

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT FCCID: 2ADUBROAMWIFIR10

Product: Roam WiFi

Trade Mark: N/A

Model Number: RoamWiFi R10

Family Model: Aerobile3

Report No.: S19040302623004

Prepared for

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TABLE OF CONTENTS

1. GENERAL INFORMATION.....	4
1. GENERAL INFORMATION.....	4
1.1 PRODUCT DESCRIPTION	4
1.2 RELATED SUBMITTAL(S) / GRANT (S)	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	5
1.5 SPECIAL ACCESSORIES.....	5
1.6 WORST-CASE CONFIGURATION AND MODE.....	5
2. SYSTEM TEST CONFIGURATION	5
2.1 EUT CONFIGURATION.....	5
2.2 EUT EXERCISE	5
2.3 CONFIGURATION OF EUT SYSTEM.....	5
2.4 TEST SETUP	7
3.TEST AND MEASUREMENT EQUIPMENT	8
4. OUTPUT POWER.....	9
4.1 OUTPUT POWER MEASUREMENT	9
5. OCCUPIED BANDWIDTH	10
6. BANEDGE AND EMISSION MASK	11
7. OUT OF BAND EMISSIONS	11
7.1 MEASUREMENT METHOD	12
8. RADIATED MEASUREMENT	13
8.1. RADIATED POWER (ERP & EIRP).....	13
8.2 LTE BAND 2.....	14
8.3 LTE BAND 4.....	18
8.4 LTE BAND 5.....	21

8.5 LTE BAND 12	23
8.6 LTE BAND 17	24
8.7 LTE BAND 26	27
8.8 LTE BAND 41	28
9. SPURIOUS RADIATION EMISSION	30
9.1 LTE BAND 2.....	33
9.2 LTE BAND 4.....	33
9.3 LTE BAND 5.....	34
9.4 LTE BAND 12	35
9.5 LTE BAND 17	36
9.6 LTE BAND 26	37
9.7 LTE BAND 41	40
9.8 Below 1G BAND 2.....	40
10. FREQUENCY STABILITY	42
10.1 LTE BAND 2	43
10.3 LTE BAND 4	44
10.4 LTE BAND 5	46
10.5 LTE BAND 12	48
10.6 LTE BAND 17	49
10.7 LTE BAND 26	51
10.8 LTE BAND 41	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:	Roam WiFi
Trade Mark	N/A
Model Name	RoamWiFi R10
Family Model	Aerobile3
Model Difference	All models are the same circuit and RF module, except the Model
FCC ID:	2ADUBROAMWIFIR10
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,12,17,26 LTE TDD Band 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE FDD Band 26 Uplink: 814MHz-849MHz, (see note 2) Downlink: 859MHz-894MHz; LTE TDD Band 41 Uplink: 2496MHz-2690MHz Downlink: 2496MHz-2690MHz
Type of Modulation:	QPSK/16QAM
SIM Card	Only supports one SIM card
Antenna:	PIFA Antenna
Antenna gain:	LTE FDD: B2: 1.5dBi, B4:0.9dBi, B5/B26:2.1dBi, B12/B17:-1.9 dBi, i LTE TDD:B41: 2.0dBi
Power Supply:	DC 3.8V/5000mAh from Battery or DC 5V from USB Port.
Adapter:	N/A
HW Version	SP956-V
SW Version	RoamWiFi_QDSP_4.01.003
** Note1: The High Voltage DC 4.4V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ADUBROAMWIFIR10** filing to comply with the FCC Part 22H&24E &27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District Shenzhen, Guangdong, China

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 5, Band 7, Band 12, Band 17, Band 26, Band 41.

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

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

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

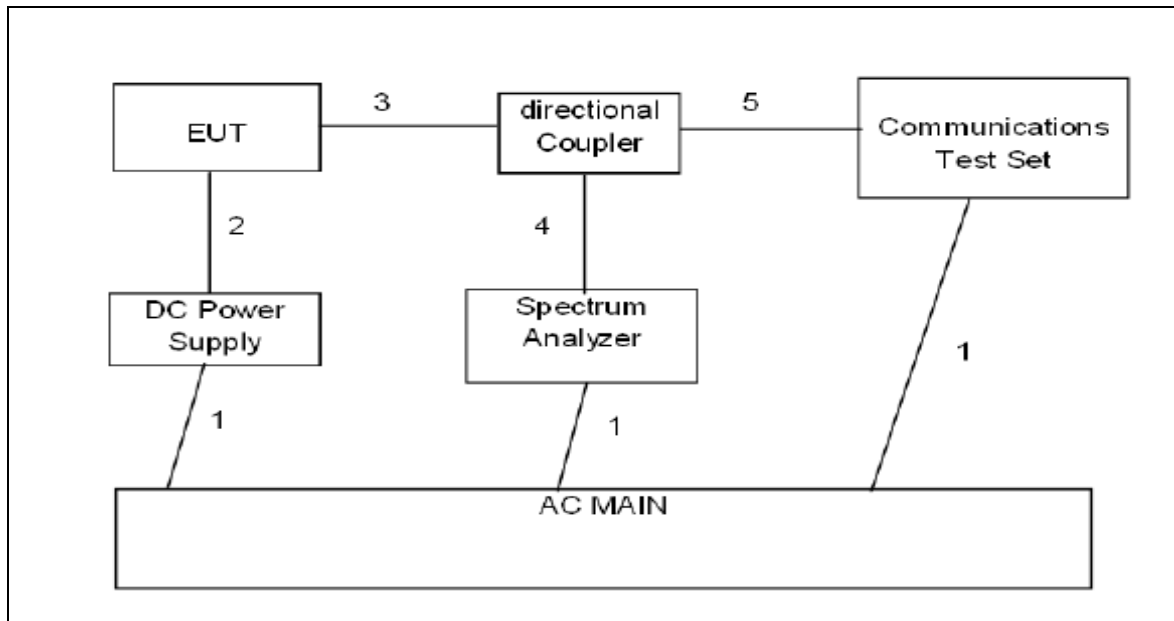
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Roam WiFi	RoamWiFi R10	FCC ID: 2ADUBROAMWIFIR10	EUT

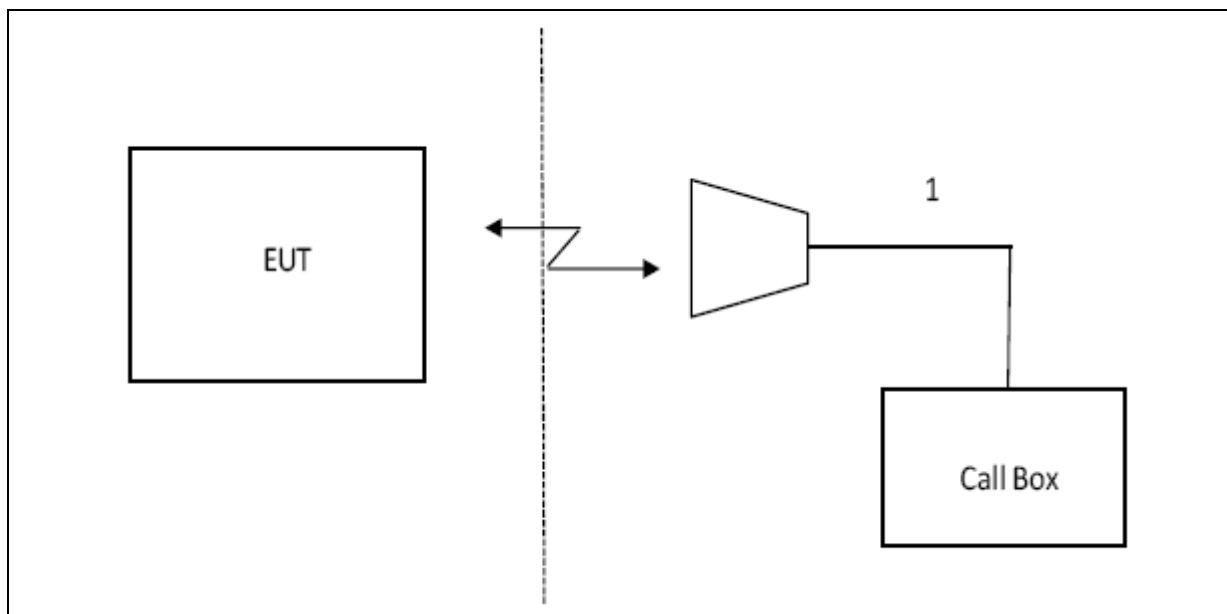
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

CONDUCTED SETUP DIAGRAM FOR TESTS



RADIATED SETUP DIAGRAM FOR TESTS



3.TEST AND MEASUREMENT EQUIPMENT

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

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2020.08.27
TEST RECEIVER	R&S	ESCI	A0304218	2020.05.12
COMMUNICATION TESTER	R&S	CMU200	117858	2020.05.12
COMMUNICATION TESTER	R&S	CMW500	148500	2020.05.12
TEST RECEIVER	R&S	ESPI	101318	2020.05.12
LISN	SCHWARZBECK	NSLK8127	A0304233	2020.05.12
CLIMATE CHAMBER	ALBATROSS	--	--	2020.05.12
Loop Antenna	ARA	PLA-1030/B	1029	2020.05.12
Biological Antenna	TESEQ	CBL6111D	31216	2020.05.12
Horn Antenna	EM	EM-AH-10180	2011071402	2020.05.12
DC Power Source	N/A	PS-6005D	20170402923	2020.05.12

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
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 26
LTE Band 41

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, and §90.691

FCC: §22.359

LIMITS

FCC: §22.359, §24.238,

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

(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

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 (704, 716, 824, 849, 1710 and 1755, 1850 and 1910 MHz)

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

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 26
LTE Band 41

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 26
LTE Band 41

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

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

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

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

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

LTE Band 4

LTE Band 5

LTE Band 12

LTE Band 17

LTE Band 26

LTE Band 41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band QPSK	6/0	1850.7	-2.62	3.76	28.24	21.86	153.587	Vertical	Pass
		1880	-2.00	3.91	28.22	22.31	170.138	Vertical	Pass
		1909.3	-2.03	3.93	28.20	22.24	167.350	Vertical	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-3.39	3.76	28.24	21.09	128.516	Vertical	Pass
		1880	-3.60	3.91	28.22	20.71	117.662	Vertical	Pass
		1909.3	-3.39	3.93	28.20	20.88	122.568	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	-2.33	3.77	28.23	22.13	163.221	Vertical	Pass
		1880	-1.86	3.91	28.24	22.47	176.685	Vertical	Pass
		1908.5	-1.95	3.94	28.25	22.36	172.052	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-2.87	3.77	28.23	21.59	144.278	Vertical	Pass
		1880	-2.80	3.91	28.24	21.53	142.326	Vertical	Pass
		1908.5	-3.08	3.94	28.25	21.23	132.851	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	-2.38	3.77	28.31	22.16	164.580	Vertical	Pass
		1880	-2.10	3.91	28.22	22.21	166.473	Vertical	Pass
		1907.5	-2.14	3.94	28.20	22.12	163.102	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-3.50	3.77	28.31	21.04	127.026	Vertical	Pass
		1880	-3.03	3.91	28.22	21.28	134.358	Vertical	Pass
		1907.5	-2.84	3.94	28.20	21.42	138.816	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	-2.14	3.79	28.33	22.40	173.796	Vertical	Pass
		1880	-2.40	3.95	28.22	21.87	153.910	Vertical	Pass
		1905	-1.92	3.97	28.19	22.30	169.661	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	-3.15	3.79	28.33	21.39	137.574	Vertical	Pass
		1880	-3.18	3.95	28.22	21.09	128.524	Vertical	Pass
		1905	-3.30	3.97	28.19	20.92	123.602	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	-2.91	3.79	28.34	21.64	145.879	Vertical	Pass
		1880	-2.15	3.95	28.22	22.12	162.930	Vertical	Pass
		1902.5	-2.18	3.97	28.18	22.03	159.588	Vertical	Pass
15.0MHz Band	75/0	1857.5	-3.83	3.79	28.34	20.72	118.101	Vertical	Pass
		1880	-2.75	3.95	28.22	21.52	141.975	Vertical	Pass

16 QAM		1902.5	-3.44	3.97	28.18	20.77	119.502	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	-3.45	3.81	28.35	21.09	128.435	Vertical	Pass
		1880	-1.94	3.96	28.22	22.32	170.587	Vertical	Pass
		1900	-2.23	4.00	28.16	21.93	155.918	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	-2.38	3.81	28.35	22.16	164.437	Vertical	Pass
		1880	-1.64	3.96	28.22	22.62	182.810	Vertical	Pass
		1900	-2.95	4.00	28.16	21.21	132.003	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/R B SIZE	Frequenc y	Result						Conclusio n
			SG	Cabl e	Antenn a Gain	Max. EIRP	Max. EIRP	Polarizatio n Of Max. ERP	
			(dBm	Loss	(dB)	Averag e	Averag e		
			)	(dBm		(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1850.7	-2.77	3.76	28.24	21.71	148.318	Horizontal	Pass
		1880	-2.78	3.91	28.22	21.53	142.233	Horizontal	Pass
		1909.3	-2.51	3.93	28.20	21.76	149.980	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-3.29	3.76	28.24	21.19	131.633	Horizontal	Pass
		1880	-3.77	3.91	28.22	20.54	113.262	Horizontal	Pass
		1909.3	-3.57	3.93	28.20	20.70	117.412	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	-2.61	3.77	28.23	21.85	153.111	Horizontal	Pass
		1880	-2.72	3.91	28.24	21.61	145.027	Horizontal	Pass
		1908.5	-2.27	3.94	28.25	22.04	159.830	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-3.41	3.77	28.23	21.05	127.483	Horizontal	Pass
		1880	-3.22	3.91	28.24	21.11	129.224	Horizontal	Pass
		1908.5	-3.80	3.94	28.25	20.51	112.431	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	-2.66	3.77	28.31	21.88	154.315	Horizontal	Pass
		1880	-2.52	3.91	28.22	21.79	151.094	Horizontal	Pass
		1907.5	-2.08	3.94	28.20	22.18	165.014	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-3.57	3.77	28.31	20.97	125.070	Horizontal	Pass
		1880	-2.76	3.91	28.22	21.55	142.727	Horizontal	Pass
		1907.5	-3.56	3.94	28.20	20.70	117.370	Horizontal	Pass
10.0MH z Band QPSK	50/0	1855	-2.86	3.79	28.33	21.68	147.265	Horizontal	Pass
		1880	-2.21	3.95	28.22	22.06	160.526	Horizontal	Pass
		1905	-2.11	3.97	28.19	22.11	162.572	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	1855	-3.61	3.79	28.33	20.93	123.958	Horizontal	Pass
		1880	-3.40	3.95	28.22	20.87	122.133	Horizontal	Pass
		1905	-3.40	3.97	28.19	20.82	120.897	Horizontal	Pass
15.0MH z Band QPSK	75/0	1857.5	-2.89	3.79	28.34	21.66	146.588	Horizontal	Pass
		1880	-2.45	3.95	28.22	21.82	151.959	Horizontal	Pass
		1902.5	-2.10	3.97	28.18	22.11	162.585	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	1857.5	-3.59	3.79	28.34	20.96	124.649	Horizontal	Pass
		1880	-3.67	3.95	28.22	20.60	114.730	Horizontal	Pass
		1902.5	-3.47	3.97	28.18	20.74	118.594	Horizontal	Pass
20.0MH z Band	100/0	1860	-2.72	3.81	28.35	21.82	152.055	Horizontal	Pass
		1880	-1.94	3.96	28.22	22.32	170.608	Horizontal	Pass

QPSK		1900	-2.03	4.00	28.16	22.13	163.305	Horizontal	Pass
20.0MHz	100/0	1860	-3.62	3.81	28.35	20.92	123.737	Horizontal	Pass
z Band		1880	-3.91	3.96	28.22	20.35	108.465	Horizontal	Pass
16 QAM		1900	-3.66	4.00	28.16	20.50	112.113	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1710.7	-3.61	3.12	27.58	20.85	121.708	Vertical	Pass
		1732.5	-3.97	3.27	27.61	20.37	108.875	Vertical	Pass
		1754.3	-3.87	3.29	27.63	20.47	111.339	Vertical	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-4.31	3.12	27.58	20.15	103.520	Vertical	Pass
		1732.5	-4.97	3.27	27.61	19.37	86.509	Vertical	Pass
		1754.3	-5.03	3.29	27.63	19.31	85.376	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-3.72	3.13	27.61	20.76	119.037	Vertical	Pass
		1732.5	-4.10	3.27	27.61	20.24	105.793	Vertical	Pass
		1753.5	-3.54	3.30	27.62	20.78	119.741	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-4.99	3.13	27.61	19.49	88.999	Vertical	Pass
		1732.5	-4.41	3.27	27.61	19.93	98.312	Vertical	Pass
		1753.5	-4.74	3.30	27.62	19.58	90.823	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-3.57	3.13	27.63	20.93	123.841	Vertical	Pass
		1732.5	-3.16	3.27	27.61	21.18	131.139	Vertical	Pass
		1752.5	-3.68	3.30	27.60	20.62	115.300	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-4.37	3.13	27.63	20.13	102.934	Vertical	Pass
		1732.5	-4.25	3.27	27.61	20.09	102.125	Vertical	Pass
		1752.5	-4.80	3.30	27.60	19.50	89.192	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-3.93	3.15	27.64	20.56	113.738	Vertical	Pass
		1732.5	-3.28	3.31	27.61	21.02	126.352	Vertical	Pass
		1750	-3.23	3.33	27.59	21.03	126.765	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-5.15	3.15	27.64	19.34	86.000	Vertical	Pass
		1732.5	-4.13	3.31	27.61	20.17	104.035	Vertical	Pass
		1750	-4.95	3.33	27.59	19.31	85.322	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	-3.93	3.15	27.65	20.57	114.014	Vertical	Pass
		1732.5	-3.94	3.31	27.61	20.36	108.672	Vertical	Pass
		1747.5	-3.49	3.33	27.57	20.75	118.897	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-4.55	3.15	27.65	19.95	98.962	Vertical	Pass
		1732.5	-4.95	3.31	27.61	19.35	86.142	Vertical	Pass
		1747.5	-4.53	3.33	27.57	19.71	93.560	Vertical	Pass

20.0MH z Band QPSK	100/0	1720	-3.25	3.17	27.66	21.24	133.045	Vertical	Pass
		1732.5	-3.18	3.32	27.61	21.11	129.122	Vertical	Pass
		1745	-3.11	3.36	27.56	21.09	128.529	Vertical	Pass
20.0MH z Band 16 QAM	100/0	1720	-3.63	3.17	27.66	20.86	121.899	Vertical	Pass
		1732.5	-3.65	3.32	27.61	20.64	115.878	Vertical	Pass
		1745	-3.74	3.36	27.56	20.46	111.173	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 4									
Mode	RB/R B SIZE	Frequenc y	Result						Conclusio n
			SG	Cabl e Loss (dBm)	Antenn a Gain (dB)	Max. EIRP	Max. EIRP	Polarizatio n Of Max. ERP	
			Level			Averag e	Averag e		
			(dBm)			(dBm)	(mW)		
1.4MHz Band QPSK	6/0	1710.7	-4.01	3.12	27.58	20.45	110.983	Horizontal	Pass
		1732.5	-4.00	3.27	27.61	20.34	108.062	Horizontal	Pass
		1754.3	-3.76	3.29	27.63	20.58	114.343	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-4.94	3.12	27.58	19.52	89.583	Horizontal	Pass
		1732.5	-5.07	3.27	27.61	19.27	84.513	Horizontal	Pass
		1754.3	-5.17	3.29	27.63	19.17	82.661	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-4.24	3.13	27.61	20.24	105.766	Horizontal	Pass
		1732.5	-4.11	3.27	27.61	20.23	105.531	Horizontal	Pass
		1753.5	-3.82	3.30	27.62	20.50	112.178	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-5.59	3.13	27.61	18.89	77.457	Horizontal	Pass
		1732.5	-4.66	3.27	27.61	19.68	92.857	Horizontal	Pass
		1753.5	-4.67	3.30	27.62	19.65	92.353	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-3.94	3.13	27.63	20.56	113.763	Horizontal	Pass
		1732.5	-3.52	3.27	27.61	20.82	120.865	Horizontal	Pass
		1752.5	-3.57	3.30	27.60	20.73	118.217	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-4.43	3.13	27.63	20.07	101.674	Horizontal	Pass
		1732.5	-4.80	3.27	27.61	19.54	89.922	Horizontal	Pass
		1752.5	-5.19	3.30	27.60	19.11	81.486	Horizontal	Pass
10.0MH z Band QPSK	50/0	1715	-4.09	3.15	27.64	20.40	109.532	Horizontal	Pass
		1732.5	-3.71	3.31	27.61	20.59	114.622	Horizontal	Pass
		1750	-3.40	3.33	27.59	20.86	121.775	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	1715	-4.85	3.15	27.64	19.64	92.124	Horizontal	Pass
		1732.5	-5.30	3.31	27.61	19.00	79.417	Horizontal	Pass
		1750	-4.73	3.33	27.59	19.53	89.798	Horizontal	Pass
15.0MH z Band QPSK	75/0	1717.5	-4.43	3.15	27.65	20.07	101.708	Horizontal	Pass
		1732.5	-3.89	3.31	27.61	20.41	109.938	Horizontal	Pass
		1747.5	-3.72	3.33	27.57	20.52	112.727	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	1717.5	-4.56	3.15	27.65	19.94	98.633	Horizontal	Pass
		1732.5	-4.86	3.31	27.61	19.44	87.937	Horizontal	Pass
		1747.5	-5.20	3.33	27.57	19.04	80.170	Horizontal	Pass
20.0MH z Band	100/0	1720	-3.63	3.17	27.66	20.86	121.899	Horizontal	Pass
		1732.5	-3.76	3.32	27.61	20.53	112.980	Horizontal	Pass

QPSK		1745	-3.97	3.36	27.56	20.23	105.439	Horizontal	Pass
20.0MHz	100/0	1720	-4.07	3.17	27.66	20.42	110.154	Horizontal	Pass
z Band		1732.5	-4.18	3.32	27.61	20.11	102.565	Horizontal	Pass
16 QAM		1745	-3.84	3.36	27.56	20.36	108.643	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	824.7	7.19	2.01	19.68	2.15	22.71	186.638	Vertical	Pass
		836.5	6.65	2.01	19.77	2.15	22.26	168.267	Vertical	Pass
		848.3	6.21	2.02	19.82	2.15	21.86	153.462	Vertical	Pass
1.4MHz Band 16 QAM	6/0	824.7	5.73	2.01	19.68	2.15	21.25	133.352	Vertical	Pass
		836.5	5.91	2.01	19.77	2.15	21.52	141.906	Vertical	Pass
		848.3	5.73	2.02	19.82	2.15	21.38	137.404	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	7.09	2.01	19.70	2.15	22.63	183.231	Vertical	Pass
		836.5	6.78	2.01	19.77	2.15	22.39	173.380	Vertical	Pass
		847.5	6.82	2.02	19.81	2.15	22.46	176.198	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	6.59	2.01	19.70	2.15	22.13	163.305	Vertical	Pass
		836.5	5.87	2.01	19.77	2.15	21.48	140.605	Vertical	Pass
		847.5	5.99	2.02	19.81	2.15	21.63	145.546	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	7.13	2.01	19.71	2.15	22.68	185.353	Vertical	Pass
		836.5	6.45	2.01	19.77	2.15	22.06	160.694	Vertical	Pass
		846.5	6.47	2.02	19.79	2.15	22.09	161.808	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	6.01	2.01	19.71	2.15	21.56	143.219	Vertical	Pass
		836.5	6.04	2.01	19.77	2.15	21.65	146.218	Vertical	Pass
		846.5	5.65	2.02	19.79	2.15	21.27	133.968	Vertical	Pass
10.0MHz Band QPSK	50/0	829	6.98	2.01	19.73	2.15	22.55	179.887	Vertical	Pass
		836.5	6.48	2.01	19.77	2.15	22.09	161.808	Vertical	Pass
		844	7.22	2.02	19.78	2.15	22.83	191.867	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	6.06	2.01	19.73	2.15	21.63	145.546	Vertical	Pass
		836.5	5.78	2.01	19.77	2.15	21.39	137.721	Vertical	Pass
		844	5.82	2.02	19.78	2.15	21.43	138.995	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	824.7	6.84	2.01	19.68	2.15	22.36	172.187	Horizontal	Pass
		836.5	6.50	2.01	19.77	2.15	22.11	162.555	Horizontal	Pass
		848.3	6.11	2.02	19.82	2.15	21.76	149.968	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	5.61	2.01	19.68	2.15	21.13	129.718	Horizontal	Pass
		836.5	5.87	2.01	19.77	2.15	21.48	140.605	Horizontal	Pass
		848.3	5.71	2.02	19.82	2.15	21.36	136.773	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	6.81	2.01	19.70	2.15	22.35	171.791	Horizontal	Pass
		836.5	6.55	2.01	19.77	2.15	22.16	164.437	Horizontal	Pass
		847.5	6.44	2.02	19.81	2.15	22.08	161.436	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	6.49	2.01	19.70	2.15	22.03	159.588	Horizontal	Pass
		836.5	5.71	2.01	19.77	2.15	21.32	135.519	Horizontal	Pass
		847.5	5.61	2.02	19.81	2.15	21.25	133.352	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	6.86	2.01	19.71	2.15	22.41	174.181	Horizontal	Pass
		836.5	6.39	2.01	19.77	2.15	22	158.489	Horizontal	Pass
		846.5	6.31	2.02	19.79	2.15	21.93	155.955	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	5.99	2.01	19.71	2.15	21.54	142.561	Horizontal	Pass
		836.5	5.72	2.01	19.77	2.15	21.33	135.831	Horizontal	Pass
		846.5	5.46	2.02	19.79	2.15	21.08	128.233	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	6.75	2.01	19.73	2.15	22.32	170.608	Horizontal	Pass
		836.5	6.51	2.01	19.77	2.15	22.12	162.930	Horizontal	Pass
		844	6.81	2.02	19.78	2.15	22.42	174.582	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	5.64	2.01	19.73	2.15	21.21	132.130	Horizontal	Pass
		836.5	5.91	2.01	19.77	2.15	21.52	141.906	Horizontal	Pass
		844	5.61	2.02	19.78	2.15	21.22	132.434	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	699.7	7.57	1.91	19.21	2.15	22.72	187.068	Vertical	Pass
		707.5	7.13	1.91	19.26	2.15	22.33	171.002	Vertical	Pass
		715.3	7.35	1.93	19.34	2.15	22.61	182.390	Vertical	Pass
1.4MHz Band 16 QAM	6/0	699.7	7.50	1.91	19.21	2.15	22.65	184.077	Vertical	Pass
		707.5	7.19	1.91	19.26	2.15	22.39	173.380	Vertical	Pass
		715.3	7.45	1.93	19.34	2.15	22.71	186.638	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	7.28	1.91	19.21	2.15	22.43	174.985	Vertical	Pass
		707.5	7.31	1.91	19.26	2.15	22.51	178.238	Vertical	Pass
		714.5	7.10	1.93	19.34	2.15	22.36	172.187	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	7.04	1.91	19.21	2.15	22.19	165.577	Vertical	Pass
		707.5	6.91	1.91	19.26	2.15	22.11	162.555	Vertical	Pass
		714.5	6.77	1.93	19.34	2.15	22.03	159.588	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	7.48	1.91	19.23	2.15	22.65	184.077	Vertical	Pass
		707.5	7.63	1.91	19.26	2.15	22.83	191.867	Vertical	Pass
		713.5	7.20	1.92	19.33	2.15	22.46	176.198	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	7.39	1.91	19.23	2.15	22.56	180.302	Vertical	Pass
		707.5	7.24	1.91	19.26	2.15	22.44	175.388	Vertical	Pass
		713.5	7.10	1.92	19.33	2.15	22.36	172.187	Vertical	Pass
10.0MHz Band QPSK	50/0	704	7.93	1.91	19.25	2.15	23.12	205.116	Vertical	Pass
		707.5	7.86	1.91	19.26	2.15	23.06	202.302	Vertical	Pass
		711	7.98	1.92	19.32	2.15	23.23	210.378	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	8.05	1.91	19.25	2.15	23.24	210.863	Vertical	Pass
		707.5	6.86	1.91	19.26	2.15	22.06	160.694	Vertical	Pass
		711	6.86	1.92	19.32	2.15	22.11	162.555	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	699.7	7.68	1.91	19.21	2.15	22.83	191.867	Horizontal	Pass
		707.5	7.26	1.91	19.26	2.15	22.46	176.198	Horizontal	Pass
		715.3	7.47	1.93	19.34	2.15	22.73	187.499	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	699.7	7.67	1.91	19.21	2.15	22.82	191.426	Horizontal	Pass
		707.5	7.23	1.91	19.26	2.15	22.43	174.985	Horizontal	Pass
		715.3	7.67	1.93	19.34	2.15	22.93	196.336	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	7.21	1.91	19.21	2.15	22.36	172.187	Horizontal	Pass
		707.5	7.65	1.91	19.26	2.15	22.85	192.752	Horizontal	Pass
		714.5	7.53	1.93	19.34	2.15	22.79	190.108	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	7.08	1.91	19.21	2.15	22.23	167.109	Horizontal	Pass
		707.5	6.96	1.91	19.26	2.15	22.16	164.437	Horizontal	Pass
		714.5	6.86	1.93	19.34	2.15	22.12	162.930	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	7.68	1.91	19.23	2.15	22.85	192.752	Horizontal	Pass
		707.5	7.73	1.91	19.26	2.15	22.93	196.336	Horizontal	Pass
		713.5	7.26	1.92	19.33	2.15	22.52	178.649	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	7.52	1.91	19.23	2.15	22.69	185.780	Horizontal	Pass
		707.5	7.16	1.91	19.26	2.15	22.36	172.187	Horizontal	Pass
		713.5	7.35	1.92	19.33	2.15	22.61	182.390	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	8.07	1.91	19.25	2.15	23.26	211.836	Horizontal	Pass
		707.5	8.02	1.91	19.26	2.15	23.22	209.894	Horizontal	Pass
		711	8.14	1.92	19.32	2.15	23.39	218.273	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	8.19	1.91	19.25	2.15	23.38	217.771	Horizontal	Pass
		707.5	7.86	1.91	19.26	2.15	23.06	202.302	Horizontal	Pass
		711	7.71	1.92	19.32	2.15	22.96	197.697	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/Mid	706.5	5.27	1.91	19.23	2.15	20.44	110.557	Vertical	Pass
		710	5.16	1.91	19.26	2.15	20.36	108.705	Vertical	Pass
		713.5	5.18	1.92	19.33	2.15	20.44	110.585	Vertical	Pass
10.0MHz z Band QPSK	1/Mid	709	5.40	1.91	19.25	2.15	20.59	114.529	Vertical	Pass
		710	5.44	1.91	19.26	2.15	20.64	115.776	Vertical	Pass
		711	5.16	1.92	19.32	2.15	20.41	109.959	Vertical	Pass
5.0MHz Band QPSK	1/Mid	706.5	5.38	1.91	19.23	2.15	20.55	113.486	Horizontal	Pass
		710	5.22	1.91	19.26	2.15	20.42	110.087	Horizontal	Pass
		713.5	5.23	1.92	19.33	2.15	20.49	111.823	Horizontal	Pass
10.0MHz z Band QPSK	1/Mid	709	5.36	1.91	19.25	2.15	20.55	113.484	Horizontal	Pass
		710	5.47	1.91	19.26	2.15	20.67	116.606	Horizontal	Pass
		711	5.11	1.92	19.32	2.15	20.36	108.568	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/ RB SIZE	Freque ncy	Result							Conclu sion
			SG Level	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. ERP	Max. ERP	Polarizati on Of Max. ERP	
			(dBm)				Averag e	Averag e		
							(dBm)	(mW)		
5.0MHz Band 16 QAM	1/Mi d	706.5	5.17	1.91	19.23	2.15	20.34	108.080	Vertical	Pass
		710	5.14	1.91	19.26	2.15	20.34	108.209	Vertical	Pass
		713.5	5.08	1.92	19.33	2.15	20.34	108.029	Vertical	Pass
10.0MH z Band 16 QAM	1/Mi d	709	5.06	1.91	19.25	2.15	20.25	106.013	Vertical	Pass
		710	4.96	1.91	19.26	2.15	20.16	103.724	Vertical	Pass
		711	4.99	1.92	19.32	2.15	20.24	105.668	Vertical	Pass
5.0MHz Band 16 QAM	1/Mi d	706.5	5.07	1.91	19.23	2.15	20.24	105.616	Horizontal	Pass
		710	5.14	1.91	19.26	2.15	20.34	108.187	Horizontal	Pass
		713.5	5.09	1.92	19.33	2.15	20.35	108.348	Horizontal	Pass
10.0MH z Band 16 QAM	1/Mi d	709	5.04	1.91	19.25	2.15	20.23	105.477	Horizontal	Pass
		710	5.25	1.91	19.26	2.15	20.45	110.987	Horizontal	Pass
		711	4.92	1.92	19.32	2.15	20.17	104.040	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.7 LTE BAND 26

Radiated Power (ERP) for Band 26										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max.	Max.	Polarization Of Max. ERP	
			Level	Loss	Gain		EIRP	EIRP		
			(dBm)	(dBm)	(dB)		(dB)	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	814.7	7.13	2.01	19.68	2.15	22.65	184.077	Vertical	Pass
		831.5	7.12	2.01	19.77	2.15	22.73	187.499	Vertical	Pass
		848.3	7.21	2.02	19.82	2.15	22.86	193.197	Vertical	Pass
1.4MHz Band 16 QAM	6/0	814.7	7.29	2.01	19.68	2.15	22.81	190.985	Vertical	Pass
		831.5	6.12	2.01	19.77	2.15	21.73	148.936	Vertical	Pass
		848.3	6.64	2.02	19.82	2.15	22.29	169.434	Vertical	Pass
3.0MHz Band QPSK	15/0	815.5	7.41	2.01	19.70	2.15	22.95	197.242	Vertical	Pass
		831.5	7.51	2.01	19.77	2.15	23.12	205.116	Vertical	Pass
		847.5	7.42	2.02	19.81	2.15	23.06	202.302	Vertical	Pass
3.0MHz Band 16 QAM	15/0	815.5	7.32	2.01	19.70	2.15	22.86	193.197	Vertical	Pass
		831.5	6.33	2.01	19.77	2.15	21.94	156.315	Vertical	Pass
		847.5	6.22	2.02	19.81	2.15	21.86	153.462	Vertical	Pass
5.0MHz Band QPSK	25/0	816.5	7.71	2.01	19.71	2.15	23.26	211.836	Vertical	Pass
		831.5	7.28	2.01	19.77	2.15	22.89	194.536	Vertical	Pass
		846.5	7.34	2.02	19.79	2.15	22.96	197.697	Vertical	Pass
5.0MHz Band 16 QAM	25/0	816.5	6.80	2.01	19.71	2.15	22.35	171.791	Vertical	Pass
		831.5	6.37	2.01	19.77	2.15	21.98	157.761	Vertical	Pass
		846.5	6.44	2.02	19.79	2.15	22.06	160.694	Vertical	Pass
10.0MHz Band QPSK	50/0	819	7.57	2.01	19.73	2.15	23.14	206.063	Vertical	Pass
		831.5	7.51	2.01	19.77	2.15	23.12	205.116	Vertical	Pass
		844	7.42	2.02	19.78	2.15	23.03	200.909	Vertical	Pass
10.0MHz Band 16 QAM	50/0	819	7.26	2.01	19.73	2.15	22.83	191.867	Vertical	Pass
		831.5	6.07	2.01	19.77	2.15	21.68	147.231	Vertical	Pass
		844	6.75	2.02	19.78	2.15	22.36	172.187	Vertical	Pass
15.0MHz Band QPSK	50/0	821.5	7.79	2.01	19.73	2.15	23.36	216.770	Vertical	Pass
		831.5	7.45	2.01	19.77	2.15	23.06	202.302	Vertical	Pass
		841.5	7.02	2.02	19.78	2.15	22.63	183.231	Vertical	Pass
15.0MHz Band 16 QAM	50/0	821.5	7.39	2.01	19.73	2.15	22.96	197.697	Vertical	Pass
		831.5	6.52	2.01	19.77	2.15	22.13	163.305	Vertical	Pass
		841.5	6.92	2.02	19.78	2.15	22.53	179.061	Vertical	Pass

Radiated Power (ERP) for Band 26										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain		Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	Correction	Average	Average	Of Max. ERP	
						(dB)	(dBm)	(mW)		
1.4MHz Band QPSK	6/0	814.7	7.34	2.01	19.68	2.15	22.86	193.197	Horizontal	Pass
		831.5	7.33	2.01	19.77	2.15	22.94	196.789	Horizontal	Pass
		848.3	7.38	2.02	19.82	2.15	23.03	200.909	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	814.7	7.59	2.01	19.68	2.15	23.11	204.644	Horizontal	Pass
		831.5	6.65	2.01	19.77	2.15	22.26	168.267	Horizontal	Pass
		848.3	6.77	2.02	19.82	2.15	22.42	174.582	Horizontal	Pass
3.0MHz Band QPSK	15/0	815.5	7.64	2.01	19.70	2.15	23.18	207.970	Horizontal	Pass
		831.5	7.65	2.01	19.77	2.15	23.26	211.836	Horizontal	Pass
		847.5	7.68	2.02	19.81	2.15	23.32	214.783	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	815.5	7.52	2.01	19.70	2.15	23.06	202.302	Horizontal	Pass
		831.5	6.52	2.01	19.77	2.15	22.13	163.305	Horizontal	Pass
		847.5	6.43	2.02	19.81	2.15	22.07	161.065	Horizontal	Pass
5.0MHz Band QPSK	25/0	816.5	7.77	2.01	19.71	2.15	23.32	214.783	Horizontal	Pass
		831.5	7.51	2.01	19.77	2.15	23.12	205.116	Horizontal	Pass
		846.5	7.56	2.02	19.79	2.15	23.18	207.970	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	816.5	7.31	2.01	19.71	2.15	22.86	193.197	Horizontal	Pass
		831.5	6.56	2.01	19.77	2.15	22.17	164.816	Horizontal	Pass
		846.5	6.97	2.02	19.79	2.15	22.59	181.552	Horizontal	Pass
10.0MHz Band QPSK	50/0	819	7.69	2.01	19.73	2.15	23.26	211.836	Horizontal	Pass
		831.5	7.64	2.01	19.77	2.15	23.25	211.349	Horizontal	Pass
		844	7.57	2.02	19.78	2.15	23.18	207.970	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	819	7.42	2.01	19.73	2.15	22.99	199.067	Horizontal	Pass
		831.5	6.71	2.01	19.77	2.15	22.32	170.608	Horizontal	Pass
		844	7.07	2.02	19.78	2.15	22.68	185.353	Horizontal	Pass
15.0MHz Band QPSK	50/0	821.5	8.05	2.01	19.73	2.15	23.62	230.144	Vertical	Pass
		831.5	7.57	2.01	19.77	2.15	23.18	207.970	Vertical	Pass
		841.5	7.28	2.02	19.78	2.15	22.89	194.536	Vertical	Pass
15.0MHz Band 16 QAM	50/0	821.5	7.64	2.01	19.73	2.15	23.21	209.411	Vertical	Pass
		831.5	6.75	2.01	19.77	2.15	22.36	172.187	Vertical	Pass
		841.5	7.23	2.02	19.78	2.15	22.84	192.309	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.8 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Average (dBm)	Average (mW)		
5.0MHz Band QPSK	25/0	2498.5	-0.19	4.54	27.75	23.02	200.447	Vertical	Pass
		2593	-0.67	4.69	27.72	22.36	172.187	Vertical	Pass
		2687.5	-0.14	4.71	27.71	22.86	193.197	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2498.5	-1.06	4.54	27.75	22.15	164.059	Vertical	Pass
		2593	-1.27	4.69	27.72	21.76	149.968	Vertical	Pass
		2687.5	-1.38	4.71	27.71	21.62	145.211	Vertical	Pass
10.0MHz Band QPSK	50/0	2501	-0.21	4.55	27.76	23	199.526	Vertical	Pass
		2593	-0.87	4.69	27.72	22.16	164.437	Vertical	Pass
		2685	-0.53	4.72	27.7	22.45	175.792	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2501	-0.28	4.55	27.76	22.93	196.336	Vertical	Pass
		2593	-1.47	4.69	27.72	21.56	143.219	Vertical	Pass
		2685	-0.55	4.72	27.7	22.43	174.985	Vertical	Pass
15.0MHz Band QPSK	75/0	2503.5	-0.10	4.55	27.77	23.12	205.116	Vertical	Pass
		2593	-0.01	4.69	27.72	23.02	200.447	Vertical	Pass
		2682.5	-0.46	4.72	27.69	22.51	178.238	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2503.5	-0.38	4.55	27.77	22.84	192.309	Vertical	Pass
		2593	-1.00	4.69	27.72	22.03	159.588	Vertical	Pass
		2682.5	-0.86	4.72	27.69	22.11	162.555	Vertical	Pass
20.0MHz Band QPSK	100/0	2506	-0.19	4.57	27.78	23.02	200.447	Vertical	Pass
		2593	0.22	4.73	27.72	23.21	209.411	Vertical	Pass
		2680	-0.08	4.75	27.68	22.85	192.752	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2506	-1.09	4.57	27.78	22.12	162.930	Vertical	Pass
		2593	-0.68	4.73	27.72	22.31	170.216	Vertical	Pass
		2680	-0.54	4.75	27.68	22.39	173.380	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable	Antenna	Max.	Max.	Polarization	
			Level	Loss	Gain	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	Average	Average	ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2498.5	-0.05	4.54	27.75	23.16	207.014	Horizontal	Pass
		2593	-0.50	4.69	27.72	22.53	179.061	Horizontal	Pass
		2687.5	0.06	4.71	27.71	23.06	202.302	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2498.5	-0.89	4.54	27.75	22.32	170.608	Horizontal	Pass
		2593	-1.14	4.69	27.72	21.89	154.525	Horizontal	Pass
		2687.5	-1.37	4.71	27.71	21.63	145.546	Horizontal	Pass
10.0MHz Band QPSK	50/0	2501	0.11	4.55	27.76	23.32	214.783	Horizontal	Pass
		2593	-0.84	4.69	27.72	22.19	165.577	Horizontal	Pass
		2685	-0.05	4.72	27.7	22.93	196.336	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2501	-0.15	4.55	27.76	23.06	202.302	Horizontal	Pass
		2593	-1.40	4.69	27.72	21.63	145.546	Horizontal	Pass
		2685	-0.45	4.72	27.7	22.53	179.061	Horizontal	Pass
15.0MHz Band QPSK	75/0	2503.5	0.04	4.55	27.77	23.26	211.836	Horizontal	Pass
		2593	0.10	4.69	27.72	23.13	205.589	Horizontal	Pass
		2682.5	-0.29	4.72	27.69	22.68	185.353	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2503.5	-0.19	4.55	27.77	23.03	200.909	Horizontal	Pass
		2593	-0.90	4.69	27.72	22.13	163.305	Horizontal	Pass
		2682.5	-0.78	4.72	27.69	22.19	165.577	Horizontal	Pass
20.0MHz Band QPSK	100/0	2506	-0.08	4.57	27.78	23.13	205.589	Horizontal	Pass
		2593	0.47	4.73	27.72	23.46	221.820	Horizontal	Pass
		2680	0.13	4.75	27.68	23.06	202.302	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2506	-1.03	4.57	27.78	22.18	165.196	Horizontal	Pass
		2593	-0.63	4.73	27.72	22.36	172.187	Horizontal	Pass
		2680	-0.41	4.75	27.68	22.52	178.649	Horizontal	Pass

Note:

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27.53

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 12

LTE Band 17

LTE Band 26

LTE Band 41

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-52.33	4.04	33.51	-22.86	-13	-9.86	Horizontal
3701.4	-54.58	4.04	33.51	-25.11	-13	-12.11	Vertical
5552.1	-56.94	5.24	35.84	-26.34	-13	-13.34	Vertical
5552.1	-67.45	5.24	35.84	-36.85	-13	-23.85	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-54.07	4.04	33.56	-24.55	-13	-11.55	Horizontal
3760	-54.27	4.04	33.56	-24.75	-13	-11.75	Vertical
5640	-54.92	5.24	35.91	-24.25	-13	-11.25	Vertical
5640	-56.39	5.24	35.91	-25.72	-13	-12.72	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-53.77	4.04	34.00	-23.81	-13	-10.81	Horizontal
3818.6	-55.40	4.04	34.00	-25.44	-13	-12.44	Vertical
5727.9	-57.98	5.24	36.04	-27.18	-13	-14.18	Vertical
5727.9	-57.07	5.24	36.04	-26.27	-13	-13.27	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-57.04	4.07	33.54	-27.57	-13	-14.57	Horizontal
3720	-52.61	4.07	33.54	-23.14	-13	-10.14	Vertical
5580	-59.30	5.28	35.86	-28.72	-13	-15.72	Vertical
5580	-60.47	5.28	35.86	-29.89	-13	-16.89	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-56.61	4.04	33.56	-27.09	-13	-14.09	Horizontal
3760	-53.44	4.04	33.56	-23.92	-13	-10.92	Vertical
5640	-58.20	5.24	35.91	-27.53	-13	-14.53	Vertical
5640	-58.86	5.24	35.91	-28.19	-13	-15.19	Horizontal
Test Results for High Channel 1900MHz							
3800	-55.82	4.04	34.00	-25.86	-13	-12.86	Horizontal
3800	-56.97	4.04	34.00	-27.01	-13	-14.01	Vertical
5700	-58.31	5.24	36.04	-27.51	-13	-14.51	Vertical
5700	-56.62	5.24	36.04	-25.82	-13	-12.82	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.

9.2 LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-59.90	4.02	29.80	-34.12	-13	-21.12	Horizontal
3421.4	-57.10	4.02	29.80	-31.32	-13	-18.32	Vertical
5132.1	-61.63	5.24	35.84	-31.03	-13	-18.03	Vertical
5132.1	-63.01	5.24	35.84	-32.41	-13	-19.41	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-51.48	4.03	30.00	-25.51	-13	-12.51	Horizontal
3465	-55.12	4.03	30.00	-29.15	-13	-16.15	Vertical
5197.5	-58.82	5.25	35.86	-28.21	-13	-15.21	Vertical
5197.5	-56.33	5.25	35.86	-25.72	-13	-12.72	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-51.05	4.05	30.01	-25.09	-13	-12.09	Horizontal
3508.6	-57.90	4.05	30.01	-31.94	-13	-18.94	Vertical
5262.9	-57.66	5.26	35.86	-27.06	-13	-14.06	Vertical
5262.9	-55.99	5.26	35.86	-25.39	-13	-12.39	Horizontal

QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-56.56	4.02	29.80	-30.78	-13	-17.78	Horizontal
3440	-57.66	4.02	29.80	-31.88	-13	-18.88	Vertical
5160	-59.82	5.24	35.84	-29.22	-13	-16.22	Vertical
5160	-62.09	5.24	35.84	-31.49	-13	-18.49	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-51.51	4.03	30.00	-25.54	-13	-12.54	Horizontal
3465	-54.19	4.03	30.00	-28.22	-13	-15.22	Vertical
5197.5	-60.84	5.25	35.86	-30.23	-13	-17.23	Vertical
5197.5	-59.39	5.25	35.86	-28.78	-13	-15.78	Horizontal
Test Results for High Channel 1745MHz							
3490	-53.96	2.91	27.68	-29.19	-13	-16.19	Horizontal
3490	-55.70	2.91	27.68	-30.93	-13	-17.93	Vertical
5235	-59.34	5.26	35.86	-28.74	-13	-15.74	Vertical
5235	-57.58	5.26	35.86	-26.98	-13	-13.98	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.

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-51.02	2.78	27.50	-26.30	-13	-13.30	Horizontal
1649.4	-56.20	2.78	27.50	-31.48	-13	-18.48	Vertical
2474.1	-55.14	2.90	27.80	-30.24	-13	-17.24	Vertical
2474.1	-53.83	2.90	27.80	-28.93	-13	-15.93	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-51.74	2.78	27.48	-27.04	-13	-14.04	Horizontal
1673	-50.11	2.78	27.48	-25.41	-13	-12.41	Vertical
2509.5	-52.27	2.91	27.70	-27.48	-13	-14.48	Vertical
2509.5	-52.30	2.91	27.70	-27.51	-13	-14.51	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.72	2.78	27.43	-28.07	-13	-15.07	Horizontal
1696.6	-54.22	2.78	27.43	-29.57	-13	-16.57	Vertical
2544.9	-50.73	2.92	27.74	-25.91	-13	-12.91	Vertical
2544.9	-52.65	2.92	27.74	-27.83	-13	-14.83	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658	-53.98	2.78	27.50	-29.26	-13	-16.26	Horizontal
1658	-50.70	2.78	27.50	-25.98	-13	-12.98	Vertical
2487	-55.15	2.90	27.80	-30.25	-13	-17.25	Vertical
2487	-52.90	2.90	27.80	-28.00	-13	-15.00	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-51.95	2.78	27.48	-27.25	-13	-14.25	Horizontal
1673	-52.04	2.78	27.48	-27.34	-13	-14.34	Vertical
2509.5	-55.90	2.91	27.70	-31.11	-13	-18.11	Vertical
2509.5	-53.15	2.91	27.70	-28.36	-13	-15.36	Horizontal
Test Results for High Channel 844MHz							
1688	-55.45	2.78	27.43	-30.80	-13	-17.80	Horizontal
1688	-50.13	2.78	27.43	-25.48	-13	-12.48	Vertical
2532	-50.76	2.92	27.74	-25.94	-13	-12.94	Vertical
2532	-52.13	2.92	27.74	-27.31	-13	-14.31	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.

9.4 LTE BAND 12

QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-50.25	2.60	27.2	-25.65	-13	-12.65	Horizontal
1399.4	-50.51	2.60	27.2	-25.91	-13	-12.91	Vertical
2099.1	-51.15	2.85	27.54	-26.46	-13	-13.46	Vertical
2099.1	-50.55	2.85	27.54	-25.86	-13	-12.86	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-52.55	2.61	27.28	-27.88	-13	-14.88	Horizontal
1415	-50.58	2.61	27.28	-25.91	-13	-12.91	Vertical
2122.5	-48.94	2.87	27.59	-24.22	-13	-11.22	Vertical
2122.5	-53.87	2.87	27.59	-29.15	-13	-16.15	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.28	2.63	27.28	-27.63	-13	-14.63	Horizontal
1430.6	-56.19	2.63	27.28	-31.54	-13	-18.54	Vertical
2145.9	-53.15	2.88	27.60	-28.43	-13	-15.43	Vertical
2145.9	-52.15	2.88	27.60	-27.43	-13	-14.43	Horizontal

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

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408	-48.97	2.61	27.26	-24.32	-13	-11.32	Horizontal
1408	-53.26	2.61	27.26	-28.61	-13	-15.61	Vertical
2112	-53.00	2.87	27.58	-28.29	-13	-15.29	Vertical
2112	-53.02	2.87	27.58	-28.31	-13	-15.31	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-51.65	2.61	27.28	-26.98	-13	-13.98	Horizontal
1415	-55.47	2.61	27.28	-30.80	-13	-17.80	Vertical
2122.5	-53.21	2.87	27.59	-28.49	-13	-15.49	Vertical
2122.5	-52.46	2.87	27.59	-27.74	-13	-14.74	Horizontal
Test Results for High Channel 711MHz							
1422	-54.82	2.62	27.28	-30.16	-13	-17.16	Horizontal
1422	-50.60	2.62	27.28	-25.94	-13	-12.94	Vertical
2133	-53.50	2.87	27.60	-28.77	-13	-15.77	Vertical
2133	-53.12	2.87	27.60	-28.39	-13	-15.39	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.

9.5 LTE BAND 17

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

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413	-50.75	2.61	27.28	-26.08	-13	-13.08	Horizontal
1413	-51.66	2.61	27.28	-26.99	-13	-13.99	Vertical
2119.5	-51.11	2.87	27.59	-26.39	-13	-13.39	Vertical
2119.5	-50.77	2.87	27.59	-26.05	-13	-13.05	Horizontal
Test Results For Mid Channel 710MHz							
1420	-50.22	2.62	27.30	-25.54	-13	-12.54	Horizontal
1420	-52.08	2.62	27.30	-27.40	-13	-14.40	Vertical
2130	-52.80	2.87	27.62	-28.05	-13	-15.05	Vertical
2130	-55.45	2.87	27.62	-30.70	-13	-17.70	Horizontal
Test Results for High Channel 713.5MHz							
1427	-52.38	2.66	27.28	-27.76	-13	-14.76	Horizontal
1427	-53.83	2.66	27.28	-29.21	-13	-16.21	Vertical
2140.5	-50.95	2.88	27.60	-26.23	-13	-13.23	Vertical
2140.5	-49.65	2.88	27.60	-24.93	-13	-11.93	Horizontal

QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418	-53.28	2.62	27.30	-28.60	-13	-15.60	Horizontal
1418	-51.14	2.62	27.30	-26.46	-13	-13.46	Vertical
2127	-52.31	2.87	27.62	-27.56	-13	-14.56	Vertical
2127	-55.40	2.87	27.62	-30.65	-13	-17.65	Horizontal
Test Results for Mid Channel 710MHz							
1420	-52.84	2.62	27.30	-28.16	-13	-15.16	Horizontal
1420	-50.35	2.62	27.30	-25.67	-13	-12.67	Vertical
2130	-54.71	2.87	27.62	-29.96	-13	-16.96	Vertical
2130	-50.29	2.87	27.62	-25.54	-13	-12.54	Horizontal
Test Results for High Channel 711MHz							
1422	-51.33	2.62	27.30	-26.65	-13	-13.65	Horizontal
1422	-51.94	2.62	27.30	-27.26	-13	-14.26	Vertical
2133	-50.89	2.87	27.62	-26.14	-13	-13.14	Vertical
2133	-53.84	2.87	27.62	-29.09	-13	-16.09	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.

9.6 LTE BAND 26

QPSK EIRP POWER FOR LTE BAND 26 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 814.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin (dBm)	Polarity
1629.4	-51.82	2.78	27.5	-27.1	-13	-14.1	Horizontal
1629.4	-53.88	2.78	27.5	-29.16	-13	-16.16	Vertical
2444.1	-56.39	2.9	27.8	-31.49	-13	-18.49	Vertical
2444.1	-67.12	2.9	27.8	-42.22	-13	-29.22	Horizontal
Test Results For Mid Channel 831.5MHz							
1663	-52.9	2.8	27.48	-28.22	-13	-15.22	Horizontal
1663	-53.99	2.8	27.48	-29.31	-13	-16.31	Vertical
2494.5	-54.47	2.91	27.7	-29.68	-13	-16.68	Vertical
2494.5	-56.15	2.91	27.7	-31.36	-13	-18.36	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-53.24	2.82	27.43	-28.63	-13	-15.63	Horizontal
1696.6	-55.32	2.82	27.43	-30.71	-13	-17.71	Vertical
2544.9	-56.94	2.92	27.74	-32.12	-13	-19.12	Vertical
2544.9	-56.35	2.92	27.74	-31.53	-13	-18.53	Horizontal

QPSK EIRP POWER FOR LTE BAND 26 (15.0MHZ BANDWIDTH)

Test Results for Low Channel 821.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margi (dBm)	Polarity
1643	-52.34	2.78	27.5	-27.62	-13	-14.62	Horizontal
1643	-54.72	2.78	27.5	-30	-13	-17	Vertical
2464.5	-55.68	2.9	27.8	-30.78	-13	-17.78	Vertical
2464.5	-60.32	2.9	27.8	-35.42	-13	-22.42	Horizontal
Test Results For Mid Channel 831.5MHz							
1638	-53.63	2.8	27.48	-28.95	-13	-15.95	Horizontal
1638	-54.86	2.8	27.48	-30.18	-13	-17.18	Vertical
2457.5	-55.26	2.91	27.7	-30.47	-13	-17.47	Vertical
2457.5	-57.18	2.91	27.7	-32.39	-13	-19.39	Horizontal
Test Results for High Channel 841.5MHz							
1683	-53.68	2.82	27.43	-29.07	-13	-16.07	Horizontal
1683	-56.26	2.82	27.43	-31.65	-13	-18.65	Vertical
2524.5	-57.82	2.92	27.74	-33	-13	-20	Vertical
2524.5	-58.96	2.92	27.74	-34.14	-13	-21.14	Horizontal

Note:

SG Level= Signal generator output

Absolute Level (dBm)= SG Level (dBm)+ Antenna Gain(dB) - Cable Loss(dBm)

9.7 LTE BAND 41

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

Test Results for Low Channel 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997	-66.35	5.28	35.81	-35.82	-25	-10.82	Horizontal
4997	-65.24	5.28	35.81	-34.71	-25	-9.71	Vertical
7495.5	-67.15	5.74	36.85	-36.04	-25	-11.04	Vertical
7495.5	-66.28	5.74	36.85	-35.17	-25	-10.17	Horizontal
Test Results For Mid Channel 2593MHz							
5186	-68.13	5.28	35.82	-37.59	-25	-12.59	Horizontal
5186	-67.31	5.28	35.82	-36.77	-25	-11.77	Vertical
7779	-66.66	5.78	36.85	-35.59	-25	-10.59	Vertical
7779	-65.29	5.78	36.85	-34.22	-25	-9.22	Horizontal
Test Results for High Channel 2687.5MHz							
5375	-68.03	5.31	35.83	-37.51	-25	-12.51	Horizontal
5375	-67.53	5.31	35.83	-37.01	-25	-12.01	Vertical
8062.5	-67.51	5.8	36.87	-36.44	-25	-11.44	Vertical
8062.5	-66.37	5.8	36.87	-35.3	-25	-10.3	Horizontal

QPSK EIRP POWER FOR LTE BAND 41 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5010	-65.13	5.28	35.82	-34.59	-25	-9.59	Horizontal
5010	-64.35	5.28	35.82	-33.81	-25	-8.81	Vertical
7515	-66.28	5.76	36.86	-35.18	-25	-10.18	Vertical
7515	-63.76	5.76	36.86	-32.66	-25	-7.66	Horizontal
Test Results for Mid Channel 2593MHz							
5186	-65.18	5.28	35.82	-34.64	-25	-9.64	Horizontal
5186	-64.39	5.28	35.82	-33.85	-25	-8.85	Vertical
7779	-67.08	5.78	36.85	-36.01	-25	-11.01	Vertical
7779	-65.83	5.78	36.85	-34.76	-25	-9.76	Horizontal
Test Results for High Channel 2680MHz							
5360	-66.13	5.3	35.83	-35.6	-25	-10.6	Horizontal
5360	-65.73	5.3	35.83	-35.2	-25	-10.2	Vertical
8040	-66.28	5.8	36.88	-35.2	-25	-10.2	Vertical
8040	-65.73	5.8	36.88	-34.65	-25	-9.65	Horizontal

Note: SG Level= Signal generator output

Absolute Level (dBm)= SG Level (dBm)+ Antenna Gain(dB) - Cable Loss(dBm)

9.8 Below 1G BAND 2

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
279.26	-59.35	1.81	19.2	-41.96	-13	-28.96	Horizontal
398.24	-60.28	1.82	19.31	-42.79	-13	-29.79	Vertical
294.79	-59.96	1.82	19.22	-42.56	-13	-29.56	Vertical
399.04	-59.31	1.81	19.24	-41.88	-13	-28.88	Horizontal
Test Results for Mid Channel 1880MHz							
222.32	-61.59	1.81	18.11	-45.29	-13	-32.29	Horizontal
279.26	-59.6	1.91	19.2	-42.31	-13	-29.31	Vertical
598.49	-60.21	1.91	19.34	-42.78	-13	-29.78	Vertical
719.21	-60.42	1.91	19.21	-43.12	-13	-30.12	Horizontal
Test Results for High Channel 1909.3MHz							
276.56	-57.96	1.91	19.2	-40.67	-13	-27.67	Horizontal
402.47	-57.31	1.92	19.33	-39.9	-13	-26.9	Vertical
563.57	-57.51	1.91	19.22	-40.2	-13	-27.2	Vertical
760.85	-57.52	1.91	19.21	-40.22	-13	-27.22	Horizontal

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 4.4V.

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
LTE Band 4
LTE Band 5
LTE Band 12
LTE Band 17
LTE Band 26
LTE Band 41

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]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-14.99	-0.007973	2.5
3.8	1880	-15.09	-0.008027	2.5
4.4	1880	-14.59	-0.007761	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-11.21	-0.005963	2.5
Extreme (50C)	1880	-9.11	-0.004846	2.5
Extreme (40C)	1880	-9.21	-0.004899	2.5
Extreme (30C)	1880	-11.31	-0.006016	2.5
Extreme (10C)	1880	-11.81	-0.006282	2.5
Extreme (0C)	1880	-11.71	-0.006229	2.5
Extreme (-10C)	1880	-13.41	-0.007133	2.5
Extreme (-20C)	1880	-12.61	-0.006707	2.5
Extreme (-30C)	1880	-13.31	-0.007080	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-17.1	-0.009101	2.5
3.8	1880	-13.5	-0.007186	2.5
4.4	1880	-16.7	-0.008888	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-17.41	-0.009261	2.5
Extreme (50C)	1880	-18.61	-0.009899	2.5
Extreme (40C)	1880	-18.21	-0.009686	2.5
Extreme (30C)	1880	-16.71	-0.008888	2.5
Extreme (10C)	1880	-17.31	-0.009207	2.5
Extreme (0C)	1880	-16.21	-0.008622	2.5
Extreme (-10C)	1880	-15.61	-0.008303	2.5
Extreme (-20C)	1880	-15.41	-0.008197	2.5
Extreme (-30C)	1880	-14.71	-0.007824	2.5

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

10.3 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	-13.01	-0.007509	2.5
3.8	1732.5	-13.01	-0.007509	2.5
4.4	1732.5	-13.11	-0.007567	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-9.91	-0.005720	2.5
Extreme (50C)	1732.5	-11.61	-0.006701	2.5
Extreme (40C)	1732.5	-11.31	-0.006528	2.5
Extreme (30C)	1732.5	-11.31	-0.006528	2.5
Extreme (10C)	1732.5	-9.61	-0.005547	2.5
Extreme (0C)	1732.5	-8.81	-0.005085	2.5
Extreme (-10C)	1732.5	-9.11	-0.005258	2.5
Extreme (-20C)	1732.5	-13.31	-0.007683	2.5
Extreme (-30C)	1732.5	-11.71	-0.006759	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	-10.71	-0.006182	2.5
3.8	1732.5	-11.41	-0.006586	2.5
4.4	1732.5	-11.21	-0.006470	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-11.31	-0.006528	2.5
Extreme (50C)	1732.5	-8.31	-0.004797	2.5
Extreme (40C)	1732.5	-8.81	-0.005085	2.5
Extreme (30C)	1732.5	-10.11	-0.005835	2.5
Extreme (10C)	1732.5	-10.71	-0.006182	2.5
Extreme (0C)	1732.5	-10.41	-0.006009	2.5
Extreme (-10C)	1732.5	-8.61	-0.004970	2.5
Extreme (-20C)	1732.5	-10.21	-0.005893	2.5
Extreme (-30C)	1732.5	-10.11	-0.005835	2.5

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

10.4 LTE BAND 5

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-12.51	-0.014955	2.5
3.8	836.5	-12.11	-0.014477	2.5
4.4	836.5	-12.71	-0.015194	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-12.21	-0.014597	2.5
Extreme (50C)	836.5	-13.21	-0.015792	2.5
Extreme (40C)	836.5	-12.71	-0.015194	2.5
Extreme (30C)	836.5	-12.51	-0.014955	2.5
Extreme (10C)	836.5	-12.41	-0.014836	2.5
Extreme (0C)	836.5	-11.31	-0.013521	2.5
Extreme (-10C)	836.5	-12.91	-0.015433	2.5
Extreme (-20C)	836.5	-15.71	-0.018781	2.5
Extreme (-30C)	836.5	-16.91	-0.020215	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-12.91	-0.015433	2.5
3.8	836.5	-13.11	-0.015672	2.5
4.4	836.5	-13.51	-0.016151	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-13.41	-0.016031	2.5
Extreme (50C)	836.5	-14.51	-0.017346	2.5
Extreme (40C)	836.5	-14.51	-0.017346	2.5
Extreme (30C)	836.5	-13.71	-0.016390	2.5
Extreme (10C)	836.5	-12.91	-0.015433	2.5
Extreme (0C)	836.5	-11.91	-0.014238	2.5
Extreme (-10C)	836.5	-13.71	-0.016390	2.5
Extreme (-20C)	836.5	-13.51	-0.016151	2.5
Extreme (-30C)	836.5	-12.41	-0.014836	2.5

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

10.5 LTE BAND 12

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	-2.51	-0.003548	2.5
3.8	707.5	-3.11	-0.004396	2.5
4.4	707.5	-2.71	-0.003830	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-2.91	-0.004113	2.5
Extreme (50C)	707.5	-3.71	-0.005244	2.5
Extreme (40C)	707.5	-3.21	-0.004537	2.5
Extreme (30C)	707.5	-4.01	-0.005668	2.5
Extreme (10C)	707.5	-3.41	-0.004820	2.5
Extreme (0C)	707.5	-0.81	-0.001145	2.5
Extreme (-10C)	707.5	-3.21	-0.004537	2.5
Extreme (-20C)	707.5	-2.81	-0.003972	2.5
Extreme (-30C)	707.5	-3.51	-0.004961	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	-8.91	-0.012594	2.5
3.8	707.5	-8.31	-0.011746	2.5
4.4	707.5	-8.51	-0.012028	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-8.21	-0.011604	2.5
Extreme (50C)	707.5	-9.01	-0.012735	2.5
Extreme (40C)	707.5	-8.41	-0.011887	2.5
Extreme (30C)	707.5	-8.51	-0.012028	2.5
Extreme (10C)	707.5	-8.61	-0.012170	2.5
Extreme (0C)	707.5	-8.11	-0.011463	2.5
Extreme (-10C)	707.5	-9.11	-0.012876	2.5
Extreme (-20C)	707.5	-8.71	-0.012311	2.5
Extreme (-30C)	707.5	-8.21	-0.011604	2.5

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

10.6 LTE BAND 17

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	-5.61	-0.007901	2.5
3.8	710.0	-5.01	-0.007056	2.5
4.4	710.0	-4.81	-0.006775	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	-5.11	-0.007197	2.5
Extreme (50C)	710.0	-5.61	-0.007901	2.5
Extreme (40C)	710.0	-5.11	-0.007197	2.5
Extreme (30C)	710.0	-5.91	-0.008324	2.5
Extreme (10C)	710.0	-5.81	-0.008183	2.5
Extreme (0C)	710.0	-5.91	-0.008324	2.5
Extreme (-10C)	710.0	-5.01	-0.007056	2.5
Extreme (-20C)	710.0	-5.51	-0.007761	2.5
Extreme (-30C)	710.0	-5.41	-0.007620	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	-6.91	-0.009732	2.5
3.8	710.0	-7.21	-0.010155	2.5
4.4	710.0	-6.71	-0.009451	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	-6.71	-0.009451	2.5
Extreme (50C)	710.0	-7.81	-0.011000	2.5
Extreme (40C)	710.0	-7.31	-0.010296	2.5
Extreme (30C)	710.0	-6.81	-0.009592	2.5
Extreme (10C)	710.0	-6.91	-0.009732	2.5
Extreme (0C)	710.0	-7.31	-0.010296	2.5
Extreme (-10C)	710.0	-7.61	-0.010718	2.5
Extreme (-20C)	710.0	-7.11	-0.010014	2.5
Extreme (-30C)	710.0	-7.51	-0.010577	2.5

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

10.7 LTE BAND 26

QPSK, (15MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 26 QPSK, (CH 26865 RB size 75 RB Offset 0 15MHz BANDWIDTH)				
3.27	819.0	3.4	0.004089	2.5
3.85	819.0	7.0	0.008425	2.5
4.43	819.0	4.6	0.005585	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 26 QPSK, (CH 26865 RB size 75 RB Offset 0 15MHz BANDWIDTH)				
Normal (25C)	819.0	5.9	0.007095	2.5
Extreme (50C)	819.0	-6.5	-0.007807	2.5
Extreme (40C)	819.0	-7.5	-0.009046	2.5
Extreme (30C)	819.0	8.1	0.009800	2.5
Extreme (10C)	819.0	8.3	0.009929	2.5
Extreme (0C)	819.0	5.9	0.007057	2.5
Extreme (-10C)	819.0	-7.7	-0.009202	2.5
Extreme (-20C)	819.0	7.8	0.009352	2.5
Extreme (-30C)	819.0	5.3	0.006369	2.5

16QAM, (15MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 26 16QAM, (CH 26865 RB size 75 RB Offset 0 15MHz BANDWIDTH)				
3.27	819.0	3.5	0.004209	2.5
3.85	819.0	6.9	0.008298	2.5
4.43	819.0	5.2	0.006254	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 26 16QAM, (CH 26865 RB size 75 RB Offset 0 15MHz BANDWIDTH)				
Normal (25C)	831.5	-5.0	-0.006013	2.5
Extreme (50C)	831.5	5.1	0.006133	2.5
Extreme (40C)	831.5	3.7	0.004450	2.5
Extreme (30C)	831.5	3.6	0.004330	2.5
Extreme (10C)	831.5	-4.6	-0.005532	2.5
Extreme (0C)	831.5	-1.5	-0.001804	2.5
Extreme (-10C)	831.5	5.6	0.006735	2.5
Extreme (-20C)	831.5	5.8	0.006975	2.5
Extreme (-30C)	831.5	5.2	0.006254	2.5

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

10.8 LTE BAND 41

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.27	2593.0	3.2	0.004396	2.5
3.85	2593.0	5.1	0.007005	2.5
4.43	2593.0	-3.2	-0.004396	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593.0	-6.3	-0.008654	2.5
Extreme (50C)	2593.0	-5.2	-0.007143	2.5
Extreme (40C)	2593.0	-5.4	-0.007418	2.5
Extreme (30C)	2593.0	2.6	0.003571	2.5
Extreme (10C)	2593.0	1.7	0.002388	2.5
Extreme (0C)	2593.0	-7.6	-0.010460	2.5
Extreme (-10C)	2593.0	-6.1	-0.008379	2.5
Extreme (-20C)	2593.0	-4.7	-0.006456	2.5
Extreme (-30C)	2593.0	-3.5	-0.004808	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.27	2593.0	2.9	0.003984	2.5
3.85	2593.0	-5.5	-0.007555	2.5
4.43	2593.0	3.6	0.004945	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593.0	-6.4	-0.008791	2.5
Extreme (50C)	2593.0	-7.1	-0.009753	2.5
Extreme (40C)	2593.0	-4.6	-0.006319	2.5
Extreme (30C)	2593.0	-6.4	-0.008791	2.5
Extreme (10C)	2593.0	3.5	0.004808	2.5
Extreme (0C)	2593.0	4.7	0.006456	2.5
Extreme (-10C)	2593.0	5.2	0.007143	2.5
Extreme (-20C)	2593.0	2.4	0.003297	2.5
Extreme (-30C)	2593.0	-3.1	-0.004258	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.

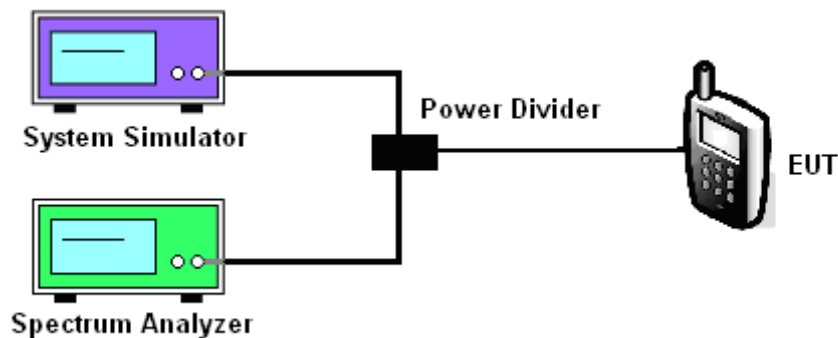
11.2 Measuring Instruments

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
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 17
- LTE Band 26
- LTE Band 41

Test data reference attachment.

----END OF REPORT----