

FCC CFR47 PART 22H, 27 CERTIFICATION TEST REPORT

FCC ID: 2ATQIW6

Product: Smart Phone

Trade Mark: Wings

Model Number: W6

Family Model: N/A

Report No.: STR190802001006E

Prepared for

Wings Mobile Telecom SL

c/Beethoven 15, piso 4, Barcelona, 08021 Spain

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : Wings Mobile Telecom SL

Address..... : c/Beethoven 15, piso 4, Barcelona, 08021 Spain

Manufacturer's Name..... : HK REXSO COM TECH CO., LIMITED

Address..... : UNIT 04, 7/F BRIGHT WAY TOWER NO 33 MONG KOK RD KL,
HONGKONG

Product name..... : Smart Phone

Model and/or type reference .. : W6

Family Model: N/A

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

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

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

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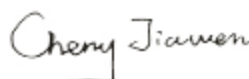
Date of Test

Date (s) of performance of tests..... 02 Aug. 2019 ~ 24 Oct. 2019

Date of Issue 26 Oct. 2019

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

Testing Engineer :



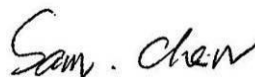
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Technical Manager :



(Jason Chen)

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(Sam Chen)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smart Phone
Trade Mark	Wings
Model Name	W6
Family Model	N/A
Model Difference	N/A
FCC ID:	2ATQIW6
Frequency Bands:	U.S. Bands: ☒ LTE-FDD Band 4,5,7; ☒ LTE-TDD Band 41
Frequency Range:	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 41 Note2
Type of Modulation:	QPSK/16QAM
SIM Card	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	Internal Antenna
Antenna gain:	Band 4: -0.86dBi; Band 5: -0.27 dBi; Band 7: -0.08 dBi; Band 41: -0.49 dBi;
Power Supply:	☒ DC supply: DC 3.85V/3250mAh from Battery or DC 5V from USB Port.
Adapter:	☒ Adapter supply: Model: ES568-U050200XYC Input: 100-240V~50/60Hz 0.3A Output: 5.0V---2000mA
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)
HW Version	L7126-mb-v.3
SW Version	Wings_W6_20190715
** Note1: The High Voltage DC 4.2V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

2. Frequency Range:

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	40265	2557.5
	10	40290	2560
	15	40315	2562.5
	20	40340	2565
Mid Range	5/10/15/20	40740	2605
High Range	5	41215	2652.5
	10	41190	2650
	15	41165	2647.5
	20	41140	2645

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ATQIW6** filing to comply with the FCC Part 22H&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 27, ANSI C63.26:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

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

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 4, Band 5, Band 7, 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

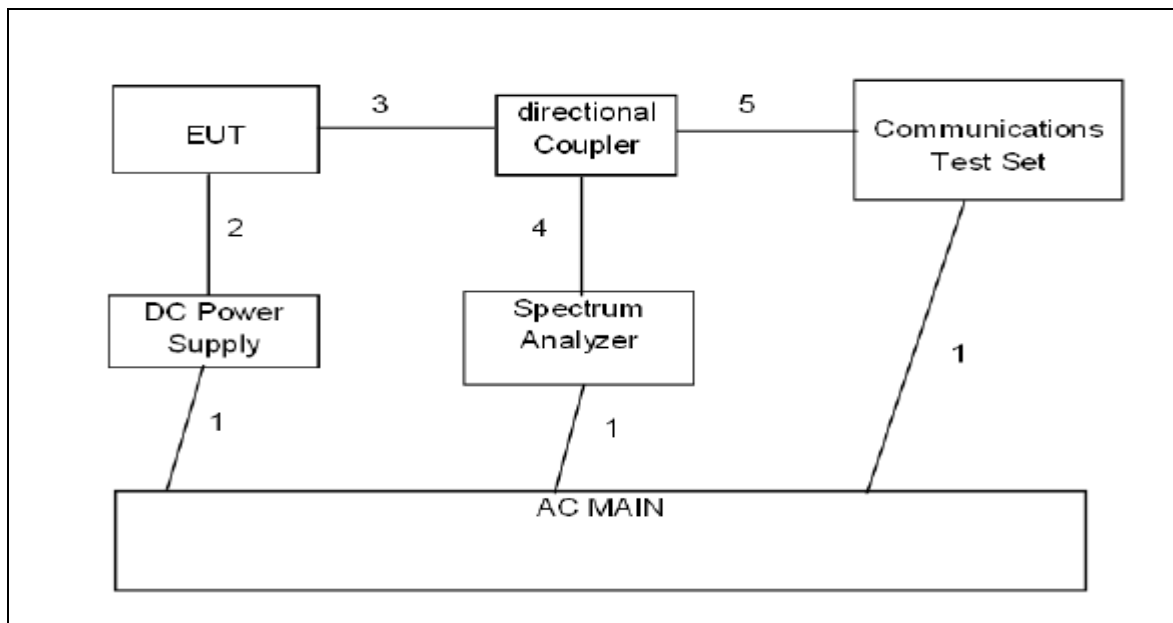
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	W6	FCC ID: 2ATQIW6	EUT

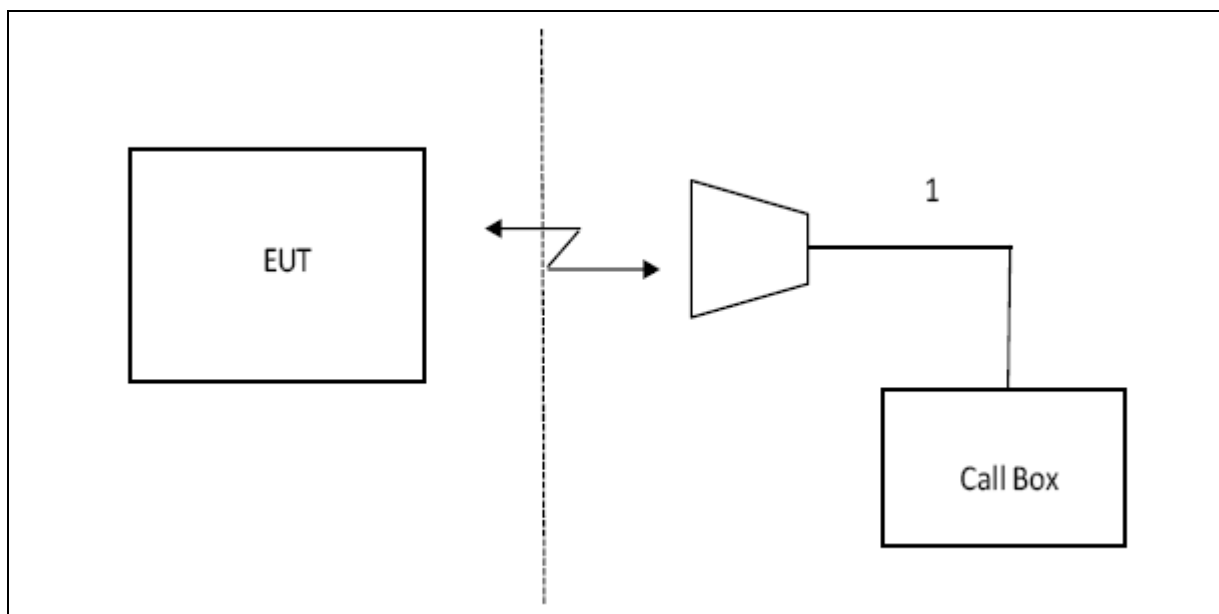
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

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 4
- ☐ LTE Band 5
- ☐ LTE Band 7
- ☐ 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.

Set display line at -13 dBm

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

MODES TESTED

- ☐ LTE Band 4
- LTE Band 5
- LTE Band 7
- 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 display line at -13 dBm
- ☐ 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 4
LTE Band 5
- ☐ LTE Band 7
LTE Band 41

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 4
LTE Band 5
- ☐ LTE Band 7
LTE Band 41

RESULTS

Pass

8.2 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/R B SIZE	Frequenc y	Result						Conclusion
			SG Level	Cable Loss (dBm)	Anten na Gain (dB)	Max. EIRP	Max. EIRP	Polarizati on Of Max. ERP	
			(dBm)			Averag e	Averag e		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mi d	1710.7	-2.04	3.12	27.58	22.42	174.643	Horizontal	Pass
		1732.5	-2.14	3.27	27.61	22.20	166.129	Horizontal	Pass
		1754.3	-1.87	3.29	27.63	22.47	176.633	Horizontal	Pass
3.0MHz Band QPSK	1/#Mi d	1711.5	-2.19	3.13	27.61	22.29	169.449	Horizontal	Pass
		1732.5	-1.87	3.27	27.61	22.47	176.411	Horizontal	Pass
		1753.5	-1.76	3.30	27.62	22.56	180.137	Horizontal	Pass
5.0MHz Band QPSK	1/#Mi d	1712.5	-1.73	3.13	27.63	22.77	189.379	Horizontal	Pass
		1732.5	-1.45	3.27	27.61	22.89	194.489	Horizontal	Pass
		1752.5	-1.59	3.30	27.60	22.71	186.638	Horizontal	Pass
10.0MH z Band QPSK	1/#Mi d	1715	-1.80	3.15	27.64	22.69	185.632	Horizontal	Pass
		1732.5	-1.71	3.31	27.61	22.59	181.463	Horizontal	Pass
		1750	-1.51	3.33	27.59	22.75	188.364	Horizontal	Pass
15.0MH z Band QPSK	1/#Mi d	1717.5	-2.14	3.15	27.65	22.36	172.200	Horizontal	Pass
		1732.5	-1.44	3.31	27.61	22.86	193.048	Horizontal	Pass
		1747.5	-1.94	3.33	27.57	22.30	169.927	Horizontal	Pass
20.0MH z Band QPSK	1/#Mi d	1720	-2.17	3.17	27.66	22.32	170.684	Horizontal	Pass
		1732.5	-1.32	3.32	27.61	22.97	198.153	Horizontal	Pass
		1745	-2.06	3.36	27.56	22.14	163.581	Horizontal	Pass
1.4MHz Band QPSK	1/#Mi d	1710.7	-1.99	3.12	27.58	22.47	176.588	Vertical	Pass
		1732.5	-1.88	3.27	27.61	22.46	176.000	Vertical	Pass
		1754.3	-1.73	3.29	27.63	22.61	182.509	Vertical	Pass
3.0MHz Band QPSK	1/#Mi d	1711.5	-1.84	3.13	27.61	22.64	183.453	Vertical	Pass
		1732.5	-1.68	3.27	27.61	22.66	184.634	Vertical	Pass
		1753.5	-1.64	3.30	27.62	22.68	185.173	Vertical	Pass
5.0MHz Band QPSK	1/#Mi d	1712.5	-2.73	3.13	27.63	21.77	150.486	Vertical	Pass
		1732.5	-2.56	3.27	27.61	21.78	150.765	Vertical	Pass
		1752.5	-2.28	3.30	27.60	22.02	159.302	Vertical	Pass
10.0MH z Band QPSK	1/#Mi d	1715	-1.88	3.15	27.64	22.61	182.538	Vertical	Pass
		1732.5	-1.76	3.31	27.61	22.54	179.413	Vertical	Pass
		1750	-1.55	3.33	27.59	22.71	186.824	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-2.03	3.15	27.65	22.47	176.432	Vertical	Pass
		1732.5	-1.73	3.31	27.61	22.57	180.780	Vertical	Pass
		1747.5	-1.44	3.33	27.57	22.80	190.387	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-1.64	3.17	27.66	22.85	192.872	Vertical	Pass
		1732.5	-1.46	3.32	27.61	22.83	191.692	Vertical	Pass
		1745	-1.85	3.36	27.56	22.35	171.610	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/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 16 QAM	1/#Mid	1710.7	-2.77	3.12	27.58	21.69	147.703	Horizontal	Pass
		1732.5	-2.52	3.27	27.61	21.82	151.882	Horizontal	Pass
		1754.3	-2.80	3.29	27.63	21.54	142.526	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.62	3.13	27.61	20.86	122.013	Horizontal	Pass
		1732.5	-3.28	3.27	27.61	21.06	127.701	Horizontal	Pass
		1753.5	-3.24	3.30	27.62	21.08	128.091	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.69	3.13	27.63	20.81	120.556	Horizontal	Pass
		1732.5	-3.41	3.27	27.61	20.93	123.756	Horizontal	Pass
		1752.5	-2.55	3.30	27.60	21.75	149.705	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-2.94	3.15	27.64	21.55	143.039	Horizontal	Pass
		1732.5	-2.58	3.31	27.61	21.72	148.719	Horizontal	Pass
		1750	-2.94	3.33	27.59	21.32	135.580	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.64	3.15	27.65	21.86	153.465	Horizontal	Pass
		1732.5	-2.55	3.31	27.61	21.75	149.730	Horizontal	Pass
		1747.5	-2.55	3.33	27.57	21.69	147.457	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-2.85	3.17	27.66	21.64	145.908	Horizontal	Pass
		1732.5	-2.65	3.32	27.61	21.64	145.739	Horizontal	Pass
		1745	-2.48	3.36	27.56	21.72	148.493	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-2.55	3.12	27.58	21.91	155.089	Vertical	Pass
		1732.5	-2.57	3.27	27.61	21.77	150.230	Vertical	Pass
		1754.3	-2.65	3.29	27.63	21.69	147.726	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.26	3.13	27.61	21.22	132.423	Vertical	Pass
		1732.5	-3.21	3.27	27.61	21.13	129.635	Vertical	Pass
		1753.5	-3.28	3.30	27.62	21.04	127.119	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.55	3.13	27.63	20.95	124.579	Vertical	Pass
		1732.5	-3.11	3.27	27.61	21.23	132.866	Vertical	Pass
		1752.5	-3.35	3.30	27.60	20.95	124.523	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-2.56	3.15	27.64	21.93	155.777	Vertical	Pass
		1732.5	-2.35	3.31	27.61	21.95	156.696	Vertical	Pass
		1750	-2.57	3.33	27.59	21.69	147.595	Vertical	Pass
15.0MHz Band	1/#Mid	1717.5	-2.99	3.15	27.65	21.51	141.612	Vertical	Pass
		1732.5	-2.76	3.31	27.61	21.54	142.551	Vertical	Pass

16 QAM		1747.5	-2.82	3.33	27.57	21.42	138.797	Vertical	Pass
20.0MHz Band	1/#Midd	1720	-2.86	3.17	27.66	21.63	145.468	Vertical	Pass
z Band		1732.5	-2.69	3.32	27.61	21.60	144.381	Vertical	Pass
16 QAM		1745	-2.23	3.36	27.56	21.97	157.396	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#M id	824.7	8.40	2.01	19.68	2.15	23.92	246.540	Horizontal	Pass
		836.5	8.31	2.01	19.77	2.15	23.92	246.761	Horizontal	Pass
		848.3	8.07	2.02	19.82	2.15	23.72	235.297	Horizontal	Pass
3.0MHz Band QPSK	1/#M id	825.5	8.31	2.01	19.70	2.15	23.85	242.689	Horizontal	Pass
		836.5	8.09	2.01	19.77	2.15	23.70	234.588	Horizontal	Pass
		847.5	8.06	2.02	19.81	2.15	23.70	234.194	Horizontal	Pass
5.0MHz Band QPSK	1/#M id	826.5	8.29	2.01	19.71	2.15	23.84	242.333	Horizontal	Pass
		836.5	8.06	2.01	19.77	2.15	23.67	232.873	Horizontal	Pass
		846.5	8.07	2.02	19.79	2.15	23.69	233.917	Horizontal	Pass
10.0MHz z Band QPSK	1/#M id	829	8.04	2.01	19.73	2.15	23.61	229.727	Horizontal	Pass
		836.5	8.03	2.01	19.77	2.15	23.64	230.957	Horizontal	Pass
		844	8.06	2.02	19.78	2.15	23.67	232.928	Horizontal	Pass
1.4MHz Band QPSK	1/#M id	824.7	8.37	2.01	19.68	2.15	23.89	245.057	Vertical	Pass
		836.5	8.29	2.01	19.77	2.15	23.90	245.728	Vertical	Pass
		848.3	8.07	2.02	19.82	2.15	23.72	235.482	Vertical	Pass
3.0MHz Band QPSK	1/#M id	825.5	8.44	2.01	19.70	2.15	23.98	249.974	Vertical	Pass
		836.5	8.03	2.01	19.77	2.15	23.64	231.061	Vertical	Pass
		847.5	8.12	2.02	19.81	2.15	23.76	237.532	Vertical	Pass
5.0MHz Band QPSK	1/#M id	826.5	8.01	2.01	19.71	2.15	23.56	227.220	Vertical	Pass
		836.5	7.96	2.01	19.77	2.15	23.57	227.505	Vertical	Pass
		846.5	8.20	2.02	19.79	2.15	23.82	241.178	Vertical	Pass
10.0MHz z Band QPSK	1/#M id	829	8.17	2.01	19.73	2.15	23.74	236.711	Vertical	Pass
		836.5	8.10	2.01	19.77	2.15	23.71	235.210	Vertical	Pass
		844	8.39	2.02	19.78	2.15	24.00	251.189	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	Freque ncy	Result							Conclu sion
			SG Level	Cable Loss	Anten na Gain	Corre ction	Max. EIRP	Max. EIRP	Polarizati on Of Max. ERP	
			(dBm)	(dBm)	(dB)	(dB)	Averag e	Averag e		
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#M id	824.7	7.27	2.01	19.68	2.15	22.79	190.170	Horizontal	Pass
		836.5	7.16	2.01	19.77	2.15	22.77	189.058	Horizontal	Pass
		848.3	7.23	2.02	19.82	2.15	22.88	194.309	Horizontal	Pass
3.0MHz Band 16 QAM	1/#M id	825.5	7.30	2.01	19.70	2.15	22.84	192.452	Horizontal	Pass
		836.5	7.38	2.01	19.77	2.15	22.99	199.099	Horizontal	Pass
		847.5	7.11	2.02	19.81	2.15	22.75	188.396	Horizontal	Pass
5.0MHz Band 16 QAM	1/#M id	826.5	7.40	2.01	19.71	2.15	22.95	197.304	Horizontal	Pass
		836.5	7.31	2.01	19.77	2.15	22.92	195.852	Horizontal	Pass
		846.5	7.21	2.02	19.79	2.15	22.83	191.875	Horizontal	Pass
10.0MH z Band 16 QAM	1/#M id	829	7.43	2.01	19.73	2.15	23.00	199.526	Horizontal	Pass
		836.5	7.19	2.01	19.77	2.15	22.80	190.639	Horizontal	Pass
		844	7.29	2.02	19.78	2.15	22.90	194.861	Horizontal	Pass
1.4MHz Band 16 QAM	1/#M id	824.7	7.25	2.01	19.68	2.15	22.77	189.247	Vertical	Pass
		836.5	7.28	2.01	19.77	2.15	22.89	194.447	Vertical	Pass
		848.3	7.33	2.02	19.82	2.15	22.98	198.589	Vertical	Pass
3.0MHz Band 16 QAM	1/#M id	825.5	7.27	2.01	19.70	2.15	22.81	191.188	Vertical	Pass
		836.5	7.15	2.01	19.77	2.15	22.76	188.871	Vertical	Pass
		847.5	7.02	2.02	19.81	2.15	22.66	184.620	Vertical	Pass
5.0MHz Band 16 QAM	1/#M id	826.5	7.34	2.01	19.71	2.15	22.89	194.456	Vertical	Pass
		836.5	7.26	2.01	19.77	2.15	22.87	193.695	Vertical	Pass
		846.5	7.20	2.02	19.79	2.15	22.82	191.306	Vertical	Pass
10.0MH z Band 16 QAM	1/#M id	829	7.35	2.01	19.73	2.15	22.92	195.884	Vertical	Pass
		836.5	7.30	2.01	19.77	2.15	22.91	195.387	Vertical	Pass
		844	7.31	2.02	19.78	2.15	22.92	195.919	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level	Cabl e Loss	Antenn a Gain	Max. EIRP	Max. EIRP	Polarizati on Of	
			(dBm)	(dBm)	(dB)	Averag e	Averag e	Max. ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#M id	2502.5	-1.25	4.54	27.75	21.96	157.044	Horizontal	Pass
		2535	-1.21	4.69	27.72	21.82	152.224	Horizontal	Pass
		2567.5	-0.95	4.71	27.71	22.05	160.231	Horizontal	Pass
10.0MH z Band QPSK	1/#M id	2505	-1.19	4.55	27.76	22.02	159.368	Horizontal	Pass
		2535	-0.96	4.69	27.72	22.07	161.070	Horizontal	Pass
		2565	-1.16	4.72	27.70	21.82	151.927	Horizontal	Pass
15.0MH z Band QPSK	1/#M id	2507.5	-1.21	4.55	27.77	22.01	158.761	Horizontal	Pass
		2535	-1.05	4.69	27.72	21.98	157.635	Horizontal	Pass
		2562.5	-1.01	4.72	27.69	21.96	156.931	Horizontal	Pass
20.0MH z Band QPSK	1/#M id	2510	-1.09	4.57	27.78	22.12	162.930	Horizontal	Pass
		2535	-1.50	4.73	27.72	21.49	140.779	Horizontal	Pass
		2560	-1.24	4.75	27.68	21.69	147.517	Horizontal	Pass
5.0MHz Band QPSK	1/#M id	2502.5	-1.49	4.54	27.75	21.72	148.611	Vertical	Pass
		2535	-1.00	4.69	27.72	22.03	159.757	Vertical	Pass
		2567.5	-1.04	4.71	27.71	21.96	157.189	Vertical	Pass
10.0MH z Band QPSK	1/#M id	2505	-1.64	4.55	27.76	21.57	143.585	Vertical	Pass
		2535	-1.00	4.69	27.72	22.03	159.738	Vertical	Pass
		2565	-1.38	4.72	27.70	21.60	144.540	Vertical	Pass
15.0MH z Band QPSK	1/#M id	2507.5	-1.16	4.55	27.77	22.06	160.664	Vertical	Pass
		2535	-1.14	4.69	27.72	21.89	154.497	Vertical	Pass
		2562.5	-1.00	4.72	27.69	21.97	157.398	Vertical	Pass
20.0MH z Band QPSK	1/#M id	2510	-1.21	4.57	27.78	22.00	158.627	Vertical	Pass
		2535	-0.88	4.73	27.72	22.11	162.425	Vertical	Pass
		2560	-0.99	4.75	27.68	21.94	156.337	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 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level	Cabl e Loss	Antenn a Gain	Max. EIRP	Max. EIRP	Polarizati on Of	
			(dBm)	(dBm)	(dB)	Averag e	Averag e	Max. ERP	
						(dBm)	(mW)		
5.0MHz Band 16 QAM	1/#M id	2502.5	-2.55	4.54	27.75	20.66	116.324	Horizontal	Pass
		2535	-2.38	4.69	27.72	20.65	116.275	Horizontal	Pass
		2567.5	-2.45	4.71	27.71	20.55	113.572	Horizontal	Pass
10.0MH z Band 16 QAM	1/#M id	2505	-2.59	4.55	27.76	20.62	115.319	Horizontal	Pass
		2535	-2.37	4.69	27.72	20.66	116.386	Horizontal	Pass
		2565	-2.31	4.72	27.70	20.67	116.640	Horizontal	Pass
15.0MH z Band 16 QAM	1/#M id	2507.5	-2.45	4.55	27.77	20.77	119.499	Horizontal	Pass
		2535	-2.41	4.69	27.72	20.62	115.413	Horizontal	Pass
		2562.5	-2.47	4.72	27.69	20.50	112.218	Horizontal	Pass
20.0MH z Band 16 QAM	1/#M id	2510	-2.70	4.57	27.78	20.51	112.508	Horizontal	Pass
		2535	-2.12	4.73	27.72	20.87	122.180	Horizontal	Pass
		2560	-2.46	4.75	27.68	20.47	111.515	Horizontal	Pass
5.0MHz Band 16 QAM	1/#M id	2502.5	-2.66	4.54	27.75	20.55	113.491	Vertical	Pass
		2535	-2.69	4.69	27.72	20.34	108.074	Vertical	Pass
		2567.5	-2.65	4.71	27.71	20.35	108.326	Vertical	Pass
10.0MH z Band 16 QAM	1/#M id	2505	-2.50	4.55	27.76	20.71	117.846	Vertical	Pass
		2535	-2.26	4.69	27.72	20.77	119.468	Vertical	Pass
		2565	-2.33	4.72	27.70	20.65	116.265	Vertical	Pass
15.0MH z Band 16 QAM	1/#M id	2507.5	-2.76	4.55	27.77	20.46	111.186	Vertical	Pass
		2535	-2.63	4.69	27.72	20.40	109.576	Vertical	Pass
		2562.5	-2.53	4.72	27.69	20.44	110.593	Vertical	Pass
20.0MH z Band 16 QAM	1/#M id	2510	-2.35	4.57	27.78	20.86	121.830	Vertical	Pass
		2535	-2.14	4.73	27.72	20.85	121.674	Vertical	Pass
		2560	-2.38	4.75	27.68	20.55	113.386	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Anten na Gain (dB)	Max. EIRP	Max. EIRP	Polarizati on Of Max. ERP	
						Average	Averag e		
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#M id	2557.5	-0.22	4.54	27.75	22.99	199.248	Horizontal	Pass
		2605	-0.05	4.69	27.72	22.98	198.552	Horizontal	Pass
		2652.5	-0.04	4.71	27.71	22.96	197.491	Horizontal	Pass
10.0MH z Band QPSK	1/#M id	2560	-0.29	4.55	27.76	22.92	195.790	Horizontal	Pass
		2605	-0.09	4.69	27.72	22.94	196.714	Horizontal	Pass
		2650	-0.03	4.72	27.70	22.95	197.224	Horizontal	Pass
15.0MH z Band QPSK	1/#M id	2562.5	-0.25	4.55	27.77	22.97	198.036	Horizontal	Pass
		2605	-0.01	4.69	27.72	23.02	200.671	Horizontal	Pass
		2647.5	-0.01	4.72	27.69	22.96	197.769	Horizontal	Pass
20.0MH z Band QPSK	1/#M id	2565	-0.05	4.57	27.78	23.16	207.014	Horizontal	Pass
		2605	-0.42	4.73	27.72	22.57	180.874	Horizontal	Pass
		2645	-0.18	4.75	27.68	22.75	188.396	Horizontal	Pass
5.0MHz Band QPSK	1/#M id	2557.5	-0.38	4.54	27.75	22.83	191.872	Vertical	Pass
		2605	-0.05	4.69	27.72	22.98	198.548	Vertical	Pass
		2652.5	-0.19	4.71	27.71	22.81	190.935	Vertical	Pass
10.0MH z Band QPSK	1/#M id	2560	-0.57	4.55	27.76	22.64	183.546	Vertical	Pass
		2605	-0.07	4.69	27.72	22.96	197.845	Vertical	Pass
		2650	-0.41	4.72	27.70	22.57	180.510	Vertical	Pass
15.0MH z Band QPSK	1/#M id	2562.5	-0.33	4.55	27.77	22.89	194.720	Vertical	Pass
		2605	0.03	4.69	27.72	23.06	202.284	Vertical	Pass
		2647.5	0.11	4.72	27.69	23.08	203.236	Vertical	Pass
20.0MH z Band QPSK	1/#M id	2565	-0.07	4.57	27.78	23.14	206.063	Vertical	Pass
		2605	0.01	4.73	27.72	23.00	199.748	Vertical	Pass
		2645	0.10	4.75	27.68	23.03	200.797	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						Conclusio n
			SG Level (dBm)	Cable Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Avera ge (dBm)	Max. EIRP	Polarizati on Of Max. ERP	
							Average		
							(mW)		
5.0MHz Band 16 QAM	1/#M id	2557.5	-1.54	4.54	27.75	21.67	146.897	Horizontal	Pass
		2605	-1.46	4.69	27.72	21.57	143.675	Horizontal	Pass
		2652.5	-1.35	4.71	27.71	21.65	146.378	Horizontal	Pass
10.0MH z Band 16 QAM	1/#M id	2560	-1.46	4.55	27.76	21.75	149.490	Horizontal	Pass
		2605	-1.52	4.69	27.72	21.51	141.612	Horizontal	Pass
		2650	-1.29	4.72	27.70	21.69	147.405	Horizontal	Pass
15.0MH z Band 16 QAM	1/#M id	2562.5	-1.44	4.55	27.77	21.78	150.589	Horizontal	Pass
		2605	-1.46	4.69	27.72	21.57	143.705	Horizontal	Pass
		2647.5	-1.43	4.72	27.69	21.54	142.602	Horizontal	Pass
20.0MH z Band 16 QAM	1/#M id	2565	-1.75	4.57	27.78	21.46	139.976	Horizontal	Pass
		2605	-1.14	4.73	27.72	21.85	153.109	Horizontal	Pass
		2645	-1.61	4.75	27.68	21.32	135.408	Horizontal	Pass
5.0MHz Band 16 QAM	1/#M id	2557.5	-1.80	4.54	27.75	21.41	138.267	Vertical	Pass
		2605	-1.56	4.69	27.72	21.47	140.252	Vertical	Pass
		2652.5	-1.50	4.71	27.71	21.50	141.369	Vertical	Pass
10.0MH z Band 16 QAM	1/#M id	2560	-1.43	4.55	27.76	21.78	150.828	Vertical	Pass
		2605	-1.23	4.69	27.72	21.80	151.346	Vertical	Pass
		2650	-1.26	4.72	27.70	21.72	148.637	Vertical	Pass
15.0MH z Band 16 QAM	1/#M id	2562.5	-1.78	4.55	27.77	21.44	139.170	Vertical	Pass
		2605	-1.68	4.69	27.72	21.35	136.556	Vertical	Pass
		2647.5	-1.68	4.72	27.69	21.29	134.650	Vertical	Pass
20.0MH z Band 16 QAM	1/#M id	2565	-1.38	4.57	27.78	21.83	152.525	Vertical	Pass
		2605	-1.22	4.73	27.72	21.77	150.342	Vertical	Pass
		2645	-1.24	4.75	27.68	21.69	147.643	Vertical	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 4
LTE Band 5
- ☐ LTE Band 7
LTE Band 41

RESULTS

PASS

9.1 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	-53.46	4.02	29.80	-27.68	-13	-14.68	Horizontal
3421.4	-45.47	4.02	29.80	-19.69	-13	-6.69	Vertical
5132.1	-52.30	5.24	35.84	-21.70	-13	-8.70	Vertical
5132.1	-49.61	5.24	35.84	-19.01	-13	-6.01	Horizontal
275.2	-65.19	1.56	17.07	-49.68	-13	-36.68	Vertical
173.7	-54.24	1.68	15.77	-40.14	-13	-27.14	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-56.50	4.03	30.00	-30.53	-13	-17.53	Horizontal
3465.0	-56.51	4.03	30.00	-30.54	-13	-17.54	Vertical
5197.5	-60.73	5.25	35.86	-30.12	-13	-17.12	Vertical
5197.5	-58.32	5.25	35.86	-27.71	-13	-14.71	Horizontal
219.4	-49.37	1.69	15.02	-36.05	-13	-23.05	Vertical
139.8	-58.68	1.63	17.01	-43.30	-13	-30.30	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-47.75	4.05	30.01	-21.79	-13	-8.79	Horizontal
3508.6	-49.21	4.05	30.01	-23.25	-13	-10.25	Vertical
5262.9	-49.91	5.26	35.86	-19.31	-13	-6.31	Vertical
5262.9	-54.01	5.26	35.86	-23.41	-13	-10.41	Horizontal
201.7	-64.52	1.33	15.53	-50.32	-13	-37.32	Vertical
235.4	-54.06	1.73	15.25	-40.55	-13	-27.55	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
3440.0	-55.99	4.02	29.80	-30.21	-13	-17.21	Horizontal
3440.0	-53.40	4.02	29.80	-27.62	-13	-14.62	Vertical
5160.0	-52.24	5.24	35.84	-21.64	-13	-8.64	Vertical
5160.0	-54.10	5.24	35.84	-23.50	-13	-10.50	Horizontal
126.6	-70.76	1.79	17.55	-54.99	-13	-41.99	Vertical
119.8	-56.03	1.74	15.13	-42.64	-13	-29.64	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.88	4.03	30.00	-19.91	-13	-6.91	Horizontal
3465.0	-49.25	4.03	30.00	-23.28	-13	-10.28	Vertical
5197.5	-53.28	5.25	35.86	-22.67	-13	-9.67	Vertical
5197.5	-49.60	5.25	35.86	-18.99	-13	-5.99	Horizontal
249.2	-57.28	1.41	15.63	-43.06	-13	-30.06	Vertical
125.5	-58.44	1.76	17.72	-42.48	-13	-29.48	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-52.91	2.91	27.68	-28.14	-13	-15.14	Horizontal
3490.0	-53.45	2.91	27.68	-28.68	-13	-15.68	Vertical
5235.0	-53.46	5.26	35.86	-22.86	-13	-9.86	Vertical
5235.0	-53.21	5.26	35.86	-22.61	-13	-9.61	Horizontal
199.5	-71.80	1.60	17.22	-56.18	-13	-43.18	Vertical
245.3	-51.08	1.54	15.45	-37.16	-13	-24.16	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 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	-51.95	2.78	27.50	-27.23	-13	-14.23	Horizontal
1649.4	-51.92	2.78	27.50	-27.20	-13	-14.20	Vertical
2474.1	-46.28	2.90	27.80	-21.38	-13	-8.38	Vertical
2474.1	-49.85	2.90	27.80	-24.95	-13	-11.95	Horizontal
273.8	-62.74	1.76	17.24	-47.26	-13	-34.26	Vertical
112.0	-48.46	1.61	15.04	-35.03	-13	-22.03	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-50.23	2.80	27.48	-25.55	-13	-12.55	Horizontal
1673.0	-48.56	2.80	27.48	-23.88	-13	-10.88	Vertical
2509.5	-49.89	2.91	27.70	-25.10	-13	-12.10	Vertical
2509.5	-47.44	2.91	27.70	-22.65	-13	-9.65	Horizontal
187.9	-73.85	1.60	17.86	-57.58	-13	-44.58	Vertical
268.2	-71.46	1.40	17.96	-54.91	-13	-41.91	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.22	2.82	27.43	-21.61	-13	-8.61	Horizontal
1696.6	-49.62	2.82	27.43	-25.01	-13	-12.01	Vertical
2544.9	-46.09	2.92	27.74	-21.27	-13	-8.27	Vertical
2544.9	-42.93	2.92	27.74	-18.11	-13	-5.11	Horizontal
178.0	-66.92	1.30	15.27	-52.96	-13	-39.96	Vertical
265.3	-63.51	1.60	16.40	-48.70	-13	-35.70	Horizontal

OPSK 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
1658.0	-50.44	2.78	27.50	-25.72	-13	-12.72	Horizontal
1658.0	-51.11	2.78	27.50	-26.39	-13	-13.39	Vertical
2487.0	-52.56	2.90	27.80	-27.66	-13	-14.66	Vertical
2487.0	-50.48	2.90	27.80	-25.58	-13	-12.58	Horizontal
129.5	-67.28	1.36	17.17	-51.47	-13	-38.47	Vertical
150.1	-49.11	1.76	15.24	-35.63	-13	-22.63	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-48.01	2.80	27.48	-23.33	-13	-10.33	Horizontal
1673.0	-45.67	2.80	27.48	-20.99	-13	-7.99	Vertical
2509.5	-45.67	2.91	27.70	-20.88	-13	-7.88	Vertical
2509.5	-45.40	2.91	27.70	-20.61	-13	-7.61	Horizontal
227.6	-55.40	1.54	15.30	-41.64	-13	-28.64	Vertical
213.3	-56.54	1.46	17.83	-40.17	-13	-27.17	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.44	2.82	27.43	-21.83	-13	-8.83	Horizontal
1688.0	-47.97	2.82	27.43	-23.36	-13	-10.36	Vertical
2532.0	-50.27	2.92	27.74	-25.45	-13	-12.45	Vertical
2532.0	-46.86	2.92	27.74	-22.04	-13	-9.04	Horizontal
226.9	-67.46	1.34	15.77	-53.03	-13	-40.03	Vertical
135.5	-53.43	1.33	17.48	-37.27	-13	-24.27	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 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-73.33	5.23	35.81	-42.75	-25	-17.75	Horizontal
5005.0	-66.82	5.23	35.81	-36.24	-25	-11.24	Vertical
7507.5	-67.03	5.67	36.85	-35.85	-25	-10.85	Vertical
7507.5	-67.14	5.67	36.85	-35.96	-25	-10.96	Horizontal
529.7	-62.29	1.46	16.58	-47.18	-25	-22.18	Vertical
399.6	-75.96	1.38	17.64	-59.70	-25	-34.70	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-68.28	5.23	35.82	-37.69	-25	-12.69	Horizontal
5070.0	-68.98	5.23	35.82	-38.39	-25	-13.39	Vertical
7605.0	-66.30	5.67	36.85	-35.12	-25	-10.12	Vertical
7605.0	-68.93	5.67	36.85	-37.75	-25	-12.75	Horizontal
470.3	-72.61	1.49	17.58	-56.52	-25	-31.52	Vertical
445.3	-62.34	1.54	16.82	-47.06	-25	-22.06	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-71.41	5.24	35.83	-40.82	-25	-15.82	Horizontal
5135.0	-63.38	5.24	35.83	-32.79	-25	-7.79	Vertical
7702.5	-71.93	5.68	36.87	-40.74	-25	-15.74	Vertical
7702.5	-66.09	5.68	36.87	-34.90	-25	-9.90	Horizontal
164.8	-68.15	1.38	15.68	-53.85	-25	-28.85	Vertical
530.8	-62.86	1.67	17.61	-46.92	-25	-21.92	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-70.07	5.23	35.82	-39.48	-25	-14.48	Horizontal
5020.0	-72.83	5.23	35.82	-42.24	-25	-17.24	Vertical
7530.0	-63.57	5.67	36.86	-32.38	-25	-7.38	Vertical
7530.0	-66.66	5.67	36.86	-35.47	-25	-10.47	Horizontal
537.8	-61.46	1.39	15.07	-47.79	-25	-22.79	Vertical
84.6	-66.97	1.49	15.38	-53.09	-25	-28.09	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-67.78	5.23	35.82	-37.19	-25	-12.19	Horizontal
5070.0	-69.38	5.23	35.82	-38.79	-25	-13.79	Vertical
7605.0	-65.87	5.67	36.85	-34.69	-25	-9.69	Vertical
7605.0	-65.69	5.67	36.85	-34.51	-25	-9.51	Horizontal
472.4	-61.38	1.39	17.69	-45.08	-25	-20.08	Vertical
371.7	-74.82	1.35	16.16	-60.01	-25	-35.01	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-61.94	5.24	35.83	-31.35	-25	-6.35	Horizontal
5120.0	-67.80	5.24	35.83	-37.21	-25	-12.21	Vertical
7680.0	-65.04	5.70	36.88	-33.86	-25	-8.86	Vertical
7680.0	-69.03	5.70	36.88	-37.85	-25	-12.85	Horizontal
462.1	-83.37	1.33	16.64	-68.06	-25	-43.06	Vertical
169.9	-73.12	1.58	17.36	-57.35	-25	-32.35	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 41

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

Test Results for Low Channel 2557.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5115.0	-72.58	5.23	35.81	-42.00	-25	-17.00	Horizontal
5115.0	-67.44	5.23	35.81	-36.86	-25	-11.86	Vertical
7672.5	-68.41	5.67	36.85	-37.23	-25	-12.23	Vertical
7672.5	-72.16	5.67	36.85	-40.98	-25	-15.98	Horizontal
415.1	-72.85	1.43	15.63	-58.64	-25	-33.64	Vertical
194.1	-69.50	1.32	16.88	-53.94	-25	-28.94	Horizontal
Test Results for Mid Channel 2605MHz							
5210.0	-70.13	5.23	35.82	-39.54	-25	-14.54	Horizontal
5210.0	-69.86	5.23	35.82	-39.27	-25	-14.27	Vertical
7815.0	-69.31	5.67	36.85	-38.13	-25	-13.13	Vertical
7815.0	-69.75	5.67	36.85	-38.57	-25	-13.57	Horizontal
244.0	-71.50	1.67	17.85	-55.33	-25	-30.33	Vertical
166.8	-69.89	1.61	17.80	-53.70	-25	-28.70	Horizontal
Test Results for High Channel 2652.5MHz							
5305.0	-68.13	5.24	35.83	-37.54	-25	-12.54	Horizontal
5305.0	-69.69	5.24	35.83	-39.10	-25	-14.10	Vertical
7957.5	-67.45	5.68	36.87	-36.26	-25	-11.26	Vertical
7957.5	-61.94	5.68	36.87	-30.75	-25	-5.75	Horizontal
554.6	-67.96	1.37	16.38	-52.94	-25	-27.94	Vertical
456.3	-80.55	1.32	16.76	-65.11	-25	-40.11	Horizontal

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

Test Results for Low Channel 2565MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5130.0	-71.04	5.23	35.82	-40.45	-25	-15.45	Horizontal
5130.0	-64.83	5.23	35.82	-34.24	-25	-9.24	Vertical
7695.0	-67.36	5.67	36.86	-36.17	-25	-11.17	Vertical
7695.0	-65.55	5.67	36.86	-34.36	-25	-9.36	Horizontal
235.1	-77.92	1.53	16.14	-63.31	-25	-38.31	Vertical
322.7	-64.00	1.73	17.01	-48.73	-25	-23.73	Horizontal
Test Results for Mid Channel 2605MHz							
5210.0	-66.64	5.23	35.82	-36.05	-25	-11.05	Horizontal
5210.0	-67.67	5.23	35.82	-37.08	-25	-12.08	Vertical
7815.0	-67.62	5.67	36.85	-36.44	-25	-11.44	Vertical
7815.0	-61.59	5.67	36.85	-30.41	-25	-5.41	Horizontal
137.0	-78.52	1.57	15.54	-64.55	-25	-39.55	Vertical
539.2	-75.28	1.53	15.22	-61.58	-25	-36.58	Horizontal
Test Results for High Channel 2645MHz							
5290.0	-64.15	5.24	35.83	-33.56	-25	-8.56	Horizontal
5290.0	-69.51	5.24	35.83	-38.92	-25	-13.92	Vertical
7935.0	-67.69	5.70	36.88	-36.51	-25	-11.51	Vertical
7935.0	-66.75	5.70	36.88	-35.57	-25	-10.57	Horizontal
134.7	-63.73	1.73	17.54	-47.93	-25	-22.93	Vertical
245.6	-62.69	1.62	18.00	-46.31	-25	-21.31	Horizontal

Note: $P_{Mea}(dBm) = Power(dBm) + ARpl(dBm)$

Over Limit = $P_{Mea}(dBm) - Limit(dBm)$

We test both H direction and V direction, recorded worst case direction.

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.4V, Normal, DC 3.85V and High voltage, DC 4.2V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

- ☐ LTE Band 4
- LTE Band 5
- ☐ LTE Band 7
- LTE Band 41

RESULTS

See the following pages.

10.1 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	13.39	0.007731	2.5
3.85	1732.5	-12.63	-0.007291	2.5
4.2	1732.5	-19.27	-0.011125	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	-6.93	-0.004000	2.5
Extreme (50C)	1732.5	5.53	0.003193	2.5
Extreme (40C)	1732.5	-0.25	-0.000145	2.5
Extreme (30C)	1732.5	13.76	0.007941	2.5
Extreme (10C)	1732.5	0.36	0.000210	2.5
Extreme (0C)	1732.5	0.33	0.000191	2.5
Extreme (-10C)	1732.5	8.20	0.004734	2.5
Extreme (-20C)	1732.5	9.05	0.005222	2.5
Extreme (-30C)	1732.5	-14.56	-0.008405	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	16.28	0.009397	2.5
3.85	1732.5	-2.44	-0.001409	2.5
4.2	1732.5	-7.37	-0.004252	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	-15.99	-0.009232	2.5
Extreme (50C)	1732.5	9.27	0.005353	2.5
Extreme (40C)	1732.5	-12.63	-0.007291	2.5
Extreme (30C)	1732.5	3.88	0.002238	2.5
Extreme (10C)	1732.5	16.08	0.009280	2.5
Extreme (0C)	1732.5	-15.77	-0.009105	2.5
Extreme (-10C)	1732.5	13.69	0.007903	2.5
Extreme (-20C)	1732.5	1.28	0.000741	2.5
Extreme (-30C)	1732.5	19.05	0.010996	2.5

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

10.2 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	6.88	0.008229	2.5
3.85	836.5	-11.26	-0.013456	2.5
4.2	836.5	-14.17	-0.016939	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	-0.01	-0.000015	2.5
Extreme (50C)	836.5	4.80	0.005736	2.5
Extreme (40C)	836.5	-13.19	-0.015770	2.5
Extreme (30C)	836.5	-4.91	-0.005870	2.5
Extreme (10C)	836.5	10.86	0.012983	2.5
Extreme (0C)	836.5	-0.18	-0.000214	2.5
Extreme (-10C)	836.5	3.60	0.004308	2.5
Extreme (-20C)	836.5	-7.74	-0.009249	2.5
Extreme (-30C)	836.5	-8.92	-0.010666	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	2.66	0.003182	2.5
3.85	836.5	-3.84	-0.004592	2.5
4.2	836.5	-16.46	-0.019675	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	5.46	0.006531	2.5
Extreme (50C)	836.5	-0.60	-0.000714	2.5
Extreme (40C)	836.5	-0.96	-0.001151	2.5
Extreme (30C)	836.5	5.93	0.007084	2.5
Extreme (10C)	836.5	-11.39	-0.013620	2.5
Extreme (0C)	836.5	-16.92	-0.020230	2.5
Extreme (-10C)	836.5	16.45	0.019665	2.5
Extreme (-20C)	836.5	9.21	0.011007	2.5
Extreme (-30C)	836.5	19.48	0.023289	2.5

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

10.3 LTE BAND 7

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	10.63	0.004195	2.5
3.85	2535	-7.17	-0.002828	2.5
4.2	2535	-2.82	-0.001112	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-3.40	-0.001341	2.5
Extreme (50C)	2535	-11.00	-0.004339	2.5
Extreme (40C)	2535	4.34	0.001712	2.5
Extreme (30C)	2535	-17.33	-0.006838	2.5
Extreme (10C)	2535	11.25	0.004438	2.5
Extreme (0C)	2535	12.77	0.005039	2.5
Extreme (-10C)	2535	4.93	0.001943	2.5
Extreme (-20C)	2535	8.74	0.003448	2.5
Extreme (-30C)	2535	9.82	0.003873	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	-8.35	-0.003293	2.5
3.85	2535	-8.82	-0.003480	2.5
4.2	2535	9.07	0.003578	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	10.04	0.003960	2.5
Extreme (50C)	2535	-11.27	-0.004447	2.5
Extreme (40C)	2535	-13.81	-0.005449	2.5
Extreme (30C)	2535	18.59	0.007335	2.5
Extreme (10C)	2535	1.52	0.000599	2.5
Extreme (0C)	2535	18.81	0.007419	2.5
Extreme (-10C)	2535	-1.15	-0.000453	2.5
Extreme (-20C)	2535	-1.46	-0.000576	2.5
Extreme (-30C)	2535	-12.69	-0.005005	2.5

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

10.4 LTE BAND 41

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
QPSK, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2605	19.72	0.007570	2.5
3.85	2605	6.29	0.002413	2.5
4.2	2605	-15.10	-0.005797	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
QPSK, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	-2.02	-0.000777	2.5
Extreme (50C)	2605	-15.00	-0.005757	2.5
Extreme (40C)	2605	15.47	0.005937	2.5
Extreme (30C)	2605	-16.61	-0.006377	2.5
Extreme (10C)	2605	-6.57	-0.002521	2.5
Extreme (0C)	2605	6.30	0.002418	2.5
Extreme (-10C)	2605	-3.95	-0.001515	2.5
Extreme (-20C)	2605	-8.65	-0.003321	2.5
Extreme (-30C)	2605	10.00	0.003837	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
16QAM, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2605	-11.47	-0.004402	2.5
3.85	2605	-12.63	-0.004850	2.5
4.2	2605	7.02	0.002694	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
16QAM, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	-3.06	-0.001175	2.5
Extreme (50C)	2605	17.25	0.006622	2.5
Extreme (40C)	2605	-5.98	-0.002297	2.5
Extreme (30C)	2605	0.90	0.000347	2.5
Extreme (10C)	2605	-18.60	-0.007141	2.5
Extreme (0C)	2605	-4.81	-0.001845	2.5
Extreme (-10C)	2605	-6.38	-0.002449	2.5
Extreme (-20C)	2605	-4.41	-0.001694	2.5
Extreme (-30C)	2605	8.14	0.003127	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.

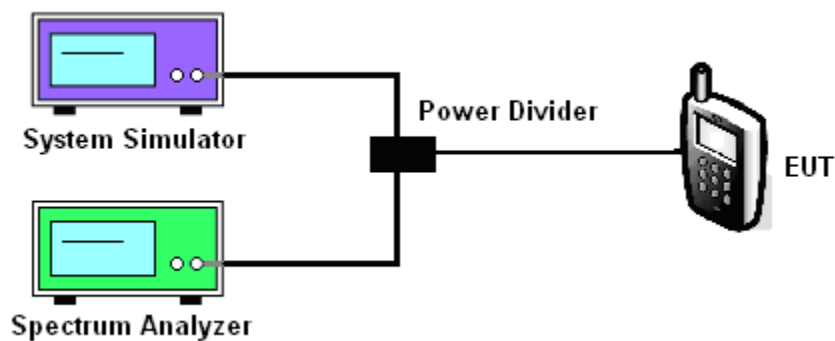
11.2 Measuring Instruments

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 Band4
- LTE Band 5
- ☐ LTE Band7
- LTE Band 41

Test data reference attachment.

----END OF REPORT----