FCC CFR47 PART 22H, 24E, 27
CERTIFICATION TEST REPORT
FCC ID: 2AXWG-RDT401BU

Product： Intelligent Driving Assist System

Trade Mark： Roadefend

Model Number： RDT401BU

Family Model： AI400

Report No.： S21032202602003

Prepared for

Roadefend Intelligence Technology (Shanghai) Co.,Ltd.

Room 01, level3, block B3, lane221, Huangxing Road Yangpu District, Shanghai, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... :	Roadefend Intelligence Technology (Shanghai) Co.,Ltd.
Address..... :	Room 01, level3, block B3, lane221, Huangxing Road Yangpu District, Shanghai, China
Manufacturer's Name..... :	Roadefend Intelligence Technology (Shanghai) Co.,Ltd.
Address..... :	Room 01, level3, block B3, lane221, Huangxing Road Yangpu District, Shanghai, China
Product name..... :	Intelligent Driving Assist System
Model and/or type reference .. :	RDT401BU
Family Model:	AI400
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. 06. 2021 ~ May 17. 2021
Date of Issue.....	May 17, 2021
Test Result.....	**Pass**

Testing Engineer : Cheng Jiawen

(Cheng Jiawen)

Technical Manager : Jason Chen

(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:	Intelligent Driving Assist System
Trade Mark	Roadefend
Model Name	RDT401BU
Family Model	AI400
Model Difference	All the model are the same circuit and RF module,except the Model names.
FCC ID:	2AXWG-RDT401BU
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 2, 4, 5, 7
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;
Type of Modulation:	QPSK/16QAM
Antenna:	patch antenna
Antenna gain:	2dBi
Power Supply:	N/A
Adapter:	N/A
Extreme Vol. Limits:	DC 20.4V to DC 27.6V (Nominal DC 24V)（Note 1）
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage 27.6V and Low Voltage 20.4V 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: 2AXWG-RDT401BU** 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 = 2Uc(y))	2.5dB
2	Conducted Emission Test	±1.38dB
3	RF power, conducted	±0.16dB
4	Spurious emissions, conducted	±0.21dB
5	All emissions, radiated(<1G)	±4.68dB
6	All emissions, radiated(>1G)	±4.89dB
7	Temperature	±0.5°C
8	Humidity	±2%

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

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 KDB 971168 D01 Power Meas License Digital Systems v03r01			
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

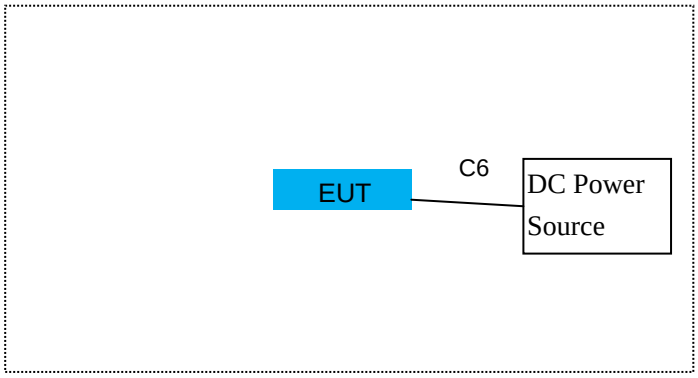
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Intelligent Driving Assist System	RDT401BU	FCC ID: 2AXWG-RDT401BU	EUT

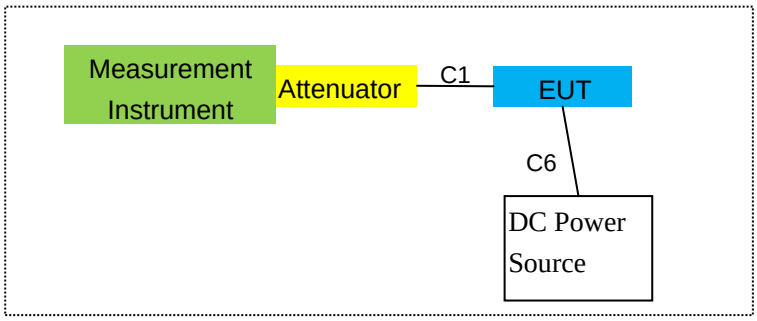
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

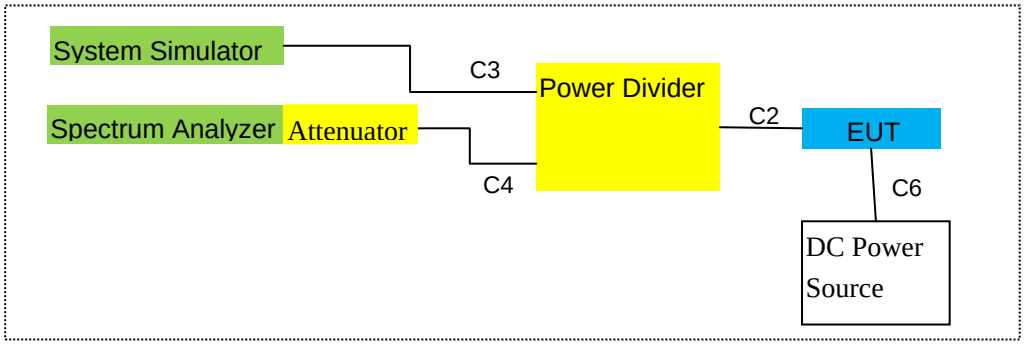
For Radiated Test Cases



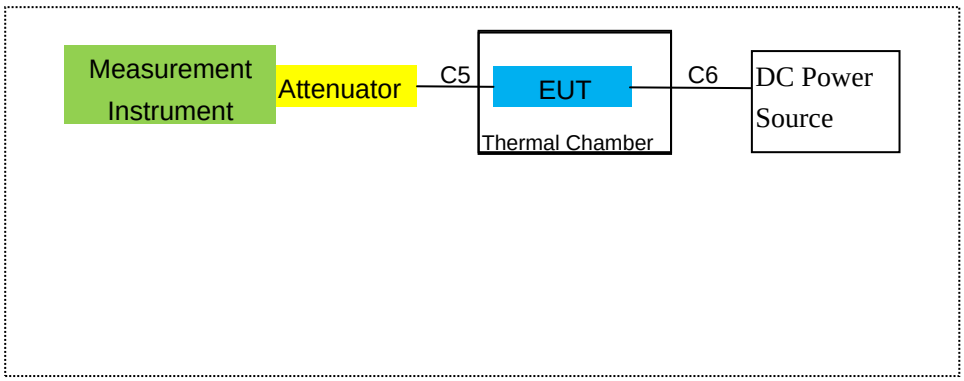
For Conducted Output Power



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



For Frequency Stability



Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	RF Cable	YES	NO	0.1m
C-2	RF Cable	YES	NO	0.1m
C-3	RF Cable	YES	NO	0.1m
C-4	RF Cable	YES	NO	0.2m
C-5	RF Cable	YES	NO	0.2m
C-6	DC Cable	YES	NO	2.5m

Notes:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

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 2021.04.27	2021.05.10 2022.04.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2020.07.13	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	2021.03.29	2022.03.28	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	2021.03.29	2022.03.28	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	2019.08.06	2022.08.05	3 year
14	Test Receiver	R&S	ESCI	101160	2020.05.11 2021.04.27	2021.05.10 2022.04.26	1 year
15	LISN	R&S	ENV216	101313	2020.05.11 2021.04.27	2021.05.10 2022.04.26	1 year
16	LISN	EMCO	3816/2	00042990	2021.03.29	2022.03.28	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2020.05.11	2023.05.10	3 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.05.11	2023.05.10	3 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2023.05.10	3 year
22	Attenuator	MCE	24-10-34	BN9258	2021.03.29	2022.03.28	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2021.03.29	2022.03.28	1 year
24	test receiver	R&S	ESCI	a0304218	2021.03.29	2022.03.28	1 year

25	Communication Tester	R&S	CMU200	A0304247	2021.03.29	2022.03.28	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2020.05.11	2023.05.10	3 year
27	DC Power Source	N/A	PS-6005D	20170402923	2020.07.13	2023.07.12	3 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2020.07.13	2021.07.12	1 year
29	Communication Tester	R&S	CMW500	148500	2020.08.07	2021.08.06	1 year
30	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2020.07.13	2021.07.12	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 Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051,§22.917, §24.238, §27.53

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 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 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 is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.

Per 27.53 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

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051,§22.917, §24.238, §27.53

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 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 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 is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.
Per 27.53 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

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 2/4/5: above 10GHz; LTE Band 7: above 15GHz).

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

22.913- The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232 Mobile and portable stations are limited to 2 watts EIRP.
27.50 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 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 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 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 D01 RF power output using broadband peak and average power meter method.
KDB 971168 D01 Power Meas License Digital Systems v03r01, “Measurement Guidance for Certification of Licensed Digital Transmitters”

MODES TESTED

- LTE Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-0.29	3.76	28.24	24.19	262.422	Horizontal	Pass
		1880	-0.31	3.91	28.22	24.00	251.189	Horizontal	Pass
		1909.3	-0.40	3.93	28.20	23.87	243.781	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.38	3.77	28.23	24.08	255.859	Horizontal	Pass
		1880	-0.35	3.91	28.24	23.98	250.035	Horizontal	Pass
		1908.5	-0.45	3.94	28.25	23.86	243.220	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-0.40	3.77	28.31	24.14	259.418	Horizontal	Pass
		1880	-0.21	3.91	28.22	24.10	257.040	Horizontal	Pass
		1907.5	-0.35	3.94	28.20	23.91	246.037	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-0.51	3.79	28.33	24.03	252.930	Horizontal	Pass
		1880	-0.05	3.95	28.22	24.22	264.241	Horizontal	Pass
		1905	-0.23	3.97	28.19	23.99	250.611	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-0.40	3.79	28.34	24.15	260.016	Horizontal	Pass
		1880	-0.12	3.95	28.22	24.15	260.016	Horizontal	Pass
		1902.5	-0.22	3.97	28.18	23.99	250.611	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-0.56	3.81	28.35	23.98	250.035	Horizontal	Pass
		1880	-0.28	3.96	28.22	23.98	250.035	Horizontal	Pass
		1900	-0.22	4.00	28.16	23.94	247.742	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-0.29	3.76	28.24	24.19	262.422	Vertical	Pass
		1880	-0.29	3.91	28.22	24.02	252.348	Vertical	Pass
		1909.3	-0.35	3.93	28.20	23.92	246.604	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.47	3.77	28.23	23.99	250.611	Vertical	Pass
		1880	-0.19	3.91	28.24	24.14	259.418	Vertical	Pass
		1908.5	-0.39	3.94	28.25	23.92	246.604	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-0.40	3.77	28.31	24.14	259.418	Vertical	Pass
		1880	-0.25	3.91	28.22	24.06	254.683	Vertical	Pass
		1907.5	-0.45	3.94	28.20	23.81	240.436	Vertical	Pass
10.0MHz Band	1/#Mid	1855	-0.50	3.79	28.33	24.04	253.513	Vertical	Pass
		1880	-0.27	3.95	28.22	24.00	251.189	Vertical	Pass

QPSK		1905	-0.39	3.97	28.19	23.83	241.546	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-0.36	3.79	28.34	24.19	262.422	Vertical	Pass
		1880	-0.09	3.95	28.22	24.18	261.818	Vertical	Pass
		1902.5	-0.38	3.97	28.18	23.83	241.546	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-0.36	3.81	28.35	24.18	261.818	Vertical	Pass
		1880	0.02	3.96	28.22	24.28	267.917	Vertical	Pass
		1900	-0.36	4.00	28.16	23.80	239.883	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 Average (mW)**	**Polarization Of Max. ERP**	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-1.91	3.76	28.24	22.57	180.717	Horizontal	Pass
		1880	-1.35	3.91	28.22	22.96	197.697	Horizontal	Pass
		1909.3	-1.97	3.93	28.20	22.30	169.824	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-1.82	3.77	28.23	22.64	183.654	Horizontal	Pass
		1880	-1.41	3.91	28.24	22.92	195.884	Horizontal	Pass
		1908.5	-1.88	3.94	28.25	22.43	174.985	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-1.79	3.77	28.31	22.75	188.365	Horizontal	Pass
		1880	-1.52	3.91	28.22	22.79	190.108	Horizontal	Pass
		1907.5	-2.01	3.94	28.20	22.25	167.880	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-1.75	3.79	28.33	22.79	190.108	Horizontal	Pass
		1880	-1.33	3.95	28.22	22.94	196.789	Horizontal	Pass
		1905	-1.81	3.97	28.19	22.41	174.181	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.93	3.79	28.34	22.62	182.810	Horizontal	Pass
		1880	-1.33	3.95	28.22	22.94	196.789	Horizontal	Pass
		1902.5	-1.99	3.97	28.18	22.22	166.725	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-1.93	3.81	28.35	22.61	182.390	Horizontal	Pass
		1880	-1.38	3.96	28.22	22.88	194.089	Horizontal	Pass
		1900	-1.87	4.00	28.16	22.29	169.434	Horizontal	Pass
1.4MHz Band 16	1/#Mid	1850.7	-1.68	3.76	28.24	22.80	190.546	Vertical	Pass
		1880	-1.35	3.91	28.22	22.96	197.697	Vertical	Pass

QAM		1909.3	-2.07	3.93	28.20	22.20	165.959	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-1.72	3.77	28.23	22.74	187.932	Vertical	Pass
		1880	-1.45	3.91	28.24	22.88	194.089	Vertical	Pass
		1908.5	-2.08	3.94	28.25	22.23	167.109	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-1.80	3.77	28.31	22.74	187.932	Vertical	Pass
		1880	-1.36	3.91	28.22	22.95	197.242	Vertical	Pass
		1907.5	-1.85	3.94	28.20	22.41	174.181	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-1.83	3.79	28.33	22.71	186.638	Vertical	Pass
		1880	-1.44	3.95	28.22	22.83	191.867	Vertical	Pass
		1905	-2.02	3.97	28.19	22.20	165.959	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.96	3.79	28.34	22.59	181.552	Vertical	Pass
		1880	-1.50	3.95	28.22	22.77	189.234	Vertical	Pass
		1902.5	-1.84	3.97	28.18	22.37	172.584	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-1.92	3.81	28.35	22.62	182.810	Vertical	Pass
		1880	-1.29	3.96	28.22	22.97	198.153	Vertical	Pass
		1900	-1.89	4.00	28.16	22.27	168.655	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					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
1.4MHz Band QPSK	1/#Mid	1710.7	-0.40	3.12	27.58	24.06	254.683	Horizontal	Pass
		1732.5	-0.43	3.27	27.61	23.91	246.037	Horizontal	Pass
		1754.3	-0.08	3.29	27.63	24.26	266.686	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.42	3.13	27.61	24.06	254.683	Horizontal	Pass
		1732.5	-0.39	3.27	27.61	23.95	248.313	Horizontal	Pass
		1753.5	-0.12	3.30	27.62	24.20	263.027	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.43	3.13	27.63	24.07	255.270	Horizontal	Pass
		1732.5	-0.38	3.27	27.61	23.96	248.886	Horizontal	Pass
		1752.5	-0.09	3.30	27.60	24.21	263.633	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.42	3.15	27.64	24.07	255.270	Horizontal	Pass
		1732.5	-0.32	3.31	27.61	23.98	250.035	Horizontal	Pass
		1750	0.11	3.33	27.59	24.37	273.527	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.59	3.15	27.65	23.91	246.037	Horizontal	Pass
		1732.5	-0.26	3.31	27.61	24.04	253.513	Horizontal	Pass
		1747.5	0.11	3.33	27.57	24.35	272.270	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.56	3.17	27.66	23.93	247.172	Horizontal	Pass
		1732.5	-0.40	3.32	27.61	23.89	244.906	Horizontal	Pass
		1745	0.02	3.36	27.56	24.22	264.241	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-0.36	3.12	27.58	24.10	257.040	Vertical	Pass
		1732.5	-0.42	3.27	27.61	23.92	246.604	Vertical	Pass
		1754.3	-0.15	3.29	27.63	24.19	262.422	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.47	3.13	27.61	24.01	251.768	Vertical	Pass
		1732.5	-0.40	3.27	27.61	23.94	247.742	Vertical	Pass
		1753.5	-0.09	3.30	27.62	24.23	264.850	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.39	3.13	27.63	24.11	257.632	Vertical	Pass
		1732.5	-0.31	3.27	27.61	24.03	252.930	Vertical	Pass
		1752.5	-0.03	3.30	27.60	24.27	267.301	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-0.37	3.15	27.64	24.12	258.226	Vertical	Pass
		1732.5	-0.41	3.31	27.61	23.89	244.906	Vertical	Pass

QPSK		1750	-0.03	3.33	27.59	24.23	264.850	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.39	3.15	27.65	24.11	257.632	Vertical	Pass
		1732.5	-0.34	3.31	27.61	23.96	248.886	Vertical	Pass
		1747.5	0.18	3.33	27.57	24.42	276.694	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1720	-0.44	3.17	27.66	24.05	254.097	Vertical	Pass
		1732.5	0.19	3.32	27.61	24.48	280.543	Vertical	Pass
		1745	0.16	3.36	27.56	24.36	272.898	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (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	-1.34	3.12	27.58	23.12	205.116	Horizontal	Pass
		1732.5	-1.46	3.27	27.61	22.88	194.089	Horizontal	Pass
		1754.3	-1.61	3.29	27.63	22.73	187.499	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-1.40	3.13	27.61	23.08	203.236	Horizontal	Pass
		1732.5	-1.35	3.27	27.61	22.99	199.067	Horizontal	Pass
		1753.5	-1.65	3.30	27.62	22.67	184.927	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-1.54	3.13	27.63	22.96	197.697	Horizontal	Pass
		1732.5	-1.41	3.27	27.61	22.93	196.336	Horizontal	Pass
		1752.5	-1.54	3.30	27.60	22.76	188.799	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.41	3.15	27.64	23.08	203.236	Horizontal	Pass
		1732.5	-1.34	3.31	27.61	22.96	197.697	Horizontal	Pass
		1750	-1.52	3.33	27.59	22.74	187.932	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.38	3.15	27.65	23.12	205.116	Horizontal	Pass
		1732.5	-1.39	3.31	27.61	22.91	195.434	Horizontal	Pass
		1747.5	-1.51	3.33	27.57	22.73	187.499	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-1.33	3.17	27.66	23.16	207.014	Horizontal	Pass
		1732.5	-1.34	3.32	27.61	22.95	197.242	Horizontal	Pass
		1745	-1.47	3.36	27.56	22.73	187.499	Horizontal	Pass
1.4MHz Band 16	1/#Mid	1710.7	-1.36	3.12	27.58	23.10	204.174	Vertical	Pass
		1732.5	-1.41	3.27	27.61	22.93	196.336	Vertical	Pass

QAM		1754.3	-1.74	3.29	27.63	22.60	181.970	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-1.33	3.13	27.61	23.15	206.538	Vertical	Pass
		1732.5	-1.37	3.27	27.61	22.97	198.153	Vertical	Pass
		1753.5	-1.78	3.30	27.62	22.54	179.473	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-1.50	3.13	27.63	23.00	199.526	Vertical	Pass
		1732.5	-1.33	3.27	27.61	23.01	199.986	Vertical	Pass
		1752.5	-1.68	3.30	27.60	22.62	182.810	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.54	3.15	27.64	22.95	197.242	Vertical	Pass
		1732.5	-1.27	3.31	27.61	23.03	200.909	Vertical	Pass
		1750	-1.59	3.33	27.59	22.67	184.927	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.50	3.15	27.65	23.00	199.526	Vertical	Pass
		1732.5	-1.40	3.31	27.61	22.90	194.984	Vertical	Pass
		1747.5	-1.61	3.33	27.57	22.63	183.231	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-1.41	3.17	27.66	23.08	203.236	Vertical	Pass
		1732.5	-1.46	3.32	27.61	22.83	191.867	Vertical	Pass
		1745	-1.46	3.36	27.56	22.74	187.932	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 Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	824.7	8.74	2.01	19.68	2.15	24.26	266.686	Horizontal	Pass
		836.5	8.87	2.01	19.77	2.15	24.48	280.543	Horizontal	Pass
		848.3	8.63	2.02	19.82	2.15	24.28	267.917	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	8.57	2.01	19.70	2.15	24.11	257.632	Horizontal	Pass
		836.5	9.00	2.01	19.77	2.15	24.61	289.068	Horizontal	Pass
		847.5	8.72	2.02	19.81	2.15	24.36	272.898	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.57	2.01	19.71	2.15	24.12	258.226	Horizontal	Pass
		836.5	8.88	2.01	19.77	2.15	24.49	281.190	Horizontal	Pass
		846.5	8.76	2.02	19.79	2.15	24.38	274.157	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	8.54	2.01	19.73	2.15	24.11	257.632	Horizontal	Pass
		836.5	8.92	2.01	19.77	2.15	24.53	283.792	Horizontal	Pass
		844	8.72	2.02	19.78	2.15	24.33	271.019	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	8.65	2.01	19.68	2.15	24.17	261.216	Vertical	Pass
		836.5	8.91	2.01	19.77	2.15	24.52	283.139	Vertical	Pass
		848.3	8.65	2.02	19.82	2.15	24.30	269.153	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	8.76	2.01	19.70	2.15	24.30	269.153	Vertical	Pass
		836.5	8.85	2.01	19.77	2.15	24.46	279.254	Vertical	Pass
		847.5	8.68	2.02	19.81	2.15	24.32	270.396	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.57	2.01	19.71	2.15	24.12	258.226	Vertical	Pass
		836.5	9.08	2.01	19.77	2.15	24.69	294.442	Vertical	Pass
		846.5	8.54	2.02	19.79	2.15	24.16	260.615	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	8.67	2.01	19.73	2.15	24.24	265.461	Vertical	Pass
		836.5	9.11	2.01	19.77	2.15	24.72	296.483	Vertical	Pass
		844	8.70	2.02	19.78	2.15	24.31	269.774	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	824.7	7.34	2.01	19.68	2.15	22.86	193.197	Horizontal	Pass
		836.5	7.54	2.01	19.77	2.15	23.15	206.538	Horizontal	Pass
		848.3	6.85	2.02	19.82	2.15	22.50	177.828	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.41	2.01	19.70	2.15	22.95	197.242	Horizontal	Pass
		836.5	7.49	2.01	19.77	2.15	23.10	204.174	Horizontal	Pass
		847.5	6.96	2.02	19.81	2.15	22.60	181.970	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.34	2.01	19.71	2.15	22.89	194.536	Horizontal	Pass
		836.5	7.54	2.01	19.77	2.15	23.15	206.538	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	7.30	2.01	19.73	2.15	22.87	193.642	Horizontal	Pass
		836.5	7.50	2.01	19.77	2.15	23.11	204.644	Horizontal	Pass
		844	6.99	2.02	19.78	2.15	22.60	181.970	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	7.36	2.01	19.68	2.15	22.88	194.089	Vertical	Pass
		836.5	7.47	2.01	19.77	2.15	23.08	203.236	Vertical	Pass
		848.3	6.81	2.02	19.82	2.15	22.46	176.198	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.41	2.01	19.70	2.15	22.95	197.242	Vertical	Pass
		836.5	7.41	2.01	19.77	2.15	23.02	200.447	Vertical	Pass
		847.5	6.73	2.02	19.81	2.15	22.37	172.584	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.41	2.01	19.71	2.15	22.96	197.697	Vertical	Pass
		836.5	7.61	2.01	19.77	2.15	23.22	209.894	Vertical	Pass
		846.5	6.75	2.02	19.79	2.15	22.37	172.584	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.36	2.01	19.73	2.15	22.93	196.336	Vertical	Pass
		836.5	7.63	2.01	19.77	2.15	23.24	210.863	Vertical	Pass
		844	6.77	2.02	19.78	2.15	22.38	172.982	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 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	2502.5	-1.55	4.54	27.75	21.66	146.555	Horizontal	Pass
		2535	-1.60	4.69	27.72	21.43	138.995	Horizontal	Pass
		2567.5	-1.47	4.71	27.71	21.53	142.233	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.67	4.55	27.76	21.54	142.561	Horizontal	Pass
		2535	-1.57	4.69	27.72	21.46	139.959	Horizontal	Pass
		2565	-1.60	4.72	27.70	21.38	137.404	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.55	4.55	27.77	21.67	146.893	Horizontal	Pass
		2535	-1.48	4.69	27.72	21.55	142.889	Horizontal	Pass
		2562.5	-1.61	4.72	27.69	21.36	136.773	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.64	4.57	27.78	21.57	143.549	Horizontal	Pass
		2535	-1.47	4.73	27.72	21.52	141.906	Horizontal	Pass
		2560	-1.57	4.75	27.68	21.36	136.773	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-1.64	4.54	27.75	21.57	143.549	Vertical	Pass
		2535	-1.56	4.69	27.72	21.47	140.281	Vertical	Pass
		2567.5	-1.52	4.71	27.71	21.48	140.605	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-1.72	4.55	27.76	21.49	140.929	Vertical	Pass
		2535	-1.57	4.69	27.72	21.46	139.959	Vertical	Pass
		2565	-1.65	4.72	27.70	21.33	135.831	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-1.59	4.55	27.77	21.63	145.546	Vertical	Pass
		2535	-1.69	4.69	27.72	21.34	136.144	Vertical	Pass
		2562.5	-1.45	4.72	27.69	21.52	141.906	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-1.50	4.57	27.78	21.71	148.252	Vertical	Pass
		2535	-1.50	4.73	27.72	21.49	140.929	Vertical	Pass
		2560	-1.48	4.75	27.68	21.45	139.637	Vertical	Pass

Radiated Power (EIRP) for Band 7									
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	2502.5	-2.99	4.54	27.75	20.22	105.196	Horizontal	Pass
		2535	-2.55	4.69	27.72	20.48	111.686	Horizontal	Pass
		2567.5	-3.11	4.71	27.71	19.89	97.499	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.14	4.55	27.76	20.07	101.625	Horizontal	Pass
		2535	-2.41	4.69	27.72	20.62	115.345	Horizontal	Pass
		2565	-3.02	4.72	27.70	19.96	99.083	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.13	4.55	27.77	20.09	102.094	Horizontal	Pass
		2535	-2.43	4.69	27.72	20.60	114.815	Horizontal	Pass
		2562.5	-3.05	4.72	27.69	19.92	98.175	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.06	4.57	27.78	20.15	103.514	Horizontal	Pass
		2535	-2.35	4.73	27.72	20.64	115.878	Horizontal	Pass
		2560	-3.05	4.75	27.68	19.88	97.275	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-3.11	4.54	27.75	20.10	102.329	Vertical	Pass
		2535	-2.43	4.69	27.72	20.60	114.815	Vertical	Pass
		2567.5	-2.95	4.71	27.71	20.05	101.158	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.08	4.55	27.76	20.13	103.039	Vertical	Pass
		2535	-2.54	4.69	27.72	20.49	111.944	Vertical	Pass
		2565	-3.02	4.72	27.70	19.96	99.083	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-2.97	4.55	27.77	20.25	105.925	Vertical	Pass
		2535	-2.36	4.69	27.72	20.67	116.681	Vertical	Pass
		2562.5	-3.14	4.72	27.69	19.83	96.161	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-2.95	4.57	27.78	20.26	106.170	Vertical	Pass
		2535	-2.26	4.73	27.72	20.73	118.304	Vertical	Pass
		2560	-2.90	4.75	27.68	20.03	100.693	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, §24.238, §27.53

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 Band 2
- LTE Band 4
- ☐ LTE Band 5
- LTE Band 7

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	-55.07	4.04	33.51	-25.60	-13	-12.60	Horizontal
3701.4	-56.23	4.04	33.51	-26.76	-13	-13.76	Vertical
5552.1	-50.35	5.24	35.84	-19.75	-13	-6.75	Vertical
5552.1	-51.68	5.24	35.84	-21.08	-13	-8.08	Horizontal
134.1	-46.49	1.43	15.60	-32.32	-13	-19.32	Vertical
93.1	-45.73	1.62	15.44	-31.91	-13	-18.91	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-49.28	4.04	33.56	-19.76	-13	-6.76	Horizontal
3760.0	-52.69	4.04	33.56	-23.17	-13	-10.17	Vertical
5640.0	-50.93	5.24	35.91	-20.26	-13	-7.26	Vertical
5640.0	-51.74	5.24	35.91	-21.07	-13	-8.07	Horizontal
95.8	-45.85	1.68	16.07	-31.46	-13	-18.46	Vertical
110.6	-45.88	1.55	15.04	-32.39	-13	-19.39	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.79	4.04	34.00	-19.83	-13	-6.83	Horizontal
3818.6	-57.26	4.04	34.00	-27.30	-13	-14.30	Vertical
5727.9	-51.59	5.24	36.04	-20.79	-13	-7.79	Vertical
5727.9	-51.45	5.24	36.04	-20.65	-13	-7.65	Horizontal
130.6	-37.98	1.77	15.66	-24.09	-13	-11.09	Vertical
106.3	-47.92	1.39	17.35	-31.96	-13	-18.96	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3720.0	-51.76	4.07	33.54	-22.29	-13	-9.29	Horizontal
3720.0	-52.82	4.07	33.54	-23.35	-13	-10.35	Vertical
5580.0	-48.90	5.28	35.86	-18.32	-13	-5.32	Vertical
5580.0	-56.03	5.28	35.86	-25.45	-13	-12.45	Horizontal
108.4	-37.60	1.68	15.86	-23.42	-13	-10.42	Vertical
171.0	-37.12	1.64	15.68	-23.08	-13	-10.08	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-55.32	4.04	33.56	-25.80	-13	-12.80	Horizontal
3760.0	-54.94	4.04	33.56	-25.42	-13	-12.42	Vertical
5640.0	-53.77	5.24	35.91	-23.10	-13	-10.10	Vertical
5640.0	-56.11	5.24	35.91	-25.44	-13	-12.44	Horizontal
91.9	-38.40	1.37	15.92	-23.85	-13	-10.85	Vertical
174.5	-45.75	1.78	16.01	-31.52	-13	-18.52	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.55	4.04	34.00	-20.59	-13	-7.59	Horizontal
3800.0	-48.84	4.04	34.00	-18.88	-13	-5.88	Vertical
5700.0	-54.56	5.24	36.04	-23.76	-13	-10.76	Vertical
5700.0	-54.53	5.24	36.04	-23.73	-13	-10.73	Horizontal
127.8	-38.78	1.57	15.06	-25.29	-13	-12.29	Vertical
226.2	-40.49	1.38	17.41	-24.46	-13	-11.46	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	-47.85	4.02	29.80	-22.07	-13	-9.07	Horizontal
3421.4	-50.16	4.02	29.80	-24.38	-13	-11.38	Vertical
5132.1	-48.63	5.24	35.84	-18.03	-13	-5.03	Vertical
5132.1	-54.42	5.24	35.84	-23.82	-13	-10.82	Horizontal
95.5	-44.16	1.80	16.62	-29.34	-13	-16.34	Vertical
108.1	-39.94	1.70	15.33	-26.31	-13	-13.31	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.73	4.03	30.00	-23.76	-13	-10.76	Horizontal
3465.0	-52.93	4.03	30.00	-26.96	-13	-13.96	Vertical
5197.5	-50.48	5.25	35.86	-19.87	-13	-6.87	Vertical
5197.5	-47.57	5.25	35.86	-16.96	-13	-3.96	Horizontal
230.0	-48.41	1.53	17.89	-32.05	-13	-19.05	Vertical
186.2	-41.23	1.56	17.73	-25.06	-13	-12.06	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.05	4.05	30.01	-23.09	-13	-10.09	Horizontal
3508.6	-50.43	4.05	30.01	-24.47	-13	-11.47	Vertical
5262.9	-53.20	5.26	35.86	-22.60	-13	-9.60	Vertical
5262.9	-54.66	5.26	35.86	-24.06	-13	-11.06	Horizontal
148.9	-39.64	1.35	17.43	-23.56	-13	-10.56	Vertical
155.2	-40.37	1.53	17.74	-24.16	-13	-11.16	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	-53.74	4.02	29.80	-27.96	-13	-14.96	Horizontal
3440.0	-47.23	4.02	29.80	-21.45	-13	-8.45	Vertical
5160.0	-52.54	5.24	35.84	-21.94	-13	-8.94	Vertical
5160.0	-52.69	5.24	35.84	-22.09	-13	-9.09	Horizontal
252.0	-45.11	1.76	16.47	-30.40	-13	-17.40	Vertical
85.6	-39.32	1.50	15.69	-25.13	-13	-12.13	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.27	4.03	30.00	-23.30	-13	-10.30	Horizontal
3465.0	-55.34	4.03	30.00	-29.37	-13	-16.37	Vertical
5197.5	-50.71	5.25	35.86	-20.10	-13	-7.10	Vertical
5197.5	-51.38	5.25	35.86	-20.77	-13	-7.77	Horizontal
135.7	-44.01	1.66	16.39	-29.28	-13	-16.28	Vertical
114.7	-44.40	1.34	17.78	-27.96	-13	-14.96	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-55.72	2.91	27.68	-30.95	-13	-17.95	Horizontal
3490.0	-49.39	2.91	27.68	-24.62	-13	-11.62	Vertical
5235.0	-52.44	5.26	35.86	-21.84	-13	-8.84	Vertical
5235.0	-49.64	5.26	35.86	-19.04	-13	-6.04	Horizontal
87.1	-44.74	1.56	15.73	-30.57	-13	-17.57	Vertical
214.5	-41.82	1.61	15.26	-28.17	-13	-15.17	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	-48.36	2.78	27.50	-23.64	-13	-10.64	Horizontal
1649.4	-45.04	2.78	27.50	-20.32	-13	-7.32	Vertical
2474.1	-45.37	2.90	27.80	-20.47	-13	-7.47	Vertical
2474.1	-52.51	2.90	27.80	-27.61	-13	-14.61	Horizontal
170.1	-42.70	1.59	17.45	-26.84	-13	-13.84	Vertical
208.2	-43.46	1.44	15.72	-29.18	-13	-16.18	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-42.53	2.80	27.48	-17.85	-13	-4.85	Horizontal
1673.0	-43.95	2.80	27.48	-19.27	-13	-6.27	Vertical
2509.5	-49.50	2.91	27.70	-24.71	-13	-11.71	Vertical
2509.5	-47.40	2.91	27.70	-22.61	-13	-9.61	Horizontal
192.2	-44.23	1.33	17.92	-27.64	-13	-14.64	Vertical
204.2	-45.53	1.31	15.97	-30.87	-13	-17.87	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.65	2.82	27.43	-22.04	-13	-9.04	Horizontal
1696.6	-49.68	2.82	27.43	-25.07	-13	-12.07	Vertical
2544.9	-46.34	2.92	27.74	-21.52	-13	-8.52	Vertical
2544.9	-43.13	2.92	27.74	-18.31	-13	-5.31	Horizontal
123.9	-43.83	1.42	17.66	-27.59	-13	-14.59	Vertical
150.2	-40.66	1.41	15.68	-26.39	-13	-13.39	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	-47.26	2.78	27.50	-22.54	-13	-9.54	Horizontal
1658.0	-41.92	2.78	27.50	-17.20	-13	-4.20	Vertical
2487.0	-48.68	2.90	27.80	-23.78	-13	-10.78	Vertical
2487.0	-49.82	2.90	27.80	-24.92	-13	-11.92	Horizontal
163.4	-43.78	1.40	15.22	-29.96	-13	-16.96	Vertical
106.6	-45.80	1.78	15.44	-32.14	-13	-19.14	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-49.45	2.80	27.48	-24.77	-13	-11.77	Horizontal
1673.0	-52.44	2.80	27.48	-27.76	-13	-14.76	Vertical
2509.5	-50.51	2.91	27.70	-25.72	-13	-12.72	Vertical
2509.5	-48.90	2.91	27.70	-24.11	-13	-11.11	Horizontal
125.8	-47.12	1.50	16.27	-32.35	-13	-19.35	Vertical
222.0	-44.75	1.49	17.84	-28.40	-13	-15.40	Horizontal
Test Results for High Channel 844MHz							
1688.0	-47.62	2.82	27.43	-23.01	-13	-10.01	Horizontal
1688.0	-46.63	2.82	27.43	-22.02	-13	-9.02	Vertical
2532.0	-46.15	2.92	27.74	-21.33	-13	-8.33	Vertical
2532.0	-43.19	2.92	27.74	-18.37	-13	-5.37	Horizontal
200.0	-44.90	1.71	15.05	-31.56	-13	-18.56	Vertical
150.6	-41.44	1.39	15.94	-26.89	-13	-13.89	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.

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	-61.51	5.23	35.81	-30.93	-25	-5.93	Horizontal
5005.0	-68.88	5.23	35.81	-38.30	-25	-13.30	Vertical
7507.5	-70.04	5.67	36.85	-38.86	-25	-13.86	Vertical
7507.5	-67.13	5.67	36.85	-35.95	-25	-10.95	Horizontal
176.1	-55.86	1.37	17.79	-39.44	-25	-14.44	Vertical
177.4	-56.91	1.37	16.86	-41.42	-25	-16.42	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-63.98	5.23	35.82	-33.39	-25	-8.39	Horizontal
5070.0	-61.34	5.23	35.82	-30.75	-25	-5.75	Vertical
7605.0	-59.76	5.67	36.85	-28.58	-25	-3.58	Vertical
7605.0	-62.59	5.67	36.85	-31.41	-25	-6.41	Horizontal
297.7	-56.70	1.59	16.54	-41.75	-25	-16.75	Vertical
426.3	-54.87	1.51	16.53	-39.85	-25	-14.85	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-59.88	5.24	35.83	-29.29	-25	-4.29	Horizontal
5135.0	-62.74	5.24	35.83	-32.15	-25	-7.15	Vertical
7702.5	-62.02	5.68	36.87	-30.83	-25	-5.83	Vertical
7702.5	-67.56	5.68	36.87	-36.37	-25	-11.37	Horizontal
183.9	-56.73	1.79	16.17	-42.35	-25	-17.35	Vertical
231.9	-54.85	1.33	17.56	-38.62	-25	-13.62	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	-63.01	5.23	35.82	-32.42	-25	-7.42	Horizontal
5020.0	-70.80	5.23	35.82	-40.21	-25	-15.21	Vertical
7530.0	-71.30	5.67	36.86	-40.11	-25	-15.11	Vertical
7530.0	-70.07	5.67	36.86	-38.88	-25	-13.88	Horizontal
480.4	-57.18	1.52	16.60	-42.10	-25	-17.10	Vertical
562.2	-49.62	1.41	15.50	-35.53	-25	-10.53	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.56	5.23	35.82	-30.97	-25	-5.97	Horizontal
5070.0	-61.82	5.23	35.82	-31.23	-25	-6.23	Vertical
7605.0	-67.19	5.67	36.85	-36.01	-25	-11.01	Vertical
7605.0	-70.13	5.67	36.85	-38.95	-25	-13.95	Horizontal
502.4	-52.40	1.52	17.87	-36.05	-25	-11.05	Vertical
233.3	-54.55	1.56	16.41	-39.70	-25	-14.70	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-67.62	5.24	35.83	-37.03	-25	-12.03	Horizontal
5120.0	-61.68	5.24	35.83	-31.09	-25	-6.09	Vertical
7680.0	-71.33	5.70	36.88	-40.15	-25	-15.15	Vertical
7680.0	-70.38	5.70	36.88	-39.20	-25	-14.20	Horizontal
213.3	-54.81	1.41	17.68	-38.54	-25	-13.54	Vertical
551.4	-51.22	1.44	16.83	-35.83	-25	-10.83	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 20.4V, Normal, DC 24V and High voltage, DC 27.6V.

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 Band 2

LTE Band 4

- LTE Band5

LTE Band 7

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]
20.4	1880	1.9	0.001011	2.5
24	1880	-9.4	-0.005021	2.5
27.6	1880	16.0	0.008521	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	22.1	0.011750	2.5
Extreme (50C)	1880	22.8	0.012128	2.5
Extreme (40C)	1880	18.2	0.009697	2.5
Extreme (30C)	1880	-12.6	-0.006691	2.5
Extreme (10C)	1880	25.7	0.013654	2.5
Extreme (0C)	1880	-23.5	-0.012479	2.5
Extreme (-10C)	1880	8.7	0.004606	2.5
Extreme (-20C)	1880	8.3	0.004415	2.5
Extreme (-30C)	1880	-26.0	-0.013803	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]
20.4	1880	-17.3	-0.009213	2.5
24	1880	-26.8	-0.014250	2.5
27.6	1880	-1.9	-0.000989	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	15.8	0.008394	2.5
Extreme (50C)	1880	-2.0	-0.001085	2.5
Extreme (40C)	1880	-24.6	-0.013074468	2.5
Extreme (30C)	1880	-29.7	-0.01581383	2.5
Extreme (10C)	1880	21.6	0.011510638	2.5
Extreme (0C)	1880	-25.1	-0.013367021	2.5
Extreme (-10C)	1880	-14.1	-0.007494681	2.5
Extreme (-20C)	1880	24.2	0.012888298	2.5
Extreme (-30C)	1880	29.6	0.015734043	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]
20.4	1732.5	-5.6	-0.003238	2.5
24	1732.5	16.3	0.009431	2.5
27.6	1732.5	-24.2	-0.013962	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	4.0	0.002297	2.5
Extreme (50C)	1732.5	25.9	0.014921	2.5
Extreme (40C)	1732.5	-18.2	-0.010488	2.5
Extreme (30C)	1732.5	17.8	0.010286	2.5
Extreme (10C)	1732.5	-0.5	-0.000266	2.5
Extreme (0C)	1732.5	-1.7	-0.000970	2.5
Extreme (-10C)	1732.5	15.9	0.009166	2.5
Extreme (-20C)	1732.5	-20.5	-0.011844	2.5
Extreme (-30C)	1732.5	-10.6	-0.006130	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]
20.4	1732.5	26.5	0.015278	2.5
24	1732.5	-9.5	-0.005495	2.5
27.6	1732.5	11.8	0.006817	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.4	0.005986	2.5
Extreme (50C)	1732.5	-27.2	-0.015700	2.5
Extreme (40C)	1732.5	21.6	0.012462	2.5
Extreme (30C)	1732.5	19.0	0.010967	2.5
Extreme (10C)	1732.5	5.7	0.003261	2.5
Extreme (0C)	1732.5	-6.3	-0.003648	2.5
Extreme (-10C)	1732.5	11.2	0.006459	2.5
Extreme (-20C)	1732.5	15.6	0.009004	2.5
Extreme (-30C)	1732.5	9.9	0.005714	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]
20.4	836.5	18.9	0.022618	2.5
24	836.5	-12.2	-0.014549	2.5
27.6	836.5	-30.3	-0.036258	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	-15.5	-0.018482	2.5
Extreme (50C)	836.5	14.7	0.017513	2.5
Extreme (40C)	836.5	7.4	0.008894	2.5
Extreme (30C)	836.5	-15.4	-0.018398	2.5
Extreme (10C)	836.5	-20.4	-0.024411	2.5
Extreme (0C)	836.5	17.1	0.020442	2.5
Extreme (-10C)	836.5	-10.6	-0.012612	2.5
Extreme (-20C)	836.5	-12.7	-0.015158	2.5
Extreme (-30C)	836.5	14.3	0.017071	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]
20.4	836.5	6.9	0.008273	2.5
24	836.5	12.1	0.014477	2.5
27.6	836.5	29.5	0.035302	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	-9.3	-0.011058	2.5
Extreme (50C)	836.5	11.0	0.013138	2.5
Extreme (40C)	836.5	-1.9	-0.002212	2.5
Extreme (30C)	836.5	3.8	0.004495	2.5
Extreme (10C)	836.5	14.1	0.016820	2.5
Extreme (0C)	836.5	-11.7	-0.013927	2.5
Extreme (-10C)	836.5	-9.9	-0.011871	2.5
Extreme (-20C)	836.5	7.6	0.009062	2.5
Extreme (-30C)	836.5	-19.3	-0.023096	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]
20.4	2535	-17.5	-0.006919	2.5
24	2535	18.3	0.007199	2.5
27.6	2535	6.2	0.002442	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	-26.0	-0.010252	2.5
Extreme (50C)	2535	-25.1	-0.009901	2.5
Extreme (40C)	2535	18.4	0.007274	2.5
Extreme (30C)	2535	6.4	0.002517	2.5
Extreme (10C)	2535	11.0	0.004331	2.5
Extreme (0C)	2535	-6.3	-0.002489	2.5
Extreme (-10C)	2535	-16.1	-0.006351	2.5
Extreme (-20C)	2535	-19.5	-0.007704	2.5
Extreme (-30C)	2535	-21.1	-0.008304	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]
20.4	2535	11.8	0.004639	2.5
24	2535	-30.9	-0.012197	2.5
27.6	2535	4.3	0.001684	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	11.4	0.004477	2.5
Extreme (50C)	2535	-30.3	-0.011945	2.5
Extreme (40C)	2535	9.4	0.003716	2.5
Extreme (30C)	2535	-7.1	-0.002813	2.5
Extreme (10C)	2535	-11.2	-0.004398	2.5
Extreme (0C)	2535	13.2	0.005187	2.5
Extreme (-10C)	2535	22.9	0.009034	2.5
Extreme (-20C)	2535	16.8	0.006619	2.5
Extreme (-30C)	2535	-6.2	-0.002442	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.

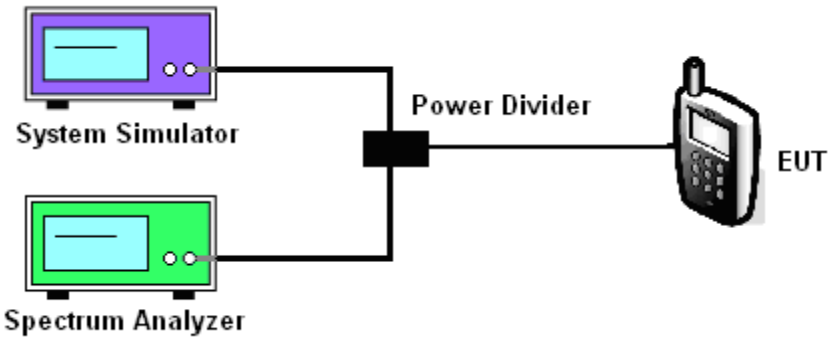
11.2 Measuring Instruments

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
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Test data reference attachment.

----END OF REPORT----