

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

FCC ID: 2AX4YS98

Product: Smart Phone
Trade Mark: DOOGEE
Model Number: S98
Family Model: S98Pro, S89, S89Pro, S61Pro, S61
Report No.: STR220325001006E

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name	Shenzhen DOOGEE Hengtong Technology CO.,LTD
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Manufacturer's Name	Shenzhen DOOGEE Hengtong Technology CO.,LTD
Address	B,2F,Silicon Valley Power Digital Industrial Park,Dafu Industrial Zone, Guanlan Aobei Community,Shenzhen, China
Product name	Smart Phone
Model and/or type reference ..	S98
Family Model:	S98Pro, S89, S89Pro, S61Pro, S61
Standards	FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure	ANSI C63.26:2015 ANSI/TIA-603-E-2016

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

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Date of Test	
Date (s) of performance of tests	Apr 01, 2022 ~ Apr 22, 2022
Date of Issue	Apr 24, 2022
Test Result	Pass

Testing Engineer :



(Allen Liu)

Authorized Signatory :



(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	DOOGEE
Model Name	S98
Family Model	S98Pro, S89, S89Pro, S61Pro, S61
Model Difference	All the model are the same circuit and RF module,except the model names.
FCC ID:	2AX4YS98
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7, 12, 17, 66
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; LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM
Power Class	Class 3
Antenna:	PIFA Antenna
Antenna gain:	-1.0dBi;
Adapter	Model: HJ-PD33W-US Input: 100-240V~50/60Hz 0.8A Output: 5.0V---3.0A OR 9.0V---3.0A OR 11.0V---3.0A 33.0W
Battery	DC 3.85V, 6000mAh, 23.1Wh
Power supply	DC 3.85V from battery or DC 9V from Adapter.
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)
HW Version	S3_02

SW Version	DOOGEE-S98-EEA-Android12.0-20220214
** 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: 2AX4YS98** filing to comply with the FCC Part 22H&24E &27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei 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
2	Conducted Emission Test	$\pm 1.38\text{dB}$
3	RF power, conducted	$\pm 0.16\text{dB}$
4	Spurious emissions, conducted	$\pm 0.21\text{dB}$
5	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
6	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
7	Temperature	$\pm 0.5^\circ\text{C}$
8	Humidity	$\pm 2\%$
9	Frequency error, conducted	$\pm 0.19\text{ ppm}$

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 5, Band 7, Band 12, Band 17, Band 66

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(m), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(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(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(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
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

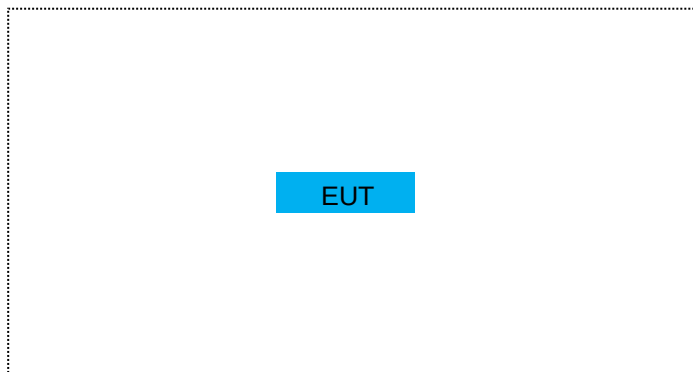
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	S98	FCC ID: 2AX4YS98	EUT

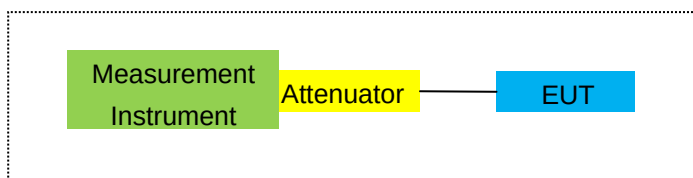
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

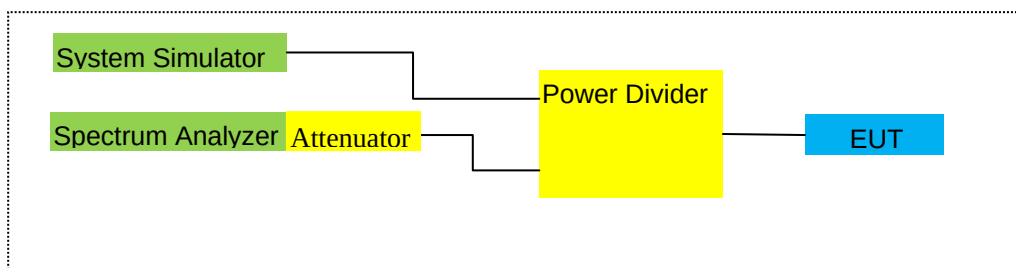
For Radiated Test Cases



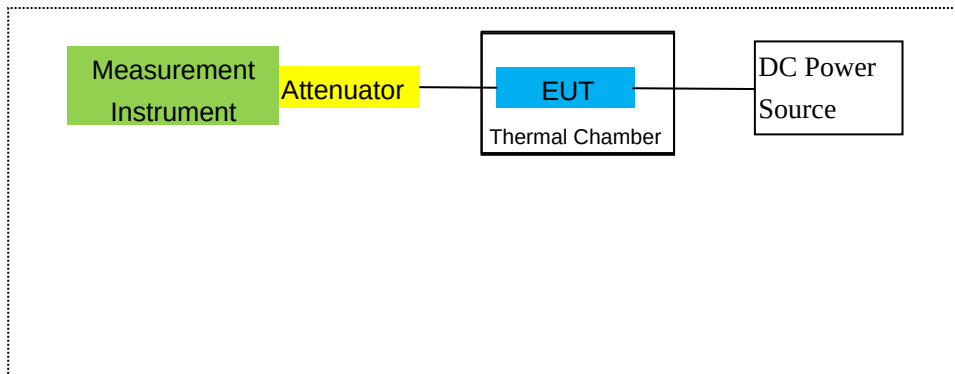
For Conducted Output Power



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	2022/03/30	2023.03.29	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	2022.03.31	2023.03.30	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2021.11.07	2022.11.06	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	2020.04.07	2023.04.06	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 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 Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17
- LTE Band 66

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 2/4/5/7/12/17/66

RESULTS

Test data reference attachment.

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
- LTE Band 66

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: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported (LTE Band 2/4/7: above 10GHz).

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
- LTE Band 66

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
						Average (dBm)	Average		
							(mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	-1.78	3.76	28.24	22.70	186.209	Horizontal	Pass
		1880	-1.59	3.91	28.22	22.72	187.068	Horizontal	Pass
		1909.3	-1.50	3.93	28.20	22.77	189.234	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-1.84	3.77	28.23	22.62	182.810	Horizontal	Pass
		1880	-1.69	3.91	28.24	22.64	183.654	Horizontal	Pass
		1908.5	-1.56	3.94	28.25	22.75	188.365	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-1.73	3.77	28.31	22.81	190.985	Horizontal	Pass
		1880	-1.35	3.91	28.22	22.96	197.697	Horizontal	Pass
		1907.5	-1.28	3.94	28.20	22.98	198.609	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-1.59	3.79	28.33	22.95	197.242	Horizontal	Pass
		1880	-1.29	3.95	28.22	22.98	198.609	Horizontal	Pass
		1905	-1.18	3.97	28.19	23.04	201.372	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-1.55	3.79	28.34	23.00	199.526	Horizontal	Pass
		1880	-1.34	3.95	28.22	22.93	196.336	Horizontal	Pass
		1902.5	-1.20	3.97	28.18	23.01	199.986	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-1.54	3.81	28.35	23.00	199.526	Horizontal	Pass
		1880	-1.21	3.96	28.22	23.05	201.837	Horizontal	Pass
		1900	-1.15	4.00	28.16	23.01	199.986	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-2.70	3.76	28.24	21.78	150.661	Vertical	Pass
		1880	-2.11	3.91	28.22	22.20	165.959	Vertical	Pass
		1909.3	-2.72	3.93	28.20	21.55	142.889	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-2.43	3.77	28.23	22.03	159.588	Vertical	Pass
		1880	-2.49	3.91	28.24	21.84	152.757	Vertical	Pass
		1908.5	-1.93	3.94	28.25	22.38	172.982	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-2.72	3.77	28.31	21.82	152.055	Vertical	Pass
		1880	-2.17	3.91	28.22	22.14	163.682	Vertical	Pass
		1907.5	-1.85	3.94	28.20	22.41	174.181	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-2.12	3.79	28.33	22.42	174.582	Vertical	Pass
		1880	-2.73	3.95	28.22	21.54	142.561	Vertical	Pass
		1905	-2.09	3.97	28.19	22.13	163.305	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-2.96	3.79	28.34	21.59	144.212	Vertical	Pass

Band QPSK		1880	-2.26	3.95	28.22	22.01	158.855	Vertical	Pass
		1902.5	-2.70	3.97	28.18	21.51	141.579	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-2.92	3.81	28.35	21.62	145.211	Vertical	Pass
		1880	-2.12	3.96	28.22	22.14	163.682	Vertical	Pass
		1900	-2.72	4.00	28.16	21.44	139.316	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average		
							(mW)		
1.4MHz Band 16 QAM	1/#Mid	1850.7	-2.90	3.76	28.24	21.58	143.880	Horizontal	Pass
		1880	-2.37	3.91	28.22	21.94	156.315	Horizontal	Pass
		1909.3	-2.30	3.93	28.20	21.97	157.398	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-2.40	3.77	28.23	22.06	160.694	Horizontal	Pass
		1880	-2.48	3.91	28.24	21.85	153.109	Horizontal	Pass
		1908.5	-2.69	3.94	28.25	21.62	145.211	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-2.34	3.77	28.31	22.20	165.959	Horizontal	Pass
		1880	-2.25	3.91	28.22	22.06	160.694	Horizontal	Pass
		1907.5	-1.93	3.94	28.20	22.33	171.002	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-2.39	3.79	28.33	22.15	164.059	Horizontal	Pass
		1880	-2.38	3.95	28.22	21.89	154.525	Horizontal	Pass
		1905	-1.85	3.97	28.19	22.37	172.584	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-2.37	3.79	28.34	22.18	165.196	Horizontal	Pass
		1880	-2.16	3.95	28.22	22.11	162.555	Horizontal	Pass
		1902.5	-2.12	3.97	28.18	22.09	161.808	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-2.26	3.81	28.35	22.28	169.044	Horizontal	Pass
		1880	-1.96	3.96	28.22	22.30	169.824	Horizontal	Pass
		1900	-1.78	4.00	28.16	22.38	172.982	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-3.90	3.76	28.24	20.58	114.288	Vertical	Pass
		1880	-3.40	3.91	28.22	20.91	123.310	Vertical	Pass
		1909.3	-3.01	3.93	28.20	21.26	133.660	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-3.18	3.77	28.23	21.28	134.276	Vertical	Pass
		1880	-3.10	3.91	28.24	21.23	132.739	Vertical	Pass
		1908.5	-3.08	3.94	28.25	21.23	132.739	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-3.26	3.77	28.31	21.28	134.276	Vertical	Pass
		1880	-3.19	3.91	28.22	21.12	129.420	Vertical	Pass
		1907.5	-3.09	3.94	28.20	21.17	130.918	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-3.42	3.79	28.33	21.12	129.420	Vertical	Pass
		1880	-3.13	3.95	28.22	21.14	130.017	Vertical	Pass
		1905	-3.55	3.97	28.19	20.67	116.681	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-3.86	3.79	28.34	20.69	117.220	Vertical	Pass
		1880	-2.97	3.95	28.22	21.30	134.896	Vertical	Pass
		1902.5	-3.48	3.97	28.18	20.73	118.304	Vertical	Pass

20.0MHz		1860	-4.03	3.81	28.35	20.51	112.460	Vertical	Pass
Band 16	1/#Mid	1880	-3.50	3.96	28.22	20.76	119.124	Vertical	Pass
QAM		1900	-3.46	4.00	28.16	20.70	117.490	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 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	Average	Average	Of Max. ERP	
						(dBm)	(mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-1.69	3.12	27.58	22.77	189.234	Horizontal	Pass
		1732.5	-1.68	3.27	27.61	22.66	184.502	Horizontal	Pass
		1754.3	-1.66	3.29	27.63	22.68	185.353	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-1.86	3.13	27.61	22.62	182.810	Horizontal	Pass
		1732.5	-1.78	3.27	27.61	22.56	180.302	Horizontal	Pass
		1753.5	-1.70	3.30	27.62	22.62	182.810	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-1.63	3.13	27.63	22.87	193.642	Horizontal	Pass
		1732.5	-1.53	3.27	27.61	22.81	190.985	Horizontal	Pass
		1752.5	-1.41	3.30	27.60	22.89	194.536	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-1.57	3.15	27.64	22.92	195.884	Horizontal	Pass
		1732.5	-1.34	3.31	27.61	22.96	197.697	Horizontal	Pass
		1750	-1.36	3.33	27.59	22.90	194.984	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-1.58	3.15	27.65	22.92	195.884	Horizontal	Pass
		1732.5	-1.42	3.31	27.61	22.88	194.089	Horizontal	Pass
		1747.5	-1.36	3.33	27.57	22.88	194.089	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-1.52	3.17	27.66	22.97	198.153	Horizontal	Pass
		1732.5	-1.35	3.32	27.61	22.94	196.789	Horizontal	Pass
		1745	-1.29	3.36	27.56	22.91	195.434	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.19	3.12	27.58	22.27	168.655	Vertical	Pass
		1732.5	-2.27	3.27	27.61	22.07	161.065	Vertical	Pass
		1754.3	-2.19	3.29	27.63	22.15	164.059	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.34	3.13	27.61	22.14	163.682	Vertical	Pass
		1732.5	-2.51	3.27	27.61	21.83	152.405	Vertical	Pass
		1753.5	-1.92	3.30	27.62	22.40	173.780	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.58	3.13	27.63	21.92	155.597	Vertical	Pass
		1732.5	-2.41	3.27	27.61	21.93	155.955	Vertical	Pass
		1752.5	-2.72	3.30	27.60	21.58	143.880	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.53	3.15	27.64	21.96	157.036	Vertical	Pass
		1732.5	-2.49	3.31	27.61	21.81	151.705	Vertical	Pass
		1750	-2.37	3.33	27.59	21.89	154.525	Vertical	Pass

15.0MHz	Band QPSK	1/#Mid	1717.5	-2.94	3.15	27.65	21.56	143.219	Vertical	Pass
			1732.5	-2.53	3.31	27.61	21.77	150.314	Vertical	Pass
			1747.5	-1.90	3.33	27.57	22.34	171.396	Vertical	Pass
20.0MHz	Band QPSK	1/#Mid	1720	-2.34	3.17	27.66	22.15	164.059	Vertical	Pass
			1732.5	-2.01	3.32	27.61	22.28	169.044	Vertical	Pass
			1745	-2.52	3.36	27.56	21.68	147.231	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	Cable	Antenna	Max.	Max.	Polarization	
			Level	Loss	Gain	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	Average	Average	ERP	
						(dBm)	(mW)		
1.4MHz Band 16 QAM	1/##Mid	1710.7	-2.50	3.12	27.58	21.96	157.036	Horizontal	Pass
		1732.5	-2.35	3.27	27.61	21.99	158.125	Horizontal	Pass
		1754.3	-2.35	3.29	27.63	21.99	158.125	Horizontal	Pass
3.0MHz Band 16 QAM	1/##Mid	1711.5	-2.44	3.13	27.61	22.04	159.956	Horizontal	Pass
		1732.5	-2.57	3.27	27.61	21.77	150.314	Horizontal	Pass
		1753.5	-2.79	3.30	27.62	21.53	142.233	Horizontal	Pass
5.0MHz Band 16 QAM	1/##Mid	1712.5	-2.27	3.13	27.63	22.23	167.109	Horizontal	Pass
		1732.5	-2.23	3.27	27.61	22.11	162.555	Horizontal	Pass
		1752.5	-1.92	3.30	27.60	22.38	172.982	Horizontal	Pass
10.0MHz Band 16 QAM	1/##Mid	1715	-2.34	3.15	27.64	22.15	164.059	Horizontal	Pass
		1732.5	-2.53	3.31	27.61	21.77	150.314	Horizontal	Pass
		1750	-1.91	3.33	27.59	22.35	171.791	Horizontal	Pass
15.0MHz Band 16 QAM	1/##Mid	1717.5	-2.14	3.15	27.65	22.36	172.187	Horizontal	Pass
		1732.5	-2.20	3.31	27.61	22.10	162.181	Horizontal	Pass
		1747.5	-2.22	3.33	27.57	22.02	159.221	Horizontal	Pass
20.0MHz Band 16 QAM	1/##Mid	1720	-2.09	3.17	27.66	22.40	173.780	Horizontal	Pass
		1732.5	-2.10	3.32	27.61	22.19	165.577	Horizontal	Pass
		1745	-1.91	3.36	27.56	22.29	169.434	Horizontal	Pass
1.4MHz Band 16 QAM	1/##Mid	1710.7	-4.01	3.12	27.58	20.45	110.917	Vertical	Pass
		1732.5	-3.79	3.27	27.61	20.55	113.501	Vertical	Pass
		1754.3	-3.50	3.29	27.63	20.84	121.339	Vertical	Pass
3.0MHz Band 16 QAM	1/##Mid	1711.5	-3.15	3.13	27.61	21.33	135.831	Vertical	Pass
		1732.5	-3.48	3.27	27.61	20.86	121.899	Vertical	Pass
		1753.5	-3.25	3.30	27.62	21.07	127.938	Vertical	Pass
5.0MHz Band 16 QAM	1/##Mid	1712.5	-3.55	3.13	27.63	20.95	124.451	Vertical	Pass
		1732.5	-3.60	3.27	27.61	20.74	118.577	Vertical	Pass
		1752.5	-3.57	3.30	27.60	20.73	118.304	Vertical	Pass
10.0MHz Band 16 QAM	1/##Mid	1715	-3.99	3.15	27.64	20.50	112.202	Vertical	Pass
		1732.5	-3.55	3.31	27.61	20.75	118.850	Vertical	Pass
		1750	-2.85	3.33	27.59	21.41	138.357	Vertical	Pass
15.0MHz Band 16	1/##Mid	1717.5	-3.99	3.15	27.65	20.51	112.460	Vertical	Pass
		1732.5	-3.36	3.31	27.61	20.94	124.165	Vertical	Pass

QAM		1747.5	-3.82	3.33	27.57	20.42	110.154	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.35	3.17	27.66	21.14	130.017	Vertical	Pass
Band 16		1732.5	-3.29	3.32	27.61	21.00	125.893	Vertical	Pass
QAM		1745	-3.68	3.36	27.56	20.52	112.720	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 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max.	Max.	Polarization Of Max. ERP	
			Level	Loss	Gain		EIRP	EIRP		
			(dBm)	(dBm)	(dB)		Average	Average		
						(dB)	(dBm)	(mW)		
1.4MHz	3/#Mid	824.7	7.70	2.01	19.68	2.15	23.22	209.894	Horizontal	Pass
Band		836.5	7.58	2.01	19.77	2.15	23.19	208.449	Horizontal	Pass
QPSK		848.3	7.38	2.02	19.82	2.15	23.03	200.909	Horizontal	Pass
3.0MHz	1/#Mid	825.5	7.47	2.01	19.70	2.15	23.01	199.986	Horizontal	Pass
Band		836.5	7.37	2.01	19.77	2.15	22.98	198.609	Horizontal	Pass
QPSK		847.5	7.24	2.02	19.81	2.15	22.88	194.089	Horizontal	Pass
5.0MHz	1/#Mid	826.5	7.75	2.01	19.71	2.15	23.30	213.796	Horizontal	Pass
Band		836.5	7.63	2.01	19.77	2.15	23.24	210.863	Horizontal	Pass
QPSK		846.5	7.47	2.02	19.79	2.15	23.09	203.704	Horizontal	Pass
10.0MHz	1/#Mid	829	7.77	2.01	19.73	2.15	23.34	215.774	Horizontal	Pass
Band		836.5	7.72	2.01	19.77	2.15	23.33	215.278	Horizontal	Pass
QPSK		844	7.62	2.02	19.78	2.15	23.23	210.378	Horizontal	Pass
1.4MHz	1/#Mid	824.7	6.96	2.01	19.68	2.15	22.48	177.011	Vertical	Pass
Band		836.5	6.01	2.01	19.77	2.15	21.62	145.211	Vertical	Pass
QPSK		848.3	6.38	2.02	19.82	2.15	22.03	159.588	Vertical	Pass
3.0MHz	1/#Mid	825.5	6.56	2.01	19.70	2.15	22.10	162.181	Vertical	Pass
Band		836.5	6.42	2.01	19.77	2.15	22.03	159.588	Vertical	Pass
QPSK		847.5	6.52	2.02	19.81	2.15	22.16	164.437	Vertical	Pass
5.0MHz	1/#Mid	826.5	6.60	2.01	19.71	2.15	22.15	164.059	Vertical	Pass
Band		836.5	6.74	2.01	19.77	2.15	22.35	171.791	Vertical	Pass
QPSK		846.5	5.96	2.02	19.79	2.15	21.58	143.880	Vertical	Pass
10.0MHz	1/#Mid	829	5.98	2.01	19.73	2.15	21.55	142.889	Vertical	Pass
Band		836.5	6.42	2.01	19.77	2.15	22.03	159.588	Vertical	Pass
QPSK		844	6.02	2.02	19.78	2.15	21.63	145.546	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP	Max.	Polarization Of Max. ERP	
			Level				EIRP			
			(dBm)				Average	Average		
						(dBm)	(mW)			
1.4MHz Band 16 QAM	3/#Mid	824.7	6.85	2.01	19.68	2.15	22.37	172.584	Horizontal	Pass
		836.5	6.78	2.01	19.77	2.15	22.39	173.380	Horizontal	Pass
		848.3	6.62	2.02	19.82	2.15	22.27	168.655	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	6.93	2.01	19.70	2.15	22.47	176.604	Horizontal	Pass
		836.5	6.64	2.01	19.77	2.15	22.25	167.880	Horizontal	Pass
		847.5	6.12	2.02	19.81	2.15	21.76	149.968	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.25	2.01	19.71	2.15	22.80	190.546	Horizontal	Pass
		836.5	7.02	2.01	19.77	2.15	22.63	183.231	Horizontal	Pass
		846.5	6.77	2.02	19.79	2.15	22.39	173.380	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.25	2.01	19.73	2.15	22.82	191.426	Horizontal	Pass
		836.5	6.97	2.01	19.77	2.15	22.58	181.134	Horizontal	Pass
		844	6.51	2.02	19.78	2.15	22.12	162.930	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	6.28	2.01	19.68	2.15	21.80	151.356	Vertical	Pass
		836.5	6.25	2.01	19.77	2.15	21.86	153.462	Vertical	Pass
		848.3	5.49	2.02	19.82	2.15	21.14	130.017	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	5.95	2.01	19.70	2.15	21.49	140.929	Vertical	Pass
		836.5	6.05	2.01	19.77	2.15	21.66	146.555	Vertical	Pass
		847.5	5.67	2.02	19.81	2.15	21.31	135.207	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	4.97	2.01	19.71	2.15	20.52	112.720	Vertical	Pass
		836.5	6.41	2.01	19.77	2.15	22.02	159.221	Vertical	Pass
		846.5	6.14	2.02	19.79	2.15	21.76	149.968	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	6.67	2.01	19.73	2.15	22.24	167.494	Vertical	Pass
		836.5	5.94	2.01	19.77	2.15	21.55	142.889	Vertical	Pass
		844	6.69	2.02	19.78	2.15	22.30	169.824	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable	Antenna	Max.	Max.	Polarization	
			Level	Loss	Gain	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	Average	Average	ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	2502.5	0.03	4.54	27.75	23.24	210.863	Horizontal	Pass
		2535	0.20	4.69	27.72	23.23	210.378	Horizontal	Pass
		2567.5	0.27	4.71	27.71	23.27	212.324	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.10	4.55	27.76	23.31	214.289	Horizontal	Pass
		2535	0.29	4.69	27.72	23.32	214.783	Horizontal	Pass
		2565	0.37	4.72	27.70	23.35	216.272	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.09	4.55	27.77	23.31	214.289	Horizontal	Pass
		2535	0.23	4.69	27.72	23.26	211.836	Horizontal	Pass
		2562.5	0.33	4.72	27.69	23.30	213.796	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.15	4.57	27.78	23.36	216.770	Horizontal	Pass
		2535	0.33	4.73	27.72	23.32	214.783	Horizontal	Pass
		2560	0.37	4.75	27.68	23.30	213.796	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-1.36	4.54	27.75	21.85	153.109	Vertical	Pass
		2535	-1.53	4.69	27.72	21.50	141.254	Vertical	Pass
		2567.5	-0.92	4.71	27.71	22.08	161.436	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.54	4.55	27.76	21.67	146.893	Vertical	Pass
		2535	-1.17	4.69	27.72	21.86	153.462	Vertical	Pass
		2565	-1.06	4.72	27.70	21.92	155.597	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.92	4.55	27.77	22.30	169.824	Vertical	Pass
		2535	-1.00	4.69	27.72	22.03	159.588	Vertical	Pass
		2562.5	-1.47	4.72	27.69	21.50	141.254	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.99	4.57	27.78	22.22	166.725	Vertical	Pass
		2535	-1.56	4.73	27.72	21.43	138.995	Vertical	Pass
		2560	-0.75	4.75	27.68	22.18	165.196	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable	Antenna	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	Loss	Gain	Average	Average	Of Max. ERP	
				(dBm)	(dB)	(dBm)	(mW)		
5.0MHz	1/#Mid	2502.5	-0.66	4.54	27.75	22.55	179.887	Horizontal	Pass
Band 16		2535	-0.35	4.69	27.72	22.68	185.353	Horizontal	Pass
QAM		2567.5	-0.43	4.71	27.71	22.57	180.717	Horizontal	Pass
10.0MHz	1/#Mid	2505	-0.55	4.55	27.76	22.66	184.502	Horizontal	Pass
Band 16		2535	-0.56	4.69	27.72	22.47	176.604	Horizontal	Pass
QAM		2565	-0.83	4.72	27.70	22.15	164.059	Horizontal	Pass
15.0MHz	1/#Mid	2507.5	-0.73	4.55	27.77	22.49	177.419	Horizontal	Pass
Band 16		2535	-0.70	4.69	27.72	22.33	171.002	Horizontal	Pass
QAM		2562.5	-0.31	4.72	27.69	22.66	184.502	Horizontal	Pass
20.0MHz	1/#Mid	2510	-0.61	4.57	27.78	22.60	181.970	Horizontal	Pass
Band 16		2535	-0.28	4.73	27.72	22.71	186.638	Horizontal	Pass
QAM		2560	-0.38	4.75	27.68	22.55	179.887	Horizontal	Pass
5.0MHz	1/#Mid	2502.5	-1.91	4.54	27.75	21.30	134.896	Vertical	Pass
Band 16		2535	-1.21	4.69	27.72	21.82	152.055	Vertical	Pass
QAM		2567.5	-1.19	4.71	27.71	21.81	151.705	Vertical	Pass
10.0MHz	1/#Mid	2505	-1.80	4.55	27.76	21.41	138.357	Vertical	Pass
Band 16		2535	-1.90	4.69	27.72	21.13	129.718	Vertical	Pass
QAM		2565	-1.87	4.72	27.70	21.11	129.122	Vertical	Pass
15.0MHz	1/#Mid	2507.5	-2.25	4.55	27.77	20.97	125.026	Vertical	Pass
Band 16		2535	-2.11	4.69	27.72	20.92	123.595	Vertical	Pass
QAM		2562.5	-0.58	4.72	27.69	22.39	173.380	Vertical	Pass
20.0MHz	1/#Mid	2510	-2.67	4.57	27.78	20.54	113.240	Vertical	Pass
Band 16		2535	-0.87	4.73	27.72	22.12	162.930	Vertical	Pass
QAM		2560	-0.83	4.75	27.68	22.10	162.181	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max. EIRP	Max.	Polarization	
			Level	Loss	Gain		EIRP	Of Max.		
			(dBm)	(dBm)	(dB)		Average	ERP		
						(dB)	Average	Average		
							(dBm)	(mW)		
1.4MHz	Band QPSK	699.7	8.07	1.91	19.21	2.15	23.22	209.894	Vertical	Pass
		707.5	7.99	1.91	19.26	2.15	23.19	208.449	Vertical	Pass
		715.3	7.77	1.93	19.34	2.15	23.03	200.909	Vertical	Pass
3.0MHz	Band QPSK	700.5	7.86	1.91	19.21	2.15	23.01	199.986	Vertical	Pass
		707.5	7.78	1.91	19.26	2.15	22.98	198.609	Vertical	Pass
		714.5	7.62	1.93	19.34	2.15	22.88	194.089	Vertical	Pass
5.0MHz	Band QPSK	701.5	8.13	1.91	19.23	2.15	23.30	213.796	Vertical	Pass
		707.5	8.04	1.91	19.26	2.15	23.24	210.863	Vertical	Pass
		713.5	7.83	1.92	19.33	2.15	23.09	203.704	Vertical	Pass
10.0MHz	Band QPSK	704	8.15	1.91	19.25	2.15	23.34	215.774	Vertical	Pass
		707.5	8.13	1.91	19.26	2.15	23.33	215.278	Vertical	Pass
		711	7.98	1.92	19.32	2.15	23.23	210.378	Vertical	Pass
1.4MHz	Band QPSK	699.7	6.44	1.91	19.21	2.15	21.59	144.212	Horizontal	Pass
		707.5	6.72	1.91	19.26	2.15	21.92	155.597	Horizontal	Pass
		715.3	6.83	1.93	19.34	2.15	22.09	161.808	Horizontal	Pass
3.0MHz	Band QPSK	700.5	6.78	1.91	19.21	2.15	21.93	155.955	Horizontal	Pass
		707.5	7.10	1.91	19.26	2.15	22.30	169.824	Horizontal	Pass
		714.5	6.26	1.93	19.34	2.15	21.52	141.906	Horizontal	Pass
5.0MHz	Band QPSK	701.5	7.27	1.91	19.23	2.15	22.44	175.388	Horizontal	Pass
		707.5	7.26	1.91	19.26	2.15	22.46	176.198	Horizontal	Pass
		713.5	6.47	1.92	19.33	2.15	21.73	148.936	Horizontal	Pass
10.0MHz	Band QPSK	704	7.07	1.91	19.25	2.15	22.26	168.267	Horizontal	Pass
		707.5	7.01	1.91	19.26	2.15	22.21	166.341	Horizontal	Pass
		711	6.51	1.92	19.32	2.15	21.76	149.968	Horizontal	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band 16 QAM	1/#Mid	699.7	8.01	1.91	19.21	2.15	23.16	207.014	Vertical	Pass
		707.5	7.93	1.91	19.26	2.15	23.13	205.589	Vertical	Pass
		715.3	7.71	1.93	19.34	2.15	22.97	198.153	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	7.80	1.91	19.21	2.15	22.95	197.242	Vertical	Pass
		707.5	7.72	1.91	19.26	2.15	22.92	195.884	Vertical	Pass
		714.5	7.56	1.93	19.34	2.15	22.82	191.426	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	8.07	1.91	19.23	2.15	23.24	210.863	Vertical	Pass
		707.5	7.98	1.91	19.26	2.15	23.18	207.970	Vertical	Pass
		713.5	7.77	1.92	19.33	2.15	23.03	200.909	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	8.09	1.91	19.25	2.15	23.28	212.814	Vertical	Pass
		707.5	8.07	1.91	19.26	2.15	23.27	212.324	Vertical	Pass
		711	7.92	1.92	19.32	2.15	23.17	207.491	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	6.47	1.91	19.21	2.15	21.62	145.211	Horizontal	Pass
		707.5	6.49	1.91	19.26	2.15	21.69	147.571	Horizontal	Pass
		715.3	6.23	1.93	19.34	2.15	21.49	140.929	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	6.95	1.91	19.21	2.15	22.10	162.181	Horizontal	Pass
		707.5	6.50	1.91	19.26	2.15	21.70	147.911	Horizontal	Pass
		714.5	6.31	1.93	19.34	2.15	21.57	143.549	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	6.98	1.91	19.23	2.15	22.15	164.059	Horizontal	Pass
		707.5	7.07	1.91	19.26	2.15	22.27	168.655	Horizontal	Pass
		713.5	6.97	1.92	19.33	2.15	22.23	167.109	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	6.60	1.91	19.25	2.15	21.79	151.008	Horizontal	Pass
		707.5	6.84	1.91	19.26	2.15	22.04	159.956	Horizontal	Pass
		711	6.59	1.92	19.32	2.15	21.84	152.757	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG	Cable	Antenna	Correction	Max.	Max.	Polarization	
			Level	Loss	Gain		EIRP	EIRP	Of Max. ERP	
			(dBm)	(dBm)	(dB)		Average	Average		
						(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	1/#Mid	706.5	8.47	1.91	19.23	2.15	23.64	231.206	Vertical	Pass
		710	8.33	1.91	19.26	2.15	23.53	225.424	Vertical	Pass
		713.5	8.23	1.92	19.33	2.15	23.49	223.357	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	8.48	1.91	19.25	2.15	23.67	232.809	Vertical	Pass
		710	8.43	1.91	19.26	2.15	23.63	230.675	Vertical	Pass
		711	8.39	1.92	19.32	2.15	23.64	231.206	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	7.52	1.91	19.23	2.15	22.69	185.780	Horizontal	Pass
		710	7.65	1.91	19.26	2.15	22.85	192.752	Horizontal	Pass
		713.5	7.22	1.92	19.33	2.15	22.48	177.011	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	6.67	1.91	19.25	2.15	21.86	153.462	Horizontal	Pass
		710	7.18	1.91	19.26	2.15	22.38	172.982	Horizontal	Pass
		711	8.00	1.92	19.32	2.15	23.25	211.349	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Gain	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz	1/#Mid	706.5	7.82	1.91	19.23	2.15	22.99	199.067	Vertical	Pass
Band 16		710	7.73	1.91	19.26	2.15	22.93	196.336	Vertical	Pass
QAM		713.5	7.53	1.92	19.33	2.15	22.79	190.108	Vertical	Pass
10.0MHz	1/#Mid	709	7.36	1.91	19.25	2.15	22.55	179.887	Vertical	Pass
Band 16		710	7.89	1.91	19.26	2.15	23.09	203.704	Vertical	Pass
QAM		711	7.62	1.92	19.32	2.15	22.87	193.642	Vertical	Pass
5.0MHz	1/#Mid	706.5	6.83	1.91	19.23	2.15	22.00	158.489	Horizontal	Pass
Band 16		710	6.77	1.91	19.26	2.15	21.97	157.398	Horizontal	Pass
QAM		713.5	7.17	1.92	19.33	2.15	22.43	174.985	Horizontal	Pass
10.0MHz	1/#Mid	709	7.17	1.91	19.25	2.15	22.36	172.187	Horizontal	Pass
Band 16		710	7.08	1.91	19.26	2.15	22.28	169.044	Horizontal	Pass
QAM		711	6.29	1.92	19.32	2.15	21.54	142.561	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.8 LTE BAND66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-1.54	3.76	28.24	22.94	196.789	Horizontal	Pass
		1745	-1.40	3.91	28.22	22.91	195.434	Horizontal	Pass
		1779.3	-1.27	3.93	28.2	23.00	199.526	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-1.60	3.77	28.23	22.86	193.197	Horizontal	Pass
		1745	-1.51	3.91	28.24	22.82	191.426	Horizontal	Pass
		1778.5	-1.53	3.94	28.25	22.78	189.671	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-1.50	3.77	28.31	23.04	201.372	Horizontal	Pass
		1745	-1.18	3.91	28.22	23.13	205.589	Horizontal	Pass
		1777.5	-1.24	3.94	28.2	23.02	200.447	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-1.39	3.79	28.33	23.15	206.538	Horizontal	Pass
		1745	-1.12	3.95	28.22	23.15	206.538	Horizontal	Pass
		1775	-1.13	3.97	28.19	23.09	203.704	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-1.41	3.79	28.34	23.14	206.063	Horizontal	Pass
		1745	-1.22	3.95	28.22	23.05	201.837	Horizontal	Pass
		1772.5	-1.17	3.97	28.18	23.04	201.372	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-1.38	3.81	28.35	23.16	207.014	Horizontal	Pass
		1745	-1.12	3.96	28.22	23.14	206.063	Horizontal	Pass
		1770	-1.14	4	28.16	23.02	200.447	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-2.74	3.76	28.24	21.74	149.279	Vertical	Pass
		1745	-2.14	3.91	28.22	22.17	164.816	Vertical	Pass
		1779.3	-2.15	3.93	28.2	22.12	162.930	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.72	3.77	28.23	21.74	149.279	Vertical	Pass
		1745	-1.93	3.91	28.24	22.40	173.780	Vertical	Pass
		1778.5	-2.01	3.94	28.25	22.30	169.824	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.49	3.77	28.31	22.05	160.325	Vertical	Pass
		1745	-2.82	3.91	28.22	21.49	140.929	Vertical	Pass
		1777.5	-2.08	3.94	28.2	22.18	165.196	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.30	3.79	28.34	22.25	167.880	Vertical	Pass
		1745	-2.18	3.95	28.22	22.09	161.808	Vertical	Pass

		1775	-2.16	3.97	28.18	22.05	160.325	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-2.14	3.81	28.35	22.40	173.780	Vertical	Pass
		1745	-2.33	3.96	28.22	21.93	155.955	Vertical	Pass
		1772.5	-2.01	4	28.16	22.15	164.059	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.90	3.79	28.34	21.65	146.218	Vertical	Pass
		1745	-2.54	3.95	28.22	21.73	148.936	Vertical	Pass
		1770	-1.96	3.97	28.18	22.25	167.880	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-2.37	3.76	28.24	22.11	162.555	Horizontal	Pass
1745		-1.98	3.91	28.22	22.33	171.002	Horizontal	Pass	
1779.3		-2.16	3.93	28.2	22.11	162.555	Horizontal	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.76	3.77	28.23	21.70	147.911	Horizontal	Pass
1745		-2.01	3.91	28.24	22.32	170.608	Horizontal	Pass	
1778.5		-2.30	3.94	28.25	22.01	158.855	Horizontal	Pass	
5.0MHz Band 16 QAM	1/#Mid	1712.5	-2.18	3.77	28.31	22.36	172.187	Horizontal	Pass
1745		-2.24	3.91	28.22	22.07	161.065	Horizontal	Pass	
1777.5		-1.91	3.94	28.2	22.35	171.791	Horizontal	Pass	
10.0MHz Band 16 QAM	1/#Mid	1715	-2.23	3.79	28.33	22.31	170.216	Horizontal	Pass
1745		-1.89	3.95	28.22	22.38	172.982	Horizontal	Pass	
1775		-2.21	3.97	28.19	22.01	158.855	Horizontal	Pass	
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.22	3.79	28.34	22.33	171.002	Horizontal	Pass
1745		-2.04	3.95	28.22	22.23	167.109	Horizontal	Pass	
1772.5		-1.83	3.97	28.18	22.38	172.982	Horizontal	Pass	
20.0MHz Band 16 QAM	1/#Mid	1720	-2.05	3.81	28.35	22.49	177.419	Horizontal	Pass
1745		-1.83	3.96	28.22	22.43	174.985	Horizontal	Pass	
1770		-1.77	4	28.16	22.39	173.380	Horizontal	Pass	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-2.70	3.76	28.24	21.78	150.661	Vertical	Pass
1745		-2.36	3.91	28.22	21.95	156.675	Vertical	Pass	
1779.3		-3.66	3.93	28.2	20.61	115.080	Vertical	Pass	
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.83	3.77	28.23	21.63	145.546	Vertical	Pass
1745		-3.83	3.91	28.24	20.50	112.202	Vertical	Pass	
1778.5		-2.50	3.94	28.25	21.81	151.705	Vertical	Pass	
5.0MHz Band 16 QAM	1/#Mid	1712.5	-3.20	3.77	28.31	21.34	136.144	Vertical	Pass
1745		-3.80	3.91	28.22	20.51	112.460	Vertical	Pass	
1777.5		-2.65	3.94	28.2	21.61	144.877	Vertical	Pass	
10.0MHz Band 16 QAM	1/#Mid	1715	-2.37	3.79	28.34	22.18	165.196	Vertical	Pass
1745		-2.17	3.95	28.22	22.10	162.181	Vertical	Pass	
1775		-2.17	3.97	28.18	22.04	159.956	Vertical	Pass	
15.0MHz Band 16	1/#Mid	1717.5	-3.63	3.81	28.35	20.91	123.310	Vertical	Pass
1745		-3.61	3.96	28.22	20.65	116.145	Vertical	Pass	

QAM		1772.5	-2.84	4	28.16	21.32	135.519	Vertical	Pass
20.0MHz	1/#Mid	1720	-3.94	3.79	28.34	20.61	115.080	Vertical	Pass
Band 16		1745	-3.51	3.95	28.22	20.76	119.124	Vertical	Pass
QAM		1770	-3.36	3.97	28.18	20.85	121.619	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: §2.1051, §22.917(a), §24.238(a), §27.53(c)(g)(h)(m)

LIMIT

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

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

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

- ☐ LTE Band2
LTE Band 4
- ☐ LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17
LTE Band 66

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	-48.41	4.04	33.51	-18.94	-13	-5.94	Horizontal
3701.4	-53.97	4.04	33.51	-24.50	-13	-11.50	Vertical
5552.1	-48.42	5.24	35.84	-17.82	-13	-4.82	Vertical
5552.1	-53.79	5.24	35.84	-23.19	-13	-10.19	Horizontal
205.4	-39.82	1.43	16.02	-25.23	-13	-12.23	Vertical
342.6	-34.34	1.30	17.99	-17.65	-13	-4.65	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.70	4.04	33.56	-18.18	-13	-5.18	Horizontal
3760.0	-46.11	4.04	33.56	-16.59	-13	-3.59	Vertical
5640.0	-49.07	5.24	35.91	-18.40	-13	-5.40	Vertical
5640.0	-49.55	5.24	35.91	-18.88	-13	-5.88	Horizontal
190.4	-38.04	1.62	16.97	-22.69	-13	-9.69	Vertical
463.5	-39.62	1.74	15.98	-25.39	-13	-12.39	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.41	4.04	34.00	-17.45	-13	-4.45	Horizontal
3818.6	-52.76	4.04	34.00	-22.80	-13	-9.80	Vertical
5727.9	-49.45	5.24	36.04	-18.65	-13	-5.65	Vertical
5727.9	-53.04	5.24	36.04	-22.24	-13	-9.24	Horizontal
176.2	-43.38	1.42	17.29	-27.51	-13	-14.51	Vertical
353.2	-40.36	1.50	17.90	-23.95	-13	-10.95	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	-50.63	4.07	33.54	-21.16	-13	-8.16	Horizontal
3720.0	-51.83	4.07	33.54	-22.36	-13	-9.36	Vertical
5580.0	-47.11	5.28	35.86	-16.53	-13	-3.53	Vertical
5580.0	-51.71	5.28	35.86	-21.13	-13	-8.13	Horizontal
198.4	-39.06	1.58	16.89	-23.74	-13	-10.74	Vertical
324.8	-38.03	1.76	17.26	-22.53	-13	-9.53	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.34	4.04	33.56	-19.82	-13	-6.82	Horizontal
3760.0	-50.83	4.04	33.56	-21.31	-13	-8.31	Vertical
5640.0	-49.46	5.24	35.91	-18.79	-13	-5.79	Vertical
5640.0	-50.55	5.24	35.91	-19.88	-13	-6.88	Horizontal
205.0	-35.53	1.46	16.27	-20.72	-13	-7.72	Vertical
450.0	-44.44	1.59	15.15	-30.88	-13	-17.88	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-49.30	4.04	34.00	-19.34	-13	-6.34	Horizontal
3800.0	-51.11	4.04	34.00	-21.15	-13	-8.15	Vertical
5700.0	-45.70	5.24	36.04	-14.90	-13	-1.90	Vertical
5700.0	-52.12	5.24	36.04	-21.32	-13	-8.32	Horizontal
209.4	-39.74	1.36	17.39	-23.70	-13	-10.70	Vertical
383.5	-35.87	1.66	15.39	-22.14	-13	-9.14	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

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	-49.11	4.02	29.80	-23.33	-13	-10.33	Horizontal
3421.4	-45.58	4.02	29.80	-19.80	-13	-6.80	Vertical
5132.1	-51.91	5.24	35.84	-21.31	-13	-8.31	Vertical
5132.1	-52.88	5.24	35.84	-22.28	-13	-9.28	Horizontal
211.3	-35.88	1.68	16.04	-21.52	-13	-8.52	Vertical
375.9	-41.87	1.78	17.74	-25.91	-13	-12.91	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-52.47	4.03	30.00	-26.50	-13	-13.50	Horizontal
3465.0	-52.97	4.03	30.00	-27.00	-13	-14.00	Vertical
5197.5	-46.14	5.25	35.86	-15.53	-13	-2.53	Vertical
5197.5	-51.46	5.25	35.86	-20.85	-13	-7.85	Horizontal
211.0	-38.42	1.72	17.69	-22.45	-13	-9.45	Vertical
332.0	-39.03	1.62	16.02	-24.62	-13	-11.62	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-53.83	4.05	30.01	-27.87	-13	-14.87	Horizontal
3508.6	-48.48	4.05	30.01	-22.52	-13	-9.52	Vertical
5262.9	-47.65	5.26	35.86	-17.05	-13	-4.05	Vertical
5262.9	-49.03	5.26	35.86	-18.43	-13	-5.43	Horizontal
189.6	-41.06	1.80	16.69	-26.17	-13	-13.17	Vertical
423.6	-38.81	1.75	16.66	-23.91	-13	-10.91	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	-46.59	4.02	29.80	-20.81	-13	-7.81	Horizontal
3440.0	-52.40	4.02	29.80	-26.62	-13	-13.62	Vertical
5160.0	-52.58	5.24	35.84	-21.98	-13	-8.98	Vertical
5160.0	-50.08	5.24	35.84	-19.48	-13	-6.48	Horizontal
185.5	-35.99	1.57	17.26	-20.30	-13	-7.30	Vertical
367.7	-40.46	1.78	16.35	-25.89	-13	-12.89	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.47	4.03	30.00	-23.50	-13	-10.50	Horizontal
3465.0	-51.50	4.03	30.00	-25.53	-13	-12.53	Vertical
5197.5	-45.90	5.25	35.86	-15.29	-13	-2.29	Vertical
5197.5	-51.00	5.25	35.86	-20.39	-13	-7.39	Horizontal
206.3	-38.32	1.44	17.95	-21.81	-13	-8.81	Vertical
280.0	-40.53	1.65	16.09	-26.09	-13	-13.09	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-53.73	2.91	27.68	-28.96	-13	-15.96	Horizontal
3490.0	-49.53	2.91	27.68	-24.76	-13	-11.76	Vertical
5235.0	-51.26	5.26	35.86	-20.66	-13	-7.66	Vertical
5235.0	-50.12	5.26	35.86	-19.52	-13	-6.52	Horizontal
212.0	-43.22	1.61	16.85	-27.98	-13	-14.98	Vertical
405.7	-43.46	1.61	15.19	-29.88	-13	-16.88	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

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	-53.55	2.78	27.50	-28.83	-13	-15.83	Horizontal
1649.4	-48.21	2.78	27.50	-23.49	-13	-10.49	Vertical
2474.1	-50.64	2.90	27.80	-25.74	-13	-12.74	Vertical
2474.1	-49.34	2.90	27.80	-24.44	-13	-11.44	Horizontal
195.3	-37.51	1.76	17.59	-21.68	-13	-8.68	Vertical
422.7	-40.94	1.63	15.87	-26.70	-13	-13.70	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-45.83	2.80	27.48	-21.15	-13	-8.15	Horizontal
1673.0	-48.55	2.80	27.48	-23.87	-13	-10.87	Vertical
2509.5	-50.38	2.91	27.70	-25.59	-13	-12.59	Vertical
2509.5	-53.77	2.91	27.70	-28.98	-13	-15.98	Horizontal
204.6	-37.80	1.61	15.68	-23.73	-13	-10.73	Vertical
308.3	-44.02	1.59	17.52	-28.10	-13	-15.10	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-45.51	2.82	27.43	-20.90	-13	-7.90	Horizontal
1696.6	-53.52	2.82	27.43	-28.91	-13	-15.91	Vertical
2544.9	-50.67	2.92	27.74	-25.85	-13	-12.85	Vertical
2544.9	-49.17	2.92	27.74	-24.35	-13	-11.35	Horizontal
201.1	-38.30	1.69	16.67	-23.31	-13	-10.31	Vertical
461.4	-39.48	1.70	17.18	-24.00	-13	-11.00	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	-50.19	2.78	27.50	-25.47	-13	-12.47	Horizontal
1658.0	-53.00	2.78	27.50	-28.28	-13	-15.28	Vertical
2487.0	-53.07	2.90	27.80	-28.17	-13	-15.17	Vertical
2487.0	-50.20	2.90	27.80	-25.30	-13	-12.30	Horizontal
181.9	-35.25	1.71	15.57	-21.39	-13	-8.39	Vertical
255.2	-41.38	1.34	16.40	-26.32	-13	-13.32	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-50.50	2.80	27.48	-25.82	-13	-12.82	Horizontal
1673.0	-50.53	2.80	27.48	-25.85	-13	-12.85	Vertical
2509.5	-45.26	2.91	27.70	-20.47	-13	-7.47	Vertical
2509.5	-51.16	2.91	27.70	-26.37	-13	-13.37	Horizontal
204.6	-37.87	1.44	17.04	-22.27	-13	-9.27	Vertical
300.7	-39.49	1.76	17.62	-23.63	-13	-10.63	Horizontal
Test Results for High Channel 844MHz							
1688.0	-46.72	2.82	27.43	-22.11	-13	-9.11	Horizontal
1688.0	-50.99	2.82	27.43	-26.38	-13	-13.38	Vertical
2532.0	-46.91	2.92	27.74	-22.09	-13	-9.09	Vertical
2532.0	-49.88	2.92	27.74	-25.06	-13	-12.06	Horizontal
197.3	-36.49	1.74	17.70	-20.53	-13	-7.53	Vertical
272.8	-34.37	1.41	17.46	-18.31	-13	-5.31	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

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	-62.65	5.23	35.81	-32.07	-25	-7.07	Horizontal
5005.0	-60.16	5.23	35.81	-29.58	-25	-4.58	Vertical
7507.5	-63.33	5.67	36.85	-32.15	-25	-7.15	Vertical
7507.5	-62.53	5.67	36.85	-31.35	-25	-6.35	Horizontal
184.7	-51.38	1.73	17.97	-35.14	-25	-10.14	Vertical
328.0	-54.39	1.38	15.11	-40.66	-25	-15.66	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-62.94	5.23	35.82	-32.35	-25	-7.35	Horizontal
5070.0	-63.46	5.23	35.82	-32.87	-25	-7.87	Vertical
7605.0	-63.30	5.67	36.85	-32.12	-25	-7.12	Vertical
7605.0	-64.98	5.67	36.85	-33.80	-25	-8.80	Horizontal
199.3	-47.71	1.77	16.17	-33.30	-25	-8.30	Vertical
372.0	-53.06	1.63	15.21	-39.48	-25	-14.48	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.31	5.24	35.83	-32.72	-25	-7.72	Horizontal
5135.0	-59.65	5.24	35.83	-29.06	-25	-4.06	Vertical
7702.5	-61.63	5.68	36.87	-30.44	-25	-5.44	Vertical
7702.5	-60.81	5.68	36.87	-29.62	-25	-4.62	Horizontal
188.2	-52.80	1.58	17.56	-36.82	-25	-11.82	Vertical
284.1	-45.85	1.45	16.58	-30.72	-25	-5.72	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	-63.73	5.23	35.82	-33.14	-25	-8.14	Horizontal
5020.0	-64.44	5.23	35.82	-33.85	-25	-8.85	Vertical
7530.0	-59.42	5.67	36.86	-28.23	-25	-3.23	Vertical
7530.0	-63.82	5.67	36.86	-32.63	-25	-7.63	Horizontal
184.6	-51.72	1.63	15.76	-37.59	-25	-12.59	Vertical
270.5	-54.45	1.71	15.44	-40.72	-25	-15.72	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.56	5.23	35.82	-29.97	-25	-4.97	Horizontal
5070.0	-63.32	5.23	35.82	-32.73	-25	-7.73	Vertical
7605.0	-61.21	5.67	36.85	-30.03	-25	-5.03	Vertical
7605.0	-63.17	5.67	36.85	-31.99	-25	-6.99	Horizontal
193.7	-53.87	1.79	16.84	-38.81	-25	-13.81	Vertical
402.8	-53.98	1.71	17.64	-38.05	-25	-13.05	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-63.52	5.24	35.83	-32.93	-25	-7.93	Horizontal
5120.0	-63.48	5.24	35.83	-32.89	-25	-7.89	Vertical
7680.0	-64.27	5.70	36.88	-33.09	-25	-8.09	Vertical
7680.0	-60.75	5.70	36.88	-29.57	-25	-4.57	Horizontal
184.4	-47.69	1.79	16.84	-32.63	-25	-7.63	Vertical
464.1	-49.94	1.71	17.64	-34.01	-25	-9.01	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

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	-48.84	2.60	27.20	-24.24	-13	-11.24	Horizontal
1399.4	-53.77	2.60	27.20	-29.17	-13	-16.17	Vertical
2099.1	-50.28	2.85	27.54	-25.59	-13	-12.59	Vertical
2099.1	-53.86	2.85	27.54	-29.17	-13	-16.17	Horizontal
199.4	-36.32	1.49	17.78	-20.03	-13	-7.03	Vertical
447.8	-44.74	1.36	17.33	-28.77	-13	-15.77	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.76	2.61	27.28	-20.09	-13	-7.09	Horizontal
1415.0	-52.30	2.61	27.28	-27.63	-13	-14.63	Vertical
2122.5	-53.97	2.87	27.59	-29.25	-13	-16.25	Vertical
2122.5	-49.75	2.87	27.59	-25.03	-13	-12.03	Horizontal
190.6	-36.28	1.73	15.74	-22.27	-13	-9.27	Vertical
432.9	-44.66	1.62	15.79	-30.49	-13	-17.49	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.60	2.63	27.28	-27.95	-13	-14.95	Horizontal
1430.6	-49.65	2.63	27.28	-25.00	-13	-12.00	Vertical
2145.9	-46.42	2.88	27.60	-21.70	-13	-8.70	Vertical
2145.9	-50.69	2.88	27.60	-25.97	-13	-12.97	Horizontal
178.5	-39.10	1.61	18.00	-22.71	-13	-9.71	Vertical
268.6	-42.48	1.45	15.49	-28.45	-13	-15.45	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	-46.01	2.61	27.26	-21.36	-13	-8.36	Horizontal
1408.0	-49.46	2.61	27.26	-24.81	-13	-11.81	Vertical
2112.0	-49.66	2.87	27.58	-24.95	-13	-11.95	Vertical
2112.0	-52.27	2.87	27.58	-27.56	-13	-14.56	Horizontal
200.2	-43.30	1.31	16.97	-27.64	-13	-14.64	Vertical
282.4	-37.04	1.65	16.70	-21.99	-13	-8.99	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-47.88	2.61	27.28	-23.21	-13	-10.21	Horizontal
1415.0	-46.63	2.61	27.28	-21.96	-13	-8.96	Vertical
2122.5	-52.20	2.87	27.59	-27.48	-13	-14.48	Vertical
2122.5	-52.34	2.87	27.59	-27.62	-13	-14.62	Horizontal
196.0	-40.46	1.72	17.99	-24.19	-13	-11.19	Vertical
326.5	-35.99	1.73	17.94	-19.78	-13	-6.78	Horizontal
Test Results for High Channel 711MHz							
1422.0	-53.97	2.62	27.28	-29.31	-13	-16.31	Horizontal
1422.0	-44.27	2.62	27.28	-19.61	-13	-6.61	Vertical
2133.0	-52.29	2.87	27.60	-27.56	-13	-14.56	Vertical
2133.0	-51.77	2.87	27.60	-27.04	-13	-14.04	Horizontal
201.2	-40.51	1.58	15.93	-26.16	-13	-13.16	Vertical
468.4	-37.43	1.36	15.59	-23.20	-13	-10.20	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

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	-46.55	2.61	27.28	-21.88	-13	-8.88	Horizontal
1413.0	-47.13	2.61	27.28	-22.46	-13	-9.46	Vertical
2119.5	-48.03	2.87	27.59	-23.31	-13	-10.31	Vertical
2119.5	-51.35	2.87	27.59	-26.63	-13	-13.63	Horizontal
184.7	-39.25	1.71	16.15	-24.81	-13	-11.81	Vertical
298.2	-38.30	1.41	17.32	-22.39	-13	-9.39	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-50.94	2.62	27.30	-26.26	-13	-13.26	Horizontal
1420.0	-44.02	2.62	27.30	-19.34	-13	-6.34	Vertical
2130.0	-44.96	2.87	27.62	-20.21	-13	-7.21	Vertical
2130.0	-52.92	2.87	27.62	-28.17	-13	-15.17	Horizontal
193.4	-42.85	1.42	15.25	-29.03	-13	-16.03	Vertical
329.3	-35.65	1.36	17.19	-19.82	-13	-6.82	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-47.77	2.66	27.28	-23.15	-13	-10.15	Horizontal
1427.0	-46.44	2.66	27.28	-21.82	-13	-8.82	Vertical
2140.5	-51.25	2.88	27.60	-26.53	-13	-13.53	Vertical
2140.5	-50.17	2.88	27.60	-25.45	-13	-12.45	Horizontal
177.1	-37.39	1.32	17.29	-21.42	-13	-8.42	Vertical
292.2	-43.52	1.72	16.89	-28.35	-13	-15.35	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	-49.73	2.62	27.30	-25.05	-13	-12.05	Horizontal
1418.0	-51.75	2.62	27.30	-27.07	-13	-14.07	Vertical
2127.0	-47.76	2.87	27.62	-23.01	-13	-10.01	Vertical
2127.0	-50.89	2.87	27.62	-26.14	-13	-13.14	Horizontal
184.0	-35.24	1.35	16.91	-19.68	-13	-6.68	Vertical
344.6	-36.20	1.62	16.31	-21.51	-13	-8.51	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-47.01	2.62	27.30	-22.33	-13	-9.33	Horizontal
1420.0	-48.71	2.62	27.30	-24.03	-13	-11.03	Vertical
2130.0	-45.75	2.87	27.62	-21.00	-13	-8.00	Vertical
2130.0	-50.29	2.87	27.62	-25.54	-13	-12.54	Horizontal
191.1	-35.18	1.51	17.14	-19.55	-13	-6.55	Vertical
270.0	-34.50	1.77	16.88	-19.39	-13	-6.39	Horizontal
Test Results for High Channel 711MHz							
1422.0	-48.17	2.62	27.30	-23.49	-13	-10.49	Horizontal
1422.0	-52.34	2.62	27.30	-27.66	-13	-14.66	Vertical
2133.0	-48.32	2.87	27.62	-23.57	-13	-10.57	Vertical
2133.0	-52.37	2.87	27.62	-27.62	-13	-14.62	Horizontal
181.2	-41.87	1.78	15.95	-27.70	-13	-14.70	Vertical
307.1	-35.24	1.34	17.95	-18.64	-13	-5.64	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

9.7 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (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	-54.20	4.02	29.80	-28.42	-13	-15.42	Horizontal
3421.4	-50.26	4.02	29.80	-24.48	-13	-11.48	Vertical
5132.1	-50.29	5.24	35.84	-19.69	-13	-6.69	Vertical
5132.1	-52.18	5.24	35.84	-21.58	-13	-8.58	Horizontal
112.6	-51.77	1.52	15.57	-37.72	-13	-24.72	Vertical
220.5	-47.13	1.33	17.14	-31.32	-13	-18.32	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-46.36	4.03	30.00	-20.39	-13	-7.39	Horizontal
3490.0	-49.82	4.03	30.00	-23.85	-13	-10.85	Vertical
5235.0	-53.78	5.25	35.86	-23.17	-13	-10.17	Vertical
5235.0	-50.02	5.25	35.86	-19.41	-13	-6.41	Horizontal
157.3	-49.28	1.53	17.13	-33.68	-13	-20.68	Vertical
213.1	-47.90	1.41	15.95	-33.36	-13	-20.36	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-44.02	4.05	30.01	-18.06	-13	-5.06	Horizontal
3558.6	-48.76	4.05	30.01	-22.80	-13	-9.80	Vertical
5337.9	-53.94	5.26	35.86	-23.34	-13	-10.34	Vertical
5337.9	-53.06	5.26	35.86	-22.46	-13	-9.46	Horizontal
170.6	-47.81	1.44	15.51	-33.74	-13	-20.74	Vertical
169.0	-52.04	1.78	15.76	-38.06	-13	-25.06	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (20MHZ 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	-51.60	4.02	29.80	-25.82	-13	-12.82	Horizontal
3440.0	-51.22	4.02	29.80	-25.44	-13	-12.44	Vertical
5160.0	-53.48	5.24	35.84	-22.88	-13	-9.88	Vertical
5160.0	-53.47	5.24	35.84	-22.87	-13	-9.87	Horizontal
268.8	-51.56	1.62	17.02	-36.16	-13	-23.16	Vertical
161.4	-53.70	1.32	17.31	-37.71	-13	-24.71	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-50.45	4.03	30.00	-24.48	-13	-11.48	Horizontal
3490.0	-53.73	4.03	30.00	-27.76	-13	-14.76	Vertical
5235.0	-54.52	5.25	35.86	-23.91	-13	-10.91	Vertical
5235.0	-47.41	5.25	35.86	-16.80	-13	-3.80	Horizontal
159.9	-48.62	1.45	15.17	-34.90	-13	-21.90	Vertical
172.1	-45.24	1.48	17.82	-28.90	-13	-15.90	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-52.46	2.91	27.68	-27.69	-13	-14.69	Horizontal
3540.0	-46.48	2.91	27.68	-21.71	-13	-8.71	Vertical
5310.0	-52.39	5.26	35.86	-21.79	-13	-8.79	Vertical
5310.0	-49.74	5.26	35.86	-19.14	-13	-6.14	Horizontal
197.3	-45.40	1.76	16.38	-30.78	-13	-17.78	Vertical
158.5	-51.85	1.43	17.13	-36.15	-13	-23.15	Horizontal

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

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

10. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 34V, 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 Band2
LTE Band 4
- ☐ LTE Band5
LTE Band 7
LTE Band 12
LTE Band 17
LTE Band 66

RESULTS

See the following pages.

10.1 LTE BAND 2

Band 2 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1880	12.5	0.006655	2.5
3.85	1880	13.5	0.007200	2.5
4.2	1880	13.7	0.007274	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.8	0.006793	2.5
Extreme (50C)	1880	11.7	0.006213	2.5
Extreme (40C)	1880	13.3	0.007091	2.5
Extreme (30C)	1880	13.6	0.007259	2.5
Extreme (10C)	1880	13.5	0.007189	2.5
Extreme (0C)	1880	12.5	0.006629	2.5
Extreme (-10C)	1880	13.4	0.007132	2.5
Extreme (-20C)	1880	13.9	0.007380	2.5
Extreme (-30C)	1880	14.2	0.007554	2.5

Band 2 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1880	9.7	0.005154	2.5
3.85	1880	8.8	0.004683	2.5
4.2	1880	7.6	0.004043	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.2	0.004917	2.5
Extreme (50C)	1880	9.3	0.004947	2.5
Extreme (40C)	1880	8.1	0.004309	2.5
Extreme (30C)	1880	9.0	0.004814	2.5
Extreme (10C)	1880	9.3	0.004949	2.5
Extreme (0C)	1880	8.2	0.004367	2.5
Extreme (-10C)	1880	8.8	0.004661	2.5
Extreme (-20C)	1880	9.0	0.004780	2.5
Extreme (-30C)	1880	8.5	0.004512	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

Band 4 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1732.5	8.8	0.005096	2.5
3.85	1732.5	8.9	0.005134	2.5
4.2	1732.5	8.7	0.005017	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.9	0.005113	2.5
Extreme (50C)	1732.5	9.3	0.005388	2.5
Extreme (40C)	1732.5	7.0	0.004031	2.5
Extreme (30C)	1732.5	5.4	0.003124	2.5
Extreme (10C)	1732.5	6.8	0.003938	2.5
Extreme (0C)	1732.5	9.2	0.005338	2.5
Extreme (-10C)	1732.5	8.5	0.004902	2.5
Extreme (-20C)	1732.5	6.6	0.003835	2.5
Extreme (-30C)	1732.5	8.6	0.004954	2.5

Band 4 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1732.5	9.9	0.005704	2.5
3.85	1732.5	8.9	0.005131	2.5
4.2	1732.5	7.6	0.004393	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.7	0.005613	2.5
Extreme (50C)	1732.5	9.1	0.005248	2.5
Extreme (40C)	1732.5	7.9	0.004581	2.5
Extreme (30C)	1732.5	8.6	0.004957	2.5
Extreme (10C)	1732.5	9.1	0.005258	2.5
Extreme (0C)	1732.5	7.6	0.004389	2.5
Extreme (-10C)	1732.5	9.2	0.005316	2.5
Extreme (-20C)	1732.5	8.6	0.004985	2.5
Extreme (-30C)	1732.5	8.6	0.004950	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

Band 5 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	836.5	6.0	0.007213	2.5
3.85	836.5	6.9	0.008209	2.5
4.2	836.5	4.4	0.005290	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.1	0.007286	2.5
Extreme (50C)	836.5	6.1	0.007242	2.5
Extreme (40C)	836.5	6.2	0.007381	2.5
Extreme (30C)	836.5	6.5	0.007801	2.5
Extreme (10C)	836.5	5.7	0.006821	2.5
Extreme (0C)	836.5	4.9	0.005819	2.5
Extreme (-10C)	836.5	5.2	0.006261	2.5
Extreme (-20C)	836.5	5.9	0.007040	2.5
Extreme (-30C)	836.5	6.1	0.007233	2.5

Band 5 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	836.5	6.3	0.007514	2.5
3.85	836.5	6.3	0.007524	2.5
4.2	836.5	5.0	0.006031	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.7	0.006798	2.5
Extreme (50C)	836.5	6.3	0.007502	2.5
Extreme (40C)	836.5	5.8	0.006929	2.5
Extreme (30C)	836.5	6.1	0.007348	2.5
Extreme (10C)	836.5	5.4	0.006406	2.5
Extreme (0C)	836.5	5.7	0.006846	2.5
Extreme (-10C)	836.5	5.4	0.006452	2.5
Extreme (-20C)	836.5	6.3	0.007528	2.5
Extreme (-30C)	836.5	6.6	0.007835	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

Band 7 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	2535	9.7	0.003808	2.5
3.85	2535	9.1	0.003595	2.5
4.2	2535	8.4	0.003307	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.2	0.003638	2.5
Extreme (50C)	2535	8.9	0.003505	2.5
Extreme (40C)	2535	7.9	0.003118	2.5
Extreme (30C)	2535	8.8	0.003464	2.5
Extreme (10C)	2535	8.5	0.003353	2.5
Extreme (0C)	2535	8.4	0.003327	2.5
Extreme (-10C)	2535	9.1	0.003584	2.5
Extreme (-20C)	2535	8.7	0.003436	2.5
Extreme (-30C)	2535	7.9	0.003122	2.5

Band 7 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	2535	6.9	0.002722	2.5
3.85	2535	6.7	0.002654	2.5
4.2	2535	5.6	0.002200	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.5	0.002188	2.5
Extreme (40C)	2535	5.6	0.002206	2.5
Extreme (30C)	2535	6.4	0.002519	2.5
Extreme (10C)	2535	5.7	0.002262	2.5
Extreme (0C)	2535	4.7	0.001848	2.5
Extreme (-10C)	2535	5.1	0.002001	2.5
Extreme (-20C)	2535	6.1	0.002393	2.5
Extreme (-30C)	2535	5.8	0.002275	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

Band 12 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	707.5	9.1	0.012838	2.5
3.85	707.5	10.0	0.014101	2.5
4.2	707.5	8.5	0.012049	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	9.2	0.012988	2.5
Extreme (50C)	707.5	7.1	0.010025	2.5
Extreme (40C)	707.5	7.7	0.010865	2.5
Extreme (30C)	707.5	8.3	0.011714	2.5
Extreme (10C)	707.5	7.0	0.009904	2.5
Extreme (0C)	707.5	9.2	0.012973	2.5
Extreme (-10C)	707.5	8.4	0.011859	2.5
Extreme (-20C)	707.5	8.8	0.012509	2.5
Extreme (-30C)	707.5	7.3	0.010366	2.5

Band 12 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	707.5	7.2	0.010237	2.5
3.85	707.5	8.6	0.012173	2.5
4.2	707.5	7.4	0.010528	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
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

Band 17 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	710.0	9.4	0.013277	2.5
3.85	710.0	9.2	0.012895	2.5
4.2	710.0	8.4	0.011862	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.9	0.014007	2.5
Extreme (50C)	710.0	9.0	0.012647	2.5
Extreme (40C)	710.0	8.2	0.011614	2.5
Extreme (30C)	710.0	8.7	0.012314	2.5
Extreme (10C)	710.0	8.4	0.011886	2.5
Extreme (0C)	710.0	8.1	0.011340	2.5
Extreme (-10C)	710.0	8.8	0.012423	2.5
Extreme (-20C)	710.0	8.9	0.012474	2.5
Extreme (-30C)	710.0	7.6	0.010749	2.5

Band 17 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	710.0	9.7	0.013672	2.5
3.85	710.0	9.3	0.013063	2.5
4.2	710.0	8.3	0.011755	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.9	0.013925	2.5
Extreme (50C)	710.0	8.7	0.012314	2.5
Extreme (40C)	710.0	8.7	0.012189	2.5
Extreme (30C)	710.0	8.7	0.012316	2.5
Extreme (10C)	710.0	8.4	0.011766	2.5
Extreme (0C)	710.0	8.8	0.012329	2.5
Extreme (-10C)	710.0	9.6	0.013565	2.5
Extreme (-20C)	710.0	9.2	0.013009	2.5
Extreme (-30C)	710.0	8.2	0.011479	2.5

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

10.7 LTE BAND 66

Band 66 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1745	7.4	0.003915	2.5
3.85	1745	6.8	0.003812	2.5
4.2	1745	7.6	0.004172	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	5.3	0.002985	2.5
Extreme (50C)	1745	8.0	0.004317	2.5
Extreme (40C)	1745	6.4	0.003454	2.5
Extreme (30C)	1745	7.7	0.003974	2.5
Extreme (10C)	1745	8.2	0.004509	2.5
Extreme (0C)	1745	6.9	0.003463	2.5
Extreme (-10C)	1745	6.1	0.003313	2.5
Extreme (-20C)	1745	7.5	0.003852	2.5
Extreme (-30C)	1745	6.3	0.003423	2.5

Band 66 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.4	1745	8.5	0.00462	2.5
3.85	1745	8.0	0.004436	2.5
4.2	1745	9.1	0.005194	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	9.1	0.005061	2.5
Extreme (50C)	1745	8.3	0.004447	2.5
Extreme (40C)	1745	8.3	0.004757	2.5
Extreme (30C)	1745	7.9	0.004539	2.5
Extreme (10C)	1745	8.1	0.004636	2.5
Extreme (0C)	1745	7.5	0.003824	2.5
Extreme (-10C)	1745	8.5	0.004745	2.5
Extreme (-20C)	1745	8.7	0.004918	2.5
Extreme (-30C)	1745	5.8	0.003037	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.

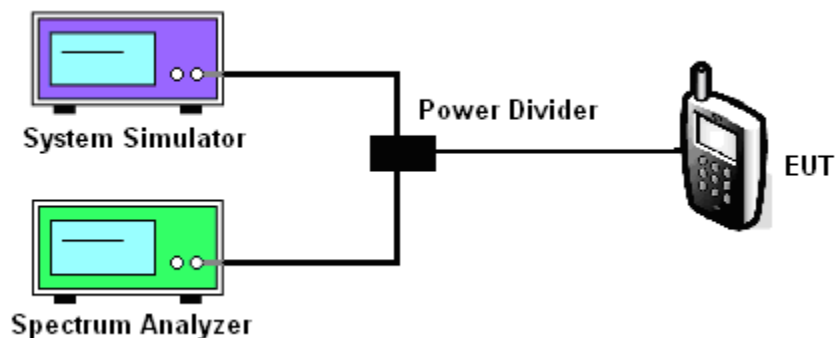
11.2 Measuring Instruments

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 LTE 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 2/4/5/7/12/17/66
- ☐

Test data reference attachment.

-----END OF REPORT-----