

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

FCC ID: ZSW-10-051

Product: Mobile Phone

Trade Mark: Bmobile

Model Number: MEGA W51

Family Model: N/A

Report No.: S25032105702003

Prepared for

b mobile HK Limited

FLAT/RM 1202 12/F GOLDEN STAR BUILDING 20
LOCKHART ROAD WANCHAI HK, CHINA

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name..... : b mobile HK Limited

Address : FLAT/RM 1202 12/F GOLDEN STAR BUILDING 20
LOCKHART ROAD WANCHAI HK, CHINA

Manufacturer's Name..... : b mobile HK Limited

Address : FLAT/RM 1202 12/F GOLDEN STAR BUILDING 20
LOCKHART ROAD WANCHAI HK, CHINA

Product name : Mobile Phone

Model and/or type reference : MEGA W51

Family Model: N/A

Test sample number S250321057002

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 Mar. 21, 2025 ~ Apr. 09, 2025

Date of Issue Apr. 09, 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:	Mobile Phone
Trade Mark	Bmobile
Model Name	MEGA W51
Family Model	N/A
Model Difference	N/A
FCC ID:	ZSW-10-051
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7
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;
Type of Modulation:	QPSK/16QAM
Antenna:	PIFA Antenna
Antenna gain:	LTE B2:0.25dBi; B4:0.27dBi; B5:0.22dBi; B7:0.35dBi
Power Supply:	DC 3.8V from Battery or DC 5V from Adapter.
Battery	DC 3.8V, 1500mAh, 5.7Wh
Adapter:	INPUT: AC 100-240V~50-60Hz 0.15A OUTPUT: DC 5.0V---500mA
Extreme Vol. Limits:	DC 3.23V to DC 4.37V (Nominal DC 3.8V) (Note 1)
HW Version	Bmobile_MEGA_W51_HW_V1.0
SW Version	Bmobile_MEGA_W51_TIGO_LATAM_V001
** Note1: The High Voltage 4.37V and Low Voltage 3.23V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: ZSW-10-051** 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, Band 4, Band 5, Band 7.

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

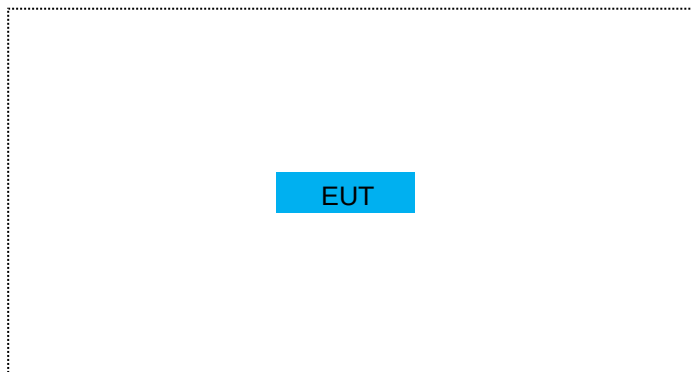
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	MEGA W51	FCC ID: ZSW-10-051	EUT

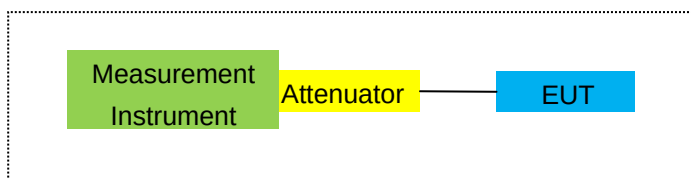
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

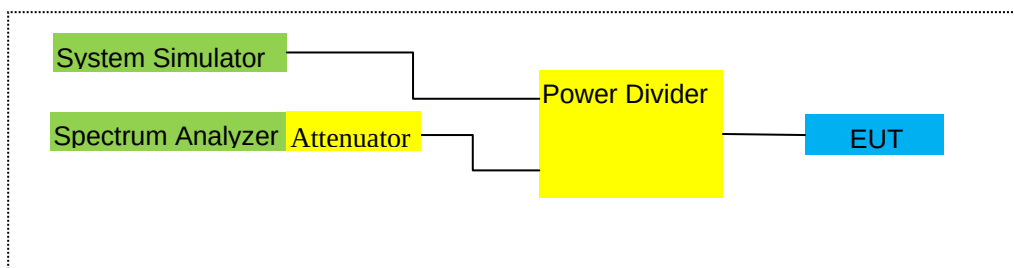
For Radiated Test Cases



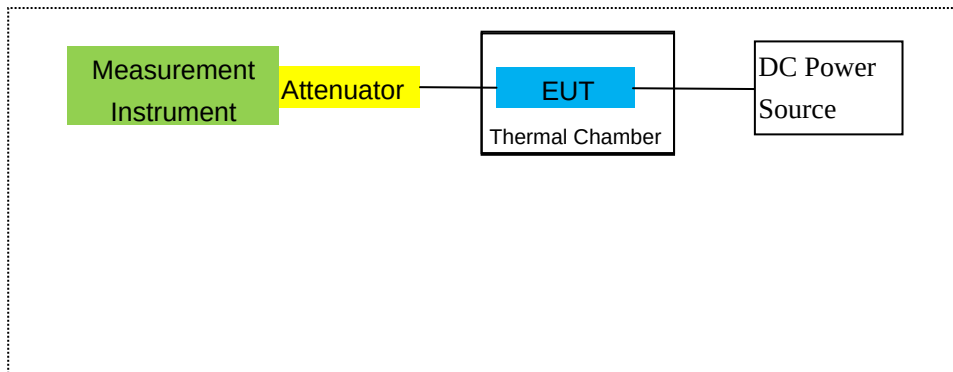
For Conducted Output Power



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	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2816	2024.5.18	2027.5.17	3 year
6	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2817	2024.5.18	2027.5.17	3 year
7	Amplifier	EM	EM-30180	060538	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.05.12	2025.05.11	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	2024.04.26	2027.04.25	3 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.05.12	2025.05.11	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	2024.04.26	2025.04.25	1 year
23	test receiver	R&S	ESCI	a0304218	2024.04.26	2025.04.25	1 year
24	Communication Tester	R&S	CMU200	A0304247	2024.04.26	2025.04.25	1 year

25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.05.12	2025.05.11	1 year
26	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
27	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	2024.5.25	2025.5.24	1 year
28	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	2024.5.25	2025.5.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.5.30	2025.5.29	1 year
30	MXG Vector Signal Generator	Agilent	N5183B	MY57280984	2024.5.30	2025.5.29	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	raditeq	RadiMation	2023.1.3	RadiatedTest
4	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

LTE Band 2, 4, 5, 7

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

FCC: §2.1046, §22.913, §24.232

LIMITS

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test 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 display line

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

MODES TESTED

LTE Band 2, 4, 5, 7

RESULTS

Test data reference attachment.

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

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

LIMITS

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, 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.

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

MODES TESTED

LTE Band 2, 4, 5, 7

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913(a)(2), §24.232(c) and §27.50 (h)(2), (b)(10), (c)(10), (d)(4)

LIMITS:

22.913(a) (2)- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232 (c) Mobile and portable stations are limited to 2 watts EIRP.

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 in the 2500–2570 MHz and 2620–2690 MHz bands. 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

LTE Band 2, 4, 5, 7

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-4.31	3.76	28.24	20.17	103.992	Horizontal	Pass
		1880	-4.12	3.91	28.22	20.19	104.472	Horizontal	Pass
		1909.3	-4.03	3.93	28.20	20.24	105.682	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-4.37	3.77	28.23	20.09	102.094	Horizontal	Pass
		1880	-4.22	3.91	28.24	20.11	102.565	Horizontal	Pass
		1908.5	-4.09	3.94	28.25	20.22	105.196	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.26	3.77	28.31	20.28	106.660	Horizontal	Pass
		1880	-3.88	3.91	28.22	20.43	110.408	Horizontal	Pass
		1907.5	-3.81	3.94	28.20	20.45	110.917	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-4.12	3.79	28.33	20.42	110.154	Horizontal	Pass
		1880	-3.82	3.95	28.22	20.45	110.917	Horizontal	Pass
		1905	-3.71	3.97	28.19	20.51	112.460	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-4.08	3.79	28.34	20.47	111.429	Horizontal	Pass
		1880	-3.87	3.95	28.22	20.40	109.648	Horizontal	Pass
		1902.5	-3.73	3.97	28.18	20.48	111.686	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.07	3.81	28.35	20.47	111.429	Horizontal	Pass
		1880	-3.74	3.96	28.22	20.52	112.720	Horizontal	Pass
		1900	-3.68	4.00	28.16	20.48	111.686	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-5.48	3.76	28.24	19.00	79.433	Vertical	Pass
		1880	-4.94	3.91	28.22	19.37	86.497	Vertical	Pass
		1909.3	-5.14	3.93	28.20	19.13	81.846	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-4.66	3.77	28.23	19.80	95.499	Vertical	Pass
		1880	-4.72	3.91	28.24	19.61	91.411	Vertical	Pass
		1908.5	-5.20	3.94	28.25	19.11	81.470	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.44	3.77	28.31	19.10	81.283	Vertical	Pass
		1880	-4.90	3.91	28.22	19.41	87.297	Vertical	Pass
		1907.5	-4.85	3.94	28.20	19.41	87.297	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.60	3.79	28.33	18.94	78.343	Vertical	Pass
		1880	-4.64	3.95	28.22	19.63	91.833	Vertical	Pass
		1905	-4.48	3.97	28.19	19.74	94.189	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-5.34	3.79	28.34	19.21	83.368	Vertical	Pass
		1880	-5.28	3.95	28.22	18.99	79.250	Vertical	Pass
		1902.5	-5.24	3.97	28.18	18.97	78.886	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.68	3.81	28.35	19.86	96.828	Vertical	Pass
		1880	-5.20	3.96	28.22	19.06	80.538	Vertical	Pass
		1900	-5.09	4.00	28.16	19.07	80.724	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

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	-5.43	3.76	28.24	19.05	80.353	Horizontal	Pass
		1880	-4.90	3.91	28.22	19.41	87.297	Horizontal	Pass
		1909.3	-4.83	3.93	28.20	19.44	87.902	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.93	3.77	28.23	19.53	89.743	Horizontal	Pass
		1880	-5.01	3.91	28.24	19.32	85.507	Horizontal	Pass
		1908.5	-5.22	3.94	28.25	19.09	81.096	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.87	3.77	28.31	19.67	92.683	Horizontal	Pass
		1880	-4.78	3.91	28.22	19.53	89.743	Horizontal	Pass
		1907.5	-4.46	3.94	28.20	19.80	95.499	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.92	3.79	28.33	19.62	91.622	Horizontal	Pass
		1880	-4.91	3.95	28.22	19.36	86.298	Horizontal	Pass
		1905	-4.38	3.97	28.19	19.84	96.383	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.90	3.79	28.34	19.65	92.257	Horizontal	Pass
		1880	-4.69	3.95	28.22	19.58	90.782	Horizontal	Pass
		1902.5	-4.65	3.97	28.18	19.56	90.365	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.79	3.81	28.35	19.75	94.406	Horizontal	Pass
		1880	-4.49	3.96	28.22	19.77	94.842	Horizontal	Pass
		1900	-4.31	4.00	28.16	19.85	96.605	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.00	3.76	28.24	18.48	70.469	Vertical	Pass
		1880	-5.92	3.91	28.22	18.39	69.024	Vertical	Pass
		1909.3	-5.71	3.93	28.20	18.56	71.779	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.84	3.77	28.23	18.62	72.778	Vertical	Pass
		1880	-5.55	3.91	28.24	18.78	75.509	Vertical	Pass
		1908.5	-6.17	3.94	28.25	18.14	65.163	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.78	3.77	28.31	18.76	75.162	Vertical	Pass
		1880	-5.60	3.91	28.22	18.71	74.302	Vertical	Pass
		1907.5	-6.15	3.94	28.20	18.11	64.714	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.18	3.79	28.33	18.36	68.549	Vertical	Pass
		1880	-6.05	3.95	28.22	18.22	66.374	Vertical	Pass
		1905	-6.05	3.97	28.19	18.17	65.615	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-6.54	3.79	28.34	18.01	63.241	Vertical	Pass
		1880	-6.17	3.95	28.22	18.10	64.565	Vertical	Pass
		1902.5	-6.12	3.97	28.18	18.09	64.417	Vertical	Pass
20.0MHz	1/#Mid	1860	-6.09	3.81	28.35	18.45	69.984	Vertical	Pass

Band 16 QAM	1880	-6.04	3.96	28.22	18.22	66.374	Vertical	Pass
	1900	-5.72	4.00	28.16	18.44	69.823	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 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	-4.22	3.12	27.58	20.24	105.682	Horizontal	Pass
		1732.5	-4.21	3.27	27.61	20.13	103.039	Horizontal	Pass
		1754.3	-4.19	3.29	27.63	20.15	103.514	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.39	3.13	27.61	20.09	102.094	Horizontal	Pass
		1732.5	-4.31	3.27	27.61	20.03	100.693	Horizontal	Pass
		1753.5	-4.23	3.30	27.62	20.09	102.094	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.16	3.13	27.63	20.34	108.143	Horizontal	Pass
		1732.5	-4.06	3.27	27.61	20.28	106.660	Horizontal	Pass
		1752.5	-3.94	3.30	27.60	20.36	108.643	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.10	3.15	27.64	20.39	109.396	Horizontal	Pass
		1732.5	-3.87	3.31	27.61	20.43	110.408	Horizontal	Pass
		1750	-3.89	3.33	27.59	20.37	108.893	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.11	3.15	27.65	20.39	109.396	Horizontal	Pass
		1732.5	-3.95	3.31	27.61	20.35	108.393	Horizontal	Pass
		1747.5	-3.89	3.33	27.57	20.35	108.393	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.05	3.17	27.66	20.44	110.662	Horizontal	Pass
		1732.5	-3.88	3.32	27.61	20.41	109.901	Horizontal	Pass
		1745	-3.82	3.36	27.56	20.38	109.144	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-5.02	3.12	27.58	19.44	87.902	Vertical	Pass
		1732.5	-5.40	3.27	27.61	18.94	78.343	Vertical	Pass
		1754.3	-5.00	3.29	27.63	19.34	85.901	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-4.92	3.13	27.61	19.56	90.365	Vertical	Pass
		1732.5	-4.45	3.27	27.61	19.89	97.499	Vertical	Pass
		1753.5	-5.29	3.30	27.62	19.03	79.983	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.78	3.13	27.63	19.72	93.756	Vertical	Pass
		1732.5	-4.62	3.27	27.61	19.72	93.756	Vertical	Pass
		1752.5	-4.85	3.30	27.60	19.45	88.105	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-5.35	3.15	27.64	19.14	82.035	Vertical	Pass
		1732.5	-4.84	3.31	27.61	19.46	88.308	Vertical	Pass
		1750	-5.02	3.33	27.59	19.24	83.946	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-5.55	3.15	27.65	18.95	78.524	Vertical	Pass
		1732.5	-5.12	3.31	27.61	19.18	82.794	Vertical	Pass
		1747.5	-5.28	3.33	27.57	18.96	78.705	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-5.51	3.17	27.66	18.98	79.068	Vertical	Pass
		1732.5	-4.46	3.32	27.61	19.83	96.161	Vertical	Pass
		1745	-5.07	3.36	27.56	19.13	81.846	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

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	-5.03	3.12	27.58	19.43	87.700	Horizontal	Pass
		1732.5	-4.88	3.27	27.61	19.46	88.308	Horizontal	Pass
		1754.3	-4.88	3.29	27.63	19.46	88.308	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-4.97	3.13	27.61	19.51	89.331	Horizontal	Pass
		1732.5	-5.10	3.27	27.61	19.24	83.946	Horizontal	Pass
		1753.5	-5.32	3.30	27.62	19.00	79.433	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-4.80	3.13	27.63	19.70	93.325	Horizontal	Pass
		1732.5	-4.76	3.27	27.61	19.58	90.782	Horizontal	Pass
		1752.5	-4.45	3.30	27.60	19.85	96.605	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-4.87	3.15	27.64	19.62	91.622	Horizontal	Pass
		1732.5	-5.06	3.31	27.61	19.24	83.946	Horizontal	Pass
		1750	-4.44	3.33	27.59	19.82	95.940	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-4.67	3.15	27.65	19.83	96.161	Horizontal	Pass
		1732.5	-4.73	3.31	27.61	19.57	90.573	Horizontal	Pass
		1747.5	-4.75	3.33	27.57	19.49	88.920	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-4.62	3.17	27.66	19.87	97.051	Horizontal	Pass
		1732.5	-4.63	3.32	27.61	19.66	92.470	Horizontal	Pass
		1745	-4.44	3.36	27.56	19.76	94.624	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-5.67	3.12	27.58	18.79	75.683	Vertical	Pass
		1732.5	-5.93	3.27	27.61	18.41	69.343	Vertical	Pass
		1754.3	-6.17	3.29	27.63	18.17	65.615	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.86	3.13	27.61	18.62	72.778	Vertical	Pass
		1732.5	-5.76	3.27	27.61	18.58	72.111	Vertical	Pass
		1753.5	-5.80	3.30	27.62	18.52	71.121	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-6.42	3.13	27.63	18.08	64.269	Vertical	Pass
		1732.5	-6.13	3.27	27.61	18.21	66.222	Vertical	Pass
		1752.5	-5.74	3.30	27.60	18.56	71.779	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-6.55	3.15	27.64	17.94	62.230	Vertical	Pass
		1732.5	-5.89	3.31	27.61	18.41	69.343	Vertical	Pass
		1750	-6.02	3.33	27.59	18.24	66.681	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-6.45	3.15	27.65	18.05	63.826	Vertical	Pass
		1732.5	-6.37	3.31	27.61	17.93	62.087	Vertical	Pass
		1747.5	-6.34	3.33	27.57	17.90	61.660	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.91	3.17	27.66	18.58	72.111	Vertical	Pass

Band 16 QAM		1732.5	-6.09	3.32	27.61	18.20	66.069	Vertical	Pass
		1745	-5.75	3.36	27.56	18.45	69.984	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 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	5.08	2.01	19.68	2.15	20.60	114.815	Horizontal	Pass
		836.5	4.96	2.01	19.77	2.15	20.57	114.025	Horizontal	Pass
		848.3	4.76	2.02	19.82	2.15	20.41	109.901	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.85	2.01	19.70	2.15	20.39	109.396	Horizontal	Pass
		836.5	4.75	2.01	19.77	2.15	20.36	108.643	Horizontal	Pass
		847.5	4.62	2.02	19.81	2.15	20.26	106.170	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	5.13	2.01	19.71	2.15	20.68	116.950	Horizontal	Pass
		836.5	5.01	2.01	19.77	2.15	20.62	115.345	Horizontal	Pass
		846.5	4.85	2.02	19.79	2.15	20.47	111.429	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	5.15	2.01	19.73	2.15	20.72	118.032	Horizontal	Pass
		836.5	5.10	2.01	19.77	2.15	20.71	117.761	Horizontal	Pass
		844	5.00	2.02	19.78	2.15	20.61	115.080	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	3.67	2.01	19.68	2.15	19.19	82.985	Vertical	Pass
		836.5	3.71	2.01	19.77	2.15	19.32	85.507	Vertical	Pass
		848.3	4.04	2.02	19.82	2.15	19.69	93.111	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.35	2.01	19.70	2.15	19.89	97.499	Vertical	Pass
		836.5	3.84	2.01	19.77	2.15	19.45	88.105	Vertical	Pass
		847.5	3.86	2.02	19.81	2.15	19.50	89.125	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	3.59	2.01	19.71	2.15	19.14	82.035	Vertical	Pass
		836.5	3.79	2.01	19.77	2.15	19.40	87.096	Vertical	Pass
		846.5	3.86	2.02	19.79	2.15	19.48	88.716	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	3.45	2.01	19.73	2.15	19.02	79.799	Vertical	Pass
		836.5	4.03	2.01	19.77	2.15	19.64	92.045	Vertical	Pass
		844	4.26	2.02	19.78	2.15	19.87	97.051	Vertical	Pass

Radiated Power (ERP) for 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 16 QAM	3/##Mid	824.7	4.23	2.01	19.68	2.15	19.75	94.406	Horizontal	Pass
		836.5	4.16	2.01	19.77	2.15	19.77	94.842	Horizontal	Pass
		848.3	4.00	2.02	19.82	2.15	19.65	92.257	Horizontal	Pass
3.0MHz Band 16 QAM	1/##Mid	825.5	4.31	2.01	19.70	2.15	19.85	96.605	Horizontal	Pass
		836.5	4.02	2.01	19.77	2.15	19.63	91.833	Horizontal	Pass
		847.5	3.50	2.02	19.81	2.15	19.14	82.035	Horizontal	Pass
5.0MHz Band 16 QAM	1/##Mid	826.5	4.63	2.01	19.71	2.15	20.18	104.232	Horizontal	Pass
		836.5	4.40	2.01	19.77	2.15	20.01	100.231	Horizontal	Pass
		846.5	4.15	2.02	19.79	2.15	19.77	94.842	Horizontal	Pass
10.0MHz Band 16 QAM	1/##Mid	829	4.63	2.01	19.73	2.15	20.20	104.713	Horizontal	Pass
		836.5	4.35	2.01	19.77	2.15	19.96	99.083	Horizontal	Pass
		844	3.89	2.02	19.78	2.15	19.50	89.125	Horizontal	Pass
1.4MHz Band 16 QAM	1/##Mid	824.7	3.37	2.01	19.68	2.15	18.89	77.446	Vertical	Pass
		836.5	4.28	2.01	19.77	2.15	19.89	97.499	Vertical	Pass
		848.3	3.80	2.02	19.82	2.15	19.45	88.105	Vertical	Pass
3.0MHz Band 16 QAM	1/##Mid	825.5	3.68	2.01	19.70	2.15	19.22	83.560	Vertical	Pass
		836.5	2.62	2.01	19.77	2.15	18.23	66.527	Vertical	Pass
		847.5	3.29	2.02	19.81	2.15	18.93	78.163	Vertical	Pass
5.0MHz Band 16 QAM	1/##Mid	826.5	3.33	2.01	19.71	2.15	18.88	77.268	Vertical	Pass
		836.5	2.87	2.01	19.77	2.15	18.48	70.469	Vertical	Pass
		846.5	2.29	2.02	19.79	2.15	17.91	61.802	Vertical	Pass
10.0MHz Band 16 QAM	1/##Mid	829	2.84	2.01	19.73	2.15	18.41	69.343	Vertical	Pass
		836.5	2.71	2.01	19.77	2.15	18.32	67.920	Vertical	Pass
		844	3.11	2.02	19.78	2.15	18.72	74.473	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

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

8.5 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	-2.50	4.54	27.75	20.71	117.761	Horizontal	Pass
		2535	-2.33	4.69	27.72	20.70	117.490	Horizontal	Pass
		2567.5	-2.26	4.71	27.71	20.74	118.577	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-2.43	4.55	27.76	20.78	119.674	Horizontal	Pass
		2535	-2.24	4.69	27.72	20.79	119.950	Horizontal	Pass
		2565	-2.16	4.72	27.70	20.82	120.781	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-2.44	4.55	27.77	20.78	119.674	Horizontal	Pass
		2535	-2.30	4.69	27.72	20.73	118.304	Horizontal	Pass
		2562.5	-2.20	4.72	27.69	20.77	119.399	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-2.38	4.57	27.78	20.83	121.060	Horizontal	Pass
		2535	-2.20	4.73	27.72	20.79	119.950	Horizontal	Pass
		2560	-2.16	4.75	27.68	20.77	119.399	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-4.30	4.54	27.75	18.91	77.804	Vertical	Pass
		2535	-4.07	4.69	27.72	18.96	78.705	Vertical	Pass
		2567.5	-3.42	4.71	27.71	19.58	90.782	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.70	4.55	27.76	19.51	89.331	Vertical	Pass
		2535	-3.36	4.69	27.72	19.67	92.683	Vertical	Pass
		2565	-3.97	4.72	27.70	19.01	79.616	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.60	4.55	27.77	19.62	91.622	Vertical	Pass
		2535	-3.30	4.69	27.72	19.73	93.972	Vertical	Pass
		2562.5	-4.08	4.72	27.69	18.89	77.446	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-3.39	4.57	27.78	19.82	95.940	Vertical	Pass
		2535	-3.85	4.73	27.72	19.14	82.035	Vertical	Pass
		2560	-4.03	4.75	27.68	18.90	77.625	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	-3.19	4.54	27.75	20.02	100.462	Horizontal	Pass
		2535	-2.88	4.69	27.72	20.15	103.514	Horizontal	Pass
		2567.5	-2.96	4.71	27.71	20.04	100.925	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.08	4.55	27.76	20.13	103.039	Horizontal	Pass
		2535	-3.09	4.69	27.72	19.94	98.628	Horizontal	Pass
		2565	-3.36	4.72	27.70	19.62	91.622	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.26	4.55	27.77	19.96	99.083	Horizontal	Pass
		2535	-3.23	4.69	27.72	19.80	95.499	Horizontal	Pass
		2562.5	-2.84	4.72	27.69	20.13	103.039	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.14	4.57	27.78	20.07	101.625	Horizontal	Pass
		2535	-2.81	4.73	27.72	20.18	104.232	Horizontal	Pass
		2560	-2.91	4.75	27.68	20.02	100.462	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-4.56	4.54	27.75	18.65	73.282	Vertical	Pass
		2535	-4.64	4.69	27.72	18.39	69.024	Vertical	Pass
		2567.5	-3.34	4.71	27.71	19.66	92.470	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.45	4.55	27.76	19.76	94.624	Vertical	Pass
		2535	-3.89	4.69	27.72	19.14	82.035	Vertical	Pass
		2565	-3.93	4.72	27.70	19.05	80.353	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.83	4.55	27.77	19.39	86.896	Vertical	Pass
		2535	-4.09	4.69	27.72	18.94	78.343	Vertical	Pass
		2562.5	-4.27	4.72	27.69	18.70	74.131	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-4.82	4.57	27.78	18.39	69.024	Vertical	Pass
		2535	-4.57	4.73	27.72	18.42	69.502	Vertical	Pass
		2560	-3.68	4.75	27.68	19.25	84.140	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

LIMIT

For Band 7, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P)$ [Watts]).

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P)$ [Watts]), where P is the transmitter power in Watts.

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

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	-50.26	4.04	33.51	-20.79	-13	-7.79	Horizontal
3701.4	-47.61	4.04	33.51	-18.14	-13	-5.14	Vertical
5552.1	-51.93	5.24	35.84	-21.33	-13	-8.33	Vertical
5552.1	-49.48	5.24	35.84	-18.88	-13	-5.88	Horizontal
184.2	-41.07	1.43	16.02	-26.48	-13	-13.48	Vertical
444.1	-43.12	1.30	17.99	-26.43	-13	-13.43	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-45.76	4.04	33.56	-16.24	-13	-3.24	Horizontal
3760.0	-52.08	4.04	33.56	-22.56	-13	-9.56	Vertical
5640.0	-51.38	5.24	35.91	-20.71	-13	-7.71	Vertical
5640.0	-53.11	5.24	35.91	-22.44	-13	-9.44	Horizontal
212.5	-40.15	1.62	16.97	-24.80	-13	-11.80	Vertical
312.1	-40.36	1.74	15.98	-26.13	-13	-13.13	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.78	4.04	34.00	-19.82	-13	-6.82	Horizontal
3818.6	-47.47	4.04	34.00	-17.51	-13	-4.51	Vertical
5727.9	-46.01	5.24	36.04	-15.21	-13	-2.21	Vertical
5727.9	-51.32	5.24	36.04	-20.52	-13	-7.52	Horizontal
175.1	-40.76	1.42	17.29	-24.89	-13	-11.89	Vertical
430.9	-40.20	1.50	17.90	-23.79	-13	-10.79	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	-50.00	4.07	33.54	-20.53	-13	-7.53	Horizontal
3720.0	-50.55	4.07	33.54	-21.08	-13	-8.08	Vertical
5580.0	-48.55	5.28	35.86	-17.97	-13	-4.97	Vertical
5580.0	-49.93	5.28	35.86	-19.35	-13	-6.35	Horizontal
194.2	-38.97	1.58	16.89	-23.65	-13	-10.65	Vertical
349.1	-36.28	1.76	17.26	-20.78	-13	-7.78	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.91	4.04	33.56	-18.39	-13	-5.39	Horizontal
3760.0	-47.15	4.04	33.56	-17.63	-13	-4.63	Vertical
5640.0	-49.38	5.24	35.91	-18.71	-13	-5.71	Vertical
5640.0	-49.76	5.24	35.91	-19.09	-13	-6.09	Horizontal
209.9	-38.52	1.46	16.27	-23.71	-13	-10.71	Vertical
285.2	-34.35	1.59	15.15	-20.79	-13	-7.79	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-51.69	4.04	34.00	-21.73	-13	-8.73	Horizontal
3800.0	-47.40	4.04	34.00	-17.44	-13	-4.44	Vertical
5700.0	-53.33	5.24	36.04	-22.53	-13	-9.53	Vertical
5700.0	-52.46	5.24	36.04	-21.66	-13	-8.66	Horizontal
189.6	-42.21	1.36	17.39	-26.17	-13	-13.17	Vertical
334.4	-34.52	1.66	15.39	-20.79	-13	-7.79	Horizontal

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	-46.13	4.02	29.80	-20.35	-13	-7.35	Horizontal
3421.4	-51.46	4.02	29.80	-25.68	-13	-12.68	Vertical
5132.1	-46.74	5.24	35.84	-16.14	-13	-3.14	Vertical
5132.1	-51.64	5.24	35.84	-21.04	-13	-8.04	Horizontal
196.7	-36.40	1.68	16.04	-22.04	-13	-9.04	Vertical
451.8	-36.99	1.78	17.74	-21.03	-13	-8.03	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-46.08	4.03	30.00	-20.11	-13	-7.11	Horizontal
3465.0	-44.25	4.03	30.00	-18.28	-13	-5.28	Vertical
5197.5	-53.22	5.25	35.86	-22.61	-13	-9.61	Vertical
5197.5	-52.80	5.25	35.86	-22.19	-13	-9.19	Horizontal
203.4	-43.87	1.72	17.69	-27.90	-13	-14.90	Vertical
340.2	-37.68	1.62	16.02	-23.27	-13	-10.27	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-50.02	4.05	30.01	-24.06	-13	-11.06	Horizontal
3508.6	-44.31	4.05	30.01	-18.35	-13	-5.35	Vertical
5262.9	-48.32	5.26	35.86	-17.72	-13	-4.72	Vertical
5262.9	-49.06	5.26	35.86	-18.46	-13	-5.46	Horizontal
205.6	-42.17	1.80	16.69	-27.28	-13	-14.28	Vertical
438.9	-43.20	1.75	16.66	-28.30	-13	-15.30	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	-45.57	4.02	29.80	-19.79	-13	-6.79	Horizontal
3440.0	-48.51	4.02	29.80	-22.73	-13	-9.73	Vertical
5160.0	-48.77	5.24	35.84	-18.17	-13	-5.17	Vertical
5160.0	-50.82	5.24	35.84	-20.22	-13	-7.22	Horizontal
184.7	-34.15	1.57	17.26	-18.46	-13	-5.46	Vertical
447.3	-36.74	1.78	16.35	-22.17	-13	-9.17	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.33	4.03	30.00	-27.36	-13	-14.36	Horizontal
3465.0	-48.07	4.03	30.00	-22.10	-13	-9.10	Vertical
5197.5	-49.25	5.25	35.86	-18.64	-13	-5.64	Vertical
5197.5	-50.75	5.25	35.86	-20.14	-13	-7.14	Horizontal
206.2	-42.95	1.44	17.95	-26.44	-13	-13.44	Vertical
347.6	-35.61	1.65	16.09	-21.17	-13	-8.17	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-47.67	2.91	27.68	-22.90	-13	-9.90	Horizontal
3490.0	-46.48	2.91	27.68	-21.71	-13	-8.71	Vertical
5235.0	-53.95	5.26	35.86	-23.35	-13	-10.35	Vertical
5235.0	-52.63	5.26	35.86	-22.03	-13	-9.03	Horizontal
197.5	-36.01	1.61	16.85	-20.77	-13	-7.77	Vertical
305.9	-41.24	1.61	15.19	-27.66	-13	-14.66	Horizontal

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	-52.89	2.78	27.50	-28.17	-13	-15.17	Horizontal
1649.4	-48.93	2.78	27.50	-24.21	-13	-11.21	Vertical
2474.1	-46.30	2.90	27.80	-21.40	-13	-8.40	Vertical
2474.1	-52.80	2.90	27.80	-27.90	-13	-14.90	Horizontal
200.9	-34.95	1.76	17.59	-19.12	-13	-6.12	Vertical
420.3	-37.36	1.63	15.87	-23.12	-13	-10.12	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-44.12	2.80	27.48	-19.44	-13	-6.44	Horizontal
1673.0	-44.37	2.80	27.48	-19.69	-13	-6.69	Vertical
2509.5	-46.26	2.91	27.70	-21.47	-13	-8.47	Vertical
2509.5	-52.49	2.91	27.70	-27.70	-13	-14.70	Horizontal
205.5	-38.19	1.61	15.68	-24.12	-13	-11.12	Vertical
431.3	-36.84	1.59	17.52	-20.92	-13	-7.92	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-53.37	2.82	27.43	-28.76	-13	-15.76	Horizontal
1696.6	-51.26	2.82	27.43	-26.65	-13	-13.65	Vertical
2544.9	-46.28	2.92	27.74	-21.46	-13	-8.46	Vertical
2544.9	-51.23	2.92	27.74	-26.41	-13	-13.41	Horizontal
207.1	-39.65	1.69	16.67	-24.66	-13	-11.66	Vertical
290.3	-44.85	1.70	17.18	-29.37	-13	-16.37	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	-47.24	2.78	27.50	-22.52	-13	-9.52	Horizontal
1658.0	-48.30	2.78	27.50	-23.58	-13	-10.58	Vertical
2487.0	-47.59	2.90	27.80	-22.69	-13	-9.69	Vertical
2487.0	-49.11	2.90	27.80	-24.21	-13	-11.21	Horizontal
187.0	-38.53	1.71	15.57	-24.67	-13	-11.67	Vertical
255.0	-36.16	1.34	16.40	-21.10	-13	-8.10	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.62	2.80	27.48	-24.94	-13	-11.94	Horizontal
1673.0	-49.69	2.80	27.48	-25.01	-13	-12.01	Vertical
2509.5	-46.32	2.91	27.70	-21.53	-13	-8.53	Vertical
2509.5	-49.95	2.91	27.70	-25.16	-13	-12.16	Horizontal
184.7	-37.23	1.44	17.04	-21.63	-13	-8.63	Vertical
352.3	-42.66	1.76	17.62	-26.80	-13	-13.80	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.64	2.82	27.43	-22.03	-13	-9.03	Horizontal
1688.0	-50.68	2.82	27.43	-26.07	-13	-13.07	Vertical
2532.0	-48.02	2.92	27.74	-23.20	-13	-10.20	Vertical
2532.0	-50.35	2.92	27.74	-25.53	-13	-12.53	Horizontal
176.0	-42.93	1.74	17.70	-26.97	-13	-13.97	Vertical
286.8	-37.63	1.41	17.46	-21.57	-13	-8.57	Horizontal

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	-60.58	5.23	35.81	-30.00	-25	-5.00	Horizontal
5005.0	-62.09	5.23	35.81	-31.51	-25	-6.51	Vertical
7507.5	-60.85	5.67	36.85	-29.67	-25	-4.67	Vertical
7507.5	-64.75	5.67	36.85	-33.57	-25	-8.57	Horizontal
197.3	-47.39	1.73	17.97	-31.15	-25	-6.15	Vertical
435.2	-53.74	1.38	15.11	-40.01	-25	-15.01	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.38	5.23	35.82	-29.79	-25	-4.79	Horizontal
5070.0	-59.39	5.23	35.82	-28.80	-25	-3.80	Vertical
7605.0	-62.84	5.67	36.85	-31.66	-25	-6.66	Vertical
7605.0	-60.06	5.67	36.85	-28.88	-25	-3.88	Horizontal
175.1	-51.47	1.77	16.17	-37.06	-25	-12.06	Vertical
340.5	-53.67	1.63	15.21	-40.09	-25	-15.09	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-60.85	5.24	35.83	-30.26	-25	-5.26	Horizontal
5135.0	-59.49	5.24	35.83	-28.90	-25	-3.90	Vertical
7702.5	-62.86	5.68	36.87	-31.67	-25	-6.67	Vertical
7702.5	-59.12	5.68	36.87	-27.93	-25	-2.93	Horizontal
198.1	-52.32	1.58	17.56	-36.34	-25	-11.34	Vertical
432.5	-45.65	1.45	16.58	-30.52	-25	-5.52	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	-59.42	5.23	35.82	-28.83	-25	-3.83	Horizontal
5020.0	-62.23	5.23	35.82	-31.64	-25	-6.64	Vertical
7530.0	-64.12	5.67	36.86	-32.93	-25	-7.93	Vertical
7530.0	-60.94	5.67	36.86	-29.75	-25	-4.75	Horizontal
206.5	-45.24	1.63	15.76	-31.11	-25	-6.11	Vertical
269.7	-45.06	1.71	15.44	-31.33	-25	-6.33	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.18	5.23	35.82	-29.59	-25	-4.59	Horizontal
5070.0	-59.64	5.23	35.82	-29.05	-25	-4.05	Vertical
7605.0	-63.70	5.67	36.85	-32.52	-25	-7.52	Vertical
7605.0	-60.25	5.67	36.85	-29.07	-25	-4.07	Horizontal
188.0	-44.12	1.79	16.84	-29.06	-25	-4.06	Vertical
458.9	-49.50	1.71	17.64	-33.57	-25	-8.57	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.42	5.24	35.83	-28.83	-25	-3.83	Horizontal
5120.0	-62.23	5.24	35.83	-31.64	-25	-6.64	Vertical
7680.0	-59.57	5.70	36.88	-28.39	-25	-3.39	Vertical
7680.0	-61.90	5.70	36.88	-30.72	-25	-5.72	Horizontal
178.3	-44.36	1.79	16.84	-29.30	-25	-4.30	Vertical
454.8	-49.98	1.71	17.64	-34.05	-25	-9.05	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 3.3V, Normal, DC 3.8V and High voltage, DC 4.37V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2, 4, 5, 7

RESULTS

See the following pages.

10.1 LTE BAND 2
QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1880	12.4	0.006588	2.5
3.8	1880	13.6	0.007225	2.5
4.37	1880	13.0	0.006934	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13.0	0.006930	2.5
Extreme (50C)	1880	11.6	0.006193	2.5
Extreme (40C)	1880	13.7	0.007299	2.5
Extreme (30C)	1880	13.9	0.007418	2.5
Extreme (10C)	1880	13.5	0.007196	2.5
Extreme (0C)	1880	12.3	0.006517	2.5
Extreme (-10C)	1880	13.2	0.006996	2.5
Extreme (-20C)	1880	14.1	0.007489	2.5
Extreme (-30C)	1880	14.5	0.007699	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1880	9.9	0.005282	2.5
3.8	1880	8.7	0.004628	2.5
4.37	1880	8.0	0.004276	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.9	0.005242	2.5
Extreme (50C)	1880	9.1	0.004842	2.5
Extreme (40C)	1880	7.9	0.004192	2.5
Extreme (30C)	1880	8.8	0.004666	2.5
Extreme (10C)	1880	8.7	0.004602	2.5
Extreme (0C)	1880	8.4	0.004472	2.5
Extreme (-10C)	1880	8.6	0.004558	2.5
Extreme (-20C)	1880	8.8	0.004684	2.5
Extreme (-30C)	1880	8.1	0.004332	2.5

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

10.2 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1732.5	9.1	0.005278	2.5
3.8	1732.5	8.7	0.005019	2.5
4.37	1732.5	8.3	0.004814	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.8	0.005084	2.5
Extreme (50C)	1732.5	8.8	0.005069	2.5
Extreme (40C)	1732.5	7.7	0.004417	2.5
Extreme (30C)	1732.5	5.7	0.003312	2.5
Extreme (10C)	1732.5	7.4	0.004257	2.5
Extreme (0C)	1732.5	9.5	0.005474	2.5
Extreme (-10C)	1732.5	8.4	0.004821	2.5
Extreme (-20C)	1732.5	6.9	0.003989	2.5
Extreme (-30C)	1732.5	8.5	0.004918	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1732.5	9.4	0.005422	2.5
3.8	1732.5	8.7	0.005049	2.5
4.37	1732.5	8.0	0.004610	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.0	0.005793	2.5
Extreme (50C)	1732.5	8.7	0.005050	2.5
Extreme (40C)	1732.5	8.5	0.004934	2.5
Extreme (30C)	1732.5	9.0	0.005190	2.5
Extreme (10C)	1732.5	9.2	0.005316	2.5
Extreme (0C)	1732.5	8.3	0.004783	2.5
Extreme (-10C)	1732.5	9.3	0.005391	2.5
Extreme (-20C)	1732.5	8.8	0.005104	2.5
Extreme (-30C)	1732.5	7.7	0.004443	2.5

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

10.3 LTE BAND 5

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	836.5	6.1	0.007337	2.5
3.8	836.5	7.2	0.008589	2.5
4.37	836.5	5.0	0.005931	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.9	0.007104	2.5
Extreme (50C)	836.5	6.1	0.007269	2.5
Extreme (40C)	836.5	6.1	0.007303	2.5
Extreme (30C)	836.5	6.4	0.007679	2.5
Extreme (10C)	836.5	5.6	0.006753	2.5
Extreme (0C)	836.5	5.6	0.006725	2.5
Extreme (-10C)	836.5	5.8	0.006915	2.5
Extreme (-20C)	836.5	6.5	0.007764	2.5
Extreme (-30C)	836.5	6.1	0.007311	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	836.5	5.6	0.006667	2.5
3.8	836.5	6.9	0.008283	2.5
4.37	836.5	4.5	0.005353	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.8	0.006991	2.5
Extreme (50C)	836.5	5.9	0.007046	2.5
Extreme (40C)	836.5	6.0	0.007217	2.5
Extreme (30C)	836.5	6.4	0.007623	2.5
Extreme (10C)	836.5	5.4	0.006419	2.5
Extreme (0C)	836.5	5.4	0.006508	2.5
Extreme (-10C)	836.5	5.9	0.007045	2.5
Extreme (-20C)	836.5	6.3	0.007554	2.5
Extreme (-30C)	836.5	6.8	0.008089	2.5

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

10.4 LTE BAND 7

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2535	10.0	0.003931	2.5
3.8	2535	8.4	0.003324	2.5
4.37	2535	8.0	0.003167	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.0	0.003564	2.5
Extreme (50C)	2535	9.0	0.003566	2.5
Extreme (40C)	2535	8.6	0.003393	2.5
Extreme (30C)	2535	8.5	0.003361	2.5
Extreme (10C)	2535	8.5	0.003372	2.5
Extreme (0C)	2535	8.1	0.003212	2.5
Extreme (-10C)	2535	9.8	0.003868	2.5
Extreme (-20C)	2535	9.0	0.003544	2.5
Extreme (-30C)	2535	8.5	0.003371	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2535	6.6	0.002606	2.5
3.8	2535	6.0	0.002373	2.5
4.37	2535	5.3	0.002092	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.3	0.002500	2.5
Extreme (50C)	2535	5.5	0.002188	2.5
Extreme (40C)	2535	5.6	0.002209	2.5
Extreme (30C)	2535	6.9	0.002726	2.5
Extreme (10C)	2535	5.8	0.002301	2.5
Extreme (0C)	2535	4.8	0.001895	2.5
Extreme (-10C)	2535	5.0	0.001957	2.5
Extreme (-20C)	2535	5.6	0.002194	2.5
Extreme (-30C)	2535	5.4	0.002144	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.

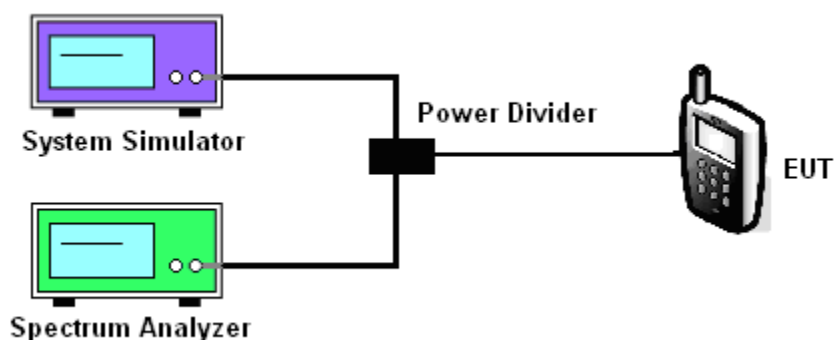
11.2 Measuring Instruments

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 GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS 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



Test data reference attachment.

----END OF REPORT----