FCC CFR47 PART 22H, 24E, 27
CERTIFICATION TEST REPORT
FCC ID: 2AHZ5-A20

Product:	Smartphone
Trade Mark:	CUBOT
Model No.:	A20
Family Model:	A10, A30, NOTE 60, P90
Report No.:	S24112100402006
Issue Date:	Dec. 27, 2024

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen Huafurui Technology Co., Ltd.
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Manufacturer's Name	:	Shenzhen Huafurui Technology Co., Ltd.
Address	:	Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Shenzhen, China
Product name	:	Smartphone
Model and/or type reference	:	A20
Trade Mark	:	CUBOT
Family Model	:	A10, A30, NOTE 60, P90
Test Sample Number		S241121004002
Standards	:	FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure	:	ANSI C63.26:2015
		ANSI/TIA-603-E-2016

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

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Date of Test .....

Date (s) of performance of tests ..... Nov. 21, 2024 ~ Dec. 27, 2024

Date of Issue ..... Dec. 27, 2024

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

Prepared By	:	Allen Liu (Project Engineer)	Reviewed By	:	Aaron Cheng (Supervisor)
Approved By	:	Alex Li (Manager)			

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smartphone
Trade Mark	CUBOT
Model Name	A20
Family Model	A10, A30, NOTE 60, P90
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2AHZ5-A20
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 2, 4, 5, 7,12, 17
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 17 Uplink: 704MHz-716MHz, Downlink: 734MHz-746MHz;
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 2: 1.2 dBi, Band 4: -0.72dBi, Band 5: -2.69 dBi, Band 7: -1.33dBi, Band 12: -2.37dBi, Band 17: -2.37 dBi
Adapter	Adapter 1: Model: HJ-0502000W2-US Input: 100-240V~50/60Hz 0.3A Output: 5.0V⎓2.0A 10.0W Adapter 2: Model: TPA-418G050200UU01 Input: 100-240V~50/60Hz 0.3A Output: 5.0V⎓2.0A 10.0W
Battery	DC 3.87V, 5100mAh, 19.737Wh
Power supply	DC 3.87V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V)（Note 1）
HW Version	G3320G-UF-V1.1
SW Version	CUBOT_A20_E091C_V2.0
** Note1: The High Voltage DC 4.45V and Low Voltage 3.29V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AHZ5-A20** 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.

No. 24 Xinfa East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of 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,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.5dB

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2/4/5/7/12/17

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

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

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

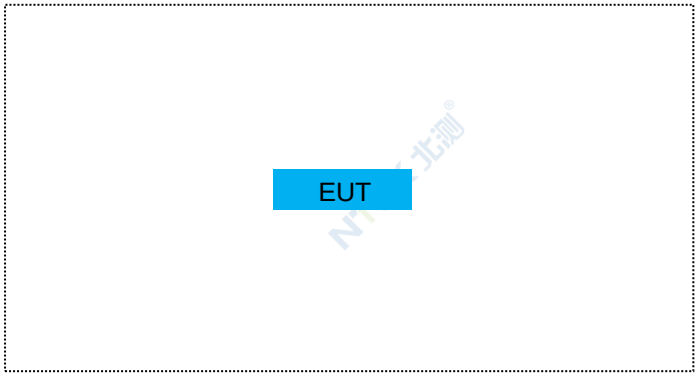
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smartphone	A20	FCC ID: 2AHZ5-A20	EUT

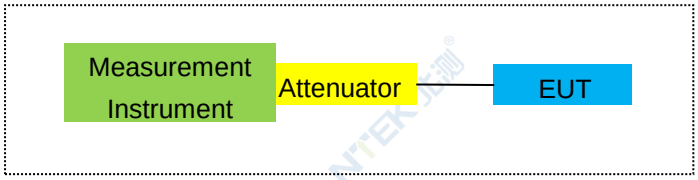
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

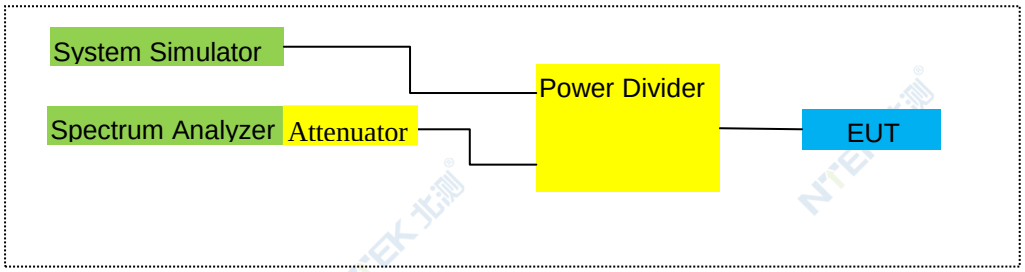
For Radiated Test Cases



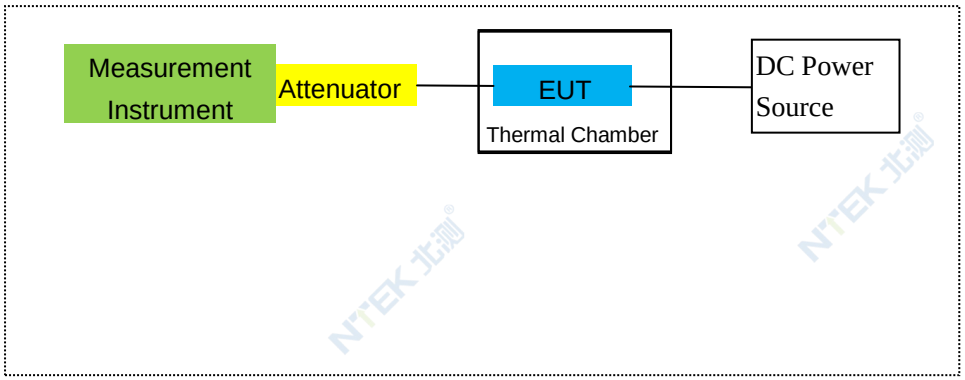
For Conducted Output Power



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	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	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	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	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	2024.03.12	2025.03.11	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	20170402923	2024.04.25	2027.04.24	3 year
27	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
28	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	1 year
29	MXG Vector Signal Generator	Agilent	N5183B	MY57280984	2024.05.30	2025.05.29	1 year
30	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	2024.05.25	2025.05.24	1 year
31	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	2024.05.12	2025.05.11	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.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

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

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

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

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

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

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

Band 2/4/5/7/12/17

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

FCC: §22.917, §24.238, §27.53
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.
(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC: §90.691 Emission mask requirements for EA-based systems.
(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

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

MODES TESTED

Band 2/4/5/7/12/17

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

□

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

MODES TESTED

□ Band 2/4/5/7/12/17

□

7.1 MEASUREMENT METHOD

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

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §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.
90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

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

- Band 2/4/5/7/12/17

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. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1850.7	-4.95	3.76	28.24	19.53	89.743	Horizontal	Pass
		1880	-4.76	3.91	28.22	19.55	90.157	Horizontal	Pass
		1909.3	-4.67	3.93	28.20	19.60	91.201	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.01	3.77	28.23	19.45	88.105	Horizontal	Pass
		1880	-4.86	3.91	28.24	19.47	88.512	Horizontal	Pass
		1908.5	-4.73	3.94	28.25	19.58	90.782	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-4.90	3.77	28.31	19.64	92.045	Horizontal	Pass
		1880	-4.52	3.91	28.22	19.79	95.280	Horizontal	Pass
		1907.5	-4.45	3.94	28.20	19.81	95.719	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-4.76	3.79	28.33	19.78	95.060	Horizontal	Pass
		1880	-4.46	3.95	28.22	19.81	95.719	Horizontal	Pass
		1905	-4.35	3.97	28.19	19.87	97.051	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-4.72	3.79	28.34	19.83	96.161	Horizontal	Pass
		1880	-4.51	3.95	28.22	19.76	94.624	Horizontal	Pass
		1902.5	-4.37	3.97	28.18	19.84	96.383	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-4.71	3.81	28.35	19.83	96.161	Horizontal	Pass
		1880	-4.38	3.96	28.22	**19.88**	97.275	Horizontal	Pass
		1900	-4.32	4.00	28.16	19.84	96.383	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-5.95	3.76	28.24	18.53	71.285	Vertical	Pass
		1880	-5.28	3.91	28.22	19.03	79.983	Vertical	Pass
		1909.3	-5.11	3.93	28.20	19.16	82.414	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-5.31	3.77	28.23	19.15	82.224	Vertical	Pass
		1880	-5.10	3.91	28.24	19.23	83.753	Vertical	Pass
		1908.5	-5.33	3.94	28.25	18.98	79.068	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-5.41	3.77	28.31	19.13	81.846	Vertical	Pass
		1880	-5.43	3.91	28.22	18.88	77.268	Vertical	Pass
		1907.5	-5.30	3.94	28.20	18.96	78.705	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-5.51	3.79	28.33	19.03	79.983	Vertical	Pass
		1880	-5.05	3.95	28.22	19.22	83.560	Vertical	Pass
		1905	-5.19	3.97	28.19	19.03	79.983	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-5.42	3.79	28.34	19.13	81.846	Vertical	Pass
Band		1880	-5.35	3.95	28.22	18.92	77.983	Vertical	Pass
QPSK		1902.5	-5.31	3.97	28.18	18.90	77.625	Vertical	Pass
20.0MHz	1/#Mid	1860	-5.39	3.81	28.35	19.15	82.224	Vertical	Pass
Band		1880	-5.68	3.96	28.22	18.58	72.111	Vertical	Pass
QPSK		1900	-5.36	4.00	28.16	18.80	75.858	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. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz	1/#Mid	1850.7	-6.07	3.76	28.24	18.41	69.343	Horizontal	Pass
Band 16		1880	-5.54	3.91	28.22	18.77	75.336	Horizontal	Pass
QAM		1909.3	-5.47	3.93	28.20	18.80	75.858	Horizontal	Pass
3.0MHz	1/#Mid	1851.5	-5.57	3.77	28.23	18.89	77.446	Horizontal	Pass
Band 16		1880	-5.65	3.91	28.24	18.68	73.790	Horizontal	Pass
QAM		1908.5	-5.86	3.94	28.25	18.45	69.984	Horizontal	Pass
5.0MHz	1/#Mid	1852.5	-5.51	3.77	28.31	19.03	79.983	Horizontal	Pass
Band 16		1880	-5.42	3.91	28.22	18.89	77.446	Horizontal	Pass
QAM		1907.5	-5.10	3.94	28.20	19.16	82.414	Horizontal	Pass
10.0MHz	1/#Mid	1855	-5.56	3.79	28.33	18.98	79.068	Horizontal	Pass
Band 16		1880	-5.55	3.95	28.22	18.72	74.473	Horizontal	Pass
QAM		1905	-5.02	3.97	28.19	19.20	83.176	Horizontal	Pass
15.0MHz	1/#Mid	1857.5	-5.54	3.79	28.34	19.01	79.616	Horizontal	Pass
Band 16		1880	-5.33	3.95	28.22	18.94	78.343	Horizontal	Pass
QAM		1902.5	-5.29	3.97	28.18	18.92	77.983	Horizontal	Pass
20.0MHz	1/#Mid	1860	-5.43	3.81	28.35	19.11	81.470	Horizontal	Pass
Band 16		1880	-5.13	3.96	28.22	19.13	81.846	Horizontal	Pass
QAM		1900	-4.95	4.00	28.16	**19.21**	83.368	Horizontal	Pass
1.4MHz	1/#Mid	1850.7	-6.34	3.76	28.24	18.14	65.163	Vertical	Pass
Band 16		1880	-6.65	3.91	28.22	17.66	58.345	Vertical	Pass
QAM		1909.3	-6.61	3.93	28.20	17.66	58.345	Vertical	Pass
3.0MHz	1/#Mid	1851.5	-6.72	3.77	28.23	17.74	59.429	Vertical	Pass
Band 16		1880	-6.50	3.91	28.24	17.83	60.674	Vertical	Pass
QAM		1908.5	-6.95	3.94	28.25	17.36	54.450	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-6.39	3.77	28.31	18.15	65.313	Vertical	Pass
Band 16		1880	-6.84	3.91	28.22	17.47	55.847	Vertical	Pass
QAM		1907.5	-6.04	3.94	28.20	18.22	66.374	Vertical	Pass

10.0MHz Band 16 QAM	1/#Mid	1855	-7.17	3.79	28.33	17.37	54.576	Vertical	Pass
		1880	-6.27	3.95	28.22	18.00	63.096	Vertical	Pass
		1905	-6.23	3.97	28.19	17.99	62.951	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-6.96	3.79	28.34	17.59	57.412	Vertical	Pass
		1880	-6.32	3.95	28.22	17.95	62.373	Vertical	Pass
		1902.5	-6.36	3.97	28.18	17.85	60.954	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-6.65	3.81	28.35	17.89	61.518	Vertical	Pass
		1880	-6.35	3.96	28.22	17.91	61.802	Vertical	Pass
		1900	-6.05	4.00	28.16	18.11	64.714	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 4

Radiated Power (EIRP) for Band 4									
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	1/#Mid	1710.7	-4.86	3.12	27.58	19.60	91.201	Horizontal	Pass
		1732.5	-4.85	3.27	27.61	19.49	88.920	Horizontal	Pass
		1754.3	-4.83	3.29	27.63	19.51	89.331	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.03	3.13	27.61	19.45	88.105	Horizontal	Pass
		1732.5	-4.95	3.27	27.61	19.39	86.896	Horizontal	Pass
		1753.5	-4.87	3.30	27.62	19.45	88.105	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-4.80	3.13	27.63	19.70	93.325	Horizontal	Pass
		1732.5	-4.70	3.27	27.61	19.64	92.045	Horizontal	Pass
		1752.5	-4.58	3.30	27.60	19.72	93.756	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-4.74	3.15	27.64	19.75	94.406	Horizontal	Pass
		1732.5	-4.51	3.31	27.61	19.79	95.280	Horizontal	Pass
		1750	-4.53	3.33	27.59	19.73	93.972	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-4.75	3.15	27.65	19.75	94.406	Horizontal	Pass
		1732.5	-4.59	3.31	27.61	19.71	93.541	Horizontal	Pass
		1747.5	-4.53	3.33	27.57	19.71	93.541	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-4.69	3.17	27.66	**19.80**	95.499	Horizontal	Pass
		1732.5	-4.52	3.32	27.61	19.77	94.842	Horizontal	Pass
		1745	-4.46	3.36	27.56	19.74	94.189	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-5.39	3.12	27.58	19.07	80.724	Vertical	Pass
		1732.5	-5.68	3.27	27.61	18.66	73.451	Vertical	Pass
		1754.3	-5.95	3.29	27.63	18.39	69.024	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-5.86	3.13	27.61	18.62	72.778	Vertical	Pass
		1732.5	-5.20	3.27	27.61	19.14	82.035	Vertical	Pass
		1753.5	-6.05	3.30	27.62	18.27	67.143	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-5.81	3.13	27.63	18.69	73.961	Vertical	Pass
		1732.5	-5.87	3.27	27.61	18.47	70.307	Vertical	Pass
		1752.5	-5.36	3.30	27.60	18.94	78.343	Vertical	Pass
10.0MHz Band	1/#Mid	1715	-5.66	3.15	27.64	18.83	76.384	Vertical	Pass
		1732.5	-5.36	3.31	27.61	18.94	78.343	Vertical	Pass

QPSK		1750	-5.95	3.33	27.59	18.31	67.764	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-5.88	3.15	27.65	18.62	72.778	Vertical	Pass
Band		1732.5	-5.64	3.31	27.61	18.66	73.451	Vertical	Pass
QPSK		1747.5	-5.65	3.33	27.57	18.59	72.277	Vertical	Pass
20.0MHz	1/#Mid	1720	-5.24	3.17	27.66	19.25	84.140	Vertical	Pass
Band		1732.5	-5.69	3.32	27.61	18.60	72.444	Vertical	Pass
QPSK		1745	-5.87	3.36	27.56	18.33	68.077	Vertical	Pass

Radiated Power (EIRP) for Band 4									
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	1/#Mid	1710.7	-5.67	3.12	27.58	18.79	75.683	Horizontal	Pass
Band 16		1732.5	-5.52	3.27	27.61	18.82	76.208	Horizontal	Pass
QAM		1754.3	-5.52	3.29	27.63	18.82	76.208	Horizontal	Pass
3.0MHz	1/#Mid	1711.5	-5.61	3.13	27.61	18.87	77.090	Horizontal	Pass
Band 16		1732.5	-5.74	3.27	27.61	18.60	72.444	Horizontal	Pass
QAM		1753.5	-5.96	3.30	27.62	18.36	68.549	Horizontal	Pass
5.0MHz	1/#Mid	1712.5	-5.44	3.13	27.63	19.06	80.538	Horizontal	Pass
Band 16		1732.5	-5.40	3.27	27.61	18.94	78.343	Horizontal	Pass
QAM		1752.5	-5.09	3.30	27.60	19.21	83.368	Horizontal	Pass
10.0MHz	1/#Mid	1715	-5.51	3.15	27.64	18.98	79.068	Horizontal	Pass
Band 16		1732.5	-5.70	3.31	27.61	18.60	72.444	Horizontal	Pass
QAM		1750	-5.08	3.33	27.59	19.18	82.794	Horizontal	Pass
15.0MHz	1/#Mid	1717.5	-5.31	3.15	27.65	19.19	82.985	Horizontal	Pass
Band 16		1732.5	-5.37	3.31	27.61	18.93	78.163	Horizontal	Pass
QAM		1747.5	-5.39	3.33	27.57	18.85	76.736	Horizontal	Pass
20.0MHz	1/#Mid	1720	-5.26	3.17	27.66	**19.23**	83.753	Horizontal	Pass
Band 16		1732.5	-5.27	3.32	27.61	19.02	79.799	Horizontal	Pass
QAM		1745	-5.08	3.36	27.56	19.12	81.658	Horizontal	Pass
1.4MHz	1/#Mid	1710.7	-6.56	3.12	27.58	17.90	61.660	Vertical	Pass
Band 16		1732.5	-6.09	3.27	27.61	18.25	66.834	Vertical	Pass
QAM		1754.3	-6.57	3.29	27.63	17.77	59.841	Vertical	Pass
3.0MHz	1/#Mid	1711.5	-6.71	3.13	27.61	17.77	59.841	Vertical	Pass
Band 16		1732.5	-6.12	3.27	27.61	18.22	66.374	Vertical	Pass
QAM		1753.5	-6.80	3.30	27.62	17.52	56.494	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-6.72	3.13	27.63	17.78	59.979	Vertical	Pass
Band 16		1732.5	-6.70	3.27	27.61	17.64	58.076	Vertical	Pass

QAM		1752.5	-6.36	3.30	27.60	17.94	62.230	Vertical	Pass
10.0MHz	1/#Mid	1715	-6.94	3.15	27.64	17.55	56.885	Vertical	Pass
Band 16		1732.5	-6.13	3.31	27.61	18.17	65.615	Vertical	Pass
QAM		1750	-6.71	3.33	27.59	17.55	56.885	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-6.63	3.15	27.65	17.87	61.235	Vertical	Pass
Band 16		1732.5	-7.02	3.31	27.61	17.28	53.456	Vertical	Pass
QAM		1747.5	-6.42	3.33	27.57	17.82	60.534	Vertical	Pass
20.0MHz	1/#Mid	1720	-6.64	3.17	27.66	17.85	60.954	Vertical	Pass
Band 16		1732.5	-6.83	3.32	27.61	17.46	55.719	Vertical	Pass
QAM		1745	-6.25	3.36	27.56	17.95	62.373	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)

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
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	
1.4MHz Band QPSK	3/#Mid	824.7	4.44	2.01	19.68	2.15	19.96	99.083	Horizontal	Pass
		836.5	4.32	2.01	19.77	2.15	19.93	98.401	Horizontal	Pass
		848.3	4.12	2.02	19.82	2.15	19.77	94.842	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	4.21	2.01	19.70	2.15	19.75	94.406	Horizontal	Pass
		836.5	4.11	2.01	19.77	2.15	19.72	93.756	Horizontal	Pass
		847.5	3.98	2.02	19.81	2.15	19.62	91.622	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	4.49	2.01	19.71	2.15	20.04	100.925	Horizontal	Pass
		836.5	4.37	2.01	19.77	2.15	19.98	99.541	Horizontal	Pass
		846.5	4.21	2.02	19.79	2.15	19.83	96.161	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	4.51	2.01	19.73	2.15	**20.08**	101.859	Horizontal	Pass
		836.5	4.46	2.01	19.77	2.15	20.07	101.625	Horizontal	Pass
		844	4.36	2.02	19.78	2.15	19.97	99.312	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	3.47	2.01	19.68	2.15	18.99	79.250	Vertical	Pass
		836.5	3.01	2.01	19.77	2.15	18.62	72.778	Vertical	Pass
		848.3	3.13	2.02	19.82	2.15	18.78	75.509	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	3.51	2.01	19.70	2.15	19.05	80.353	Vertical	Pass
		836.5	3.56	2.01	19.77	2.15	19.17	82.604	Vertical	Pass
		847.5	3.28	2.02	19.81	2.15	18.92	77.983	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	2.97	2.01	19.71	2.15	18.52	71.121	Vertical	Pass
		836.5	3.43	2.01	19.77	2.15	19.04	80.168	Vertical	Pass
		846.5	2.91	2.02	19.79	2.15	18.53	71.285	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	2.83	2.01	19.73	2.15	18.40	69.183	Vertical	Pass
		836.5	3.26	2.01	19.77	2.15	18.87	77.090	Vertical	Pass
		844	3.01	2.02	19.78	2.15	18.62	72.778	Vertical	Pass

Radiated Power (ERP) for Band 5										
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	
1.4MHz Band 16 QAM	3/#Mid	824.7	3.59	2.01	19.68	2.15	19.11	81.470	Horizontal	Pass
		836.5	3.52	2.01	19.77	2.15	19.13	81.846	Horizontal	Pass
		848.3	3.36	2.02	19.82	2.15	19.01	79.616	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	3.67	2.01	19.70	2.15	19.21	83.368	Horizontal	Pass
		836.5	3.38	2.01	19.77	2.15	18.99	79.250	Horizontal	Pass
		847.5	2.86	2.02	19.81	2.15	18.50	70.795	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	3.99	2.01	19.71	2.15	19.54	89.950	Horizontal	Pass
		836.5	3.76	2.01	19.77	2.15	19.37	86.497	Horizontal	Pass
		846.5	3.51	2.02	19.79	2.15	19.13	81.846	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	3.99	2.01	19.73	2.15	**19.56**	90.365	Horizontal	Pass
		836.5	3.71	2.01	19.77	2.15	19.32	85.507	Horizontal	Pass
		844	3.25	2.02	19.78	2.15	18.86	76.913	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	3.19	2.01	19.68	2.15	18.71	74.302	Vertical	Pass
		836.5	2.48	2.01	19.77	2.15	18.09	64.417	Vertical	Pass
		848.3	3.41	2.02	19.82	2.15	19.06	80.538	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	2.81	2.01	19.70	2.15	18.35	68.391	Vertical	Pass
		836.5	2.60	2.01	19.77	2.15	18.21	66.222	Vertical	Pass
		847.5	2.14	2.02	19.81	2.15	17.78	59.979	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	1.87	2.01	19.71	2.15	17.42	55.208	Vertical	Pass
		836.5	2.73	2.01	19.77	2.15	18.34	68.234	Vertical	Pass
		846.5	3.37	2.02	19.79	2.15	18.99	79.250	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	2.96	2.01	19.73	2.15	18.53	71.285	Vertical	Pass
		836.5	2.33	2.01	19.77	2.15	17.94	62.230	Vertical	Pass
		844	1.70	2.02	19.78	2.15	17.31	53.827	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(dBm)=EIRP-2.15

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	-3.14	4.54	27.75	20.07	101.625	Horizontal	Pass
		2535	-2.97	4.69	27.72	20.06	101.391	Horizontal	Pass
		2567.5	-2.90	4.71	27.71	20.10	102.329	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	-3.07	4.55	27.76	20.14	103.276	Horizontal	Pass
		2535	-2.88	4.69	27.72	20.15	103.514	Horizontal	Pass
		2565	-2.80	4.72	27.70	20.18	104.232	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.08	4.55	27.77	20.14	103.276	Horizontal	Pass
		2535	-2.94	4.69	27.72	20.09	102.094	Horizontal	Pass
		2562.5	-2.84	4.72	27.69	20.13	103.039	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-3.02	4.57	27.78	**20.19**	104.472	Horizontal	Pass
		2535	-2.84	4.73	27.72	20.15	103.514	Horizontal	Pass
		2560	-2.80	4.75	27.68	20.13	103.039	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	-4.39	4.54	27.75	18.82	76.208	Vertical	Pass
		2535	-4.77	4.69	27.72	18.26	66.988	Vertical	Pass
		2567.5	-4.10	4.71	27.71	18.90	77.625	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-4.76	4.55	27.76	18.45	69.984	Vertical	Pass
		2535	-4.74	4.69	27.72	18.29	67.453	Vertical	Pass
		2565	-4.27	4.72	27.70	18.71	74.302	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	-3.99	4.55	27.77	19.23	83.753	Vertical	Pass
		2535	-4.11	4.69	27.72	18.92	77.983	Vertical	Pass
		2562.5	-4.47	4.72	27.69	18.50	70.795	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-4.67	4.57	27.78	18.54	71.450	Vertical	Pass
		2535	-3.97	4.73	27.72	19.02	79.799	Vertical	Pass
		2560	-3.70	4.75	27.68	19.23	83.753	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	1/#Mid	2502.5	-3.83	4.54	27.75	19.38	86.696	Horizontal	Pass
		2535	-3.52	4.69	27.72	19.51	89.331	Horizontal	Pass
		2567.5	-3.60	4.71	27.71	19.40	87.096	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-3.72	4.55	27.76	19.49	88.920	Horizontal	Pass
		2535	-3.73	4.69	27.72	19.30	85.114	Horizontal	Pass
		2565	-4.00	4.72	27.70	18.98	79.068	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-3.90	4.55	27.77	19.32	85.507	Horizontal	Pass
		2535	-3.87	4.69	27.72	19.16	82.414	Horizontal	Pass
		2562.5	-3.48	4.72	27.69	19.49	88.920	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-3.78	4.57	27.78	19.43	87.700	Horizontal	Pass
		2535	-3.45	4.73	27.72	**19.54**	89.950	Horizontal	Pass
		2560	-3.55	4.75	27.68	19.38	86.696	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-5.73	4.54	27.75	17.48	55.976	Vertical	Pass
		2535	-4.94	4.69	27.72	18.09	64.417	Vertical	Pass
		2567.5	-4.95	4.71	27.71	18.05	63.826	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-5.12	4.55	27.76	18.09	64.417	Vertical	Pass
		2535	-5.69	4.69	27.72	17.34	54.200	Vertical	Pass
		2565	-5.56	4.72	27.70	17.42	55.208	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-5.48	4.55	27.77	17.74	59.429	Vertical	Pass
		2535	-5.67	4.69	27.72	17.36	54.450	Vertical	Pass
		2562.5	-4.76	4.72	27.69	18.21	66.222	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-5.50	4.57	27.78	17.71	59.020	Vertical	Pass
		2535	-4.81	4.73	27.72	18.18	65.766	Vertical	Pass
		2560	-4.81	4.75	27.68	18.12	64.863	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 (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	699.7	4.81	1.91	19.21	2.15	19.96	99.083	Vertical	Pass
		707.5	4.73	1.91	19.26	2.15	19.93	98.401	Vertical	Pass
		715.3	4.51	1.93	19.34	2.15	19.77	94.842	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	700.5	4.60	1.91	19.21	2.15	19.75	94.406	Vertical	Pass
		707.5	4.52	1.91	19.26	2.15	19.72	93.756	Vertical	Pass
		714.5	4.36	1.93	19.34	2.15	19.62	91.622	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	701.5	4.87	1.91	19.23	2.15	20.04	100.925	Vertical	Pass
		707.5	4.78	1.91	19.26	2.15	19.98	99.541	Vertical	Pass
		713.5	4.57	1.92	19.33	2.15	19.83	96.161	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	704	4.89	1.91	19.25	2.15	**20.08**	101.859	Vertical	Pass
		707.5	4.87	1.91	19.26	2.15	20.07	101.625	Vertical	Pass
		711	4.72	1.92	19.32	2.15	19.97	99.312	Vertical	Pass
1.4MHz Band QPSK	1/#Mid	699.7	3.76	1.91	19.21	2.15	18.91	77.804	Horizontal	Pass
		707.5	3.51	1.91	19.26	2.15	18.71	74.302	Horizontal	Pass
		715.3	3.12	1.93	19.34	2.15	18.38	68.865	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	700.5	3.99	1.91	19.21	2.15	19.14	82.035	Horizontal	Pass
		707.5	3.33	1.91	19.26	2.15	18.53	71.285	Horizontal	Pass
		714.5	3.08	1.93	19.34	2.15	18.34	68.234	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	701.5	3.67	1.91	19.23	2.15	18.84	76.560	Horizontal	Pass
		707.5	3.51	1.91	19.26	2.15	18.71	74.302	Horizontal	Pass
		713.5	3.15	1.92	19.33	2.15	18.41	69.343	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	704	3.94	1.91	19.25	2.15	19.13	81.846	Horizontal	Pass
		707.5	3.47	1.91	19.26	2.15	18.67	73.621	Horizontal	Pass
		711	3.20	1.92	19.32	2.15	18.45	69.984	Horizontal	Pass

Radiated Power (ERP) for Band 12										
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	
1.4MHz Band 16 QAM	1/#Mid	699.7	4.75	1.91	19.21	2.15	19.90	97.724	Vertical	Pass
		707.5	4.67	1.91	19.26	2.15	19.87	97.051	Vertical	Pass
		715.3	4.45	1.93	19.34	2.15	19.71	93.541	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	4.54	1.91	19.21	2.15	19.69	93.111	Vertical	Pass
		707.5	4.46	1.91	19.26	2.15	19.66	92.470	Vertical	Pass
		714.5	4.30	1.93	19.34	2.15	19.56	90.365	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	4.81	1.91	19.23	2.15	19.98	99.541	Vertical	Pass
		707.5	4.72	1.91	19.26	2.15	19.92	98.175	Vertical	Pass
		713.5	4.51	1.92	19.33	2.15	19.77	94.842	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	704	4.83	1.91	19.25	2.15	**20.02**	100.462	Vertical	Pass
		707.5	4.81	1.91	19.26	2.15	20.01	100.231	Vertical	Pass
		711	4.66	1.92	19.32	2.15	19.91	97.949	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mid	699.7	3.16	1.91	19.21	2.15	18.31	67.764	Horizontal	Pass
		707.5	3.70	1.91	19.26	2.15	18.90	77.625	Horizontal	Pass
		715.3	3.00	1.93	19.34	2.15	18.26	66.988	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	700.5	3.94	1.91	19.21	2.15	19.09	81.096	Horizontal	Pass
		707.5	3.50	1.91	19.26	2.15	18.70	74.131	Horizontal	Pass
		714.5	3.30	1.93	19.34	2.15	18.56	71.779	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	701.5	3.57	1.91	19.23	2.15	18.74	74.817	Horizontal	Pass
		707.5	3.84	1.91	19.26	2.15	19.04	80.168	Horizontal	Pass
		713.5	3.53	1.92	19.33	2.15	18.79	75.683	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	704	3.62	1.91	19.25	2.15	18.81	76.033	Horizontal	Pass
		707.5	3.37	1.91	19.26	2.15	18.57	71.945	Horizontal	Pass
		711	3.67	1.92	19.32	2.15	18.92	77.983	Horizontal	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(dBm)=EIRP-2.15

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
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	1/#Mid	706.5	5.15	1.91	19.23	2.15	20.32	107.647	Vertical	Pass
		710	5.01	1.91	19.26	2.15	20.21	104.954	Vertical	Pass
		713.5	4.91	1.92	19.33	2.15	20.17	103.992	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	5.16	1.91	19.25	2.15	**20.35**	108.393	Vertical	Pass
		710	5.11	1.91	19.26	2.15	20.31	107.399	Vertical	Pass
		711	5.07	1.92	19.32	2.15	20.32	107.647	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	2.99	1.91	19.23	2.15	18.16	65.464	Horizontal	Pass
		710	3.24	1.91	19.26	2.15	18.44	69.823	Horizontal	Pass
		713.5	3.07	1.92	19.33	2.15	18.33	68.077	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	4.01	1.91	19.25	2.15	19.20	83.176	Horizontal	Pass
		710	3.81	1.91	19.26	2.15	19.01	79.616	Horizontal	Pass
		711	4.23	1.92	19.32	2.15	19.48	88.716	Horizontal	Pass

Radiated Power (ERP) for Band 17										
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	1/#Mid	706.5	4.44	1.91	19.23	2.15	19.61	91.411	Vertical	Pass
		710	4.35	1.91	19.26	2.15	19.55	90.157	Vertical	Pass
		713.5	4.15	1.92	19.33	2.15	19.41	87.297	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	3.98	1.91	19.25	2.15	19.17	82.604	Vertical	Pass
		710	4.51	1.91	19.26	2.15	**19.71**	93.541	Vertical	Pass
		711	4.24	1.92	19.32	2.15	19.49	88.920	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	3.46	1.91	19.23	2.15	18.63	72.946	Horizontal	Pass
		710	3.72	1.91	19.26	2.15	18.92	77.983	Horizontal	Pass
		713.5	3.55	1.92	19.33	2.15	18.81	76.033	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	3.05	1.91	19.25	2.15	18.24	66.681	Horizontal	Pass
		710	3.56	1.91	19.26	2.15	18.76	75.162	Horizontal	Pass
		711	2.87	1.92	19.32	2.15	18.12	64.863	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)

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

§22.917 (e) and §24.238 and §90.691 (a): 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 2/4/5/7/12/17

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	-47.96	4.04	33.51	-18.49	-13	-5.49	Horizontal
3701.4	-50.93	4.04	33.51	-21.46	-13	-8.46	Vertical
5552.1	-45.81	5.24	35.84	-15.21	-13	-2.21	Vertical
5552.1	-53.73	5.24	35.84	-23.13	-13	-10.13	Horizontal
208.4	-35.42	1.43	16.02	-20.83	-13	-7.83	Vertical
286.2	-40.96	1.30	17.99	-24.27	-13	-11.27	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.42	4.04	33.56	-17.90	-13	-4.90	Horizontal
3760.0	-49.94	4.04	33.56	-20.42	-13	-7.42	Vertical
5640.0	-49.16	5.24	35.91	-18.49	-13	-5.49	Vertical
5640.0	-50.72	5.24	35.91	-20.05	-13	-7.05	Horizontal
211.4	-35.29	1.62	16.97	-19.94	-13	-6.94	Vertical
269.7	-39.55	1.74	15.98	-25.32	-13	-12.32	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-51.40	4.04	34.00	-21.44	-13	-8.44	Horizontal
3818.6	-50.29	4.04	34.00	-20.33	-13	-7.33	Vertical
5727.9	-51.02	5.24	36.04	-20.22	-13	-7.22	Vertical
5727.9	-50.68	5.24	36.04	-19.88	-13	-6.88	Horizontal
187.9	-40.50	1.42	17.29	-24.63	-13	-11.63	Vertical
451.0	-38.63	1.50	17.90	-22.22	-13	-9.22	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
3720.0	-46.90	4.07	33.54	-17.43	-13	-4.43	Horizontal
3720.0	-51.64	4.07	33.54	-22.17	-13	-9.17	Vertical
5580.0	-47.51	5.28	35.86	-16.93	-13	-3.93	Vertical
5580.0	-52.38	5.28	35.86	-21.80	-13	-8.80	Horizontal
179.2	-39.64	1.58	16.89	-24.32	-13	-11.32	Vertical
316.3	-34.33	1.76	17.26	-18.83	-13	-5.83	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-51.04	4.04	33.56	-21.52	-13	-8.52	Horizontal
3760.0	-47.90	4.04	33.56	-18.38	-13	-5.38	Vertical
5640.0	-51.71	5.24	35.91	-21.04	-13	-8.04	Vertical
5640.0	-49.25	5.24	35.91	-18.58	-13	-5.58	Horizontal
176.2	-43.43	1.46	16.27	-28.62	-13	-15.62	Vertical
392.0	-40.57	1.59	15.15	-27.01	-13	-14.01	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-49.53	4.04	34.00	-19.57	-13	-6.57	Horizontal
3800.0	-52.72	4.04	34.00	-22.76	-13	-9.76	Vertical
5700.0	-53.80	5.24	36.04	-23.00	-13	-10.00	Vertical
5700.0	-52.45	5.24	36.04	-21.65	-13	-8.65	Horizontal
205.5	-37.05	1.36	17.39	-21.01	-13	-8.01	Vertical
372.2	-41.91	1.66	15.39	-28.18	-13	-15.18	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-48.08	4.02	29.80	-22.30	-13	-9.30	Horizontal
3421.4	-44.60	4.02	29.80	-18.82	-13	-5.82	Vertical
5132.1	-50.52	5.24	35.84	-19.92	-13	-6.92	Vertical
5132.1	-52.47	5.24	35.84	-21.87	-13	-8.87	Horizontal
196.7	-44.74	1.68	16.04	-30.38	-13	-17.38	Vertical
458.7	-35.54	1.78	17.74	-19.58	-13	-6.58	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.05	4.03	30.00	-23.08	-13	-10.08	Horizontal
3465.0	-50.94	4.03	30.00	-24.97	-13	-11.97	Vertical
5197.5	-52.32	5.25	35.86	-21.71	-13	-8.71	Vertical
5197.5	-49.44	5.25	35.86	-18.83	-13	-5.83	Horizontal
202.4	-37.93	1.72	17.69	-21.96	-13	-8.96	Vertical
286.8	-43.54	1.62	16.02	-29.13	-13	-16.13	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-53.23	4.05	30.01	-27.27	-13	-14.27	Horizontal
3508.6	-46.89	4.05	30.01	-20.93	-13	-7.93	Vertical
5262.9	-48.02	5.26	35.86	-17.42	-13	-4.42	Vertical
5262.9	-49.38	5.26	35.86	-18.78	-13	-5.78	Horizontal
190.6	-36.73	1.80	16.69	-21.84	-13	-8.84	Vertical
382.5	-38.66	1.75	16.66	-23.76	-13	-10.76	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
3440.0	-52.80	4.02	29.80	-27.02	-13	-14.02	Horizontal
3440.0	-48.64	4.02	29.80	-22.86	-13	-9.86	Vertical
5160.0	-51.87	5.24	35.84	-21.27	-13	-8.27	Vertical
5160.0	-53.23	5.24	35.84	-22.63	-13	-9.63	Horizontal
203.9	-37.51	1.57	17.26	-21.82	-13	-8.82	Vertical
304.2	-44.92	1.78	16.35	-30.35	-13	-17.35	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-47.28	4.03	30.00	-21.31	-13	-8.31	Horizontal
3465.0	-45.72	4.03	30.00	-19.75	-13	-6.75	Vertical
5197.5	-49.21	5.25	35.86	-18.60	-13	-5.60	Vertical
5197.5	-51.15	5.25	35.86	-20.54	-13	-7.54	Horizontal
196.5	-39.07	1.44	17.95	-22.56	-13	-9.56	Vertical
409.0	-41.33	1.65	16.09	-26.89	-13	-13.89	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-46.50	2.91	27.68	-21.73	-13	-8.73	Horizontal
3490.0	-48.87	2.91	27.68	-24.10	-13	-11.10	Vertical
5235.0	-49.76	5.26	35.86	-19.16	-13	-6.16	Vertical
5235.0	-49.47	5.26	35.86	-18.87	-13	-5.87	Horizontal
186.9	-34.34	1.61	16.85	-19.10	-13	-6.10	Vertical
465.8	-43.32	1.61	15.19	-29.74	-13	-16.74	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1649.4	-44.04	2.78	27.50	-19.32	-13	-6.32	Horizontal
1649.4	-45.27	2.78	27.50	-20.55	-13	-7.55	Vertical
2474.1	-45.67	2.90	27.80	-20.77	-13	-7.77	Vertical
2474.1	-52.85	2.90	27.80	-27.95	-13	-14.95	Horizontal
196.6	-44.42	1.76	17.59	-28.59	-13	-15.59	Vertical
432.9	-40.99	1.63	15.87	-26.75	-13	-13.75	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-53.91	2.80	27.48	-29.23	-13	-16.23	Horizontal
1673.0	-52.10	2.80	27.48	-27.42	-13	-14.42	Vertical
2509.5	-48.90	2.91	27.70	-24.11	-13	-11.11	Vertical
2509.5	-51.85	2.91	27.70	-27.06	-13	-14.06	Horizontal
205.6	-44.96	1.61	15.68	-30.89	-13	-17.89	Vertical
421.5	-41.68	1.59	17.52	-25.76	-13	-12.76	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-47.59	2.82	27.43	-22.98	-13	-9.98	Horizontal
1696.6	-46.95	2.82	27.43	-22.34	-13	-9.34	Vertical
2544.9	-53.65	2.92	27.74	-28.83	-13	-15.83	Vertical
2544.9	-52.58	2.92	27.74	-27.76	-13	-14.76	Horizontal
187.1	-42.27	1.69	16.67	-27.28	-13	-14.28	Vertical
261.7	-44.70	1.70	17.18	-29.22	-13	-16.22	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
1658.0	-46.38	2.78	27.50	-21.66	-13	-8.66	Horizontal
1658.0	-49.58	2.78	27.50	-24.86	-13	-11.86	Vertical
2487.0	-48.71	2.90	27.80	-23.81	-13	-10.81	Vertical
2487.0	-50.67	2.90	27.80	-25.77	-13	-12.77	Horizontal
192.0	-39.97	1.71	15.57	-26.11	-13	-13.11	Vertical
335.7	-44.06	1.34	16.40	-29.00	-13	-16.00	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-44.98	2.80	27.48	-20.30	-13	-7.30	Horizontal
1673.0	-45.87	2.80	27.48	-21.19	-13	-8.19	Vertical
2509.5	-49.42	2.91	27.70	-24.63	-13	-11.63	Vertical
2509.5	-50.85	2.91	27.70	-26.06	-13	-13.06	Horizontal
202.1	-36.03	1.44	17.04	-20.43	-13	-7.43	Vertical
360.4	-43.83	1.76	17.62	-27.97	-13	-14.97	Horizontal
Test Results for High Channel 844MHz							
1688.0	-47.94	2.82	27.43	-23.33	-13	-10.33	Horizontal
1688.0	-47.70	2.82	27.43	-23.09	-13	-10.09	Vertical
2532.0	-49.83	2.92	27.74	-25.01	-13	-12.01	Vertical
2532.0	-50.77	2.92	27.74	-25.95	-13	-12.95	Horizontal
183.6	-36.39	1.74	17.70	-20.43	-13	-7.43	Vertical
257.9	-41.03	1.41	17.46	-24.97	-13	-11.97	Horizontal

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

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

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

9.4 LTE BAND 7

QPSK EIRP POWER FOR LTE BAND 7 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5005.0	-59.97	5.23	35.81	-29.39	-25	-4.39	Horizontal
5005.0	-61.85	5.23	35.81	-31.27	-25	-6.27	Vertical
7507.5	-60.91	5.67	36.85	-29.73	-25	-4.73	Vertical
7507.5	-64.50	5.67	36.85	-33.32	-25	-8.32	Horizontal
177.5	-51.74	1.73	17.97	-35.50	-25	-10.50	Vertical
244.8	-52.88	1.38	15.11	-39.15	-25	-14.15	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-61.55	5.23	35.82	-30.96	-25	-5.96	Horizontal
5070.0	-63.56	5.23	35.82	-32.97	-25	-7.97	Vertical
7605.0	-60.94	5.67	36.85	-29.76	-25	-4.76	Vertical
7605.0	-62.29	5.67	36.85	-31.11	-25	-6.11	Horizontal
183.9	-45.49	1.77	16.17	-31.08	-25	-6.08	Vertical
382.8	-47.24	1.63	15.21	-33.66	-25	-8.66	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-62.97	5.24	35.83	-32.38	-25	-7.38	Horizontal
5135.0	-59.24	5.24	35.83	-28.65	-25	-3.65	Vertical
7702.5	-59.51	5.68	36.87	-28.32	-25	-3.32	Vertical
7702.5	-61.27	5.68	36.87	-30.08	-25	-5.08	Horizontal
198.9	-45.98	1.58	17.56	-30.00	-25	-5.00	Vertical
253.2	-54.12	1.45	16.58	-38.99	-25	-13.99	Horizontal

QPSK EIRP POWER FOR LTE BAND 7 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020.0	-61.88	5.23	35.82	-31.29	-25	-6.29	Horizontal
5020.0	-62.88	5.23	35.82	-32.29	-25	-7.29	Vertical
7530.0	-61.10	5.67	36.86	-29.91	-25	-4.91	Vertical
7530.0	-61.70	5.67	36.86	-30.51	-25	-5.51	Horizontal
180.3	-54.48	1.63	15.76	-40.35	-25	-15.35	Vertical
264.5	-46.36	1.71	15.44	-32.63	-25	-7.63	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-64.29	5.23	35.82	-33.70	-25	-8.70	Horizontal
5070.0	-59.27	5.23	35.82	-28.68	-25	-3.68	Vertical
7605.0	-61.87	5.67	36.85	-30.69	-25	-5.69	Vertical
7605.0	-59.82	5.67	36.85	-28.64	-25	-3.64	Horizontal
208.1	-49.67	1.79	16.84	-34.61	-25	-9.61	Vertical
457.3	-52.14	1.71	17.64	-36.21	-25	-11.21	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-61.28	5.24	35.83	-30.69	-25	-5.69	Horizontal
5120.0	-61.85	5.24	35.83	-31.26	-25	-6.26	Vertical
7680.0	-60.58	5.70	36.88	-29.40	-25	-4.40	Vertical
7680.0	-59.97	5.70	36.88	-28.79	-25	-3.79	Horizontal
176.5	-48.68	1.79	16.84	-33.62	-25	-8.62	Vertical
446.0	-47.10	1.71	17.64	-31.17	-25	-6.17	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	-52.63	2.60	27.20	-28.03	-13	-15.03	Horizontal
1399.4	-47.31	2.60	27.20	-22.71	-13	-9.71	Vertical
2099.1	-47.34	2.85	27.54	-22.65	-13	-9.65	Vertical
2099.1	-51.81	2.85	27.54	-27.12	-13	-14.12	Horizontal
197.1	-38.04	1.49	17.78	-21.75	-13	-8.75	Vertical
443.9	-36.79	1.36	17.33	-20.82	-13	-7.82	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-44.97	2.61	27.28	-20.30	-13	-7.30	Horizontal
1415.0	-48.09	2.61	27.28	-23.42	-13	-10.42	Vertical
2122.5	-50.20	2.87	27.59	-25.48	-13	-12.48	Vertical
2122.5	-49.98	2.87	27.59	-25.26	-13	-12.26	Horizontal
183.6	-36.11	1.73	15.74	-22.10	-13	-9.10	Vertical
290.6	-42.57	1.62	15.79	-28.40	-13	-15.40	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-48.29	2.63	27.28	-23.64	-13	-10.64	Horizontal
1430.6	-47.48	2.63	27.28	-22.83	-13	-9.83	Vertical
2145.9	-48.37	2.88	27.60	-23.65	-13	-10.65	Vertical
2145.9	-51.03	2.88	27.60	-26.31	-13	-13.31	Horizontal
194.8	-34.85	1.61	18.00	-18.46	-13	-5.46	Vertical
242.1	-36.37	1.45	15.49	-22.34	-13	-9.34	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
1408.0	-53.25	2.61	27.26	-28.60	-13	-15.60	Horizontal
1408.0	-51.05	2.61	27.26	-26.40	-13	-13.40	Vertical
2112.0	-51.99	2.87	27.58	-27.28	-13	-14.28	Vertical
2112.0	-51.59	2.87	27.58	-26.88	-13	-13.88	Horizontal
193.3	-37.88	1.31	16.97	-22.22	-13	-9.22	Vertical
429.1	-43.53	1.65	16.70	-28.48	-13	-15.48	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-49.33	2.61	27.28	-24.66	-13	-11.66	Horizontal
1415.0	-50.80	2.61	27.28	-26.13	-13	-13.13	Vertical
2122.5	-45.76	2.87	27.59	-21.04	-13	-8.04	Vertical
2122.5	-50.68	2.87	27.59	-25.96	-13	-12.96	Horizontal
197.3	-42.28	1.72	17.99	-26.01	-13	-13.01	Vertical
407.4	-38.83	1.73	17.94	-22.62	-13	-9.62	Horizontal
Test Results for High Channel 711MHz							
1422.0	-52.89	2.62	27.28	-28.23	-13	-15.23	Horizontal
1422.0	-53.83	2.62	27.28	-29.17	-13	-16.17	Vertical
2133.0	-51.58	2.87	27.60	-26.85	-13	-13.85	Vertical
2133.0	-51.40	2.87	27.60	-26.67	-13	-13.67	Horizontal
188.5	-35.42	1.58	15.93	-21.07	-13	-8.07	Vertical
354.6	-41.65	1.36	15.59	-27.42	-13	-14.42	Horizontal

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

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

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

9.6 LTE BAND 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
1413.0	-53.63	2.61	27.28	-28.96	-13	-15.96	Horizontal
1413.0	-52.20	2.61	27.28	-27.53	-13	-14.53	Vertical
2119.5	-47.59	2.87	27.59	-22.87	-13	-9.87	Vertical
2119.5	-50.31	2.87	27.59	-25.59	-13	-12.59	Horizontal
207.7	-43.92	1.71	16.15	-29.48	-13	-16.48	Vertical
457.1	-35.43	1.41	17.32	-19.52	-13	-6.52	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-53.42	2.62	27.30	-28.74	-13	-15.74	Horizontal
1420.0	-46.51	2.62	27.30	-21.83	-13	-8.83	Vertical
2130.0	-53.72	2.87	27.62	-28.97	-13	-15.97	Vertical
2130.0	-51.73	2.87	27.62	-26.98	-13	-13.98	Horizontal
180.7	-40.84	1.42	15.25	-27.02	-13	-14.02	Vertical
317.6	-39.33	1.36	17.19	-23.50	-13	-10.50	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-46.90	2.66	27.28	-22.28	-13	-9.28	Horizontal
1427.0	-48.93	2.66	27.28	-24.31	-13	-11.31	Vertical
2140.5	-46.55	2.88	27.60	-21.83	-13	-8.83	Vertical
2140.5	-50.05	2.88	27.60	-25.33	-13	-12.33	Horizontal
178.0	-38.61	1.32	17.29	-22.64	-13	-9.64	Vertical
458.0	-44.89	1.72	16.89	-29.72	-13	-16.72	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
1418.0	-52.13	2.62	27.30	-27.45	-13	-14.45	Horizontal
1418.0	-50.78	2.62	27.30	-26.10	-13	-13.10	Vertical
2127.0	-53.00	2.87	27.62	-28.25	-13	-15.25	Vertical
2127.0	-53.24	2.87	27.62	-28.49	-13	-15.49	Horizontal
187.3	-34.37	1.35	16.91	-18.81	-13	-5.81	Vertical
250.4	-35.30	1.62	16.31	-20.61	-13	-7.61	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-44.06	2.62	27.30	-19.38	-13	-6.38	Horizontal
1420.0	-48.37	2.62	27.30	-23.69	-13	-10.69	Vertical
2130.0	-46.33	2.87	27.62	-21.58	-13	-8.58	Vertical
2130.0	-51.30	2.87	27.62	-26.55	-13	-13.55	Horizontal
188.0	-41.89	1.51	17.14	-26.26	-13	-13.26	Vertical
422.7	-39.35	1.77	16.88	-24.24	-13	-11.24	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.25	2.62	27.30	-25.57	-13	-12.57	Horizontal
1422.0	-47.62	2.62	27.30	-22.94	-13	-9.94	Vertical
2133.0	-52.13	2.87	27.62	-27.38	-13	-14.38	Vertical
2133.0	-51.68	2.87	27.62	-26.93	-13	-13.93	Horizontal
198.5	-38.61	1.78	15.95	-24.44	-13	-11.44	Vertical
419.9	-40.29	1.34	17.95	-23.69	-13	-10.69	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.

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, DC3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2/4/5/7/12/17

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]
3.29	1880	12.3	0.006528	2.5
3.87	1880	14.2	0.007558	2.5
4.45	1880	12.9	0.006880	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.5	0.006664	2.5
Extreme (50C)	1880	11.8	0.006276	2.5
Extreme (40C)	1880	14.0	0.007423	2.5
Extreme (30C)	1880	13.4	0.007132	2.5
Extreme (10C)	1880	14.1	0.007490	2.5
Extreme (0C)	1880	12.5	0.006641	2.5
Extreme (-10C)	1880	13.0	0.006910	2.5
Extreme (-20C)	1880	13.8	0.007316	2.5
Extreme (-30C)	1880	14.8	0.007850	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]
3.29	1880	9.5	0.005040	2.5
3.87	1880	9.0	0.004785	2.5
4.45	1880	8.0	0.004241	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.8	0.005224	2.5
Extreme (50C)	1880	8.4	0.004473	2.5
Extreme (40C)	1880	8.3	0.004419	2.5
Extreme (30C)	1880	8.8	0.004675	2.5
Extreme (10C)	1880	8.7	0.004614	2.5
Extreme (0C)	1880	8.4	0.004484	2.5
Extreme (-10C)	1880	8.7	0.004621	2.5
Extreme (-20C)	1880	8.5	0.004509	2.5
Extreme (-30C)	1880	8.1	0.004285	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]
3.29	1732.5	9.1	0.005256	2.5
3.87	1732.5	8.9	0.005113	2.5
4.45	1732.5	8.0	0.004636	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.6	0.004983	2.5
Extreme (50C)	1732.5	9.2	0.005318	2.5
Extreme (40C)	1732.5	7.3	0.004240	2.5
Extreme (30C)	1732.5	6.0	0.003485	2.5
Extreme (10C)	1732.5	7.3	0.004214	2.5
Extreme (0C)	1732.5	9.4	0.005413	2.5
Extreme (-10C)	1732.5	8.5	0.004894	2.5
Extreme (-20C)	1732.5	6.6	0.003835	2.5
Extreme (-30C)	1732.5	8.4	0.004851	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]
3.29	1732.5	9.6	0.005548	2.5
3.87	1732.5	8.9	0.005119	2.5
4.45	1732.5	8.1	0.004652	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	9.4	0.005417	2.5
Extreme (50C)	1732.5	9.3	0.005371	2.5
Extreme (40C)	1732.5	7.7	0.004426	2.5
Extreme (30C)	1732.5	9.4	0.005440	2.5
Extreme (10C)	1732.5	8.9	0.005131	2.5
Extreme (0C)	1732.5	8.4	0.004850	2.5
Extreme (-10C)	1732.5	9.0	0.005219	2.5
Extreme (-20C)	1732.5	9.0	0.005200	2.5
Extreme (-30C)	1732.5	8.3	0.004781	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]
3.29	836.5	5.4	0.006485	2.5
3.87	836.5	6.9	0.008227	2.5
4.45	836.5	4.7	0.005569	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.3	0.007483	2.5
Extreme (50C)	836.5	6.3	0.007569	2.5
Extreme (40C)	836.5	6.3	0.007478	2.5
Extreme (30C)	836.5	6.4	0.007676	2.5
Extreme (10C)	836.5	5.4	0.006425	2.5
Extreme (0C)	836.5	5.1	0.006083	2.5
Extreme (-10C)	836.5	5.1	0.006119	2.5
Extreme (-20C)	836.5	5.7	0.006766	2.5
Extreme (-30C)	836.5	6.3	0.007543	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]
3.29	836.5	5.4	0.006496	2.5
3.87	836.5	7.1	0.008450	2.5
4.45	836.5	4.4	0.005270	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	5.9	0.007071	2.5
Extreme (50C)	836.5	6.2	0.007397	2.5
Extreme (40C)	836.5	6.2	0.007356	2.5
Extreme (30C)	836.5	6.6	0.007866	2.5
Extreme (10C)	836.5	5.6	0.006750	2.5
Extreme (0C)	836.5	5.7	0.006758	2.5
Extreme (-10C)	836.5	6.0	0.007156	2.5
Extreme (-20C)	836.5	6.0	0.007201	2.5
Extreme (-30C)	836.5	6.0	0.007221	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]
3.29	2535	9.9	0.003889	2.5
3.87	2535	8.9	0.003510	2.5
4.45	2535	8.4	0.003325	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.2	0.003613	2.5
Extreme (50C)	2535	8.9	0.003501	2.5
Extreme (40C)	2535	8.4	0.003306	2.5
Extreme (30C)	2535	8.5	0.003337	2.5
Extreme (10C)	2535	8.3	0.003269	2.5
Extreme (0C)	2535	8.7	0.003437	2.5
Extreme (-10C)	2535	9.1	0.003575	2.5
Extreme (-20C)	2535	8.9	0.003523	2.5
Extreme (-30C)	2535	8.9	0.003495	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]
3.29	2535	6.8	0.002677	2.5
3.87	2535	6.2	0.002445	2.5
4.45	2535	5.7	0.002240	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	7.1	0.002793	2.5
Extreme (50C)	2535	6.0	0.002373	2.5
Extreme (40C)	2535	5.4	0.002120	2.5
Extreme (30C)	2535	6.3	0.002500	2.5
Extreme (10C)	2535	5.3	0.002084	2.5
Extreme (0C)	2535	5.5	0.002150	2.5
Extreme (-10C)	2535	4.9	0.001921	2.5
Extreme (-20C)	2535	5.7	0.002231	2.5
Extreme (-30C)	2535	6.2	0.002430	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]
3.29	707.5	8.7	0.012304	2.5
3.87	707.5	10.4	0.014745	2.5
4.45	707.5	8.8	0.012431	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	8.7	0.012340	2.5
Extreme (50C)	707.5	7.1	0.010043	2.5
Extreme (40C)	707.5	7.1	0.010095	2.5
Extreme (30C)	707.5	7.9	0.011202	2.5
Extreme (10C)	707.5	7.4	0.010416	2.5
Extreme (0C)	707.5	9.2	0.012998	2.5
Extreme (-10C)	707.5	8.6	0.012124	2.5
Extreme (-20C)	707.5	9.1	0.012931	2.5
Extreme (-30C)	707.5	8.1	0.011394	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]
3.29	707.5	7.4	0.010390	2.5
3.87	707.5	8.4	0.011911	2.5
4.45	707.5	7.7	0.010849	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	6.5	0.009175	2.5
Extreme (50C)	707.5	5.5	0.007765	2.5
Extreme (40C)	707.5	6.4	0.009110	2.5
Extreme (30C)	707.5	-7.7	-0.010912	2.5
Extreme (10C)	707.5	-8.2	-0.011590	2.5
Extreme (0C)	707.5	2.9	0.004100	2.5
Extreme (-10C)	707.5	-5.2	-0.007292	2.5
Extreme (-20C)	707.5	-8.7	-0.012302	2.5
Extreme (-30C)	707.5	-10.2	-0.014350	2.5

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

10.6 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]
3.29	710.0	9.3	0.013106	2.5
3.87	710.0	9.0	0.012740	2.5
4.45	710.0	7.7	0.010858	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.5	0.013382	2.5
Extreme (50C)	710.0	8.7	0.012272	2.5
Extreme (40C)	710.0	8.1	0.011435	2.5
Extreme (30C)	710.0	9.5	0.013334	2.5
Extreme (10C)	710.0	8.8	0.012331	2.5
Extreme (0C)	710.0	7.9	0.011072	2.5
Extreme (-10C)	710.0	9.0	0.012626	2.5
Extreme (-20C)	710.0	9.3	0.013063	2.5
Extreme (-30C)	710.0	8.5	0.011973	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]
3.29	710.0	10.0	0.014079	2.5
3.87	710.0	8.9	0.012556	2.5
4.45	710.0	8.7	0.012286	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	710.0	9.8	0.013864	2.5
Extreme (50C)	710.0	9.0	0.012707	2.5
Extreme (40C)	710.0	8.1	0.011473	2.5
Extreme (30C)	710.0	8.8	0.012430	2.5
Extreme (10C)	710.0	8.2	0.011521	2.5
Extreme (0C)	710.0	8.6	0.012100	2.5
Extreme (-10C)	710.0	9.8	0.013867	2.5
Extreme (-20C)	710.0	9.3	0.013134	2.5
Extreme (-30C)	710.0	8.2	0.011586	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.

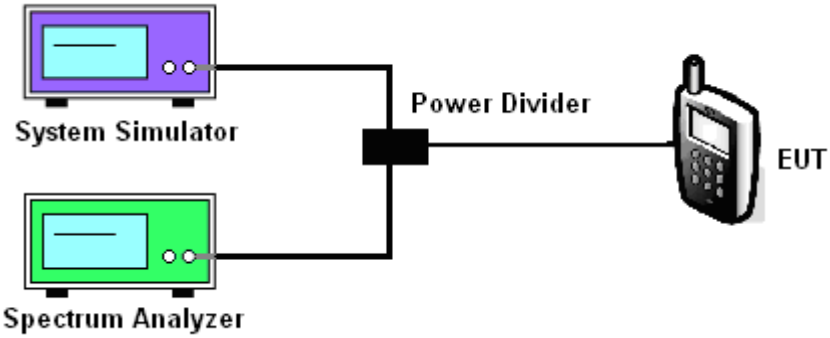
11.2 Measuring Instruments

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 2/4/5/7/12/17

Test data reference attachment.

----END OF REPORT----