

FCC CFR47 PART 22H, 24E, 27, 90S CERTIFICATION TEST REPORT

FCC ID: 2BLYC-G05A

Product: GPS TRACKER

Trade Mark: S make

Model No.: G05A

N01H, G20A, G20B, G20C, G20D, G20,
Family Model: G05A, G05B, G05C, G02H, G02S, G02,
G06H, SK05

Report No.: S24102903202002

Issue Date: Dec. 03, 2024

Prepared for

SHENZHEN NIUNIU INTELLIGENT EQUIPMENT CO., LTD.
ROOM 707, XIWAN BUILDING, XIXIANG STREET, BAOAN DISTRICT,
SHENZHEN CITY, GUANGDONG, CHINA

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	: SHENZHEN NIUNIU INTELLIGENT EQUIPMENT CO., LTD.
Address.....	: ROOM 707, XIWAN BUILDING, XIXIANG STREET, BAOAN DISTRICT, SHENZHEN CITY, GUANGDONG, CHINA
Manufacturer's Name	: SHENZHEN NIUNIU INTELLIGENT EQUIPMENT CO., LTD.
Address.....	: ROOM 707, XIWAN BUILDING, XIXIANG STREET, BAOAN DISTRICT, SHENZHEN CITY, GUANGDONG, CHINA
Product name	: GPS TRACKER
Trade Mark.....	: S make
Model and/or type reference	: G05A
Family Model.....	: N01H, G20A, G20B, G20C, G20D, G20, G05A, G05B, G05C, G02H, G02S, G02, G06H, SK05
Test Sample Number.....	: S241029032002
Standards	: FCC CFR 47 Part 22H, Part 24E, Part 27, Part 90S
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..... Oct. 29, 2024~ Dec. 03, 2024

Date of Issue Dec. 03, 2024

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

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	GPS TRACKER
Trade Mark	S make
Model Name	G05A
Family Model	N01H, G20A, G20B, G20C, G20D, G20, G05A, G05B, G05C, G02H, G02S, G02, G06H, SK05
Model Difference	All models are the same circuit and RF module, except for model names.
FCC ID:	2BLYC-G05A
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 2,4,5,7 TDD Band 38,40,41,66
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 TDD Band 38 Uplink&Downlink: 2570MHz-2620MHz, LTE TDD Band 40A Uplink& Downlink: 2305MHz-2315MHz, LTE TDD Band 40BUplink& Downlink: 2350MHz-2360MHz, LTE TDD Band 41 Uplink& Downlink: 2535MHz-2655MHz, LTE TDD 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:	Shrapnel Antenna
Antenna gain:	Band 2: 2.3 dBi, Band 4: 1.43 dBi, Band 5: -0.5 dBi, Band 7: 1.28 dBi, Band 38:1.28 dBi, Band 40:-0.1 dBi, Band 41: 1.28 dBi, Band 66: 1.43 dBi,
Adapter	N/A
Battery	DC 3.7V, 6000mAh, 22.2Wh
Power supply	DC 3.7V from battery or DC 5V from USB port
Extreme Vol. Limits:	DC 3.15V to DC 4.26V (Nominal DC 3.7V) (Note 1)
HW Version	G05-MB-V1.0
SW Version	g05a_mc_n58_la_v01_oct162023_13:48:19
** 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.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2BLYC-G05A** filing to comply with the FCC Part 22H&24E&27&90S.

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, Part 90S, 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 Xinfu 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-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

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: LTE Band 2/4/5/7/38/40/41/66

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.

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	GPS TRACKER	G05A	FCC ID: 2BLYC-G05A	EUT

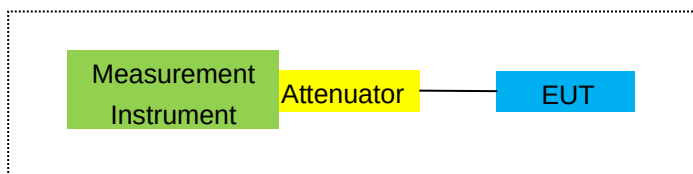
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

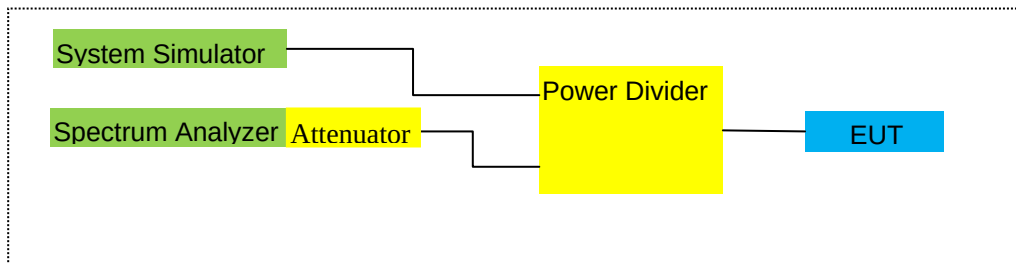
For Radiated Test Cases



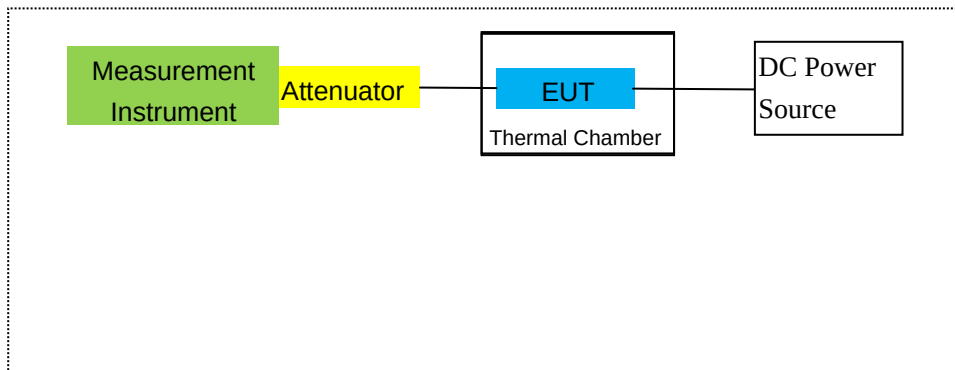
For Conducted Output Power



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	Attenuator	Weinschel	24-20-34	BP4485	2024.04.25	2027.04.24	3 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2024.03.12	2025.03.11	1 year

26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 year
27	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2024.04.25	2025.04.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	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	MWRFTtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest
4	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

☐

LTE Band 2/4/5/7/38/40/41/66

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, and §90.691

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 than $43 + 10 \log (P)$ 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 $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ 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 $43 + 10 \log_{10}(P)$ 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

LTE Band 2/4/5/7/38/40/41/66

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 and §90.691

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

- ☐ LTE Band 2/4/5/7/38/40/41/66

☐

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.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

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

- ☐ LTE Band 2/4/5/7/38/40/41/66

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band QPSK	1/#Mid	1850.7	0.49	3.76	28.24	24.97	314.051	Horizontal	Pass
		1880	0.98	3.91	28.22	25.29	338.065	Horizontal	Pass
		1909.3	1.46	3.93	28.20	25.73	374.111	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	0.99	3.77	28.23	25.45	350.752	Horizontal	Pass
		1880	1.35	3.91	28.24	25.68	369.828	Horizontal	Pass
		1908.5	2.17	3.94	28.25	26.48	444.631	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	0.34	3.77	28.31	24.88	307.610	Horizontal	Pass
		1880	0.77	3.91	28.22	25.08	322.107	Horizontal	Pass
		1907.5	1.43	3.94	28.20	25.69	370.681	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	0.42	3.79	28.33	24.96	313.329	Horizontal	Pass
		1880	1.11	3.95	28.22	25.38	345.144	Horizontal	Pass
		1905	1.54	3.97	28.19	25.76	376.704	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	0.25	3.79	28.34	24.80	301.995	Horizontal	Pass
		1880	0.84	3.95	28.22	25.11	324.340	Horizontal	Pass
		1902.5	1.71	3.97	28.18	25.92	390.841	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	0.66	3.81	28.35	25.20	331.131	Horizontal	Pass
		1880	1.10	3.96	28.22	25.36	343.558	Horizontal	Pass
		1900	1.96	4.00	28.16	26.12	409.261	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	0.32	3.76	28.24	24.80	301.995	Vertical	Pass
		1880	0.53	3.91	28.22	24.84	304.789	Vertical	Pass
		1909.3	0.80	3.93	28.20	25.07	321.366	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	0.63	3.77	28.23	25.09	322.849	Vertical	Pass
		1880	0.07	3.91	28.24	24.40	275.423	Vertical	Pass
		1908.5	0.34	3.94	28.25	24.65	291.743	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	0.23	3.77	28.31	24.77	299.916	Vertical	Pass
		1880	0.33	3.91	28.22	24.64	291.072	Vertical	Pass
		1907.5	0.95	3.94	28.20	25.21	331.894	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	0.19	3.79	28.33	24.73	297.167	Vertical	Pass
		1880	0.47	3.95	28.22	24.74	297.852	Vertical	Pass
		1905	0.95	3.97	28.19	25.17	328.852	Vertical	Pass

15.0MHz	1/#Mid	1857.5	-0.09	3.79	28.34	24.46	279.254	Vertical	Pass
Band		1880	0.87	3.95	28.22	25.14	326.588	Vertical	Pass
QPSK		1902.5	0.47	3.97	28.18	24.68	293.765	Vertical	Pass
20.0MHz	1/#Mid	1860	0.22	3.81	28.35	24.76	299.226	Vertical	Pass
Band		1880	0.27	3.96	28.22	24.53	283.792	Vertical	Pass
QPSK		1900	1.10	4.00	28.16	25.26	335.738	Vertical	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz	1/#Mid	1850.7	-0.42	3.76	28.24	24.06	254.683	Horizontal	Pass
Band 16		1880	0.16	3.91	28.22	24.47	279.898	Horizontal	Pass
QAM		1909.3	0.34	3.93	28.20	24.61	289.068	Horizontal	Pass
3.0MHz	1/#Mid	1851.5	0.43	3.77	28.23	24.89	308.319	Horizontal	Pass
Band 16		1880	0.60	3.91	28.24	24.93	311.172	Horizontal	Pass
QAM		1908.5	1.25	3.94	28.25	25.56	359.749	Horizontal	Pass
5.0MHz	1/#Mid	1852.5	-0.17	3.77	28.31	24.37	273.527	Horizontal	Pass
Band 16		1880	0.13	3.91	28.22	24.44	277.971	Horizontal	Pass
QAM		1907.5	0.73	3.94	28.20	24.99	315.500	Horizontal	Pass
10.0MHz	1/#Mid	1855	-0.10	3.79	28.33	24.44	277.971	Horizontal	Pass
Band 16		1880	0.33	3.95	28.22	24.60	288.403	Horizontal	Pass
QAM		1905	0.37	3.97	28.19	24.59	287.740	Horizontal	Pass
15.0MHz	1/#Mid	1857.5	-0.30	3.79	28.34	24.25	266.073	Horizontal	Pass
Band 16		1880	0.11	3.95	28.22	24.38	274.157	Horizontal	Pass
QAM		1902.5	1.04	3.97	28.18	25.25	334.965	Horizontal	Pass
20.0MHz	1/#Mid	1860	-0.04	3.81	28.35	24.50	281.838	Horizontal	Pass
Band 16		1880	0.29	3.96	28.22	24.55	285.102	Horizontal	Pass
QAM		1900	1.18	4.00	28.16	25.34	341.979	Horizontal	Pass
1.4MHz	1/#Mid	1850.7	-0.53	3.76	28.24	23.95	248.313	Vertical	Pass
Band 16		1880	-0.11	3.91	28.22	24.20	263.027	Vertical	Pass
QAM		1909.3	-0.70	3.93	28.20	23.57	227.510	Vertical	Pass
3.0MHz	1/#Mid	1851.5	-0.24	3.77	28.23	24.22	264.241	Vertical	Pass
Band 16		1880	-0.16	3.91	28.24	24.17	261.216	Vertical	Pass
QAM		1908.5	-0.93	3.94	28.25	23.38	217.771	Vertical	Pass
5.0MHz	1/#Mid	1852.5	-0.38	3.77	28.31	24.16	260.615	Vertical	Pass

Band 16 QAM		1880	-0.63	3.91	28.22	23.68	233.346	Vertical	Pass
		1907.5	-0.60	3.94	28.20	23.66	232.274	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-0.68	3.79	28.33	23.86	243.220	Vertical	Pass
		1880	-0.94	3.95	28.22	23.33	215.278	Vertical	Pass
		1905	-0.61	3.97	28.19	23.61	229.615	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-0.25	3.79	28.34	24.30	269.153	Vertical	Pass
		1880	-0.53	3.95	28.22	23.74	236.592	Vertical	Pass
		1902.5	-0.18	3.97	28.18	24.03	252.930	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-0.75	3.81	28.35	23.79	239.332	Vertical	Pass
		1880	-0.54	3.96	28.22	23.72	235.505	Vertical	Pass
		1900	-0.09	4.00	28.16	24.07	255.270	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 Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	1710.7	0.49	3.12	27.58	24.95	312.608	Horizontal	Pass
		1732.5	-0.03	3.27	27.61	24.31	269.774	Horizontal	Pass
		1754.3	-0.30	3.29	27.63	24.04	253.513	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	0.69	3.13	27.61	25.17	328.852	Horizontal	Pass
		1732.5	0.15	3.27	27.61	24.49	281.190	Horizontal	Pass
		1753.5	0.01	3.30	27.62	24.33	271.019	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.16	3.13	27.63	24.34	271.644	Horizontal	Pass
		1732.5	-0.66	3.27	27.61	23.68	233.346	Horizontal	Pass
		1752.5	-0.64	3.30	27.60	23.66	232.274	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	0.26	3.15	27.64	24.75	298.538	Horizontal	Pass
		1732.5	-0.04	3.31	27.61	24.26	266.686	Horizontal	Pass
		1750	-0.57	3.33	27.59	23.69	233.884	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-0.03	3.15	27.65	24.47	279.898	Horizontal	Pass
		1732.5	-0.17	3.31	27.61	24.13	258.821	Horizontal	Pass
		1747.5	-1.09	3.33	27.57	23.15	206.538	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	0.27	3.17	27.66	24.76	299.226	Horizontal	Pass
		1732.5	0.41	3.32	27.61	24.70	295.121	Horizontal	Pass
		1745	-0.76	3.36	27.56	23.44	220.800	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-0.19	3.12	27.58	24.27	267.301	Vertical	Pass
		1732.5	-0.36	3.27	27.61	23.98	250.035	Vertical	Pass
		1754.3	-0.74	3.29	27.63	23.60	229.087	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.34	3.13	27.61	24.14	259.418	Vertical	Pass
		1732.5	0.02	3.27	27.61	24.36	272.898	Vertical	Pass
		1753.5	-0.41	3.30	27.62	23.91	246.037	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-0.31	3.13	27.63	24.19	262.422	Vertical	Pass
		1732.5	-0.53	3.27	27.61	23.81	240.436	Vertical	Pass
		1752.5	-0.51	3.30	27.60	23.79	239.332	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-0.28	3.15	27.64	24.21	263.633	Vertical	Pass
		1732.5	-0.49	3.31	27.61	23.81	240.436	Vertical	Pass
		1750	-0.05	3.33	27.59	24.21	263.633	Vertical	Pass

15.0MHz	1/#Mid	1717.5	-0.93	3.15	27.65	23.57	227.510	Vertical	Pass
Band		1732.5	-0.20	3.31	27.61	24.10	257.040	Vertical	Pass
QPSK		1747.5	0.06	3.33	27.57	24.30	269.153	Vertical	Pass
20.0MHz	1/#Mid	1720	-0.90	3.17	27.66	23.59	228.560	Vertical	Pass
Band		1732.5	-0.01	3.32	27.61	24.28	267.917	Vertical	Pass
QPSK		1745	-0.50	3.36	27.56	23.70	234.423	Vertical	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz	1/#Mid	1710.7	-0.97	3.12	27.58	23.49	223.357	Horizontal	Pass
Band 16		1732.5	-0.27	3.27	27.61	24.07	255.270	Horizontal	Pass
QAM		1754.3	-1.42	3.29	27.63	22.92	195.884	Horizontal	Pass
3.0MHz	1/#Mid	1711.5	-0.67	3.13	27.61	23.81	240.436	Horizontal	Pass
Band 16		1732.5	-0.07	3.27	27.61	24.27	267.301	Horizontal	Pass
QAM		1753.5	-0.98	3.30	27.62	23.34	215.774	Horizontal	Pass
5.0MHz	1/#Mid	1712.5	-1.34	3.13	27.63	23.16	207.014	Horizontal	Pass
Band 16		1732.5	-0.64	3.27	27.61	23.70	234.423	Horizontal	Pass
QAM		1752.5	-1.33	3.30	27.60	22.97	198.153	Horizontal	Pass
10.0MHz	1/#Mid	1715	-1.31	3.15	27.64	23.18	207.970	Horizontal	Pass
Band 16		1732.5	-0.39	3.31	27.61	23.91	246.037	Horizontal	Pass
QAM		1750	-1.20	3.33	27.59	23.06	202.302	Horizontal	Pass
15.0MHz	1/#Mid	1717.5	-1.90	3.15	27.65	22.60	181.970	Horizontal	Pass
Band 16		1732.5	-0.62	3.31	27.61	23.68	233.346	Horizontal	Pass
QAM		1747.5	-0.87	3.33	27.57	23.37	217.270	Horizontal	Pass
20.0MHz	1/#Mid	1720	-1.79	3.17	27.66	22.70	186.209	Horizontal	Pass
Band 16		1732.5	-0.41	3.32	27.61	23.88	244.343	Horizontal	Pass
QAM		1745	-0.29	3.36	27.56	23.91	246.037	Horizontal	Pass
1.4MHz	1/#Mid	1710.7	-1.93	3.12	27.58	22.53	179.061	Vertical	Pass
Band 16		1732.5	-1.77	3.27	27.61	22.57	180.717	Vertical	Pass
QAM		1754.3	-1.62	3.29	27.63	22.72	187.068	Vertical	Pass
3.0MHz	1/#Mid	1711.5	-1.21	3.13	27.61	23.27	212.324	Vertical	Pass
Band 16		1732.5	-1.23	3.27	27.61	23.11	204.644	Vertical	Pass
QAM		1753.5	-1.42	3.30	27.62	22.90	194.984	Vertical	Pass
5.0MHz	1/#Mid	1712.5	-1.76	3.13	27.63	22.74	187.932	Vertical	Pass

Band 16 QAM		1732.5	-1.74	3.27	27.61	22.60	181.970	Vertical	Pass
		1752.5	-1.74	3.30	27.60	22.56	180.302	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.48	3.15	27.64	23.01	199.986	Vertical	Pass
		1732.5	-1.18	3.31	27.61	23.12	205.116	Vertical	Pass
		1750	-1.25	3.33	27.59	23.01	199.986	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-1.40	3.15	27.65	23.10	204.174	Vertical	Pass
		1732.5	-1.42	3.31	27.61	22.88	194.089	Vertical	Pass
		1747.5	-1.71	3.33	27.57	22.53	179.061	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-1.54	3.17	27.66	22.95	197.242	Vertical	Pass
		1732.5	-1.34	3.32	27.61	22.95	197.242	Vertical	Pass
		1745	-0.90	3.36	27.56	23.30	213.796	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 Gain (dBi)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	824.7	6.75	2.01	19.68	2.15	22.27	168.655	Horizontal	Pass
		836.5	6.76	2.01	19.77	2.15	22.37	172.584	Horizontal	Pass
		848.3	6.38	2.02	19.82	2.15	22.03	159.588	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.03	2.01	19.70	2.15	22.57	180.717	Horizontal	Pass
		836.5	7.04	2.01	19.77	2.15	22.65	184.077	Horizontal	Pass
		847.5	6.65	2.02	19.81	2.15	22.29	169.434	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	6.67	2.01	19.71	2.15	22.22	166.725	Horizontal	Pass
		836.5	6.50	2.01	19.77	2.15	22.11	162.555	Horizontal	Pass
		846.5	6.33	2.02	19.79	2.15	21.95	156.675	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	7.02	2.01	19.73	2.15	22.59	181.552	Horizontal	Pass
		836.5	6.88	2.01	19.77	2.15	22.49	177.419	Horizontal	Pass
		844	6.87	2.02	19.78	2.15	22.48	177.011	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	5.30	2.01	19.68	2.15	20.82	120.781	Vertical	Pass
		836.5	5.63	2.01	19.77	2.15	21.24	133.045	Vertical	Pass
		848.3	5.71	2.02	19.82	2.15	21.36	136.773	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	5.10	2.01	19.70	2.15	20.64	115.878	Vertical	Pass
		836.5	5.34	2.01	19.77	2.15	20.95	124.451	Vertical	Pass
		847.5	5.79	2.02	19.81	2.15	21.43	138.995	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	5.06	2.01	19.71	2.15	20.61	115.080	Vertical	Pass
		836.5	4.99	2.01	19.77	2.15	20.60	114.815	Vertical	Pass
		846.5	5.00	2.02	19.79	2.15	20.62	115.345	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	5.03	2.01	19.73	2.15	20.60	114.815	Vertical	Pass
		836.5	5.40	2.01	19.77	2.15	21.01	126.183	Vertical	Pass
		844	5.34	2.02	19.78	2.15	20.95	124.451	Vertical	Pass

Radiated Power (ERP) for Band 5										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	824.7	5.94	2.01	19.68	2.15	21.46	139.959	Horizontal	Pass
		836.5	6.02	2.01	19.77	2.15	21.63	145.546	Horizontal	Pass
		848.3	5.38	2.02	19.82	2.15	21.03	126.765	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	6.49	2.01	19.70	2.15	22.03	159.588	Horizontal	Pass
		836.5	6.32	2.01	19.77	2.15	21.93	155.955	Horizontal	Pass
		847.5	5.67	2.02	19.81	2.15	21.31	135.207	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	6.27	2.01	19.71	2.15	21.82	152.055	Horizontal	Pass
		836.5	5.94	2.01	19.77	2.15	21.55	142.889	Horizontal	Pass
		846.5	5.80	2.02	19.79	2.15	21.42	138.676	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	6.47	2.01	19.73	2.15	22.04	159.956	Horizontal	Pass
		836.5	6.11	2.01	19.77	2.15	21.72	148.594	Horizontal	Pass
		844	5.78	2.02	19.78	2.15	21.39	137.721	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	5.88	2.01	19.68	2.15	21.40	138.038	Vertical	Pass
		836.5	5.30	2.01	19.77	2.15	20.91	123.310	Vertical	Pass
		848.3	5.26	2.02	19.82	2.15	20.91	123.310	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	4.97	2.01	19.70	2.15	20.51	112.460	Vertical	Pass
		836.5	5.02	2.01	19.77	2.15	20.63	115.611	Vertical	Pass
		847.5	5.58	2.02	19.81	2.15	21.22	132.434	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	5.35	2.01	19.71	2.15	20.90	123.027	Vertical	Pass
		836.5	5.53	2.01	19.77	2.15	21.14	130.017	Vertical	Pass
		846.5	5.81	2.02	19.79	2.15	21.43	138.995	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	5.61	2.01	19.73	2.15	21.18	131.220	Vertical	Pass
		836.5	5.40	2.01	19.77	2.15	21.01	126.183	Vertical	Pass
		844	5.30	2.02	19.78	2.15	20.91	123.310	Vertical	Pass

Note:

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2502.5	0.48	4.54	27.75	23.69	233.884	Horizontal	Pass
		2535	1.76	4.69	27.72	24.79	301.301	Horizontal	Pass
		2567.5	0.88	4.71	27.71	23.88	244.343	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.50	4.55	27.76	23.71	234.963	Horizontal	Pass
		2535	2.01	4.69	27.72	25.04	319.154	Horizontal	Pass
		2565	0.25	4.72	27.70	23.23	210.378	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.00	4.55	27.77	23.22	209.894	Horizontal	Pass
		2535	1.84	4.69	27.72	24.87	306.902	Horizontal	Pass
		2562.5	-0.82	4.72	27.69	22.15	164.059	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.05	4.57	27.78	23.16	207.014	Horizontal	Pass
		2535	2.09	4.73	27.72	25.08	322.107	Horizontal	Pass
		2560	-1.06	4.75	27.68	21.87	153.815	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	0.81	4.54	27.75	24.02	252.348	Vertical	Pass
		2535	0.48	4.69	27.72	23.51	224.388	Vertical	Pass
		2567.5	-0.10	4.71	27.71	22.90	194.984	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	-0.43	4.55	27.76	22.78	189.671	Vertical	Pass
		2535	-0.67	4.69	27.72	22.36	172.187	Vertical	Pass
		2565	0.40	4.72	27.70	23.38	217.771	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.37	4.55	27.77	23.59	228.560	Vertical	Pass
		2535	-0.23	4.69	27.72	22.80	190.546	Vertical	Pass
		2562.5	0.14	4.72	27.69	23.11	204.644	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	-0.09	4.57	27.78	23.12	205.116	Vertical	Pass
		2535	1.08	4.73	27.72	24.07	255.270	Vertical	Pass
		2560	1.17	4.75	27.68	24.10	257.040	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.12	4.54	27.75	23.09	203.704	Horizontal	Pass
		2535	1.34	4.69	27.72	24.37	273.527	Horizontal	Pass
		2567.5	0.23	4.71	27.71	23.23	210.378	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.07	4.55	27.76	23.14	206.063	Horizontal	Pass
		2535	1.24	4.69	27.72	24.27	267.301	Horizontal	Pass
		2565	-0.74	4.72	27.70	22.24	167.494	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.48	4.55	27.77	22.74	187.932	Horizontal	Pass
		2535	1.08	4.69	27.72	24.11	257.632	Horizontal	Pass
		2562.5	-1.60	4.72	27.69	21.37	137.088	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.64	4.57	27.78	22.57	180.717	Horizontal	Pass
		2535	1.35	4.73	27.72	24.34	271.644	Horizontal	Pass
		2560	1.04	4.75	27.68	23.97	249.459	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	0.43	4.54	27.75	23.64	231.206	Vertical	Pass
		2535	0.58	4.69	27.72	23.61	229.615	Vertical	Pass
		2567.5	0.84	4.71	27.71	23.84	242.103	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.63	4.55	27.76	22.58	181.134	Vertical	Pass
		2535	0.63	4.69	27.72	23.66	232.274	Vertical	Pass
		2565	0.37	4.72	27.70	23.35	216.272	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.89	4.55	27.77	22.33	171.002	Vertical	Pass
		2535	-0.10	4.69	27.72	22.93	196.336	Vertical	Pass
		2562.5	1.15	4.72	27.69	24.12	258.226	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	-0.39	4.57	27.78	22.82	191.426	Vertical	Pass
		2535	0.74	4.73	27.72	23.73	236.048	Vertical	Pass
		2560	1.08	4.75	27.68	24.01	251.768	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 38

Radiated Power (EIRP) for Band38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2572.5	17.13	4.54	9.00	21.59	144.21	Horizontal	Pass
		2595	18.81	4.69	9.00	23.12	205.12	Horizontal	Pass
		2617.5	18.96	4.71	9.00	23.25	211.35	Horizontal	Pass
10.0MHz Band QPSK	50/0	2575	17.63	4.55	9.00	22.08	161.44	Horizontal	Pass
		2595	19.08	4.69	9.00	23.39	218.27	Horizontal	Pass
		2615	19.36	4.72	9.00	23.64	231.21	Horizontal	Pass
15.0MHz Band QPSK	75/0	2577.5	17.47	4.55	9.00	21.92	155.60	Horizontal	Pass
		2595	18.89	4.69	9.00	23.20	208.93	Horizontal	Pass
		2612.5	19.20	4.72	9.00	23.48	222.84	Horizontal	Pass
20.0MHz Band QPSK	100/0	2580	17.93	4.57	9.00	22.36	172.19	Horizontal	Pass
		2595	19.07	4.73	9.00	23.34	215.77	Horizontal	Pass
		2610	19.51	4.75	9.00	23.76	237.68	Horizontal	Pass
5.0MHz Band QPSK	25/0	2572.5	15.86	4.54	9.00	20.32	107.65	Vertical	Pass
		2595	15.98	4.69	9.00	20.29	106.91	Vertical	Pass
		2617.5	16.05	4.71	9.00	20.34	108.14	Vertical	Pass
10.0MHz Band QPSK	50/0	2575	16.13	4.55	9.00	20.58	114.29	Vertical	Pass
		2595	16.88	4.69	9.00	21.19	131.52	Vertical	Pass
		2615	16.93	4.72	9.00	21.21	132.13	Vertical	Pass
15.0MHz Band QPSK	75/0	2577.5	15.96	4.55	9.00	20.41	109.90	Vertical	Pass
		2595	16.38	4.69	9.00	20.69	117.22	Vertical	Pass
		2612.5	16.71	4.72	9.00	20.99	125.60	Vertical	Pass
20.0MHz Band QPSK	100/0	2580	16.27	4.57	9.00	20.70	117.49	Vertical	Pass
		2595	16.88	4.73	9.00	21.15	130.32	Vertical	Pass
		2610	16.22	4.75	9.00	20.47	111.43	Vertical	Pass

Radiated Power (EIRP) for Band38									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2572.5	16.43	4.54	9.00	20.89	122.74	Horizontal	Pass
		2595	18.22	4.69	9.00	22.53	179.06	Horizontal	Pass
		2617.5	18.50	4.71	9.00	22.79	190.11	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2575	17.17	4.55	9.00	21.62	145.21	Horizontal	Pass
		2595	18.20	4.69	9.00	22.51	178.24	Horizontal	Pass
		2615	18.51	4.72	9.00	22.79	190.11	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2577.5	17.06	4.55	9.00	21.51	141.58	Horizontal	Pass
		2595	18.07	4.69	9.00	22.38	172.98	Horizontal	Pass
		2612.5	18.67	4.72	9.00	22.95	197.24	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2580	17.25	4.57	9.00	21.68	147.23	Horizontal	Pass
		2595	18.34	4.73	9.00	22.61	182.39	Horizontal	Pass
		2610	18.81	4.75	9.00	23.06	202.30	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2572.5	16.58	4.54	9.00	21.04	127.06	Vertical	Pass
		2595	16.91	4.69	9.00	21.22	132.43	Vertical	Pass
		2617.5	16.72	4.71	9.00	21.01	126.18	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2575	16.24	4.55	9.00	20.69	117.22	Vertical	Pass
		2595	16.20	4.69	9.00	20.51	112.46	Vertical	Pass
		2615	16.96	4.72	9.00	21.24	133.05	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2577.5	16.80	4.55	9.00	21.25	133.35	Vertical	Pass
		2595	16.75	4.69	9.00	21.06	127.64	Vertical	Pass
		2612.5	16.75	4.72	9.00	21.03	126.77	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2580	15.87	4.57	9.00	20.30	107.15	Vertical	Pass
		2595	16.78	4.73	9.00	21.05	127.35	Vertical	Pass
		2610	16.86	4.75	9.00	21.11	129.12	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)

8.7 LTE BAND 40A

Radiated Power (EIRP) for Band 40A (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2307.5	17.15	4.95	9.00	21.20	131.83	Horizontal	Pass
		2310	17.69	5.02	9.00	21.67	146.89	Horizontal	Pass
		2312.5	18.41	4.97	9.00	22.44	175.39	Horizontal	Pass
10.0MHz Band QPSK	50/0	2310	18.04	5	9.00	22.04	159.96	Horizontal	Pass
5.0MHz Band QPSK	25/0	2307.5	16.57	4.95	9.00	20.62	115.35	Vertical	Pass
		2310	16.84	5.02	9.00	20.82	120.78	Vertical	Pass
		2312.5	16.09	4.97	9.00	20.12	102.80	Vertical	Pass
10.0MHz Band QPSK	50/0	2310	16.04	4.75	9.00	20.29	106.91	Vertical	Pass

Radiated Power (EIRP) for Band 40A (2305-2315MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2307.5	16.70	4.95	9.00	20.75	118.85	Horizontal	Pass
		2310	17.03	5.02	9.00	21.01	126.18	Horizontal	Pass
		2312.5	17.75	4.97	9.00	21.78	150.66	Horizontal	Pass
10.0MHz Band QPSK	50/0	2310	17.66	5	9.00	21.66	146.55	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2307.5	16.24	4.95	9.00	20.29	106.91	Vertical	Pass
		2310	16.87	5.02	9.00	20.85	121.62	Vertical	Pass
		2312.5	15.95	4.97	9.00	19.98	99.54	Vertical	Pass
10.0MHz Band QPSK	50/0	2310	16.40	4.75	9.00	20.65	116.14	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)

8.8 LTE BAND 40B

Radiated Power (EIRP) for Band 40B (2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2352.5	17.56	4.92	9.00	21.64	145.88	Horizontal	Pass
		2355	17.45	4.95	9.00	21.50	141.25	Horizontal	Pass
		2357.5	16.97	4.81	9.00	21.16	130.62	Horizontal	Pass
10.0MHz Band QPSK	50/0	2355	17.62	4.86	9.00	21.76	149.97	Horizontal	Pass
5.0MHz Band QPSK	25/0	2352.5	15.93	4.92	9.00	20.01	100.23	Vertical	Pass
		2355	16.81	4.95	9.00	20.86	121.90	Vertical	Pass
		2357.5	15.75	4.81	9.00	19.94	98.63	Vertical	Pass
10.0MHz Band QPSK	50/0	2355	16.26	4.86	9.00	20.40	109.65	Vertical	Pass

Radiated Power (EIRP) for Band 40B (2350-2360MHz)									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	2352.5	17.28	4.92	9.00	21.36	136.77	Vertical	Pass
		2355	16.70	4.95	9.00	20.75	118.85	Vertical	Pass
		2357.5	16.36	4.81	9.00	20.55	113.50	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2355	17.17	4.86	9.00	21.31	135.21	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2352.5	15.88	4.92	9.00	19.96	99.08	Horizontal	Pass
		2355	15.99	4.95	9.00	20.04	100.93	Horizontal	Pass
		2357.5	16.69	4.81	9.00	20.88	122.46	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2355	15.99	4.86	9.00	20.13	103.04	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)

8.9 LTE BAND 41

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	1/#Mid	2537.5	1.88	4.54	27.75	25.09	322.849	Horizontal	Pass
		2595	0.24	4.69	27.72	23.27	212.324	Horizontal	Pass
		2652.5	0.19	4.71	27.71	23.19	208.449	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2540	1.81	4.55	27.76	25.02	317.687	Horizontal	Pass
		2595	0.51	4.69	27.72	23.54	225.944	Horizontal	Pass
		2650	-0.02	4.72	27.70	22.96	197.697	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2542.5	1.07	4.55	27.77	24.29	268.534	Horizontal	Pass
		2595	0.32	4.69	27.72	23.35	216.272	Horizontal	Pass
		2647.5	-0.58	4.72	27.69	22.39	173.380	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2545	0.84	4.57	27.78	24.05	254.097	Horizontal	Pass
		2595	0.49	4.73	27.72	23.48	222.844	Horizontal	Pass
		2645	-0.48	4.75	27.68	22.45	175.792	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2537.5	0.40	4.54	27.75	23.61	229.615	Vertical	Pass
		2595	0.36	4.69	27.72	23.39	218.273	Vertical	Pass
		2652.5	0.49	4.71	27.71	23.49	223.357	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2540	0.56	4.55	27.76	23.77	238.232	Vertical	Pass
		2595	1.20	4.69	27.72	24.23	264.850	Vertical	Pass
		2650	0.56	4.72	27.70	23.54	225.944	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2542.5	0.48	4.55	27.77	23.70	234.423	Vertical	Pass
		2595	0.72	4.69	27.72	23.75	237.137	Vertical	Pass
		2647.5	0.46	4.72	27.69	23.43	220.293	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2545	0.35	4.57	27.78	23.56	226.986	Vertical	Pass
		2595	0.68	4.73	27.72	23.67	232.809	Vertical	Pass
		2645	0.96	4.75	27.68	23.89	244.906	Vertical	Pass

Radiated Power (EIRP) for Band 41									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	2537.5	1.28	4.54	27.75	24.49	281.190	Horizontal	Pass
		2595	-0.26	4.69	27.72	22.77	189.234	Horizontal	Pass
		2652.5	-0.51	4.71	27.71	22.49	177.419	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2540	1.35	4.55	27.76	24.56	285.759	Horizontal	Pass
		2595	-0.35	4.69	27.72	22.68	185.353	Horizontal	Pass
		2650	-0.92	4.72	27.70	22.06	160.694	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2542.5	0.63	4.55	27.77	23.85	242.661	Horizontal	Pass
		2595	-0.53	4.69	27.72	22.50	177.828	Horizontal	Pass
		2647.5	-1.19	4.72	27.69	21.78	150.661	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2545	0.15	4.57	27.78	23.36	216.770	Horizontal	Pass
		2595	-0.27	4.73	27.72	22.72	187.068	Horizontal	Pass
		2645	-1.21	4.75	27.68	21.72	148.594	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2537.5	-1.60	4.54	27.75	21.61	144.877	Vertical	Pass
		2595	-1.25	4.69	27.72	21.78	150.661	Vertical	Pass
		2652.5	-1.17	4.71	27.71	21.83	152.405	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2540	-1.72	4.55	27.76	21.49	140.929	Vertical	Pass
		2595	-1.65	4.69	27.72	21.38	137.404	Vertical	Pass
		2650	-1.22	4.72	27.70	21.76	149.968	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2542.5	-1.56	4.55	27.77	21.66	146.555	Vertical	Pass
		2595	-1.10	4.69	27.72	21.93	155.955	Vertical	Pass
		2647.5	-1.36	4.72	27.69	21.61	144.877	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2545	-1.92	4.57	27.78	21.29	134.586	Vertical	Pass
		2595	-1.52	4.73	27.72	21.47	140.281	Vertical	Pass
		2645	-1.48	4.75	27.68	21.45	139.637	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)

8.10 LTE BAND 66

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP	Polarization Of Max. ERP	
							Average (mW)		
1.4MHz Band QPSK	6/0	1710.7	0.62	3.76	28.24	25.10	323.594	Horizontal	Pass
		1745	0.98	3.91	28.22	25.29	338.065	Horizontal	Pass
		1779.3	1.20	3.93	28.2	25.47	352.371	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	0.61	3.77	28.23	25.07	321.366	Horizontal	Pass
		1745	1.39	3.91	28.24	25.72	373.250	Horizontal	Pass
		1778.5	1.23	3.94	28.25	25.54	358.096	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-0.28	3.77	28.31	24.26	266.686	Horizontal	Pass
		1745	0.73	3.91	28.22	25.04	319.154	Horizontal	Pass
		1777.5	0.62	3.94	28.2	24.88	307.610	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-0.01	3.79	28.33	24.53	283.792	Horizontal	Pass
		1745	1.00	3.95	28.22	25.27	336.512	Horizontal	Pass
		1775	0.69	3.97	28.19	24.91	309.742	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-0.31	3.79	28.34	24.24	265.461	Horizontal	Pass
		1745	0.87	3.95	28.22	25.14	326.588	Horizontal	Pass
		1772.5	0.43	3.97	28.18	24.64	291.072	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	0.35	3.81	28.35	24.89	308.319	Horizontal	Pass
		1745	1.15	3.96	28.22	25.41	347.536	Horizontal	Pass
		1770	0.68	4	28.16	24.84	304.789	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	-1.04	3.76	28.24	23.44	220.800	Vertical	Pass
		1745	-0.39	3.91	28.22	23.92	246.604	Vertical	Pass
		1779.3	-0.35	3.93	28.2	23.92	246.604	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-0.12	3.77	28.23	24.34	271.644	Vertical	Pass
		1745	-0.09	3.91	28.24	24.24	265.461	Vertical	Pass
		1778.5	-0.33	3.94	28.25	23.98	250.035	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-0.30	3.77	28.31	24.24	265.461	Vertical	Pass
		1745	-0.61	3.91	28.22	23.70	234.423	Vertical	Pass
		1777.5	0.04	3.94	28.2	24.30	269.153	Vertical	Pass
10.0MHz Band	50/0	1715	-0.58	3.79	28.34	23.97	249.459	Vertical	Pass
		1745	-0.41	3.95	28.22	23.86	243.220	Vertical	Pass

QPSK		1775	-0.06	3.97	28.18	24.15	260.016	Vertical	Pass
15.0MHz	75/0	1717.5	-0.21	3.81	28.35	24.33	271.019	Vertical	Pass
Band		1745	-0.13	3.96	28.22	24.13	258.821	Vertical	Pass
QPSK		1772.5	-0.29	4	28.16	23.87	243.781	Vertical	Pass
20.0MHz	100/0	1720	-0.21	3.79	28.34	24.34	271.644	Vertical	Pass
Band		1745	-0.51	3.95	28.22	23.76	237.684	Vertical	Pass
QPSK		1770	0.16	3.97	28.18	24.37	273.527	Vertical	Pass

Radiated Power (EIRP) for Band 66									
Mode	RB/RB SIZE	Frequency	Result					Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP		
							Average (mW)		
1.4MHz Band 16 QAM	6/0	1710.7	-0.46	3.76	28.24	24.02	252.348	Horizontal	Pass
		1745	0.03	3.91	28.22	24.34	271.644	Horizontal	Pass
		1779.3	0.05	3.93	28.2	24.32	270.396	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	0.10	3.77	28.23	24.56	285.759	Horizontal	Pass
		1745	0.62	3.91	28.24	24.95	312.608	Horizontal	Pass
		1778.5	0.14	3.94	28.25	24.45	278.612	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-0.60	3.77	28.31	23.94	247.742	Horizontal	Pass
		1745	0.13	3.91	28.22	24.44	277.971	Horizontal	Pass
		1777.5	-0.06	3.94	28.2	24.20	263.027	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-0.57	3.79	28.33	23.97	249.459	Horizontal	Pass
		1745	0.21	3.95	28.22	24.48	280.543	Horizontal	Pass
		1775	-0.33	3.97	28.19	23.89	244.906	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-0.70	3.79	28.34	23.85	242.661	Horizontal	Pass
		1745	0.13	3.95	28.22	24.40	275.423	Horizontal	Pass
		1772.5	-0.35	3.97	28.18	23.86	243.220	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-0.59	3.81	28.35	23.95	248.313	Horizontal	Pass
		1745	0.28	3.96	28.22	24.54	284.446	Horizontal	Pass
		1770	-0.07	4	28.16	24.09	256.448	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-0.69	3.76	28.24	23.79	239.332	Vertical	Pass
		1745	0.05	3.91	28.22	24.36	272.898	Vertical	Pass
		1779.3	-0.40	3.93	28.2	23.87	243.781	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-0.78	3.77	28.23	23.68	233.346	Vertical	Pass
		1745	-1.58	3.91	28.24	22.75	188.365	Vertical	Pass
		1778.5	-0.79	3.94	28.25	23.52	224.905	Vertical	Pass
5.0MHz	25/0	1712.5	-1.98	3.77	28.31	22.56	180.302	Vertical	Pass

Band 16 QAM		1745	-1.45	3.91	28.22	22.86	193.197	Vertical	Pass
		1777.5	-1.77	3.94	28.2	22.49	177.419	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-1.84	3.79	28.34	22.71	186.638	Vertical	Pass
		1745	-0.01	3.95	28.22	24.26	266.686	Vertical	Pass
		1775	-0.79	3.97	28.18	23.42	219.786	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-1.03	3.81	28.35	23.51	224.388	Vertical	Pass
		1745	0.07	3.96	28.22	24.33	271.019	Vertical	Pass
		1772.5	-0.45	4	28.16	23.71	234.963	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	-0.35	3.79	28.34	24.20	263.027	Vertical	Pass
		1745	-1.25	3.95	28.22	23.02	200.447	Vertical	Pass
		1770	-1.14	3.97	28.18	23.07	202.768	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: §2.1053, §22.917, §24.238, §27.53 and §90.691

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

MODES TESTED

LTE Band 2/4/5/7/38/40/41/66

RESULTS

PASS

9.1 LTE BAND 2

QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-45.81	4.04	33.51	-16.34	-13	-3.34	Horizontal
3701.4	-52.25	4.04	33.51	-22.78	-13	-9.78	Vertical
5552.1	-52.33	5.24	35.84	-21.73	-13	-8.73	Vertical
5552.1	-51.59	5.24	35.84	-20.99	-13	-7.99	Horizontal
201.5	-35.00	1.43	16.02	-20.41	-13	-7.41	Vertical
351.1	-39.63	1.30	17.99	-22.94	-13	-9.94	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.98	4.04	33.56	-18.46	-13	-5.46	Horizontal
3760.0	-44.58	4.04	33.56	-15.06	-13	-2.06	Vertical
5640.0	-46.66	5.24	35.91	-15.99	-13	-2.99	Vertical
5640.0	-50.95	5.24	35.91	-20.28	-13	-7.28	Horizontal
182.3	-35.09	1.62	16.97	-19.74	-13	-6.74	Vertical
367.1	-39.19	1.74	15.98	-24.96	-13	-11.96	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-49.82	4.04	34.00	-19.86	-13	-6.86	Horizontal
3818.6	-53.68	4.04	34.00	-23.72	-13	-10.72	Vertical
5727.9	-47.30	5.24	36.04	-16.50	-13	-3.50	Vertical
5727.9	-53.23	5.24	36.04	-22.43	-13	-9.43	Horizontal
183.0	-41.49	1.42	17.29	-25.62	-13	-12.62	Vertical
431.2	-43.01	1.50	17.90	-26.60	-13	-13.60	Horizontal

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

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720.0	-48.07	4.07	33.54	-18.60	-13	-5.60	Horizontal
3720.0	-51.84	4.07	33.54	-22.37	-13	-9.37	Vertical
5580.0	-51.46	5.28	35.86	-20.88	-13	-7.88	Vertical
5580.0	-50.55	5.28	35.86	-19.97	-13	-6.97	Horizontal
176.1	-36.89	1.58	16.89	-21.57	-13	-8.57	Vertical
413.1	-37.33	1.76	17.26	-21.83	-13	-8.83	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-48.51	4.04	33.56	-18.99	-13	-5.99	Horizontal
3760.0	-45.54	4.04	33.56	-16.02	-13	-3.02	Vertical
5640.0	-45.07	5.24	35.91	-14.40	-13	-1.40	Vertical
5640.0	-50.04	5.24	35.91	-19.37	-13	-6.37	Horizontal
211.5	-39.99	1.46	16.27	-25.18	-13	-12.18	Vertical
314.8	-40.40	1.59	15.15	-26.84	-13	-13.84	Horizontal
Test Results for High Channel 1890MHz							
3800.0	-46.94	4.04	34.00	-16.98	-13	-3.98	Horizontal
3800.0	-46.10	4.04	34.00	-16.14	-13	-3.14	Vertical
5700.0	-49.53	5.24	36.04	-18.73	-13	-5.73	Vertical
5700.0	-51.67	5.24	36.04	-20.87	-13	-7.87	Horizontal
199.3	-40.86	1.36	17.39	-24.82	-13	-11.82	Vertical
395.0	-35.87	1.66	15.39	-22.14	-13	-9.14	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-45.81	4.02	29.80	-20.03	-13	-7.03	Horizontal
3421.4	-50.43	4.02	29.80	-24.65	-13	-11.65	Vertical
5132.1	-44.18	5.24	35.84	-13.58	-13	-0.58	Vertical
5132.1	-52.26	5.24	35.84	-21.66	-13	-8.66	Horizontal
202.2	-40.79	1.68	16.04	-26.43	-13	-13.43	Vertical
450.0	-34.76	1.78	17.74	-18.80	-13	-5.80	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-45.54	4.03	30.00	-19.57	-13	-6.57	Horizontal
3465.0	-52.71	4.03	30.00	-26.74	-13	-13.74	Vertical
5197.5	-52.37	5.25	35.86	-21.76	-13	-8.76	Vertical
5197.5	-51.49	5.25	35.86	-20.88	-13	-7.88	Horizontal
180.2	-35.79	1.72	17.69	-19.82	-13	-6.82	Vertical
349.5	-41.52	1.62	16.02	-27.11	-13	-14.11	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-53.95	4.05	30.01	-27.99	-13	-14.99	Horizontal
3508.6	-51.12	4.05	30.01	-25.16	-13	-12.16	Vertical
5262.9	-44.42	5.26	35.86	-13.82	-13	-0.82	Vertical
5262.9	-53.84	5.26	35.86	-23.24	-13	-10.24	Horizontal
185.9	-40.18	1.80	16.69	-25.29	-13	-12.29	Vertical
239.2	-41.86	1.75	16.66	-26.96	-13	-13.96	Horizontal

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

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-44.86	4.02	29.80	-19.08	-13	-6.08	Horizontal
3440.0	-47.00	4.02	29.80	-21.22	-13	-8.22	Vertical
5160.0	-50.53	5.24	35.84	-19.93	-13	-6.93	Vertical
5160.0	-53.85	5.24	35.84	-23.25	-13	-10.25	Horizontal
176.7	-41.21	1.57	17.26	-25.52	-13	-12.52	Vertical
354.2	-36.51	1.78	16.35	-21.94	-13	-8.94	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.76	4.03	30.00	-23.79	-13	-10.79	Horizontal
3465.0	-50.13	4.03	30.00	-24.16	-13	-11.16	Vertical
5197.5	-50.46	5.25	35.86	-19.85	-13	-6.85	Vertical
5197.5	-50.83	5.25	35.86	-20.22	-13	-7.22	Horizontal
177.2	-40.15	1.44	17.95	-23.64	-13	-10.64	Vertical
290.3	-39.00	1.65	16.09	-24.56	-13	-11.56	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-48.62	2.91	27.68	-23.85	-13	-10.85	Horizontal
3490.0	-48.04	2.91	27.68	-23.27	-13	-10.27	Vertical
5235.0	-48.85	5.26	35.86	-18.25	-13	-5.25	Vertical
5235.0	-49.30	5.26	35.86	-18.70	-13	-5.70	Horizontal
192.7	-36.85	1.61	16.85	-21.61	-13	-8.61	Vertical
321.4	-41.40	1.61	15.19	-27.82	-13	-14.82	Horizontal

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

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

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

9.3 LTE BAND 5

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

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-48.85	2.78	27.50	-24.13	-13	-11.13	Horizontal
1649.4	-47.59	2.78	27.50	-22.87	-13	-9.87	Vertical
2474.1	-45.06	2.90	27.80	-20.16	-13	-7.16	Vertical
2474.1	-53.11	2.90	27.80	-28.21	-13	-15.21	Horizontal
178.9	-42.21	1.76	17.59	-26.38	-13	-13.38	Vertical
427.3	-42.52	1.63	15.87	-28.28	-13	-15.28	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-53.83	2.80	27.48	-29.15	-13	-16.15	Horizontal
1673.0	-48.09	2.80	27.48	-23.41	-13	-10.41	Vertical
2509.5	-53.53	2.91	27.70	-28.74	-13	-15.74	Vertical
2509.5	-52.64	2.91	27.70	-27.85	-13	-14.85	Horizontal
176.7	-40.19	1.61	15.68	-26.12	-13	-13.12	Vertical
249.9	-35.37	1.59	17.52	-19.45	-13	-6.45	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-46.07	2.82	27.43	-21.46	-13	-8.46	Horizontal
1696.6	-53.19	2.82	27.43	-28.58	-13	-15.58	Vertical
2544.9	-50.66	2.92	27.74	-25.84	-13	-12.84	Vertical
2544.9	-52.76	2.92	27.74	-27.94	-13	-14.94	Horizontal
186.2	-41.27	1.69	16.67	-26.28	-13	-13.28	Vertical
241.0	-43.28	1.70	17.18	-27.80	-13	-14.80	Horizontal

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

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658.0	-52.06	2.78	27.50	-27.34	-13	-14.34	Horizontal
1658.0	-52.70	2.78	27.50	-27.98	-13	-14.98	Vertical
2487.0	-44.87	2.90	27.80	-19.97	-13	-6.97	Vertical
2487.0	-49.04	2.90	27.80	-24.14	-13	-11.14	Horizontal
208.7	-42.37	1.71	15.57	-28.51	-13	-15.51	Vertical
298.0	-43.15	1.34	16.40	-28.09	-13	-15.09	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-45.47	2.80	27.48	-20.79	-13	-7.79	Horizontal
1673.0	-53.48	2.80	27.48	-28.80	-13	-15.80	Vertical
2509.5	-45.93	2.91	27.70	-21.14	-13	-8.14	Vertical
2509.5	-51.29	2.91	27.70	-26.50	-13	-13.50	Horizontal
204.9	-44.18	1.44	17.04	-28.58	-13	-15.58	Vertical
252.9	-42.70	1.76	17.62	-26.84	-13	-13.84	Horizontal
Test Results for High Channel 844MHz							
1688.0	-53.01	2.82	27.43	-28.40	-13	-15.40	Horizontal
1688.0	-52.67	2.82	27.43	-28.06	-13	-15.06	Vertical
2532.0	-50.84	2.92	27.74	-26.02	-13	-13.02	Vertical
2532.0	-52.46	2.92	27.74	-27.64	-13	-14.64	Horizontal
203.0	-39.06	1.74	17.70	-23.10	-13	-10.10	Vertical
236.6	-40.38	1.41	17.46	-24.32	-13	-11.32	Horizontal

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

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

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

9.4 LTE BAND 7

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

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-63.66	5.23	35.81	-33.08	-25	-8.08	Horizontal
5005.0	-59.81	5.23	35.81	-29.23	-25	-4.23	Vertical
7507.5	-62.83	5.67	36.85	-31.65	-25	-6.65	Vertical
7507.5	-64.41	5.67	36.85	-33.23	-25	-8.23	Horizontal
178.1	-44.73	1.73	17.97	-28.49	-25	-3.49	Vertical
415.3	-48.41	1.38	15.11	-34.68	-25	-9.68	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.72	5.23	35.82	-29.13	-25	-4.13	Horizontal
5070.0	-62.53	5.23	35.82	-31.94	-25	-6.94	Vertical
7605.0	-64.66	5.67	36.85	-33.48	-25	-8.48	Vertical
7605.0	-60.31	5.67	36.85	-29.13	-25	-4.13	Horizontal
185.9	-44.61	1.77	16.17	-30.20	-25	-5.20	Vertical
346.5	-49.38	1.63	15.21	-35.80	-25	-10.80	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-64.18	5.24	35.83	-33.59	-25	-8.59	Horizontal
5135.0	-63.59	5.24	35.83	-33.00	-25	-8.00	Vertical
7702.5	-64.68	5.68	36.87	-33.49	-25	-8.49	Vertical
7702.5	-60.64	5.68	36.87	-29.45	-25	-4.45	Horizontal
178.8	-54.03	1.58	17.56	-38.05	-25	-13.05	Vertical
461.3	-52.09	1.45	16.58	-36.96	-25	-11.96	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	-64.88	5.23	35.82	-34.29	-25	-9.29	Vertical
7530.0	-60.70	5.67	36.86	-29.51	-25	-4.51	Vertical
7530.0	-63.35	5.67	36.86	-32.16	-25	-7.16	Horizontal
181.8	-49.58	1.63	15.76	-35.45	-25	-10.45	Vertical
277.1	-44.85	1.71	15.44	-31.12	-25	-6.12	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.10	5.23	35.82	-28.51	-25	-3.51	Horizontal
5070.0	-60.49	5.23	35.82	-29.90	-25	-4.90	Vertical
7605.0	-60.17	5.67	36.85	-28.99	-25	-3.99	Vertical
7605.0	-59.58	5.67	36.85	-28.40	-25	-3.40	Horizontal
192.4	-46.95	1.79	16.84	-31.89	-25	-6.89	Vertical
399.1	-46.07	1.71	17.64	-30.14	-25	-5.14	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-60.86	5.24	35.83	-30.27	-25	-5.27	Horizontal
5120.0	-59.56	5.24	35.83	-28.97	-25	-3.97	Vertical
7680.0	-62.24	5.70	36.88	-31.06	-25	-6.06	Vertical
7680.0	-64.57	5.70	36.88	-33.39	-25	-8.39	Horizontal
185.4	-44.91	1.79	16.84	-29.85	-25	-4.85	Vertical
246.0	-45.63	1.71	17.64	-29.70	-25	-4.70	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 38

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

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5145	-60.51	2.63	27.26	-35.88	-25	-10.88	Horizontal
5145	-60.09	2.63	27.26	-35.46	-25	-10.46	Vertical
7717.5	-63.76	2.67	27.58	-38.85	-25	-13.85	Vertical
7717.5	-61.61	2.67	27.58	-36.70	-25	-11.70	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-59.77	2.62	27.28	-35.11	-25	-10.11	Horizontal
5190	-63.03	2.62	27.28	-38.37	-25	-13.37	Vertical
7785	-63.85	2.85	27.62	-39.08	-25	-14.08	Vertical
7785	-61.56	2.85	27.62	-36.79	-25	-11.79	Horizontal
Test Results for High Channel 2617.5MHz							
5235	-61.24	2.64	27.28	-36.60	-25	-11.60	Horizontal
5235	-64.22	2.64	27.28	-39.58	-25	-14.58	Vertical
7852.5	-60.97	2.85	27.70	-36.12	-25	-11.12	Vertical
7852.5	-60.07	2.85	27.70	-35.22	-25	-10.22	Horizontal

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

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5160	-60.98	2.63	27.30	-36.31	-25	-11.31	Horizontal
5160	-61.65	2.63	27.30	-36.98	-25	-11.98	Vertical
7740	-59.95	2.67	27.62	-35.00	-25	-10.00	Vertical
7740	-59.33	2.67	27.62	-34.38	-25	-9.38	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-61.16	2.62	27.33	-36.45	-25	-11.45	Horizontal
5190	-62.73	2.62	27.33	-38.02	-25	-13.02	Vertical
7785	-61.08	2.85	27.67	-36.26	-25	-11.26	Vertical
7785	-63.35	2.85	27.67	-38.53	-25	-13.53	Horizontal
Test Results for High Channel 2610MHz							
5220	-63.36	2.64	27.33	-38.67	-25	-13.67	Horizontal
5220	-63.57	2.64	27.33	-38.88	-25	-13.88	Vertical
7830	-63.64	2.85	27.67	-38.82	-25	-13.82	Vertical
7830	-61.07	2.85	27.67	-36.25	-25	-11.25	Horizontal

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

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

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

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

9.6 LTE BAND 40A

QPSK EIRP POWER FOR LTE BAND 40A (5MHZ BANDWIDTH)

Test Results for Low Channel 2307.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4615	-75.23	4.04	33.51	-45.76	-40	-5.76	Horizontal
4615	-76.81	4.04	33.51	-47.34	-40	-7.34	Vertical
6922.5	-79.68	5.24	35.84	-49.08	-40	-9.08	Vertical
6922.5	-88.87	5.24	35.84	-58.27	-40	-18.27	Horizontal
Test Results for Mid Channel 2310MHz							
4620	-77.45	4.04	33.56	-47.93	-40	-7.93	Horizontal
4620	-75.97	4.04	33.56	-46.45	-40	-6.45	Vertical
6930	-77.33	5.24	35.91	-46.66	-40	-6.66	Vertical
6930	-77.47	5.24	35.91	-46.80	-40	-6.80	Horizontal
Test Results for High Channel 2312.5MHz							
4625	-76.01	4.04	34	-46.05	-40	-6.05	Horizontal
4625	-77.11	4.04	34	-47.15	-40	-7.15	Vertical
6937.5	-80.20	5.24	36.04	-49.40	-40	-9.40	Vertical
6937.5	-78.95	5.24	36.04	-48.15	-40	-8.15	Horizontal

QPSK EIRP POWER FOR LTE BAND 40A (10MHZ BANDWIDTH)

Test Results for Low Channel 2310MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4620	-77.25	4.04	33.56	-47.73	-40	-7.73	Horizontal
4620	-75.03	4.04	33.56	-45.51	-40	-5.51	Vertical
6930	-79.77	5.24	35.91	-49.10	-40	-9.10	Vertical
6930	-80.63	5.24	35.91	-49.96	-40	-9.96	Horizontal

9.7 LTE BAND 40B

QPSK EIRP POWER FOR LTE BAND 40B (5MHZ BANDWIDTH)

Test Results for Low Channel 2352.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4705	-77.08	4.04	33.51	-47.61	-40	-7.61	Horizontal
4705	-78.51	4.04	33.51	-49.04	-40	-9.04	Vertical
7057.5	-81.01	5.24	35.84	-50.41	-40	-10.41	Vertical
7057.5	-90.91	5.24	35.84	-60.31	-40	-20.31	Horizontal
Test Results for Mid Channel 2355MHz							
4710	-77.75	4.04	33.56	-48.23	-40	-8.23	Horizontal
4710	-78.91	4.04	33.56	-49.39	-40	-9.39	Vertical
7065	-78.09	5.24	35.91	-47.42	-40	-7.42	Vertical
7065	-81.18	5.24	35.91	-50.51	-40	-10.51	Horizontal
Test Results for High Channel 2357.5MHz							
4715	-75.92	4.04	34	-45.96	-40	-5.96	Horizontal
4715	-79.34	4.04	34	-49.38	-40	-9.38	Vertical
7072.5	-79.92	5.24	36.04	-49.12	-40	-9.12	Vertical
7072.5	-79.99	5.24	36.04	-49.19	-40	-9.19	Horizontal

QPSK EIRP POWER FOR LTE BAND 40B (10MHZ BANDWIDTH)

Test Results for Low Channel 2355MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4710	-76.11	4.04	33.56	-46.59	-40	-6.59	Horizontal
4710	-74.45	4.04	33.56	-44.93	-40	-4.93	Vertical
7065	-74.94	5.24	35.91	-44.27	-40	-4.27	Vertical
7065	-79.68	5.24	35.91	-49.01	-40	-9.01	Horizontal

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

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

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

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

9.8 LTE BAND 41

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

Test Results for Low Channel 2537.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5145.0	-64.38	5.23	35.81	-33.80	-25	-8.80	Horizontal
5145.0	-62.25	5.23	35.81	-31.67	-25	-6.67	Vertical
7717.5	-63.52	5.67	36.85	-32.34	-25	-7.34	Vertical
7717.5	-60.58	5.67	36.85	-29.40	-25	-4.40	Horizontal
209.3	-45.30	1.38	15.98	-30.70	-25	-5.70	Vertical
323.3	-53.43	1.62	15.66	-39.39	-25	-14.39	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-59.68	5.23	35.82	-29.09	-25	-4.09	Horizontal
5190.0	-63.04	5.23	35.82	-32.45	-25	-7.45	Vertical
7785.0	-63.18	5.67	36.85	-32.00	-25	-7.00	Vertical
7785.0	-61.11	5.67	36.85	-29.93	-25	-4.93	Horizontal
212.8	-51.50	1.62	16.17	-36.95	-25	-11.95	Vertical
378.9	-48.44	1.74	17.63	-32.55	-25	-7.55	Horizontal
Test Results for High Channel 2652.5MHz							
5235.0	-61.90	5.24	35.83	-31.31	-25	-6.31	Horizontal
5235.0	-59.35	5.24	35.83	-28.76	-25	-3.76	Vertical
7852.5	-60.02	5.68	36.87	-28.83	-25	-3.83	Vertical
7852.5	-59.39	5.68	36.87	-28.20	-25	-3.20	Horizontal
198.5	-53.90	1.55	15.84	-39.61	-25	-14.61	Vertical
410.7	-47.04	1.51	17.06	-31.49	-25	-6.49	Horizontal

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

Test Results for Low Channel 2545MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5160.0	-61.36	5.23	35.82	-30.77	-25	-5.77	Horizontal
5160.0	-64.08	5.23	35.82	-33.49	-25	-8.49	Vertical
7740.0	-60.58	5.67	36.86	-29.39	-25	-4.39	Vertical
7740.0	-63.91	5.67	36.86	-32.72	-25	-7.72	Horizontal
198.5	-45.46	1.43	15.51	-31.38	-25	-6.38	Vertical
359.9	-45.78	1.40	16.97	-30.21	-25	-5.21	Horizontal
Test Results for Mid Channel 2595MHz							
5190.0	-64.95	5.23	35.82	-34.36	-25	-9.36	Horizontal
5190.0	-59.88	5.23	35.82	-29.29	-25	-4.29	Vertical
7785.0	-63.35	5.67	36.85	-32.17	-25	-7.17	Vertical
7785.0	-63.53	5.67	36.85	-32.35	-25	-7.35	Horizontal
206.5	-46.76	1.77	16.72	-31.81	-25	-6.81	Vertical
436.3	-53.48	1.31	16.99	-37.80	-25	-12.80	Horizontal
Test Results for High Channel 2645MHz							
5220.0	-61.95	5.24	35.83	-31.36	-25	-6.36	Horizontal
5220.0	-59.09	5.24	35.83	-28.50	-25	-3.50	Vertical
7830.0	-61.29	5.70	36.88	-30.11	-25	-5.11	Vertical
7830.0	-61.98	5.70	36.88	-30.80	-25	-5.80	Horizontal
184.7	-52.06	1.70	15.73	-38.03	-25	-13.03	Vertical
266.6	-48.66	1.75	17.33	-33.08	-25	-8.08	Horizontal

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

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

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

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

9.9 LTE BAND 66

QPSK EIRP POWER FOR LTE BAND 66 (5MHZ 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	-53.09	3.84	35.81	-21.12	-13	-8.12	Horizontal
3421.4	-49.21	3.84	35.81	-17.24	-13	-4.24	Vertical
5132.1	-53.82	5.18	36.85	-22.15	-13	-9.15	Vertical
5132.1	-53.92	5.18	36.85	-22.25	-13	-9.25	Horizontal
203.6	-35.98	1.56	17.97	-19.57	-13	-6.57	Vertical
384.4	-35.93	1.33	15.11	-22.15	-13	-9.15	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-51.16	3.85	35.82	-19.19	-13	-6.19	Horizontal
3490.0	-50.49	3.85	35.82	-18.52	-13	-5.52	Vertical
5235.0	-53.87	5.21	36.85	-22.23	-13	-9.23	Vertical
5235.0	-53.20	5.21	36.85	-21.56	-13	-8.56	Horizontal
185.4	-36.32	1.77	16.17	-21.91	-13	-8.91	Vertical
324.5	-36.35	1.63	15.21	-22.77	-13	-9.77	Horizontal
Test Results for High Channel 779.3MHz							
3558.6	-51.86	3.86	35.83	-19.89	-13	-6.89	Horizontal
3558.6	-51.53	3.86	35.83	-19.56	-13	-6.56	Vertical
5337.9	-49.05	5.24	36.87	-17.42	-13	-4.42	Vertical
5337.9	-49.43	5.24	36.87	-17.80	-13	-4.80	Horizontal
188.4	-39.46	1.58	17.56	-23.48	-13	-10.48	Vertical
354.9	-39.53	1.45	16.58	-24.40	-13	-11.40	Horizontal

QPSK EIRP POWER FOR LTE BAND 66 (40MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440.0	-53.51	3.84	35.82	-21.53	-13	-8.53	Horizontal
3440.0	-52.58	3.84	35.82	-20.60	-13	-7.60	Vertical
5160.0	-53.14	5.18	36.86	-21.46	-13	-8.46	Vertical
5160.0	-53.49	5.18	36.86	-21.81	-13	-8.81	Horizontal
183.7	-37.88	1.56	15.76	-23.68	-13	-10.68	Vertical
329.8	-34.22	1.33	15.44	-20.11	-13	-7.11	Horizontal
Test Results for Mid Channel 1745MHz							
3490.0	-50.82	3.85	35.82	-18.85	-13	-5.85	Horizontal
3490.0	-53.90	3.85	35.82	-21.93	-13	-8.93	Vertical
5235.0	-50.98	5.21	36.85	-19.34	-13	-6.34	Vertical
5235.0	-51.73	5.21	36.85	-20.09	-13	-7.09	Horizontal
192.8	-38.72	1.77	16.84	-23.64	-13	-10.64	Vertical
240.9	-43.16	1.63	17.64	-27.15	-13	-14.15	Horizontal
Test Results for High Channel 1770MHz							
3540.0	-53.95	3.86	35.83	-21.98	-13	-8.98	Horizontal
3540.0	-49.63	3.86	35.83	-17.66	-13	-4.66	Vertical
5310.0	-53.40	5.24	36.88	-21.76	-13	-8.76	Vertical
5310.0	-50.23	5.24	36.88	-18.59	-13	-5.59	Horizontal
212.0	-43.88	1.58	16.84	-28.61	-13	-15.61	Vertical
376.2	-36.29	1.45	17.64	-20.10	-13	-7.10	Horizontal

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

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

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

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

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.15V, Normal, DC 3.7V and High voltage, DC 4.26V.

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2/4/5/7/38/40/41/66

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]
3.15	1880	12.9	0.006879	2.5
3.7	1880	14.0	0.007432	2.5
4.26	1880	13.6	0.007227	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	12.4	0.006602	2.5
Extreme (50C)	1880	11.5	0.006093	2.5
Extreme (40C)	1880	13.8	0.007365	2.5
Extreme (30C)	1880	13.5	0.007198	2.5
Extreme (10C)	1880	13.6	0.007248	2.5
Extreme (0C)	1880	11.8	0.006264	2.5
Extreme (-10C)	1880	13.4	0.007102	2.5
Extreme (-20C)	1880	14.5	0.007705	2.5
Extreme (-30C)	1880	15.1	0.008011	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]
3.15	1880	9.6	0.005130	2.5
3.7	1880	8.6	0.004558	2.5
4.26	1880	7.8	0.004148	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	9.7	0.005144	2.5
Extreme (50C)	1880	8.6	0.004554	2.5
Extreme (40C)	1880	8.4	0.00446651	2.5
Extreme (30C)	1880	9.3	0.004931919	2.5
Extreme (10C)	1880	8.7	0.004645983	2.5
Extreme (0C)	1880	8.3	0.004440729	2.5
Extreme (-10C)	1880	8.9	0.004759442	2.5
Extreme (-20C)	1880	8.6	0.004578346	2.5
Extreme (-30C)	1880	7.6	0.004058659	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]
3.15	1732.5	9.1	0.005264	2.5
3.7	1732.5	8.6	0.004941	2.5
4.26	1732.5	8.4	0.004848	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	8.1	0.004683	2.5
Extreme (50C)	1732.5	8.5	0.004918	2.5
Extreme (40C)	1732.5	7.3	0.004194	2.5
Extreme (30C)	1732.5	5.5	0.003168	2.5
Extreme (10C)	1732.5	6.9	0.003972	2.5
Extreme (0C)	1732.5	9.6	0.005520	2.5
Extreme (-10C)	1732.5	8.4	0.004870	2.5
Extreme (-20C)	1732.5	6.7	0.003890	2.5
Extreme (-30C)	1732.5	8.1	0.004654	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	9.4	0.005419	2.5
3.7	1732.5	9.0	0.005198	2.5
4.26	1732.5	8.4	0.004845	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1732.5	10.2	0.005866	2.5
Extreme (50C)	1732.5	8.6	0.004969	2.5
Extreme (40C)	1732.5	8.2	0.004731	2.5
Extreme (30C)	1732.5	8.7	0.004994	2.5
Extreme (10C)	1732.5	9.4	0.005401	2.5
Extreme (0C)	1732.5	7.7	0.004418	2.5
Extreme (-10C)	1732.5	9.1	0.005260	2.5
Extreme (-20C)	1732.5	8.7	0.005021	2.5
Extreme (-30C)	1732.5	7.7	0.004424	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]
3.15	836.5	6.0	0.007134	2.5
3.7	836.5	6.7	0.008038	2.5
4.26	836.5	4.3	0.005176	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.0	0.007129	2.5
Extreme (50C)	836.5	6.2	0.007452	2.5
Extreme (40C)	836.5	5.9	0.007062	2.5
Extreme (30C)	836.5	6.7	0.008060	2.5
Extreme (10C)	836.5	5.1	0.006123	2.5
Extreme (0C)	836.5	5.8	0.006901	2.5
Extreme (-10C)	836.5	5.1	0.006101	2.5
Extreme (-20C)	836.5	6.0	0.007121	2.5
Extreme (-30C)	836.5	6.7	0.007956	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	5.5	0.006536	2.5
3.7	836.5	6.6	0.007913	2.5
4.26	836.5	4.4	0.005305	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	6.1	0.007266	2.5
Extreme (50C)	836.5	5.6	0.006753	2.5
Extreme (40C)	836.5	6.5	0.007761	2.5
Extreme (30C)	836.5	6.1	0.007335	2.5
Extreme (10C)	836.5	5.6	0.006709	2.5
Extreme (0C)	836.5	4.8	0.005771	2.5
Extreme (-10C)	836.5	5.9	0.007090	2.5
Extreme (-20C)	836.5	6.4	0.007616	2.5
Extreme (-30C)	836.5	6.7	0.008025	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]
3.15	2535	9.8	0.003849	2.5
3.7	2535	9.4	0.003702	2.5
4.26	2535	8.6	0.003390	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	9.4	0.003726	2.5
Extreme (50C)	2535	9.1	0.003592	2.5
Extreme (40C)	2535	8.4	0.003328	2.5
Extreme (30C)	2535	9.0	0.003568	2.5
Extreme (10C)	2535	8.4	0.003312	2.5
Extreme (0C)	2535	8.5	0.003341	2.5
Extreme (-10C)	2535	9.0	0.003552	2.5
Extreme (-20C)	2535	9.3	0.003662	2.5
Extreme (-30C)	2535	8.8	0.003454	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	6.9	0.002722	2.5
3.7	2535	6.7	0.002649	2.5
4.26	2535	5.3	0.002090	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	6.9	0.002722	2.5
Extreme (50C)	2535	5.3	0.002106	2.5
Extreme (40C)	2535	5.9	0.002314	2.5
Extreme (30C)	2535	7.1	0.002797	2.5
Extreme (10C)	2535	5.6	0.002196	2.5
Extreme (0C)	2535	5.4	0.002119	2.5
Extreme (-10C)	2535	5.1	0.001997	2.5
Extreme (-20C)	2535	5.6	0.002202	2.5
Extreme (-30C)	2535	5.4	0.002120	2.5

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

10.5 LTE BAND 38

Band 38 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	2595	8.2	0.003160	2.5
3.7	2595	9.0	0.003460	2.5
4.26	2595	8.4	0.003252	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	8.8	0.003405	2.5
Extreme (50C)	2595	8.1	0.003129	2.5
Extreme (40C)	2595	8.0	0.003093	2.5
Extreme (30C)	2595	7.9	0.003035	2.5
Extreme (10C)	2595	8.6	0.003307	2.5
Extreme (0C)	2595	6.4	0.002465	2.5
Extreme (-10C)	2595	8.8	0.003395	2.5
Extreme (-20C)	2595	8.9	0.003418	2.5
Extreme (-30C)	2595	5.8	0.002239	2.5

Band 38 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	2595	8.4	0.003243	2.5
3.7	2595	8.7	0.003354	2.5
4.26	2595	8.2	0.003169	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	8.9	0.003445	2.5
Extreme (50C)	2595	8.2	0.003173	2.5
Extreme (40C)	2595	8.2	0.003148	2.5
Extreme (30C)	2595	7.7	0.002978	2.5
Extreme (10C)	2595	8.3	0.003182	2.5
Extreme (0C)	2595	6.1	0.002349	2.5
Extreme (-10C)	2595	8.5	0.003277	2.5
Extreme (-20C)	2595	8.7	0.003337	2.5
Extreme (-30C)	2595	5.5	0.002115	2.5

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

10.6 LTE BAND 40A(2305MHz-2315MHz)

Band 40A 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	2310	9.0	0.003875	2.5
3.7	2310	9.0	0.003899	2.5
4.26	2310	8.8	0.003801	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2310	8.5	0.003681	2.5
Extreme (50C)	2310	7.7	0.003350	2.5
Extreme (40C)	2310	8.6	0.003733	2.5
Extreme (30C)	2310	7.7	0.003342	2.5
Extreme (10C)	2310	8.2	0.003543	2.5
Extreme (0C)	2310	6.0	0.002616	2.5
Extreme (-10C)	2310	8.5	0.003671	2.5
Extreme (-20C)	2310	8.9	0.003850	2.5
Extreme (-30C)	2310	5.2	0.002232	2.5

Band 40A 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	2310	8.6	0.003730	2.5
3.7	2310	8.7	0.003746	2.5
4.26	2310	8.4	0.003652	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2310	8.7	0.003776	2.5
Extreme (50C)	2310	8.1	0.003502	2.5
Extreme (40C)	2310	8.3	0.003573	2.5
Extreme (30C)	2310	7.5	0.003255	2.5
Extreme (10C)	2310	8.8	0.003796	2.5
Extreme (0C)	2310	6.0	0.002617	2.5
Extreme (-10C)	2310	8.9	0.003844	2.5
Extreme (-20C)	2310	8.2	0.003564	2.5
Extreme (-30C)	2310	5.6	0.002444	2.5

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

10.7 LTE BAND 40B(2350MHz-2360MHz)

Band 40B 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	2355	8.8	0.003746	2.5
3.7	2355	7.8	0.003329	2.5
4.26	2355	9.6	0.004096	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2355	8.8	0.003753	2.5
Extreme (50C)	2355	7.9	0.003374	2.5
Extreme (40C)	2355	8.8	0.003739	2.5
Extreme (30C)	2355	7.9	0.003374	2.5
Extreme (10C)	2355	8.6	0.003655	2.5
Extreme (0C)	2355	6.5	0.002754	2.5
Extreme (-10C)	2355	8.5	0.003603	2.5
Extreme (-20C)	2355	8.6	0.003637	2.5
Extreme (-30C)	2355	5.4	0.002297	2.5

Band 40B 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	2355	8.0	0.003413	2.5
3.7	2355	7.1	0.003023	2.5
4.26	2355	9.7	0.004113	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2355	8.7	0.003683	2.5
Extreme (50C)	2355	8.4	0.003568	2.5
Extreme (40C)	2355	8.6	0.003666	2.5
Extreme (30C)	2355	8.4	0.003563	2.5
Extreme (10C)	2355	8.7	0.003707	2.5
Extreme (0C)	2355	6.0	0.002555	2.5
Extreme (-10C)	2355	8.9	0.003791	2.5
Extreme (-20C)	2355	8.1	0.003441	2.5
Extreme (-30C)	2355	5.8	0.002454	2.5

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

10.8 LTE BAND 41

Band 41 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	2595	8.4	0.003227	2.5
3.7	2595	9.2	0.003564	2.5
4.26	2595	8.0	0.003088	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	8.4	0.003249	2.5
Extreme (50C)	2595	7.9	0.003050	2.5
Extreme (40C)	2595	8.1	0.003106	2.5
Extreme (30C)	2595	7.9	0.003062	2.5
Extreme (10C)	2595	8.7	0.003359	2.5
Extreme (0C)	2595	6.5	0.002490	2.5
Extreme (-10C)	2595	8.6	0.003316	2.5
Extreme (-20C)	2595	8.9	0.003447	2.5
Extreme (-30C)	2595	5.3	0.002050	2.5

Band 41 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	2595	9.2	0.003546	2.5
3.7	2595	8.6	0.003323	2.5
4.26	2595	8.5	0.003258	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2595	8.7	0.003367	2.5
Extreme (50C)	2595	8.2	0.003170	2.5
Extreme (40C)	2595	8.8	0.003400	2.5
Extreme (30C)	2595	8.3	0.003211	2.5
Extreme (10C)	2595	8.8	0.003388	2.5
Extreme (0C)	2595	6.3	0.002437	2.5
Extreme (-10C)	2595	8.5	0.003290	2.5
Extreme (-20C)	2595	8.5	0.003292	2.5
Extreme (-30C)	2595	5.2	0.001997	2.5

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

10.9 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	6.5	0.003728	2.5
3.7	1745	7.4	0.004230	2.5
4.26	1745	7.6	0.004357	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	6.0	0.003412	2.5
Extreme (50C)	1745	7.5	0.004296	2.5
Extreme (40C)	1745	6.0	0.003466	2.5
Extreme (30C)	1745	7.4	0.004224	2.5
Extreme (10C)	1745	7.8	0.004461	2.5
Extreme (0C)	1745	6.6	0.003765	2.5
Extreme (-10C)	1745	6.0	0.003426	2.5
Extreme (-20C)	1745	6.0	0.003452	2.5
Extreme (-30C)	1745	5.9	0.003386	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	8.5	0.004879	2.5
3.7	1745	7.9	0.004545	2.5
4.26	1745	9.6	0.005502	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	9.2	0.005270	2.5
Extreme (50C)	1745	8.1	0.004657	2.5
Extreme (40C)	1745	8.2	0.004682	2.5
Extreme (30C)	1745	8.4	0.004835	2.5
Extreme (10C)	1745	8.5	0.004894	2.5
Extreme (0C)	1745	6.3	0.003590	2.5
Extreme (-10C)	1745	9.0	0.005143	2.5
Extreme (-20C)	1745	8.3	0.004782	2.5
Extreme (-30C)	1745	5.7	0.003271	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.

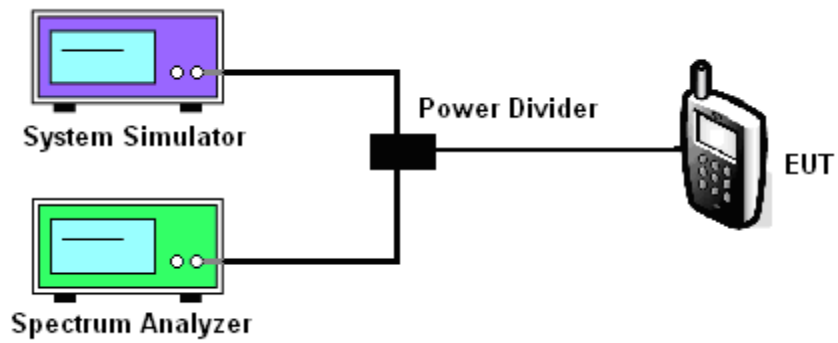
11.2 Measuring Instruments

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 2/4/5/7/38/40/41/66

Test data reference attachment.

-----END OF REPORT-----