FCC CFR47 PART 24E, 27
CERTIFICATION TEST REPORT
FCC ID: 2A8WC-S400-0102

Product: Remote control

Trade Mark:

Model No.: GDU RC SEE

Family Model: N/A

Report No.: S22092902306007

Issue Date: Apr 01, 2024

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name ..... :	GDU-Tech Co., Ltd.
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Manufacturer's Name ..... :	GDU-Tech Co., Ltd.
Address ..... :	Building 2, No.5, Huanglongshan South Road, Donghu New Technology Development Zone, Wuhan 430074, China
Product name ..... :	Remote control
Trade Mark ..... :	
Model and/or type reference ... :	GDU RC SEE
Test Sample number ..... :	S220929023001
Date of Test ..... :	Mar 01, 2024 ~ Apr 01, 2024
Standards ..... :	FCC CFR 47 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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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Remote control
Trade Mark	
Model Name	GDU RC SEE
Family Model	N/A
Model Difference	N/A
FCC ID:	2A8WC-S400-0102
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 2, 7 LTE TDD Band 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE TDD Band 41 Uplink& Downlink: 2555MHz-2655MHz,
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
Antenna:	FPC Antenna
Antenna gain:	Band 2: 1.58 dBi, Band 7: 0.89dBi, Band 41: 0.89 dBi,
Adapter	Model: CPD-BC12 Input: AC100-240V~50/60Hz 5A Output: 26.4V⎓14A; 12V⎓3A; 5V⎓3A
Battery	DC 7.2V, 7000mAh
Power supply	DC 7.2V from battery or DC 26.4V from adapter
Extreme Vol. Limits:	DC 6.12V to DC 8.28V (Nominal DC 7.2)（Note 1）
HW Version	N/A
SW Version	N/A
** Note1: The High Voltage DC 8.28V and Low Voltage 6.12V 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: 2A8WC-S400-0102** filing to comply with the FCC Part 24E&27.

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, 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

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 2/7/41

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

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

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

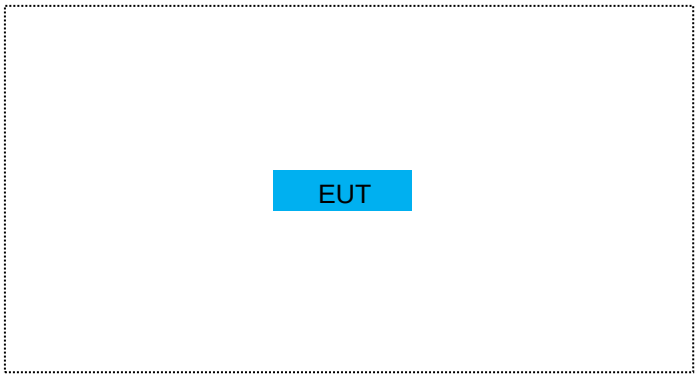
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Remote control	GDU RC SEE	FCC ID: 2A8WC-S400-0102	EUT

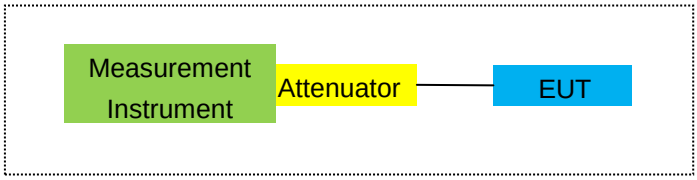
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

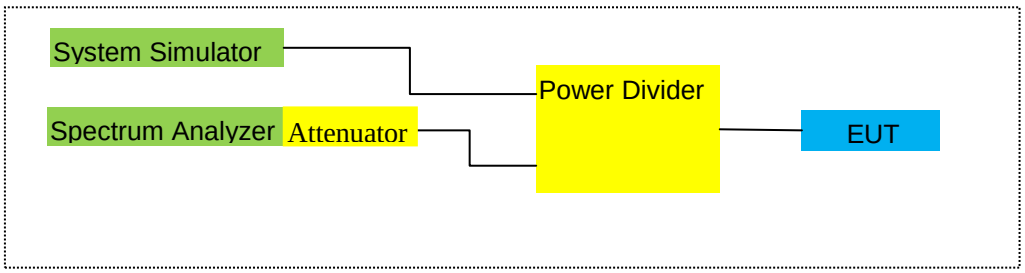
For Radiated Test Cases



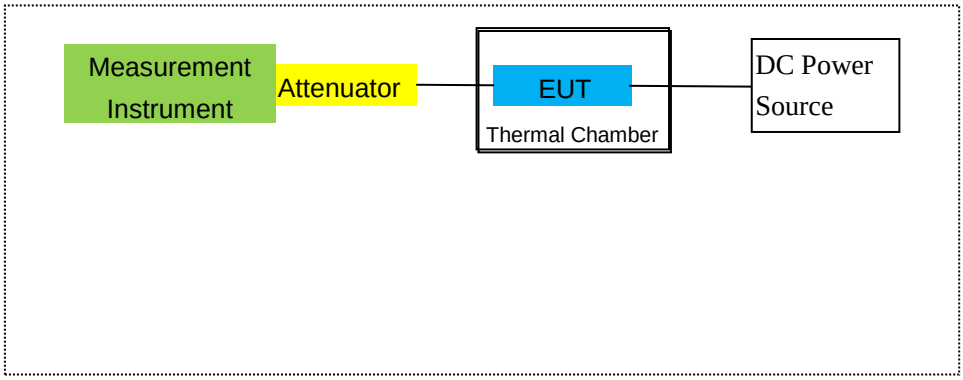
For Conducted Output Power



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	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16 2024.03.11	2024.03.15 2025.03.10	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2023.05.06	2026.05.05	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2025.03.30	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2022.11.07	2025.11.06	3 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2023.11.03	2026.11.02	3 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.05.29	2024.05.28	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
15	LISN	R&S	ENV216	101313	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.05.06	2026.05.05	3 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	2023.03.27	2026.03.26	3 year

23	Spectrum Analyzer	agilent	e4440a	us44300399	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2023.03.27 2024.03.12	2024.03.26 2025.03.11	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2023.05.06	2026.05.05	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2023.05.29	2024.05.28	1 year
29	Communication Tester	R&S	CMW500	148500	2023.05.29	2024.05.28	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

- Band 2/7/41

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051,§24.238, §27.53

LIMITS

FCC: §24.238, §27.53

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/7/41

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §24.238, §27.53

LIMITS

1. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log (P) dB.

TEST PROCEDURE

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

For each out of band emissions measurement:

□

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

MODES TESTED

□ Band 2/7/41

□

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.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §24.232, §27.50

LIMITS:

24.232(c) The maximum output power of the transmitter for mobile and portable stations are limited to 2 watts EIRP.
27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

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

- Band 2/7/41

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)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-3.40	3.76	28.24	21.08	128.233	Horizontal	Pass
		1880	-3.30	3.91	28.22	21.01	126.183	Horizontal	Pass
		1909.3	-3.27	3.93	28.20	21.00	125.893	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.42	3.77	28.23	21.04	127.057	Horizontal	Pass
		1880	-3.37	3.91	28.24	20.96	124.738	Horizontal	Pass
		1908.5	-3.36	3.94	28.25	20.95	124.451	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.61	3.77	28.31	20.93	123.880	Horizontal	Pass
		1880	-3.31	3.91	28.22	21.00	125.893	Horizontal	Pass
		1907.5	-3.31	3.94	28.20	20.95	124.451	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.49	3.79	28.33	21.05	127.350	Horizontal	Pass
		1880	-3.26	3.95	28.22	21.01	126.183	Horizontal	Pass
		1905	-3.28	3.97	28.19	20.94	124.165	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-3.50	3.79	28.34	21.05	127.350	Horizontal	Pass
		1880	-3.33	3.95	28.22	20.94	124.165	Horizontal	Pass
		1902.5	-3.16	3.97	28.18	21.05	127.350	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.55	3.81	28.35	20.99	125.603	Horizontal	Pass
		1880	-3.20	3.96	28.22	21.06	127.644	Horizontal	Pass
		1900	-3.09	4.00	28.16	21.07	127.938	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-3.47	3.76	28.24	21.01	126.183	Vertical	Pass
		1880	-3.36	3.91	28.22	20.95	124.451	Vertical	Pass
		1909.3	-3.20	3.93	28.20	21.07	127.938	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-3.44	3.77	28.23	21.02	126.474	Vertical	Pass
		1880	-3.29	3.91	28.24	21.04	127.057	Vertical	Pass
		1908.5	-3.33	3.94	28.25	20.98	125.314	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-3.62	3.77	28.31	20.92	123.595	Vertical	Pass
		1880	-3.36	3.91	28.22	20.95	124.451	Vertical	Pass
		1907.5	-3.18	3.94	28.20	21.08	128.233	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-3.55	3.79	28.33	20.99	125.603	Vertical	Pass
		1880	-3.27	3.95	28.22	21.00	125.893	Vertical	Pass
		1905	-3.22	3.97	28.19	21.00	125.893	Vertical	Pass

15.0MHz Band QPSK	1/#Mid	1857.5	-3.53	3.79	28.34	21.02	126.474	Vertical	Pass
		1880	-3.20	3.95	28.22	21.07	127.938	Vertical	Pass
		1902.5	-3.16	3.97	28.18	21.05	127.350	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	1860	-3.44	3.81	28.35	21.10	128.825	Vertical	Pass
		1880	-3.13	3.96	28.22	**21.13**	129.718	Vertical	Pass
		1900	-3.06	4.00	28.16	21.10	128.825	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.41	3.76	28.24	20.07	101.625	Horizontal	Pass
		1880	-4.25	3.91	28.22	20.06	101.391	Horizontal	Pass
		1909.3	-4.13	3.93	28.20	20.14	103.276	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.36	3.77	28.23	20.10	102.329	Horizontal	Pass
		1880	-4.21	3.91	28.24	20.12	102.802	Horizontal	Pass
		1908.5	-4.22	3.94	28.25	20.09	102.094	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-4.48	3.77	28.31	20.06	101.391	Horizontal	Pass
		1880	-4.15	3.91	28.22	20.16	103.753	Horizontal	Pass
		1907.5	-4.20	3.94	28.20	20.06	101.391	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.43	3.79	28.33	20.11	102.565	Horizontal	Pass
		1880	-4.17	3.95	28.22	20.10	102.329	Horizontal	Pass
		1905	-4.12	3.97	28.19	20.10	102.329	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.40	3.79	28.34	20.15	103.514	Horizontal	Pass
		1880	-4.21	3.95	28.22	20.06	101.391	Horizontal	Pass
		1902.5	-4.18	3.97	28.18	20.03	100.693	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.43	3.81	28.35	20.11	102.565	Horizontal	Pass
		1880	-4.09	3.96	28.22	20.17	103.992	Horizontal	Pass
		1900	-4.09	4.00	28.16	20.07	101.625	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-4.40	3.76	28.24	20.08	101.859	Vertical	Pass
		1880	-4.21	3.91	28.22	20.10	102.329	Vertical	Pass
		1909.3	-4.17	3.93	28.20	20.10	102.329	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-4.35	3.77	28.23	20.11	102.565	Vertical	Pass
		1880	-4.26	3.91	28.24	20.07	101.625	Vertical	Pass
		1908.5	-4.26	3.94	28.25	20.05	101.158	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-4.48	3.77	28.31	20.06	101.391	Vertical	Pass

Band 16 QAM		1880	-4.28	3.91	28.22	20.03	100.693	Vertical	Pass
		1907.5	-4.19	3.94	28.20	20.07	101.625	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-4.50	3.79	28.33	20.04	100.925	Vertical	Pass
		1880	-4.12	3.95	28.22	20.15	103.514	Vertical	Pass
		1905	-4.04	3.97	28.19	20.18	104.232	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-4.44	3.79	28.34	20.11	102.565	Vertical	Pass
		1880	-4.19	3.95	28.22	20.08	101.859	Vertical	Pass
		1902.5	-4.19	3.97	28.18	20.02	100.462	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-4.31	3.81	28.35	20.23	105.439	Vertical	Pass
		1880	-4.05	3.96	28.22	20.21	104.954	Vertical	Pass
		1900	-3.97	4.00	28.16	20.19	104.472	Vertical	Pass

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

8.3 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	-0.82	4.54	27.75	22.39	173.380	Horizontal	Pass
		2535	-0.60	4.69	27.72	22.43	174.985	Horizontal	Pass
		2567.5	-0.65	4.71	27.71	22.35	171.791	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.82	4.55	27.76	22.39	173.380	Horizontal	Pass
		2535	-0.58	4.69	27.72	22.45	175.792	Horizontal	Pass
		2565	-0.53	4.72	27.70	22.45	175.792	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.74	4.55	27.77	22.48	177.011	Horizontal	Pass
		2535	-0.69	4.69	27.72	22.34	171.396	Horizontal	Pass
		2562.5	-0.66	4.72	27.69	22.31	170.216	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.79	4.57	27.78	22.42	174.582	Horizontal	Pass
		2535	-0.55	4.73	27.72	22.44	175.388	Horizontal	Pass
		2560	-0.47	4.75	27.68	22.46	176.198	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-0.79	4.54	27.75	22.42	174.582	Vertical	Pass
		2535	-0.59	4.69	27.72	22.44	175.388	Vertical	Pass
		2567.5	-0.66	4.71	27.71	22.34	171.396	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.74	4.55	27.76	22.47	176.604	Vertical	Pass
		2535	-0.69	4.69	27.72	22.34	171.396	Vertical	Pass
		2565	-0.54	4.72	27.70	22.44	175.388	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-0.79	4.55	27.77	22.43	174.985	Vertical	Pass
		2535	-0.70	4.69	27.72	22.33	171.002	Vertical	Pass
		2562.5	-0.50	4.72	27.69	22.47	176.604	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.71	4.57	27.78	22.50	177.828	Vertical	Pass
		2535	-0.47	4.73	27.72	22.52	178.649	Vertical	Pass
		2560	-0.41	4.75	27.68	22.52	178.649	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.87	4.54	27.75	21.34	136.144	Horizontal	Pass
		2535	-1.74	4.69	27.72	21.29	134.586	Horizontal	Pass
		2567.5	-1.65	4.71	27.71	21.35	136.458	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.95	4.55	27.76	21.26	133.660	Horizontal	Pass
		2535	-1.65	4.69	27.72	21.38	137.404	Horizontal	Pass
		2565	-1.63	4.72	27.70	21.35	136.458	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.90	4.55	27.77	21.32	135.519	Horizontal	Pass
		2535	-1.78	4.69	27.72	21.25	133.352	Horizontal	Pass
		2562.5	-1.74	4.72	27.69	21.23	132.739	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.84	4.57	27.78	21.37	137.088	Horizontal	Pass
		2535	-1.65	4.73	27.72	21.34	136.144	Horizontal	Pass
		2560	-1.61	4.75	27.68	21.32	135.519	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-1.82	4.54	27.75	21.39	137.721	Vertical	Pass
		2535	-1.78	4.69	27.72	21.25	133.352	Vertical	Pass
		2567.5	-1.67	4.71	27.71	21.33	135.831	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-1.86	4.55	27.76	21.35	136.458	Vertical	Pass
		2535	-1.77	4.69	27.72	21.26	133.660	Vertical	Pass
		2565	-1.64	4.72	27.70	21.34	136.144	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-1.86	4.55	27.77	21.36	136.773	Vertical	Pass
		2535	-1.81	4.69	27.72	21.22	132.434	Vertical	Pass
		2562.5	-1.65	4.72	27.69	21.32	135.519	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-1.79	4.57	27.78	21.42	138.676	Vertical	Pass
		2535	-1.59	4.73	27.72	21.40	138.038	Vertical	Pass
		2560	-1.53	4.75	27.68	21.40	138.038	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2557.5	-1.89	4.54	27.75	21.32	135.519	Horizontal	Pass
		2605	-1.68	4.69	27.72	21.35	136.458	Horizontal	Pass
		2652.5	-1.71	4.71	27.71	21.29	134.586	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.93	4.55	27.76	21.28	134.276	Horizontal	Pass
		2605	-1.75	4.69	27.72	21.28	134.276	Horizontal	Pass
		2650	-1.72	4.72	27.70	21.26	133.660	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-1.99	4.55	27.77	21.23	132.739	Horizontal	Pass
		2605	-1.72	4.69	27.72	21.31	135.207	Horizontal	Pass
		2647.5	-1.64	4.72	27.69	21.33	135.831	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2565	-1.88	4.57	27.78	21.33	135.831	Horizontal	Pass
		2605	-1.70	4.73	27.72	21.29	134.586	Horizontal	Pass
		2645	-1.60	4.75	27.68	21.33	135.831	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2557.5	-1.91	4.54	27.75	21.30	134.896	Vertical	Pass
		2605	-1.67	4.69	27.72	21.36	136.773	Vertical	Pass
		2652.5	-1.61	4.71	27.71	21.39	137.721	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2560	-1.81	4.55	27.76	21.40	138.038	Vertical	Pass
		2605	-1.74	4.69	27.72	21.29	134.586	Vertical	Pass
		2650	-1.70	4.72	27.70	21.28	134.276	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2562.5	-1.98	4.55	27.77	21.24	133.045	Vertical	Pass
		2605	-1.70	4.69	27.72	21.33	135.831	Vertical	Pass
		2647.5	-1.59	4.72	27.69	21.38	137.404	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2565	-1.78	4.57	27.78	21.43	138.995	Vertical	Pass
		2605	-1.58	4.73	27.72	21.41	138.357	Vertical	Pass
		2645	-1.49	4.75	27.68	21.44	139.316	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2557.5	-2.73	4.54	27.75	20.48	111.686	Horizontal	Pass
		2605	-2.48	4.69	27.72	20.55	113.501	Horizontal	Pass
		2652.5	-2.53	4.71	27.71	20.47	111.429	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-2.65	4.55	27.76	20.56	113.763	Horizontal	Pass
		2605	-2.51	4.69	27.72	20.52	112.720	Horizontal	Pass
		2650	-2.53	4.72	27.70	20.45	110.917	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-2.79	4.55	27.77	20.43	110.408	Horizontal	Pass
		2605	-2.54	4.69	27.72	20.49	111.944	Horizontal	Pass
		2647.5	-2.51	4.72	27.69	20.46	111.173	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-2.63	4.57	27.78	20.58	114.288	Horizontal	Pass
		2605	-2.51	4.73	27.72	20.48	111.686	Horizontal	Pass
		2645	-2.40	4.75	27.68	20.53	112.980	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2557.5	-2.76	4.54	27.75	20.45	110.917	Vertical	Pass
		2605	-2.49	4.69	27.72	20.54	113.240	Vertical	Pass
		2652.5	-2.49	4.71	27.71	20.51	112.460	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2560	-2.75	4.55	27.76	20.46	111.173	Vertical	Pass
		2605	-2.44	4.69	27.72	20.59	114.551	Vertical	Pass
		2650	-2.39	4.72	27.70	20.59	114.551	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2562.5	-2.79	4.55	27.77	20.43	110.408	Vertical	Pass
		2605	-2.60	4.69	27.72	20.43	110.408	Vertical	Pass
		2647.5	-2.51	4.72	27.69	20.46	111.173	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2565	-2.59	4.57	27.78	20.62	115.345	Vertical	Pass
		2605	-2.36	4.73	27.72	20.63	115.611	Vertical	Pass
		2645	-2.29	4.75	27.68	20.64	115.878	Vertical	Pass

Note:

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §24.238, §27.53

LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.

TEST PROCEDURE

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 2/7/41

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	-44.35	4.04	33.51	-14.88	-13	-1.88	Horizontal
3701.4	-45.62	4.04	33.51	-16.15	-13	-3.15	Vertical
5552.1	-44.81	5.24	35.84	-14.21	-13	-1.21	Vertical
5552.1	-50.64	5.24	35.84	-20.04	-13	-7.04	Horizontal
207.2	-43.98	1.43	16.02	-29.39	-13	-16.39	Vertical
451.6	-42.73	1.30	17.99	-26.04	-13	-13.04	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-50.36	4.04	33.56	-20.84	-13	-7.84	Horizontal
3760.0	-49.94	4.04	33.56	-20.42	-13	-7.42	Vertical
5640.0	-49.48	5.24	35.91	-18.81	-13	-5.81	Vertical
5640.0	-49.39	5.24	35.91	-18.72	-13	-5.72	Horizontal
203.2	-39.20	1.62	16.97	-23.85	-13	-10.85	Vertical
368.7	-43.81	1.74	15.98	-29.58	-13	-16.58	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-51.45	4.04	34.00	-21.49	-13	-8.49	Horizontal
3818.6	-48.24	4.04	34.00	-18.28	-13	-5.28	Vertical
5727.9	-44.34	5.24	36.04	-13.54	-13	-0.54	Vertical
5727.9	-51.99	5.24	36.04	-21.19	-13	-8.19	Horizontal
196.3	-44.65	1.42	17.29	-28.78	-13	-15.78	Vertical
465.0	-43.51	1.50	17.90	-27.10	-13	-14.10	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	-52.55	4.07	33.54	-23.08	-13	-10.08	Horizontal
3720.0	-47.64	4.07	33.54	-18.17	-13	-5.17	Vertical
5580.0	-48.14	5.28	35.86	-17.56	-13	-4.56	Vertical
5580.0	-51.75	5.28	35.86	-21.17	-13	-8.17	Horizontal
209.6	-37.35	1.58	16.89	-22.03	-13	-9.03	Vertical
420.2	-43.81	1.76	17.26	-28.31	-13	-15.31	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.74	4.04	33.56	-22.22	-13	-9.22	Horizontal
3760.0	-48.80	4.04	33.56	-19.28	-13	-6.28	Vertical
5640.0	-50.83	5.24	35.91	-20.16	-13	-7.16	Vertical
5640.0	-51.57	5.24	35.91	-20.90	-13	-7.90	Horizontal
198.5	-39.55	1.46	16.27	-24.74	-13	-11.74	Vertical
275.1	-44.08	1.59	15.15	-30.52	-13	-17.52	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-50.86	4.04	34.00	-20.90	-13	-7.90	Horizontal
3800.0	-45.55	4.04	34.00	-15.59	-13	-2.59	Vertical
5700.0	-50.16	5.24	36.04	-19.36	-13	-6.36	Vertical
5700.0	-50.85	5.24	36.04	-20.05	-13	-7.05	Horizontal
187.7	-37.48	1.36	17.39	-21.44	-13	-8.44	Vertical
446.3	-39.75	1.66	15.39	-26.02	-13	-13.02	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 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 Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5005.0	-64.58	5.23	35.81	-34.00	-25	-9.00	Horizontal
5005.0	-60.26	5.23	35.81	-29.68	-25	-4.68	Vertical
7507.5	-59.56	5.67	36.85	-28.38	-25	-3.38	Vertical
7507.5	-60.22	5.67	36.85	-29.04	-25	-4.04	Horizontal
207.6	-45.63	1.73	17.97	-29.39	-25	-4.39	Vertical
416.5	-45.21	1.38	15.11	-31.48	-25	-6.48	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.30	5.23	35.82	-28.71	-25	-3.71	Horizontal
5070.0	-63.92	5.23	35.82	-33.33	-25	-8.33	Vertical
7605.0	-64.28	5.67	36.85	-33.10	-25	-8.10	Vertical
7605.0	-61.86	5.67	36.85	-30.68	-25	-5.68	Horizontal
185.8	-49.92	1.77	16.17	-35.51	-25	-10.51	Vertical
395.0	-54.71	1.63	15.21	-41.13	-25	-16.13	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-62.47	5.24	35.83	-31.88	-25	-6.88	Horizontal
5135.0	-63.91	5.24	35.83	-33.32	-25	-8.32	Vertical
7702.5	-62.68	5.68	36.87	-31.49	-25	-6.49	Vertical
7702.5	-62.93	5.68	36.87	-31.74	-25	-6.74	Horizontal
211.3	-48.31	1.58	17.56	-32.33	-25	-7.33	Vertical
306.7	-53.39	1.45	16.58	-38.26	-25	-13.26	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 Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020.0	-61.86	5.23	35.82	-31.27	-25	-6.27	Horizontal
5020.0	-60.97	5.23	35.82	-30.38	-25	-5.38	Vertical
7530.0	-61.49	5.67	36.86	-30.30	-25	-5.30	Vertical
7530.0	-64.74	5.67	36.86	-33.55	-25	-8.55	Horizontal
196.4	-53.36	1.63	15.76	-39.23	-25	-14.23	Vertical
358.9	-47.49	1.71	15.44	-33.76	-25	-8.76	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.05	5.23	35.82	-30.46	-25	-5.46	Horizontal
5070.0	-60.66	5.23	35.82	-30.07	-25	-5.07	Vertical
7605.0	-60.21	5.67	36.85	-29.03	-25	-4.03	Vertical
7605.0	-64.42	5.67	36.85	-33.24	-25	-8.24	Horizontal
212.7	-46.29	1.79	16.84	-31.23	-25	-6.23	Vertical
364.9	-44.62	1.71	17.64	-28.69	-25	-3.69	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-63.49	5.24	35.83	-32.90	-25	-7.90	Horizontal
5120.0	-60.37	5.24	35.83	-29.78	-25	-4.78	Vertical
7680.0	-63.96	5.70	36.88	-32.78	-25	-7.78	Vertical
7680.0	-60.94	5.70	36.88	-29.76	-25	-4.76	Horizontal
210.5	-46.14	1.79	16.84	-31.08	-25	-6.08	Vertical
306.4	-49.03	1.71	17.64	-33.10	-25	-8.10	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

9.3 LTE BAND 41

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

Test Results for Low Channel 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5115.0	-60.93	5.13	35.81	-30.25	-25	-5.25	Horizontal
5115.0	-60.92	5.13	35.81	-30.24	-25	-5.24	Vertical
7672.5	-61.41	5.42	36.85	-29.98	-25	-4.98	Vertical
7672.5	-64.86	5.42	36.85	-33.43	-25	-8.43	Horizontal
181.2	-48.02	1.56	17.97	-31.61	-25	-6.61	Vertical
256.0	-53.75	1.33	15.11	-39.97	-25	-14.97	Horizontal
Test Results for Mid Channel 2593MHz							
5210.0	-62.61	5.16	35.82	-31.95	-25	-6.95	Horizontal
5210.0	-61.08	5.16	35.82	-30.42	-25	-5.42	Vertical
7815.0	-60.72	5.53	36.85	-29.40	-25	-4.40	Vertical
7815.0	-59.41	5.53	36.85	-28.09	-25	-3.09	Horizontal
176.6	-54.65	1.77	16.17	-40.24	-25	-15.24	Vertical
392.0	-49.21	1.63	15.21	-35.63	-25	-10.63	Horizontal
Test Results for High Channel 2687.5MHz							
5305.0	-63.00	5.23	35.83	-32.40	-25	-7.40	Horizontal
5305.0	-60.87	5.23	35.83	-30.27	-25	-5.27	Vertical
7957.5	-59.51	5.62	36.87	-28.26	-25	-3.26	Vertical
7957.5	-63.12	5.62	36.87	-31.87	-25	-6.87	Horizontal
194.1	-44.96	1.58	17.56	-28.98	-25	-3.98	Vertical
468.5	-54.46	1.45	16.58	-39.33	-25	-14.33	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5130.0	-63.24	5.23	35.82	-32.65	-25	-7.65	Horizontal
5130.0	-60.80	5.23	35.82	-30.21	-25	-5.21	Vertical
7695.0	-59.45	5.67	36.86	-28.26	-25	-3.26	Vertical
7695.0	-62.40	5.67	36.86	-31.21	-25	-6.21	Horizontal
193.2	-46.48	1.55	15.76	-32.27	-25	-7.27	Vertical
264.2	-54.02	1.62	15.44	-40.20	-25	-15.20	Horizontal
Test Results for Mid Channel 2593MHz							
5210.0	-62.30	5.16	35.82	-31.64	-25	-6.64	Horizontal
5210.0	-59.62	5.16	35.82	-28.96	-25	-3.96	Vertical
7815.0	-63.24	5.53	36.85	-31.92	-25	-6.92	Vertical
7815.0	-61.16	5.53	36.85	-29.84	-25	-4.84	Horizontal
206.8	-54.88	1.58	16.84	-39.62	-25	-14.62	Vertical
263.1	-48.68	1.61	17.64	-32.65	-25	-7.65	Horizontal
Test Results for High Channel 2680MHz							
5290.0	-61.58	5.24	35.83	-30.99	-25	-5.99	Horizontal
5290.0	-63.25	5.24	35.83	-32.66	-25	-7.66	Vertical
7935.0	-63.95	5.70	36.88	-32.77	-25	-7.77	Vertical
7935.0	-64.59	5.70	36.88	-33.41	-25	-8.41	Horizontal
177.6	-46.21	1.48	16.84	-30.85	-25	-5.85	Vertical
268.3	-44.82	1.59	17.64	-28.77	-25	-3.77	Horizontal

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

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

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

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, §24.235, §27.54

LIMITS

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

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage =low voltage, DC 6.12V, Normal, DC 7.2V and High voltage, DC 8.28V.

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

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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]
6.12	1880	12.9	0.006864	2.5
7.2	1880	13.9	0.007411	2.5
8.28	1880	13.1	0.006942	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13.0	0.006929	2.5
Extreme (50C)	1880	11.9	0.006331	2.5
Extreme (40C)	1880	14.0	0.007470	2.5
Extreme (30C)	1880	13.0	0.006922	2.5
Extreme (10C)	1880	13.8	0.007314	2.5
Extreme (0C)	1880	11.7	0.006245	2.5
Extreme (-10C)	1880	13.1	0.006944	2.5
Extreme (-20C)	1880	14.4	0.007649	2.5
Extreme (-30C)	1880	14.6	0.007750	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]
6.12	1880	9.4	0.005000	2.5
7.2	1880	8.6	0.004584	2.5
8.28	1880	8.1	0.004304	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.4	0.005021	2.5
Extreme (50C)	1880	8.9	0.004729	2.5
Extreme (40C)	1880	7.8	0.004174012	2.5
Extreme (30C)	1880	8.6	0.004585524	2.5
Extreme (10C)	1880	9.3	0.004967136	2.5
Extreme (0C)	1880	8.0	0.004259321	2.5
Extreme (-10C)	1880	8.9	0.004713301	2.5
Extreme (-20C)	1880	8.7	0.004611117	2.5
Extreme (-30C)	1880	8.2	0.004360535	2.5

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

10.2 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]
6.12	2535	9.9	0.003896	2.5
7.2	2535	9.2	0.003625	2.5
8.28	2535	8.0	0.003161	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.6	0.003786	2.5
Extreme (50C)	2535	8.6	0.003373	2.5
Extreme (40C)	2535	8.0	0.003139	2.5
Extreme (30C)	2535	8.7	0.003435	2.5
Extreme (10C)	2535	8.2	0.003247	2.5
Extreme (0C)	2535	8.7	0.003430	2.5
Extreme (-10C)	2535	9.0	0.003541	2.5
Extreme (-20C)	2535	8.7	0.003440	2.5
Extreme (-30C)	2535	7.9	0.003126	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]
6.12	2535	6.9	0.002722	2.5
7.2	2535	6.5	0.002550	2.5
8.28	2535	5.6	0.002225	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.2	0.002056	2.5
Extreme (40C)	2535	5.2	0.002068	2.5
Extreme (30C)	2535	6.6	0.002597	2.5
Extreme (10C)	2535	6.1	0.002390	2.5
Extreme (0C)	2535	5.5	0.002188	2.5
Extreme (-10C)	2535	5.3	0.002099	2.5
Extreme (-20C)	2535	5.4	0.002135	2.5
Extreme (-30C)	2535	6.1	0.002420	2.5

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

10.3 LTE BAND 41

Band 41 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]
6.12	2593	9.9	0.003801	2.5
7.2	2593	8.7	0.003353	2.5
8.28	2593	8.3	0.003194	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	9.6	0.003696	2.5
Extreme (50C)	2593	8.4	0.003250	2.5
Extreme (40C)	2593	8.2	0.003160	2.5
Extreme (30C)	2593	8.5	0.003283	2.5
Extreme (10C)	2593	8.2	0.003156	2.5
Extreme (0C)	2593	8.1	0.003136	2.5
Extreme (-10C)	2593	9.4	0.003632	2.5
Extreme (-20C)	2593	8.4	0.003243	2.5
Extreme (-30C)	2593	8.3	0.003185	2.5

Band 41 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]
6.12	2593	6.9	0.002661	2.5
7.2	2593	6.6	0.002528	2.5
8.28	2593	5.2	0.002013	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2593	6.9	0.002661	2.5
Extreme (50C)	2593	6.0	0.002300	2.5
Extreme (40C)	2593	5.5	0.002137	2.5
Extreme (30C)	2593	7.0	0.002699	2.5
Extreme (10C)	2593	5.8	0.002230	2.5
Extreme (0C)	2593	5.5	0.002115	2.5
Extreme (-10C)	2593	5.4	0.002093	2.5
Extreme (-20C)	2593	6.2	0.002388	2.5
Extreme (-30C)	2593	6.1	0.002360	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.

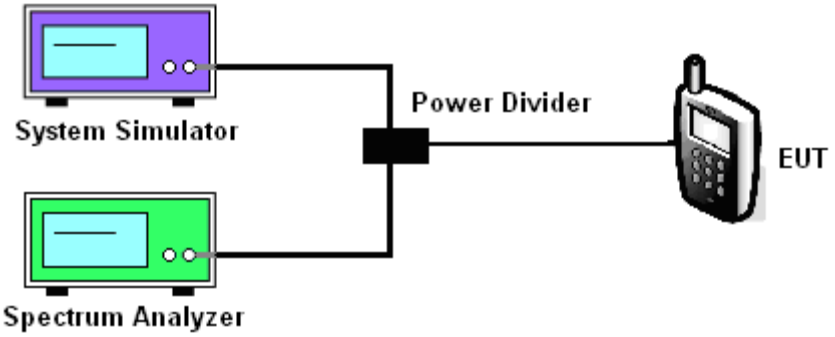
11.2 Measuring Instruments

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



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Test data reference attachment.

----END OF REPORT----