

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

FCC ID: ZSW-30-136

Product: Mobile Phone

Trade Mark: Bmobile

Model Number: Cosmo B6

Family Model: N/A

Report No.: S24080503902005

Prepared for

b mobile HK Limited

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

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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

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

TEST RESULT CERTIFICATION

Applicant's name..... : 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 : Cosmo B6

Family Model: N/A

Test sample number S240805039002

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

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

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

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

Date of Test

Date (s) of performance of tests Aug. 06, 2024 ~ Jan. 14, 2025

Date of Issue Jan. 14, 2025

Test Result **Pass**

Prepared : 
By : Allen Liu
(Project Engineer)

Reviewed : 
By : Aaron Cheng
(Supervisor)

Approved : 
By : Alex Li
(Manager)

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	5
1.1 PRODUCT DESCRIPTION	5
1.2 RELATED SUBMITTAL(S) / GRANT (S)	6
1.3 TEST METHODOLOGY	6
1.4 TEST FACILITY	6
MEASUREMENT UNCERTAINTY	6
1.5 SPECIAL ACCESSORIES.....	6
1.6 WORST-CASE CONFIGURATION AND MODE.....	6
2. SYSTEM TEST CONFIGURATION	7
2.1 EUT CONFIGURATION.....	7
2.2 EUT EXERCISE	7
2.3 CONFIGURATION OF EUT SYSTEM.....	7
2.4 TEST SETUP	8
3.TEST AND MEASUREMENT EQUIPMENT	9
4. OUTPUT POWER.....	11
4.1 OUTPUT POWER MEASUREMENT	11
6. BANDEDGE AND EMISSION MASK	14
7. OUT OF BAND EMISSIONS	15
7.1 MEASUREMENT METHOD	16
8. RADIATED MEASUREMENT	17
8.1. RADIATED POWER (ERP & EIRP).....	17
8.2 LTE BAND 2.....	18
8.3 LTE BAND 4.....	22
8.4 LTE BAND 5.....	26
8.5 LTE BAND 7.....	28

8.6 LTE BAND 38	30
9. SPURIOUS RADIATION EMISSION	32
9.1 LTE BAND 2.....	34
9.2 LTE BAND 4.....	36
9.3 LTE BAND 5.....	38
9.4 LTE BAND 7.....	40
9.5 LTE BAND 38	42
10. FREQUENCY STABILITY	44
10.1 LTE BAND 2	45
10.2 LTE BAND 4	47
10.3 LTE BAND 5	49
10.4 LTE BAND 7	51
10.5 LTE BAND 38	53
11. PEAK-TO-AVERAGE RATIO.....	55
11.1 Description of the PAR Measurement.....	55
11.2 Measuring Instruments	55
11.3 Test Procedures.....	55
11.4 Test Setup.....	55

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	Cosmo B6
Family Model	N/A
Model Difference	N/A
FCC ID:	ZSW-30-136
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7 LTE TDD Band 38
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 TDD Band 38 Uplink& Downlink: 2570MHz-2620MHz
Type of Modulation:	QPSK/16QAM
Antenna:	PIFA Antenna
Antenna gain:	LTE B2:0.6dBi; B4:0.6dBi; B5:-1.1dBi; B7:0.4dBi; B38:0.4dBi;
Power Supply:	DC 3.8V from Battery or DC 5V from Adapter.
Battery	DC 3.8V, 3000mAh, 11.4Wh
Adapter:	INPUT: AC 100-240V~50-60Hz 0.2A OUTPUT: DC 5.0V---1A
Extreme Vol. Limits:	DC 3.23V to DC 4.37V (Nominal DC 3.8V) (Note 1)
HW Version	Bmobile_COSMO_B6_HW_V001
SW Version	Bmobile_COSMO_B6_TIGO_LATAM_V002
** 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-30-136** 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, Band 38.

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

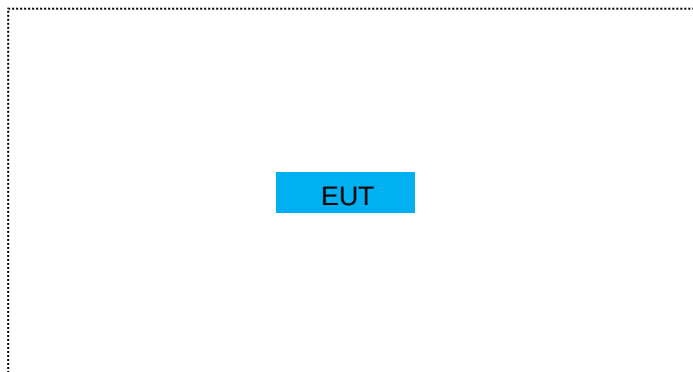
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	Cosmo B6	FCC ID: ZSW-30-136	EUT

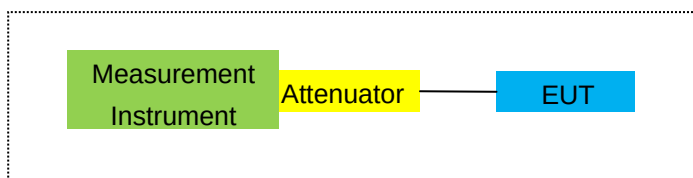
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

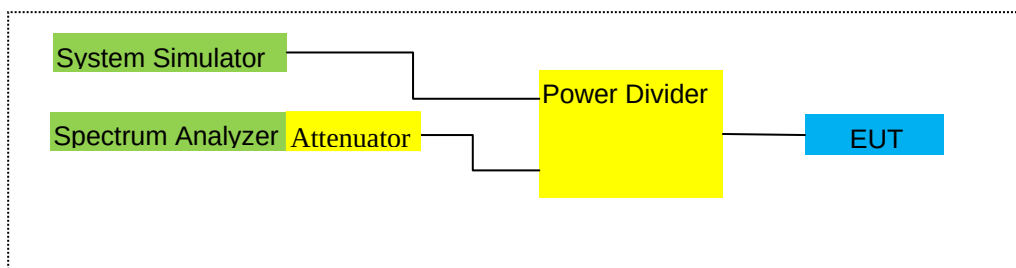
For Radiated Test Cases



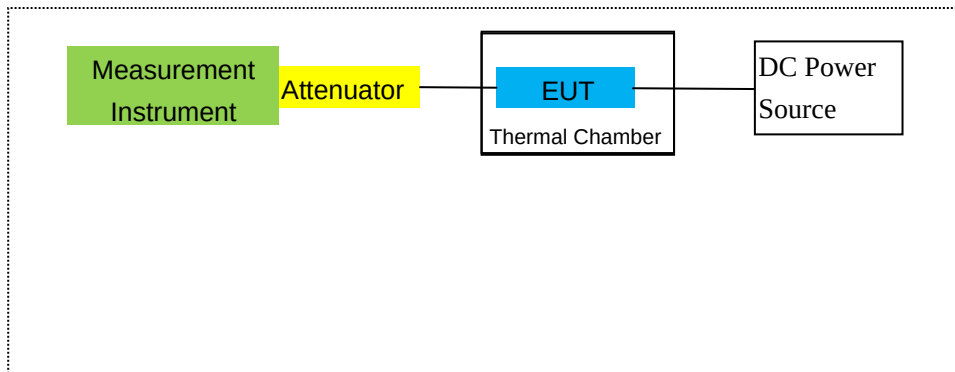
For Conducted Output Power



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	Attenuator	MCE	24-10-34	BN9258	2024.03.12	2025.03.11	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2024.04.26	2025.04.25	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2023.05.06	2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.04.26	2025.04.25	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	MWRTest	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
64 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, 38

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 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 display line

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

MODES TESTED

LTE Band 2, 4, 5, 7, 38

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, 38

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, 38

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	-5.07	3.76	28.24	19.41	87.297	Horizontal	Pass
		1880	-4.88	3.91	28.22	19.43	87.700	Horizontal	Pass
		1909.3	-4.79	3.93	28.20	19.48	88.716	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.13	3.77	28.23	19.33	85.704	Horizontal	Pass
		1880	-4.98	3.91	28.24	19.35	86.099	Horizontal	Pass
		1908.5	-4.85	3.94	28.25	19.46	88.308	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.02	3.77	28.31	19.52	89.536	Horizontal	Pass
		1880	-4.64	3.91	28.22	19.67	92.683	Horizontal	Pass
		1907.5	-4.57	3.94	28.20	19.69	93.111	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-4.88	3.79	28.33	19.66	92.470	Horizontal	Pass
		1880	-4.58	3.95	28.22	19.69	93.111	Horizontal	Pass
		1905	-4.47	3.97	28.19	19.75	94.406	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-4.84	3.79	28.34	19.71	93.541	Horizontal	Pass
		1880	-4.63	3.95	28.22	19.64	92.045	Horizontal	Pass
		1902.5	-4.49	3.97	28.18	19.72	93.756	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.83	3.81	28.35	19.71	93.541	Horizontal	Pass
		1880	-4.50	3.96	28.22	19.76	94.624	Horizontal	Pass
		1900	-4.44	4.00	28.16	19.72	93.756	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-6.24	3.76	28.24	18.24	66.681	Vertical	Pass
		1880	-5.70	3.91	28.22	18.61	72.611	Vertical	Pass
		1909.3	-5.90	3.93	28.20	18.37	68.707	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.42	3.77	28.23	19.04	80.168	Vertical	Pass
		1880	-5.48	3.91	28.24	18.85	76.736	Vertical	Pass
		1908.5	-5.96	3.94	28.25	18.35	68.391	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-6.20	3.77	28.31	18.34	68.234	Vertical	Pass
		1880	-5.66	3.91	28.22	18.65	73.282	Vertical	Pass
		1907.5	-5.61	3.94	28.20	18.65	73.282	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-6.36	3.79	28.33	18.18	65.766	Vertical	Pass
		1880	-5.40	3.95	28.22	18.87	77.090	Vertical	Pass
		1905	-5.24	3.97	28.19	18.98	79.068	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-6.10	3.79	28.34	18.45	69.984	Vertical	Pass
Band		1880	-6.04	3.95	28.22	18.23	66.527	Vertical	Pass
QPSK		1902.5	-6.00	3.97	28.18	18.21	66.222	Vertical	Pass
20.0MHz	1/#Mid	1860	-5.44	3.81	28.35	19.10	81.283	Vertical	Pass
Band		1880	-5.96	3.96	28.22	18.30	67.608	Vertical	Pass
QPSK		1900	-5.85	4.00	28.16	18.31	67.764	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	-6.19	3.76	28.24	18.29	67.453	Horizontal	Pass
		1880	-5.66	3.91	28.22	18.65	73.282	Horizontal	Pass
		1909.3	-5.59	3.93	28.20	18.68	73.790	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-5.69	3.77	28.23	18.77	75.336	Horizontal	Pass
		1880	-5.77	3.91	28.24	18.56	71.779	Horizontal	Pass
		1908.5	-5.98	3.94	28.25	18.33	68.077	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-5.63	3.77	28.31	18.91	77.804	Horizontal	Pass
		1880	-5.54	3.91	28.22	18.77	75.336	Horizontal	Pass
		1907.5	-5.22	3.94	28.20	19.04	80.168	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-5.68	3.79	28.33	18.86	76.913	Horizontal	Pass
		1880	-5.67	3.95	28.22	18.60	72.444	Horizontal	Pass
		1905	-5.14	3.97	28.19	19.08	80.910	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-5.66	3.79	28.34	18.89	77.446	Horizontal	Pass
		1880	-5.45	3.95	28.22	18.82	76.208	Horizontal	Pass
		1902.5	-5.41	3.97	28.18	18.80	75.858	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-5.55	3.81	28.35	18.99	79.250	Horizontal	Pass
		1880	-5.25	3.96	28.22	19.01	79.616	Horizontal	Pass
		1900	-5.07	4.00	28.16	19.09	81.096	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-6.76	3.76	28.24	17.72	59.156	Vertical	Pass
		1880	-6.68	3.91	28.22	17.63	57.943	Vertical	Pass
		1909.3	-6.47	3.93	28.20	17.80	60.256	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-6.60	3.77	28.23	17.86	61.094	Vertical	Pass
		1880	-6.31	3.91	28.24	18.02	63.387	Vertical	Pass
		1908.5	-6.93	3.94	28.25	17.38	54.702	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-6.54	3.77	28.31	18.00	63.096	Vertical	Pass
		1880	-6.36	3.91	28.22	17.95	62.373	Vertical	Pass
		1907.5	-6.91	3.94	28.20	17.35	54.325	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-6.94	3.79	28.33	17.60	57.544	Vertical	Pass
		1880	-6.81	3.95	28.22	17.46	55.719	Vertical	Pass
		1905	-6.81	3.97	28.19	17.41	55.081	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-7.30	3.79	28.34	17.25	53.088	Vertical	Pass
		1880	-6.93	3.95	28.22	17.34	54.200	Vertical	Pass
		1902.5	-6.88	3.97	28.18	17.33	54.075	Vertical	Pass
20.0MHz	1/#Mid	1860	-6.85	3.81	28.35	17.69	58.749	Vertical	Pass

Band 16 QAM	1880	-6.80	3.96	28.22	17.46	55.719	Vertical	Pass
	1900	-6.48	4.00	28.16	17.68	58.614	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	-4.98	3.12	27.58	19.48	88.716	Horizontal	Pass
		1732.5	-4.97	3.27	27.61	19.37	86.497	Horizontal	Pass
		1754.3	-4.95	3.29	27.63	19.39	86.896	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.15	3.13	27.61	19.33	85.704	Horizontal	Pass
		1732.5	-5.07	3.27	27.61	19.27	84.528	Horizontal	Pass
		1753.5	-4.99	3.30	27.62	19.33	85.704	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.92	3.13	27.63	19.58	90.782	Horizontal	Pass
		1732.5	-4.82	3.27	27.61	19.52	89.536	Horizontal	Pass
		1752.5	-4.70	3.30	27.60	19.60	91.201	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.86	3.15	27.64	19.63	91.833	Horizontal	Pass
		1732.5	-4.63	3.31	27.61	19.67	92.683	Horizontal	Pass
		1750	-4.65	3.33	27.59	19.61	91.411	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.87	3.15	27.65	19.63	91.833	Horizontal	Pass
		1732.5	-4.71	3.31	27.61	19.59	90.991	Horizontal	Pass
		1747.5	-4.65	3.33	27.57	19.59	90.991	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.81	3.17	27.66	19.68	92.897	Horizontal	Pass
		1732.5	-4.64	3.32	27.61	19.65	92.257	Horizontal	Pass
		1745	-4.58	3.36	27.56	19.62	91.622	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-5.78	3.12	27.58	18.68	73.790	Vertical	Pass
		1732.5	-6.16	3.27	27.61	18.18	65.766	Vertical	Pass
		1754.3	-5.76	3.29	27.63	18.58	72.111	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.68	3.13	27.61	18.80	75.858	Vertical	Pass
		1732.5	-5.21	3.27	27.61	19.13	81.846	Vertical	Pass
		1753.5	-6.05	3.30	27.62	18.27	67.143	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-5.54	3.13	27.63	18.96	78.705	Vertical	Pass
		1732.5	-5.38	3.27	27.61	18.96	78.705	Vertical	Pass
		1752.5	-5.61	3.30	27.60	18.69	73.961	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-6.11	3.15	27.64	18.38	68.865	Vertical	Pass
		1732.5	-5.60	3.31	27.61	18.70	74.131	Vertical	Pass
		1750	-5.78	3.33	27.59	18.48	70.469	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-6.31	3.15	27.65	18.19	65.917	Vertical	Pass
		1732.5	-5.88	3.31	27.61	18.42	69.502	Vertical	Pass
		1747.5	-6.04	3.33	27.57	18.20	66.069	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-6.27	3.17	27.66	18.22	66.374	Vertical	Pass
		1732.5	-5.22	3.32	27.61	19.07	80.724	Vertical	Pass
		1745	-5.83	3.36	27.56	18.37	68.707	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	-5.79	3.12	27.58	18.67	73.621	Horizontal	Pass
		1732.5	-5.64	3.27	27.61	18.70	74.131	Horizontal	Pass
		1754.3	-5.64	3.29	27.63	18.70	74.131	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-5.73	3.13	27.61	18.75	74.989	Horizontal	Pass
		1732.5	-5.86	3.27	27.61	18.48	70.469	Horizontal	Pass
		1753.5	-6.08	3.30	27.62	18.24	66.681	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-5.56	3.13	27.63	18.94	78.343	Horizontal	Pass
		1732.5	-5.52	3.27	27.61	18.82	76.208	Horizontal	Pass
		1752.5	-5.21	3.30	27.60	19.09	81.096	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-5.63	3.15	27.64	18.86	76.913	Horizontal	Pass
		1732.5	-5.82	3.31	27.61	18.48	70.469	Horizontal	Pass
		1750	-5.20	3.33	27.59	19.06	80.538	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-5.43	3.15	27.65	19.07	80.724	Horizontal	Pass
		1732.5	-5.49	3.31	27.61	18.81	76.033	Horizontal	Pass
		1747.5	-5.51	3.33	27.57	18.73	74.645	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-5.38	3.17	27.66	19.11	81.470	Horizontal	Pass
		1732.5	-5.39	3.32	27.61	18.90	77.625	Horizontal	Pass
		1745	-5.20	3.36	27.56	19.00	79.433	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-6.43	3.12	27.58	18.03	63.533	Vertical	Pass
		1732.5	-6.69	3.27	27.61	17.65	58.210	Vertical	Pass
		1754.3	-6.93	3.29	27.63	17.41	55.081	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-6.62	3.13	27.61	17.86	61.094	Vertical	Pass
		1732.5	-6.52	3.27	27.61	17.82	60.534	Vertical	Pass
		1753.5	-6.56	3.30	27.62	17.76	59.704	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-7.18	3.13	27.63	17.32	53.951	Vertical	Pass
		1732.5	-6.89	3.27	27.61	17.45	55.590	Vertical	Pass
		1752.5	-6.50	3.30	27.60	17.80	60.256	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-7.31	3.15	27.64	17.18	52.240	Vertical	Pass
		1732.5	-6.65	3.31	27.61	17.65	58.210	Vertical	Pass
		1750	-6.78	3.33	27.59	17.48	55.976	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-7.21	3.15	27.65	17.29	53.580	Vertical	Pass
		1732.5	-7.13	3.31	27.61	17.17	52.119	Vertical	Pass
		1747.5	-7.10	3.33	27.57	17.14	51.761	Vertical	Pass
20.0MHz	1/#Mid	1720	-6.67	3.17	27.66	17.82	60.534	Vertical	Pass

Band 16 QAM		1732.5	-6.85	3.32	27.61	17.44	55.463	Vertical	Pass
		1745	-6.51	3.36	27.56	17.69	58.749	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	4.32	2.01	19.68	2.15	19.84	96.383	Horizontal	Pass
		836.5	4.20	2.01	19.77	2.15	19.81	95.719	Horizontal	Pass
		848.3	4.00	2.02	19.82	2.15	19.65	92.257	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.09	2.01	19.70	2.15	19.63	91.833	Horizontal	Pass
		836.5	3.99	2.01	19.77	2.15	19.60	91.201	Horizontal	Pass
		847.5	3.86	2.02	19.81	2.15	19.50	89.125	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	4.37	2.01	19.71	2.15	19.92	98.175	Horizontal	Pass
		836.5	4.25	2.01	19.77	2.15	19.86	96.828	Horizontal	Pass
		846.5	4.09	2.02	19.79	2.15	19.71	93.541	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	4.39	2.01	19.73	2.15	19.96	99.083	Horizontal	Pass
		836.5	4.34	2.01	19.77	2.15	19.95	98.855	Horizontal	Pass
		844	4.24	2.02	19.78	2.15	19.85	96.605	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	2.91	2.01	19.68	2.15	18.43	69.663	Vertical	Pass
		836.5	2.95	2.01	19.77	2.15	18.56	71.779	Vertical	Pass
		848.3	3.28	2.02	19.82	2.15	18.93	78.163	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	3.59	2.01	19.70	2.15	19.13	81.846	Vertical	Pass
		836.5	3.08	2.01	19.77	2.15	18.69	73.961	Vertical	Pass
		847.5	3.10	2.02	19.81	2.15	18.74	74.817	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	2.83	2.01	19.71	2.15	18.38	68.865	Vertical	Pass
		836.5	3.03	2.01	19.77	2.15	18.64	73.114	Vertical	Pass
		846.5	3.10	2.02	19.79	2.15	18.72	74.473	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	2.69	2.01	19.73	2.15	18.26	66.988	Vertical	Pass
		836.5	3.27	2.01	19.77	2.15	18.88	77.268	Vertical	Pass
		844	3.50	2.02	19.78	2.15	19.11	81.470	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	3.47	2.01	19.68	2.15	18.99	79.250	Horizontal	Pass
		836.5	3.40	2.01	19.77	2.15	19.01	79.616	Horizontal	Pass
		848.3	3.24	2.02	19.82	2.15	18.89	77.446	Horizontal	Pass
3.0MHz Band 16 QAM	1/##Mid	825.5	3.55	2.01	19.70	2.15	19.09	81.096	Horizontal	Pass
		836.5	3.26	2.01	19.77	2.15	18.87	77.090	Horizontal	Pass
		847.5	2.74	2.02	19.81	2.15	18.38	68.865	Horizontal	Pass
5.0MHz Band 16 QAM	1/##Mid	826.5	3.87	2.01	19.71	2.15	19.42	87.498	Horizontal	Pass
		836.5	3.64	2.01	19.77	2.15	19.25	84.140	Horizontal	Pass
		846.5	3.39	2.02	19.79	2.15	19.01	79.616	Horizontal	Pass
10.0MHz Band 16 QAM	1/##Mid	829	3.87	2.01	19.73	2.15	19.44	87.902	Horizontal	Pass
		836.5	3.59	2.01	19.77	2.15	19.20	83.176	Horizontal	Pass
		844	3.13	2.02	19.78	2.15	18.74	74.817	Horizontal	Pass
1.4MHz Band 16 QAM	1/##Mid	824.7	2.61	2.01	19.68	2.15	18.13	65.013	Vertical	Pass
		836.5	3.52	2.01	19.77	2.15	19.13	81.846	Vertical	Pass
		848.3	3.04	2.02	19.82	2.15	18.69	73.961	Vertical	Pass
3.0MHz Band 16 QAM	1/##Mid	825.5	2.92	2.01	19.70	2.15	18.46	70.146	Vertical	Pass
		836.5	1.86	2.01	19.77	2.15	17.47	55.847	Vertical	Pass
		847.5	2.53	2.02	19.81	2.15	18.17	65.615	Vertical	Pass
5.0MHz Band 16 QAM	1/##Mid	826.5	2.57	2.01	19.71	2.15	18.12	64.863	Vertical	Pass
		836.5	2.11	2.01	19.77	2.15	17.72	59.156	Vertical	Pass
		846.5	1.53	2.02	19.79	2.15	17.15	51.880	Vertical	Pass
10.0MHz Band 16 QAM	1/##Mid	829	2.08	2.01	19.73	2.15	17.65	58.210	Vertical	Pass
		836.5	1.95	2.01	19.77	2.15	17.56	57.016	Vertical	Pass
		844	2.35	2.02	19.78	2.15	17.96	62.517	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	-3.26	4.54	27.75	19.95	98.855	Horizontal	Pass
		2535	-3.09	4.69	27.72	19.94	98.628	Horizontal	Pass
		2567.5	-3.02	4.71	27.71	19.98	99.541	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.19	4.55	27.76	20.02	100.462	Horizontal	Pass
		2535	-3.00	4.69	27.72	20.03	100.693	Horizontal	Pass
		2565	-2.92	4.72	27.70	20.06	101.391	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.20	4.55	27.77	20.02	100.462	Horizontal	Pass
		2535	-3.06	4.69	27.72	19.97	99.312	Horizontal	Pass
		2562.5	-2.96	4.72	27.69	20.01	100.231	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-3.14	4.57	27.78	20.07	101.625	Horizontal	Pass
		2535	-2.96	4.73	27.72	20.03	100.693	Horizontal	Pass
		2560	-2.92	4.75	27.68	20.01	100.231	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-5.06	4.54	27.75	18.15	65.313	Vertical	Pass
		2535	-4.83	4.69	27.72	18.20	66.069	Vertical	Pass
		2567.5	-4.18	4.71	27.71	18.82	76.208	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-4.46	4.55	27.76	18.75	74.989	Vertical	Pass
		2535	-4.12	4.69	27.72	18.91	77.804	Vertical	Pass
		2565	-4.73	4.72	27.70	18.25	66.834	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-4.36	4.55	27.77	18.86	76.913	Vertical	Pass
		2535	-4.06	4.69	27.72	18.97	78.886	Vertical	Pass
		2562.5	-4.84	4.72	27.69	18.13	65.013	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-4.15	4.57	27.78	19.06	80.538	Vertical	Pass
		2535	-4.61	4.73	27.72	18.38	68.865	Vertical	Pass
		2560	-4.79	4.75	27.68	18.14	65.163	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	-3.95	4.54	27.75	19.26	84.333	Horizontal	Pass
		2535	-3.64	4.69	27.72	19.39	86.896	Horizontal	Pass
		2567.5	-3.72	4.71	27.71	19.28	84.723	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.84	4.55	27.76	19.37	86.497	Horizontal	Pass
		2535	-3.85	4.69	27.72	19.18	82.794	Horizontal	Pass
		2565	-4.12	4.72	27.70	18.86	76.913	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-4.02	4.55	27.77	19.20	83.176	Horizontal	Pass
		2535	-3.99	4.69	27.72	19.04	80.168	Horizontal	Pass
		2562.5	-3.60	4.72	27.69	19.37	86.497	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.90	4.57	27.78	19.31	85.310	Horizontal	Pass
		2535	-3.57	4.73	27.72	19.42	87.498	Horizontal	Pass
		2560	-3.67	4.75	27.68	19.26	84.333	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-5.32	4.54	27.75	17.89	61.518	Vertical	Pass
		2535	-5.40	4.69	27.72	17.63	57.943	Vertical	Pass
		2567.5	-4.10	4.71	27.71	18.90	77.625	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-4.21	4.55	27.76	19.00	79.433	Vertical	Pass
		2535	-4.65	4.69	27.72	18.38	68.865	Vertical	Pass
		2565	-4.69	4.72	27.70	18.29	67.453	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-4.59	4.55	27.77	18.63	72.946	Vertical	Pass
		2535	-4.85	4.69	27.72	18.18	65.766	Vertical	Pass
		2562.5	-5.03	4.72	27.69	17.94	62.230	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-5.58	4.57	27.78	17.63	57.943	Vertical	Pass
		2535	-5.33	4.73	27.72	17.66	58.345	Vertical	Pass
		2560	-4.44	4.75	27.68	18.49	70.632	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.6 LTE BAND 38

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2572.5	-2.12	4.95	27.79	18.15	65.313	Vertical	Pass
		2595	-2.64	4.88	27.71	18.18	65.766	Vertical	Pass
		2617.5	-2.58	4.93	27.95	19.11	81.470	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	19.09	81.096	Vertical	Pass
		2595	-2.47	4.95	27.81	18.55	71.614	Vertical	Pass
		2617.5	-2.59	5.03	27.69	19.01	79.616	Vertical	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	18.24	66.681	Vertical	Pass
		2595	-2.6	5	27.65	18.89	77.446	Vertical	Pass
		2615	-2.67	4.87	27.89	18.59	72.277	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	18.45	69.984	Vertical	Pass
		2595	-2.38	4.87	27.87	19.03	79.983	Vertical	Pass
		2615	-2.56	4.94	27.77	18.84	76.560	Vertical	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.9	4.89	27.88	18.98	79.068	Vertical	Pass
		2595	-2.32	4.87	27.84	19.01	79.616	Vertical	Pass
		2612.5	-2.52	4.92	27.93	18.40	69.183	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	18.85	76.736	Vertical	Pass
		2595	-2.53	4.98	27.82	18.39	69.024	Vertical	Pass
		2612.5	-2.6	4.95	27.83	18.25	66.834	Vertical	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.8	18.44	69.823	Vertical	Pass
		2595	-2.37	4.79	27.83	19.73	93.972	Vertical	Pass
		2610	-2.68	4.89	27.87	18.39	69.024	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	18.58	72.111	Vertical	Pass
		2595	-2.88	4.91	27.71	18.46	70.146	Vertical	Pass
		2610	-2.81	4.96	27.92	18.48	70.469	Vertical	Pass

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2572.5	-2.12	4.95	27.79	18.76	75.162	Horizontal	Pass
		2595	-2.64	4.88	27.71	18.55	71.614	Horizontal	Pass
		2617.5	-2.58	4.93	27.95	19.08	80.910	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	18.95	78.524	Horizontal	Pass
		2595	-2.47	4.95	27.81	18.67	73.621	Horizontal	Pass
		2617.5	-2.59	5.03	27.69	18.79	75.683	Horizontal	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	18.53	71.285	Horizontal	Pass
		2595	-2.6	5	27.65	19.21	83.368	Horizontal	Pass
		2615	-2.67	4.87	27.89	18.99	79.250	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	19.26	84.333	Horizontal	Pass
		2595	-2.38	4.87	27.87	18.62	72.778	Horizontal	Pass
		2615	-2.56	4.94	27.77	18.42	69.502	Horizontal	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.9	4.89	27.88	19.14	82.035	Horizontal	Pass
		2595	-2.32	4.87	27.84	19.28	84.723	Horizontal	Pass
		2612.5	-2.52	4.92	27.93	18.51	70.958	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	19.14	82.035	Horizontal	Pass
		2595	-2.53	4.98	27.82	18.42	69.502	Horizontal	Pass
		2612.5	-2.6	4.95	27.83	19.02	79.799	Horizontal	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.8	18.96	78.705	Horizontal	Pass
		2595	-2.37	4.79	27.83	19.91	97.949	Horizontal	Pass
		2610	-2.68	4.89	27.87	18.46	70.146	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	18.42	69.502	Horizontal	Pass
		2595	-2.88	4.91	27.71	19.99	99.770	Horizontal	Pass
		2610	-2.81	4.96	27.92	19.11	81.470	Horizontal	Pass

Note:

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1051, §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 $55 + \log_{10}(P \text{ [Watts]})$.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P \text{ [Watts]})$, 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, 38

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-44.84	4.04	33.51	-15.37	-13	-2.37	Horizontal
3701.4	-49.48	4.04	33.51	-20.01	-13	-7.01	Vertical
5552.1	-53.70	5.24	35.84	-23.10	-13	-10.10	Vertical
5552.1	-50.64	5.24	35.84	-20.04	-13	-7.04	Horizontal
204.5	-40.22	1.43	16.02	-25.63	-13	-12.63	Vertical
343.5	-39.00	1.30	17.99	-22.31	-13	-9.31	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.51	4.04	33.56	-17.99	-13	-4.99	Horizontal
3760.0	-46.68	4.04	33.56	-17.16	-13	-4.16	Vertical
5640.0	-53.27	5.24	35.91	-22.60	-13	-9.60	Vertical
5640.0	-51.30	5.24	35.91	-20.63	-13	-7.63	Horizontal
206.7	-39.51	1.62	16.97	-24.16	-13	-11.16	Vertical
343.8	-37.46	1.74	15.98	-23.23	-13	-10.23	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.49	4.04	34.00	-17.53	-13	-4.53	Horizontal
3818.6	-50.16	4.04	34.00	-20.20	-13	-7.20	Vertical
5727.9	-46.15	5.24	36.04	-15.35	-13	-2.35	Vertical
5727.9	-51.15	5.24	36.04	-20.35	-13	-7.35	Horizontal
180.6	-37.50	1.42	17.29	-21.63	-13	-8.63	Vertical
295.1	-44.76	1.50	17.90	-28.35	-13	-15.35	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-53.89	4.07	33.54	-24.42	-13	-11.42	Horizontal
3720.0	-53.61	4.07	33.54	-24.14	-13	-11.14	Vertical
5580.0	-53.62	5.28	35.86	-23.04	-13	-10.04	Vertical
5580.0	-53.62	5.28	35.86	-23.04	-13	-10.04	Horizontal
193.1	-38.33	1.58	16.89	-23.01	-13	-10.01	Vertical
398.9	-42.03	1.76	17.26	-26.53	-13	-13.53	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.97	4.04	33.56	-20.45	-13	-7.45	Horizontal
3760.0	-46.94	4.04	33.56	-17.42	-13	-4.42	Vertical
5640.0	-53.19	5.24	35.91	-22.52	-13	-9.52	Vertical
5640.0	-53.09	5.24	35.91	-22.42	-13	-9.42	Horizontal
181.8	-38.42	1.46	16.27	-23.61	-13	-10.61	Vertical
275.3	-40.26	1.59	15.15	-26.70	-13	-13.70	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.73	4.04	34.00	-20.77	-13	-7.77	Horizontal
3800.0	-51.78	4.04	34.00	-21.82	-13	-8.82	Vertical
5700.0	-50.77	5.24	36.04	-19.97	-13	-6.97	Vertical
5700.0	-49.38	5.24	36.04	-18.58	-13	-5.58	Horizontal
201.7	-40.25	1.36	17.39	-24.21	-13	-11.21	Vertical
335.7	-35.39	1.66	15.39	-21.66	-13	-8.66	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	-46.25	4.02	29.80	-20.47	-13	-7.47	Horizontal
3421.4	-53.40	4.02	29.80	-27.62	-13	-14.62	Vertical
5132.1	-49.63	5.24	35.84	-19.03	-13	-6.03	Vertical
5132.1	-53.82	5.24	35.84	-23.22	-13	-10.22	Horizontal
188.2	-36.27	1.68	16.04	-21.91	-13	-8.91	Vertical
321.8	-34.05	1.78	17.74	-18.09	-13	-5.09	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.41	4.03	30.00	-19.44	-13	-6.44	Horizontal
3465.0	-50.49	4.03	30.00	-24.52	-13	-11.52	Vertical
5197.5	-46.11	5.25	35.86	-15.50	-13	-2.50	Vertical
5197.5	-53.68	5.25	35.86	-23.07	-13	-10.07	Horizontal
196.6	-37.77	1.72	17.69	-21.80	-13	-8.80	Vertical
375.5	-40.34	1.62	16.02	-25.93	-13	-12.93	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-46.72	4.05	30.01	-20.76	-13	-7.76	Horizontal
3508.6	-48.86	4.05	30.01	-22.90	-13	-9.90	Vertical
5262.9	-49.08	5.26	35.86	-18.48	-13	-5.48	Vertical
5262.9	-52.14	5.26	35.86	-21.54	-13	-8.54	Horizontal
203.9	-40.85	1.80	16.69	-25.96	-13	-12.96	Vertical
317.7	-40.70	1.75	16.66	-25.80	-13	-12.80	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	-48.25	4.02	29.80	-22.47	-13	-9.47	Horizontal
3440.0	-46.33	4.02	29.80	-20.55	-13	-7.55	Vertical
5160.0	-47.06	5.24	35.84	-16.46	-13	-3.46	Vertical
5160.0	-53.94	5.24	35.84	-23.34	-13	-10.34	Horizontal
185.8	-37.05	1.57	17.26	-21.36	-13	-8.36	Vertical
256.3	-39.08	1.78	16.35	-24.51	-13	-11.51	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-46.33	4.03	30.00	-20.36	-13	-7.36	Horizontal
3465.0	-45.03	4.03	30.00	-19.06	-13	-6.06	Vertical
5197.5	-48.61	5.25	35.86	-18.00	-13	-5.00	Vertical
5197.5	-51.20	5.25	35.86	-20.59	-13	-7.59	Horizontal
184.8	-42.27	1.44	17.95	-25.76	-13	-12.76	Vertical
307.2	-34.76	1.65	16.09	-20.32	-13	-7.32	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-51.27	2.91	27.68	-26.50	-13	-13.50	Horizontal
3490.0	-52.63	2.91	27.68	-27.86	-13	-14.86	Vertical
5235.0	-50.53	5.26	35.86	-19.93	-13	-6.93	Vertical
5235.0	-52.38	5.26	35.86	-21.78	-13	-8.78	Horizontal
181.0	-41.49	1.61	16.85	-26.25	-13	-13.25	Vertical
309.0	-36.15	1.61	15.19	-22.57	-13	-9.57	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	-50.19	2.78	27.50	-25.47	-13	-12.47	Horizontal
1649.4	-49.36	2.78	27.50	-24.64	-13	-11.64	Vertical
2474.1	-53.54	2.90	27.80	-28.64	-13	-15.64	Vertical
2474.1	-51.60	2.90	27.80	-26.70	-13	-13.70	Horizontal
184.1	-36.07	1.76	17.59	-20.24	-13	-7.24	Vertical
344.8	-42.35	1.63	15.87	-28.11	-13	-15.11	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-52.00	2.80	27.48	-27.32	-13	-14.32	Horizontal
1673.0	-47.52	2.80	27.48	-22.84	-13	-9.84	Vertical
2509.5	-47.60	2.91	27.70	-22.81	-13	-9.81	Vertical
2509.5	-49.43	2.91	27.70	-24.64	-13	-11.64	Horizontal
201.6	-38.69	1.61	15.68	-24.62	-13	-11.62	Vertical
409.8	-34.15	1.59	17.52	-18.23	-13	-5.23	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-47.46	2.82	27.43	-22.85	-13	-9.85	Horizontal
1696.6	-51.24	2.82	27.43	-26.63	-13	-13.63	Vertical
2544.9	-52.61	2.92	27.74	-27.79	-13	-14.79	Vertical
2544.9	-50.99	2.92	27.74	-26.17	-13	-13.17	Horizontal
194.8	-37.59	1.69	16.67	-22.60	-13	-9.60	Vertical
440.8	-37.01	1.70	17.18	-21.53	-13	-8.53	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	-46.12	2.78	27.50	-21.40	-13	-8.40	Horizontal
1658.0	-50.33	2.78	27.50	-25.61	-13	-12.61	Vertical
2487.0	-49.54	2.90	27.80	-24.64	-13	-11.64	Vertical
2487.0	-52.86	2.90	27.80	-27.96	-13	-14.96	Horizontal
195.6	-43.55	1.71	15.57	-29.69	-13	-16.69	Vertical
419.5	-34.81	1.34	16.40	-19.75	-13	-6.75	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-44.06	2.80	27.48	-19.38	-13	-6.38	Horizontal
1673.0	-47.14	2.80	27.48	-22.46	-13	-9.46	Vertical
2509.5	-50.16	2.91	27.70	-25.37	-13	-12.37	Vertical
2509.5	-49.52	2.91	27.70	-24.73	-13	-11.73	Horizontal
179.9	-40.10	1.44	17.04	-24.50	-13	-11.50	Vertical
253.1	-38.79	1.76	17.62	-22.93	-13	-9.93	Horizontal
Test Results for High Channel 844MHz							
1688.0	-50.07	2.82	27.43	-25.46	-13	-12.46	Horizontal
1688.0	-50.22	2.82	27.43	-25.61	-13	-12.61	Vertical
2532.0	-52.38	2.92	27.74	-27.56	-13	-14.56	Vertical
2532.0	-50.41	2.92	27.74	-25.59	-13	-12.59	Horizontal
210.3	-40.09	1.74	17.70	-24.13	-13	-11.13	Vertical
354.1	-35.14	1.41	17.46	-19.08	-13	-6.08	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	-61.46	5.23	35.81	-30.88	-25	-5.88	Horizontal
5005.0	-60.13	5.23	35.81	-29.55	-25	-4.55	Vertical
7507.5	-59.10	5.67	36.85	-27.92	-25	-2.92	Vertical
7507.5	-62.76	5.67	36.85	-31.58	-25	-6.58	Horizontal
194.8	-53.61	1.73	17.97	-37.37	-25	-12.37	Vertical
280.5	-53.26	1.38	15.11	-39.53	-25	-14.53	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.63	5.23	35.82	-34.04	-25	-9.04	Horizontal
5070.0	-64.85	5.23	35.82	-34.26	-25	-9.26	Vertical
7605.0	-59.30	5.67	36.85	-28.12	-25	-3.12	Vertical
7605.0	-62.60	5.67	36.85	-31.42	-25	-6.42	Horizontal
200.9	-49.25	1.77	16.17	-34.84	-25	-9.84	Vertical
346.3	-48.23	1.63	15.21	-34.65	-25	-9.65	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.98	5.24	35.83	-33.39	-25	-8.39	Horizontal
5135.0	-60.20	5.24	35.83	-29.61	-25	-4.61	Vertical
7702.5	-63.14	5.68	36.87	-31.95	-25	-6.95	Vertical
7702.5	-59.36	5.68	36.87	-28.17	-25	-3.17	Horizontal
205.7	-50.86	1.58	17.56	-34.88	-25	-9.88	Vertical
408.5	-45.36	1.45	16.58	-30.23	-25	-5.23	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	-61.52	5.23	35.82	-30.93	-25	-5.93	Horizontal
5020.0	-64.90	5.23	35.82	-34.31	-25	-9.31	Vertical
7530.0	-64.62	5.67	36.86	-33.43	-25	-8.43	Vertical
7530.0	-61.11	5.67	36.86	-29.92	-25	-4.92	Horizontal
210.0	-52.02	1.63	15.76	-37.89	-25	-12.89	Vertical
408.1	-51.80	1.71	15.44	-38.07	-25	-13.07	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.83	5.23	35.82	-30.24	-25	-5.24	Horizontal
5070.0	-63.24	5.23	35.82	-32.65	-25	-7.65	Vertical
7605.0	-63.47	5.67	36.85	-32.29	-25	-7.29	Vertical
7605.0	-62.59	5.67	36.85	-31.41	-25	-6.41	Horizontal
203.4	-47.46	1.79	16.84	-32.40	-25	-7.40	Vertical
354.0	-46.64	1.71	17.64	-30.71	-25	-5.71	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.99	5.24	35.83	-30.40	-25	-5.40	Horizontal
5120.0	-62.14	5.24	35.83	-31.55	-25	-6.55	Vertical
7680.0	-62.81	5.70	36.88	-31.63	-25	-6.63	Vertical
7680.0	-64.98	5.70	36.88	-33.80	-25	-8.80	Horizontal
175.7	-45.31	1.79	16.84	-30.25	-25	-5.25	Vertical
265.1	-46.91	1.71	17.64	-30.98	-25	-5.98	Horizontal

9.5 LTE BAND 38

QPSK EIRP POWER FOR LTE BAND 38 (5MHZ BANDWIDTH)

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5145	-52.69	4.01	27.5	-29.20	-25	-4.20	Horizontal
5145	-53.30	4.01	27.5	-29.81	-25	-4.81	Vertical
7717.5	-51.24	5.09	27.8	-28.53	-25	-3.53	Vertical
7717.5	-54.18	5.09	27.8	-31.47	-25	-6.47	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-52.26	4.1	27.48	-28.88	-25	-3.88	Horizontal
5190	-53.95	4.1	27.48	-30.57	-25	-5.57	Vertical
7785	-51.58	5.42	27.7	-29.30	-25	-4.30	Vertical
7785	-50.25	5.42	27.7	-27.97	-25	-2.97	Horizontal
Test Results for High Channel 2617.5MHz							
5234	-50.67	4.11	27.43	-27.35	-25	-2.35	Horizontal
5234	-51.51	4.11	27.43	-28.19	-25	-3.19	Vertical
7851	-54.77	5.31	27.74	-32.34	-25	-7.34	Vertical
7851	-49.48	5.31	27.74	-27.05	-25	-2.05	Horizontal

QPSK EIRP POWER FOR LTE BAND 38 (20MHZ BANDWIDTH)

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5160	-51.65	3.89	27.5	-28.04	-25	-3.04	Horizontal
5160	-51.58	3.89	27.5	-27.97	-25	-2.97	Vertical
7740	-52.71	5.33	27.8	-30.24	-25	-5.24	Vertical
7740	-50.08	5.33	27.8	-27.61	-25	-2.61	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-54.02	4.1	27.48	-30.64	-25	-5.64	Horizontal
5190	-50.71	4.1	27.48	-27.33	-25	-2.33	Vertical
7785	-54.27	5.42	27.7	-31.99	-25	-6.99	Vertical
7785	-53.88	5.42	27.7	-31.60	-25	-6.60	Horizontal
Test Results for High Channel 2610MHz							
5220	-51.44	4.01	27.43	-28.02	-25	-3.02	Horizontal
5220	-51.39	4.01	27.43	-27.97	-25	-2.97	Vertical
7830	-54.98	5.34	27.74	-32.58	-25	-7.58	Vertical
7830	-51.81	5.34	27.74	-29.41	-25	-4.41	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 3.23V, 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, 38

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	0.006614	2.5
3.8	1880	13.9	0.007403	2.5
4.37	1880	13.4	0.007140	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.7	0.006749	2.5
Extreme (50C)	1880	11.4	0.006070	2.5
Extreme (40C)	1880	13.4	0.007116	2.5
Extreme (30C)	1880	13.2	0.007000	2.5
Extreme (10C)	1880	13.5	0.007194	2.5
Extreme (0C)	1880	12.2	0.006494	2.5
Extreme (-10C)	1880	13.1	0.006972	2.5
Extreme (-20C)	1880	14.2	0.007540	2.5
Extreme (-30C)	1880	14.7	0.007817	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	1880	9.8	0.005205	2.5
3.8	1880	9.2	0.004871	2.5
4.37	1880	8.2	0.004363	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.9	0.005273	2.5
Extreme (50C)	1880	8.5	0.004502	2.5
Extreme (40C)	1880	7.9	0.004190	2.5
Extreme (30C)	1880	9.4	0.004997	2.5
Extreme (10C)	1880	9.2	0.004915	2.5
Extreme (0C)	1880	7.9	0.004210	2.5
Extreme (-10C)	1880	9.2	0.004897	2.5
Extreme (-20C)	1880	9.3	0.004941	2.5
Extreme (-30C)	1880	7.8	0.004147	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	9.3	0.005346	2.5
3.8	1732.5	9.2	0.005312	2.5
4.37	1732.5	8.1	0.004656	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.9	0.005134	2.5
Extreme (50C)	1732.5	8.6	0.004967	2.5
Extreme (40C)	1732.5	7.8	0.004476	2.5
Extreme (30C)	1732.5	5.7	0.003307	2.5
Extreme (10C)	1732.5	7.5	0.004332	2.5
Extreme (0C)	1732.5	9.6	0.005516	2.5
Extreme (-10C)	1732.5	8.5	0.004934	2.5
Extreme (-20C)	1732.5	7.3	0.004189	2.5
Extreme (-30C)	1732.5	8.2	0.004710	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	9.7	0.005575	2.5
3.8	1732.5	8.7	0.005012	2.5
4.37	1732.5	8.1	0.004648	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.2	0.005316	2.5
Extreme (50C)	1732.5	8.6	0.004976	2.5
Extreme (40C)	1732.5	7.8	0.004489	2.5
Extreme (30C)	1732.5	9.1	0.005249	2.5
Extreme (10C)	1732.5	9.1	0.005252	2.5
Extreme (0C)	1732.5	8.1	0.004654	2.5
Extreme (-10C)	1732.5	8.9	0.005123	2.5
Extreme (-20C)	1732.5	8.9	0.005162	2.5
Extreme (-30C)	1732.5	8.5	0.004918	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	5.7	0.006812	2.5
3.8	836.5	7.1	0.008492	2.5
4.37	836.5	4.6	0.005548	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.8	0.006879	2.5
Extreme (50C)	836.5	6.4	0.007637	2.5
Extreme (40C)	836.5	5.6	0.006697	2.5
Extreme (30C)	836.5	6.3	0.007571	2.5
Extreme (10C)	836.5	5.4	0.006429	2.5
Extreme (0C)	836.5	5.7	0.006842	2.5
Extreme (-10C)	836.5	5.7	0.006842	2.5
Extreme (-20C)	836.5	5.8	0.006917	2.5
Extreme (-30C)	836.5	6.8	0.008081	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	5.3	0.006336	2.5
3.8	836.5	6.2	0.007470	2.5
4.37	836.5	4.8	0.005744	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.0	0.007147	2.5
Extreme (50C)	836.5	5.9	0.007042	2.5
Extreme (40C)	836.5	6.1	0.007250	2.5
Extreme (30C)	836.5	6.6	0.007852	2.5
Extreme (10C)	836.5	5.8	0.006935	2.5
Extreme (0C)	836.5	5.6	0.006721	2.5
Extreme (-10C)	836.5	5.6	0.006743	2.5
Extreme (-20C)	836.5	5.8	0.006991	2.5
Extreme (-30C)	836.5	6.0	0.007119	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	9.9	0.003898	2.5
3.8	2535	9.2	0.003636	2.5
4.37	2535	8.1	0.003185	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.2	0.003644	2.5
Extreme (50C)	2535	8.5	0.003360	2.5
Extreme (40C)	2535	8.8	0.003476	2.5
Extreme (30C)	2535	9.3	0.003656	2.5
Extreme (10C)	2535	7.7	0.003050	2.5
Extreme (0C)	2535	8.3	0.003291	2.5
Extreme (-10C)	2535	8.9	0.003518	2.5
Extreme (-20C)	2535	9.2	0.003647	2.5
Extreme (-30C)	2535	8.5	0.003360	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2535	7.0	0.002755	2.5
3.8	2535	6.3	0.002472	2.5
4.37	2535	5.8	0.002274	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.5	0.002581	2.5
Extreme (50C)	2535	6.1	0.002393	2.5
Extreme (40C)	2535	5.0	0.001964	2.5
Extreme (30C)	2535	7.0	0.002779	2.5
Extreme (10C)	2535	5.9	0.002322	2.5
Extreme (0C)	2535	5.0	0.001978	2.5
Extreme (-10C)	2535	5.5	0.002168	2.5
Extreme (-20C)	2535	5.8	0.002306	2.5
Extreme (-30C)	2535	5.7	0.002251	2.5

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

10.5 LTE BAND 38

Band 38 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2595	8.8	0.003395	2.5
3.8	2595	6.3	0.002417	2.5
4.37	2595	7.5	0.002909	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7.4	0.002849	2.5
Extreme (50C)	2595	4.8	0.001867	2.5
Extreme (40C)	2595	5.9	0.002264	2.5
Extreme (30C)	2595	4.4	0.001695	2.5
Extreme (10C)	2595	6.0	0.002314	2.5
Extreme (0C)	2595	5.1	0.001961	2.5
Extreme (-10C)	2595	9.8	0.003758	2.5
Extreme (-20C)	2595	10.7	0.004106	2.5
Extreme (-30C)	2595	6.5	0.002504	2.5

Band 38 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2595	9.0	0.003453	2.5
3.8	2595	6.0	0.002325	2.5
4.37	2595	6.7	0.002586	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	8.0	0.003065	2.5
Extreme (50C)	2595	4.5	0.001735	2.5
Extreme (40C)	2595	5.2	0.001992	2.5
Extreme (30C)	2595	5.1	0.001962	2.5
Extreme (10C)	2595	6.9	0.002654	2.5
Extreme (0C)	2595	5.3	0.002032	2.5
Extreme (-10C)	2595	9.6	0.003707	2.5
Extreme (-20C)	2595	10.7	0.004105	2.5
Extreme (-30C)	2595	6.1	0.002361	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.

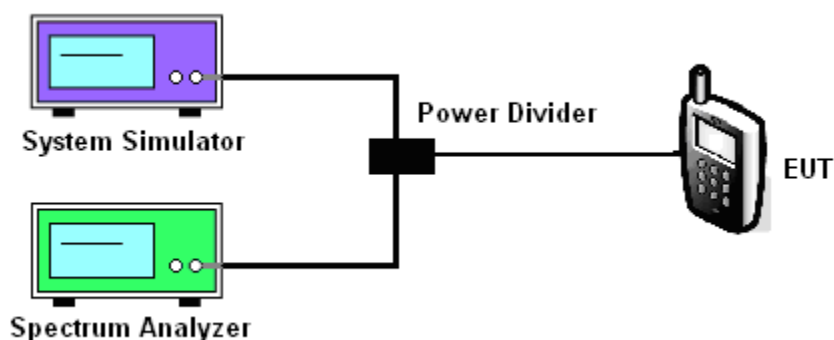
11.2 Measuring Instruments

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, 38



Test data reference attachment.

----END OF REPORT----