FCC CFR47 PART 22H, 24E, 27
CERTIFICATION TEST REPORT
FCC ID: 2AY9QBWC-R3

Product：	Body worn camera
Trade Mark：	YULONG
Model Number：	BWC-R3
Family Model：	BWC-R3S, BWC-R3L, BWC-R5, BWC-R5S, BWC-R5L, BWC-R3H, DSJ-YDTK2A1, DSJ-YDTK3A1, DSJ-YDTK4A1, DSJ-YDTF2A1, DSJ-YDTF3A1, DSJ-YDTF4A1, DSJ-K2 , DSJ-K3, DSJ-K4
Report No.：	S20110700107006

Prepared for

Shenzhen YULONG Digital Technology Co., ltd

601, Building F1,TCL Science Park,No. 1001 Zhongshanyuan Road, Nanshan District,Shenzhen, P.R.China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen YULONG Digital Technology Co., ltd
Address	:	601, Building F1,TCL Science Park,No. 1001 Zhongshanyuan Road, Nanshan District,Shenzhen, P.R.China
Manufacturer's Name	:	Shenzhen YULONG Digital Technology Co., ltd
Address	:	601, Building F1,TCL Science Park,No. 1001 Zhongshanyuan Road, Nanshan District,Shenzhen, P.R.China
Product name	:	Body worn camera
Model and/or type reference	:	BWC-R3, BWC-R3S, BWC-R3L, BWC-R5, BWC-R5S, BWC-R5L, BWC-R3H, DSJ-YDTK2A1, DSJ-YDTK3A1, DSJ-YDTK4A1, DSJ-YDTF2A1, DSJ-YDTF3A1, DSJ-YDTF4A1, DSJ-K2 , DSJ-K3, DSJ-K4
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..... Nov 07. 2020 ~ Mar 08. 2021

Date of Issue..... Mar 08. 2021

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

Testing Engineer : Cheng Jiawen

(Cheng Jiawen)

Technical Manager : Jasonchen

(Jason Chen)

Authorized Signatory : Alex

(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:	Body worn camera
Trade Mark	YULONG
Model Name	BWC-R3
Family Model	BWC-R3S, BWC-R3L, BWC-R5, BWC-R5S, BWC-R5L, BWC-R3H, DSJ-YDTK2A1, DSJ-YDTK3A1, DSJ-YDTK4A1, DSJ-YDTF2A1, DSJ-YDTF3A1, DSJ-YDTF4A1, DSJ-K2 , DSJ-K3, DSJ-K4
Model Difference	All models are the same circuit and RF module, except the model name.
FCC ID:	2AY9QBWC-R3
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 2, 4, 5, 7, 40, 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE TDD Band 40 Uplink: 2305MHz-2315MHz&2350-2360MHz Downlink: 2305MHz-2315MHz&2350-2360MHz(Number Of Channel see note 2) LTE TDD Band 41 Uplink: 2496MHz-2690MHz Downlink: 2496MHz-2690MHz
Type of Modulation:	QPSK/16QAM
Antenna:	monopole Antenna
Antenna gain:	1.5dBi
Power Supply:	DC 3.8V/ 3050mAh from battery or DC 5V from usb port.
Adapter:	N/A
Extreme Vol. Limits:	DC 3.4V to DC 4.4V (Nominal DC 3.8V)（Note 1）
HW Version	V03
SW Version	N/A
** Note1: The High Voltage 4.4V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

Note: 2

Frequency Bands	Modes	Bandwidth (MHz)	CH/Test Frequency(MHz)		
			Low	Middle	High
LTE Band 40 2305-2315MHz	Single Carrier	5	38725/2307.5	38750/2310	38775/2312.5
		10	38750/2310		
LTE Band 40 2350-2360MHz	Single Carrier	5	39175/2352.5	39200/2355	39225/2357.5
		10	39200/2355		

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AY9QBWC-R3** 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 C63.46:2015& 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 40, Band 41.

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

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

1.6 SUMMARY OF TEST RESULTS

FCC Part22, FCC Part24, FCC Part27, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	**Test Item**	**Verdict**	**Remark**
2.1046	Conducted Output Power	PASS	
22.913 24.232 27.50 KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917 24.238 KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917 24.238 27.53 KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913 27.50 KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232 27.50 KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	

2.1053 22.917 24.238 27.53 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 24.238 27.53 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

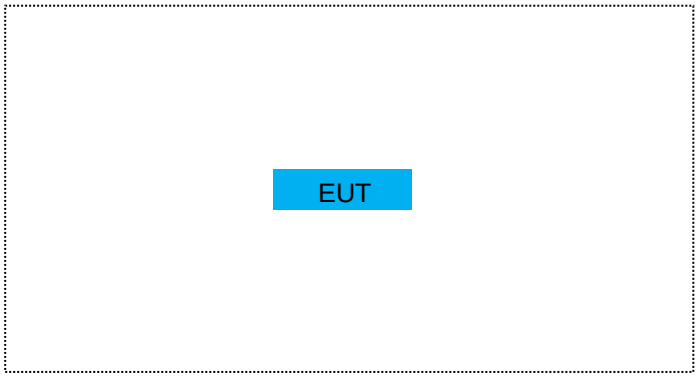
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Body worn camera	BWC-R3	FCC ID: 2AY9QBWC-R3	EUT

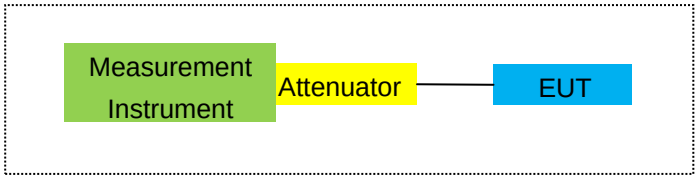
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

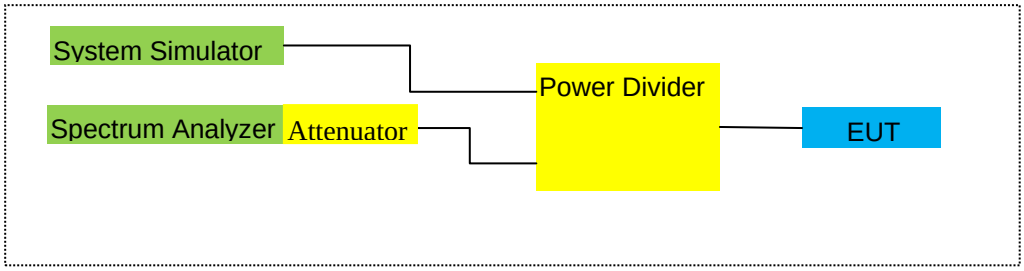
For Radiated Test Cases



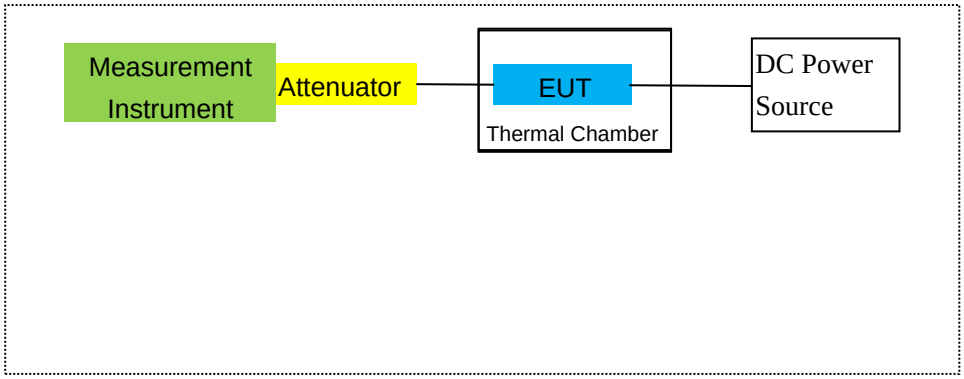
For Conducted Output Power



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	2020.07.13	2021.07.12	1 year
2	Test Receiver	R&S	ESPI	101318	2020.05.11	2021.05.10	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2020.04.11	2021.04.10	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	2020.04.11	2021.04.10	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.07.13	2021.07.12	1 year
7	Amplifier	EM	EM-30180	060538	2020.07.13	2021.07.12	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2020.05.11	2021.05.10	1 year
9	Power Meter	R&S	NRVS	100696	2020.07.13	2021.07.12	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2020.05.11	2021.05.10	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	2020.07.13	2021.07.12	1 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	2020.05.11	2021.05.10	1 year
15	LISN	R&S	ENV216	101313	2020.05.11	2021.05.10	1 year
16	LISN	EMCO	3816/2	00042990	2020.05.11	2021.05.10	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2020.05.11	2021.05.10	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.04.11	2021.04.10	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	2021.05.10	1 year
22	Attenuator	MCE	24-10-34	BN9258	2020.05.11	2021.05.10	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2020.05.11	2021.05.10	1 year
24	test receiver	R&S	ESCI	a0304218	2020.05.11	2021.05.10	1 year
25	Communication Tester	R&S	CMU200	A0304247	2020.07.13	2021.07.12	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2020.05.11	2021.05.10	1 year

27	DC Power Source	N/A	PS-6005D	20170402923	2020.07.13	2021.07.12	1 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2020.07.13	2021.07.12	1 year
29	Communication Tester	R&S	CMW500	148500	2020.05.11	2021.05.10	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 40
- LTE Band 41

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 + log10(P[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 + 10log10(P) = -35dBm 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 2/4/5/7/40/41

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 + log10(P[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 + 10log10(P) = -35dBm 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 40
LTE Band 41

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

Note: The emission level from 5th harmonic up to 10th harmonic frequency range are attenuated more than 20dB below the permissible limit , so it does not reported in the report.

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 40
- LTE Band 41

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-0.05	3.76	28.24	24.43	277.332	Horizontal	Pass
		1880	0.24	3.91	28.22	24.55	285.102	Horizontal	Pass
		1909.3	0.41	3.93	28.20	24.68	293.765	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.10	3.77	28.23	24.36	272.898	Horizontal	Pass
		1880	0.39	3.91	28.24	24.72	296.483	Horizontal	Pass
		1908.5	0.36	3.94	28.25	24.67	293.089	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-0.11	3.77	28.31	24.43	277.332	Horizontal	Pass
		1880	0.32	3.91	28.22	24.63	290.402	Horizontal	Pass
		1907.5	0.40	3.94	28.20	24.66	292.415	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-0.04	3.79	28.33	24.50	281.838	Horizontal	Pass
		1880	0.38	3.95	28.22	24.65	291.743	Horizontal	Pass
		1905	0.40	3.97	28.19	24.62	289.734	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-0.04	3.79	28.34	24.51	282.488	Horizontal	Pass
		1880	0.20	3.95	28.22	24.47	279.898	Horizontal	Pass
		1902.5	0.26	3.97	28.18	24.47	279.898	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	0.01	3.81	28.35	24.55	285.102	Horizontal	Pass
		1880	0.57	3.96	28.22	24.83	304.089	Horizontal	Pass
		1900	0.46	4.00	28.16	24.62	289.734	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-0.02	3.76	28.24	24.46	279.254	Vertical	Pass
		1880	-0.05	3.91	28.22	24.26	266.686	Vertical	Pass
		1909.3	-0.65	3.93	28.20	23.62	230.144	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.39	3.77	28.23	24.07	255.270	Vertical	Pass
		1880	-0.80	3.91	28.24	23.53	225.424	Vertical	Pass
		1908.5	-0.65	3.94	28.25	23.66	232.274	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-1.03	3.77	28.31	23.51	224.388	Vertical	Pass
		1880	0.16	3.91	28.22	24.47	279.898	Vertical	Pass
		1907.5	-0.25	3.94	28.20	24.01	251.768	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-0.06	3.79	28.33	24.48	280.543	Vertical	Pass
		1880	-0.58	3.95	28.22	23.69	233.884	Vertical	Pass
		1905	-0.65	3.97	28.19	23.57	227.510	Vertical	Pass
15.0MHz	1/#Mid	1857.5	-0.93	3.79	28.34	23.62	230.144	Vertical	Pass

Band		1880	-0.62	3.95	28.22	23.65	231.739	Vertical	Pass
QPSK		1902.5	-0.51	3.97	28.18	23.70	234.423	Vertical	Pass
20.0MHz		1860	-0.04	3.81	28.35	24.50	281.838	Vertical	Pass
Band	1/#Mid	1880	-0.13	3.96	28.22	24.13	258.821	Vertical	Pass
QPSK		1900	0.02	4.00	28.16	24.18	261.818	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.97	3.76	28.24	23.51	224.388	Horizontal	Pass
		1880	-0.60	3.91	28.22	23.71	234.963	Horizontal	Pass
		1909.3	-0.39	3.93	28.20	23.88	244.343	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.59	3.77	28.23	23.87	243.781	Horizontal	Pass
		1880	-0.54	3.91	28.24	23.79	239.332	Horizontal	Pass
		1908.5	-0.70	3.94	28.25	23.61	229.615	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-0.73	3.77	28.31	23.81	240.436	Horizontal	Pass
		1880	-0.15	3.91	28.22	24.16	260.615	Horizontal	Pass
		1907.5	-0.10	3.94	28.20	24.16	260.615	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-1.16	3.79	28.33	23.38	217.771	Horizontal	Pass
		1880	-0.22	3.95	28.22	24.05	254.097	Horizontal	Pass
		1905	-0.35	3.97	28.19	23.87	243.781	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-0.94	3.79	28.34	23.61	229.615	Horizontal	Pass
		1880	-0.51	3.95	28.22	23.76	237.684	Horizontal	Pass
		1902.5	-0.54	3.97	28.18	23.67	232.809	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-0.27	3.81	28.35	24.27	267.301	Horizontal	Pass
		1880	-0.31	3.96	28.22	23.95	248.313	Horizontal	Pass
		1900	-0.39	4.00	28.16	23.77	238.232	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-0.28	3.76	28.24	24.20	263.027	Vertical	Pass
		1880	-1.51	3.91	28.22	22.80	190.546	Vertical	Pass
		1909.3	-1.77	3.93	28.20	22.50	177.828	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.46	3.77	28.23	24.00	251.189	Vertical	Pass
		1880	-0.83	3.91	28.24	23.50	223.872	Vertical	Pass
		1908.5	-0.51	3.94	28.25	23.80	239.883	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-1.64	3.77	28.31	22.90	194.984	Vertical	Pass
		1880	-0.91	3.91	28.22	23.40	218.776	Vertical	Pass
		1907.5	-0.56	3.94	28.20	23.70	234.423	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.94	3.79	28.33	23.60	229.087	Vertical	Pass
		1880	-0.37	3.95	28.22	23.90	245.471	Vertical	Pass
		1905	-0.42	3.97	28.19	23.80	239.883	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-0.85	3.79	28.34	23.70	234.423	Vertical	Pass
		1880	-0.27	3.95	28.22	24.00	251.189	Vertical	Pass
		1902.5	-0.21	3.97	28.18	24.00	251.189	Vertical	Pass

20.0MHz Band 16 QAM	1/#Mid	1860	-0.54	3.81	28.35	24.00	251.189	Vertical	Pass
		1880	-1.66	3.96	28.22	22.60	181.970	Vertical	Pass
		1900	-1.16	4.00	28.16	23.00	199.526	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	-0.15	3.12	27.58	24.31	269.774	Horizontal	Pass
		1732.5	-0.05	3.27	27.61	24.29	268.534	Horizontal	Pass
		1754.3	0.09	3.29	27.63	24.43	277.332	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.12	3.13	27.61	24.36	272.898	Horizontal	Pass
		1732.5	-0.02	3.27	27.61	24.32	270.396	Horizontal	Pass
		1753.5	0.10	3.30	27.62	24.42	276.694	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	0.00	3.13	27.63	24.50	281.838	Horizontal	Pass
		1732.5	-0.01	3.27	27.61	24.33	271.019	Horizontal	Pass
		1752.5	0.12	3.30	27.60	24.42	276.694	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.03	3.15	27.64	24.46	279.254	Horizontal	Pass
		1732.5	0.05	3.31	27.61	24.35	272.270	Horizontal	Pass
		1750	0.12	3.33	27.59	24.38	274.157	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.08	3.15	27.65	24.42	276.694	Horizontal	Pass
		1732.5	-0.04	3.31	27.61	24.26	266.686	Horizontal	Pass
		1747.5	0.07	3.33	27.57	24.31	269.774	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.10	3.17	27.66	24.39	274.789	Horizontal	Pass
		1732.5	0.24	3.32	27.61	24.53	283.792	Horizontal	Pass
		1745	0.18	3.36	27.56	24.38	274.157	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-0.33	3.12	27.58	24.13	258.821	Vertical	Pass
		1732.5	-0.71	3.27	27.61	23.63	230.675	Vertical	Pass
		1754.3	0.01	3.29	27.63	24.35	272.270	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.61	3.13	27.61	23.87	243.781	Vertical	Pass
		1732.5	0.08	3.27	27.61	24.42	276.694	Vertical	Pass
		1753.5	-0.12	3.30	27.62	24.20	263.027	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.35	3.13	27.63	24.15	260.016	Vertical	Pass
		1732.5	-0.64	3.27	27.61	23.70	234.423	Vertical	Pass
		1752.5	-0.72	3.30	27.60	23.58	228.034	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.14	3.15	27.64	24.35	272.270	Vertical	Pass
		1732.5	-0.26	3.31	27.61	24.04	253.513	Vertical	Pass
		1750	-0.74	3.33	27.59	23.52	224.905	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1717.5	-0.23	3.15	27.65	24.27	267.301	Vertical	Pass
		1732.5	-0.21	3.31	27.61	24.09	256.448	Vertical	Pass
		1747.5	0.17	3.33	27.57	24.41	276.058	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.52	3.17	27.66	23.97	249.459	Vertical	Pass
		1732.5	-0.77	3.32	27.61	23.52	224.905	Vertical	Pass
		1745	-0.41	3.36	27.56	23.79	239.332	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1710.7	-0.89	3.12	27.58	23.57	227.510	Horizontal	Pass
		1732.5	-0.97	3.27	27.61	23.37	217.270	Horizontal	Pass
		1754.3	-0.82	3.29	27.63	23.52	224.905	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-0.91	3.13	27.61	23.57	227.510	Horizontal	Pass
		1732.5	-1.09	3.27	27.61	23.25	211.349	Horizontal	Pass
		1753.5	-0.45	3.30	27.62	23.87	243.781	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-0.63	3.13	27.63	23.87	243.781	Horizontal	Pass
		1732.5	-0.63	3.27	27.61	23.71	234.963	Horizontal	Pass
		1752.5	-0.55	3.30	27.60	23.75	237.137	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.19	3.15	27.64	23.30	213.796	Horizontal	Pass
		1732.5	-0.55	3.31	27.61	23.75	237.137	Horizontal	Pass
		1750	-0.68	3.33	27.59	23.58	228.034	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-0.96	3.15	27.65	23.54	225.944	Horizontal	Pass
		1732.5	-0.80	3.31	27.61	23.50	223.872	Horizontal	Pass
		1747.5	-0.80	3.33	27.57	23.44	220.800	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-0.64	3.17	27.66	23.85	242.661	Horizontal	Pass
		1732.5	-0.32	3.32	27.61	23.97	249.459	Horizontal	Pass
		1745	-0.58	3.36	27.56	23.62	230.144	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-1.46	3.12	27.58	23.00	199.526	Vertical	Pass
		1732.5	-1.64	3.27	27.61	22.70	186.209	Vertical	Pass
		1754.3	-1.74	3.29	27.63	22.60	181.970	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-1.18	3.13	27.61	23.30	213.796	Vertical	Pass
		1732.5	-1.34	3.27	27.61	23.00	199.526	Vertical	Pass
		1753.5	-0.82	3.30	27.62	23.50	223.872	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-1.60	3.13	27.63	22.90	194.984	Vertical	Pass
		1732.5	-1.44	3.27	27.61	22.90	194.984	Vertical	Pass
		1752.5	-0.90	3.30	27.60	23.40	218.776	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.79	3.15	27.64	22.70	186.209	Vertical	Pass
		1732.5	-1.60	3.31	27.61	22.70	186.209	Vertical	Pass
		1750	-1.16	3.33	27.59	23.10	204.174	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.20	3.15	27.65	23.30	213.796	Vertical	Pass
		1732.5	-1.30	3.31	27.61	23.00	199.526	Vertical	Pass
		1747.5	-1.14	3.33	27.57	23.10	204.174	Vertical	Pass

20.0MHz Band 16 QAM	1/#Mid	1720	-1.39	3.17	27.66	23.10	204.174	Vertical	Pass
		1732.5	-1.59	3.32	27.61	22.70	186.209	Vertical	Pass
		1745	-0.70	3.36	27.56	23.50	223.872	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 Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	3/#Mid	824.7	8.54	2.01	19.68	2.15	24.06	254.683	Horizontal	Pass
		836.5	8.80	2.01	19.77	2.15	24.41	276.058	Horizontal	Pass
		848.3	8.72	2.02	19.82	2.15	24.37	273.527	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	8.87	2.01	19.70	2.15	24.41	276.058	Horizontal	Pass
		836.5	8.78	2.01	19.77	2.15	24.39	274.789	Horizontal	Pass
		847.5	8.73	2.02	19.81	2.15	24.37	273.527	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.90	2.01	19.71	2.15	24.45	278.612	Horizontal	Pass
		836.5	8.87	2.01	19.77	2.15	24.48	280.543	Horizontal	Pass
		846.5	8.78	2.02	19.79	2.15	24.40	275.423	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	8.96	2.01	19.73	2.15	24.53	283.792	Horizontal	Pass
		836.5	8.86	2.01	19.77	2.15	24.47	279.898	Horizontal	Pass
		844	8.81	2.02	19.78	2.15	24.42	276.694	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	7.64	2.01	19.68	2.15	23.16	207.014	Vertical	Pass
		836.5	7.04	2.01	19.77	2.15	22.65	184.077	Vertical	Pass
		848.3	7.01	2.02	19.82	2.15	22.66	184.502	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.85	2.01	19.70	2.15	23.39	218.273	Vertical	Pass
		836.5	7.78	2.01	19.77	2.15	23.39	218.273	Vertical	Pass
		847.5	7.47	2.02	19.81	2.15	23.11	204.644	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	7.92	2.01	19.71	2.15	23.47	222.331	Vertical	Pass
		836.5	7.71	2.01	19.77	2.15	23.32	214.783	Vertical	Pass
		846.5	7.41	2.02	19.79	2.15	23.03	200.909	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	7.33	2.01	19.73	2.15	22.90	194.984	Vertical	Pass
		836.5	7.73	2.01	19.77	2.15	23.34	215.774	Vertical	Pass
		844	7.19	2.02	19.78	2.15	22.80	190.546	Vertical	Pass

Radiated Power (ERP) for Band 5

Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	3/#Mid	824.7	8.03	2.01	19.68	2.15	23.55	226.464	Horizontal	Pass
		836.5	7.92	2.01	19.77	2.15	23.53	225.424	Horizontal	Pass
		848.3	7.90	2.02	19.82	2.15	23.55	226.464	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	8.31	2.01	19.70	2.15	23.85	242.661	Horizontal	Pass
		836.5	8.02	2.01	19.77	2.15	23.63	230.675	Horizontal	Pass
		847.5	7.65	2.02	19.81	2.15	23.29	213.304	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	8.28	2.01	19.71	2.15	23.83	241.546	Horizontal	Pass
		836.5	8.36	2.01	19.77	2.15	23.97	249.459	Horizontal	Pass
		846.5	8.24	2.02	19.79	2.15	23.86	243.220	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	8.41	2.01	19.73	2.15	23.98	250.035	Horizontal	Pass
		836.5	7.75	2.01	19.77	2.15	23.36	216.770	Horizontal	Pass
		844	8.18	2.02	19.78	2.15	23.79	239.332	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	7.50	2.01	19.68	2.15	23.02	200.447	Vertical	Pass
		836.5	7.73	2.01	19.77	2.15	23.34	215.774	Vertical	Pass
		848.3	7.82	2.02	19.82	2.15	23.47	222.331	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.83	2.01	19.70	2.15	23.37	217.270	Vertical	Pass
		836.5	7.69	2.01	19.77	2.15	23.30	213.796	Vertical	Pass
		847.5	7.23	2.02	19.81	2.15	22.87	193.642	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.10	2.01	19.71	2.15	22.65	184.077	Vertical	Pass
		836.5	7.48	2.01	19.77	2.15	23.09	203.704	Vertical	Pass
		846.5	6.94	2.02	19.79	2.15	22.56	180.302	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.08	2.01	19.73	2.15	22.65	184.077	Vertical	Pass
		836.5	7.26	2.01	19.77	2.15	22.87	193.642	Vertical	Pass
		844	7.18	2.02	19.78	2.15	22.79	190.108	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 Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	1.85	4.54	27.75	25.06	320.627	Horizontal	Pass
		2535	2.12	4.69	27.72	25.15	327.341	Horizontal	Pass
		2567.5	2.33	4.71	27.71	25.33	341.193	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	2.13	4.55	27.76	25.34	341.979	Horizontal	Pass
		2535	2.33	4.69	27.72	25.36	343.558	Horizontal	Pass
		2565	2.38	4.72	27.70	25.36	343.558	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.99	4.55	27.77	25.21	331.894	Horizontal	Pass
		2535	2.32	4.69	27.72	25.35	342.768	Horizontal	Pass
		2562.5	2.30	4.72	27.69	25.27	336.512	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	2.02	4.57	27.78	25.23	333.426	Horizontal	Pass
		2535	2.35	4.73	27.72	25.34	341.979	Horizontal	Pass
		2560	2.57	4.75	27.68	25.50	354.813	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	0.49	4.54	27.75	23.70	234.423	Vertical	Pass
		2535	1.17	4.69	27.72	24.20	263.027	Vertical	Pass
		2567.5	1.05	4.71	27.71	24.05	254.097	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.89	4.55	27.76	24.10	257.040	Vertical	Pass
		2535	0.55	4.69	27.72	23.58	228.034	Vertical	Pass
		2565	1.15	4.72	27.70	24.13	258.821	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.66	4.55	27.77	23.88	244.343	Vertical	Pass
		2535	0.98	4.69	27.72	24.01	251.768	Vertical	Pass
		2562.5	1.26	4.72	27.69	24.23	264.850	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.41	4.57	27.78	23.62	230.144	Vertical	Pass
		2535	1.02	4.73	27.72	24.01	251.768	Vertical	Pass
		2560	1.23	4.75	27.68	24.16	260.615	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	1.42	4.54	27.75	24.63	290.402	Horizontal	Pass
		2535	1.60	4.69	27.72	24.63	290.402	Horizontal	Pass
		2567.5	1.65	4.71	27.71	24.65	291.743	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	1.05	4.55	27.76	24.26	266.686	Horizontal	Pass
		2535	1.76	4.69	27.72	24.79	301.301	Horizontal	Pass
		2565	1.56	4.72	27.70	24.54	284.446	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	1.49	4.55	27.77	24.71	295.801	Horizontal	Pass
		2535	1.45	4.69	27.72	24.48	280.543	Horizontal	Pass
		2562.5	1.57	4.72	27.69	24.54	284.446	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	1.60	4.57	27.78	24.81	302.691	Horizontal	Pass
		2535	1.59	4.73	27.72	24.58	287.078	Horizontal	Pass
		2560	1.79	4.75	27.68	24.72	296.483	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.43	4.54	27.75	22.78	189.671	Vertical	Pass
		2535	-0.34	4.69	27.72	22.69	185.780	Vertical	Pass
		2567.5	-0.41	4.71	27.71	22.59	181.552	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	0.72	4.55	27.76	23.93	247.172	Vertical	Pass
		2535	1.31	4.69	27.72	24.34	271.644	Vertical	Pass
		2565	-0.31	4.72	27.70	22.67	184.927	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.63	4.55	27.77	23.85	242.661	Vertical	Pass
		2535	-0.30	4.69	27.72	22.73	187.499	Vertical	Pass
		2562.5	-0.23	4.72	27.69	22.74	187.932	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.79	4.57	27.78	24.00	251.189	Vertical	Pass
		2535	1.21	4.73	27.72	24.20	263.027	Vertical	Pass
		2560	1.50	4.75	27.68	24.43	277.332	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 40

Radiated Power (EIRP) for Band 40 (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2307.5	1.05	4.95	27.87	23.97	249.459	Horizontal	Pass
		2310	1.11	5.02	27.77	23.86	243.220	Horizontal	Pass
		2312.5	0.89	4.97	27.9	23.82	240.991	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2307.5	0.74	4.98	27.77	23.53	225.424	Horizontal	Pass
		2310	0.34	4.97	27.83	23.20	208.930	Horizontal	Pass
		2312.5	0.23	4.82	27.81	23.22	209.894	Horizontal	Pass
10MHz Band QPSK	1/#Mid	2310	1.10	5	27.88	23.98	250.035	Horizontal	Pass
10MHz Band 16 QAM	1/#Mid	2310	0.45	4.75	27.86	23.56	226.986	Horizontal	Pass

Radiated Power (EIRP) for Band 40 (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2307.5	0.64	4.95	27.87	23.56	226.986	Vertical	Pass
		2310	0.92	5.02	27.77	23.67	232.809	Vertical	Pass
		2312.5	0.58	4.97	27.9	23.51	224.388	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	2307.5	0.58	4.98	27.77	23.37	217.270	Vertical	Pass
		2310	0.27	4.97	27.83	23.13	205.589	Vertical	Pass
		2312.5	0.06	4.82	27.81	23.05	201.837	Vertical	Pass
10MHz Band QPSK	1/#Mid	2310	0.93	5	27.88	23.81	240.436	Vertical	Pass
10MHz Band 16 QAM	1/#Mid	2310	0.03	4.75	27.86	23.14	206.063	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)

8.6 LTE BAND 40

Radiated Power (EIRP) for Band 40 (2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2352.5	0.93	4.92	27.59	23.60	229.087	Horizontal	Pass
		2355	0.89	4.95	27.72	23.66	232.274	Horizontal	Pass
		2357.5	0.63	4.81	27.78	23.60	229.087	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2352.5	0.27	4.98	27.68	22.97	198.153	Horizontal	Pass
		2355	0.36	4.77	27.72	23.31	214.289	Horizontal	Pass
		2357.5	0.03	4.84	27.78	22.97	198.153	Horizontal	Pass
10MHz Band QPSK	1/#Mid	2355	0.86	4.86	27.68	23.68	233.346	Horizontal	Pass
10MHz Band 16 QAM	1/#Mid	2355	0.50	4.83	27.68	23.35	216.272	Horizontal	Pass

Radiated Power (EIRP) for Band 40(2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2352.5	0.81	4.92	27.59	23.48	222.844	Vertical	Pass
		2355	0.78	4.95	27.72	23.55	226.464	Vertical	Pass
		2357.5	0.51	4.81	27.78	23.48	222.844	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	2352.5	0.13	4.98	27.68	22.83	191.867	Vertical	Pass
		2355	0.31	4.77	27.72	23.26	211.836	Vertical	Pass
		2357.5	-0.18	4.84	27.78	22.76	188.799	Vertical	Pass
10MHz Band QPSK	1/#Mid	2355	0.80	4.86	27.68	23.62	230.144	Vertical	Pass
10MHz Band 16 QAM	1/#Mid	2355	0.32	4.83	27.68	23.17	207.491	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)

8.6 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2498.5	2.97	4.54	27.75	26.18	414.954	Horizontal	Pass
		2593	3.35	4.69	27.72	26.38	434.510	Horizontal	Pass
		2687.5	3.19	4.71	27.71	26.19	415.911	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2501	2.93	4.55	27.76	26.14	411.150	Horizontal	Pass
		2593	3.16	4.69	27.72	26.19	415.911	Horizontal	Pass
		2685	3.28	4.72	27.70	26.26	422.669	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	2.85	4.55	27.77	26.07	404.576	Horizontal	Pass
		2593	3.21	4.69	27.72	26.24	420.727	Horizontal	Pass
		2682.5	3.21	4.72	27.69	26.18	414.954	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2506	2.97	4.57	27.78	26.18	414.954	Horizontal	Pass
		2593	3.44	4.73	27.72	26.43	439.542	Horizontal	Pass
		2680	3.35	4.75	27.68	26.28	424.620	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2498.5	1.62	4.54	27.75	24.83	304.089	Vertical	Pass
		2593	1.55	4.69	27.72	24.58	287.078	Vertical	Pass
		2687.5	2.08	4.71	27.71	25.08	322.107	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2501	1.35	4.55	27.76	24.56	285.759	Vertical	Pass
		2593	2.45	4.69	27.72	25.48	353.183	Vertical	Pass
		2685	2.19	4.72	27.70	25.17	328.852	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2503.5	2.17	4.55	27.77	25.39	345.939	Vertical	Pass
		2593	1.91	4.69	27.72	24.94	311.889	Vertical	Pass
		2682.5	2.23	4.72	27.69	25.20	331.131	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2506	1.68	4.57	27.78	24.89	308.319	Vertical	Pass
		2593	1.64	4.73	27.72	24.63	290.402	Vertical	Pass
		2680	2.01	4.75	27.68	24.94	311.889	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2498.5	2.96	4.54	27.75	26.17	414.000	Horizontal	Pass
		2593	3.28	4.69	27.72	26.31	427.563	Horizontal	Pass
		2687.5	3.21	4.71	27.71	26.21	417.830	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2501	2.91	4.55	27.76	26.12	409.261	Horizontal	Pass
		2593	2.87	4.69	27.72	25.90	389.045	Horizontal	Pass
		2685	3.21	4.72	27.70	26.19	415.911	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2503.5	3.05	4.55	27.77	26.27	423.643	Horizontal	Pass
		2593	3.24	4.69	27.72	26.27	423.643	Horizontal	Pass
		2682.5	3.29	4.72	27.69	26.26	422.669	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2506	3.09	4.57	27.78	26.30	426.580	Horizontal	Pass
		2593	3.48	4.73	27.72	26.47	443.609	Horizontal	Pass
		2680	3.53	4.75	27.68	26.46	442.588	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2498.5	1.91	4.54	27.75	25.12	325.087	Vertical	Pass
		2593	2.00	4.69	27.72	25.03	318.420	Vertical	Pass
		2687.5	1.94	4.71	27.71	24.94	311.889	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2501	2.22	4.55	27.76	25.43	349.140	Vertical	Pass
		2593	1.76	4.69	27.72	24.79	301.301	Vertical	Pass
		2685	1.90	4.72	27.70	24.88	307.610	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2503.5	1.56	4.55	27.77	24.78	300.608	Vertical	Pass
		2593	1.88	4.69	27.72	24.91	309.742	Vertical	Pass
		2682.5	2.44	4.72	27.69	25.41	347.536	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2506	1.84	4.57	27.78	25.05	319.890	Vertical	Pass
		2593	2.37	4.73	27.72	25.36	343.558	Vertical	Pass
		2680	2.11	4.75	27.68	25.04	319.154	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)

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 + log10 (P [Watts]).
The minimum permissible attenuation level of any spurious emission is 43 + log10 (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 Log10 (p), dB; and
b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (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 40
- LTE Band 41

RESULTS

PASS

9.1 LTE BAND 2

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

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3701.4	-46.87	4.04	33.51	-17.40	-13	-4.40	Horizontal
3701.4	-51.15	4.04	33.51	-21.68	-13	-8.68	Vertical
5552.1	-44.91	5.24	35.84	-14.31	-13	-1.31	Vertical
5552.1	-49.12	5.24	35.84	-18.52	-13	-5.52	Horizontal
187.3	-41.05	1.43	16.02	-26.46	-13	-13.46	Vertical
467.5	-42.71	1.30	17.99	-26.02	-13	-13.02	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.19	4.04	33.56	-17.67	-13	-4.67	Horizontal
3760.0	-52.86	4.04	33.56	-23.34	-13	-10.34	Vertical
5640.0	-48.45	5.24	35.91	-17.78	-13	-4.78	Vertical
5640.0	-51.80	5.24	35.91	-21.13	-13	-8.13	Horizontal
186.7	-36.76	1.62	16.97	-21.41	-13	-8.41	Vertical
465.8	-38.40	1.74	15.98	-24.17	-13	-11.17	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-47.28	4.04	34.00	-17.32	-13	-4.32	Horizontal
3818.6	-44.11	4.04	34.00	-14.15	-13	-1.15	Vertical
5727.9	-46.99	5.24	36.04	-16.19	-13	-3.19	Vertical
5727.9	-51.90	5.24	36.04	-21.10	-13	-8.10	Horizontal
210.0	-35.31	1.42	17.29	-19.44	-13	-6.44	Vertical
232.4	-38.38	1.50	17.90	-21.97	-13	-8.97	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	-53.82	4.07	33.54	-24.35	-13	-11.35	Horizontal
3720.0	-48.93	4.07	33.54	-19.46	-13	-6.46	Vertical
5580.0	-53.13	5.28	35.86	-22.55	-13	-9.55	Vertical
5580.0	-52.23	5.28	35.86	-21.65	-13	-8.65	Horizontal
194.6	-40.54	1.58	16.89	-25.22	-13	-12.22	Vertical
390.3	-44.96	1.76	17.26	-29.46	-13	-16.46	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-52.01	4.04	33.56	-22.49	-13	-9.49	Horizontal
3760.0	-45.29	4.04	33.56	-15.77	-13	-2.77	Vertical
5640.0	-46.19	5.24	35.91	-15.52	-13	-2.52	Vertical
5640.0	-52.86	5.24	35.91	-22.19	-13	-9.19	Horizontal
183.3	-40.38	1.46	16.27	-25.57	-13	-12.57	Vertical
362.4	-43.61	1.59	15.15	-30.05	-13	-17.05	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-44.20	4.04	34.00	-14.24	-13	-1.24	Horizontal
3800.0	-51.98	4.04	34.00	-22.02	-13	-9.02	Vertical
5700.0	-50.39	5.24	36.04	-19.59	-13	-6.59	Vertical
5700.0	-52.25	5.24	36.04	-21.45	-13	-8.45	Horizontal
190.0	-40.61	1.36	17.39	-24.57	-13	-11.57	Vertical
438.3	-40.20	1.66	15.39	-26.47	-13	-13.47	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. 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	-53.38	4.02	29.80	-27.60	-13	-14.60	Horizontal
3421.4	-53.39	4.02	29.80	-27.61	-13	-14.61	Vertical
5132.1	-51.00	5.24	35.84	-20.40	-13	-7.40	Vertical
5132.1	-52.79	5.24	35.84	-22.19	-13	-9.19	Horizontal
191.7	-44.51	1.68	16.04	-30.15	-13	-17.15	Vertical
400.2	-37.61	1.78	17.74	-21.65	-13	-8.65	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.47	4.03	30.00	-19.50	-13	-6.50	Horizontal
3465.0	-52.33	4.03	30.00	-26.36	-13	-13.36	Vertical
5197.5	-44.26	5.25	35.86	-13.65	-13	-0.65	Vertical
5197.5	-49.16	5.25	35.86	-18.55	-13	-5.55	Horizontal
208.9	-40.07	1.72	17.69	-24.10	-13	-11.10	Vertical
339.1	-40.63	1.62	16.02	-26.22	-13	-13.22	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-51.65	4.05	30.01	-25.69	-13	-12.69	Horizontal
3508.6	-44.70	4.05	30.01	-18.74	-13	-5.74	Vertical
5262.9	-51.31	5.26	35.86	-20.71	-13	-7.71	Vertical
5262.9	-53.34	5.26	35.86	-22.74	-13	-9.74	Horizontal
205.4	-37.32	1.80	16.69	-22.43	-13	-9.43	Vertical
336.7	-35.81	1.75	16.66	-20.91	-13	-7.91	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	-52.09	4.02	29.80	-26.31	-13	-13.31	Horizontal
3440.0	-51.01	4.02	29.80	-25.23	-13	-12.23	Vertical
5160.0	-51.32	5.24	35.84	-20.72	-13	-7.72	Vertical
5160.0	-53.95	5.24	35.84	-23.35	-13	-10.35	Horizontal
188.0	-41.64	1.57	17.26	-25.95	-13	-12.95	Vertical
238.1	-35.98	1.78	16.35	-21.41	-13	-8.41	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-48.63	4.03	30.00	-22.66	-13	-9.66	Horizontal
3465.0	-48.86	4.03	30.00	-22.89	-13	-9.89	Vertical
5197.5	-46.43	5.25	35.86	-15.82	-13	-2.82	Vertical
5197.5	-50.40	5.25	35.86	-19.79	-13	-6.79	Horizontal
211.3	-35.87	1.44	17.95	-19.36	-13	-6.36	Vertical
232.2	-34.35	1.65	16.09	-19.91	-13	-6.91	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-47.72	2.91	27.68	-22.95	-13	-9.95	Horizontal
3490.0	-53.88	2.91	27.68	-29.11	-13	-16.11	Vertical
5235.0	-45.17	5.26	35.86	-14.57	-13	-1.57	Vertical
5235.0	-51.01	5.26	35.86	-20.41	-13	-7.41	Horizontal
212.0	-44.86	1.61	16.85	-29.62	-13	-16.62	Vertical
324.6	-41.98	1.61	15.19	-28.40	-13	-15.40	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. 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	-44.33	2.78	27.50	-19.61	-13	-6.61	Horizontal
1649.4	-51.05	2.78	27.50	-26.33	-13	-13.33	Vertical
2474.1	-53.89	2.90	27.80	-28.99	-13	-15.99	Vertical
2474.1	-49.62	2.90	27.80	-24.72	-13	-11.72	Horizontal
186.6	-39.52	1.76	17.59	-23.69	-13	-10.69	Vertical
327.2	-34.40	1.63	15.87	-20.16	-13	-7.16	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-48.03	2.80	27.48	-23.35	-13	-10.35	Horizontal
1673.0	-52.12	2.80	27.48	-27.44	-13	-14.44	Vertical
2509.5	-46.35	2.91	27.70	-21.56	-13	-8.56	Vertical
2509.5	-50.84	2.91	27.70	-26.05	-13	-13.05	Horizontal
196.6	-37.63	1.61	15.68	-23.56	-13	-10.56	Vertical
255.0	-35.83	1.59	17.52	-19.91	-13	-6.91	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-51.38	2.82	27.43	-26.77	-13	-13.77	Horizontal
1696.6	-50.08	2.82	27.43	-25.47	-13	-12.47	Vertical
2544.9	-51.74	2.92	27.74	-26.92	-13	-13.92	Vertical
2544.9	-50.04	2.92	27.74	-25.22	-13	-12.22	Horizontal
191.8	-36.65	1.69	16.67	-21.66	-13	-8.66	Vertical
333.0	-38.52	1.70	17.18	-23.04	-13	-10.04	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	-51.45	2.78	27.50	-26.73	-13	-13.73	Horizontal
1658.0	-50.16	2.78	27.50	-25.44	-13	-12.44	Vertical
2487.0	-48.24	2.90	27.80	-23.34	-13	-10.34	Vertical
2487.0	-50.48	2.90	27.80	-25.58	-13	-12.58	Horizontal
194.9	-44.79	1.71	15.57	-30.93	-13	-17.93	Vertical
280.7	-36.50	1.34	16.40	-21.44	-13	-8.44	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.68	2.80	27.48	-25.00	-13	-12.00	Horizontal
1673.0	-48.33	2.80	27.48	-23.65	-13	-10.65	Vertical
2509.5	-45.17	2.91	27.70	-20.38	-13	-7.38	Vertical
2509.5	-52.94	2.91	27.70	-28.15	-13	-15.15	Horizontal
192.4	-37.77	1.44	17.04	-22.17	-13	-9.17	Vertical
261.5	-35.91	1.76	17.62	-20.05	-13	-7.05	Horizontal
Test Results for High Channel 844MHz							
1688.0	-52.67	2.82	27.43	-28.06	-13	-15.06	Horizontal
1688.0	-51.15	2.82	27.43	-26.54	-13	-13.54	Vertical
2532.0	-50.01	2.92	27.74	-25.19	-13	-12.19	Vertical
2532.0	-49.92	2.92	27.74	-25.10	-13	-12.10	Horizontal
190.3	-35.17	1.74	17.70	-19.21	-13	-6.21	Vertical
358.3	-38.13	1.41	17.46	-22.07	-13	-9.07	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. 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	-60.56	5.23	35.81	-29.98	-25	-4.98	Horizontal
5005.0	-61.84	5.23	35.81	-31.26	-25	-6.26	Vertical
7507.5	-62.21	5.67	36.85	-31.03	-25	-6.03	Vertical
7507.5	-59.38	5.67	36.85	-28.20	-25	-3.20	Horizontal
195.5	-54.84	1.73	17.97	-38.60	-25	-13.60	Vertical
406.9	-51.05	1.38	15.11	-37.32	-25	-12.32	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.35	5.23	35.82	-29.76	-25	-4.76	Horizontal
5070.0	-64.50	5.23	35.82	-33.91	-25	-8.91	Vertical
7605.0	-60.42	5.67	36.85	-29.24	-25	-4.24	Vertical
7605.0	-62.30	5.67	36.85	-31.12	-25	-6.12	Horizontal
212.7	-52.29	1.77	16.17	-37.88	-25	-12.88	Vertical
418.1	-49.59	1.63	15.21	-36.01	-25	-11.01	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-63.24	5.24	35.83	-32.65	-25	-7.65	Horizontal
5135.0	-62.75	5.24	35.83	-32.16	-25	-7.16	Vertical
7702.5	-62.99	5.68	36.87	-31.80	-25	-6.80	Vertical
7702.5	-61.91	5.68	36.87	-30.72	-25	-5.72	Horizontal
181.1	-50.54	1.58	17.56	-34.56	-25	-9.56	Vertical
239.5	-47.16	1.45	16.58	-32.03	-25	-7.03	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	-59.69	5.23	35.82	-29.10	-25	-4.10	Horizontal
5020.0	-59.33	5.23	35.82	-28.74	-25	-3.74	Vertical
7530.0	-62.99	5.67	36.86	-31.80	-25	-6.80	Vertical
7530.0	-64.26	5.67	36.86	-33.07	-25	-8.07	Horizontal
190.6	-48.09	1.63	15.76	-33.96	-25	-8.96	Vertical
237.1	-53.72	1.71	15.44	-39.99	-25	-14.99	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-60.42	5.23	35.82	-29.83	-25	-4.83	Horizontal
5070.0	-59.49	5.23	35.82	-28.90	-25	-3.90	Vertical
7605.0	-60.41	5.67	36.85	-29.23	-25	-4.23	Vertical
7605.0	-60.97	5.67	36.85	-29.79	-25	-4.79	Horizontal
185.8	-49.79	1.79	16.84	-34.73	-25	-9.73	Vertical
337.1	-46.16	1.71	17.64	-30.23	-25	-5.23	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-61.79	5.24	35.83	-31.20	-25	-6.20	Horizontal
5120.0	-61.23	5.24	35.83	-30.64	-25	-5.64	Vertical
7680.0	-63.87	5.70	36.88	-32.69	-25	-7.69	Vertical
7680.0	-64.86	5.70	36.88	-33.68	-25	-8.68	Horizontal
186.6	-45.28	1.79	16.84	-30.22	-25	-5.22	Vertical
374.4	-45.55	1.71	17.64	-29.62	-25	-4.62	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

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

9.5 LTE BAND 40

QPSK EIRP POWER FOR LTE BAND 40 (2305-2315MHz) (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2307.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
4615	-73.48	4.04	33.51	-44.01	-40	-4.01	Horizontal
4615	-75.24	4.04	33.51	-45.77	-40	-5.77	Vertical
6922.5	-78.01	5.24	35.84	-47.41	-40	-7.41	Vertical
6922.5	-78.34	5.24	35.84	-47.74	-40	-7.74	Horizontal
Test Results For Mid Channel 2310MHz							
4620	-74.17	4.04	33.56	-44.65	-40	-4.65	Horizontal
4620	-74.63	4.04	33.56	-45.11	-40	-5.11	Vertical
6930	-77	5.24	35.91	-46.33	-40	-6.33	Vertical
6930	-77.74	5.24	35.91	-47.07	-40	-7.07	Horizontal
Test Results for High Channel 2312.5MHz							
4625	-75.25	4.04	34	-45.29	-40	-5.29	Horizontal
4625	-76.78	4.04	34	-46.82	-40	-6.82	Vertical
6937.5	-79.94	5.24	36.04	-49.14	-40	-9.14	Vertical
6937.5	-78.01	5.24	36.04	-47.21	-40	-7.21	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10MHZ BANDWIDTH)

Test Results for Low Channel 2310MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
4620	-77.79	4.07	33.54	-48.32	-40	-8.32	Horizontal
4620	-75.24	4.07	33.54	-45.77	-40	-5.77	Vertical
6930	-74.67	5.28	35.86	-44.09	-40	-4.09	Vertical
6930	-79.82	5.28	35.86	-49.24	-40	-9.24	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

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

9.6 LTE BAND 40

QPSK EIRP POWER FOR LTE BAND 40 (2350-2360MHz) (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2352.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
4705	-75.2	4.04	33.51	-45.73	-40	-5.73	Horizontal
4705	-78.15	4.04	33.51	-48.68	-40	-8.68	Vertical
7057.5	-80.76	5.24	35.84	-50.16	-40	-10.16	Vertical
7057.5	-79.95	5.24	35.84	-49.35	-40	-9.35	Horizontal
Test Results For Mid Channel 2355MHz							
4710	-76.38	4.04	33.56	-46.86	-40	-6.86	Horizontal
4710	-77.84	4.04	33.56	-48.32	-40	-8.32	Vertical
7065	-77.05	5.24	35.91	-46.38	-40	-6.38	Vertical
7065	-80.25	5.24	35.91	-49.58	-40	-9.58	Horizontal
Test Results for High Channel 2357.5MHz							
4715	-75.55	4.04	34	-45.59	-40	-5.59	Horizontal
4715	-79.02	4.04	34	-49.06	-40	-9.06	Vertical
7072.5	-80.21	5.24	36.04	-49.41	-40	-9.41	Vertical
7072.5	-80.29	5.24	36.04	-49.49	-40	-9.49	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10MHZ BANDWIDTH)

Test Results for Low Channel 2355MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
4710	-81.32	4.07	33.54	-51.85	-40	-11.85	Horizontal
4710	-74.35	4.07	33.54	-44.88	-40	-4.88	Vertical
7065	-82.59	5.28	35.86	-52.01	-40	-12.01	Vertical
7065	-73.28	5.28	35.86	-42.70	-40	-2.70	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

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

9.6 LTE BAND 41

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

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5145	-52.86	3.92	27.5	-29.28	-25	-4.28	Horizontal
5145	-57.81	3.92	27.5	-34.23	-25	-9.23	Vertical
7717.5	-57.21	5.35	27.8	-34.76	-25	-9.76	Vertical
7717.5	-55.26	5.35	27.8	-32.81	-25	-7.81	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-53.02	4.21	27.48	-29.75	-25	-4.75	Horizontal
5190	-51.98	4.21	27.48	-28.71	-25	-3.71	Vertical
7785	-54.79	5.27	27.7	-32.36	-25	-7.36	Vertical
7785	-53.3	5.27	27.7	-30.87	-25	-5.87	Horizontal
Test Results for High Channel 2617MHz							
5234	-53.68	4.11	27.43	-30.36	-25	-5.36	Horizontal
5234	-55.19	4.11	27.43	-31.87	-25	-6.87	Vertical
7851	-52.13	5.44	27.74	-29.83	-25	-4.83	Vertical
7851	-52.86	5.44	27.74	-30.56	-25	-5.56	Horizontal

QPSK EIRP POWER FOR LTE BAND 41 (20MHZ BANDWIDTH)

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5160	-54.53	4.12	27.5	-31.15	-25	-6.15	Horizontal
5160	-52.76	4.12	27.5	-29.38	-25	-4.38	Vertical
7740	-57.43	5.41	27.8	-35.04	-25	-10.04	Vertical
7740	-55.18	5.41	27.8	-32.79	-25	-7.79	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-53.95	4.21	27.48	-30.68	-25	-5.68	Horizontal
5190	-53.59	4.21	27.48	-30.32	-25	-5.32	Vertical
7785	-56.83	5.27	27.7	-34.4	-25	-9.4	Vertical
7785	-55.15	5.27	27.7	-32.72	-25	-7.72	Horizontal
Test Results for High Channel 2610MHz							
5220	-56.31	3.95	27.43	-32.83	-25	-7.83	Horizontal
5220	-51.92	3.95	27.43	-28.44	-25	-3.44	Vertical
7830	-53.13	5.22	27.74	-30.61	-25	-5.61	Vertical
7830	-54.41	5.22	27.74	-31.89	-25	-6.89	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. 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°C
- Voltage =low voltage, DC 3.4V, Normal, DC 3.8V and High voltage, DC 4.4V.

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to -30ºC 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 +50ºC 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 40

LTE Band 41

RESULTS

See the following pages.

10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	12.7	0.006767	2.5
3.8	1880	13.5	0.007163	2.5
4.4	1880	13.5	0.007163	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	13.2	0.007020	2.5
Extreme (50C)	1880	11.9	0.006352	2.5
Extreme (40C)	1880	13.5	0.007206	2.5
Extreme (30C)	1880	13.5	0.007166	2.5
Extreme (10C)	1880	13.8	0.007336	2.5
Extreme (0C)	1880	12.0	0.006391	2.5
Extreme (-10C)	1880	12.6	0.006714	2.5
Extreme (-20C)	1880	13.9	0.007415	2.5
Extreme (-30C)	1880	14.2	0.007567	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	10.0	0.005329	2.5
3.8	1880	8.6	0.004597	2.5
4.4	1880	8.4	0.004479	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	9.7	0.005157	2.5
Extreme (50C)	1880	8.6	0.004583	2.5
Extreme (40C)	1880	7.8	0.004168539	2.5
Extreme (30C)	1880	9.4	0.004998073	2.5
Extreme (10C)	1880	9.3	0.00492935	2.5
Extreme (0C)	1880	7.6	0.004061397	2.5
Extreme (-10C)	1880	9.3	0.004943354	2.5
Extreme (-20C)	1880	8.6	0.004562512	2.5
Extreme (-30C)	1880	8.4	0.004459894	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	9.3	0.005353	2.5
3.8	1732.5	8.7	0.005042	2.5
4.4	1732.5	8.4	0.004871	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	8.7	0.005007	2.5
Extreme (50C)	1732.5	8.5	0.004912	2.5
Extreme (40C)	1732.5	7.9	0.004556	2.5
Extreme (30C)	1732.5	6.1	0.003540	2.5
Extreme (10C)	1732.5	7.4	0.004278	2.5
Extreme (0C)	1732.5	9.6	0.005532	2.5
Extreme (-10C)	1732.5	8.5	0.004912	2.5
Extreme (-20C)	1732.5	7.2	0.004158	2.5
Extreme (-30C)	1732.5	8.3	0.004766	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	9.4	0.005407	2.5
3.8	1732.5	8.5	0.004926	2.5
4.4	1732.5	8.4	0.004870	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	9.7	0.005583	2.5
Extreme (50C)	1732.5	9.3	0.005390	2.5
Extreme (40C)	1732.5	8.4	0.004866	2.5
Extreme (30C)	1732.5	9.4	0.005431	2.5
Extreme (10C)	1732.5	8.9	0.005163	2.5
Extreme (0C)	1732.5	8.2	0.004748	2.5
Extreme (-10C)	1732.5	9.0	0.005189	2.5
Extreme (-20C)	1732.5	9.1	0.005227	2.5
Extreme (-30C)	1732.5	8.0	0.004646	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	6.2	0.007430	2.5
3.8	836.5	6.5	0.007811	2.5
4.4	836.5	4.8	0.005777	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	6.2	0.007427	2.5
Extreme (50C)	836.5	6.0	0.007197	2.5
Extreme (40C)	836.5	6.3	0.007581	2.5
Extreme (30C)	836.5	6.3	0.007524	2.5
Extreme (10C)	836.5	5.4	0.006433	2.5
Extreme (0C)	836.5	5.7	0.006810	2.5
Extreme (-10C)	836.5	5.8	0.006986	2.5
Extreme (-20C)	836.5	6.4	0.007628	2.5
Extreme (-30C)	836.5	6.6	0.007941	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	6.1	0.007351	2.5
3.8	836.5	6.9	0.008223	2.5
4.4	836.5	5.0	0.005924	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	5.6	0.006730	2.5
Extreme (50C)	836.5	5.9	0.007093	2.5
Extreme (40C)	836.5	6.2	0.007425	2.5
Extreme (30C)	836.5	6.2	0.007386	2.5
Extreme (10C)	836.5	5.5	0.006593	2.5
Extreme (0C)	836.5	5.5	0.006579	2.5
Extreme (-10C)	836.5	5.4	0.006404	2.5
Extreme (-20C)	836.5	6.0	0.007127	2.5
Extreme (-30C)	836.5	6.7	0.007974	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	9.7	0.003817	2.5
3.8	2535	9.0	0.003563	2.5
4.4	2535	8.5	0.003356	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	9.4	0.003727	2.5
Extreme (50C)	2535	9.3	0.003674	2.5
Extreme (40C)	2535	8.5	0.003354	2.5
Extreme (30C)	2535	9.2	0.003638	2.5
Extreme (10C)	2535	8.1	0.003185	2.5
Extreme (0C)	2535	8.1	0.003189	2.5
Extreme (-10C)	2535	9.0	0.003569	2.5
Extreme (-20C)	2535	9.3	0.003666	2.5
Extreme (-30C)	2535	8.8	0.003464	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
3.85	2535	6.4	0.002513	2.5
4.4	2535	5.5	0.002159	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	5.9	0.002315	2.5
Extreme (40C)	2535	5.2	0.002049	2.5
Extreme (30C)	2535	6.4	0.002511	2.5
Extreme (10C)	2535	5.9	0.002337	2.5
Extreme (0C)	2535	4.7	0.001873	2.5
Extreme (-10C)	2535	5.1	0.002020	2.5
Extreme (-20C)	2535	5.5	0.002166	2.5
Extreme (-30C)	2535	5.4	0.002125	2.5

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

10.5 LTE BAND 40

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	2310	8.6	0.003723	2.5
3.8	2310	7.4	0.003203	2.5
4.4	2310	5.9	0.002554	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2310	-5.6	-0.002424	2.5
Extreme (50C)	2310	-9.3	-0.004026	2.5
Extreme (40C)	2310	-10.2	-0.004416	2.5
Extreme (30C)	2310	4.9	0.002121	2.5
Extreme (10C)	2310	7.6	0.003290	2.5
Extreme (0C)	2310	9.1	0.003939	2.5
Extreme (-10C)	2310	-6.3	-0.002727	2.5
Extreme (-20C)	2310	6.4	0.002771	2.5
Extreme (-30C)	2310	-3.2	-0.001385	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 16QAM, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	2310	5.8	0.002511	2.5
3.8	2310	6.1	0.002641	2.5
4.4	2310	10.2	0.004416	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2310	10.2	0.004416	2.5
Extreme (50C)	2310	4.8	0.002078	2.5
Extreme (40C)	2310	10.5	0.004545	2.5
Extreme (30C)	2310	-6.3	-0.002727	2.5
Extreme (10C)	2310	-7.1	-0.003074	2.5
Extreme (0C)	2310	-6.3	-0.002727	2.5
Extreme (-10C)	2310	6.7	0.002900	2.5
Extreme (-20C)	2310	10.1	0.004372	2.5
Extreme (-30C)	2310	7.5	0.003247	2.5

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

10.6 LTE BAND 41

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40640 RB size 100 RB Offset 0 10MHz BANDWIDTH)				
3.4	2595	10.3	0.003969	2.5
3.8	2595	7.3	0.002813	2.5
4.4	2595	5.3	0.002042	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40640 RB size 100 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2595	-5.3	-0.002042	2.5
Extreme (50C)	2595	-9.4	-0.003622	2.5
Extreme (40C)	2595	-1.3	-0.000501	2.5
Extreme (30C)	2595	6.3	0.002428	2.5
Extreme (10C)	2595	5.6	0.002158	2.5
Extreme (0C)	2595	4.3	0.001657	2.5
Extreme (-10C)	2595	2.9	0.001118	2.5
Extreme (-20C)	2595	-3.7	-0.001426	2.5
Extreme (-30C)	2595	5.5	0.002119	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40640 RB size 100 RB Offset 0 10MHz BANDWIDTH)				
3.4	2595	-3.6	-0.001387	2.5
3.8	2595	5.4	0.002081	2.5
4.4	2595	-7.6	-0.002929	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40640 RB size 100 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2595	10.4	0.004008	2.5
Extreme (50C)	2595	-7.3	-0.002813	2.5
Extreme (40C)	2595	6.4	0.002466	2.5
Extreme (30C)	2595	-7.2	-0.002775	2.5
Extreme (10C)	2595	-3.3	-0.001272	2.5
Extreme (0C)	2595	-1.8	-0.000694	2.5
Extreme (-10C)	2595	4.6	0.001773	2.5
Extreme (-20C)	2595	6.6	0.002543	2.5
Extreme (-30C)	2595	7.4	0.002852	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.

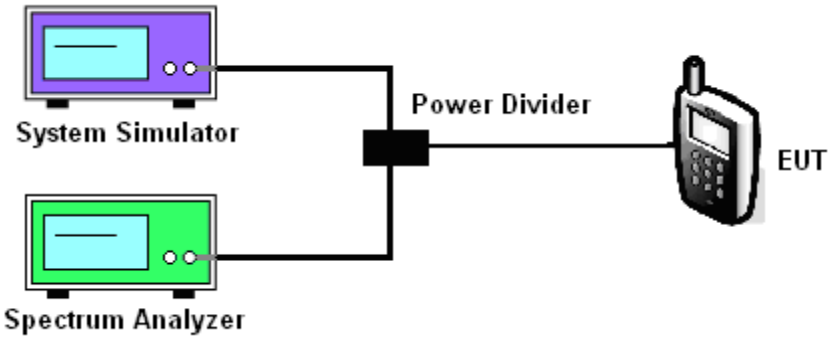
11.2 Measuring Instruments

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 2/4/5/7/40/41
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Test data reference attachment.

----END OF REPORT----