

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

FCC ID: 2A954-X7

Product: CPE

Trade Mark: FIRSTNUM, Stoneoim, VPLUS

Model Number: C401

Family Model: FIRSTNUM X7, FIRSTNUM X001,
FIRSTNUM X101, FIRSTNUM X201,
FIRSTNUM X301, FIRSTNUM X401,
FIRSTNUM X501, FIRSTNUM X601,
FIRSTNUM X701, FIRSTNUM X801,
FIRSTNUM X901

Report No.: S24032802801003

Prepared for

Shenzhen Firstnum E-commerce Co., Ltd
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Prepared by

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TEST RESULT CERTIFICATION	
Applicant's name	Shenzhen Firstnum E-commerce Co.,Ltd
Address	10E, Building B, XianDaiZhiChuang, 1078 HuaQiang north road, HuaQiangBei street, Futian, ShenZhen, GuangDong, China
Manufacturer's Name	Shenzhen Firstnum E-commerce Co.,Ltd
Address	10E, Building B, XianDaiZhiChuang, 1078 HuaQiang north road, HuaQiangBei street, Futian, ShenZhen, GuangDong, China
Product name	CPE
Model and/or type reference	C401
Family Model	FIRSTNUM X7,FIRSTNUM X001,FIRSTNUM X101,FIRSTNUM X201,FIRSTNUM X301,FIRSTNUM X401,FIRSTNUM X501,FIRSTNUM X601,FIRSTNUM X701,FIRSTNUM X801,FIRSTNUM X901
Standards	FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure	ANSI C63.26:2015 ANSI/TIA-603-E-2016
Test sample number	S240328028001

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.....	Mar 28, 2024 ~ May 08, 2024
Date of Issue	May 08, 2024
Test Result	Pass

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TABLE OF CONTENTS

1.1 PRODUCT DESCRIPTION	6
1.2 RELATED SUBMITTAL(S) / GRANT (S).....	8
1.3 TEST METHODOLOGY	8
1.4 TEST FACILITY	8
MEASUREMENT UNCERTAINTY	8
1.5 SPECIAL ACCESSORIES.....	9
1.6 WORST-CASE CONFIGURATION AND MODE.....	9
1.6 SUMMARY OF TEST RESULTS	9
2. SYSTEM TEST CONFIGURATION	11
2.1 EUT CONFIGURATION	11
2.2 EUT EXERCISE	11
2.3 CONFIGURATION OF EUT SYSTEM.....	11
2.4 TEST SETUP	12
3.TEST AND MEASUREMENT EQUIPMENT	13
4. OUTPUT POWER.....	15
4.1 OUTPUT POWER MEASUREMENT	15
6. BANDEDGE AND EMISSION MASK	18
7. OUT OF BAND EMISSIONS.....	19
7.1 MEASUREMENT METHOD	20
8. RADIATED MEASUREMENT	21
8.1. RADIATED POWER (ERP & EIRP)	21
8.2 LTE BAND 2	22
8.3 LTE BAND 4	26
8.4 LTE BAND 5	30
8.5 LTE BAND 7	32
8.6 LTE BAND 12	34

8.7 LTE BAND 13	36
8.8 LTE BAND 17	38
8.9 LTE BAND 38	40
8.10 LTE BAND 40	42
8.11 LTE BAND 41	46
9. SPURIOUS RADIATION EMISSION	48
9.1 LTE BAND 2	50
9.2 LTE BAND 4	52
9.3 LTE BAND 5	54
9.4 LTE BAND 7	56
9.5 LTE BAND 12	58
9.6 LTE BAND 13	60
9.7 LTE BAND 17	62
9.8 LTE BAND 38	64
9.9 LTE BAND 40	66
9.10 LTE BAND 41	70
10. FREQUENCY STABILITY	72
10.1 LTE BAND 2	73
10.2 LTE BAND 4	75
10.3 LTE BAND 5	77
10.4 LTE BAND 7	79
10.5 LTE BAND 12	81
10.6 LTE BAND 13	83
10.7 LTE BAND 17	85
10.8 LTE BAND 38	87
10.9 LTE BAND 40	89
10.10 LTE BAND 41	93
11. PEAK-TO-AVERAGE RATIO	95

11.1 Description of the PAR Measurement	95
11.2 Measuring Instruments	95
11.3 Test Procedures.....	95
11.4 Test Setup.....	95
12. DUTY CYCLE	96
12.1 LIMITS	96
The duty cycle must not exceed 38 percent	96
12.2 Measuring Instruments.....	96
12.3 Test Procedures.....	96
12.4 Test Setup	96

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	CPE
Trade Mark	FIRSTNUM, Stoneoim, VPLUS
Model Name	C401
Family Model	FIRSTNUM X7,FIRSTNUM X001,FIRSTNUM X101,FIRSTNUM X201, FIRSTNUM X301,FIRSTNUM X401,FIRSTNUM X501,FIRSTNUM X601,FIRSTNUM X701,FIRSTNUM X801,FIRSTNUM X901
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2A954-X7
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2, 4, 5, 7, 12, 13, 17 ☒ LTE TDD Band 38, 40, 41
Frequency Range:	LTE FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz; LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz; LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz; LTE-FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; LTE FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz; LTE FDD Band 13 Uplink: 777MHz-787MHz, Downlink: 746MHz-756MHz; LTE FDD Band 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz; LTE TDD Band 38 Uplink& Downlink: 2570MHz-2620MHz LTE TDD Band 40 Uplink& Downlink: 2305MHz-2320MHz, 2345MHz-2360MHz,(Number Of Channel see note 2) LTE TDD Band 41 Uplink& Downlink: 2555MHz-2655MHz, (Number Of Channel see note 3)
Type of Modulation:	QPSK/16QAM
Power Class	Class 3
Antenna:	FPC Antenna

Antenna gain:	B2: 4.5dBi; B4: -1.08dBi; B5: 1dBi; B7: 3.87dBi; B12: -2.09dBi; B13: -2.09dBi; B17: -2.09dBi; B38: 3.46dBi; B40: 3.42dBi; B41: 3.46dBi
Adapter	Model: HJ-1201000 Input: 100-240V~50/60Hz 0.6A Output: 12.0V $\overline{\sim}$ 1.0A 12.0W
Battery	DC 3.7V,4000mAh
Power supply	DC 3.7V from battery or DC 12V from Adapter.
Extreme Vol. Limits:	DC 3.16V to DC 4.26V (Nominal DC 3.7V) (Note 1)
HW Version	CRH51C5_MB_V1.0_20231113
SW Version	asr1803l_crh51c5-03_c401_rtl_ssit_cc_na_64mb_openwrt_lte_mul
** Note1: The High Voltage 4.26V and Low Voltage 3.16V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

Note: 2

LTE Band 40 2305-2320MHz

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	38725	2307.5
	10	38750	2310
	15	/	/
Mid Range	5/10/15	38775	2312.5
High Range	5	38825	2317.5
	10	38800	2315
	15	/	/

LTE Band 40 2345-2360MHz

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	39125	2347.5
	10	39150	2350
	15	/	/
Mid Range	5/10/15	39175	2352.5
High Range	5	39225	2357.5
	10	39200	2355
	15	/	/

Note: 3 LTE band 41

Test Frequency ID	Bandwidth(MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	40065	2557.5
	10	40090	2560
	15	40115	2562.5

	20	40140	2565
Mid Range	5/10/15/20	40640	2605
High Range	5	41215	2652.5
	10	41190	2650
	15	41165	2647.5
	20	41140	2645

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2A954-X7** filing to comply with the FCC Part 22H&24E &27.

1.3 TEST METHODOLOGY

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

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R.China.

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB
2	Conducted Emission Test	$\pm 1.38\text{dB}$
3	RF power, conducted	$\pm 0.16\text{dB}$
4	Spurious emissions, conducted	$\pm 0.21\text{dB}$
5	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
6	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
7	Temperature	$\pm 0.5^\circ\text{C}$
8	Humidity	$\pm 2\%$
9	Frequency error, conducted	$\pm 0.19\text{ ppm}$

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 5, Band 7, Band 12, Band 13, Band 17, Band 38, Band 40, Band 41.

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

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

1.6 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(m), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	

24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	
2.1051 22.917(a) 24.238(a) 27.53(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
27.50 KDB 971168 D01 Clause 6	Duty cycle	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

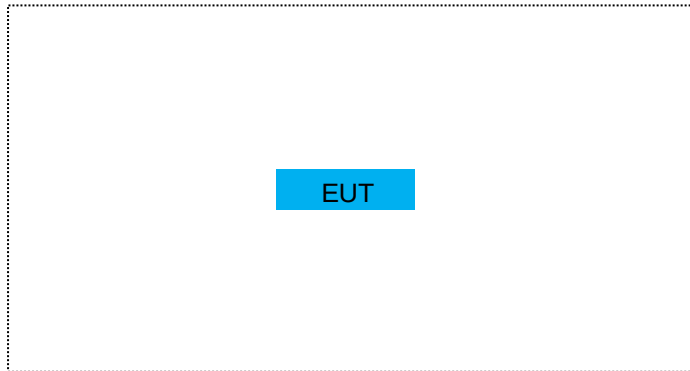
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	CPE	C401	FCC ID: 2A954-X7	EUT

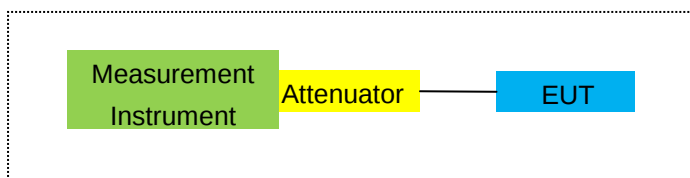
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

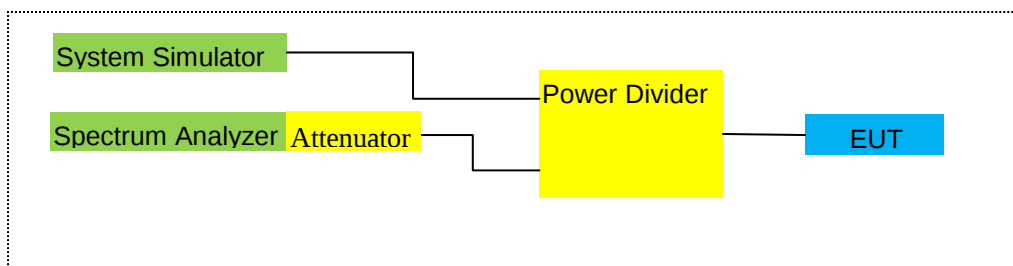
For Radiated Test Cases



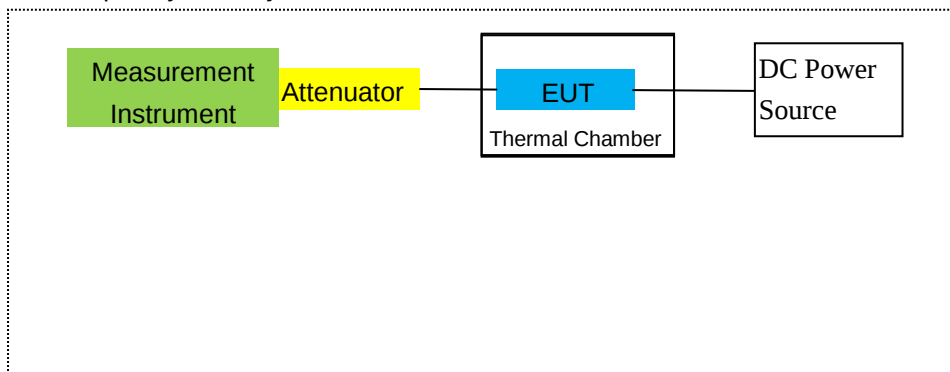
For Conducted Output Power



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	2024.03.12	2025.03.11	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.03.11	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	2024.03.12	2025.03.11	1 year
15	LISN	R&S	ENV216	101313	2024.03.12	2025.03.11	1 year
16	LISN	EMCO	3816/2	00042990	2024.03.12	2025.03.11	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.05.06	2026.05.05	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	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	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
23	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
24	Communication Tester	R&S	CMU200	A0304247	2023.05.29	2024.05.28	1 year
25	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year

26	DC Power Source	N/A	PS-6005D	2017040292 3	2023.05.06	2026.05.05	3 year
27	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2023.09.14	2024.09.13	1 year
28	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

☐ LTE Band 2/4/5/7/12/13/17/38/40/41

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §2.1046, §22.913, §24.232

LIMITS

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

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

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

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

Set display line

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

MODES TESTED

- ☐ LTE Band2/4/5/7/12/13/17/38/40/41

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

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

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

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

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

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/13/17/38/40/41

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/13/17/38/40/41

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)	Antenna Factor (dB)	Max.	Max.	Polarization Of Max. ERP	
						EIRP	EIRP		
						Average (dBm)	Average (mW)		
1.4MHz Band QPSK	6/0	1850.7	16.45	3.76	8.90	21.59	144.16	Horizontal	Pass
		1880	13.68	3.91	8.90	18.67	73.55	Horizontal	Pass
		1909.3	14.92	3.93	8.90	19.89	97.42	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	13.00	3.77	8.90	18.13	65.02	Horizontal	Pass
		1880	15.46	3.91	8.90	20.45	111.04	Horizontal	Pass
		1908.5	15.48	3.94	8.90	20.44	110.76	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	14.97	3.77	8.90	20.10	102.42	Horizontal	Pass
		1880	15.96	3.91	8.90	20.95	124.44	Horizontal	Pass
		1907.5	16.95	3.94	8.90	21.91	155.09	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	17.33	3.79	8.90	22.44	175.40	Horizontal	Pass
		1880	17.68	3.95	8.90	22.63	183.04	Horizontal	Pass
		1905	15.57	3.97	8.90	20.50	112.30	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	14.57	3.79	8.90	19.68	93.00	Horizontal	Pass
		1880	16.60	3.95	8.90	21.55	142.95	Horizontal	Pass
		1902.5	14.46	3.97	8.90	19.39	86.92	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	15.36	3.81	8.90	20.45	111.01	Horizontal	Pass
		1880	14.60	3.96	8.90	19.54	89.97	Horizontal	Pass
		1900	15.20	4.00	8.90	20.10	102.42	Horizontal	Pass
1.4MHz Band QPSK	6/0	1850.7	16.12	3.76	8.90	21.26	133.63	Vertical	Pass
		1880	14.41	3.91	8.90	19.40	87.10	Vertical	Pass
		1909.3	15.34	3.93	8.90	20.31	107.33	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	14.74	3.77	8.90	19.87	96.97	Vertical	Pass
		1880	17.10	3.91	8.90	22.09	161.73	Vertical	Pass
		1908.5	14.41	3.94	8.90	19.37	86.44	Vertical	Pass
5.0MHz Band QPSK	25/0	1852.5	14.75	3.77	8.90	19.88	97.25	Vertical	Pass
		1880	14.96	3.91	8.90	19.95	98.84	Vertical	Pass
		1907.5	16.96	3.94	8.90	21.92	155.72	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	13.94	3.79	8.90	19.05	80.39	Vertical	Pass
		1880	12.89	3.95	8.90	17.84	60.79	Vertical	Pass
		1905	14.09	3.97	8.90	19.02	79.82	Vertical	Pass

15.0MHz	75/0	1857.5	14.26	3.79	8.90	19.37	86.58	Vertical	Pass
Band		1880	14.85	3.95	8.90	19.80	95.45	Vertical	Pass
QPSK		1902.5	16.42	3.97	8.90	21.35	136.38	Vertical	Pass
20.0MHz	100/0	1860	16.76	3.81	8.90	21.85	153.12	Vertical	Pass
Band		1880	16.16	3.96	8.90	21.10	128.85	Vertical	Pass
QPSK		1900	16.29	4.00	8.90	21.19	131.46	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max.	Max.	Polarization Of Max. ERP	
						EIRP	EIRP		
						Average (dBm)	Average (mW)		
1.4MHz Band 16 QAM	6/0	1850.7	14.60	3.76	8.90	22.41	174.15	Horizontal	Pass
		1880	15.75	3.91	8.90	19.94	98.72	Horizontal	Pass
		1909.3	15.45	3.93	8.90	22.12	162.80	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	15.29	3.77	8.90	19.53	89.78	Horizontal	Pass
		1880	14.95	3.91	8.90	20.32	107.72	Horizontal	Pass
		1908.5	14.55	3.94	8.90	20.46	111.17	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	15.14	3.77	8.90	20.83	121.04	Horizontal	Pass
		1880	15.50	3.91	8.90	19.88	97.27	Horizontal	Pass
		1907.5	14.00	3.94	8.90	19.08	80.92	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	15.35	3.79	8.90	21.15	130.40	Horizontal	Pass
		1880	14.05	3.95	8.90	21.08	128.27	Horizontal	Pass
		1905	15.36	3.97	8.90	22.68	185.52	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.68	3.79	8.90	21.17	130.96	Horizontal	Pass
		1880	15.77	3.95	8.90	21.27	134.12	Horizontal	Pass
		1902.5	15.65	3.97	8.90	21.09	128.67	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	13.84	3.81	8.90	19.70	93.26	Horizontal	Pass
		1880	16.17	3.96	8.90	19.97	99.20	Horizontal	Pass
		1900	14.55	4.00	8.90	19.33	85.74	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	14.61	3.76	8.90	20.58	114.17	Vertical	Pass
		1880	15.84	3.91	8.90	20.33	107.80	Vertical	Pass
		1909.3	15.13	3.93	8.90	20.67	116.77	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	13.77	3.77	8.90	19.87	97.07	Vertical	Pass
		1880	14.83	3.91	8.90	21.28	134.30	Vertical	Pass
		1908.5	14.56	3.94	8.90	19.49	88.96	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1852.5	13.76	3.77	8.90	21.71	148.11	Vertical	Pass
		1880	15.05	3.91	8.90	22.11	162.65	Vertical	Pass
		1907.5	15.69	3.94	8.90	21.11	129.19	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	13.98	3.79	8.90	21.89	154.68	Vertical	Pass
		1880	15.57	3.95	8.90	21.03	126.63	Vertical	Pass
		1905	15.12	3.97	8.90	21.66	146.45	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	13.85	3.79	8.90	20.78	119.64	Vertical	Pass
		1880	14.87	3.95	8.90	21.52	141.81	Vertical	Pass
		1902.5	13.66	3.97	8.90	22.10	162.24	Vertical	Pass

20.0MHz	100/0	1860	14.29	3.81	8.90	22.85	192.94	Vertical	Pass
Band 16		1880	14.90	3.96	8.90	21.81	151.77	Vertical	Pass
QAM		1900	13.78	4.00	8.90	20.56	113.69	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Average (dBm)	Average (mW)		
1.4MHz Band QPSK	6/0	1710.7	13.60	3.12	8.90	19.38	86.77	Horizontal	Pass
		1732.5	12.04	3.27	8.90	17.67	58.49	Horizontal	Pass
		1754.3	15.02	3.29	8.90	20.63	115.56	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	12.15	3.13	8.90	17.92	61.97	Horizontal	Pass
		1732.5	14.05	3.27	8.90	19.68	92.94	Horizontal	Pass
		1753.5	13.00	3.30	8.90	18.60	72.37	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	15.74	3.13	8.90	21.51	141.72	Horizontal	Pass
		1732.5	14.74	3.27	8.90	20.37	108.90	Horizontal	Pass
		1752.5	14.27	3.30	8.90	19.87	97.16	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	13.88	3.15	8.90	19.63	91.73	Horizontal	Pass
		1732.5	13.16	3.31	8.90	18.75	75.07	Horizontal	Pass
		1750	15.56	3.33	8.90	21.13	129.61	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	13.21	3.15	8.90	18.96	78.76	Horizontal	Pass
		1732.5	13.63	3.31	8.90	19.22	83.57	Horizontal	Pass
		1747.5	15.44	3.33	8.90	21.01	126.22	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	13.71	3.17	8.90	19.44	87.80	Horizontal	Pass
		1732.5	13.38	3.32	8.90	18.96	78.64	Horizontal	Pass
		1745	13.74	3.36	8.90	19.28	84.76	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	13.14	3.12	8.90	18.92	78.01	Vertical	Pass
		1732.5	14.80	3.27	8.90	20.43	110.34	Vertical	Pass
		1754.3	15.05	3.29	8.90	20.66	116.41	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	13.29	3.13	8.90	19.06	80.46	Vertical	Pass
		1732.5	15.66	3.27	8.90	21.29	134.56	Vertical	Pass
		1753.5	14.78	3.30	8.90	20.38	109.13	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	14.30	3.13	8.90	20.07	101.60	Vertical	Pass
		1732.5	14.70	3.27	8.90	20.33	107.86	Vertical	Pass
		1752.5	12.69	3.30	8.90	18.29	67.47	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	10.86	3.15	8.90	16.61	45.85	Vertical	Pass
		1732.5	15.10	3.31	8.90	20.69	117.23	Vertical	Pass
		1750	14.32	3.33	8.90	19.89	97.48	Vertical	Pass

15.0MHz	75/0	1717.5	13.97	3.15	8.90	19.72	93.75	Vertical	Pass
Band		1732.5	14.00	3.31	8.90	19.59	91.06	Vertical	Pass
QPSK		1747.5	14.72	3.33	8.90	20.29	106.84	Vertical	Pass
20.0MHz	100/0	1720	15.38	3.17	8.90	21.11	128.98	Vertical	Pass
Band		1732.5	14.97	3.32	8.90	20.55	113.55	Vertical	Pass
QPSK		1745	12.29	3.36	8.90	17.83	60.654	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable	Antenna	Max.	Max.	Polarization	
			Level	Loss	Factor	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	Average	Average	ERP	
						(dBm)	(mW)		
1.4MHz Band 16 QAM	6/0	1710.7	14.28	3.12	8.90	20.06	101.35	Horizontal	Pass
		1732.5	15.09	3.27	8.90	20.72	117.93	Horizontal	Pass
		1754.3	14.53	3.29	8.90	20.14	103.22	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.28	3.13	8.90	19.05	80.29	Horizontal	Pass
		1732.5	14.70	3.27	8.90	20.33	107.78	Horizontal	Pass
		1753.5	15.75	3.30	8.90	21.35	136.41	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	13.78	3.13	8.90	19.55	90.20	Horizontal	Pass
		1732.5	11.70	3.27	8.90	17.33	54.09	Horizontal	Pass
		1752.5	13.52	3.30	8.90	19.12	81.73	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	16.10	3.15	8.90	21.85	153.27	Horizontal	Pass
		1732.5	13.78	3.31	8.90	19.37	86.54	Horizontal	Pass
		1750	13.02	3.33	8.90	18.59	72.26	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	13.51	3.15	8.90	19.26	84.40	Horizontal	Pass
		1732.5	15.73	3.31	8.90	21.32	135.40	Horizontal	Pass
		1747.5	14.27	3.33	8.90	19.84	96.28	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	14.13	3.17	8.90	19.86	96.75	Horizontal	Pass
		1732.5	13.93	3.32	8.90	19.51	89.39	Horizontal	Pass
		1745	15.56	3.36	8.90	21.10	128.89	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	15.65	3.12	8.90	21.43	138.99	Vertical	Pass
		1732.5	13.95	3.27	8.90	19.58	90.71	Vertical	Pass
		1754.3	15.54	3.29	8.90	21.15	130.21	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	13.76	3.13	8.90	19.53	89.72	Vertical	Pass
		1732.5	14.81	3.27	8.90	20.44	110.58	Vertical	Pass
		1753.5	14.29	3.30	8.90	19.89	97.61	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	15.10	3.13	8.90	20.87	122.13	Vertical	Pass
		1732.5	14.75	3.27	8.90	20.38	109.25	Vertical	Pass
		1752.5	12.52	3.30	8.90	18.12	64.82	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	13.77	3.15	8.90	19.52	89.44	Vertical	Pass
		1732.5	15.24	3.31	8.90	20.83	121.10	Vertical	Pass
		1750	16.54	3.33	8.90	22.11	162.38	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	14.12	3.15	8.90	19.87	97.02	Vertical	Pass
		1732.5	14.55	3.31	8.90	20.14	103.29	Vertical	Pass
		1747.5	15.45	3.33	8.90	21.02	126.49	Vertical	Pass

20.0MHz Band 16 QAM	100/0	1720	13.97	3.17	8.90	19.70	93.29	Vertical	Pass
		1732.5	15.60	3.32	8.90	21.18	131.30	Vertical	Pass
		1745	15.77	3.36	8.90	21.31	135.349	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 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	824.7	18.07	2.01	5.30	2.15	19.21	83.39	Horizontal	Pass
		836.5	20.21	2.01	5.30	2.15	21.35	136.41	Horizontal	Pass
		848.3	18.49	2.02	5.70	2.15	20.02	100.39	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	19.62	2.01	5.30	2.15	20.76	119.00	Horizontal	Pass
		836.5	20.55	2.01	5.30	2.15	21.69	147.42	Horizontal	Pass
		847.5	19.35	2.02	5.70	2.15	20.88	122.34	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	16.63	2.01	5.30	2.15	17.77	59.82	Horizontal	Pass
		836.5	19.49	2.01	5.30	2.15	20.63	115.57	Horizontal	Pass
		846.5	18.80	2.02	5.70	2.15	20.33	107.78	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	19.37	2.01	5.30	2.15	20.51	112.45	Horizontal	Pass
		836.5	17.98	2.01	5.30	2.15	19.12	81.73	Horizontal	Pass
		844	18.15	2.02	5.70	2.15	19.68	92.95	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	20.92	2.01	5.30	2.15	22.06	160.87	Vertical	Pass
		836.5	20.54	2.01	5.30	2.15	21.68	147.32	Vertical	Pass
		848.3	19.48	2.02	5.70	2.15	21.01	126.21	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	18.71	2.01	5.30	2.15	19.85	96.67	Vertical	Pass
		836.5	19.90	2.01	5.30	2.15	21.04	127.18	Vertical	Pass
		847.5	17.04	2.02	5.70	2.15	18.57	71.95	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	15.92	2.01	5.30	2.15	17.06	50.80	Vertical	Pass
		836.5	19.30	2.01	5.30	2.15	20.44	110.60	Vertical	Pass
		846.5	19.07	2.02	5.70	2.15	20.60	114.79	Vertical	Pass
10.0MHz Band QPSK	50/0	829	16.97	2.01	5.30	2.15	18.11	64.66	Vertical	Pass
		836.5	21.21	2.01	5.30	2.15	22.35	171.79	Vertical	Pass
		844	19.25	2.02	5.70	2.15	20.78	119.61	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band 16 QAM	6/0	824.7	18.51	2.01	5.30	2.15	19.65	92.24	Horizontal	Pass
		836.5	18.61	2.01	5.30	2.15	19.75	94.48	Horizontal	Pass
		848.3	17.33	2.02	5.70	2.15	18.86	77.00	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	18.03	2.01	5.30	2.15	19.17	82.55	Horizontal	Pass
		836.5	18.80	2.01	5.30	2.15	19.94	98.70	Horizontal	Pass
		847.5	17.56	2.02	5.70	2.15	19.09	81.04	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	17.71	2.01	5.30	2.15	18.85	76.74	Horizontal	Pass
		836.5	18.19	2.01	5.30	2.15	19.33	85.64	Horizontal	Pass
		846.5	17.55	2.02	5.70	2.15	19.08	80.94	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	17.14	2.01	5.30	2.15	18.28	67.24	Horizontal	Pass
		836.5	17.69	2.01	5.30	2.15	18.83	76.43	Horizontal	Pass
		844	17.46	2.02	5.70	2.15	18.99	79.30	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	18.89	2.01	5.30	2.15	20.03	100.59	Vertical	Pass
		836.5	19.01	2.01	5.30	2.15	20.15	103.44	Vertical	Pass
		848.3	16.91	2.02	5.70	2.15	18.44	69.81	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	15.73	2.01	5.30	2.15	16.87	48.62	Vertical	Pass
		836.5	19.66	2.01	5.30	2.15	20.80	120.19	Vertical	Pass
		847.5	17.36	2.02	5.70	2.15	18.89	77.44	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	18.34	2.01	5.30	2.15	19.48	88.67	Vertical	Pass
		836.5	15.31	2.01	5.30	2.15	16.45	44.20	Vertical	Pass
		846.5	18.65	2.02	5.70	2.15	20.18	104.18	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	15.51	2.01	5.30	2.15	16.65	46.25	Vertical	Pass
		836.5	19.97	2.01	5.30	2.15	21.11	129.03	Vertical	Pass
		844	17.55	2.02	5.70	2.15	19.08	80.95	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable	Antenna	Max.	Max.	Polarization	
			Level	Loss	Factor	EIRP	EIRP	Of Max.	
			(dBm)	(dBm)	(dB)	Average	Average	ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2502.5	16.64	4.54	9.00	21.10	128.69	Horizontal	Pass
		2535	16.28	4.69	9.00	20.59	114.44	Horizontal	Pass
		2567.5	13.16	4.71	9.00	17.45	55.64	Horizontal	Pass
10.0MHz Band QPSK	50/0	2505	13.16	4.55	9.00	17.61	57.72	Horizontal	Pass
		2535	15.95	4.69	9.00	20.26	106.23	Horizontal	Pass
		2565	16.54	4.72	9.00	20.82	120.85	Horizontal	Pass
15.0MHz Band QPSK	75/0	2507.5	16.43	4.55	9.00	20.88	122.42	Horizontal	Pass
		2535	16.37	4.69	9.00	20.68	116.93	Horizontal	Pass
		2562.5	15.67	4.72	9.00	19.95	98.91	Horizontal	Pass
20.0MHz Band QPSK	100/0	2510	14.79	4.57	9.00	19.22	83.47	Horizontal	Pass
		2535	16.61	4.73	9.00	20.88	122.36	Horizontal	Pass
		2560	14.73	4.75	9.00	18.98	79.15	Horizontal	Pass
5.0MHz Band QPSK	25/0	2502.5	15.43	4.54	9.00	19.89	97.48	Vertical	Pass
		2535	17.50	4.69	9.00	21.81	151.82	Vertical	Pass
		2567.5	16.72	4.71	9.00	21.01	126.25	Vertical	Pass
10.0MHz Band QPSK	50/0	2505	14.78	4.55	9.00	19.23	83.82	Vertical	Pass
		2535	15.37	4.69	9.00	19.68	92.97	Vertical	Pass
		2565	15.65	4.72	9.00	19.93	98.36	Vertical	Pass
15.0MHz Band QPSK	75/0	2507.5	15.07	4.55	9.00	19.52	89.48	Vertical	Pass
		2535	17.04	4.69	9.00	21.35	136.57	Vertical	Pass
		2562.5	15.13	4.72	9.00	19.41	87.30	Vertical	Pass
20.0MHz Band QPSK	100/0	2510	17.71	4.57	9.00	22.14	163.57	Vertical	Pass
		2535	16.02	4.73	9.00	20.29	107.02	Vertical	Pass
		2560	16.20	4.75	9.00	20.45	111.02	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	25/0	2502.5	14.73	4.54	9.00	19.19	83.01	Horizontal	Pass
		2535	14.46	4.69	9.00	18.77	75.41	Horizontal	Pass
		2567.5	15.80	4.71	9.00	20.09	102.07	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2505	15.63	4.55	9.00	20.08	101.91	Horizontal	Pass
		2535	15.45	4.69	9.00	19.76	94.69	Horizontal	Pass
		2565	16.42	4.72	9.00	20.70	117.59	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2507.5	15.72	4.55	9.00	20.17	104.07	Horizontal	Pass
		2535	16.68	4.69	9.00	20.99	125.51	Horizontal	Pass
		2562.5	14.73	4.72	9.00	19.01	79.70	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2510	14.30	4.57	9.00	18.73	74.71	Horizontal	Pass
		2535	13.38	4.73	9.00	17.65	58.16	Horizontal	Pass
		2560	15.62	4.75	9.00	19.87	97.15	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2502.5	14.64	4.54	9.00	19.10	81.37	Vertical	Pass
		2535	15.56	4.69	9.00	19.87	97.11	Vertical	Pass
		2567.5	15.52	4.71	9.00	19.81	95.76	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2505	16.03	4.55	9.00	20.48	111.63	Vertical	Pass
		2535	16.20	4.69	9.00	20.51	112.49	Vertical	Pass
		2565	14.15	4.72	9.00	18.43	69.68	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2507.5	16.09	4.55	9.00	20.54	113.15	Vertical	Pass
		2535	15.53	4.69	9.00	19.84	96.46	Vertical	Pass
		2562.5	14.53	4.72	9.00	18.81	75.98	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2510	16.99	4.57	9.00	21.42	138.70	Vertical	Pass
		2535	14.88	4.73	9.00	19.15	82.30	Vertical	Pass
		2560	16.04	4.75	9.00	20.29	106.82	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
1.4MHz Band QPSK	6/0	699.7	21.37	1.91	5.60	2.15	22.91	195.43	Horizontal	Pass
		707.5	22.36	1.91	5.70	2.15	24.00	251.19	Horizontal	Pass
		715.3	19.75	1.93	5.80	2.15	21.47	140.28	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	20.11	1.91	5.60	2.15	21.65	146.22	Horizontal	Pass
		707.5	20.86	1.91	5.70	2.15	22.50	177.83	Horizontal	Pass
		714.5	20.96	1.93	5.80	2.15	22.68	185.35	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	21.14	1.91	5.60	2.15	22.68	185.35	Horizontal	Pass
		707.5	21.61	1.91	5.70	2.15	23.25	211.35	Horizontal	Pass
		713.5	21.50	1.92	5.80	2.15	23.23	210.38	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	21.00	1.91	5.60	2.15	22.54	179.47	Horizontal	Pass
		707.5	20.10	1.91	5.70	2.15	21.74	149.28	Horizontal	Pass
		711	19.65	1.92	5.80	2.15	21.38	137.40	Horizontal	Pass
1.4MHz Band QPSK	6/0	699.7	20.09	1.91	5.60	2.15	21.63	145.55	Vertical	Pass
		707.5	20.93	1.91	5.70	2.15	22.57	180.72	Vertical	Pass
		715.3	19.70	1.93	5.80	2.15	21.42	138.68	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	20.97	1.91	5.60	2.15	22.51	178.24	Vertical	Pass
		707.5	19.81	1.91	5.70	2.15	21.45	139.64	Vertical	Pass
		714.5	22.41	1.93	5.80	2.15	24.13	258.82	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	20.22	1.91	5.60	2.15	21.76	149.97	Vertical	Pass
		707.5	20.86	1.91	5.70	2.15	22.50	177.83	Vertical	Pass
		713.5	20.88	1.92	5.80	2.15	22.61	182.39	Vertical	Pass
10.0MHz Band QPSK	50/0	704	20.03	1.91	5.60	2.15	21.57	143.55	Vertical	Pass
		707.5	20.25	1.91	5.70	2.15	21.89	154.53	Vertical	Pass
		711	22.00	1.92	5.80	2.15	23.73	236.05	Vertical	Pass

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)		Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)				Average	Average		
						(dB)	(dBm)	(mW)		
1.4MHz Band 16 QAM	6/0	699.7	20.86	1.91	5.60	2.15	22.4	173.78	Horizontal	Pass
		707.5	21.17	1.91	5.70	2.15	22.81	190.99	Horizontal	Pass
		715.3	20.93	1.93	5.80	2.15	22.65	184.08	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	21.85	1.91	5.60	2.15	23.39	218.27	Horizontal	Pass
		707.5	19.51	1.91	5.70	2.15	21.15	130.32	Horizontal	Pass
		714.5	20.03	1.93	5.80	2.15	21.75	149.62	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	19.94	1.91	5.60	2.15	21.48	140.60	Horizontal	Pass
		707.5	22.12	1.91	5.70	2.15	23.76	237.68	Horizontal	Pass
		713.5	21.81	1.92	5.80	2.15	23.54	225.94	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	21.34	1.91	5.60	2.15	22.88	194.09	Horizontal	Pass
		707.5	19.95	1.91	5.70	2.15	21.59	144.21	Horizontal	Pass
		711	21.57	1.92	5.80	2.15	23.3	213.80	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	699.7	19.29	1.91	5.60	2.15	20.83	121.06	Vertical	Pass
		707.5	21.54	1.91	5.70	2.15	23.18	207.97	Vertical	Pass
		715.3	20.99	1.93	5.80	2.15	22.71	186.64	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	22.17	1.91	5.60	2.15	23.71	234.96	Vertical	Pass
		707.5	21.29	1.91	5.70	2.15	22.93	196.34	Vertical	Pass
		714.5	22.25	1.93	5.80	2.15	23.97	249.46	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	20.95	1.91	5.60	2.15	22.49	177.42	Vertical	Pass
		707.5	22.09	1.91	5.70	2.15	23.73	236.05	Vertical	Pass
		713.5	20.01	1.92	5.80	2.15	21.74	149.28	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	21.65	1.91	5.60	2.15	23.19	208.45	Vertical	Pass
		707.5	22.44	1.91	5.70	2.15	24.08	255.86	Vertical	Pass
		711	21.21	1.92	5.80	2.15	22.94	196.79	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.7 LTE BAND 13

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band QPSK	25/0	779.5	18.37	1.91	5.80	2.15	20.11	102.486	Horizontal	Pass
		782	20.30	1.91	5.60	2.15	21.84	152.929	Horizontal	Pass
		784.5	20.26	1.92	5.70	2.15	21.89	154.525	Horizontal	Pass
10.0MHz Band QPSK	50/0	782	19.64	1.91	5.8	2.15	21.38	137.485	Horizontal	Pass
5.0MHz Band QPSK	25/0	779.5	18.30	1.91	5.80	2.15	20.04	100.832	Vertical	Pass
		782	20.40	1.91	5.60	2.15	21.94	156.266	Vertical	Pass
		784.5	18.78	1.92	5.70	2.15	20.41	109.903	Vertical	Pass
10.0MHz Band QPSK	50/0	782	19.48	1.91	5.8	2.15	21.22	132.434	Vertical	Pass

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	(dB)	Average	Average	Of Max. ERP	
							(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	779.5	18.83	1.91	5.80	2.15	20.57	113.959	Horizontal	Pass
		782	20.51	1.91	5.60	2.15	22.05	160.266	Horizontal	Pass
		784.5	19.94	1.92	5.70	2.15	21.57	143.694	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	782	19.17	1.91	5.8	2.15	20.91	123.3104833	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	779.5	17.70	1.91	5.80	2.15	19.44	87.947	Vertical	Pass
		782	19.06	1.91	5.60	2.15	20.60	114.927	Vertical	Pass
		784.5	18.89	1.92	5.70	2.15	20.52	112.774	Vertical	Pass
10.0MHz Band 16 QAM	50/0	782	18.88	1.91	5.8	2.15	20.62	115.345	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)

8.8 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor	Correction	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)		Average	Average	Of Max. ERP	
						(dB)	(dBm)	(mW)		
5.0MHz Band QPSK	25/0	706.5	18.56	1.91	5.60	2.15	20.10	102.42	Vertical	Pass
		710	20.25	1.91	5.70	2.15	21.89	154.43	Vertical	Pass
		713.5	20.07	1.92	5.80	2.15	21.80	151.38	Vertical	Pass
10.0MHz Band QPSK	50/0	709	18.18	1.91	5.60	2.15	19.72	93.81	Vertical	Pass
		710	19.42	1.91	5.70	2.15	21.06	127.71	Vertical	Pass
		711	17.52	1.92	5.80	2.15	19.25	84.12	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	18.18	1.91	5.60	2.15	19.72	93.75	Horizontal	Pass
		710	17.94	1.91	5.70	2.15	19.58	90.71	Horizontal	Pass
		713.5	18.77	1.92	5.80	2.15	20.50	112.18	Horizontal	Pass
10.0MHz Band QPSK	50/0	709	19.95	1.91	5.60	2.15	21.49	140.81	Horizontal	Pass
		710	20.30	1.91	5.70	2.15	21.94	156.21	Horizontal	Pass
		711	19.91	1.92	5.80	2.15	21.64	146.03	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level	Cable Loss	Antenna Factor		Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Correction (dB)	Average (dBm)	Average (mW)		
5.0MHz Band 16 QAM	25/0	706.5	16.81	1.91	5.6	2.15	21.25	133.32	Vertical	Pass
		710	16.39	1.91	5.7	2.15	20.81	120.37	Vertical	Pass
		713.5	17.43	1.92	5.8	2.15	21.49	141.02	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	15.91	1.91	5.6	2.15	21.61	144.87	Vertical	Pass
		710	15.84	1.91	5.7	2.15	22.25	167.72	Vertical	Pass
		711	15.59	1.92	5.8	2.15	22.27	168.78	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	17.52	1.91	5.6	2.15	22.07	161.10	Horizontal	Pass
		710	17.46	1.91	5.7	2.15	21.94	156.29	Horizontal	Pass
		713.5	16.25	1.92	5.8	2.15	21.36	136.85	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	17.30	1.91	5.6	2.15	21.35	136.49	Horizontal	Pass
		710	17.57	1.91	5.7	2.15	22.69	185.74	Horizontal	Pass
		711	16.65	1.92	5.8	2.15	22.99	199.23	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.9 LTE BAND 38

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization	
			(dBm)	(dBm)	(dB)	Average	Average	Of Max. ERP	
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2572.5	19.10	4.54	9.00	23.56	226.76	Horizontal	Pass
		2595	19.73	4.69	9.00	24.04	253.64	Horizontal	Pass
		2617.5	16.90	4.71	9.00	21.19	131.52	Horizontal	Pass
10.0MHz Band QPSK	50/0	2575	18.50	4.55	9.00	22.95	197.27	Horizontal	Pass
		2595	18.51	4.69	9.00	22.82	191.65	Horizontal	Pass
		2615	20.43	4.72	9.00	24.71	295.67	Horizontal	Pass
15.0MHz Band QPSK	75/0	2577.5	20.07	4.55	9.00	24.52	283.32	Horizontal	Pass
		2595	18.45	4.69	9.00	22.76	188.67	Horizontal	Pass
		2612.5	18.02	4.72	9.00	22.30	169.69	Horizontal	Pass
20.0MHz Band QPSK	100/0	2580	17.71	4.57	9.00	22.14	163.81	Horizontal	Pass
		2595	19.03	4.73	9.00	23.30	213.86	Horizontal	Pass
		2610	18.02	4.75	9.00	22.27	168.77	Horizontal	Pass
5.0MHz Band QPSK	25/0	2572.5	19.57	4.54	9.00	24.03	253.02	Vertical	Pass
		2595	19.06	4.69	9.00	23.37	217.04	Vertical	Pass
		2617.5	18.67	4.71	9.00	22.96	197.91	Vertical	Pass
10.0MHz Band QPSK	50/0	2575	17.89	4.55	9.00	22.34	171.26	Vertical	Pass
		2595	20.61	4.69	9.00	24.92	310.21	Vertical	Pass
		2615	18.91	4.72	9.00	23.19	208.35	Vertical	Pass
15.0MHz Band QPSK	75/0	2577.5	18.64	4.55	9.00	23.09	203.86	Vertical	Pass
		2595	19.27	4.69	9.00	23.58	227.89	Vertical	Pass
		2612.5	20.56	4.72	9.00	24.84	304.99	Vertical	Pass
20.0MHz Band QPSK	100/0	2580	19.16	4.57	9.00	23.59	228.77	Vertical	Pass
		2595	18.73	4.73	9.00	23.00	199.42	Vertical	Pass
		2610	20.72	4.75	9.00	24.97	314.20	Vertical	Pass

Radiated Power (EIRP) for Band 38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Gain	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)	(dB)	Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	2572.5	17.36	4.54	9.00	21.82	152.05	Horizontal	Pass
		2595	16.62	4.69	9.00	20.93	123.88	Horizontal	Pass
		2617.5	18.27	4.71	9.00	22.56	180.30	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2575	17.01	4.55	9.00	21.46	139.96	Horizontal	Pass
		2595	17.32	4.69	9.00	21.63	145.55	Horizontal	Pass
		2615	18.91	4.72	9.00	23.19	208.45	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2577.5	18.24	4.55	9.00	22.69	185.78	Horizontal	Pass
		2595	18.12	4.69	9.00	22.43	174.98	Horizontal	Pass
		2612.5	18.47	4.72	9.00	22.75	188.36	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2580	19.05	4.57	9.00	23.48	222.84	Horizontal	Pass
		2595	17.22	4.73	9.00	21.49	140.93	Horizontal	Pass
		2610	18.23	4.75	9.00	22.48	177.01	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2572.5	16.69	4.54	9.00	21.15	130.32	Vertical	Pass
		2595	17.85	4.69	9.00	22.16	164.44	Vertical	Pass
		2617.5	18.69	4.71	9.00	22.98	198.61	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2575	17.68	4.55	9.00	22.13	163.31	Vertical	Pass
		2595	19.29	4.69	9.00	23.6	229.09	Vertical	Pass
		2615	17.17	4.72	9.00	21.45	139.64	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2577.5	19.04	4.55	9.00	23.49	223.36	Vertical	Pass
		2595	18.16	4.69	9.00	22.47	176.60	Vertical	Pass
		2612.5	17.56	4.72	9.00	21.84	152.76	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2580	20.13	4.57	9.00	24.56	285.76	Vertical	Pass
		2595	18.79	4.73	9.00	23.06	202.30	Vertical	Pass
		2610	19.74	4.75	9.00	23.99	250.61	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.10 LTE BAND 40

Radiated Power (EIRP) for Band 40 (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG	Cable	Antenna Factor (dB)	Max.	Max.	Polarization Of Max. ERP	
			Level	Loss		EIRP	EIRP		
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2307.5	18.16	4.95	9.00	22.21	166.34	Horizontal	Pass
		2310	19.56	5.02	9.00	23.54	225.94	Horizontal	Pass
		2312.5	17.32	4.97	9.00	21.35	136.46	Horizontal	Pass
10.0MHz Band QPSK	50/0	2310	17.22	5	9.00	21.22	132.43	Horizontal	Pass
5.0MHz Band QPSK	25/0	2307.5	17.46	4.95	9.00	21.51	141.58	Vertical	Pass
		2310	18.04	5.02	9.00	22.02	159.22	Vertical	Pass
		2312.5	17.28	4.97	9.00	21.31	135.21	Vertical	Pass
10.0MHz Band QPSK	50/0	2310	19.56	4.75	9.00	23.81	240.44	Vertical	Pass

Radiated Power (EIRP) for Band 40 (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	2307.5	18.27	4.95	9.00	22.32	170.61	Horizontal	Pass
		2310	19.26	5.02	9.00	23.24	210.86	Horizontal	Pass
		2312.5	18.96	4.97	9.00	22.99	199.07	Horizontal	Pass
10.0MHz Band QPSK	50/0	2310	18.35	5	9.00	22.35	171.79	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2307.5	17.87	4.95	9.00	21.92	155.60	Vertical	Pass
		2310	19.15	5.02	9.00	23.13	205.59	Vertical	Pass
		2312.5	18.32	4.97	9.00	22.35	171.79	Vertical	Pass
10.0MHz Band QPSK	50/0	2310	19.17	4.75	9.00	23.42	219.79	Vertical	Pass

Radiated Power (EIRP) for Band 40 (2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2352.5	17.41	4.92	9.00	21.49	140.93	Horizontal	Pass
		2355	17.35	4.95	9.00	21.4	138.04	Horizontal	Pass
		2357.5	17.33	4.81	9.00	21.52	141.91	Horizontal	Pass
10.0MHz Band QPSK	50/0	2355	16.49	4.86	9.00	20.63	115.61	Horizontal	Pass
5.0MHz Band QPSK	25/0	2352.5	17.61	4.92	9.00	21.69	147.57	Vertical	Pass
		2355	18.39	4.95	9.00	22.44	175.39	Vertical	Pass
		2357.5	18.39	4.81	9.00	22.58	181.13	Vertical	Pass
10.0MHz Band QPSK	50/0	2355	18.52	4.86	9.00	22.66	184.50	Vertical	Pass

Radiated Power (EIRP) for Band 40 (2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)	(dBm)		Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	2352.5	16.56	4.92	9.00	20.64	115.88	Vertical	Pass
		2355	18.23	4.95	9.00	22.28	169.04	Vertical	Pass
		2357.5	17.00	4.81	9.00	21.19	131.52	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2355	16.68	4.86	9.00	20.82	120.78	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2352.5	17.60	4.92	9.00	21.68	147.23	Horizontal	Pass
		2355	17.74	4.95	9.00	21.79	151.01	Horizontal	Pass
		2357.5	17.50	4.81	9.00	21.69	147.57	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2355	18.60	4.86	9.00	22.74	187.93	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.11 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band QPSK	25/0	2557.5	17.50	4.54	9.00	21.96	157.15	Horizontal	Pass
		2605	17.50	4.69	9.00	21.81	151.64	Horizontal	Pass
		2652.5	15.83	4.71	9.00	20.12	102.81	Horizontal	Pass
10.0MHz Band QPSK	50/0	2560	17.84	4.55	9.00	22.29	169.59	Horizontal	Pass
		2605	17.67	4.69	9.00	21.98	157.83	Horizontal	Pass
		2650	16.01	4.72	9.00	20.29	106.85	Horizontal	Pass
15.0MHz Band QPSK	75/0	2562.5	15.02	4.55	9.00	19.47	88.44	Horizontal	Pass
		2605	17.42	4.69	9.00	21.73	149.09	Horizontal	Pass
		2647.5	17.41	4.72	9.00	21.69	147.40	Horizontal	Pass
20.0MHz Band QPSK	100/0	2565	16.49	4.57	9.00	20.92	123.55	Horizontal	Pass
		2605	17.03	4.73	9.00	21.30	134.82	Horizontal	Pass
		2645	17.88	4.75	9.00	22.13	163.28	Horizontal	Pass
5.0MHz Band QPSK	25/0	2557.5	17.73	4.54	9.00	22.19	165.56	Vertical	Pass
		2605	16.30	4.69	9.00	20.61	115.09	Vertical	Pass
		2652.5	16.55	4.71	9.00	20.84	121.42	Vertical	Pass
10.0MHz Band QPSK	50/0	2560	15.40	4.55	9.00	19.85	96.58	Vertical	Pass
		2605	16.40	4.69	9.00	20.71	117.88	Vertical	Pass
		2650	17.02	4.72	9.00	21.30	134.76	Vertical	Pass
15.0MHz Band QPSK	75/0	2562.5	15.63	4.55	9.00	20.08	101.80	Vertical	Pass
		2605	17.42	4.69	9.00	21.73	148.85	Vertical	Pass
		2647.5	16.80	4.72	9.00	21.08	128.17	Vertical	Pass
20.0MHz Band QPSK	100/0	2565	17.53	4.57	9.00	21.96	157.11	Vertical	Pass
		2605	15.93	4.73	9.00	20.20	104.64	Vertical	Pass
		2645	16.84	4.75	9.00	21.09	128.41	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP	Max. EIRP	Polarization Of Max. ERP	
			(dBm)			Average	Average		
						(dBm)	(mW)		
5.0MHz Band 16 QAM	25/0	2557.5	15.17	4.54	9.00	19.63	91.88	Horizontal	Pass
		2605	16.41	4.69	9.00	20.72	118.05	Horizontal	Pass
		2652.5	17.80	4.71	9.00	22.09	161.70	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2560	16.33	4.55	9.00	20.78	119.63	Horizontal	Pass
		2605	17.23	4.69	9.00	21.54	142.53	Horizontal	Pass
		2650	17.44	4.72	9.00	21.72	148.69	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2562.5	17.69	4.55	9.00	22.14	163.52	Horizontal	Pass
		2605	17.21	4.69	9.00	21.52	141.86	Horizontal	Pass
		2647.5	18.13	4.72	9.00	22.41	174.30	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2565	17.07	4.57	9.00	21.50	141.37	Horizontal	Pass
		2605	17.26	4.73	9.00	21.53	142.33	Horizontal	Pass
		2645	17.83	4.75	9.00	22.08	161.54	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2557.5	17.55	4.54	9.00	22.01	158.86	Vertical	Pass
		2605	17.38	4.69	9.00	21.69	147.61	Vertical	Pass
		2652.5	17.73	4.71	9.00	22.02	159.24	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2560	18.01	4.55	9.00	22.46	176.28	Vertical	Pass
		2605	16.52	4.69	9.00	20.83	121.14	Vertical	Pass
		2650	15.66	4.72	9.00	19.94	98.73	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2562.5	17.74	4.55	9.00	22.19	165.57	Vertical	Pass
		2605	17.53	4.69	9.00	21.84	152.86	Vertical	Pass
		2647.5	17.72	4.72	9.00	22.00	158.35	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2565	17.75	4.57	9.00	22.18	165.17	Vertical	Pass
		2605	18.11	4.73	9.00	22.38	172.93	Vertical	Pass
		2645	17.97	4.75	9.00	22.22	166.59	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)

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

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

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

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/13/17/38/40/41

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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.97	4.04	33.51	-19.50	-13	-6.50	Horizontal
3701.4	-49.39	4.04	33.51	-19.92	-13	-6.92	Vertical
5552.1	-53.35	5.24	35.84	-22.75	-13	-9.75	Vertical
5552.1	-63.04	5.24	35.84	-32.44	-13	-19.44	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-50.11	4.04	33.56	-20.59	-13	-7.59	Horizontal
3760	-50.36	4.04	33.56	-20.84	-13	-7.84	Vertical
5640	-49.65	5.24	35.91	-18.98	-13	-5.98	Vertical
5640	-53.00	5.24	35.91	-22.33	-13	-9.33	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.40	4.04	34.00	-19.44	-13	-6.44	Horizontal
3818.6	-53.28	4.04	34.00	-23.32	-13	-10.32	Vertical
5727.9	-53.99	5.24	36.04	-23.19	-13	-10.19	Vertical
5727.9	-54.30	5.24	36.04	-23.50	-13	-10.50	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-52.78	4.07	33.54	-23.31	-13	-10.31	Horizontal
3720	-47.85	4.07	33.54	-18.38	-13	-5.38	Vertical
5580	-52.96	5.28	35.86	-22.38	-13	-9.38	Vertical
5580	-56.17	5.28	35.86	-25.59	-13	-12.59	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-52.10	4.04	33.56	-22.58	-13	-9.58	Horizontal
3760	-48.23	4.04	33.56	-18.71	-13	-5.71	Vertical
5640	-52.41	5.24	35.91	-21.74	-13	-8.74	Vertical
5640	-54.35	5.24	35.91	-23.68	-13	-10.68	Horizontal
Test Results for High Channel 1900MHz							
3800	-49.53	4.04	34.00	-19.57	-13	-6.57	Horizontal
3800	-51.54	4.04	34.00	-21.58	-13	-8.58	Vertical
5700	-53.91	5.24	36.04	-23.11	-13	-10.11	Vertical
5700	-53.64	5.24	36.04	-22.84	-13	-9.84	Horizontal

Note: $P_{Mea}(dBm) = Power(dBm) + ARpl(dBm)$

. Over Limit = $P_{Mea}(dBm) - Limit(dBm)$

. 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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-53.63	4.02	29.80	-27.85	-13	-14.85	Horizontal
3421.4	-52.73	4.02	29.80	-26.95	-13	-13.95	Vertical
5132.1	-55.98	5.24	35.84	-25.38	-13	-12.38	Vertical
5132.1	-57.92	5.24	35.84	-27.32	-13	-14.32	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-45.91	4.03	30.00	-19.94	-13	-6.94	Horizontal
3465	-51.54	4.03	30.00	-25.57	-13	-12.57	Vertical
5197.5	-53.18	5.25	35.86	-22.57	-13	-9.57	Vertical
5197.5	-53.01	5.25	35.86	-22.40	-13	-9.40	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-47.48	4.05	30.01	-21.52	-13	-8.52	Horizontal
3508.6	-55.07	4.05	30.01	-29.11	-13	-16.11	Vertical
5262.9	-51.92	5.26	35.86	-21.32	-13	-8.32	Vertical
5262.9	-51.55	5.26	35.86	-20.95	-13	-7.95	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-51.22	4.02	29.80	-25.44	-13	-12.44	Horizontal
3440	-52.78	4.02	29.80	-27.00	-13	-14.00	Vertical
5160	-54.92	5.24	35.84	-24.32	-13	-11.32	Vertical
5160	-57.67	5.24	35.84	-27.07	-13	-14.07	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-45.41	4.03	30.00	-19.44	-13	-6.44	Horizontal
3465	-47.93	4.03	30.00	-21.96	-13	-8.96	Vertical
5197.5	-55.58	5.25	35.86	-24.97	-13	-11.97	Vertical
5197.5	-53.97	5.25	35.86	-23.36	-13	-10.36	Horizontal
Test Results for High Channel 1745MHz							
2490	-48.66	2.91	27.68	-23.89	-13	-10.89	Horizontal
3490	-51.48	2.91	27.68	-26.71	-13	-13.71	Vertical
5235	-54.53	5.26	35.86	-23.93	-13	-10.93	Vertical
5235	-54.01	5.26	35.86	-23.41	-13	-10.41	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-46.80	2.78	27.50	-22.08	-13	-9.08	Horizontal
1649.4	-54.50	2.78	27.50	-29.78	-13	-16.78	Vertical
2474.1	-49.30	2.90	27.80	-24.40	-13	-11.40	Vertical
2474.1	-49.31	2.90	27.80	-24.41	-13	-11.41	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-48.19	2.78	27.48	-23.49	-13	-10.49	Horizontal
1673	-46.57	2.78	27.48	-21.87	-13	-8.87	Vertical
2509.5	-49.03	2.91	27.70	-24.24	-13	-11.24	Vertical
2509.5	-46.65	2.91	27.70	-21.86	-13	-8.86	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-48.34	2.78	27.43	-23.69	-13	-10.69	Horizontal
1696.6	-50.38	2.78	27.43	-25.73	-13	-12.73	Vertical
2544.9	-48.03	2.92	27.74	-23.21	-13	-10.21	Vertical
2544.9	-48.31	2.92	27.74	-23.49	-13	-10.49	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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658	-14.25	2.78	27.50	10.47	-13	23.47	Horizontal
1658	-13.86	2.78	27.50	10.86	-13	23.86	Vertical
2487	-13.54	2.90	27.80	11.36	-13	24.36	Vertical
2487	-14.42	2.90	27.80	10.48	-13	23.48	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-14.28	2.78	27.48	10.42	-13	23.42	Horizontal
1673	-14.14	2.78	27.48	10.56	-13	23.56	Vertical
2509.5	-14.76	2.91	27.70	10.03	-13	23.03	Vertical
2509.5	-14.42	2.91	27.70	10.37	-13	23.37	Horizontal
Test Results for High Channel 844MHz							
1688	-13.78	2.78	27.43	10.87	-13	23.87	Horizontal
1688	-13.68	2.78	27.43	10.97	-13	23.97	Vertical
2532	-13.37	2.92	27.74	11.45	-13	24.45	Vertical
2532	-13.78	2.92	27.74	11.04	-13	24.04	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(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 Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005	-65.02	5.23	35.81	-34.44	-25	-9.44	Horizontal
5005	-63.26	5.23	35.81	-32.68	-25	-7.68	Vertical
7507.5	-67.55	5.67	36.85	-36.37	-25	-11.37	Vertical
7507.5	-63.90	5.67	36.85	-32.72	-25	-7.72	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-63.06	5.23	35.82	-32.47	-25	-7.47	Horizontal
5070	-65.14	5.23	35.82	-34.55	-25	-9.55	Vertical
7605	-65.52	5.67	36.85	-34.34	-25	-9.34	Vertical
7605	-65.70	5.67	36.85	-34.52	-25	-9.52	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-66.08	5.24	35.83	-35.49	-25	-10.49	Horizontal
5135	-63.76	5.24	35.83	-33.17	-25	-8.17	Vertical
7702.5	-65.68	5.68	36.87	-34.49	-25	-9.49	Vertical
7702.5	-67.09	5.68	36.87	-35.90	-25	-10.90	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	-64.98	5.23	35.82	-34.39	-25	-9.39	Horizontal
5020	-61.96	5.23	35.82	-31.37	-25	-6.37	Vertical
7530	-65.32	5.67	36.86	-34.13	-25	-9.13	Vertical
7530	-61.23	5.67	36.86	-30.04	-25	-5.04	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-62.24	5.23	35.82	-31.65	-25	-6.65	Horizontal
5070	-62.95	5.23	35.82	-32.36	-25	-7.36	Vertical
7605	-64.15	5.67	36.85	-32.97	-25	-7.97	Vertical
7605	-66.75	5.67	36.85	-35.57	-25	-10.57	Horizontal
Test Results for High Channel 2560MHz							
5120	-60.79	5.24	35.83	-30.20	-25	-5.20	Horizontal
5120	-66.77	5.24	35.83	-36.18	-25	-11.18	Vertical
7680	-65.83	5.70	36.88	-34.65	-25	-9.65	Vertical
7680	-66.72	5.70	36.88	-35.54	-25	-10.54	Horizontal

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

- Margin = Spurious Emission Level - Limit
- Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.5 LTE BAND 12

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

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-13.44	2.60	27.2	11.16	-13	24.16	Horizontal
1399.4	-13.26	2.60	27.2	11.34	-13	24.34	Vertical
2099.1	-13.26	2.85	27.54	11.43	-13	24.43	Vertical
2099.1	-13.02	2.85	27.54	11.67	-13	24.67	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-13.93	2.61	27.28	10.74	-13	23.74	Horizontal
1415	-13.04	2.61	27.28	11.63	-13	24.63	Vertical
2122.5	-13.03	2.87	27.59	11.69	-13	24.69	Vertical
2122.5	-13.14	2.87	27.59	11.58	-13	24.58	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-13.67	2.63	27.28	10.98	-13	23.98	Horizontal
1430.6	-13.23	2.63	27.28	11.42	-13	24.42	Vertical
2145.9	-13.75	2.88	27.60	10.97	-13	23.97	Vertical
2145.9	-13.49	2.88	27.60	11.23	-13	24.23	Horizontal

QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408	-44.64	2.61	27.26	-19.99	-13	-6.99	Horizontal
1408	-50.14	2.61	27.26	-25.49	-13	-12.49	Vertical
2112	-48.70	2.87	27.58	-23.99	-13	-10.99	Vertical
2112	-50.05	2.87	27.58	-25.34	-13	-12.34	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-46.93	2.61	27.28	-22.26	-13	-9.26	Horizontal
1415	-52.14	2.61	27.28	-27.47	-13	-14.47	Vertical
2122.5	-49.42	2.87	27.59	-24.70	-13	-11.70	Vertical
2122.5	-47.47	2.87	27.59	-22.75	-13	-9.75	Horizontal
Test Results for High Channel 711MHz							
1422	-50.82	2.62	27.28	-26.16	-13	-13.16	Horizontal
1422	-45.19	2.62	27.28	-20.53	-13	-7.53	Vertical
2133	-50.77	2.87	27.60	-26.04	-13	-13.04	Vertical
2133	-50.15	2.87	27.60	-25.42	-13	-12.42	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

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

9.6 LTE BAND 13

QPSK EIRP POWER FOR LTE BAND 13 (5MHZ BANDWIDTH)

Test Results for Low Channel 779.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1559	-71.71	2.61	27.28	-47.04	-40	-7.04	Horizontal
1559	-73.64	2.61	27.28	-48.97	-40	-8.97	Vertical
2338.5	-52.10	2.87	27.59	-27.38	-13	-14.38	Vertical
2338.5	-51.21	2.87	27.59	-26.49	-13	-13.49	Horizontal
Test Results For Mid Channel 782MHz							
1564	-72.54	2.62	27.30	-47.86	-40	-7.86	Horizontal
1564	-73.30	2.62	27.30	-48.62	-40	-8.62	Vertical
2346	-51.60	2.87	27.62	-26.85	-13	-13.85	Vertical
2346	-54.07	2.87	27.62	-29.32	-13	-16.32	Horizontal
Test Results for High Channel 784.5MHz							
1569	-72.68	2.66	27.28	-48.06	-40	-8.06	Horizontal
1569	-71.25	2.66	27.28	-46.63	-40	-6.63	Vertical
2353.5	-44.34	2.88	27.60	-19.62	-13	-6.62	Vertical
2353.5	-47.07	2.88	27.60	-22.35	-13	-9.35	Horizontal

QPSK EIRP POWER FOR LTE BAND 13 (10MHZ BANDWIDTH)

Test Results for Channel 782MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1564	-71.46	2.62	27.30	-46.78	-40	-6.78	Horizontal
1564	-72.21	2.62	27.30	-47.53	-40	-7.53	Vertical
2346	-49.47	2.87	27.62	-24.72	-13	-11.72	Vertical
2346	-51.28	2.87	27.62	-26.53	-13	-13.53	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

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

9.7 LTE BAND 17

QPSK EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413	-52.97	2.61	27.28	-28.30	-13	-15.30	Horizontal
1413	-49.02	2.61	27.28	-24.35	-13	-11.35	Vertical
2119.5	-49.91	2.87	27.59	-25.19	-13	-12.19	Vertical
2119.5	-51.13	2.87	27.59	-26.41	-13	-13.41	Horizontal
Test Results For Mid Channel 710MHz							
1420	-51.56	2.62	27.30	-26.88	-13	-13.88	Horizontal
1420	-49.71	2.62	27.30	-25.03	-13	-12.03	Vertical
2130	-52.39	2.87	27.62	-27.64	-13	-14.64	Vertical
2130	-47.12	2.87	27.62	-22.37	-13	-9.37	Horizontal
Test Results for High Channel 713.5MHz							
1427	-46.53	2.66	27.28	-21.91	-13	-8.91	Horizontal
1427	-47.81	2.66	27.28	-23.19	-13	-10.19	Vertical
2140.5	-50.26	2.88	27.60	-25.54	-13	-12.54	Vertical
2140.5	-53.47	2.88	27.60	-28.75	-13	-15.75	Horizontal

QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418	-51.23	2.62	27.30	-26.55	-13	-13.55	Horizontal
1418	-48.66	2.62	27.30	-23.98	-13	-10.98	Vertical
2127	-51.10	2.87	27.62	-26.35	-13	-13.35	Vertical
2127	-51.79	2.87	27.62	-27.04	-13	-14.04	Horizontal
Test Results for Mid Channel 710MHz							
1420	-51.36	2.62	27.30	-26.68	-13	-13.68	Horizontal
1420	-50.73	2.62	27.30	-26.05	-13	-13.05	Vertical
2130	-51.91	2.87	27.62	-27.16	-13	-14.16	Vertical
2130	-50.00	2.87	27.62	-25.25	-13	-12.25	Horizontal
Test Results for High Channel 711MHz							
1422	-49.63	2.62	27.30	-24.95	-13	-11.95	Horizontal
1422	-49.27	2.62	27.30	-24.59	-13	-11.59	Vertical
2133	-51.04	2.87	27.62	-26.29	-13	-13.29	Vertical
2133	-52.80	2.87	27.62	-28.05	-13	-15.05	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.

9.8 LTE BAND 38

QPSK EIRP POWER FOR LTE BAND 38 (5MHZ BANDWIDTH)

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5145	-58.48	2.63	27.26	-33.85	-25	-8.85	Horizontal
5145	-56.11	2.63	27.26	-31.48	-25	-6.48	Vertical
7717.5	-58.59	2.67	27.58	-33.68	-25	-8.68	Vertical
7717.5	-60.73	2.67	27.58	-35.82	-25	-10.82	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-54.90	2.62	27.28	-30.24	-25	-5.24	Horizontal
5190	-54.77	2.62	27.28	-30.11	-25	-5.11	Vertical
7785	-56.99	2.85	27.62	-32.22	-25	-7.22	Vertical
7785	-54.46	2.85	27.62	-29.69	-25	-4.69	Horizontal
Test Results for High Channel 2617.5MHz							
5235	-52.29	2.64	27.28	-27.65	-25	-2.65	Horizontal
5235	-56.42	2.64	27.28	-31.78	-25	-6.78	Vertical
7852.5	-56.14	2.85	27.70	-31.29	-25	-6.29	Vertical
7852.5	-54.60	2.85	27.70	-29.75	-25	-4.75	Horizontal

QPSK EIRP POWER FOR LTE BAND 38 (20MHZ BANDWIDTH)

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5160	-57.96	2.63	27.30	-33.29	-25	-8.29	Horizontal
5160	-51.83	2.63	27.30	-27.16	-25	-2.16	Vertical
7740	-57.50	2.67	27.62	-32.55	-25	-7.55	Vertical
7740	-61.63	2.67	27.62	-36.68	-25	-11.68	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-56.21	2.62	27.33	-31.50	-25	-6.50	Horizontal
5190	-54.42	2.62	27.33	-29.71	-25	-4.71	Vertical
7785	-58.34	2.85	27.67	-33.52	-25	-8.52	Vertical
7785	-58.53	2.85	27.67	-33.71	-25	-8.71	Horizontal
Test Results for High Channel 2610MHz							
5220	-54.57	2.64	27.33	-29.88	-25	-4.88	Horizontal
5220	-57.16	2.64	27.33	-32.47	-25	-7.47	Vertical
7830	-58.71	2.85	27.67	-33.89	-25	-8.89	Vertical
7830	-55.85	2.85	27.67	-31.03	-25	-6.03	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(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.

9.9 LTE BAND 40

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

Test Results for Low Channel 2307.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4615	-74.72	4.04	33.51	-45.25	-40	-5.25	Horizontal
4615	-75.17	4.04	33.51	-45.70	-40	-5.70	Vertical
6922.5	-78.24	5.24	35.84	-47.64	-40	-7.64	Vertical
6922.5	-87.68	5.24	35.84	-57.08	-40	-17.08	Horizontal
Test Results for Mid Channel 2310MHz							
4620	-75.78	4.04	33.56	-46.26	-40	-6.26	Horizontal
4620	-74.76	4.04	33.56	-45.24	-40	-5.24	Vertical
6930	-76.39	5.24	35.91	-45.72	-40	-5.72	Vertical
6930	-76.76	5.24	35.91	-46.09	-40	-6.09	Horizontal
Test Results for High Channel 2312.5MHz							
4625	-74.46	4.04	34	-44.50	-40	-4.50	Horizontal
4625	-75.68	4.04	34	-45.72	-40	-5.72	Vertical
6937.5	-79.23	5.24	36.04	-48.43	-40	-8.43	Vertical
6937.5	-77.83	5.24	36.04	-47.03	-40	-7.03	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10.0MHZ BANDWIDTH)

Test Results for Low Channel 2310MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4620	-77.33	4.04	33.56	-47.81	-40	-7.81	Horizontal
4620	-74.48	4.04	33.56	-44.96	-40	-4.96	Vertical
6930	-79.76	5.24	35.91	-49.09	-40	-9.09	Vertical
6930	-80.77	5.24	35.91	-50.10	-40	-10.10	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (2345-2360MHz) (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2347.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4705	-74.70	4.04	33.51	-45.23	-40	-5.23	Horizontal
4705	-77.13	4.04	33.51	-47.66	-40	-7.66	Vertical
7057.5	-80.91	5.24	35.84	-50.31	-40	-10.31	Vertical
7057.5	-90.32	5.24	35.84	-59.72	-40	-19.72	Horizontal
Test Results for Mid Channel 2352.5MHz							
4705	-83.08	4.04	33.56	-53.56	-40	-13.56	Horizontal
4705	-83.46	4.04	33.56	-53.94	-40	-13.94	Vertical
7057.5	-80.52	5.24	35.91	-49.85	-40	-9.85	Vertical
7057.5	-84.31	5.24	35.91	-53.64	-40	-13.64	Horizontal
Test Results for High Channel 2357.5MHz							
4715	-74.69	4.04	34	-44.73	-40	-4.73	Horizontal
4715	-79.15	4.04	34	-49.19	-40	-9.19	Vertical
7072.5	-78.70	5.24	36.04	-47.90	-40	-7.90	Vertical
7072.5	-79.05	5.24	36.04	-48.25	-40	-8.25	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10.0MHZ BANDWIDTH)

Test Results for Low Channel 2355MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4710	-80.37	4.04	33.56	-50.85	-40	-10.85	Horizontal
4710	-76.62	4.04	33.56	-47.10	-40	-7.10	Vertical
7065	-80.79	5.24	35.91	-50.12	-40	-10.12	Vertical
7065	-81.80	5.24	35.91	-51.13	-40	-11.13	Horizontal

9.10 LTE BAND 41

LTE BAND 41 (5MHZ BANDWIDTH)

Test Results for Low Channel 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5125	-60.76	2.63	27.26	-36.13	-25	-11.13	Horizontal
5125	-59.73	2.63	27.26	-35.10	-25	-10.10	Vertical
7687.5	-63.27	2.67	27.58	-38.36	-25	-13.36	Vertical
7687.5	-64.66	2.67	27.58	-39.75	-25	-14.75	Horizontal
Test Results for Mid Channel 2595MHz							
5205	-57.11	2.62	27.28	-32.45	-25	-7.45	Horizontal
5205	-56.63	2.62	27.28	-31.97	-25	-6.97	Vertical
7807.5	-59.38	2.85	27.62	-34.61	-25	-9.61	Vertical
7807.5	-57.60	2.85	27.62	-32.83	-25	-7.83	Horizontal
Test Results for High Channel 2652.5MHz							
5285	-54.45	2.64	27.28	-29.81	-25	-4.81	Horizontal
5285	-57.83	2.64	27.28	-33.19	-25	-8.19	Vertical
7927.5	-57.80	2.85	27.70	-32.95	-25	-7.95	Vertical
7927.5	-56.11	2.85	27.70	-31.26	-25	-6.26	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5140	-58.47	2.63	27.30	-33.80	-25	-8.80	Horizontal
5140	-57.29	2.63	27.30	-32.62	-25	-7.62	Vertical
7710	-59.66	2.67	27.62	-34.71	-25	-9.71	Vertical
7710	-63.63	2.67	27.62	-38.68	-25	-13.68	Horizontal
Test Results for Mid Channel 2595MHz							
5205	-58.74	2.62	27.33	-34.03	-25	-9.03	Horizontal
5205	-55.59	2.62	27.33	-30.88	-25	-5.88	Vertical
7807.5	-61.26	2.85	27.67	-36.44	-25	-11.44	Vertical
7807.5	-60.29	2.85	27.67	-35.47	-25	-10.47	Horizontal
Test Results for High Channel 2645MHz							
5270	-56.15	2.64	27.33	-31.46	-25	-6.46	Horizontal
5270	-59.24	2.64	27.33	-34.55	-25	-9.55	Vertical
7905	-61.13	2.85	27.67	-36.31	-25	-11.31	Vertical
7905	-56.82	2.85	27.67	-32.00	-25	-7.00	Horizontal

Note: $P_{Mea}(dBm) = Power(dBm) + ARpl(dBm)$

Over Limit = $P_{Mea}(dBm) - Limit(dBm)$

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, §22.355, §24.235, §27.54

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.16V, Normal, DC 3.7V and High voltage, DC 4.26V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/13/17/38/40/41

RESULTS

See the following pages.

10.1 LTE BAND 2

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	1880	13	0.00691	2.5
3.7	1880	1	0.00053	2.5
4.26	1880	6	0.00319	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	8	0.00426	2.5
Extreme (50C)	1880	27	0.01436	2.5
Extreme (40C)	1880	11	0.00585	2.5
Extreme (30C)	1880	9	0.00479	2.5
Extreme (10C)	1880	17	0.00904	2.5
Extreme (0C)	1880	12	0.00638	2.5
Extreme (-10C)	1880	7	0.00372	2.5
Extreme (-20C)	1880	12	0.00638	2.5
Extreme (-30C)	1880	9	0.00479	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	1880	2	0.00106	2.5
3.7	1880	18	0.00957	2.5
4.26	1880	14	0.00745	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	13	0.00691	2.5
Extreme (50C)	1880	16	0.00851	2.5
Extreme (40C)	1880	7	0.00372	2.5
Extreme (30C)	1880	9	0.00479	2.5
Extreme (10C)	1880	24	0.01277	2.5
Extreme (0C)	1880	8	0.00426	2.5
Extreme (-10C)	1880	5	0.00266	2.5
Extreme (-20C)	1880	11	0.00585	2.5
Extreme (-30C)	1880	11	0.00585	2.5

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

10.2 LTE BAND 4

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	1732.5	23	0.01328	2.5
3.7	1732.5	9	0.00519	2.5
4.26	1732.5	15	0.00866	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	5	0.00289	2.5
Extreme (50C)	1732.5	1	0.00058	2.5
Extreme (40C)	1732.5	4	0.00231	2.5
Extreme (30C)	1732.5	17	0.00981	2.5
Extreme (10C)	1732.5	2	0.00115	2.5
Extreme (0C)	1732.5	27	0.01558	2.5
Extreme (-10C)	1732.5	26	0.01501	2.5
Extreme (-20C)	1732.5	9	0.00519	2.5
Extreme (-30C)	1732.5	2	0.00115	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	1732.5	22	0.01270	2.5
3.7	1732.5	17	0.00981	2.5
4.26	1732.5	18	0.01039	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	12	0.00693	2.5
Extreme (50C)	1732.5	24	0.01385	2.5
Extreme (40C)	1732.5	17	0.00981	2.5
Extreme (30C)	1732.5	10	0.00577	2.5
Extreme (10C)	1732.5	8	0.00462	2.5
Extreme (0C)	1732.5	20	0.01154	2.5
Extreme (-10C)	1732.5	27	0.01558	2.5
Extreme (-20C)	1732.5	7	0.00404	2.5
Extreme (-30C)	1732.5	22	0.01270	2.5

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

10.3 LTE BAND 5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	836.5	20	0.02391	2.5
3.7	836.5	26	0.03108	2.5
4.26	836.5	20	0.02391	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	2	0.00239	2.5
Extreme (50C)	836.5	5	0.00598	2.5
Extreme (40C)	836.5	19	0.02271	2.5
Extreme (30C)	836.5	14	0.01674	2.5
Extreme (10C)	836.5	22	0.02630	2.5
Extreme (0C)	836.5	8	0.00956	2.5
Extreme (-10C)	836.5	8	0.00956	2.5
Extreme (-20C)	836.5	25	0.02989	2.5
Extreme (-30C)	836.5	21	0.02510	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	836.5	23	0.02750	2.5
3.7	836.5	22	0.02630	2.5
4.26	836.5	22	0.02630	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	19	0.02271	2.5
Extreme (50C)	836.5	18	0.02152	2.5
Extreme (40C)	836.5	1	0.00120	2.5
Extreme (30C)	836.5	13	0.01554	2.5
Extreme (10C)	836.5	11	0.01315	2.5
Extreme (0C)	836.5	18	0.02152	2.5
Extreme (-10C)	836.5	21	0.02510	2.5
Extreme (-20C)	836.5	14	0.01674	2.5
Extreme (-30C)	836.5	10	0.01195	2.5

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

10.4 LTE BAND 7

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	2535	12	0.00473	2.5
3.7	2535	0	0.00000	2.5
4.26	2535	27	0.01065	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	10	0.00394	2.5
Extreme (50C)	2535	7	0.00276	2.5
Extreme (40C)	2535	7	0.00276	2.5
Extreme (30C)	2535	7	0.00276	2.5
Extreme (10C)	2535	26	0.01026	2.5
Extreme (0C)	2535	12	0.00473	2.5
Extreme (-10C)	2535	20	0.00789	2.5
Extreme (-20C)	2535	5	0.00197	2.5
Extreme (-30C)	2535	19	0.00750	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	2535	13	0.00513	2.5
3.7	2535	25	0.00986	2.5
4.26	2535	15	0.00592	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	26	0.01026	2.5
Extreme (50C)	2535	1	0.00039	2.5
Extreme (40C)	2535	27	0.01065	2.5
Extreme (30C)	2535	8	0.00316	2.5
Extreme (10C)	2535	26	0.01026	2.5
Extreme (0C)	2535	24	0.00947	2.5
Extreme (-10C)	2535	11	0.00434	2.5
Extreme (-20C)	2535	9	0.00355	2.5
Extreme (-30C)	2535	1	0.00039	2.5

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

10.5 LTE BAND 12

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	707.5	21	0.02968	2.5
3.7	707.5	6	0.00848	2.5
4.26	707.5	3	0.00424	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	7	0.00989	2.5
Extreme (50C)	707.5	14	0.01979	2.5
Extreme (40C)	707.5	10	0.01413	2.5
Extreme (30C)	707.5	9	0.01272	2.5
Extreme (10C)	707.5	3	0.00424	2.5
Extreme (0C)	707.5	7	0.00989	2.5
Extreme (-10C)	707.5	13	0.01837	2.5
Extreme (-20C)	707.5	9	0.01272	2.5
Extreme (-30C)	707.5	12	0.01696	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	707.5	7	0.00989	2.5
3.7	707.5	2	0.00283	2.5
4.26	707.5	10	0.01413	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	14	0.01979	2.5
Extreme (50C)	707.5	19	0.02686	2.5
Extreme (40C)	707.5	21	0.02968	2.5
Extreme (30C)	707.5	18	0.02544	2.5
Extreme (10C)	707.5	2	0.00283	2.5
Extreme (0C)	707.5	12	0.01696	2.5
Extreme (-10C)	707.5	19	0.02686	2.5
Extreme (-20C)	707.5	22	0.03110	2.5
Extreme (-30C)	707.5	17	0.02403	2.5

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

10.6 LTE BAND 13

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	782	14	0.01790	2.5
3.7	782	7	0.00895	2.5
4.26	782	23	0.02941	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	782	16	0.02046	2.5
Extreme (50C)	782	2	0.00256	2.5
Extreme (40C)	782	8	0.01023	2.5
Extreme (30C)	782	23	0.02941	2.5
Extreme (10C)	782	7	0.00895	2.5
Extreme (0C)	782	4	0.00512	2.5
Extreme (-10C)	782	14	0.01790	2.5
Extreme (-20C)	782	19	0.02430	2.5
Extreme (-30C)	782	10	0.01279	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 16QAM, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	782	15	0.01918	2.5
3.7	782	25	0.03197	2.5
4.26	782	23	0.02941	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 13 QPSK, (CH 23230 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	782	24	0.03069	2.5
Extreme (50C)	782	27	0.03453	2.5
Extreme (40C)	782	14	0.01790	2.5
Extreme (30C)	782	17	0.02174	2.5
Extreme (10C)	782	15	0.01918	2.5
Extreme (0C)	782	9	0.01151	2.5
Extreme (-10C)	782	1	0.00128	2.5
Extreme (-20C)	782	3	0.00384	2.5
Extreme (-30C)	782	8	0.01023	2.5

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

10.7 LTE BAND 17

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	710	23	0.03239	2.5
3.7	710	27	0.03803	2.5
4.26	710	16	0.02254	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	9	0.01268	2.5
Extreme (50C)	710	5	0.00704	2.5
Extreme (40C)	710	15	0.02113	2.5
Extreme (30C)	710	25	0.03521	2.5
Extreme (10C)	710	17	0.02394	2.5
Extreme (0C)	710	27	0.03803	2.5
Extreme (-10C)	710	16	0.02254	2.5
Extreme (-20C)	710	4	0.00563	2.5
Extreme (-30C)	710	11	0.01549	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	710	22	0.03099	2.5
3.7	710	24	0.03380	2.5
4.26	710	22	0.03099	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710	17	0.02394	2.5
Extreme (50C)	710	8	0.01127	2.5
Extreme (40C)	710	9	0.01268	2.5
Extreme (30C)	710	19	0.02676	2.5
Extreme (10C)	710	25	0.03521	2.5
Extreme (0C)	710	9	0.01268	2.5
Extreme (-10C)	710	5	0.00704	2.5
Extreme (-20C)	710	20	0.02817	2.5
Extreme (-30C)	710	22	0.03099	2.5

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

10.8 LTE BAND 38

Band 38 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	2595	9	0.00347	2.5
3.7	2595	11	0.00424	2.5
4.26	2595	10	0.00385	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	7	0.00270	2.5
Extreme (50C)	2595	22	0.00848	2.5
Extreme (40C)	2595	17	0.00655	2.5
Extreme (30C)	2595	13	0.00501	2.5
Extreme (10C)	2595	4	0.00154	2.5
Extreme (0C)	2595	9	0.00347	2.5
Extreme (-10C)	2595	15	0.00578	2.5
Extreme (-20C)	2595	1	0.00039	2.5
Extreme (-30C)	2595	22	0.00848	2.5

Band 38 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.16	2595	8	0.00308	2.5
3.7	2595	11	0.00424	2.5
4.26	2595	7	0.00270	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	16	0.00617	2.5
Extreme (50C)	2595	16	0.00617	2.5
Extreme (40C)	2595	3	0.00116	2.5
Extreme (30C)	2595	21	0.00809	2.5
Extreme (10C)	2595	1	0.00039	2.5
Extreme (0C)	2595	21	0.00809	2.5
Extreme (-10C)	2595	4	0.00154	2.5
Extreme (-20C)	2595	13	0.00501	2.5
Extreme (-30C)	2595	2	0.00077	2.5

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

10.9 LTE BAND 40

(2305-2320MHz)QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage	Frequency	Frequency*	Frequency	Limit
[Vdc]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 QPSK, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	2310	8	0.00346	2.5
3.7	2310	17	0.00736	2.5
4.26	2310	14	0.00606	2.5

Frequency error vs. Voltage

Temperature	Frequency	Frequency*	Frequency	Limit
[°C]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 QPSK, (CH 38750 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2310	18	0.00779	2.5
Extreme (50C)	2310	25	0.01082	2.5
Extreme (40C)	2310	24	0.01039	2.5
Extreme (30C)	2310	21	0.00909	2.5
Extreme (10C)	2310	8	0.00346	2.5
Extreme (0C)	2310	26	0.01126	2.5
Extreme (-10C)	2310	19	0.00823	2.5
Extreme (-20C)	2310	26	0.01126	2.5
Extreme (-30C)	2310	4	0.00173	2.5

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

(2305-2320MHz)16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage	Frequency	Frequency*	Frequency	Limit
[Vdc]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 16QAM, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	2310	16	0.00693	2.5
3.7	2310	15	0.00649	2.5
4.26	2310	8	0.00346	2.5

Frequency error vs. Temperature

Temperature	Frequency	Frequency*	Frequency	Limit
[°C]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 16QAM, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2310	12	0.00519	2.5
Extreme (50C)	2310	7	0.00303	2.5
Extreme (40C)	2310	25	0.01082	2.5
Extreme (30C)	2310	10	0.00433	2.5
Extreme (10C)	2310	1	0.00043	2.5
Extreme (0C)	2310	17	0.00736	2.5
Extreme (-10C)	2310	20	0.00866	2.5
Extreme (-20C)	2310	13	0.00563	2.5
Extreme (-30C)	2310	3	0.00130	2.5

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

(2345-2360MHz)QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage	Frequency	Frequency*	Frequency	Limit
[Vdc]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 QPSK, (CH 39200 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	2355	8	0.00340	2.5
3.7	2355	5	0.00212	2.5
4.26	2355	1	0.00042	2.5

Frequency error vs. Temperature

Temperature	Frequency	Frequency*	Frequency	Limit
[°C]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 QPSK, (CH 39200 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2355	18	0.00764	2.5
Extreme (50C)	2355	4	0.00170	2.5
Extreme (40C)	2355	10	0.00425	2.5
Extreme (30C)	2355	1	0.00042	2.5
Extreme (10C)	2355	21	0.00892	2.5
Extreme (0C)	2355	23	0.00977	2.5
Extreme (-10C)	2355	5	0.00212	2.5
Extreme (-20C)	2355	5	0.00212	2.5
Extreme (-30C)	2355	7	0.00297	2.5

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

(2345-2360MHz)16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage	Frequency	Frequency*	Frequency	Limit
[Vdc]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 16QAM, (CH 39200 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.16	2355	1	0.00042	2.5
3.7	2355	9	0.00382	2.5
4.26	2355	10	0.00425	2.5

Frequency error vs. Temperature

Temperature	Frequency	Frequency*	Frequency	Limit
[°C]	[MHz]	Error[Hz]	Error[ppm]	[ppm]
BAND 40 16QAM, (CH 39200 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2355	18	0.00764	2.5
Extreme (50C)	2355	26	0.01104	2.5
Extreme (40C)	2355	19	0.00807	2.5
Extreme (30C)	2355	12	0.00510	2.5
Extreme (10C)	2355	19	0.00807	2.5
Extreme (0C)	2355	18	0.00764	2.5
Extreme (-10C)	2355	8	0.00340	2.5
Extreme (-20C)	2355	4	0.00170	2.5
Extreme (-30C)	2355	14	0.00594	2.5

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

10.10 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]
BAND 41 QPSK, (CH 40639 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.16	2605	10	0.00384	2.5
3.7	2605	13	0.00499	2.5
4.26	2605	5	0.00192	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 QPSK, (CH 40639 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	11	0.00422	2.5
Extreme (50C)	2605	5	0.00192	2.5
Extreme (40C)	2605	14	0.00537	2.5
Extreme (30C)	2605	11	0.00422	2.5
Extreme (10C)	2605	4	0.00154	2.5
Extreme (0C)	2605	12	0.00461	2.5
Extreme (-10C)	2605	12	0.00461	2.5
Extreme (-20C)	2605	3	0.00115	2.5
Extreme (-30C)	2605	12	0.00461	2.5

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

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]
BAND 41 16QAM, (CH 40639 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.16	2605	10	0.00384	2.5
3.7	2605	1	0.00038	2.5
4.26	2605	17	0.00653	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 41 16QAM, (CH 40639 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	16	0.00614	2.5
Extreme (50C)	2605	7	0.00269	2.5
Extreme (40C)	2605	6	0.00230	2.5
Extreme (30C)	2605	17	0.00653	2.5
Extreme (10C)	2605	3	0.00115	2.5
Extreme (0C)	2605	0	0.00000	2.5
Extreme (-10C)	2605	4	0.00154	2.5
Extreme (-20C)	2605	14	0.00537	2.5
Extreme (-30C)	2605	15	0.00576	2.5

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

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

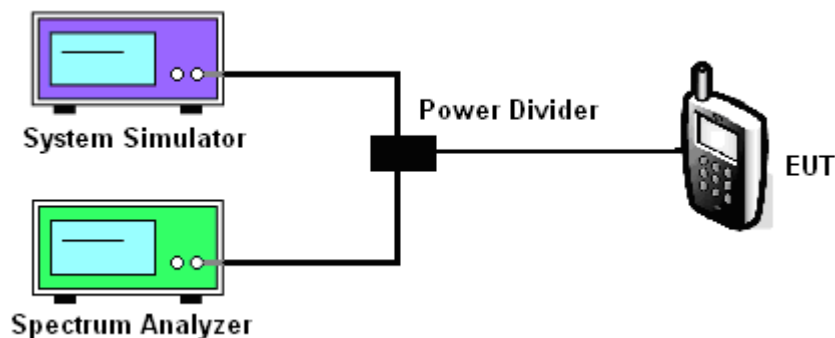
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For LTE operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



MODES TESTED

- ☐ LTE Band 2/4/5/7/12/13/17/38/40/41
- ☐

12. Duty Cycle

12.1 LIMITS

The duty cycle must not exceed 38 percent

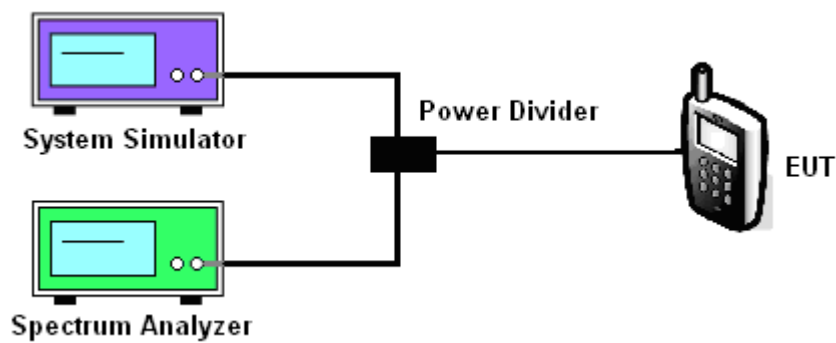
12.2 Measuring Instruments

See list of measuring instruments of this test report.

12.3 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.

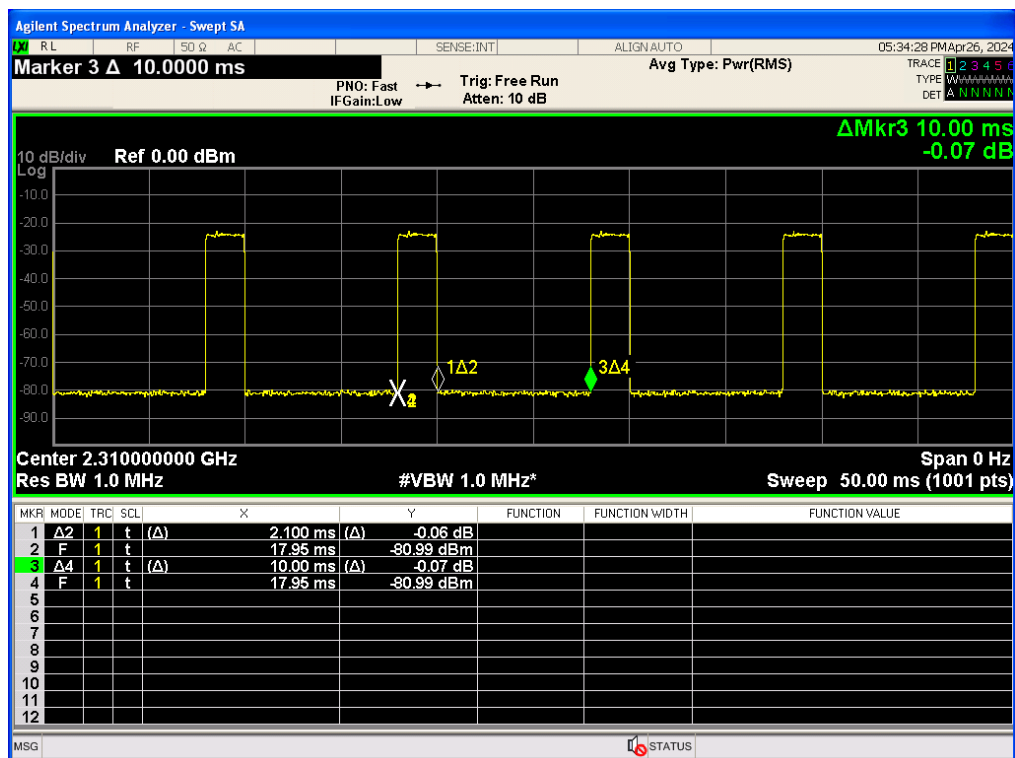
12.4 Test Setup



MODES TESTED

- ☐ LTE Band 40

RESULTS



$$T_{on}=2.10\text{ms} \quad T_{total}=10\text{ms}$$

$$\text{Duty cycle}=T_{on}/T_{total}=2.10\text{ms}/10\text{ms}=21\%$$

Test data reference attachment.

----END OF REPORT----