754.3	-4.75	3.29	27.63	19.59	90.991	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.84	3.13	27.61	19.64	92.045	Horizontal	Pass
		1732.5	-4.97	3.27	27.61	19.37	86.497	Horizontal	Pass
		1753.5	-5.19	3.30	27.62	19.13	81.846	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.67	3.13	27.63	19.83	96.161	Horizontal	Pass
		1732.5	-4.63	3.27	27.61	19.71	93.541	Horizontal	Pass
		1752.5	-4.32	3.30	27.60	19.98	99.541	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.74	3.15	27.64	19.75	94.406	Horizontal	Pass
		1732.5	-4.93	3.31	27.61	19.37	86.497	Horizontal	Pass
		1750	-4.31	3.33	27.59	19.95	98.855	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.54	3.15	27.65	19.96	99.083	Horizontal	Pass
		1732.5	-4.60	3.31	27.61	19.70	93.325	Horizontal	Pass
		1747.5	-4.62	3.33	27.57	19.62	91.622	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.49	3.17	27.66	20.00	100.000	Horizontal	Pass
		1732.5	-4.50	3.32	27.61	19.79	95.280	Horizontal	Pass
		1745	-4.31	3.36	27.56	19.89	97.499	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.54	3.12	27.58	18.92	77.983	Vertical	Pass
		1732.5	-5.80	3.27	27.61	18.54	71.450	Vertical	Pass
		1754.3	-6.04	3.29	27.63	18.30	67.608	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.73	3.13	27.61	18.75	74.989	Vertical	Pass
		1732.5	-5.63	3.27	27.61	18.71	74.302	Vertical	Pass
		1753.5	-5.67	3.30	27.62	18.65	73.282	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-6.29	3.13	27.63	18.21	66.222	Vertical	Pass
		1732.5	-6.00	3.27	27.61	18.34	68.234	Vertical	Pass
		1752.5	-5.61	3.30	27.60	18.69	73.961	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-6.42	3.15	27.64	18.07	64.121	Vertical	Pass
		1732.5	-5.76	3.31	27.61	18.54	71.450	Vertical	Pass
		1750	-5.89	3.33	27.59	18.37	68.707	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-6.32	3.15	27.65	18.18	65.766	Vertical	Pass
		1732.5	-6.24	3.31	27.61	18.06	63.973	Vertical	Pass
		1747.5	-6.21	3.33	27.57	18.03	63.533	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.78	3.17	27.66	18.71	74.302	Vertical	Pass

Band 16 QAM		1732.5	-5.96	3.32	27.61	18.33	68.077	Vertical	Pass
		1745	-5.62	3.36	27.56	18.58	72.111	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	3#Mid	824.7	5.21	2.01	19.68	2.15	20.73	118.304	Horizontal	Pass
		836.5	5.09	2.01	19.77	2.15	20.70	117.490	Horizontal	Pass
		848.3	4.89	2.02	19.82	2.15	20.54	113.240	Horizontal	Pass
3.0MHz Band QPSK	1#Mid	825.5	4.98	2.01	19.70	2.15	20.52	112.720	Horizontal	Pass
		836.5	4.88	2.01	19.77	2.15	20.49	111.944	Horizontal	Pass
		847.5	4.75	2.02	19.81	2.15	20.39	109.396	Horizontal	Pass
5.0MHz Band QPSK	1#Mid	826.5	5.26	2.01	19.71	2.15	20.81	120.504	Horizontal	Pass
		836.5	5.14	2.01	19.77	2.15	20.75	118.850	Horizontal	Pass
		846.5	4.98	2.02	19.79	2.15	20.60	114.815	Horizontal	Pass
10.0MHz Band QPSK	1#Mid	829	5.28	2.01	19.73	2.15	20.85	121.619	Horizontal	Pass
		836.5	5.23	2.01	19.77	2.15	20.84	121.339	Horizontal	Pass
		844	5.13	2.02	19.78	2.15	20.74	118.577	Horizontal	Pass
1.4MHz Band QPSK	1#Mid	824.7	3.80	2.01	19.68	2.15	19.32	85.507	Vertical	Pass
		836.5	3.84	2.01	19.77	2.15	19.45	88.105	Vertical	Pass
		848.3	4.17	2.02	19.82	2.15	19.82	95.940	Vertical	Pass
3.0MHz Band QPSK	1#Mid	825.5	4.48	2.01	19.70	2.15	20.02	100.462	Vertical	Pass
		836.5	3.97	2.01	19.77	2.15	19.58	90.782	Vertical	Pass
		847.5	3.99	2.02	19.81	2.15	19.63	91.833	Vertical	Pass
5.0MHz Band QPSK	1#Mid	826.5	3.72	2.01	19.71	2.15	19.27	84.528	Vertical	Pass
		836.5	3.92	2.01	19.77	2.15	19.53	89.743	Vertical	Pass
		846.5	3.99	2.02	19.79	2.15	19.61	91.411	Vertical	Pass
10.0MHz Band QPSK	1#Mid	829	3.58	2.01	19.73	2.15	19.15	82.224	Vertical	Pass
		836.5	4.16	2.01	19.77	2.15	19.77	94.842	Vertical	Pass
		844	4.39	2.02	19.78	2.15	20.00	100.000	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	3/#Mid	824.7	4.36	2.01	19.68	2.15	19.88	97.275	Horizontal	Pass
		836.5	4.29	2.01	19.77	2.15	19.90	97.724	Horizontal	Pass
		848.3	4.13	2.02	19.82	2.15	19.78	95.060	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	4.44	2.01	19.70	2.15	19.98	99.541	Horizontal	Pass
		836.5	4.15	2.01	19.77	2.15	19.76	94.624	Horizontal	Pass
		847.5	3.63	2.02	19.81	2.15	19.27	84.528	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	4.76	2.01	19.71	2.15	20.31	107.399	Horizontal	Pass
		836.5	4.53	2.01	19.77	2.15	20.14	103.276	Horizontal	Pass
		846.5	4.28	2.02	19.79	2.15	19.90	97.724	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	4.76	2.01	19.73	2.15	20.33	107.895	Horizontal	Pass
		836.5	4.48	2.01	19.77	2.15	20.09	102.094	Horizontal	Pass
		844	4.02	2.02	19.78	2.15	19.63	91.833	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	3.50	2.01	19.68	2.15	19.02	79.799	Vertical	Pass
		836.5	4.41	2.01	19.77	2.15	20.02	100.462	Vertical	Pass
		848.3	3.93	2.02	19.82	2.15	19.58	90.782	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	3.81	2.01	19.70	2.15	19.35	86.099	Vertical	Pass
		836.5	2.75	2.01	19.77	2.15	18.36	68.549	Vertical	Pass
		847.5	3.42	2.02	19.81	2.15	19.06	80.538	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	3.46	2.01	19.71	2.15	19.01	79.616	Vertical	Pass
		836.5	3.00	2.01	19.77	2.15	18.61	72.611	Vertical	Pass
		846.5	2.42	2.02	19.79	2.15	18.04	63.680	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	2.97	2.01	19.73	2.15	18.54	71.450	Vertical	Pass
		836.5	2.84	2.01	19.77	2.15	18.45	69.984	Vertical	Pass
		844	3.24	2.02	19.78	2.15	18.85	76.736	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	-2.37	4.54	27.75	20.84	121.339	Horizontal	Pass
		2535	-2.20	4.69	27.72	20.83	121.060	Horizontal	Pass
		2567.5	-2.13	4.71	27.71	20.87	122.180	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.30	4.55	27.76	20.91	123.310	Horizontal	Pass
		2535	-2.11	4.69	27.72	20.92	123.595	Horizontal	Pass
		2565	-2.03	4.72	27.70	20.95	124.451	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.31	4.55	27.77	20.91	123.310	Horizontal	Pass
		2535	-2.17	4.69	27.72	20.86	121.899	Horizontal	Pass
		2562.5	-2.07	4.72	27.69	20.90	123.027	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.25	4.57	27.78	20.96	124.738	Horizontal	Pass
		2535	-2.07	4.73	27.72	20.92	123.595	Horizontal	Pass
		2560	-2.03	4.75	27.68	20.90	123.027	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-4.17	4.54	27.75	19.04	80.168	Vertical	Pass
		2535	-3.94	4.69	27.72	19.09	81.096	Vertical	Pass
		2567.5	-3.29	4.71	27.71	19.71	93.541	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.57	4.55	27.76	19.64	92.045	Vertical	Pass
		2535	-3.23	4.69	27.72	19.80	95.499	Vertical	Pass
		2565	-3.84	4.72	27.70	19.14	82.035	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.47	4.55	27.77	19.75	94.406	Vertical	Pass
		2535	-3.17	4.69	27.72	19.86	96.828	Vertical	Pass
		2562.5	-3.95	4.72	27.69	19.02	79.799	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-3.26	4.57	27.78	19.95	98.855	Vertical	Pass
		2535	-3.72	4.73	27.72	19.27	84.528	Vertical	Pass
		2560	-3.90	4.75	27.68	19.03	79.983	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-3.06	4.54	27.75	20.15	103.514	Horizontal	Pass
		2535	-2.75	4.69	27.72	20.28	106.660	Horizontal	Pass
		2567.5	-2.83	4.71	27.71	20.17	103.992	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-2.95	4.55	27.76	20.26	106.170	Horizontal	Pass
		2535	-2.96	4.69	27.72	20.07	101.625	Horizontal	Pass
		2565	-3.23	4.72	27.70	19.75	94.406	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.13	4.55	27.77	20.09	102.094	Horizontal	Pass
		2535	-3.10	4.69	27.72	19.93	98.401	Horizontal	Pass
		2562.5	-2.71	4.72	27.69	20.26	106.170	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.01	4.57	27.78	20.20	104.713	Horizontal	Pass
		2535	-2.68	4.73	27.72	20.31	107.399	Horizontal	Pass
		2560	-2.78	4.75	27.68	20.15	103.514	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-4.43	4.54	27.75	18.78	75.509	Vertical	Pass
		2535	-4.51	4.69	27.72	18.52	71.121	Vertical	Pass
		2567.5	-3.21	4.71	27.71	19.79	95.280	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.32	4.55	27.76	19.89	97.499	Vertical	Pass
		2535	-3.76	4.69	27.72	19.27	84.528	Vertical	Pass
		2565	-3.80	4.72	27.70	19.18	82.794	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.70	4.55	27.77	19.52	89.536	Vertical	Pass
		2535	-3.96	4.69	27.72	19.07	80.724	Vertical	Pass
		2562.5	-4.14	4.72	27.69	18.83	76.384	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-4.69	4.57	27.78	18.52	71.121	Vertical	Pass
		2535	-4.44	4.73	27.72	18.55	71.614	Vertical	Pass
		2560	-3.55	4.75	27.68	19.38	86.696	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 Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	699.7	5.58	1.91	19.21	2.15	20.73	118.304	Vertical	Pass
		707.5	5.50	1.91	19.26	2.15	20.70	117.490	Vertical	Pass
		715.3	5.28	1.93	19.34	2.15	20.54	113.240	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	5.37	1.91	19.21	2.15	20.52	112.720	Vertical	Pass
		707.5	5.29	1.91	19.26	2.15	20.49	111.944	Vertical	Pass
		714.5	5.13	1.93	19.34	2.15	20.39	109.396	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	5.64	1.91	19.23	2.15	20.81	120.504	Vertical	Pass
		707.5	5.55	1.91	19.26	2.15	20.75	118.850	Vertical	Pass
		713.5	5.34	1.92	19.33	2.15	20.60	114.815	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	704	5.66	1.91	19.25	2.15	20.85	121.619	Vertical	Pass
		707.5	5.64	1.91	19.26	2.15	20.84	121.339	Vertical	Pass
		711	5.49	1.92	19.32	2.15	20.74	118.577	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	4.50	1.91	19.21	2.15	19.65	92.257	Horizontal	Pass
		707.5	4.81	1.91	19.26	2.15	20.01	100.231	Horizontal	Pass
		715.3	4.65	1.93	19.34	2.15	19.91	97.949	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	3.88	1.91	19.21	2.15	19.03	79.983	Horizontal	Pass
		707.5	3.92	1.91	19.26	2.15	19.12	81.658	Horizontal	Pass
		714.5	4.06	1.93	19.34	2.15	19.32	85.507	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	4.43	1.91	19.23	2.15	19.60	91.201	Horizontal	Pass
		707.5	4.11	1.91	19.26	2.15	19.31	85.310	Horizontal	Pass
		713.5	4.44	1.92	19.33	2.15	19.70	93.325	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	704	4.66	1.91	19.25	2.15	19.85	96.605	Horizontal	Pass
		707.5	4.33	1.91	19.26	2.15	19.53	89.743	Horizontal	Pass
		711	4.52	1.92	19.32	2.15	19.77	94.842	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Correction	Max. ERP	Max. ERP	Polarization Of Max. ERP	
			(dBm)			(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	699.7	5.74	1.91	19.21	2.15	20.89	122.744	Vertical	Pass
		707.5	5.66	1.91	19.26	2.15	20.86	121.899	Vertical	Pass
		715.3	5.44	1.93	19.34	2.15	20.70	117.490	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	5.53	1.91	19.21	2.15	20.68	116.950	Vertical	Pass
		707.5	5.45	1.91	19.26	2.15	20.65	116.145	Vertical	Pass
		714.5	5.29	1.93	19.34	2.15	20.55	113.501	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	5.80	1.91	19.23	2.15	20.97	125.026	Vertical	Pass
		707.5	5.71	1.91	19.26	2.15	20.91	123.310	Vertical	Pass
		713.5	5.50	1.92	19.33	2.15	20.76	119.124	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	5.82	1.91	19.25	2.15	21.01	126.183	Vertical	Pass
		707.5	5.80	1.91	19.26	2.15	21.00	125.893	Vertical	Pass
		711	5.65	1.92	19.32	2.15	20.90	123.027	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	4.38	1.91	19.21	2.15	19.53	89.743	Horizontal	Pass
		707.5	4.40	1.91	19.26	2.15	19.60	91.201	Horizontal	Pass
		715.3	4.45	1.93	19.34	2.15	19.71	93.541	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	4.44	1.91	19.21	2.15	19.59	90.991	Horizontal	Pass
		707.5	4.55	1.91	19.26	2.15	19.75	94.406	Horizontal	Pass
		714.5	4.28	1.93	19.34	2.15	19.54	89.950	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	4.78	1.91	19.23	2.15	19.95	98.855	Horizontal	Pass
		707.5	4.62	1.91	19.26	2.15	19.82	95.940	Horizontal	Pass
		713.5	4.78	1.92	19.33	2.15	20.04	100.925	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	4.26	1.91	19.25	2.15	19.45	88.105	Horizontal	Pass
		707.5	4.03	1.91	19.26	2.15	19.23	83.753	Horizontal	Pass
		711	4.19	1.92	19.32	2.15	19.44	87.902	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.7 LTE BAND 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	1/#Mid	2498.5	-2.51	4.54	27.75	20.70	117.490	Horizontal	Pass
		2593	-2.36	4.69	27.72	20.67	116.681	Horizontal	Pass
		2687.5	-2.24	4.71	27.71	20.76	119.124	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2501	-2.59	4.55	27.76	20.62	115.345	Horizontal	Pass
		2593	-2.45	4.69	27.72	20.58	114.288	Horizontal	Pass
		2685	-2.44	4.72	27.70	20.54	113.240	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	-2.42	4.55	27.77	20.80	120.226	Horizontal	Pass
		2593	-2.14	4.69	27.72	20.89	122.744	Horizontal	Pass
		2682.5	-2.19	4.72	27.69	20.78	119.674	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2506	-2.03	4.57	27.78	21.18	131.220	Horizontal	Pass
		2593	-2.08	4.73	27.72	20.91	123.310	Horizontal	Pass
		2680	-2.08	4.75	27.68	20.85	121.619	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2498.5	-2.31	4.54	27.75	20.90	123.027	Vertical	Pass
		2593	-2.22	4.69	27.72	20.81	120.504	Vertical	Pass
		2687.5	-2.20	4.71	27.71	20.80	120.226	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2501	-2.29	4.55	27.76	20.92	123.595	Vertical	Pass
		2593	-2.13	4.69	27.72	20.90	123.027	Vertical	Pass
		2685	-2.20	4.72	27.70	20.78	119.674	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	-3.43	4.55	27.77	19.79	95.280	Vertical	Pass
		2593	-3.79	4.69	27.72	19.24	83.946	Vertical	Pass
		2682.5	-3.01	4.72	27.69	19.96	99.083	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2506	-3.80	4.57	27.78	19.41	87.297	Vertical	Pass
		2593	-2.93	4.73	27.72	20.06	101.391	Vertical	Pass
		2680	-3.31	4.75	27.68	19.62	91.622	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization	
			(dBm)			Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#Mid	2498.5	-2.44	4.54	27.75	20.77	119.399	Horizontal	Pass
		2593	-2.29	4.69	27.72	20.74	118.577	Horizontal	Pass
		2687.5	-2.17	4.71	27.71	20.83	121.060	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2501	-2.52	4.55	27.76	20.69	117.220	Horizontal	Pass
		2593	-2.38	4.69	27.72	20.65	116.145	Horizontal	Pass
		2685	-2.37	4.72	27.70	20.61	115.080	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2503.5	-2.35	4.55	27.77	20.87	122.180	Horizontal	Pass
		2593	-2.07	4.69	27.72	20.96	124.738	Horizontal	Pass
		2682.5	-2.12	4.72	27.69	20.85	121.619	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2506	-2.07	4.57	27.78	21.14	130.017	Horizontal	Pass
		2593	-2.01	4.73	27.72	20.98	125.314	Horizontal	Pass
		2680	-2.01	4.75	27.68	20.92	123.595	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2498.5	-2.24	4.54	27.75	20.97	125.026	Vertical	Pass
		2593	-2.15	4.69	27.72	20.88	122.462	Vertical	Pass
		2687.5	-2.13	4.71	27.71	20.87	122.180	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2501	-2.22	4.55	27.76	20.99	125.603	Vertical	Pass
		2593	-2.06	4.69	27.72	20.97	125.026	Vertical	Pass
		2685	-2.13	4.72	27.70	20.85	121.619	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2503.5	-3.43	4.55	27.77	19.79	95.280	Vertical	Pass
		2593	-3.04	4.69	27.72	19.99	99.770	Vertical	Pass
		2682.5	-3.14	4.72	27.69	19.83	96.161	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2506	-3.35	4.57	27.78	19.86	96.828	Vertical	Pass
		2593	-3.23	4.73	27.72	19.76	94.624	Vertical	Pass
		2680	-2.77	4.75	27.68	20.16	103.753	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 2/4/5/7/12/41

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	-51.74	4.04	33.51	-22.27	-13	-9.27	Horizontal
3701.4	-52.27	4.04	33.51	-22.80	-13	-9.80	Vertical
5552.1	-53.58	5.24	35.84	-22.98	-13	-9.98	Vertical
5552.1	-52.13	5.24	35.84	-21.53	-13	-8.53	Horizontal
191.6	-34.76	1.43	16.02	-20.17	-13	-7.17	Vertical
377.2	-43.55	1.30	17.99	-26.86	-13	-13.86	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.74	4.04	33.56	-18.22	-13	-5.22	Horizontal
3760.0	-49.34	4.04	33.56	-19.82	-13	-6.82	Vertical
5640.0	-48.81	5.24	35.91	-18.14	-13	-5.14	Vertical
5640.0	-51.11	5.24	35.91	-20.44	-13	-7.44	Horizontal
202.6	-44.84	1.62	16.97	-29.49	-13	-16.49	Vertical
320.5	-38.36	1.74	15.98	-24.13	-13	-11.13	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-52.84	4.04	34.00	-22.88	-13	-9.88	Horizontal
3818.6	-51.60	4.04	34.00	-21.64	-13	-8.64	Vertical
5727.9	-51.84	5.24	36.04	-21.04	-13	-8.04	Vertical
5727.9	-52.29	5.24	36.04	-21.49	-13	-8.49	Horizontal
200.0	-34.69	1.42	17.29	-18.82	-13	-5.82	Vertical
413.7	-44.93	1.50	17.90	-28.52	-13	-15.52	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-48.50	4.07	33.54	-19.03	-13	-6.03	Horizontal
3720.0	-49.30	4.07	33.54	-19.83	-13	-6.83	Vertical
5580.0	-50.51	5.28	35.86	-19.93	-13	-6.93	Vertical
5580.0	-49.97	5.28	35.86	-19.39	-13	-6.39	Horizontal
203.0	-38.17	1.58	16.89	-22.85	-13	-9.85	Vertical
335.2	-43.31	1.76	17.26	-27.81	-13	-14.81	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.16	4.04	33.56	-19.64	-13	-6.64	Horizontal
3760.0	-45.02	4.04	33.56	-15.50	-13	-2.50	Vertical
5640.0	-51.90	5.24	35.91	-21.23	-13	-8.23	Vertical
5640.0	-52.59	5.24	35.91	-21.92	-13	-8.92	Horizontal
187.0	-34.43	1.46	16.27	-19.62	-13	-6.62	Vertical
356.9	-34.09	1.59	15.15	-20.53	-13	-7.53	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-47.79	4.04	34.00	-17.83	-13	-4.83	Horizontal
3800.0	-51.27	4.04	34.00	-21.31	-13	-8.31	Vertical
5700.0	-52.89	5.24	36.04	-22.09	-13	-9.09	Vertical
5700.0	-51.96	5.24	36.04	-21.16	-13	-8.16	Horizontal
196.7	-44.81	1.36	17.39	-28.77	-13	-15.77	Vertical
284.3	-40.76	1.66	15.39	-27.03	-13	-14.03	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	-47.42	4.02	29.80	-21.64	-13	-8.64	Horizontal
3421.4	-44.28	4.02	29.80	-18.50	-13	-5.50	Vertical
5132.1	-46.34	5.24	35.84	-15.74	-13	-2.74	Vertical
5132.1	-50.52	5.24	35.84	-19.92	-13	-6.92	Horizontal
198.8	-44.28	1.68	16.04	-29.92	-13	-16.92	Vertical
304.8	-35.12	1.78	17.74	-19.16	-13	-6.16	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.01	4.03	30.00	-27.04	-13	-14.04	Horizontal
3465.0	-47.56	4.03	30.00	-21.59	-13	-8.59	Vertical
5197.5	-52.48	5.25	35.86	-21.87	-13	-8.87	Vertical
5197.5	-53.77	5.25	35.86	-23.16	-13	-10.16	Horizontal
211.5	-41.73	1.72	17.69	-25.76	-13	-12.76	Vertical
249.4	-34.36	1.62	16.02	-19.95	-13	-6.95	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.91	4.05	30.01	-23.95	-13	-10.95	Horizontal
3508.6	-50.36	4.05	30.01	-24.40	-13	-11.40	Vertical
5262.9	-51.25	5.26	35.86	-20.65	-13	-7.65	Vertical
5262.9	-52.68	5.26	35.86	-22.08	-13	-9.08	Horizontal
183.3	-44.10	1.80	16.69	-29.21	-13	-16.21	Vertical
340.2	-34.09	1.75	16.66	-19.19	-13	-6.19	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	-52.75	4.02	29.80	-26.97	-13	-13.97	Horizontal
3440.0	-46.59	4.02	29.80	-20.81	-13	-7.81	Vertical
5160.0	-51.90	5.24	35.84	-21.30	-13	-8.30	Vertical
5160.0	-51.02	5.24	35.84	-20.42	-13	-7.42	Horizontal
210.4	-38.49	1.57	17.26	-22.80	-13	-9.80	Vertical
449.3	-37.56	1.78	16.35	-22.99	-13	-9.99	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-52.25	4.03	30.00	-26.28	-13	-13.28	Horizontal
3465.0	-47.61	4.03	30.00	-21.64	-13	-8.64	Vertical
5197.5	-46.12	5.25	35.86	-15.51	-13	-2.51	Vertical
5197.5	-53.63	5.25	35.86	-23.02	-13	-10.02	Horizontal
201.5	-39.71	1.44	17.95	-23.20	-13	-10.20	Vertical
398.4	-43.38	1.65	16.09	-28.94	-13	-15.94	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.31	2.91	27.68	-28.54	-13	-15.54	Horizontal
3490.0	-50.05	2.91	27.68	-25.28	-13	-12.28	Vertical
5235.0	-52.63	5.26	35.86	-22.03	-13	-9.03	Vertical
5235.0	-49.03	5.26	35.86	-18.43	-13	-5.43	Horizontal
185.5	-34.76	1.61	16.85	-19.52	-13	-6.52	Vertical
302.8	-36.48	1.61	15.19	-22.90	-13	-9.90	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	-47.26	2.78	27.50	-22.54	-13	-9.54	Horizontal
1649.4	-53.82	2.78	27.50	-29.10	-13	-16.10	Vertical
2474.1	-50.28	2.90	27.80	-25.38	-13	-12.38	Vertical
2474.1	-50.01	2.90	27.80	-25.11	-13	-12.11	Horizontal
212.7	-41.25	1.76	17.59	-25.42	-13	-12.42	Vertical
409.2	-39.18	1.63	15.87	-24.94	-13	-11.94	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-49.99	2.80	27.48	-25.31	-13	-12.31	Horizontal
1673.0	-51.70	2.80	27.48	-27.02	-13	-14.02	Vertical
2509.5	-47.60	2.91	27.70	-22.81	-13	-9.81	Vertical
2509.5	-53.26	2.91	27.70	-28.47	-13	-15.47	Horizontal
204.0	-44.83	1.61	15.68	-30.76	-13	-17.76	Vertical
439.9	-35.33	1.59	17.52	-19.41	-13	-6.41	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-45.63	2.82	27.43	-21.02	-13	-8.02	Horizontal
1696.6	-47.13	2.82	27.43	-22.52	-13	-9.52	Vertical
2544.9	-51.73	2.92	27.74	-26.91	-13	-13.91	Vertical
2544.9	-51.84	2.92	27.74	-27.02	-13	-14.02	Horizontal
176.2	-37.73	1.69	16.67	-22.74	-13	-9.74	Vertical
344.8	-43.97	1.70	17.18	-28.49	-13	-15.49	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	-47.96	2.78	27.50	-23.24	-13	-10.24	Horizontal
1658.0	-44.62	2.78	27.50	-19.90	-13	-6.90	Vertical
2487.0	-50.30	2.90	27.80	-25.40	-13	-12.40	Vertical
2487.0	-52.26	2.90	27.80	-27.36	-13	-14.36	Horizontal
196.5	-43.25	1.71	15.57	-29.39	-13	-16.39	Vertical
424.5	-43.92	1.34	16.40	-28.86	-13	-15.86	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.57	2.80	27.48	-24.89	-13	-11.89	Horizontal
1673.0	-53.89	2.80	27.48	-29.21	-13	-16.21	Vertical
2509.5	-52.91	2.91	27.70	-28.12	-13	-15.12	Vertical
2509.5	-52.32	2.91	27.70	-27.53	-13	-14.53	Horizontal
199.4	-39.31	1.44	17.04	-23.71	-13	-10.71	Vertical
463.5	-39.16	1.76	17.62	-23.30	-13	-10.30	Horizontal
Test Results for High Channel 844MHz							
1688.0	-50.01	2.82	27.43	-25.40	-13	-12.40	Horizontal
1688.0	-44.91	2.82	27.43	-20.30	-13	-7.30	Vertical
2532.0	-52.96	2.92	27.74	-28.14	-13	-15.14	Vertical
2532.0	-50.78	2.92	27.74	-25.96	-13	-12.96	Horizontal
185.7	-37.67	1.74	17.70	-21.71	-13	-8.71	Vertical
305.3	-36.66	1.41	17.46	-20.60	-13	-7.60	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	-61.37	5.23	35.81	-30.79	-25	-5.79	Horizontal
5005.0	-62.63	5.23	35.81	-32.05	-25	-7.05	Vertical
7507.5	-63.72	5.67	36.85	-32.54	-25	-7.54	Vertical
7507.5	-59.59	5.67	36.85	-28.41	-25	-3.41	Horizontal
178.1	-54.21	1.73	17.97	-37.97	-25	-12.97	Vertical
281.7	-49.06	1.38	15.11	-35.33	-25	-10.33	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.98	5.23	35.82	-33.39	-25	-8.39	Horizontal
5070.0	-62.26	5.23	35.82	-31.67	-25	-6.67	Vertical
7605.0	-62.39	5.67	36.85	-31.21	-25	-6.21	Vertical
7605.0	-61.01	5.67	36.85	-29.83	-25	-4.83	Horizontal
200.6	-49.70	1.77	16.17	-35.29	-25	-10.29	Vertical
438.2	-44.40	1.63	15.21	-30.82	-25	-5.82	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.22	5.24	35.83	-28.63	-25	-3.63	Horizontal
5135.0	-60.31	5.24	35.83	-29.72	-25	-4.72	Vertical
7702.5	-59.45	5.68	36.87	-28.26	-25	-3.26	Vertical
7702.5	-64.47	5.68	36.87	-33.28	-25	-8.28	Horizontal
180.2	-50.32	1.58	17.56	-34.34	-25	-9.34	Vertical
417.4	-51.45	1.45	16.58	-36.32	-25	-11.32	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	-59.66	5.23	35.82	-29.07	-25	-4.07	Horizontal
5020.0	-61.02	5.23	35.82	-30.43	-25	-5.43	Vertical
7530.0	-62.67	5.67	36.86	-31.48	-25	-6.48	Vertical
7530.0	-63.74	5.67	36.86	-32.55	-25	-7.55	Horizontal
206.7	-47.58	1.63	15.76	-33.45	-25	-8.45	Vertical
283.8	-52.83	1.71	15.44	-39.10	-25	-14.10	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.18	5.23	35.82	-33.59	-25	-8.59	Horizontal
5070.0	-59.75	5.23	35.82	-29.16	-25	-4.16	Vertical
7605.0	-60.89	5.67	36.85	-29.71	-25	-4.71	Vertical
7605.0	-60.48	5.67	36.85	-29.30	-25	-4.30	Horizontal
210.5	-50.84	1.79	16.84	-35.78	-25	-10.78	Vertical
268.5	-44.26	1.71	17.64	-28.33	-25	-3.33	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-64.19	5.24	35.83	-33.60	-25	-8.60	Horizontal
5120.0	-63.41	5.24	35.83	-32.82	-25	-7.82	Vertical
7680.0	-59.67	5.70	36.88	-28.49	-25	-3.49	Vertical
7680.0	-62.73	5.70	36.88	-31.55	-25	-6.55	Horizontal
176.7	-46.83	1.79	16.84	-31.77	-25	-6.77	Vertical
236.9	-47.64	1.71	17.64	-31.71	-25	-6.71	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	-48.39	2.60	27.20	-23.79	-13	-10.79	Horizontal
1399.4	-50.90	2.60	27.20	-26.30	-13	-13.30	Vertical
2099.1	-46.03	2.85	27.54	-21.34	-13	-8.34	Vertical
2099.1	-51.17	2.85	27.54	-26.48	-13	-13.48	Horizontal
193.2	-42.19	1.49	17.78	-25.90	-13	-12.90	Vertical
455.5	-38.09	1.36	17.33	-22.12	-13	-9.12	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-49.09	2.61	27.28	-24.42	-13	-11.42	Horizontal
1415.0	-44.78	2.61	27.28	-20.11	-13	-7.11	Vertical
2122.5	-46.52	2.87	27.59	-21.80	-13	-8.80	Vertical
2122.5	-52.08	2.87	27.59	-27.36	-13	-14.36	Horizontal
193.3	-41.67	1.73	15.74	-27.66	-13	-14.66	Vertical
304.7	-38.53	1.62	15.79	-24.36	-13	-11.36	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.10	2.63	27.28	-27.45	-13	-14.45	Horizontal
1430.6	-53.54	2.63	27.28	-28.89	-13	-15.89	Vertical
2145.9	-51.83	2.88	27.60	-27.11	-13	-14.11	Vertical
2145.9	-50.27	2.88	27.60	-25.55	-13	-12.55	Horizontal
175.1	-39.02	1.61	18.00	-22.63	-13	-9.63	Vertical
404.6	-42.81	1.45	15.49	-28.78	-13	-15.78	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	-45.72	2.61	27.26	-21.07	-13	-8.07	Horizontal
1408.0	-49.28	2.61	27.26	-24.63	-13	-11.63	Vertical
2112.0	-51.73	2.87	27.58	-27.02	-13	-14.02	Vertical
2112.0	-51.42	2.87	27.58	-26.71	-13	-13.71	Horizontal
205.6	-43.10	1.31	16.97	-27.44	-13	-14.44	Vertical
233.8	-42.15	1.65	16.70	-27.10	-13	-14.10	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-52.60	2.61	27.28	-27.93	-13	-14.93	Horizontal
1415.0	-47.66	2.61	27.28	-22.99	-13	-9.99	Vertical
2122.5	-49.81	2.87	27.59	-25.09	-13	-12.09	Vertical
2122.5	-50.83	2.87	27.59	-26.11	-13	-13.11	Horizontal
179.6	-36.84	1.72	17.99	-20.57	-13	-7.57	Vertical
418.6	-34.20	1.73	17.94	-17.99	-13	-4.99	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.50	2.62	27.28	-25.84	-13	-12.84	Horizontal
1422.0	-53.68	2.62	27.28	-29.02	-13	-16.02	Vertical
2133.0	-47.36	2.87	27.60	-22.63	-13	-9.63	Vertical
2133.0	-49.75	2.87	27.60	-25.02	-13	-12.02	Horizontal
179.1	-41.57	1.58	15.93	-27.22	-13	-14.22	Vertical
295.2	-40.07	1.36	15.59	-25.84	-13	-12.84	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 41

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

Test Results for Low Channel 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997.0	-63.28	5.23	35.81	-32.70	-25	-7.70	Horizontal
4997.0	-64.46	5.23	35.81	-33.88	-25	-8.88	Vertical
2495.5	-63.77	5.67	36.85	-32.59	-25	-7.59	Vertical
2495.5	-62.76	5.67	36.85	-31.58	-25	-6.58	Horizontal
435.3	-47.05	1.38	15.98	-32.45	-25	-7.45	Vertical
465.8	-48.70	1.62	15.66	-34.66	-25	-9.66	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-62.87	5.23	35.82	-32.28	-25	-7.28	Horizontal
5186.0	-63.69	5.23	35.82	-33.10	-25	-8.10	Vertical
5186.0	-62.52	5.67	36.85	-31.34	-25	-6.34	Vertical
5186.0	-64.12	5.67	36.85	-32.94	-25	-7.94	Horizontal
510.4	-45.44	1.62	16.17	-30.89	-25	-5.89	Vertical
562.9	-45.28	1.74	17.63	-29.39	-25	-4.39	Horizontal
Test Results for High Channel 2617.5MHz							
5375.0	-60.04	5.24	35.83	-29.45	-25	-4.45	Horizontal
5375.0	-60.77	5.24	35.83	-30.18	-25	-5.18	Vertical
8062.5	-60.38	5.68	36.87	-29.19	-25	-4.19	Vertical
8062.5	-61.43	5.68	36.87	-30.24	-25	-5.24	Horizontal
197.6	-47.05	1.55	15.84	-32.76	-25	-7.76	Vertical
353.1	-48.89	1.51	17.06	-33.34	-25	-8.34	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012.0	-63.42	5.23	35.82	-32.83	-25	-7.83	Horizontal
5012.0	-60.69	5.23	35.82	-30.10	-25	-5.10	Vertical
7518.0	-62.94	5.67	36.86	-31.75	-25	-6.75	Vertical
7518.0	-61.41	5.67	36.86	-30.22	-25	-5.22	Horizontal
128.9	-47.01	1.43	15.51	-32.93	-25	-7.93	Vertical
344.8	-45.64	1.40	16.97	-30.07	-25	-5.07	Horizontal
Test Results for Mid Channel 2593MHz							
5186.0	-61.20	5.23	35.82	-30.61	-25	-5.61	Horizontal
5186.0	-62.26	5.23	35.82	-31.67	-25	-6.67	Vertical
7779.0	-62.69	5.67	36.85	-31.51	-25	-6.51	Vertical
7779.0	-64.34	5.67	36.85	-33.16	-25	-8.16	Horizontal
100.8	-46.72	1.77	16.72	-31.77	-25	-6.77	Vertical
263.5	-44.94	1.31	16.99	-29.26	-25	-4.26	Horizontal
Test Results for High Channel 2680MHz							
5360.0	-61.23	5.24	35.83	-30.64	-25	-5.64	Horizontal
5360.0	-60.78	5.24	35.83	-30.19	-25	-5.19	Vertical
2677.0	-60.66	5.70	36.88	-29.48	-25	-4.48	Vertical
2677.0	-62.94	5.70	36.88	-31.76	-25	-6.76	Horizontal
349.9	-47.14	1.70	15.73	-33.11	-25	-8.11	Vertical
110.3	-46.30	1.75	17.33	-30.72	-25	-5.72	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 3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2/4/5/7/12/41

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]
3.29	1880	12.2	0.006501	2.5
3.87	1880	13.5	0.007194	2.5
4.45	1880	13.3	0.007050	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.8	0.006827	2.5
Extreme (50C)	1880	11.7	0.006204	2.5
Extreme (40C)	1880	13.6	0.007225	2.5
Extreme (30C)	1880	14.0	0.007425	2.5
Extreme (10C)	1880	13.6	0.007252	2.5
Extreme (0C)	1880	11.8	0.006294	2.5
Extreme (-10C)	1880	13.2	0.006999	2.5
Extreme (-20C)	1880	14.6	0.007756	2.5
Extreme (-30C)	1880	14.9	0.007908	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]
3.29	1880	9.5	0.005079	2.5
3.87	1880	8.6	0.004555	2.5
4.45	1880	8.5	0.004543	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.3	0.004925	2.5
Extreme (50C)	1880	8.6	0.004594	2.5
Extreme (40C)	1880	8.3	0.004439	2.5
Extreme (30C)	1880	8.9	0.004709	2.5
Extreme (10C)	1880	9.1	0.004852	2.5
Extreme (0C)	1880	7.9	0.004181	2.5
Extreme (-10C)	1880	9.4	0.005019	2.5
Extreme (-20C)	1880	8.9	0.004715	2.5
Extreme (-30C)	1880	7.8	0.004171	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]
3.29	1732.5	8.5	0.004906	2.5
3.87	1732.5	8.8	0.005057	2.5
4.45	1732.5	8.9	0.005124	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.4	0.004858	2.5
Extreme (50C)	1732.5	8.7	0.005005	2.5
Extreme (40C)	1732.5	7.6	0.004386	2.5
Extreme (30C)	1732.5	5.7	0.003280	2.5
Extreme (10C)	1732.5	7.2	0.004146	2.5
Extreme (0C)	1732.5	8.9	0.005139	2.5
Extreme (-10C)	1732.5	8.0	0.004593	2.5
Extreme (-20C)	1732.5	7.1	0.004114	2.5
Extreme (-30C)	1732.5	8.5	0.004878	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]
3.29	1732.5	9.9	0.005693	2.5
3.87	1732.5	9.0	0.005174	2.5
4.45	1732.5	8.4	0.004837	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.0	0.005775	2.5
Extreme (50C)	1732.5	9.1	0.005256	2.5
Extreme (40C)	1732.5	7.8	0.004513	2.5
Extreme (30C)	1732.5	9.5	0.005472	2.5
Extreme (10C)	1732.5	9.2	0.005329	2.5
Extreme (0C)	1732.5	8.2	0.004742	2.5
Extreme (-10C)	1732.5	9.4	0.005425	2.5
Extreme (-20C)	1732.5	8.6	0.004954	2.5
Extreme (-30C)	1732.5	7.6	0.004405	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]
3.29	836.5	5.3	0.006380	2.5
3.87	836.5	6.4	0.007710	2.5
4.45	836.5	4.4	0.005204	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.2	0.007413	2.5
Extreme (50C)	836.5	5.8	0.006919	2.5
Extreme (40C)	836.5	6.6	0.007844	2.5
Extreme (30C)	836.5	6.8	0.008125	2.5
Extreme (10C)	836.5	5.1	0.006091	2.5
Extreme (0C)	836.5	4.9	0.005815	2.5
Extreme (-10C)	836.5	5.7	0.006775	2.5
Extreme (-20C)	836.5	6.2	0.007455	2.5
Extreme (-30C)	836.5	6.4	0.007637	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]
3.29	836.5	6.3	0.007522	2.5
3.87	836.5	6.7	0.008019	2.5
4.45	836.5	4.9	0.005863	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.4	0.007619	2.5
Extreme (50C)	836.5	5.5	0.006524	2.5
Extreme (40C)	836.5	5.7	0.006788	2.5
Extreme (30C)	836.5	6.0	0.007179	2.5
Extreme (10C)	836.5	5.8	0.006886	2.5
Extreme (0C)	836.5	5.4	0.006505	2.5
Extreme (-10C)	836.5	5.4	0.006459	2.5
Extreme (-20C)	836.5	6.6	0.007868	2.5
Extreme (-30C)	836.5	6.4	0.007659	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]
3.29	2535	9.7	0.003830	2.5
3.87	2535	8.4	0.003320	2.5
4.45	2535	8.6	0.003410	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.8	0.003884	2.5
Extreme (50C)	2535	9.2	0.003630	2.5
Extreme (40C)	2535	8.0	0.003136	2.5
Extreme (30C)	2535	9.1	0.003608	2.5
Extreme (10C)	2535	7.6	0.003000	2.5
Extreme (0C)	2535	8.6	0.003406	2.5
Extreme (-10C)	2535	9.2	0.003635	2.5
Extreme (-20C)	2535	9.2	0.003635	2.5
Extreme (-30C)	2535	8.5	0.003359	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]
3.29	2535	6.9	0.002711	2.5
3.87	2535	6.7	0.002655	2.5
4.45	2535	5.5	0.002172	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.4	0.002505	2.5
Extreme (50C)	2535	5.2	0.002043	2.5
Extreme (40C)	2535	5.3	0.002095	2.5
Extreme (30C)	2535	6.9	0.002710	2.5
Extreme (10C)	2535	6.1	0.002404	2.5
Extreme (0C)	2535	4.8	0.001909	2.5
Extreme (-10C)	2535	5.0	0.001959	2.5
Extreme (-20C)	2535	5.7	0.002259	2.5
Extreme (-30C)	2535	5.6	0.002208	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]
3.29	707.5	8.9	0.012599	2.5
3.87	707.5	9.7	0.013670	2.5
4.45	707.5	8.6	0.012198	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.0	0.012763	2.5
Extreme (50C)	707.5	7.6	0.010675	2.5
Extreme (40C)	707.5	7.1	0.010083	2.5
Extreme (30C)	707.5	8.0	0.011296	2.5
Extreme (10C)	707.5	6.9	0.009815	2.5
Extreme (0C)	707.5	8.9	0.012545	2.5
Extreme (-10C)	707.5	8.6	0.012139	2.5
Extreme (-20C)	707.5	8.4	0.011921	2.5
Extreme (-30C)	707.5	7.8	0.011026	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]
3.29	707.5	7.3	0.010329	2.5
3.87	707.5	7.9	0.011107	2.5
4.45	707.5	7.2	0.010147	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	6.5	0.009175	2.5
Extreme (50C)	707.5	5.5	0.007765	2.5
Extreme (40C)	707.5	6.4	0.009110	2.5
Extreme (30C)	707.5	-7.7	-0.010912	2.5
Extreme (10C)	707.5	-8.2	-0.011590	2.5
Extreme (0C)	707.5	2.9	0.004100	2.5
Extreme (-10C)	707.5	-5.2	-0.007292	2.5
Extreme (-20C)	707.5	-8.7	-0.012302	2.5
Extreme (-30C)	707.5	-10.2	-0.014350	2.5

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

10.6 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]
3.29	2593	8.5	0.003293	2.5
3.87	2593	6.3	0.002448	2.5
4.45	2593	7.6	0.002912	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	7.5	0.002893	2.5
Extreme (50C)	2593	4.7	0.001816	2.5
Extreme (40C)	2593	5.9	0.002259	2.5
Extreme (30C)	2593	4.7	0.001800	2.5
Extreme (10C)	2593	6.1	0.002348	2.5
Extreme (0C)	2593	4.8	0.001857	2.5
Extreme (-10C)	2593	9.7	0.003743	2.5
Extreme (-20C)	2593	10.8	0.004171	2.5
Extreme (-30C)	2593	5.9	0.002270	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]
3.29	2593	8.4	0.003247	2.5
3.87	2593	6.7	0.002590	2.5
4.45	2593	6.1	0.002344	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	7.3	0.002799	2.5
Extreme (50C)	2593	4.8	0.001860	2.5
Extreme (40C)	2593	5.0	0.001914	2.5
Extreme (30C)	2593	4.6	0.001756	2.5
Extreme (10C)	2593	6.8	0.002620	2.5
Extreme (0C)	2593	4.8	0.001844	2.5
Extreme (-10C)	2593	9.3	0.003582	2.5
Extreme (-20C)	2593	11.2	0.004304	2.5
Extreme (-30C)	2593	6.4	0.002455	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.

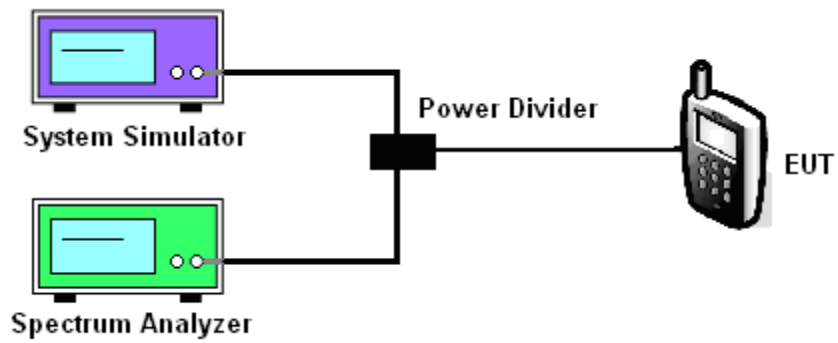
11.2 Measuring Instruments

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 2/4/5/7/12/41

Test data reference attachment.

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