

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

FCC ID: 2ANMU-WP16

Product: Smart Phone

Trade Mark: OUKITEL

Model Number: WP16

Family Model: N/A

Report No.: S21101103909006

Prepared for

SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL
ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name..... : SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
Address..... : A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China
Manufacturer's Name..... : SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
Address..... : A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China
Product name..... : Smart Phone
Model and/or type reference : WP16
Family Model: N/A
Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.46:2015
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 13 Oct. 2021 ~01 Nov, 2021
Date of Issue 03 Nov, 2021
Test Result..... Pass

Testing Engineer : [Signature]
(Allen Liu)

Authorized Signatory : [Signature]
(Alex Li)

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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	OUKITEL
Model Name	WP16
Family Model	N/A
Model Difference	N/A
FCC ID:	2ANMU-WP16
Frequency Bands:	U.S. Bands: <input checked="" type="checkbox"/> LTE FDD Band 2, 4, 5, 7, 12, 17
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz;
Type of Modulation:	QPSK/16QAM
Antenna:	FPC Antenna
Antenna gain:	Band 2: 0.22dBi, Band 4: 0.24dBi, Band 5: -0.21dBi, Band 7: 0.19dBi, Band 12: -0.36dBi, Band 17: -0.36dBi
Power Supply:	DC 3.87V/10600mAh from battery or DC 5V from Adapter.
Adapter:	Model: HJ-FC017K7-US Input: 100-240V~50/60Hz 0.6A Output: 5.0V $\overline{\text{---}}$ 2.0A OR 7.0V $\overline{\text{---}}$ 2.0A OR 9.0V $\overline{\text{---}}$ 2.0A OR 12.0V $\overline{\text{---}}$ 1.5A 18.0W
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.87V) (Note 1)
HW Version	LV978_MB_V1.0
SW Version	OUKITEL_WP16_EEA_V01

** Note1: The High Voltage 4.2V 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: 2ANMU-WP16** 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 C63.46:2015.

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 C63.46:2015& 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 = 2Uc(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.

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.

1.6 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(c), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	

2.1051 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
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Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. No modifications are made to the EUT during all test items.

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

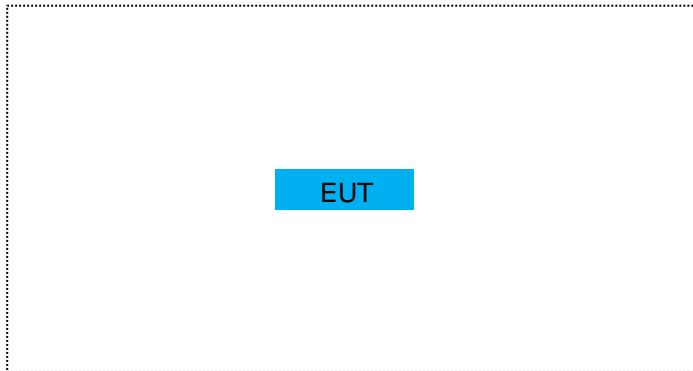
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	WP16	FCC ID: 2ANMU-WP16	EUT

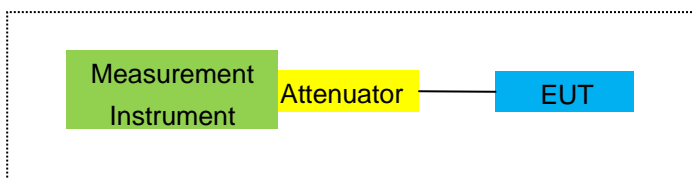
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

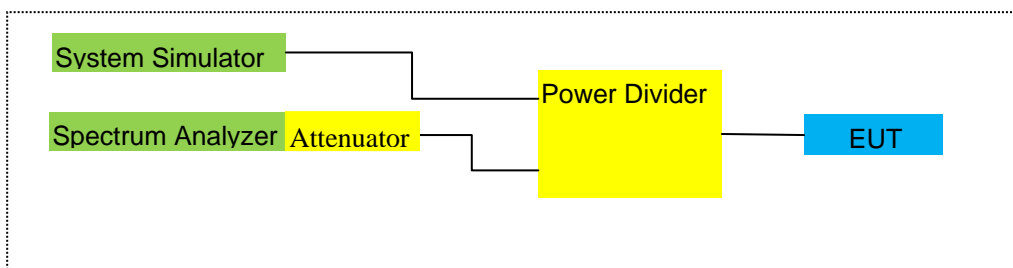
For Radiated Test Cases



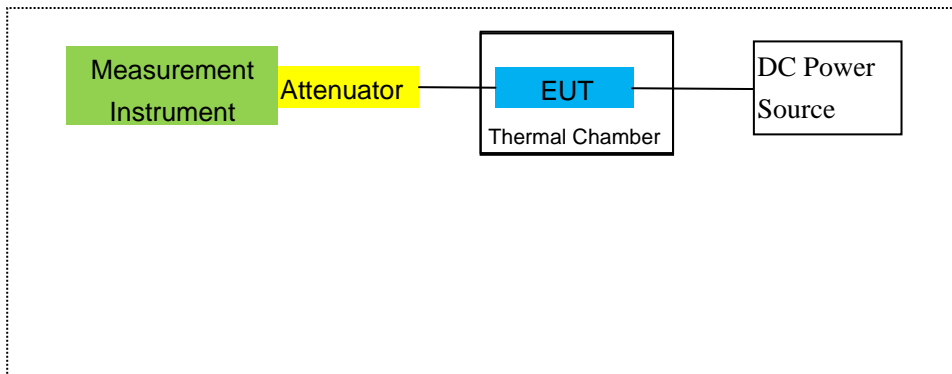
For Conducted Output Power



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



For Frequency Stability



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

3. TEST AND MEASUREMENT EQUIPMENT

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2021.07.01	2022.06.30	1 year
2	Test Receiver	R&S	ESPI	101318	2021.04.27	2022.04.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.11.20	2021.11.19	1 year
7	Amplifier	EM	EM-30180	060538	2021.07.01	2022.06.30	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2021.04.27	2022.04.26	1 year
9	Power Meter	R&S	NRVS	100696	2021.07.01	2022.06.30	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2021.04.27	2022.04.26	1 year
11	Test Cable	N/A	R-01	N/A	2019.08.06	2022.08.05	3 year
12	Test Cable	N/A	R-02	N/A	2019.08.06	2022.08.05	3 year
13	Test Cable	N/A	R-03	N/A	2019.06.28	2022.06.27	3 year
14	Test Receiver	R&S	ESCI	101160	2021.04.27	2022.04.26	1 year
15	LISN	R&S	ENV216	101313	2021.04.27	2022.04.26	1 year
16	LISN	EMCO	3816/2	00042990	2021.04.27	2022.04.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2021.04.27	2022.04.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2021.04.27	2022.04.26	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2021.07.01	2022.06.30	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2021.04.27	2022.04.26	1 year
24	test receiver	R&S	ESCI	a0304218	2021.04.27	2022.04.26	1 year
25	Communication Tester	R&S	CMU200	A0304247	2021.07.01	2022.06.30	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2021.04.27	2022.04.26	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.05.11	2023.05.10	3 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	1 year
29	Communication Tester	R&S	CMW500	148500	2021.07.01	2022.06.30	1 year
30	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.01	2022.06.30	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
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 Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §2.1046, §22.913, §24.232

LIMITS

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

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

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

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

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

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

Set display line

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

MODES TESTED

- LTE Band 2/4/5/7/12/17

RESULTS

Test data reference attachment.

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

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

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

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

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

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

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- LTE Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

22.913(a) (2)- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232 (c) Mobile and portable stations are limited to 2 watts EIRP.
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
27.50 (h)(2) Mobile and other user stations in the 2500–2570 MHz and 2620–2690 MHz bands. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

- LTE Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	1/#Mid	1850.7	-1.40	3.76	28.24	23.08	203.236	Horizontal	Pass	
		1880	-1.21	3.91	28.22	23.10	204.174	Horizontal	Pass	
		1909.3	-1.12	3.93	28.20	23.15	206.538	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-1.46	3.77	28.23	23.00	199.526	Horizontal	Pass	
		1880	-1.31	3.91	28.24	23.02	200.447	Horizontal	Pass	
		1908.5	-1.18	3.94	28.25	23.13	205.589	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-1.35	3.77	28.31	23.19	208.449	Horizontal	Pass	
		1880	-0.97	3.91	28.22	23.34	215.774	Horizontal	Pass	
		1907.5	-0.90	3.94	28.20	23.36	216.770	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-1.21	3.79	28.33	23.33	215.278	Horizontal	Pass	
		1880	-0.91	3.95	28.22	23.36	216.770	Horizontal	Pass	
		1905	-0.80	3.97	28.19	23.42	219.786	Horizontal	Pass	
15.0MHz Band QPSK	1/#Mid	1857.5	-1.17	3.79	28.34	23.38	217.771	Horizontal	Pass	
		1880	-0.96	3.95	28.22	23.31	214.289	Horizontal	Pass	
		1902.5	-0.82	3.97	28.18	23.39	218.273	Horizontal	Pass	
20.0MHz Band QPSK	1/#Mid	1860	-1.16	3.81	28.35	23.38	217.771	Horizontal	Pass	
		1880	-0.83	3.96	28.22	23.43	220.293	Horizontal	Pass	
		1900	-0.77	4.00	28.16	23.39	218.273	Horizontal	Pass	
1.4MHz Band QPSK	1/#Mid	1850.7	-1.97	3.76	28.24	22.51	178.238	Vertical	Pass	
		1880	-2.46	3.91	28.22	21.85	153.109	Vertical	Pass	
		1909.3	-2.33	3.93	28.20	21.94	156.315	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	1851.5	-2.36	3.77	28.23	22.10	162.181	Vertical	Pass	
		1880	-1.71	3.91	28.24	22.62	182.810	Vertical	Pass	
		1908.5	-2.17	3.94	28.25	22.14	163.682	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	1852.5	-1.86	3.77	28.31	22.68	185.353	Vertical	Pass	
		1880	-2.01	3.91	28.22	22.30	169.824	Vertical	Pass	
		1907.5	-2.21	3.94	28.20	22.05	160.325	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	1855	-2.14	3.79	28.33	22.40	173.780	Vertical	Pass	
		1880	-2.24	3.95	28.22	22.03	159.588	Vertical	Pass	
		1905	-1.63	3.97	28.19	22.59	181.552	Vertical	Pass	
15.0MHz	1/#Mid	1857.5	-2.05	3.79	28.34	22.50	177.828	Vertical	Pass	

Band		1880	-1.95	3.95	28.22	22.32	170.608	Vertical	Pass
QPSK		1902.5	-1.66	3.97	28.18	22.55	179.887	Vertical	Pass
20.0MHz	1/#Mid	1860	-2.06	3.81	28.35	22.48	177.011	Vertical	Pass
Band		1880	-1.51	3.96	28.22	22.75	188.365	Vertical	Pass
QPSK		1900	-1.40	4.00	28.16	22.76	188.799	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-2.52	3.76	28.24	21.96	157.036	Horizontal	Pass
		1880	-1.99	3.91	28.22	22.32	170.608	Horizontal	Pass
		1909.3	-1.92	3.93	28.20	22.35	171.791	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-2.02	3.77	28.23	22.44	175.388	Horizontal	Pass
		1880	-2.10	3.91	28.24	22.23	167.109	Horizontal	Pass
		1908.5	-2.31	3.94	28.25	22.00	158.489	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-1.96	3.77	28.31	22.58	181.134	Horizontal	Pass
		1880	-1.87	3.91	28.22	22.44	175.388	Horizontal	Pass
		1907.5	-1.55	3.94	28.20	22.71	186.638	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-2.01	3.79	28.33	22.53	179.061	Horizontal	Pass
		1880	-2.00	3.95	28.22	22.27	168.655	Horizontal	Pass
		1905	-1.47	3.97	28.19	22.75	188.365	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.99	3.79	28.34	22.56	180.302	Horizontal	Pass
		1880	-1.78	3.95	28.22	22.49	177.419	Horizontal	Pass
		1902.5	-1.74	3.97	28.18	22.47	176.604	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-1.88	3.81	28.35	22.66	184.502	Horizontal	Pass
		1880	-1.58	3.96	28.22	22.68	185.353	Horizontal	Pass
		1900	-1.40	4.00	28.16	22.76	188.799	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-3.13	3.76	28.24	21.35	136.458	Vertical	Pass
		1880	-2.97	3.91	28.22	21.34	136.144	Vertical	Pass
		1909.3	-2.88	3.93	28.20	21.39	137.721	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.39	3.77	28.23	21.07	127.938	Vertical	Pass
		1880	-2.97	3.91	28.24	21.36	136.773	Vertical	Pass
		1908.5	-2.96	3.94	28.25	21.35	136.458	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.27	3.77	28.31	21.27	133.968	Vertical	Pass
		1880	-2.74	3.91	28.22	21.57	143.549	Vertical	Pass
		1907.5	-2.64	3.94	28.20	21.62	145.211	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-3.72	3.79	28.33	20.82	120.781	Vertical	Pass
		1880	-3.04	3.95	28.22	21.23	132.739	Vertical	Pass
		1905	-2.51	3.97	28.19	21.71	148.252	Vertical	Pass
15.0MHz Band 16	1/#Mid	1857.5	-2.93	3.79	28.34	21.62	145.211	Vertical	Pass
		1880	-3.41	3.95	28.22	20.86	121.899	Vertical	Pass

QAM		1902.5	-2.89	3.97	28.18	21.32	135.519	Vertical	Pass
20.0MHz		1860	-3.62	3.81	28.35	20.92	123.595	Vertical	Pass
Band 16	1/#Mid	1880	-2.90	3.96	28.22	21.36	136.773	Vertical	Pass
QAM		1900	-3.33	4.00	28.16	20.83	121.060	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP		
			(dBm)	(dBm)	(dB)	Average	Average		
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-1.31	3.12	27.58	23.15	206.538	Horizontal	Pass
		1732.5	-1.30	3.27	27.61	23.04	201.372	Horizontal	Pass
		1754.3	-1.28	3.29	27.63	23.06	202.302	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-1.48	3.13	27.61	23.00	199.526	Horizontal	Pass
		1732.5	-1.40	3.27	27.61	22.94	196.789	Horizontal	Pass
		1753.5	-1.32	3.30	27.62	23.00	199.526	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-1.25	3.13	27.63	23.25	211.349	Horizontal	Pass
		1732.5	-1.15	3.27	27.61	23.19	208.449	Horizontal	Pass
		1752.5	-1.03	3.30	27.60	23.27	212.324	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-1.19	3.15	27.64	23.30	213.796	Horizontal	Pass
		1732.5	-0.96	3.31	27.61	23.34	215.774	Horizontal	Pass
		1750	-0.98	3.33	27.59	23.28	212.814	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-1.20	3.15	27.65	23.30	213.796	Horizontal	Pass
		1732.5	-1.04	3.31	27.61	23.26	211.836	Horizontal	Pass
		1747.5	-0.98	3.33	27.57	23.26	211.836	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-1.14	3.17	27.66	23.35	216.272	Horizontal	Pass
		1732.5	-0.97	3.32	27.61	23.32	214.783	Horizontal	Pass
		1745	-0.91	3.36	27.56	23.29	213.304	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-1.77	3.12	27.58	22.69	185.780	Vertical	Pass
		1732.5	-1.77	3.27	27.61	22.57	180.717	Vertical	Pass
		1754.3	-1.82	3.29	27.63	22.52	178.649	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.48	3.13	27.61	22.00	158.489	Vertical	Pass
		1732.5	-2.19	3.27	27.61	22.15	164.059	Vertical	Pass
		1753.5	-1.65	3.30	27.62	22.67	184.927	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.61	3.13	27.63	21.89	154.525	Vertical	Pass
		1732.5	-2.24	3.27	27.61	22.10	162.181	Vertical	Pass
		1752.5	-1.79	3.30	27.60	22.51	178.238	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.28	3.15	27.64	22.21	166.341	Vertical	Pass
		1732.5	-2.12	3.31	27.61	22.18	165.196	Vertical	Pass
		1750	-2.16	3.33	27.59	22.10	162.181	Vertical	Pass

15.0MHz		1717.5	-2.23	3.15	27.65	22.27	168.655	Vertical	Pass
Band	1/#Mid	1732.5	-2.41	3.31	27.61	21.89	154.525	Vertical	Pass
QPSK		1747.5	-2.06	3.33	27.57	22.18	165.196	Vertical	Pass
20.0MHz		1720	-2.33	3.17	27.66	22.16	164.437	Vertical	Pass
Band	1/#Mid	1732.5	-1.97	3.32	27.61	22.32	170.608	Vertical	Pass
QPSK		1745	-1.65	3.36	27.56	22.55	179.887	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	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	-2.12	3.12	27.58	22.34	171.396	Horizontal	Pass
		1732.5	-1.97	3.27	27.61	22.37	172.584	Horizontal	Pass
		1754.3	-1.97	3.29	27.63	22.37	172.584	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.06	3.13	27.61	22.42	174.582	Horizontal	Pass
		1732.5	-2.19	3.27	27.61	22.15	164.059	Horizontal	Pass
		1753.5	-2.41	3.30	27.62	21.91	155.239	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-1.89	3.13	27.63	22.61	182.390	Horizontal	Pass
		1732.5	-1.85	3.27	27.61	22.49	177.419	Horizontal	Pass
		1752.5	-1.54	3.30	27.60	22.76	188.799	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.96	3.15	27.64	22.53	179.061	Horizontal	Pass
		1732.5	-2.15	3.31	27.61	22.15	164.059	Horizontal	Pass
		1750	-1.53	3.33	27.59	22.73	187.499	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.76	3.15	27.65	22.74	187.932	Horizontal	Pass
		1732.5	-1.82	3.31	27.61	22.48	177.011	Horizontal	Pass
		1747.5	-1.84	3.33	27.57	22.40	173.780	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-1.71	3.17	27.66	22.78	189.671	Horizontal	Pass
		1732.5	-1.72	3.32	27.61	22.57	180.717	Horizontal	Pass
		1745	-1.53	3.36	27.56	22.67	184.927	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-3.26	3.12	27.58	21.20	131.826	Vertical	Pass
		1732.5	-3.29	3.27	27.61	21.05	127.350	Vertical	Pass
		1754.3	-2.69	3.29	27.63	21.65	146.218	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-3.08	3.13	27.61	21.40	138.038	Vertical	Pass
		1732.5	-3.43	3.27	27.61	20.91	123.310	Vertical	Pass
		1753.5	-3.34	3.30	27.62	20.98	125.314	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.53	3.13	27.63	20.97	125.026	Vertical	Pass
		1732.5	-3.34	3.27	27.61	21.00	125.893	Vertical	Pass
		1752.5	-3.32	3.30	27.60	20.98	125.314	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-3.38	3.15	27.64	21.11	129.122	Vertical	Pass
		1732.5	-3.50	3.31	27.61	20.80	120.226	Vertical	Pass
		1750	-2.91	3.33	27.59	21.35	136.458	Vertical	Pass
15.0MHz Band 16	1/#Mid	1717.5	-3.32	3.15	27.65	21.18	131.220	Vertical	Pass
		1732.5	-3.00	3.31	27.61	21.30	134.896	Vertical	Pass

QAM		1747.5	-3.02	3.33	27.57	21.22	132.434	Vertical	Pass
20.0MHz		1720	-2.81	3.17	27.66	21.68	147.231	Vertical	Pass
Band 16	1/#Mid	1732.5	-3.48	3.32	27.61	20.81	120.504	Vertical	Pass
QAM		1745	-2.43	3.36	27.56	21.77	150.314	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
							(dBm)	(mW)		
1.4MHz Band QPSK	3/#Mid	824.7	7.99	2.01	19.68	2.15	23.51	224.388	Horizontal	Pass
		836.5	7.87	2.01	19.77	2.15	23.48	222.844	Horizontal	Pass
		848.3	7.67	2.02	19.82	2.15	23.32	214.783	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.76	2.01	19.70	2.15	23.30	213.796	Horizontal	Pass
		836.5	7.66	2.01	19.77	2.15	23.27	212.324	Horizontal	Pass
		847.5	7.53	2.02	19.81	2.15	23.17	207.491	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.04	2.01	19.71	2.15	23.59	228.560	Horizontal	Pass
		836.5	7.92	2.01	19.77	2.15	23.53	225.424	Horizontal	Pass
		846.5	7.76	2.02	19.79	2.15	23.38	217.771	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	8.06	2.01	19.73	2.15	23.63	230.675	Horizontal	Pass
		836.5	8.01	2.01	19.77	2.15	23.62	230.144	Horizontal	Pass
		844	7.91	2.02	19.78	2.15	23.52	224.905	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	6.33	2.01	19.68	2.15	21.85	153.109	Vertical	Pass
		836.5	6.20	2.01	19.77	2.15	21.81	151.705	Vertical	Pass
		848.3	6.51	2.02	19.82	2.15	22.16	164.437	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	6.44	2.01	19.70	2.15	21.98	157.761	Vertical	Pass
		836.5	6.20	2.01	19.77	2.15	21.81	151.705	Vertical	Pass
		847.5	6.97	2.02	19.81	2.15	22.61	182.390	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.38	2.01	19.71	2.15	21.93	155.955	Vertical	Pass
		836.5	6.84	2.01	19.77	2.15	22.45	175.792	Vertical	Pass
		846.5	6.72	2.02	19.79	2.15	22.34	171.396	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	6.85	2.01	19.73	2.15	22.42	174.582	Vertical	Pass
		836.5	7.17	2.01	19.77	2.15	22.78	189.671	Vertical	Pass
		844	6.22	2.02	19.78	2.15	21.83	152.405	Vertical	Pass

Radiated Power (ERP) for Band 5

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP			
			(dBm)				Average	Average			
							(dBm)	(mW)			
1.4MHz	3/#Mid	824.7	7.14	2.01	19.68	2.15	22.66	184.502	Horizontal	Pass	
Band 16		836.5	7.07	2.01	19.77	2.15	22.68	185.353	Horizontal	Pass	
QAM		848.3	6.91	2.02	19.82	2.15	22.56	180.302	Horizontal	Pass	
3.0MHz	1/#Mid	825.5	7.22	2.01	19.70	2.15	22.76	188.799	Horizontal	Pass	
Band 16		836.5	6.93	2.01	19.77	2.15	22.54	179.473	Horizontal	Pass	
QAM		847.5	6.41	2.02	19.81	2.15	22.05	160.325	Horizontal	Pass	
5.0MHz	1/#Mid	826.5	7.54	2.01	19.71	2.15	23.09	203.704	Horizontal	Pass	
Band 16		836.5	7.31	2.01	19.77	2.15	22.92	195.884	Horizontal	Pass	
QAM		846.5	7.06	2.02	19.79	2.15	22.68	185.353	Horizontal	Pass	
10.0MHz	1/#Mid	829	7.54	2.01	19.73	2.15	23.11	204.644	Horizontal	Pass	
Band 16		836.5	7.26	2.01	19.77	2.15	22.87	193.642	Horizontal	Pass	
QAM		844	6.80	2.02	19.78	2.15	22.41	174.181	Horizontal	Pass	
1.4MHz	1/#Mid	824.7	6.99	2.01	19.68	2.15	22.51	178.238	Vertical	Pass	
Band 16		836.5	6.92	2.01	19.77	2.15	22.53	179.061	Vertical	Pass	
QAM		848.3	6.61	2.02	19.82	2.15	22.26	168.267	Vertical	Pass	
3.0MHz	1/#Mid	825.5	5.38	2.01	19.70	2.15	20.92	123.595	Vertical	Pass	
Band 16		836.5	6.84	2.01	19.77	2.15	22.45	175.792	Vertical	Pass	
QAM		847.5	5.55	2.02	19.81	2.15	21.19	131.522	Vertical	Pass	
5.0MHz	1/#Mid	826.5	6.40	2.01	19.71	2.15	21.95	156.675	Vertical	Pass	
Band 16		836.5	5.57	2.01	19.77	2.15	21.18	131.220	Vertical	Pass	
QAM		846.5	5.59	2.02	19.79	2.15	21.21	132.130	Vertical	Pass	
10.0MHz	1/#Mid	829	5.36	2.01	19.73	2.15	20.93	123.880	Vertical	Pass	
Band 16		836.5	5.78	2.01	19.77	2.15	21.39	137.721	Vertical	Pass	
QAM		844	6.11	2.02	19.78	2.15	21.72	148.594	Vertical	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization Of	
			(dBm)	(dBm)	(dB)	Average	Average	Max. ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	1#Mid	2502.5	0.41	4.54	27.75	23.62	230.144	Horizontal	Pass
		2535	0.58	4.69	27.72	23.61	229.615	Horizontal	Pass
		2567.5	0.65	4.71	27.71	23.65	231.739	Horizontal	Pass
10.0MHz Band QPSK	1#Mid	2505	0.48	4.55	27.76	23.69	233.884	Horizontal	Pass
		2535	0.67	4.69	27.72	23.70	234.423	Horizontal	Pass
		2565	0.75	4.72	27.70	23.73	236.048	Horizontal	Pass
15.0MHz Band QPSK	1#Mid	2507.5	0.47	4.55	27.77	23.69	233.884	Horizontal	Pass
		2535	0.61	4.69	27.72	23.64	231.206	Horizontal	Pass
		2562.5	0.71	4.72	27.69	23.68	233.346	Horizontal	Pass
20.0MHz Band QPSK	1#Mid	2510	0.53	4.57	27.78	23.74	236.592	Horizontal	Pass
		2535	0.71	4.73	27.72	23.70	234.423	Horizontal	Pass
		2560	0.75	4.75	27.68	23.68	233.346	Horizontal	Pass
5.0MHz Band QPSK	1#Mid	2502.5	-1.23	4.54	27.75	21.98	157.761	Vertical	Pass
		2535	-0.88	4.69	27.72	22.15	164.059	Vertical	Pass
		2567.5	-0.97	4.71	27.71	22.03	159.588	Vertical	Pass
10.0MHz Band QPSK	1#Mid	2505	-0.45	4.55	27.76	22.76	188.799	Vertical	Pass
		2535	-0.88	4.69	27.72	22.15	164.059	Vertical	Pass
		2565	-0.51	4.72	27.70	22.47	176.604	Vertical	Pass
15.0MHz Band QPSK	1#Mid	2507.5	-1.35	4.55	27.77	21.87	153.815	Vertical	Pass
		2535	-1.15	4.69	27.72	21.88	154.170	Vertical	Pass
		2562.5	-1.03	4.72	27.69	21.94	156.315	Vertical	Pass
20.0MHz Band QPSK	1#Mid	2510	-0.82	4.57	27.78	22.39	173.380	Vertical	Pass
		2535	-0.50	4.73	27.72	22.49	177.419	Vertical	Pass
		2560	-0.66	4.75	27.68	22.27	168.655	Vertical	Pass

Radiated Power (EIRP) for Band 7									
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)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.28	4.54	27.75	22.93	196.336	Horizontal	Pass
		2535	0.03	4.69	27.72	23.06	202.302	Horizontal	Pass
		2567.5	-0.05	4.71	27.71	22.95	197.242	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.17	4.55	27.76	23.04	201.372	Horizontal	Pass
		2535	-0.18	4.69	27.72	22.85	192.752	Horizontal	Pass
		2565	-0.45	4.72	27.70	22.53	179.061	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.35	4.55	27.77	22.87	193.642	Horizontal	Pass
		2535	-0.32	4.69	27.72	22.71	186.638	Horizontal	Pass
		2562.5	0.07	4.72	27.69	23.04	201.372	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.23	4.57	27.78	22.98	198.609	Horizontal	Pass
		2535	0.10	4.73	27.72	23.09	203.704	Horizontal	Pass
		2560	0.00	4.75	27.68	22.93	196.336	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.31	4.54	27.75	21.90	154.882	Vertical	Pass
		2535	-0.25	4.69	27.72	22.78	189.671	Vertical	Pass
		2567.5	-2.03	4.71	27.71	20.97	125.026	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.75	4.55	27.76	22.46	176.198	Vertical	Pass
		2535	-0.71	4.69	27.72	22.32	170.608	Vertical	Pass
		2565	-1.95	4.72	27.70	21.03	126.765	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.95	4.55	27.77	21.27	133.968	Vertical	Pass
		2535	-0.56	4.69	27.72	22.47	176.604	Vertical	Pass
		2562.5	-1.49	4.72	27.69	21.48	140.605	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.70	4.57	27.78	22.51	178.238	Vertical	Pass
		2535	-1.81	4.73	27.72	21.18	131.220	Vertical	Pass
		2560	-2.11	4.75	27.68	20.82	120.781	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)			
1.4MHz Band QPSK	1/#Mid	699.7	8.36	1.91	19.21	2.15	23.51	224.388	Vertical	Pass	
		707.5	8.28	1.91	19.26	2.15	23.48	222.844	Vertical	Pass	
		715.3	8.06	1.93	19.34	2.15	23.32	214.783	Vertical	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	8.15	1.91	19.21	2.15	23.30	213.796	Vertical	Pass	
		707.5	8.07	1.91	19.26	2.15	23.27	212.324	Vertical	Pass	
		714.5	7.91	1.93	19.34	2.15	23.17	207.491	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	8.42	1.91	19.23	2.15	23.59	228.560	Vertical	Pass	
		707.5	8.33	1.91	19.26	2.15	23.53	225.424	Vertical	Pass	
		713.5	8.12	1.92	19.33	2.15	23.38	217.771	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	704	8.44	1.91	19.25	2.15	23.63	230.675	Vertical	Pass	
		707.5	8.42	1.91	19.26	2.15	23.62	230.144	Vertical	Pass	
		711	8.27	1.92	19.32	2.15	23.52	224.905	Vertical	Pass	
1.4MHz Band QPSK	1/#Mid	699.7	7.22	1.91	19.21	2.15	22.37	172.584	Horizontal	Pass	
		707.5	6.91	1.91	19.26	2.15	22.11	162.555	Horizontal	Pass	
		715.3	7.03	1.93	19.34	2.15	22.29	169.434	Horizontal	Pass	
3.0MHz Band QPSK	1/#Mid	700.5	7.43	1.91	19.21	2.15	22.58	181.134	Horizontal	Pass	
		707.5	7.27	1.91	19.26	2.15	22.47	176.604	Horizontal	Pass	
		714.5	7.54	1.93	19.34	2.15	22.80	190.546	Horizontal	Pass	
5.0MHz Band QPSK	1/#Mid	701.5	6.76	1.91	19.23	2.15	21.93	155.955	Horizontal	Pass	
		707.5	6.87	1.91	19.26	2.15	22.07	161.065	Horizontal	Pass	
		713.5	6.80	1.92	19.33	2.15	22.06	160.694	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	704	7.46	1.91	19.25	2.15	22.65	184.077	Horizontal	Pass	
		707.5	7.46	1.91	19.26	2.15	22.66	184.502	Horizontal	Pass	
		711	6.64	1.92	19.32	2.15	21.89	154.525	Horizontal	Pass	

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
				(dBm)	(mW)					
1.4MHz Band 16 QAM	1/#Mid	699.7	8.06	1.91	19.21	2.15	23.21	209.411	Vertical	Pass
		707.5	7.98	1.91	19.26	2.15	23.18	207.970	Vertical	Pass
		715.3	7.76	1.93	19.34	2.15	23.02	200.447	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	7.85	1.91	19.21	2.15	23.00	199.526	Vertical	Pass
		707.5	7.77	1.91	19.26	2.15	22.97	198.153	Vertical	Pass
		714.5	7.61	1.93	19.34	2.15	22.87	193.642	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	8.12	1.91	19.23	2.15	23.29	213.304	Vertical	Pass
		707.5	8.03	1.91	19.26	2.15	23.23	210.378	Vertical	Pass
		713.5	7.82	1.92	19.33	2.15	23.08	203.236	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	8.14	1.91	19.25	2.15	23.33	215.278	Vertical	Pass
		707.5	8.12	1.91	19.26	2.15	23.32	214.783	Vertical	Pass
		711	7.97	1.92	19.32	2.15	23.22	209.894	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	6.84	1.91	19.21	2.15	21.99	158.125	Horizontal	Pass
		707.5	6.72	1.91	19.26	2.15	21.92	155.597	Horizontal	Pass
		715.3	6.53	1.93	19.34	2.15	21.79	151.008	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	7.10	1.91	19.21	2.15	22.25	167.880	Horizontal	Pass
		707.5	6.60	1.91	19.26	2.15	21.80	151.356	Horizontal	Pass
		714.5	7.07	1.93	19.34	2.15	22.33	171.002	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	6.35	1.91	19.23	2.15	21.52	141.906	Horizontal	Pass
		707.5	6.51	1.91	19.26	2.15	21.71	148.252	Horizontal	Pass
		713.5	6.52	1.92	19.33	2.15	21.78	150.661	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	6.98	1.91	19.25	2.15	22.17	164.816	Horizontal	Pass
		707.5	7.07	1.91	19.26	2.15	22.27	168.655	Horizontal	Pass
		711	6.77	1.92	19.32	2.15	22.02	159.221	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

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

8.6 LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP			
			(dBm)	(dBm)	(dB)		Average	Average			
							(dBm)	(mW)			
5.0MHz Band QPSK	1/#Mid	706.5	8.52	1.91	19.23	2.15	23.69	233.884	Vertical	Pass	
		710	8.38	1.91	19.26	2.15	23.58	228.034	Vertical	Pass	
		713.5	8.28	1.92	19.33	2.15	23.54	225.944	Vertical	Pass	
10.0MHz Band QPSK	1/#Mid	709	8.53	1.91	19.25	2.15	23.72	235.505	Vertical	Pass	
		710	8.48	1.91	19.26	2.15	23.68	233.346	Vertical	Pass	
		711	8.44	1.92	19.32	2.15	23.69	233.884	Vertical	Pass	
5.0MHz Band QPSK	1/#Mid	706.5	6.41	1.91	19.23	2.15	21.58	143.880	Horizontal	Pass	
		710	7.16	1.91	19.26	2.15	22.36	172.187	Horizontal	Pass	
		713.5	7.15	1.92	19.33	2.15	22.41	174.181	Horizontal	Pass	
10.0MHz Band QPSK	1/#Mid	709	7.05	1.91	19.25	2.15	22.24	167.494	Horizontal	Pass	
		710	6.68	1.91	19.26	2.15	21.88	154.170	Horizontal	Pass	
		711	7.37	1.92	19.32	2.15	22.62	182.810	Horizontal	Pass	

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level	Cable Loss (dBm)	Antenna Gain (dB)	Correction	Max. EIRP	Max. EIRP			
			(dBm)				Average	Average			
				(dB)	(dBm)	(mW)					
5.0MHz Band 16 QAM	1/#Mid	706.5	7.87	1.91	19.23	2.15	23.04	201.372	Vertical	Pass	
		710	7.78	1.91	19.26	2.15	22.98	198.609	Vertical	Pass	
		713.5	7.58	1.92	19.33	2.15	22.84	192.309	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	709	7.41	1.91	19.25	2.15	22.60	181.970	Vertical	Pass	
		710	7.94	1.91	19.26	2.15	23.14	206.063	Vertical	Pass	
		711	7.67	1.92	19.32	2.15	22.92	195.884	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	706.5	6.84	1.91	19.23	2.15	22.01	158.855	Horizontal	Pass	
		710	7.08	1.91	19.26	2.15	22.28	169.044	Horizontal	Pass	
		713.5	6.61	1.92	19.33	2.15	21.87	153.815	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	709	6.54	1.91	19.25	2.15	21.73	148.936	Horizontal	Pass	
		710	6.99	1.91	19.26	2.15	22.19	165.577	Horizontal	Pass	
		711	6.42	1.92	19.32	2.15	21.67	146.893	Horizontal	Pass	

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

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

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

TEST PROCEDURE

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

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \text{ Log}_{10} (p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \text{ Log}_{10} (p)$, dB at the channel edges and $55 + 10 \text{ Log}_{10} (p)$ 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 Band2
LTE Band 4
- LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17

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	-44.47	4.04	33.51	-15.00	-13	-2.00	Horizontal
3701.4	-47.15	4.04	33.51	-17.68	-13	-4.68	Vertical
5552.1	-49.90	5.24	35.84	-19.30	-13	-6.30	Vertical
5552.1	-51.81	5.24	35.84	-21.21	-13	-8.21	Horizontal
202.3	-38.35	1.43	16.02	-23.76	-13	-10.76	Vertical
304.7	-37.17	1.30	17.99	-20.48	-13	-7.48	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-45.74	4.04	33.56	-16.22	-13	-3.22	Horizontal
3760.0	-52.74	4.04	33.56	-23.22	-13	-10.22	Vertical
5640.0	-47.88	5.24	35.91	-17.21	-13	-4.21	Vertical
5640.0	-53.42	5.24	35.91	-22.75	-13	-9.75	Horizontal
203.2	-38.27	1.62	16.97	-22.92	-13	-9.92	Vertical
250.2	-36.20	1.74	15.98	-21.97	-13	-8.97	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-51.08	4.04	34.00	-21.12	-13	-8.12	Horizontal
3818.6	-52.94	4.04	34.00	-22.98	-13	-9.98	Vertical
5727.9	-51.94	5.24	36.04	-21.14	-13	-8.14	Vertical
5727.9	-51.15	5.24	36.04	-20.35	-13	-7.35	Horizontal
179.3	-34.26	1.42	17.29	-18.39	-13	-5.39	Vertical
392.9	-37.70	1.50	17.90	-21.29	-13	-8.29	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
3720.0	-51.39	4.07	33.54	-21.92	-13	-8.92	Horizontal
3720.0	-52.33	4.07	33.54	-22.86	-13	-9.86	Vertical
5580.0	-53.41	5.28	35.86	-22.83	-13	-9.83	Vertical
5580.0	-50.11	5.28	35.86	-19.53	-13	-6.53	Horizontal
191.9	-36.59	1.58	16.89	-21.27	-13	-8.27	Vertical
325.0	-37.89	1.76	17.26	-22.39	-13	-9.39	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.13	4.04	33.56	-17.61	-13	-4.61	Horizontal
3760.0	-47.90	4.04	33.56	-18.38	-13	-5.38	Vertical
5640.0	-46.91	5.24	35.91	-16.24	-13	-3.24	Vertical
5640.0	-52.97	5.24	35.91	-22.30	-13	-9.30	Horizontal
189.8	-35.90	1.46	16.27	-21.09	-13	-8.09	Vertical
349.0	-35.13	1.59	15.15	-21.57	-13	-8.57	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-46.14	4.04	34.00	-16.18	-13	-3.18	Horizontal
3800.0	-47.71	4.04	34.00	-17.75	-13	-4.75	Vertical
5700.0	-44.63	5.24	36.04	-13.83	-13	-0.83	Vertical
5700.0	-53.62	5.24	36.04	-22.82	-13	-9.82	Horizontal
204.6	-40.39	1.36	17.39	-24.35	-13	-11.35	Vertical
352.6	-34.83	1.66	15.39	-21.10	-13	-8.10	Horizontal

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-48.93	4.02	29.80	-23.15	-13	-10.15	Horizontal
3421.4	-53.63	4.02	29.80	-27.85	-13	-14.85	Vertical
5132.1	-47.44	5.24	35.84	-16.84	-13	-3.84	Vertical
5132.1	-50.16	5.24	35.84	-19.56	-13	-6.56	Horizontal
192.7	-39.79	1.68	16.04	-25.43	-13	-12.43	Vertical
413.1	-42.82	1.78	17.74	-26.86	-13	-13.86	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-50.32	4.03	30.00	-24.35	-13	-11.35	Horizontal
3465.0	-45.13	4.03	30.00	-19.16	-13	-6.16	Vertical
5197.5	-44.99	5.25	35.86	-14.38	-13	-1.38	Vertical
5197.5	-49.47	5.25	35.86	-18.86	-13	-5.86	Horizontal
175.4	-41.82	1.72	17.69	-25.85	-13	-12.85	Vertical
238.6	-37.70	1.62	16.02	-23.29	-13	-10.29	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-46.34	4.05	30.01	-20.38	-13	-7.38	Horizontal
3508.6	-49.84	4.05	30.01	-23.88	-13	-10.88	Vertical
5262.9	-48.48	5.26	35.86	-17.88	-13	-4.88	Vertical
5262.9	-50.27	5.26	35.86	-19.67	-13	-6.67	Horizontal
177.0	-38.79	1.80	16.69	-23.90	-13	-10.90	Vertical
365.7	-35.86	1.75	16.66	-20.96	-13	-7.96	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	-49.87	4.02	29.80	-24.09	-13	-11.09	Horizontal
3440.0	-47.71	4.02	29.80	-21.93	-13	-8.93	Vertical
5160.0	-47.99	5.24	35.84	-17.39	-13	-4.39	Vertical
5160.0	-53.29	5.24	35.84	-22.69	-13	-9.69	Horizontal
202.9	-36.39	1.57	17.26	-20.70	-13	-7.70	Vertical
260.3	-34.54	1.78	16.35	-19.97	-13	-6.97	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-53.11	4.03	30.00	-27.14	-13	-14.14	Horizontal
3465.0	-45.14	4.03	30.00	-19.17	-13	-6.17	Vertical
5197.5	-44.51	5.25	35.86	-13.90	-13	-0.90	Vertical
5197.5	-50.97	5.25	35.86	-20.36	-13	-7.36	Horizontal
199.5	-38.98	1.44	17.95	-22.47	-13	-9.47	Vertical
295.2	-37.68	1.65	16.09	-23.24	-13	-10.24	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-49.41	2.91	27.68	-24.64	-13	-11.64	Horizontal
3490.0	-51.82	2.91	27.68	-27.05	-13	-14.05	Vertical
5235.0	-50.22	5.26	35.86	-19.62	-13	-6.62	Vertical
5235.0	-50.76	5.26	35.86	-20.16	-13	-7.16	Horizontal
184.9	-39.12	1.61	16.85	-23.88	-13	-10.88	Vertical
391.8	-37.77	1.61	15.19	-24.19	-13	-11.19	Horizontal

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-47.16	2.78	27.50	-22.44	-13	-9.44	Horizontal
1649.4	-52.45	2.78	27.50	-27.73	-13	-14.73	Vertical
2474.1	-48.57	2.90	27.80	-23.67	-13	-10.67	Vertical
2474.1	-49.71	2.90	27.80	-24.81	-13	-11.81	Horizontal
192.4	-40.19	1.76	17.59	-24.36	-13	-11.36	Vertical
339.5	-37.26	1.63	15.87	-23.02	-13	-10.02	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-50.68	2.80	27.48	-26.00	-13	-13.00	Horizontal
1673.0	-51.66	2.80	27.48	-26.98	-13	-13.98	Vertical
2509.5	-51.68	2.91	27.70	-26.89	-13	-13.89	Vertical
2509.5	-49.40	2.91	27.70	-24.61	-13	-11.61	Horizontal
178.7	-36.38	1.61	15.68	-22.31	-13	-9.31	Vertical
405.2	-41.50	1.59	17.52	-25.58	-13	-12.58	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-49.52	2.82	27.43	-24.91	-13	-11.91	Horizontal
1696.6	-46.34	2.82	27.43	-21.73	-13	-8.73	Vertical
2544.9	-52.54	2.92	27.74	-27.72	-13	-14.72	Vertical
2544.9	-51.16	2.92	27.74	-26.34	-13	-13.34	Horizontal
189.7	-42.47	1.69	16.67	-27.48	-13	-14.48	Vertical
458.9	-43.65	1.70	17.18	-28.17	-13	-15.17	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
1658.0	-52.99	2.78	27.50	-28.27	-13	-15.27	Horizontal
1658.0	-44.39	2.78	27.50	-19.67	-13	-6.67	Vertical
2487.0	-51.36	2.90	27.80	-26.46	-13	-13.46	Vertical
2487.0	-49.04	2.90	27.80	-24.14	-13	-11.14	Horizontal
178.1	-34.04	1.71	15.57	-20.18	-13	-7.18	Vertical
324.2	-37.25	1.34	16.40	-22.19	-13	-9.19	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-45.56	2.80	27.48	-20.88	-13	-7.88	Horizontal
1673.0	-51.96	2.80	27.48	-27.28	-13	-14.28	Vertical
2509.5	-48.71	2.91	27.70	-23.92	-13	-10.92	Vertical
2509.5	-53.12	2.91	27.70	-28.33	-13	-15.33	Horizontal
210.9	-40.68	1.44	17.04	-25.08	-13	-12.08	Vertical
389.5	-43.32	1.76	17.62	-27.46	-13	-14.46	Horizontal
Test Results for High Channel 844MHz							
1688.0	-52.28	2.82	27.43	-27.67	-13	-14.67	Horizontal
1688.0	-46.20	2.82	27.43	-21.59	-13	-8.59	Vertical
2532.0	-44.09	2.92	27.74	-19.27	-13	-6.27	Vertical
2532.0	-50.52	2.92	27.74	-25.70	-13	-12.70	Horizontal
185.1	-41.89	1.74	17.70	-25.93	-13	-12.93	Vertical
381.6	-35.68	1.41	17.46	-19.62	-13	-6.62	Horizontal

9.4 LTE BAND 7

QPSK EIRP POWER FOR LTE BAND 7 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-64.47	5.23	35.81	-33.89	-25	-8.89	Horizontal
5005.0	-59.74	5.23	35.81	-29.16	-25	-4.16	Vertical
7507.5	-63.75	5.67	36.85	-32.57	-25	-7.57	Vertical
7507.5	-63.45	5.67	36.85	-32.27	-25	-7.27	Horizontal
193.1	-54.11	1.73	17.97	-37.87	-25	-12.87	Vertical
265.4	-54.35	1.38	15.11	-40.62	-25	-15.62	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.42	5.23	35.82	-29.83	-25	-4.83	Horizontal
5070.0	-63.76	5.23	35.82	-33.17	-25	-8.17	Vertical
7605.0	-59.90	5.67	36.85	-28.72	-25	-3.72	Vertical
7605.0	-63.34	5.67	36.85	-32.16	-25	-7.16	Horizontal
193.8	-52.25	1.77	16.17	-37.84	-25	-12.84	Vertical
469.6	-52.07	1.63	15.21	-38.49	-25	-13.49	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.14	5.24	35.83	-28.55	-25	-3.55	Horizontal
5135.0	-64.70	5.24	35.83	-34.11	-25	-9.11	Vertical
7702.5	-64.19	5.68	36.87	-33.00	-25	-8.00	Vertical
7702.5	-60.23	5.68	36.87	-29.04	-25	-4.04	Horizontal
201.7	-53.29	1.58	17.56	-37.31	-25	-12.31	Vertical
298.7	-50.83	1.45	16.58	-35.70	-25	-10.70	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	-60.77	5.23	35.82	-30.18	-25	-5.18	Horizontal
5020.0	-63.16	5.23	35.82	-32.57	-25	-7.57	Vertical
7530.0	-62.64	5.67	36.86	-31.45	-25	-6.45	Vertical
7530.0	-62.48	5.67	36.86	-31.29	-25	-6.29	Horizontal
197.1	-47.65	1.63	15.76	-33.52	-25	-8.52	Vertical
370.9	-50.84	1.71	15.44	-37.11	-25	-12.11	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.24	5.23	35.82	-32.65	-25	-7.65	Horizontal
5070.0	-61.50	5.23	35.82	-30.91	-25	-5.91	Vertical
7605.0	-62.86	5.67	36.85	-31.68	-25	-6.68	Vertical
7605.0	-62.37	5.67	36.85	-31.19	-25	-6.19	Horizontal
207.6	-45.36	1.79	16.84	-30.30	-25	-5.30	Vertical
366.4	-45.75	1.71	17.64	-29.82	-25	-4.82	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-64.42	5.24	35.83	-33.83	-25	-8.83	Horizontal
5120.0	-59.02	5.24	35.83	-28.43	-25	-3.43	Vertical
7680.0	-64.80	5.70	36.88	-33.62	-25	-8.62	Vertical
7680.0	-63.33	5.70	36.88	-32.15	-25	-7.15	Horizontal
181.2	-48.86	1.79	16.84	-33.80	-25	-8.80	Vertical
424.5	-44.76	1.71	17.64	-28.83	-25	-3.83	Horizontal

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-45.68	2.60	27.20	-21.08	-13	-8.08	Horizontal
1399.4	-48.47	2.60	27.20	-23.87	-13	-10.87	Vertical
2099.1	-49.07	2.85	27.54	-24.38	-13	-11.38	Vertical
2099.1	-53.56	2.85	27.54	-28.87	-13	-15.87	Horizontal
198.0	-41.86	1.49	17.78	-25.57	-13	-12.57	Vertical
340.3	-44.43	1.36	17.33	-28.46	-13	-15.46	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-45.33	2.61	27.28	-20.66	-13	-7.66	Horizontal
1415.0	-46.58	2.61	27.28	-21.91	-13	-8.91	Vertical
2122.5	-49.83	2.87	27.59	-25.11	-13	-12.11	Vertical
2122.5	-52.60	2.87	27.59	-27.88	-13	-14.88	Horizontal
207.8	-43.26	1.73	15.74	-29.25	-13	-16.25	Vertical
288.6	-37.49	1.62	15.79	-23.32	-13	-10.32	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.54	2.63	27.28	-27.89	-13	-14.89	Horizontal
1430.6	-50.76	2.63	27.28	-26.11	-13	-13.11	Vertical
2145.9	-47.25	2.88	27.60	-22.53	-13	-9.53	Vertical
2145.9	-50.06	2.88	27.60	-25.34	-13	-12.34	Horizontal
199.8	-38.55	1.61	18.00	-22.16	-13	-9.16	Vertical
338.8	-43.07	1.45	15.49	-29.04	-13	-16.04	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
1408.0	-46.22	2.61	27.26	-21.57	-13	-8.57	Horizontal
1408.0	-52.74	2.61	27.26	-28.09	-13	-15.09	Vertical
2112.0	-49.88	2.87	27.58	-25.17	-13	-12.17	Vertical
2112.0	-50.49	2.87	27.58	-25.78	-13	-12.78	Horizontal
197.5	-43.26	1.31	16.97	-27.60	-13	-14.60	Vertical
277.3	-42.69	1.65	16.70	-27.64	-13	-14.64	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-47.79	2.61	27.28	-23.12	-13	-10.12	Horizontal
1415.0	-49.08	2.61	27.28	-24.41	-13	-11.41	Vertical
2122.5	-50.30	2.87	27.59	-25.58	-13	-12.58	Vertical
2122.5	-51.80	2.87	27.59	-27.08	-13	-14.08	Horizontal
192.3	-42.08	1.72	17.99	-25.81	-13	-12.81	Vertical
300.2	-44.46	1.73	17.94	-28.25	-13	-15.25	Horizontal
Test Results for High Channel 711MHz							
1422.0	-47.58	2.62	27.28	-22.92	-13	-9.92	Horizontal
1422.0	-47.31	2.62	27.28	-22.65	-13	-9.65	Vertical
2133.0	-46.79	2.87	27.60	-22.06	-13	-9.06	Vertical
2133.0	-49.78	2.87	27.60	-25.05	-13	-12.05	Horizontal
180.1	-36.64	1.58	15.93	-22.29	-13	-9.29	Vertical
435.9	-42.05	1.36	15.59	-27.82	-13	-14.82	Horizontal

9.6 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
1413.0	-50.70	2.61	27.28	-26.03	-13	-13.03	Horizontal
1413.0	-50.45	2.61	27.28	-25.78	-13	-12.78	Vertical
2119.5	-44.38	2.87	27.59	-19.66	-13	-6.66	Vertical
2119.5	-51.11	2.87	27.59	-26.39	-13	-13.39	Horizontal
190.5	-41.30	1.71	16.15	-26.86	-13	-13.86	Vertical
399.5	-34.05	1.41	17.32	-18.14	-13	-5.14	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-45.18	2.62	27.30	-20.50	-13	-7.50	Horizontal
1420.0	-53.95	2.62	27.30	-29.27	-13	-16.27	Vertical
2130.0	-49.96	2.87	27.62	-25.21	-13	-12.21	Vertical
2130.0	-52.67	2.87	27.62	-27.92	-13	-14.92	Horizontal
205.0	-36.36	1.42	15.25	-22.54	-13	-9.54	Vertical
263.3	-39.08	1.36	17.19	-23.25	-13	-10.25	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-53.52	2.66	27.28	-28.90	-13	-15.90	Horizontal
1427.0	-53.43	2.66	27.28	-28.81	-13	-15.81	Vertical
2140.5	-50.14	2.88	27.60	-25.42	-13	-12.42	Vertical
2140.5	-53.99	2.88	27.60	-29.27	-13	-16.27	Horizontal
179.3	-38.53	1.32	17.29	-22.56	-13	-9.56	Vertical
375.0	-41.78	1.72	16.89	-26.61	-13	-13.61	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
1418.0	-50.41	2.62	27.30	-25.73	-13	-12.73	Horizontal
1418.0	-48.49	2.62	27.30	-23.81	-13	-10.81	Vertical
2127.0	-46.88	2.87	27.62	-22.13	-13	-9.13	Vertical
2127.0	-51.08	2.87	27.62	-26.33	-13	-13.33	Horizontal
200.5	-36.85	1.35	16.91	-21.29	-13	-8.29	Vertical
415.0	-34.91	1.62	16.31	-20.22	-13	-7.22	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-51.59	2.62	27.30	-26.91	-13	-13.91	Horizontal
1420.0	-44.91	2.62	27.30	-20.23	-13	-7.23	Vertical
2130.0	-44.85	2.87	27.62	-20.10	-13	-7.10	Vertical
2130.0	-53.11	2.87	27.62	-28.36	-13	-15.36	Horizontal
194.4	-37.44	1.51	17.14	-21.81	-13	-8.81	Vertical
310.7	-37.75	1.77	16.88	-22.64	-13	-9.64	Horizontal
Test Results for High Channel 711MHz							
1422.0	-48.77	2.62	27.30	-24.09	-13	-11.09	Horizontal
1422.0	-50.73	2.62	27.30	-26.05	-13	-13.05	Vertical
2133.0	-50.51	2.87	27.62	-25.76	-13	-12.76	Vertical
2133.0	-50.20	2.87	27.62	-25.45	-13	-12.45	Horizontal
175.7	-34.57	1.78	15.95	-20.40	-13	-7.40	Vertical
439.4	-37.44	1.34	17.95	-20.84	-13	-7.84	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 3.4V, Normal, DC3.87V 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 Band2
LTE Band 4
- LTE Band5
LTE Band 7
LTE Band 12
LTE Band 17

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	13.2	0.007004	2.5
3.87	1880	13.6	0.007217	2.5
4.2	1880	13.0	0.006937	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	12.9	0.006865	2.5
Extreme (50C)	1880	11.2	0.005961	2.5
Extreme (40C)	1880	13.8	0.007324	2.5
Extreme (30C)	1880	13.0	0.006930	2.5
Extreme (10C)	1880	13.7	0.007262	2.5
Extreme (0C)	1880	11.8	0.006270	2.5
Extreme (-10C)	1880	13.4	0.007140	2.5
Extreme (-20C)	1880	14.2	0.007527	2.5
Extreme (-30C)	1880	14.6	0.007772	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	10.2	0.005426	2.5
3.87	1880	9.0	0.004804	2.5
4.2	1880	8.3	0.004438	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	9.9	0.005277	2.5
Extreme (50C)	1880	8.8	0.004680	2.5
Extreme (40C)	1880	7.7	0.004107	2.5
Extreme (30C)	1880	8.7	0.004640	2.5
Extreme (10C)	1880	8.9	0.004712	2.5
Extreme (0C)	1880	7.6	0.004064	2.5
Extreme (-10C)	1880	8.8	0.004681	2.5
Extreme (-20C)	1880	8.5	0.004511	2.5
Extreme (-30C)	1880	7.8	0.004146	2.5

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

10.2 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	8.7	0.005001	2.5
3.87	1732.5	8.9	0.005145	2.5
4.2	1732.5	8.6	0.004985	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	8.9	0.005130	2.5
Extreme (50C)	1732.5	8.4	0.004858	2.5
Extreme (40C)	1732.5	7.4	0.004269	2.5
Extreme (30C)	1732.5	5.7	0.003315	2.5
Extreme (10C)	1732.5	7.6	0.004373	2.5
Extreme (0C)	1732.5	9.2	0.005302	2.5
Extreme (-10C)	1732.5	8.0	0.004590	2.5
Extreme (-20C)	1732.5	6.6	0.003819	2.5
Extreme (-30C)	1732.5	8.0	0.004592	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	9.5	0.005490	2.5
3.87	1732.5	8.7	0.005032	2.5
4.2	1732.5	7.9	0.004536	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	9.5	0.005462	2.5
Extreme (50C)	1732.5	8.8	0.005058	2.5
Extreme (40C)	1732.5	8.1	0.004659	2.5
Extreme (30C)	1732.5	9.0	0.005188	2.5
Extreme (10C)	1732.5	8.8	0.005081	2.5
Extreme (0C)	1732.5	8.4	0.004869	2.5
Extreme (-10C)	1732.5	9.1	0.005269	2.5
Extreme (-20C)	1732.5	9.0	0.005203	2.5
Extreme (-30C)	1732.5	7.8	0.004480	2.5

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

10.3 LTE BAND 5

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	5.9	0.007053	2.5
3.87	836.5	6.7	0.008021	2.5
4.2	836.5	4.9	0.005895	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	6.3	0.007484	2.5
Extreme (50C)	836.5	6.1	0.007277	2.5
Extreme (40C)	836.5	5.7	0.006825	2.5
Extreme (30C)	836.5	6.2	0.007384	2.5
Extreme (10C)	836.5	5.0	0.006009	2.5
Extreme (0C)	836.5	5.5	0.006577	2.5
Extreme (-10C)	836.5	6.0	0.007150	2.5
Extreme (-20C)	836.5	5.6	0.006730	2.5
Extreme (-30C)	836.5	6.3	0.007473	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	5.8	0.006985	2.5
3.87	836.5	6.8	0.008188	2.5
4.2	836.5	4.7	0.005595	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	6.4	0.007653	2.5
Extreme (50C)	836.5	5.6	0.006676	2.5
Extreme (40C)	836.5	6.1	0.007285	2.5
Extreme (30C)	836.5	6.3	0.007508	2.5
Extreme (10C)	836.5	5.3	0.006363	2.5
Extreme (0C)	836.5	5.1	0.006133	2.5
Extreme (-10C)	836.5	5.8	0.006980	2.5
Extreme (-20C)	836.5	6.5	0.007788	2.5
Extreme (-30C)	836.5	6.3	0.007539	2.5

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

10.4 LTE BAND 7

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	10.0	0.003925	2.5
3.87	2535	8.7	0.003436	2.5
4.2	2535	8.0	0.003159	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	9.6	0.003774	2.5
Extreme (50C)	2535	9.2	0.003633	2.5
Extreme (40C)	2535	8.7	0.003436	2.5
Extreme (30C)	2535	8.6	0.003412	2.5
Extreme (10C)	2535	8.3	0.003287	2.5
Extreme (0C)	2535	8.2	0.003239	2.5
Extreme (-10C)	2535	8.9	0.003524	2.5
Extreme (-20C)	2535	8.6	0.003383	2.5
Extreme (-30C)	2535	8.1	0.003206	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	6.9	0.002722	2.5
3.87	2535	6.0	0.002350	2.5
4.2	2535	5.9	0.002344	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	6.9	0.002722	2.5
Extreme (50C)	2535	5.8	0.002305	2.5
Extreme (40C)	2535	5.3	0.002109	2.5
Extreme (30C)	2535	6.9	0.002713	2.5
Extreme (10C)	2535	5.5	0.002158	2.5
Extreme (0C)	2535	4.6	0.001819	2.5
Extreme (-10C)	2535	4.9	0.001922	2.5
Extreme (-20C)	2535	5.9	0.002324	2.5
Extreme (-30C)	2535	5.6	0.002190	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	8.2	0.011653	2.5
3.87	707.5	9.6	0.013579	2.5
4.2	707.5	8.6	0.012103	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	8.5	0.012027	2.5
Extreme (50C)	707.5	7.4	0.010393	2.5
Extreme (40C)	707.5	7.3	0.010292	2.5
Extreme (30C)	707.5	8.0	0.011240	2.5
Extreme (10C)	707.5	7.2	0.010123	2.5
Extreme (0C)	707.5	9.0	0.012663	2.5
Extreme (-10C)	707.5	8.4	0.011834	2.5
Extreme (-20C)	707.5	8.9	0.012545	2.5
Extreme (-30C)	707.5	8.1	0.011504	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	7.7	0.010816	2.5
3.87	707.5	8.7	0.012294	2.5
4.2	707.5	7.5	0.010578	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	6.5	0.009175	2.5
Extreme (50C)	707.5	5.5	0.007765	2.5
Extreme (40C)	707.5	6.4	0.009110	2.5
Extreme (30C)	707.5	-7.7	-0.010912	2.5
Extreme (10C)	707.5	-8.2	-0.011590	2.5
Extreme (0C)	707.5	2.9	0.004100	2.5
Extreme (-10C)	707.5	-5.2	-0.007292	2.5
Extreme (-20C)	707.5	-8.7	-0.012302	2.5
Extreme (-30C)	707.5	-10.2	-0.014350	2.5

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

10.6 LTE BAND 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	10.2	0.014321	2.5
3.87	710.0	9.2	0.012907	2.5
4.2	710.0	7.8	0.010929	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	10.0	0.014108	2.5
Extreme (50C)	710.0	9.4	0.013173	2.5
Extreme (40C)	710.0	7.7	0.010887	2.5
Extreme (30C)	710.0	8.7	0.012204	2.5
Extreme (10C)	710.0	9.2	0.012937	2.5
Extreme (0C)	710.0	8.3	0.011691	2.5
Extreme (-10C)	710.0	8.7	0.012259	2.5
Extreme (-20C)	710.0	8.8	0.012337	2.5
Extreme (-30C)	710.0	7.8	0.010973	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	9.6	0.013485	2.5
3.87	710.0	9.0	0.012722	2.5
4.2	710.0	8.2	0.011582	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	8.9	0.012558	2.5
Extreme (50C)	710.0	8.6	0.012141	2.5
Extreme (40C)	710.0	8.3	0.011676	2.5
Extreme (30C)	710.0	8.6	0.012148	2.5
Extreme (10C)	710.0	8.0	0.011225	2.5
Extreme (0C)	710.0	8.6	0.012106	2.5
Extreme (-10C)	710.0	9.6	0.013547	2.5
Extreme (-20C)	710.0	8.6	0.012149	2.5
Extreme (-30C)	710.0	8.6	0.012098	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

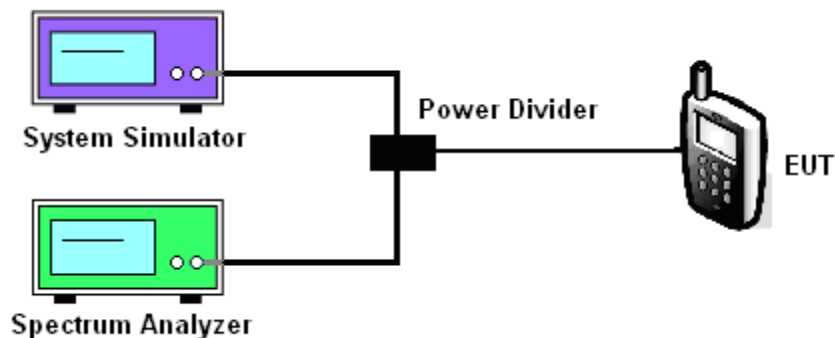
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



MODES TESTED

- LTE Band 2/4/5/7/12/17
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Test data reference attachment.

----END OF REPORT----