FCC CFR47 PART 22H, 24E, 27
CERTIFICATION TEST REPORT
FCC ID: 2BCZE-DOPF3820

Product: 4G Feature phone

Trade Mark: Doppio

Model No.: F3820

Family Model: N/A

Report No.: S23091302003004

Issue Date: Oct. 26, 2023

Prepared for

DOPPIO MOBILE, S.A DE C.V.

RIO SAN JOAQUIN AVENUE, EXT. No. 406 , INT. No. 3RD FLOOR, OFFICE 2, MEXICO CITY, MEXICO 11529

Prepared by

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
Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090
Website: http://www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name ..... :	DOPPIO MOBILE, S.A DE C.V.
Address ..... :	RIO SAN JOAQUIN AVENUE, EXT. No. 406 , INT. No. 3RD FLOOR, OFFICE 2, MEXICO CITY, MEXICO 11529
Manufacturer's Name ..... :	Shenzhen United Time Technology Co., Ltd
Address ..... :	7/F.,5-A Building,Software IndustrialBase, No.11 haitian Road, NanshanDistrict,Shenzhen,P.R.China.
Product name ..... :	4G Feature phone
Model and/or type reference ...:	F3820
Trade Mark ..... :	Doppio
Family Model ..... :	N/A
Test Sample Number	S230913020004
Standards ..... :	FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure ..... :	ANSI C63.26:2015
	ANSI/TIA-603-E-2016

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

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Date of Test .....

Date (s) of performance of tests ..... Sep. 13, 2023 ~ Oct. 26, 2023

Date of Issue ..... Oct. 26, 2023

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

Prepared By :	Reviewed By :	Approved By :
Mary Hu	Aaron Cheng	Alex Li
(Project Engineer)	(Supervisor)	(Manager)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	4G Feature phone
Trade Mark	Doppio
Model Name	F3820
Family Model	N/A
Model Difference	N/A
FCC ID:	2BCZE-DOPF3820
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 4,5,7,13, 66
Frequency Range:	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 13 Uplink: 777MHz-787MHz, Downlink: 746MHz-756MHz; LTE FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM Card:	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	PIFA Antenna
Antenna gain:	Band 4: 2dBi, Band 5: 0.5dBi, Band 7: 2.1dBi, Band 13: 0.3dBi, Band 66: 2dBi
Adapter	Model: F3820 Input: 100-240V~50/60Hz 0.15A Output: 5.0V⎓500mA
Battery	DC 3.7V, 1750mAh, 6.48Wh
Power supply	DC 3.7V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.15V to DC 4.26V (Nominal DC 3.7V)（Note 1）
HW Version	HS900-MB-V2.1
SW Version	F3820_4G_V03_202300901
** Note1: The High Voltage DC 4.26V and Low Voltage 3.15V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

Note 2: Test band

Test band	Band Width	Modulation Mode	Test Channel
LTE FDD Band 4	1.4 MHz	QPSK/ 16QAM	Ch 19957
			Ch 20175
			Ch 20393
	3MHz	QPSK/ 16QAM	Ch 19965
			Ch 20175
			Ch 20385
	5MHz	QPSK/ 16QAM	Ch 19975
			Ch 20175
			Ch 20375
	10MHz	QPSK/ 16QAM	Ch 20000
			Ch 20175
			Ch 20350
	15MHz	QPSK/ 16QAM	Ch 20025
			Ch 20175
			Ch 20325
	20MHz	QPSK/ 16QAM	Ch 20050
			Ch 20175
			Ch 20300
LTE FDD Band 5	1.4MHz	QPSK/ 16QAM	Ch 20407
			Ch 20525
			Ch 20643
	3MHz	QPSK/ 16QAM	Ch 20415
			Ch 20525
			Ch 20635
	5MHz	QPSK/ 16QAM	Ch 20425
			Ch 20525
			Ch 20625
	10MHz	QPSK/ 16QAM	Ch 20450
			Ch 20525
			Ch 20600
LTE FDD Band 7	5MHz	QPSK/ 16QAM	Ch 20775
			Ch 21100
			Ch 21425
	10MHz	QPSK/ 16QAM	Ch 20800
			Ch 21100
			Ch 21400
	15MHz	QPSK/ 16QAM	Ch 20825
			Ch 21100
			Ch 21375
	20MHz	QPSK/ 16QAM	Ch 20850
			Ch 21100
			Ch 21350

LTE FDD Band 13	5MHz	QPSK/ 16QAM	Ch 23205
			Ch 23230
			Ch 23255
	10MHz	QPSK/ 16QAM	Ch 23230
LTE FDD Band 66	1.4MHz	QPSK/ 16QAM	Ch 131979
			Ch 132322
			Ch 132665
	3MHz	QPSK/ 16QAM	Ch 131987
			Ch 132322
			Ch 132657
	5MHz	QPSK/ 16QAM	Ch 131997
			Ch 132322
			Ch 132647
	10MHz	QPSK/ 16QAM	Ch 132022
			Ch 132322
			Ch 132622
	15MHz	QPSK/ 16QAM	Ch 132047
			Ch 132322
			Ch 132597
	20MHz	QPSK/ 16QAM	Ch 132072
			Ch 132322
			Ch 132572

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2BCZE-DOPF3820** 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	Conducted Emission Test	±1.38dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(30MHz~1GHz)	±2.64dB
5	All emissions, radiated(<1G)	±4.68dB
6	All emissions, radiated(>1G)	±4.89dB
7	Temperature	±0.5°C
9	Humidity	±2%
10	All emissions, radiated(9KHz~30MHz)	±6dB
11	Occupied bandwidth	±4.7%
12	Radio Frequency	$\pm 1\times10^{-6}$

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 4/5/7/13/66

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.
For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

1.7 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03r01			
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(g), (h), (m) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (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. 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

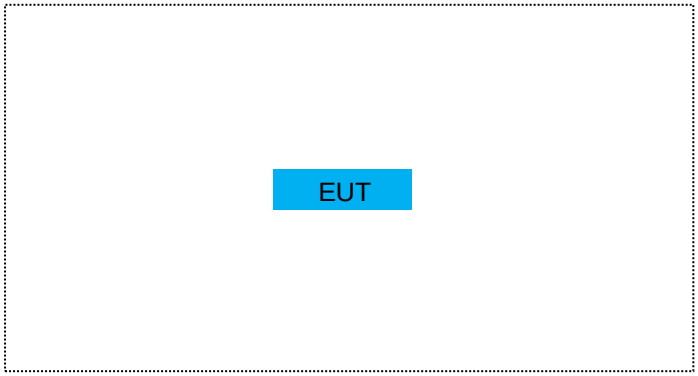
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	4G Feature phone	F3820	FCC ID: 2BCZE-DOPF3820	EUT

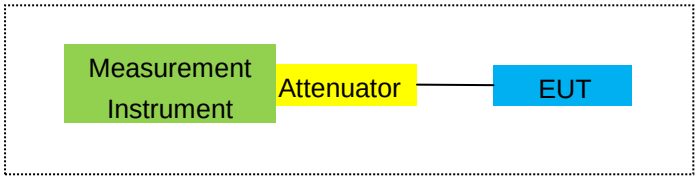
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

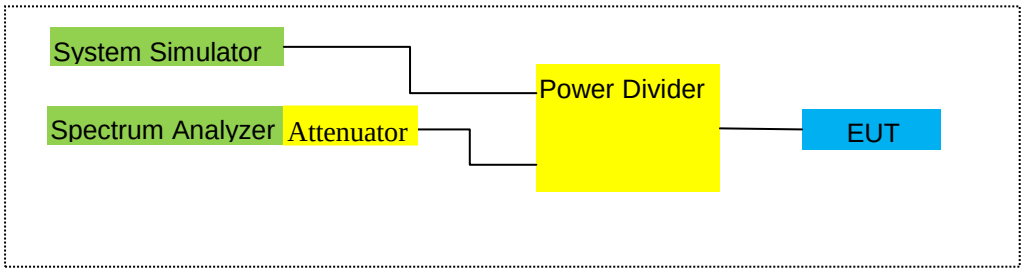
For Radiated Test Cases



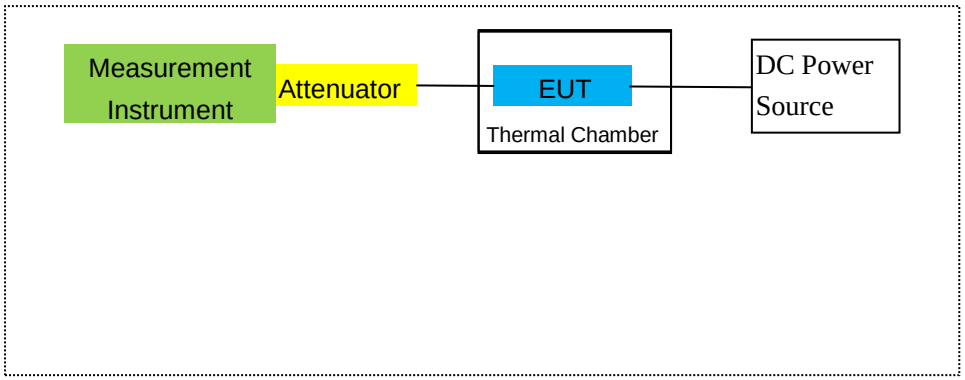
For Conducted Output Power



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



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.

3.TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2023.05.29	2024.05.28	1 year
2	Test Receiver	R&S	ESPI	101318	2023.03.27	2024.03.26	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2023.03.16	2024.03.15	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	2023.11.06	1 year
7	Amplifier	EM	EM-30180	060538	2023.05.29	2024.05.28	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2022.11.04	2023.11.05	1 year
9	Power Meter	R&S	NRVS	100696	2023.05.29	2024.05.28	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2023.05.29	2024.05.28	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2023.03.27	2024.03.26	1 year
15	LISN	R&S	ENV216	101313	2023.03.27	2024.03.26	1 year
16	LISN	EMCO	3816/2	00042990	2023.03.27	2024.03.26	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2023.03.27	2024.03.26	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2023.03.27	2024.03.26	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	2023.03.27	2024.03.26	1 year
23	test receiver	R&S	ESCI	a0304218	2023.03.27	2024.03.26	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	2023.03.27	2024.03.26	1 year

26	DC Power Source	N/A	PS-6005D	20170402923	2023.05.06	2026.05.05	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.3

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
--					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

Band 4/5/7/13/66

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53,
FCC: §22.359

LIMITS

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.
The minimum permissible attenuation level for Band 7 is as following.
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:
Set the spectrum analyzer span to include the block edge frequency
Set a marker to point the corresponding band edge frequency in each test case.
Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

Band 4/5/7/13/66

RESULTS

Test data reference attachment.
Note: Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53

LIMITS

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

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

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

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

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.

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

TEST PROCEDURE

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

For each out of band emissions measurement:

□

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

MODES TESTED

□ Band 4/5/7/13/66

□ 7.1 MEASUREMENT METHOD

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

Test data reference attachment.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
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. 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 v03r01 RF power output using broadband peak and average power meter method.
KDB 971168 D01 Power Meas License Digital Systems v03r01, “Measurement Guidance for Certification of Licensed Digital Transmitters”

MODES TESTED

- Band 4/5/7/13/66

RESULTS

Pass

8.2 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
1.4MHz Band QPSK	6/0	1710.7	15.65	3.12	8.90	21.43	138.995	Horizontal	Pass
		1732.5	13.92	3.27	8.90	19.55	90.157	Horizontal	Pass
		1754.3	17.01	3.29	8.90	22.62	182.810	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	14.42	3.13	8.90	20.19	104.472	Horizontal	Pass
		1732.5	15.57	3.27	8.90	21.2	131.826	Horizontal	Pass
		1753.5	16.59	3.30	8.90	22.19	165.577	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	15.48	3.13	8.90	21.25	133.352	Horizontal	Pass
		1732.5	16.14	3.27	8.90	21.77	150.314	Horizontal	Pass
		1752.5	14.71	3.30	8.90	20.31	107.399	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	15.52	3.15	8.90	21.27	133.968	Horizontal	Pass
		1732.5	15.75	3.31	8.90	21.34	136.144	Horizontal	Pass
		1750	16.95	3.33	8.90	22.52	178.649	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	16.33	3.15	8.90	22.08	161.436	Horizontal	Pass
		1732.5	16.35	3.31	8.90	21.94	156.315	Horizontal	Pass
		1747.5	17.31	3.33	8.90	22.88	194.089	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	15.17	3.17	8.90	20.9	123.027	Horizontal	Pass
		1732.5	16.44	3.32	8.90	22.02	159.221	Horizontal	Pass
		1745	15.78	3.36	8.90	21.32	135.519	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	16.94	3.12	8.90	22.72	187.068	Vertical	Pass
		1732.5	16.18	3.27	8.90	21.81	151.705	Vertical	Pass
		1754.3	14.81	3.29	8.90	20.42	110.154	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	17.10	3.13	8.90	22.87	193.642	Vertical	Pass
		1732.5	17.51	3.27	8.90	23.14	206.063	Vertical	Pass
		1753.5	17.56	3.30	8.90	23.16	207.014	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	14.96	3.13	8.90	20.73	118.304	Vertical	Pass
		1732.5	16.69	3.27	8.90	22.32	170.608	Vertical	Pass
		1752.5	15.27	3.30	8.90	20.87	122.180	Vertical	Pass
10.0MHz Band	50/0	1715	13.58	3.15	8.90	19.33	85.704	Vertical	Pass
		1732.5	16.68	3.31	8.90	22.27	168.655	Vertical	Pass

QPSK		1750	16.74	3.33	8.90	22.31	170.216	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	17.36	3.15	8.90	23.11	204.644	Vertical	Pass
		1732.5	15.79	3.31	8.90	21.38	137.404	Vertical	Pass
		1747.5	16.14	3.33	8.90	21.71	148.252	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	17.65	3.17	8.90	23.38	217.771	Vertical	Pass
		1732.5	17.66	3.32	8.90	23.24	210.863	Vertical	Pass
		1745	15.84	3.36	8.90	21.38	137.404	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	16.87	3.12	8.90	22.65	184.077	Horizontal	Pass
		1732.5	16.90	3.27	8.90	22.53	179.061	Horizontal	Pass
		1754.3	17.55	3.29	8.90	23.16	207.014	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.48	3.13	8.90	21.25	133.352	Horizontal	Pass
		1732.5	17.81	3.27	8.90	23.44	220.800	Horizontal	Pass
		1753.5	17.08	3.30	8.90	22.68	185.353	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	15.26	3.13	8.90	21.03	126.765	Horizontal	Pass
		1732.5	15.59	3.27	8.90	21.22	132.434	Horizontal	Pass
		1752.5	16.22	3.30	8.90	21.82	152.055	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	17.59	3.15	8.90	23.34	215.774	Horizontal	Pass
		1732.5	15.00	3.31	8.90	20.59	114.551	Horizontal	Pass
		1750	15.46	3.33	8.90	21.03	126.765	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	16.69	3.15	8.90	22.44	175.388	Horizontal	Pass
		1732.5	16.52	3.31	8.90	22.11	162.555	Horizontal	Pass
		1747.5	16.87	3.33	8.90	22.44	175.388	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	17.38	3.17	8.90	23.11	204.644	Horizontal	Pass
		1732.5	17.42	3.32	8.90	23	199.526	Horizontal	Pass
		1745	17.63	3.36	8.90	23.17	207.491	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	16.50	3.12	8.90	22.28	169.044	Vertical	Pass
		1732.5	16.16	3.27	8.90	21.79	151.008	Vertical	Pass
		1754.3	17.63	3.29	8.90	23.24	210.863	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	15.55	3.13	8.90	21.32	135.519	Vertical	Pass
		1732.5	16.56	3.27	8.90	22.19	165.577	Vertical	Pass
		1753.5	16.51	3.30	8.90	22.11	162.555	Vertical	Pass

5.0MHz Band 16 QAM	25/0	1712.5	15.55	3.13	8.90	21.32	135.519	Vertical	Pass
		1732.5	16.53	3.27	8.90	22.16	164.437	Vertical	Pass
		1752.5	14.95	3.30	8.90	20.55	113.501	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	15.29	3.15	8.90	21.04	127.057	Vertical	Pass
		1732.5	16.76	3.31	8.90	22.35	171.791	Vertical	Pass
		1750	17.29	3.33	8.90	22.86	193.197	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	16.17	3.15	8.90	21.92	155.597	Vertical	Pass
		1732.5	17.15	3.31	8.90	22.74	187.932	Vertical	Pass
		1747.5	17.16	3.33	8.90	22.73	187.499	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	17.08	3.17	8.90	22.81	190.985	Vertical	Pass
		1732.5	16.74	3.32	8.90	22.32	170.608	Vertical	Pass
		1745	17.99	3.36	8.90	23.53	225.424	Vertical	Pass

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

8.3 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	19.46	2.01	5.30	2.15	20.6	114.815	Horizontal	Pass
		836.5	19.21	2.01	5.30	2.15	20.35	108.393	Horizontal	Pass
		848.3	19.32	2.02	5.70	2.15	20.85	121.619	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	20.16	2.01	5.30	2.15	21.3	134.896	Horizontal	Pass
		836.5	21.12	2.01	5.30	2.15	22.26	168.267	Horizontal	Pass
		847.5	19.39	2.02	5.70	2.15	20.92	123.595	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	18.27	2.01	5.30	2.15	19.41	87.297	Horizontal	Pass
		836.5	21.08	2.01	5.30	2.15	22.22	166.725	Horizontal	Pass
		846.5	20.79	2.02	5.70	2.15	22.32	170.608	Horizontal	Pass
10.0MHz Band QPSK	50/0	829	19.96	2.01	5.30	2.15	21.1	128.825	Horizontal	Pass
		836.5	19.88	2.01	5.30	2.15	21.02	126.474	Horizontal	Pass
		844	19.03	2.02	5.70	2.15	20.56	113.763	Horizontal	Pass
1.4MHz Band QPSK	6/0	824.7	20.19	2.01	5.30	2.15	21.33	135.831	Vertical	Pass
		836.5	20.32	2.01	5.30	2.15	21.46	139.959	Vertical	Pass
		848.3	20.47	2.02	5.70	2.15	22	158.489	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	20.64	2.01	5.30	2.15	21.78	150.661	Vertical	Pass
		836.5	20.61	2.01	5.30	2.15	21.75	149.624	Vertical	Pass
		847.5	20.28	2.02	5.70	2.15	21.81	151.705	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	18.96	2.01	5.30	2.15	20.1	102.329	Vertical	Pass
		836.5	19.81	2.01	5.30	2.15	20.95	124.451	Vertical	Pass
		846.5	17.67	2.02	5.70	2.15	19.2	83.176	Vertical	Pass
10.0MHz Band QPSK	50/0	829	18.69	2.01	5.30	2.15	19.83	96.161	Vertical	Pass
		836.5	21.42	2.01	5.30	2.15	22.56	180.302	Vertical	Pass
		844	19.67	2.02	5.70	2.15	21.2	131.826	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	824.7	19.50	2.01	5.30	2.15	20.64	115.878	Horizontal	Pass
		836.5	19.90	2.01	5.30	2.15	21.04	127.057	Horizontal	Pass
		848.3	19.88	2.02	5.70	2.15	21.41	138.357	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	19.02	2.01	5.30	2.15	20.16	103.753	Horizontal	Pass
		836.5	19.98	2.01	5.30	2.15	21.12	129.420	Horizontal	Pass
		847.5	18.65	2.02	5.70	2.15	20.18	104.232	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	17.36	2.01	5.30	2.15	18.5	70.795	Horizontal	Pass
		836.5	18.15	2.01	5.30	2.15	19.29	84.918	Horizontal	Pass
		846.5	18.75	2.02	5.70	2.15	20.28	106.660	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	829	17.92	2.01	5.30	2.15	19.06	80.538	Horizontal	Pass
		836.5	18.80	2.01	5.30	2.15	19.94	98.628	Horizontal	Pass
		844	18.99	2.02	5.70	2.15	20.52	112.720	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	20.64	2.01	5.30	2.15	21.78	150.661	Vertical	Pass
		836.5	18.94	2.01	5.30	2.15	20.08	101.859	Vertical	Pass
		848.3	18.80	2.02	5.70	2.15	20.33	107.895	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	18.99	2.01	5.30	2.15	20.13	103.039	Vertical	Pass
		836.5	18.79	2.01	5.30	2.15	19.93	98.401	Vertical	Pass
		847.5	18.53	2.02	5.70	2.15	20.06	101.391	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	18.70	2.01	5.30	2.15	19.84	96.383	Vertical	Pass
		836.5	18.31	2.01	5.30	2.15	19.45	88.105	Vertical	Pass
		846.5	18.34	2.02	5.70	2.15	19.87	97.051	Vertical	Pass
10.0MHz Band 16 QAM	50/0	829	18.71	2.01	5.30	2.15	19.85	96.605	Vertical	Pass
		836.5	21.25	2.01	5.30	2.15	22.39	173.380	Vertical	Pass
		844	19.28	2.02	5.70	2.15	20.81	120.504	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)
ERP=EIRP-2.15

8.4 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	17.65	4.54	9.00	22.11	162.555	Horizontal	Pass
		2535	18.04	4.69	9.00	22.35	171.791	Horizontal	Pass
		2567.5	17.47	4.71	9.00	21.76	149.968	Horizontal	Pass
10.0MHz Band QPSK	50/0	2505	19.42	4.55	9.00	23.87	243.781	Horizontal	Pass
		2535	18.80	4.69	9.00	23.11	204.644	Horizontal	Pass
		2565	19.73	4.72	9.00	24.01	251.768	Horizontal	Pass
15.0MHz Band QPSK	75/0	2507.5	19.20	4.55	9.00	23.65	231.739	Horizontal	Pass
		2535	17.59	4.69	9.00	21.9	154.882	Horizontal	Pass
		2562.5	18.21	4.72	9.00	22.49	177.419	Horizontal	Pass
20.0MHz Band QPSK	100/0	2510	18.10	4.57	9.00	22.53	179.061	Horizontal	Pass
		2535	18.65	4.73	9.00	22.92	195.884	Horizontal	Pass
		2560	17.84	4.75	9.00	22.09	161.808	Horizontal	Pass
5.0MHz Band QPSK	25/0	2502.5	19.17	4.54	9.00	23.63	230.675	Vertical	Pass
		2535	19.15	4.69	9.00	23.46	221.820	Vertical	Pass
		2567.5	17.97	4.71	9.00	22.26	168.267	Vertical	Pass
10.0MHz Band QPSK	50/0	2505	19.37	4.55	9.00	23.82	240.991	Vertical	Pass
		2535	18.98	4.69	9.00	23.29	213.304	Vertical	Pass
		2565	19.09	4.72	9.00	23.37	217.270	Vertical	Pass
15.0MHz Band QPSK	75/0	2507.5	19.59	4.55	9.00	24.04	253.513	Vertical	Pass
		2535	19.72	4.69	9.00	24.03	252.930	Vertical	Pass
		2562.5	17.66	4.72	9.00	21.94	156.315	Vertical	Pass
20.0MHz Band QPSK	100/0	2510	19.22	4.57	9.00	23.65	231.739	Vertical	Pass
		2535	19.78	4.73	9.00	24.05	254.097	Vertical	Pass
		2560	19.67	4.75	9.00	23.92	246.604	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2502.5	16.70	4.54	9.00	21.16	130.617	Horizontal	Pass
		2535	15.57	4.69	9.00	19.88	97.275	Horizontal	Pass
		2567.5	17.77	4.71	9.00	22.06	160.694	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2505	18.61	4.55	9.00	23.06	202.302	Horizontal	Pass
		2535	18.53	4.69	9.00	22.84	192.309	Horizontal	Pass
		2565	17.11	4.72	9.00	21.39	137.721	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2507.5	17.90	4.55	9.00	22.35	171.791	Horizontal	Pass
		2535	18.01	4.69	9.00	22.32	170.608	Horizontal	Pass
		2562.5	18.50	4.72	9.00	22.78	189.671	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2510	16.76	4.57	9.00	21.19	131.522	Horizontal	Pass
		2535	18.74	4.73	9.00	23.01	199.986	Horizontal	Pass
		2560	18.79	4.75	9.00	23.04	201.372	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2502.5	17.59	4.54	9.00	22.05	160.325	Vertical	Pass
		2535	16.77	4.69	9.00	21.08	128.233	Vertical	Pass
		2567.5	18.39	4.71	9.00	22.68	185.353	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2505	17.95	4.55	9.00	22.4	173.780	Vertical	Pass
		2535	18.12	4.69	9.00	22.43	174.985	Vertical	Pass
		2565	15.89	4.72	9.00	20.17	103.992	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2507.5	18.59	4.55	9.00	23.04	201.372	Vertical	Pass
		2535	18.20	4.69	9.00	22.51	178.238	Vertical	Pass
		2562.5	16.92	4.72	9.00	21.2	131.826	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2510	17.08	4.57	9.00	21.51	141.579	Vertical	Pass
		2535	18.89	4.73	9.00	23.16	207.014	Vertical	Pass
		2560	16.29	4.75	9.00	20.54	113.240	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 13

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	779.5	14.98	1.91	5.80	2.15	16.72	46.950	Horizontal	Pass
		782	16.78	1.91	5.60	2.15	18.32	67.920	Horizontal	Pass
		784.5	16.75	1.92	5.70	2.15	18.38	68.896	Horizontal	Pass
10.0MHz Band QPSK	50/0	782	16.32	1.91	5.80	2.15	18.06	63.973	Horizontal	Pass
5.0MHz Band QPSK	25/0	779.5	15.69	1.91	5.80	2.15	17.43	55.352	Vertical	Pass
		782	16.47	1.91	5.60	2.15	18.01	63.241	Vertical	Pass
		784.5	16.01	1.92	5.70	2.15	17.64	58.093	Vertical	Pass
10.0MHz Band QPSK	50/0	782	17.5	1.91	5.8	2.15	19.24	83.946	Vertical	Pass

Radiated Power (ERP) for Band 13										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	779.5	15.88	1.91	5.80	2.15	17.62	57.810	Horizontal	Pass
		782	16.42	1.91	5.60	2.15	17.96	62.517	Horizontal	Pass
		784.5	15.59	1.92	5.70	2.15	17.22	52.723	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	782	16.39	1.91	5.8	2.15	18.13	65.013	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	779.5	15.77	1.91	5.80	2.15	17.51	56.364	Vertical	Pass
		782	16.48	1.91	5.60	2.15	18.02	63.387	Vertical	Pass
		784.5	16.35	1.92	5.70	2.15	17.98	62.806	Vertical	Pass
10.0MHz Band 16 QAM	50/0	782	15.79	1.91	5.8	2.15	17.53	56.624	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)

8.6 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	17.43	3.76	8.90	22.57	180.717	Horizontal	Pass
		1745	17.03	3.91	8.90	22.02	159.221	Horizontal	Pass
		1779.3	17.46	3.93	8.90	22.43	174.985	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	17.54	3.77	8.90	22.67	184.927	Horizontal	Pass
		1745	17.65	3.91	8.90	22.64	183.654	Horizontal	Pass
		1778.5	17.26	3.94	8.90	22.22	166.725	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	17.68	3.77	8.90	22.81	190.985	Horizontal	Pass
		1745	17.06	3.91	8.90	22.05	160.325	Horizontal	Pass
		1777.5	17.34	3.94	8.90	22.3	169.824	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	17.19	3.79	8.90	22.3	169.824	Horizontal	Pass
		1745	16.57	3.95	8.90	21.52	141.906	Horizontal	Pass
		1775	16.98	3.97	8.90	21.91	155.239	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	17.28	3.79	8.90	22.39	173.380	Horizontal	Pass
		1745	17.18	3.95	8.90	22.13	163.305	Horizontal	Pass
		1772.5	17.40	3.97	8.90	22.33	171.002	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	17.43	3.81	8.90	22.52	178.649	Horizontal	Pass
		1745	16.90	3.96	8.90	21.84	152.757	Horizontal	Pass
		1770	17.40	4	8.90	22.3	169.824	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	17.22	3.76	8.90	22.36	172.187	Vertical	Pass
		1745	17.52	3.91	8.90	22.51	178.238	Vertical	Pass
		1779.3	16.64	3.93	8.90	21.61	144.877	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	17.17	3.77	8.90	22.3	169.824	Vertical	Pass
		1745	17.12	3.91	8.90	22.11	162.555	Vertical	Pass
		1778.5	17.81	3.94	8.90	22.77	189.234	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	17.18	3.77	8.90	22.31	170.216	Vertical	Pass
		1745	17.32	3.91	8.90	22.31	170.216	Vertical	Pass
		1777.5	16.21	3.94	8.90	21.17	130.918	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	17.16	3.79	8.90	22.27	168.655	Vertical	Pass
		1745	16.77	3.95	8.90	21.72	148.594	Vertical	Pass
		1775	17.00	3.97	8.90	21.93	155.955	Vertical	Pass

15.0MHz Band QPSK	75/0	1717.5	17.21	3.79	8.90	22.32	170.608	Vertical	Pass
		1745	16.94	3.95	8.90	21.89	154.525	Vertical	Pass
		1772.5	17.30	3.97	8.90	22.23	167.109	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	17.89	3.81	8.90	22.98	198.609	Vertical	Pass
		1745	17.77	3.96	8.90	22.71	186.638	Vertical	Pass
		1770	17.58	4	8.90	22.48	177.011	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	17.58	3.76	8.90	22.72	187.068	Horizontal	Pass
		1745	17.36	3.91	8.90	22.35	171.791	Horizontal	Pass
		1779.3	17.35	3.93	8.90	22.32	170.608	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	17.17	3.77	8.90	22.3	169.824	Horizontal	Pass
		1745	17.27	3.91	8.90	22.26	168.267	Horizontal	Pass
		1778.5	17.66	3.94	8.90	22.62	182.810	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	16.22	3.77	8.90	21.35	136.458	Horizontal	Pass
		1745	17.46	3.91	8.90	22.45	175.792	Horizontal	Pass
		1777.5	17.15	3.94	8.90	22.11	162.555	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	17.24	3.79	8.90	22.35	171.791	Horizontal	Pass
		1745	17.39	3.95	8.90	22.34	171.396	Horizontal	Pass
		1775	17.74	3.97	8.90	22.67	184.927	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	17.55	3.79	8.90	22.66	184.502	Horizontal	Pass
		1745	15.37	3.95	8.90	20.32	107.647	Horizontal	Pass
		1772.5	16.76	3.97	8.90	21.69	147.571	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	16.27	3.81	8.90	21.36	136.773	Horizontal	Pass
		1745	17.10	3.96	8.90	22.04	159.956	Horizontal	Pass
		1770	16.87	4	8.90	21.77	150.314	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	16.98	3.76	8.90	22.12	162.930	Vertical	Pass
		1745	17.09	3.91	8.90	22.08	161.436	Vertical	Pass
		1779.3	17.14	3.93	8.90	22.11	162.555	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	17.17	3.77	8.90	22.3	169.824	Vertical	Pass
		1745	17.41	3.91	8.90	22.4	173.780	Vertical	Pass
		1778.5	17.38	3.94	8.90	22.34	171.396	Vertical	Pass
5.0MHz	25/0	1712.5	17.30	3.77	8.90	22.43	174.985	Vertical	Pass

Band 16 QAM		1745	17.67	3.91	8.90	22.66	184.502	Vertical	Pass
		1777.5	17.75	3.94	8.90	22.71	186.638	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	17.12	3.79	8.90	22.23	167.109	Vertical	Pass
		1745	17.38	3.95	8.90	22.33	171.002	Vertical	Pass
		1775	16.77	3.97	8.90	21.7	147.911	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	17.08	3.79	8.90	22.19	165.577	Vertical	Pass
		1745	17.16	3.95	8.90	22.11	162.555	Vertical	Pass
		1772.5	16.42	3.97	8.90	21.35	136.458	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	17.71	3.81	8.90	22.8	190.546	Vertical	Pass
		1745	17.12	3.96	8.90	22.06	160.694	Vertical	Pass
		1770	17.63	4	8.90	22.53	179.061	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, § 24.238, § 27.53

LIMIT

§22.917 (e) and §24.238: Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST PROCEDURE

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

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

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

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:
a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB; and
b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (p) at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

LTE Band 4/5/7/13/66

RESULTS

PASS

Note: Other emissions which has not list below has attenuated 20dB below the limit.

9.1 LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-50.67	4.02	29.80	-24.89	-13	-11.89	Horizontal
3421.4	-50.32	4.02	29.80	-24.54	-13	-11.54	Vertical
5132.1	-52.38	5.24	35.84	-21.78	-13	-8.78	Vertical
5132.1	-54.05	5.24	35.84	-23.45	-13	-10.45	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-42.79	4.03	30.00	-16.82	-13	-3.82	Horizontal
3465	-48.71	4.03	30.00	-22.74	-13	-9.74	Vertical
5197.5	-49.10	5.25	35.86	-18.49	-13	-5.49	Vertical
5197.5	-48.32	5.25	35.86	-17.71	-13	-4.71	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-43.25	4.05	30.01	-17.29	-13	-4.29	Horizontal
3508.6	-50.77	4.05	30.01	-24.81	-13	-11.81	Vertical
5262.9	-48.86	5.26	35.86	-18.26	-13	-5.26	Vertical
5262.9	-47.02	5.26	35.86	-16.42	-13	-3.42	Horizontal

QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3440	-47.10	4.02	29.80	-21.32	-13	-8.32	Horizontal
3440	-49.17	4.02	29.80	-23.39	-13	-10.39	Vertical
5160	-50.56	5.24	35.84	-19.96	-13	-6.96	Vertical
5160	-53.41	5.24	35.84	-22.81	-13	-9.81	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-41.02	4.03	30.00	-15.05	-13	-2.05	Horizontal
3465	-45.30	4.03	30.00	-19.33	-13	-6.33	Vertical
5197.5	-51.50	5.25	35.86	-20.89	-13	-7.89	Vertical
5197.5	-49.74	5.25	35.86	-19.13	-13	-6.13	Horizontal
Test Results for High Channel 1745MHz							
2490	-47.08	2.91	27.68	-22.31	-13	-9.31	Horizontal
3490	-47.02	2.91	27.68	-22.25	-13	-9.25	Vertical
5235	-52.23	5.26	35.86	-21.63	-13	-8.63	Vertical
5235	-50.93	5.26	35.86	-20.33	-13	-7.33	Horizontal

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

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

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

9.2 LTE BAND 5

QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1649.4	-41.98	2.78	27.50	-17.26	-13	-4.26	Horizontal
1649.4	-50.04	2.78	27.50	-25.32	-13	-12.32	Vertical
2474.1	-47.72	2.90	27.80	-22.82	-13	-9.82	Vertical
2474.1	-47.07	2.90	27.80	-22.17	-13	-9.17	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-44.24	2.78	27.48	-19.54	-13	-6.54	Horizontal
1673	-43.23	2.78	27.48	-18.53	-13	-5.53	Vertical
2509.5	-43.77	2.91	27.70	-18.98	-13	-5.98	Vertical
2509.5	-44.08	2.91	27.70	-19.29	-13	-6.29	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-44.68	2.78	27.43	-20.03	-13	-7.03	Horizontal
1696.6	-46.93	2.78	27.43	-22.28	-13	-9.28	Vertical
2544.9	-43.67	2.92	27.74	-18.85	-13	-5.85	Vertical
2544.9	-43.03	2.92	27.74	-18.21	-13	-5.21	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1658	-44.75	2.78	27.50	-20.03	-13	-7.03	Horizontal
1658	-43.31	2.78	27.50	-18.59	-13	-5.59	Vertical
2487	-46.37	2.90	27.80	-21.47	-13	-8.47	Vertical
2487	-46.70	2.90	27.80	-21.80	-13	-8.80	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-45.44	2.78	27.48	-20.74	-13	-7.74	Horizontal
1673	-46.34	2.78	27.48	-21.64	-13	-8.64	Vertical
2509.5	-49.12	2.91	27.70	-24.33	-13	-11.33	Vertical
2509.5	-44.77	2.91	27.70	-19.98	-13	-6.98	Horizontal
Test Results for High Channel 844MHz							
1688	-46.63	2.78	27.43	-21.98	-13	-8.98	Horizontal
1688	-42.77	2.78	27.43	-18.12	-13	-5.12	Vertical
2532	-43.60	2.92	27.74	-18.78	-13	-5.78	Vertical
2532	-42.55	2.92	27.74	-17.73	-13	-4.73	Horizontal

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

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

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

9.3 LTE BAND 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	-65.03	5.23	35.81	-34.45	-25	-9.45	Horizontal
5005	-59.56	5.23	35.81	-28.98	-25	-3.98	Vertical
7507.5	-66.10	5.67	36.85	-34.92	-25	-9.92	Vertical
7507.5	-62.90	5.67	36.85	-31.72	-25	-6.72	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-62.13	5.23	35.82	-31.54	-25	-6.54	Horizontal
5070	-61.78	5.23	35.82	-31.19	-25	-6.19	Vertical
7605	-64.20	5.67	36.85	-33.02	-25	-8.02	Vertical
7605	-62.83	5.67	36.85	-31.65	-25	-6.65	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-66.43	5.24	35.83	-35.84	-25	-10.84	Horizontal
5135	-62.24	5.24	35.83	-31.65	-25	-6.65	Vertical
7702.5	-64.19	5.68	36.87	-33.00	-25	-8.00	Vertical
7702.5	-66.26	5.68	36.87	-35.07	-25	-10.07	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	-63.07	5.23	35.82	-32.48	-25	-7.48	Horizontal
5020	-60.80	5.23	35.82	-30.21	-25	-5.21	Vertical
7530	-64.83	5.67	36.86	-33.64	-25	-8.64	Vertical
7530	-59.95	5.67	36.86	-28.76	-25	-3.76	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-61.25	5.23	35.82	-30.66	-25	-5.66	Horizontal
5070	-61.85	5.23	35.82	-31.26	-25	-6.26	Vertical
7605	-63.57	5.67	36.85	-32.39	-25	-7.39	Vertical
7605	-65.26	5.67	36.85	-34.08	-25	-9.08	Horizontal
Test Results for High Channel 2560MHz							
5120	-60.82	5.24	35.83	-30.23	-25	-5.23	Horizontal
5120	-63.81	5.24	35.83	-33.22	-25	-8.22	Vertical
7680	-64.99	5.70	36.88	-33.81	-25	-8.81	Vertical
7680	-66.70	5.70	36.88	-35.52	-25	-10.52	Horizontal

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

. Margin = Spurious Emission Level - Limit

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

9.4 LTE BAND 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 Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1559	-80.72	2.61	27.28	-56.05	-40	-16.05	Horizontal
1559	-81.15	2.61	27.28	-56.48	-40	-16.48	Vertical
2338.5	-51.09	2.87	27.59	-26.37	-13	-13.37	Vertical
2338.5	-51.25	2.87	27.59	-26.53	-13	-13.53	Horizontal
Test Results For Mid Channel 782MHz							
1564	-86.85	2.62	27.30	-62.17	-40	-22.17	Horizontal
1564	-87.78	2.62	27.30	-63.10	-40	-23.10	Vertical
2346	-49.44	2.87	27.62	-24.69	-13	-11.69	Vertical
2346	-52.51	2.87	27.62	-27.76	-13	-14.76	Horizontal
Test Results for High Channel 784.5MHz							
1569	-81.63	2.66	27.28	-57.01	-40	-17.01	Horizontal
1569	-79.58	2.66	27.28	-54.96	-40	-14.96	Vertical
2353.5	-48.41	2.88	27.60	-23.69	-13	-10.69	Vertical
2353.5	-46.00	2.88	27.60	-21.28	-13	-8.28	Horizontal

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

Test Results for Channel 782MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1564	-80.38	2.62	27.30	-55.70	-40	-15.70	Horizontal
1564	-87.94	2.62	27.30	-63.26	-40	-23.26	Vertical
2346	-49.52	2.87	27.62	-24.77	-13	-11.77	Vertical
2346	-52.61	2.87	27.62	-27.86	-13	-14.86	Horizontal

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

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

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

9.5 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (5MHZ BANDWIDTH)

Test Results for Low Channel 1710.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-54.42	2.61	27.28	-29.75	-13	-16.75	Horizontal
3421.4	-58.32	2.61	27.28	-33.65	-13	-20.65	Vertical
5132.1	-61.60	2.87	27.59	-36.88	-13	-23.88	Vertical
5132.1	-49.90	2.87	27.59	-25.18	-13	-12.18	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-52.54	2.62	27.3	-27.86	-13	-14.86	Horizontal
3490	-61.83	2.62	27.3	-37.15	-13	-24.15	Vertical
5337.9	-59.06	2.87	27.62	-34.31	-13	-21.31	Vertical
5337.9	-57.24	2.87	27.62	-32.49	-13	-19.49	Horizontal
Test Results for High Channel 1779.3MHz							
3558.6	-58.88	2.66	27.28	-34.26	-13	-21.26	Horizontal
3558.6	-53.58	2.66	27.28	-28.96	-13	-15.96	Vertical
5337.9	-55.86	2.88	27.6	-31.14	-13	-18.14	Vertical
5337.9	-59.87	2.88	27.6	-35.15	-13	-22.15	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (20MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3440	-50.79	2.62	27.3	-26.11	-13	-13.11	Horizontal
3440	-56.23	2.62	27.3	-31.55	-13	-18.55	Vertical
5160	-59.33	2.87	27.62	-34.58	-13	-21.58	Vertical
5160	-56.48	2.87	27.62	-31.73	-13	-18.73	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-56.46	2.62	27.3	-31.78	-13	-18.78	Horizontal
3490	-53.92	2.62	27.3	-29.24	-13	-16.24	Vertical
5337.9	-60.06	2.87	27.62	-35.31	-13	-22.31	Vertical
5337.9	-57.37	2.87	27.62	-32.62	-13	-19.62	Horizontal
Test Results for High Channel 1770MHz							
3540	-55.69	2.62	27.3	-31.01	-13	-18.01	Horizontal
3540	-54.66	2.62	27.3	-29.98	-13	-16.98	Vertical
5310	-53.94	2.87	27.62	-29.19	-13	-16.19	Vertical
5310	-50.81	2.87	27.62	-26.06	-13	-13.06	Horizontal

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

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

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

10. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage =low voltage, DC 315V, Normal, DC 3.7V and High voltage, DC 4.26V.

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to -30ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 4/5/7/13/66

RESULTS

See the following pages.

10.1 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]
3.15	1732.5	7	0.00404	2.5
3.7	1732.5	1	0.00058	2.5
4.26	1732.5	14	0.00808	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10	0.00577	2.5
Extreme (50C)	1732.5	9	0.00519	2.5
Extreme (40C)	1732.5	6	0.00346	2.5
Extreme (30C)	1732.5	16	0.00924	2.5
Extreme (10C)	1732.5	19	0.01097	2.5
Extreme (0C)	1732.5	9	0.00519	2.5
Extreme (-10C)	1732.5	17	0.00981	2.5
Extreme (-20C)	1732.5	3	0.00173	2.5
Extreme (-30C)	1732.5	13	0.00750	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]
3.15	1732.5	15	0.00866	2.5
3.7	1732.5	2	0.00115	2.5
4.26	1732.5	16	0.00924	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	4	0.00231	2.5
Extreme (50C)	1732.5	12	0.00693	2.5
Extreme (40C)	1732.5	16	0.00924	2.5
Extreme (30C)	1732.5	15	0.00866	2.5
Extreme (10C)	1732.5	13	0.00750	2.5
Extreme (0C)	1732.5	9	0.00519	2.5
Extreme (-10C)	1732.5	6	0.00346	2.5
Extreme (-20C)	1732.5	3	0.00173	2.5
Extreme (-30C)	1732.5	1	0.00058	2.5

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

10.2 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]
3.15	836.5	15	0.01793	2.5
3.7	836.5	20	0.02391	2.5
4.26	836.5	2	0.00239	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	12	0.01435	2.5
Extreme (50C)	836.5	2	0.00239	2.5
Extreme (40C)	836.5	8	0.00956	2.5
Extreme (30C)	836.5	11	0.01315	2.5
Extreme (10C)	836.5	8	0.00956	2.5
Extreme (0C)	836.5	12	0.01435	2.5
Extreme (-10C)	836.5	1	0.00120	2.5
Extreme (-20C)	836.5	12	0.01435	2.5
Extreme (-30C)	836.5	4	0.00478	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]
3.15	836.5	13	0.01554	2.5
3.7	836.5	5	0.00598	2.5
4.26	836.5	1	0.00120	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	3	0.00359	2.5
Extreme (50C)	836.5	11	0.01315	2.5
Extreme (40C)	836.5	7	0.00837	2.5
Extreme (30C)	836.5	13	0.01554	2.5
Extreme (10C)	836.5	12	0.01435	2.5
Extreme (0C)	836.5	8	0.00956	2.5
Extreme (-10C)	836.5	0	0.00000	2.5
Extreme (-20C)	836.5	1	0.00120	2.5
Extreme (-30C)	836.5	19	0.02271	2.5

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

10.3 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]
3.15	2535	13	0.00513	2.5
3.7	2535	16	0.00631	2.5
4.26	2535	9	0.00355	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	2	0.00079	2.5
Extreme (50C)	2535	4	0.00158	2.5
Extreme (40C)	2535	8	0.00316	2.5
Extreme (30C)	2535	3	0.00118	2.5
Extreme (10C)	2535	11	0.00434	2.5
Extreme (0C)	2535	7	0.00276	2.5
Extreme (-10C)	2535	13	0.00513	2.5
Extreme (-20C)	2535	10	0.00394	2.5
Extreme (-30C)	2535	13	0.00513	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]
3.15	2535	19	0.00750	2.5
3.7	2535	11	0.00434	2.5
4.26	2535	8	0.00316	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	19	0.00750	2.5
Extreme (50C)	2535	12	0.00473	2.5
Extreme (40C)	2535	10	0.00394	2.5
Extreme (30C)	2535	14	0.00552	2.5
Extreme (10C)	2535	16	0.00631	2.5
Extreme (0C)	2535	19	0.00750	2.5
Extreme (-10C)	2535	8	0.00316	2.5
Extreme (-20C)	2535	12	0.00473	2.5
Extreme (-30C)	2535	2	0.00079	2.5

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

10.4 LTE BAND 13

Band 13 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]
3.15	782.0	19	0.02430	2.5
3.7	782.0	14	0.01790	2.5
4.26	782.0	4	0.00512	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	8	0.01023	2.5
Extreme (50C)	782.0	14	0.01790	2.5
Extreme (40C)	782.0	7	0.00895	2.5
Extreme (30C)	782.0	10	0.01279	2.5
Extreme (10C)	782.0	11	0.01407	2.5
Extreme (0C)	782.0	15	0.01918	2.5
Extreme (-10C)	782.0	5	0.00639	2.5
Extreme (-20C)	782.0	1	0.00128	2.5
Extreme (-30C)	782.0	18	0.02302	2.5

Band 13 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]
3.15	782.0	13	0.01662	2.5
3.7	782.0	8	0.01023	2.5
4.26	782.0	11	0.01407	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	782.0	21	0.02685	2.5
Extreme (50C)	782.0	12	0.01535	2.5
Extreme (40C)	782.0	6	0.00767	2.5
Extreme (30C)	782.0	16	0.02046	2.5
Extreme (10C)	782.0	11	0.01407	2.5
Extreme (0C)	782.0	5	0.00639	2.5
Extreme (-10C)	782.0	8	0.01023	2.5
Extreme (-20C)	782.0	3	0.00384	2.5
Extreme (-30C)	782.0	11	0.01407	2.5

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

10.5 LTE BAND 66

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1745	5	0.00287	2.5
3.7	1745	11	0.00630	2.5
4.26	1745	25	0.01433	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	16	0.00917	2.5
Extreme (50C)	1745	5	0.00287	2.5
Extreme (40C)	1745	3	0.00172	2.5
Extreme (30C)	1745	9	0.00516	2.5
Extreme (10C)	1745	7	0.00401	2.5
Extreme (0C)	1745	2	0.00115	2.5
Extreme (-10C)	1745	0	0.00000	2.5
Extreme (-20C)	1745	1	0.00057	2.5
Extreme (-30C)	1745	25	0.01433	2.5

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

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	1745	10	0.00573	2.5
3.7	1745	7	0.00401	2.5
4.26	1745	3	0.00172	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	11	0.00630	2.5
Extreme (50C)	1745	13	0.00745	2.5
Extreme (40C)	1745	9	0.00516	2.5
Extreme (30C)	1745	12	0.00688	2.5
Extreme (10C)	1745	16	0.00917	2.5
Extreme (0C)	1745	9	0.00516	2.5
Extreme (-10C)	1745	7	0.00401	2.5
Extreme (-20C)	1745	6	0.00344	2.5
Extreme (-30C)	1745	5	0.00287	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.

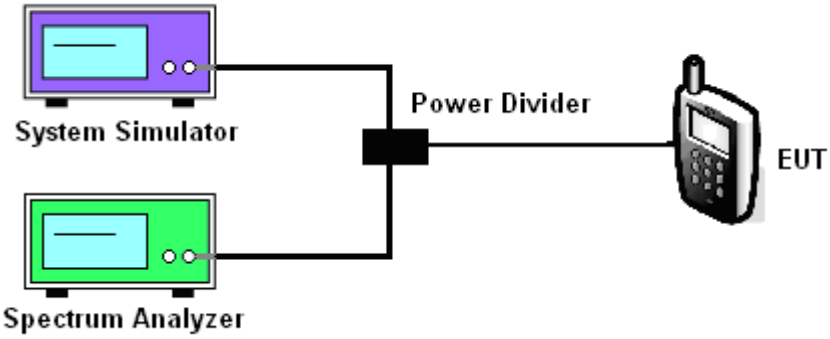
11.2 Measuring Instruments

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 4/5/7/13/66

Test data reference attachment.

----END OF REPORT----