

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

FCC ID: 2AXNU-1910

Product: Smart Phone

Trade Mark: ANT INTELLIGENT

Model Number: 1910

Family Model: N/A

Report No.: S20082800402005

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen KaiCheng Technology Co. Ltd
Address..... : Room 2005, 20th floor, Block C, DaChong business center, No.5 Tong Gu road, NanShan district, Shenzhen, China
Manufacturer's Name..... : Shenzhen KaiCheng Technology Co. Ltd
Address..... : Room 2005, 20th floor, Block C, DaChong business center, No.5 Tong Gu road, NanShan district, Shenzhen, China
Product name..... : Smart Phone
Model and/or type reference .. : 1910
Family Model: : N/A
Standards..... : FCC CFR 47 Part 22H, Part 24E, Part 27
Test procedure : ANSI C63.46:2015
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..... 28 Aug. 2020 ~ 18 Sep, 2020

Date of Issue 21 Sep, 2020

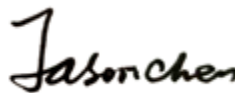
Test Result..... **Pass**

Testing Engineer :



(Cheng Jiawen)

Technical Manager :



(Jason Chen)

Authorized Signatory :



(Alex Li)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smart Phone
Trade Mark	ANT INTELLIGENT
Model Name	1910
Family Model	N/A
Model Difference	N/A
FCC ID:	2AXNU-1910
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
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:	FPC Antenna
Antenna gain:	1.68dBi,
Power Supply:	DC 3.85V/4000mAh from battery or DC 5V from Adapter.
Adapter:	Model: TPA-46050200UU Input: 100-240V~50/60Hz 0.3A Output: 5.0V $\overline{\text{---}}$ 2000mA
Extreme Vol. Limits:	DC 3.4V to DC 4.2V (Nominal DC 3.85V) (Note 1)
HW Version	1910EU-MAINBOARD-P1.1
SW Version	ASW1910QD_2201_T0285
** Note1: The High Voltage 4.2V and Low Voltage 3.4V 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: 2AXNU-1910** 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 C63.46:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

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

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.46:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

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

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

1.5 SPECIAL ACCESSORIES

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

1.6 WORST-CASE CONFIGURATION AND MODE

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

The device has LTE Bands of: Band 2, Band 4, Band 5, Band 7, Band 12, Band 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.

1.6 SUMMARY OF TEST RESULTS

FCC Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(c), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	

2.1051 22.917(a) 24.238(a) 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
Remark: 1. "N/A" denotes test is not applicable in this Test Report. 2. All test items were verified and recorded according to the standards and without any deviation during the test. 3. No modifications are made to the EUT during all test items.			

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

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

2.3 CONFIGURATION OF EUT SYSTEM

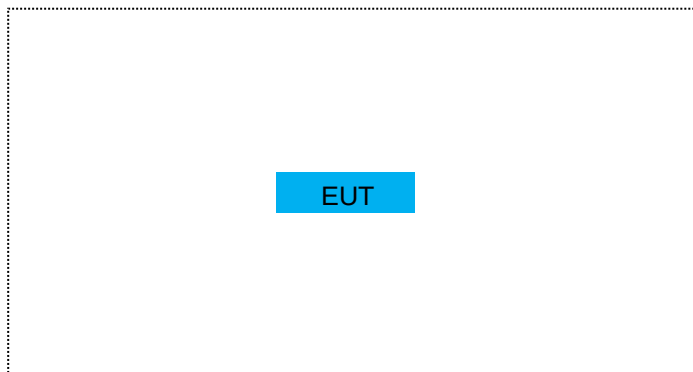
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Smart Phone	1910	FCC ID: 2AXNU-1910	EUT

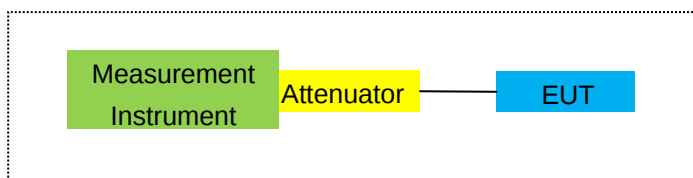
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

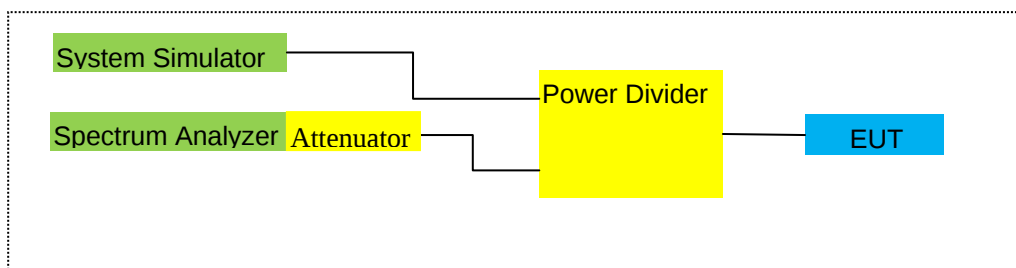
For Radiated Test Cases



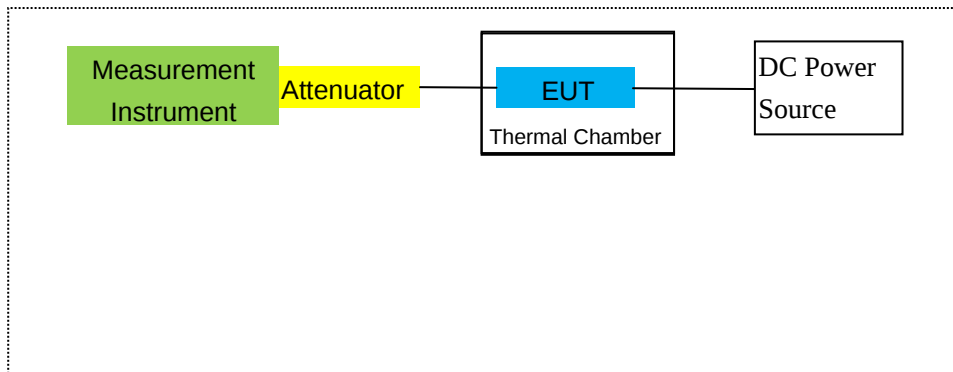
For Conducted Output Power



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	2020.07.13	2021.07.12	1 year
2	Test Receiver	R&S	ESPI	101318	2020.05.11	2021.05.10	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2020.04.11	2021.04.10	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2020.04.11	2021.04.10	1 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2019.12.10	2020.12.09	1 year
7	Amplifier	EM	EM-30180	060538	2020.07.13	2021.07.12	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2020.05.11	2021.05.10	1 year
9	Power Meter	R&S	NRVS	100696	2020.07.13	2021.07.12	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2020.05.11	2021.05.10	1 year
11	Test Cable	N/A	R-01	N/A	2019.08.06	2022.08.05	3 year
12	Test Cable	N/A	R-02	N/A	2020.07.13	2021.07.12	1 year
13	Test Cable	N/A	R-03	N/A	2019.06.28	2022.06.27	3 year
14	Test Receiver	R&S	ESCI	101160	2020.05.11	2021.05.10	1 year
15	LISN	R&S	ENV216	101313	2020.05.11	2021.05.10	1 year
16	LISN	EMCO	3816/2	00042990	2020.05.11	2021.05.10	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2020.05.11	2021.05.10	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.04.11	2021.04.10	1 year
19	Test Cable	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
20	Test Cable	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
21	Test Cable	N/A	C03	N/A	2020.05.11	2021.05.10	1 year
22	Attenuator	MCE	24-10-34	BN9258	2020.05.11	2021.05.10	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2020.05.11	2021.05.10	1 year
24	test receiver	R&S	ESCI	a0304218	2020.05.11	2021.05.10	1 year
25	Communication Tester	R&S	CMU200	A0304247	2020.07.13	2021.07.12	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2020.05.11	2021.05.10	1 year

27	DC Power Source	N/A	PS-6005D	2017040292 3	2020.07.13	2021.07.12	1 year
28	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2020.07.13	2021.07.12	1 year
29	Communication Tester	R&S	CMW500	148500	2020.05.11	2021.05.10	1 year

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

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

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

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

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

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
64 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
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

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

FCC: §2.1046, §22.913, §24.232

LIMITS

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

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

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

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

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

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

TEST PROCEDURE

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

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

Set display line

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

MODES TESTED

- ☐ LTE Band 2/4/5/7/12/17

RESULTS

Test data reference attachment.

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

7. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

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

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

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

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

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

- ☐ LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 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.

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

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

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

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

MODES TESTED

- ☐ LTE Band2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/ RB Position	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	1850.7	-1.49	3.76	28.24	22.99	199.067	Horizontal	Pass
		1880	-0.73	3.91	28.22	23.58	228.034	Horizontal	Pass
		1909.3	-1.76	3.93	28.20	22.51	178.238	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-0.77	3.77	28.23	23.69	233.884	Horizontal	Pass
		1880	-1.07	3.91	28.24	23.26	211.836	Horizontal	Pass
		1908.5	-1.18	3.94	28.25	23.13	205.589	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-1.63	3.77	28.31	22.91	195.434	Horizontal	Pass
		1880	-1.34	3.91	28.22	22.97	198.153	Horizontal	Pass
		1907.5	-0.53	3.94	28.20	23.73	236.048	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1855	-1.31	3.79	28.33	23.23	210.378	Horizontal	Pass
		1880	-1.05	3.95	28.22	23.22	209.894	Horizontal	Pass
		1905	-0.51	3.97	28.19	23.71	234.963	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1857.5	-1.68	3.79	28.34	22.87	193.642	Horizontal	Pass
		1880	-0.57	3.95	28.22	23.70	234.423	Horizontal	Pass
		1902.5	-0.26	3.97	28.18	23.95	248.313	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1860	-0.84	3.81	28.35	23.70	234.423	Horizontal	Pass
		1880	-1.34	3.96	28.22	22.92	195.884	Horizontal	Pass
		1900	-0.51	4.00	28.16	23.65	231.739	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1850.7	-0.83	3.76	28.24	23.65	231.739	Vertical	Pass
		1880	-0.42	3.91	28.22	23.89	244.906	Vertical	Pass
		1909.3	-1.31	3.93	28.20	22.96	197.697	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1851.5	-1.43	3.77	28.23	23.03	200.909	Vertical	Pass
		1880	-0.91	3.91	28.24	23.42	219.786	Vertical	Pass
		1908.5	-0.43	3.94	28.25	23.88	244.343	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1852.5	-0.51	3.77	28.31	24.03	252.930	Vertical	Pass
		1880	-0.26	3.91	28.22	24.05	254.097	Vertical	Pass
		1907.5	-0.28	3.94	28.20	23.98	250.035	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1855	-1.21	3.79	28.33	23.33	215.278	Vertical	Pass
		1880	-1.22	3.95	28.22	23.05	201.837	Vertical	Pass
		1905	-1.96	3.97	28.19	22.26	168.267	Vertical	Pass
15.0MHz Band	1/#Mid	1857.5	-1.85	3.79	28.34	22.70	186.209	Vertical	Pass
		1880	-1.02	3.95	28.22	23.25	211.349	Vertical	Pass

QPSK		1902.5	-1.64	3.97	28.18	22.57	180.717	Vertical	Pass
20.0MHz	1/#Mid	1860	-1.52	3.81	28.35	23.02	200.447	Vertical	Pass
Band		1880	-1.61	3.96	28.22	22.65	184.077	Vertical	Pass
QPSK		1900	0.00	4.00	28.16	24.16	260.735	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 2									
Mode	RB/ RB Position	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 16 QAM	1/#Mid	1850.7	-2.11	3.76	28.24	22.37	172.584	Horizontal	Pass
		1880	-2.08	3.91	28.22	22.23	167.109	Horizontal	Pass
		1909.3	-1.73	3.93	28.20	22.54	179.473	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-2.27	3.77	28.23	22.19	165.577	Horizontal	Pass
		1880	-0.87	3.91	28.24	23.46	221.820	Horizontal	Pass
		1908.5	-1.91	3.94	28.25	22.40	173.780	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-2.08	3.77	28.31	22.46	176.198	Horizontal	Pass
		1880	-1.13	3.91	28.22	23.18	207.970	Horizontal	Pass
		1907.5	-1.86	3.94	28.20	22.40	173.780	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-1.23	3.79	28.33	23.31	214.289	Horizontal	Pass
		1880	-1.94	3.95	28.22	22.33	171.002	Horizontal	Pass
		1905	-1.27	3.97	28.19	22.95	197.242	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.23	3.79	28.34	23.32	214.783	Horizontal	Pass
		1880	-1.05	3.95	28.22	23.22	209.894	Horizontal	Pass
		1902.5	-1.39	3.97	28.18	22.82	191.426	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1860	-1.30	3.81	28.35	23.24	210.863	Horizontal	Pass
		1880	-1.29	3.96	28.22	22.97	198.153	Horizontal	Pass
		1900	-1.73	4.00	28.16	22.43	174.985	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1850.7	-1.74	3.76	28.24	22.74	187.932	Vertical	Pass
		1880	-1.85	3.91	28.22	22.46	176.198	Vertical	Pass
		1909.3	-1.81	3.93	28.20	22.46	176.198	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1851.5	-0.98	3.77	28.23	23.48	222.844	Vertical	Pass
		1880	-1.14	3.91	28.24	23.19	208.449	Vertical	Pass
		1908.5	-1.59	3.94	28.25	22.72	187.068	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1852.5	-1.50	3.77	28.31	23.04	201.372	Vertical	Pass
		1880	-1.49	3.91	28.22	22.82	191.426	Vertical	Pass
		1907.5	-1.61	3.94	28.20	22.65	184.077	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1855	-1.75	3.79	28.33	22.79	190.108	Vertical	Pass
		1880	-1.75	3.95	28.22	22.52	178.649	Vertical	Pass
		1905	-2.09	3.97	28.19	22.13	163.305	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1857.5	-1.65	3.79	28.34	22.90	194.984	Vertical	Pass
		1880	-2.40	3.95	28.22	21.87	153.815	Vertical	Pass
		1902.5	-1.61	3.97	28.18	22.60	181.970	Vertical	Pass

20.0MHz	1/#Mid	1860	-1.49	3.81	28.35	23.05	201.837	Vertical	Pass
Band 16		1880	-0.72	3.96	28.22	23.54	226.100	Vertical	Pass
QAM		1900	-2.20	4.00	28.16	21.96	157.036	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/ RB Position	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	-0.91	3.12	27.58	23.55	226.464	Horizontal	Pass
		1732.5	-0.70	3.27	27.61	23.64	231.206	Horizontal	Pass
		1754.3	-1.22	3.29	27.63	23.12	205.116	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-2.47	3.13	27.61	22.01	158.855	Horizontal	Pass
		1732.5	-2.60	3.27	27.61	21.74	149.279	Horizontal	Pass
		1753.5	-2.27	3.30	27.62	22.05	160.325	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-1.95	3.13	27.63	22.55	179.887	Horizontal	Pass
		1732.5	-3.08	3.27	27.61	21.26	133.660	Horizontal	Pass
		1752.5	-0.88	3.30	27.60	23.42	219.786	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	1715	-1.54	3.15	27.64	22.95	197.242	Horizontal	Pass
		1732.5	-1.04	3.31	27.61	23.26	211.836	Horizontal	Pass
		1750	-0.91	3.33	27.59	23.35	216.272	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	1717.5	-1.54	3.15	27.65	22.96	197.697	Horizontal	Pass
		1732.5	-1.24	3.31	27.61	23.06	202.302	Horizontal	Pass
		1747.5	-1.08	3.33	27.57	23.16	207.014	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	1720	-2.19	3.17	27.66	22.30	169.824	Horizontal	Pass
		1732.5	-1.04	3.32	27.61	23.25	211.349	Horizontal	Pass
		1745	-1.20	3.36	27.56	23.00	199.526	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	1710.7	-1.14	3.12	27.58	23.32	214.783	Vertical	Pass
		1732.5	-1.97	3.27	27.61	22.37	172.584	Vertical	Pass
		1754.3	-2.21	3.29	27.63	22.13	163.305	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	1711.5	-0.92	3.13	27.61	23.56	226.986	Vertical	Pass
		1732.5	-0.44	3.27	27.61	23.90	245.471	Vertical	Pass
		1753.5	-1.18	3.30	27.62	23.14	206.063	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	1712.5	-2.46	3.13	27.63	22.04	159.956	Vertical	Pass
		1732.5	-1.86	3.27	27.61	22.48	177.011	Vertical	Pass
		1752.5	-2.22	3.30	27.60	22.08	161.436	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	1715	-2.14	3.15	27.64	22.35	171.791	Vertical	Pass
		1732.5	-1.79	3.31	27.61	22.51	178.238	Vertical	Pass
		1750	-1.03	3.33	27.59	23.23	210.378	Vertical	Pass
15.0MHz	1/#Mid	1717.5	-2.00	3.15	27.65	22.50	177.828	Vertical	Pass

Band QPSK		1732.5	-1.49	3.31	27.61	22.81	190.985	Vertical	Pass
		1747.5	-1.98	3.33	27.57	22.26	168.267	Vertical	Pass
20.0MHz	1/#Mid	1720	-1.43	3.17	27.66	23.06	202.302	Vertical	Pass
Band		1732.5	-0.37	3.32	27.61	23.92	246.604	Vertical	Pass
QPSK		1745	-0.87	3.36	27.56	23.33	215.278	Vertical	Pass

Note:

SG Level= Signal generator output

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

Radiated Power (EIRP) for Band 4									
Mode	RB/ RB Position	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 16 QAM	1/#Mid	1710.7	-2.13	3.12	27.58	22.33	171.002	Horizontal	Pass
		1732.5	-1.09	3.27	27.61	23.25	211.349	Horizontal	Pass
		1754.3	-2.13	3.29	27.63	22.21	166.341	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-2.27	3.13	27.61	22.21	166.341	Horizontal	Pass
		1732.5	-3.34	3.27	27.61	21.00	125.893	Horizontal	Pass
		1753.5	-2.16	3.30	27.62	22.16	164.437	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-2.25	3.13	27.63	22.25	167.880	Horizontal	Pass
		1732.5	-2.51	3.27	27.61	21.83	152.405	Horizontal	Pass
		1752.5	-1.58	3.30	27.60	22.72	187.068	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-2.36	3.15	27.64	22.13	163.305	Horizontal	Pass
		1732.5	-1.93	3.31	27.61	22.37	172.584	Horizontal	Pass
		1750	-2.63	3.33	27.59	21.63	145.546	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.45	3.15	27.65	22.05	160.325	Horizontal	Pass
		1732.5	-1.08	3.31	27.61	23.22	209.894	Horizontal	Pass
		1747.5	-1.81	3.33	27.57	22.43	174.985	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	1720	-1.47	3.17	27.66	23.02	200.447	Horizontal	Pass
		1732.5	-1.30	3.32	27.61	22.99	199.067	Horizontal	Pass
		1745	-1.79	3.36	27.56	22.41	174.181	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	1710.7	-1.86	3.12	27.58	22.60	181.970	Vertical	Pass
		1732.5	-1.60	3.27	27.61	22.74	187.932	Vertical	Pass
		1754.3	-2.17	3.29	27.63	22.17	164.816	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	1711.5	-1.98	3.13	27.61	22.50	177.828	Vertical	Pass
		1732.5	-3.33	3.27	27.61	21.01	126.183	Vertical	Pass
		1753.5	-2.62	3.30	27.62	21.70	147.911	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	1712.5	-2.52	3.13	27.63	21.98	157.761	Vertical	Pass
		1732.5	-1.93	3.27	27.61	22.41	174.181	Vertical	Pass
		1752.5	-2.07	3.30	27.60	22.23	167.109	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	1715	-1.76	3.15	27.64	22.73	187.499	Vertical	Pass
		1732.5	-2.07	3.31	27.61	22.23	167.109	Vertical	Pass
		1750	-1.57	3.33	27.59	22.69	185.780	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	1717.5	-2.04	3.15	27.65	22.46	176.198	Vertical	Pass
		1732.5	-2.61	3.31	27.61	21.69	147.571	Vertical	Pass
		1747.5	-1.48	3.33	27.57	22.76	188.799	Vertical	Pass

20.0MHz	1/#Mid	1720	-1.37	3.17	27.66	23.12	205.116	Vertical	Pass
Band 16		1732.5	-1.15	3.32	27.61	23.14	206.063	Vertical	Pass
QAM		1745	-0.93	3.36	27.56	23.27	212.324	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	1/#Mid	824.7	7.66	2.01	19.68	2.15	23.18	207.970	Horizontal	Pass
		836.5	7.53	2.01	19.77	2.15	23.14	206.063	Horizontal	Pass
		848.3	6.94	2.02	19.82	2.15	22.59	181.552	Horizontal	Pass
3.0MHz Band QPSK	1/#Mid	825.5	8.22	2.01	19.70	2.15	23.76	237.684	Horizontal	Pass
		836.5	7.65	2.01	19.77	2.15	23.26	211.836	Horizontal	Pass
		847.5	8.15	2.02	19.81	2.15	23.79	239.332	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	826.5	8.13	2.01	19.71	2.15	23.68	233.346	Horizontal	Pass
		836.5	7.69	2.01	19.77	2.15	23.30	213.796	Horizontal	Pass
		846.5	8.18	2.02	19.79	2.15	23.80	239.883	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	829	7.61	2.01	19.73	2.15	23.18	207.970	Horizontal	Pass
		836.5	8.54	2.01	19.77	2.15	24.15	260.016	Horizontal	Pass
		844	7.06	2.02	19.78	2.15	22.67	184.927	Horizontal	Pass
1.4MHz Band QPSK	1/#Mid	824.7	8.69	2.01	19.68	2.15	24.21	263.633	Vertical	Pass
		836.5	8.24	2.01	19.77	2.15	23.85	242.661	Vertical	Pass
		848.3	7.22	2.02	19.82	2.15	22.87	193.642	Vertical	Pass
3.0MHz Band QPSK	1/#Mid	825.5	7.30	2.01	19.70	2.15	22.84	192.309	Vertical	Pass
		836.5	7.94	2.01	19.77	2.15	23.55	226.464	Vertical	Pass
		847.5	8.16	2.02	19.81	2.15	23.80	239.883	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	826.5	7.99	2.01	19.71	2.15	23.54	225.944	Vertical	Pass
		836.5	6.72	2.01	19.77	2.15	22.33	171.002	Vertical	Pass
		846.5	8.57	2.02	19.79	2.15	24.19	262.422	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	829	8.22	2.01	19.73	2.15	23.79	239.332	Vertical	Pass
		836.5	8.71	2.01	19.77	2.15	24.32	270.396	Vertical	Pass
		844	7.53	2.02	19.78	2.15	23.14	206.063	Vertical	Pass

Radiated Power (ERP) for Band 5

Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mid	824.7	7.41	2.01	19.68	2.15	22.93	196.336	Horizontal	Pass
		836.5	7.62	2.01	19.77	2.15	23.23	210.378	Horizontal	Pass
		848.3	6.97	2.02	19.82	2.15	22.62	182.810	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	7.07	2.01	19.70	2.15	22.61	182.390	Horizontal	Pass
		836.5	7.48	2.01	19.77	2.15	23.09	203.704	Horizontal	Pass
		847.5	7.21	2.02	19.81	2.15	22.85	192.752	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	7.88	2.01	19.71	2.15	23.43	220.293	Horizontal	Pass
		836.5	6.69	2.01	19.77	2.15	22.30	169.824	Horizontal	Pass
		846.5	7.73	2.02	19.79	2.15	23.35	216.272	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.16	2.01	19.73	2.15	22.73	187.499	Horizontal	Pass
		836.5	6.66	2.01	19.77	2.15	22.27	168.655	Horizontal	Pass
		844	6.57	2.02	19.78	2.15	22.18	165.196	Horizontal	Pass
1.4MHz Band 16 QAM	1/#Mid	824.7	7.55	2.01	19.68	2.15	23.07	202.768	Vertical	Pass
		836.5	6.50	2.01	19.77	2.15	22.11	162.555	Vertical	Pass
		848.3	6.41	2.02	19.82	2.15	22.06	160.694	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mid	825.5	6.88	2.01	19.70	2.15	22.42	174.582	Vertical	Pass
		836.5	7.26	2.01	19.77	2.15	22.87	193.642	Vertical	Pass
		847.5	6.69	2.02	19.81	2.15	22.33	171.002	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	826.5	6.37	2.01	19.71	2.15	21.92	155.597	Vertical	Pass
		836.5	7.37	2.01	19.77	2.15	22.98	198.609	Vertical	Pass
		846.5	7.71	2.02	19.79	2.15	23.33	215.278	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	829	7.30	2.01	19.73	2.15	22.87	193.642	Vertical	Pass
		836.5	7.83	2.01	19.77	2.15	23.44	220.800	Vertical	Pass
		844	6.75	2.02	19.78	2.15	22.36	172.187	Vertical	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB Position	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	0.95	4.54	27.75	24.16	260.615	Horizontal	Pass
		2535	1.24	4.69	27.72	24.27	267.301	Horizontal	Pass
		2567.5	1.64	4.71	27.71	24.64	291.072	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.69	4.55	27.76	23.90	245.471	Horizontal	Pass
		2535	0.15	4.69	27.72	23.18	207.970	Horizontal	Pass
		2565	0.54	4.72	27.70	23.52	224.905	Horizontal	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	1.44	4.55	27.77	24.66	292.415	Horizontal	Pass
		2535	1.36	4.69	27.72	24.39	274.789	Horizontal	Pass
		2562.5	0.44	4.72	27.69	23.41	219.280	Horizontal	Pass
20.0MHz Band QPSK	1/#Mid	2510	0.57	4.57	27.78	23.78	238.781	Horizontal	Pass
		2535	0.32	4.73	27.72	23.31	214.289	Horizontal	Pass
		2560	1.57	4.75	27.68	24.50	281.838	Horizontal	Pass
5.0MHz Band QPSK	1/#Mid	2502.5	0.63	4.54	27.75	23.84	242.103	Vertical	Pass
		2535	0.59	4.69	27.72	23.62	230.144	Vertical	Pass
		2567.5	0.45	4.71	27.71	23.45	221.309	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	2505	0.84	4.55	27.76	24.05	254.097	Vertical	Pass
		2535	0.92	4.69	27.72	23.95	248.313	Vertical	Pass
		2565	0.15	4.72	27.70	23.13	205.589	Vertical	Pass
15.0MHz Band QPSK	1/#Mid	2507.5	0.94	4.55	27.77	24.16	260.615	Vertical	Pass
		2535	0.71	4.69	27.72	23.74	236.592	Vertical	Pass
		2562.5	1.30	4.72	27.69	24.27	267.301	Vertical	Pass
20.0MHz Band QPSK	1/#Mid	2510	1.36	4.57	27.78	24.57	286.418	Vertical	Pass
		2535	1.23	4.73	27.72	24.22	264.241	Vertical	Pass
		2560	1.78	4.75	27.68	24.71	295.801	Vertical	Pass

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB Position	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	-0.80	4.54	27.75	22.41	174.181	Horizontal	Pass
		2535	-0.09	4.69	27.72	22.94	196.789	Horizontal	Pass
		2567.5	0.47	4.71	27.71	23.48	222.587	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	0.59	4.55	27.76	23.80	239.883	Horizontal	Pass
		2535	-0.03	4.69	27.72	23.00	199.526	Horizontal	Pass
		2565	0.15	4.72	27.70	23.13	205.589	Horizontal	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	-0.02	4.55	27.77	23.20	208.930	Horizontal	Pass
		2535	-0.15	4.69	27.72	22.88	194.089	Horizontal	Pass
		2562.5	0.46	4.72	27.69	23.43	220.293	Horizontal	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.26	4.57	27.78	23.47	222.126	Horizontal	Pass
		2535	0.48	4.73	27.72	23.47	222.075	Horizontal	Pass
		2560	-0.33	4.75	27.68	22.60	181.970	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mid	2502.5	-0.24	4.54	27.75	22.97	198.153	Vertical	Pass
		2535	0.04	4.69	27.72	23.07	202.768	Vertical	Pass
		2567.5	-0.42	4.71	27.71	22.58	181.134	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	2505	-0.50	4.55	27.76	22.71	186.638	Vertical	Pass
		2535	-0.49	4.69	27.72	22.54	179.473	Vertical	Pass
		2565	0.51	4.72	27.70	23.49	223.254	Vertical	Pass
15.0MHz Band 16 QAM	1/#Mid	2507.5	0.46	4.55	27.77	23.68	233.346	Vertical	Pass
		2535	0.33	4.69	27.72	23.36	216.770	Vertical	Pass
		2562.5	0.29	4.72	27.69	23.26	211.836	Vertical	Pass
20.0MHz Band 16 QAM	1/#Mid	2510	0.76	4.57	27.78	23.97	249.459	Vertical	Pass
		2535	0.64	4.73	27.72	23.63	230.675	Vertical	Pass
		2560	0.50	4.75	27.68	23.43	220.293	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.5 LTE BAND 12

Radiated Power (ERP) for Band 12									
Mode	RB/ RB Position	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	699.7	8.65	1.91	19.21	2.15	23.80	239.883	Vertical
		707.5	7.79	1.91	19.26	2.15	22.99	199.067	Vertical
		715.3	7.17	1.93	19.34	2.15	22.43	174.985	Vertical
3.0MHz Band QPSK	1/#Mid	700.5	8.22	1.91	19.21	2.15	23.37	217.270	Vertical
		707.5	7.75	1.91	19.26	2.15	22.95	197.242	Vertical
		714.5	7.40	1.93	19.34	2.15	22.66	184.502	Vertical
5.0MHz Band QPSK	1/#Mid	701.5	7.48	1.91	19.23	2.15	22.65	184.077	Vertical
		707.5	8.28	1.91	19.26	2.15	23.48	222.844	Vertical
		713.5	7.64	1.92	19.33	2.15	22.90	194.984	Vertical
10.0MHz Band QPSK	1/#Mid	704	7.89	1.91	19.25	2.15	23.08	203.236	Vertical
		707.5	8.18	1.91	19.26	2.15	23.38	217.771	Vertical
		711	8.18	1.92	19.32	2.15	23.43	220.293	Vertical
1.4MHz Band QPSK	1/#Mid	699.7	8.26	1.91	19.21	2.15	23.41	219.280	Horizontal
		707.5	7.57	1.91	19.26	2.15	22.77	189.234	Horizontal
		715.3	7.60	1.93	19.34	2.15	22.86	193.197	Horizontal
3.0MHz Band QPSK	1/#Mid	700.5	7.60	1.91	19.21	2.15	22.75	188.365	Horizontal
		707.5	7.48	1.91	19.26	2.15	22.68	185.353	Horizontal
		714.5	8.07	1.93	19.34	2.15	23.33	215.278	Horizontal
5.0MHz Band QPSK	1/#Mid	701.5	8.08	1.91	19.23	2.15	23.25	211.349	Horizontal
		707.5	8.68	1.91	19.26	2.15	23.88	244.343	Horizontal
		713.5	8.26	1.92	19.33	2.15	23.52	224.905	Horizontal
10.0MHz Band QPSK	1/#Mid	704	8.78	1.91	19.25	2.15	23.97	249.459	Horizontal
		707.5	7.00	1.91	19.26	2.15	22.20	165.959	Horizontal
		711	7.47	1.92	19.32	2.15	22.72	187.068	Horizontal

Radiated Power (EIRP) for Band 12										
Mode	RB/ RB Positi on	Freque ncy	Result							Conclusi on
			SG Level (dBm)	Cable Loss (dBm)	Antenn a Gain (dB)	Correct ion (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	1/#Mi d	699.7	7.31	1.91	19.21	2.15	22.46	176.198	Vertical	Pass
		707.5	6.37	1.91	19.26	2.15	21.57	143.549	Vertical	Pass
		715.3	6.08	1.93	19.34	2.15	21.34	136.144	Vertical	Pass
3.0MHz Band 16 QAM	1/#Mi d	700.5	7.32	1.91	19.21	2.15	22.47	176.604	Vertical	Pass
		707.5	7.20	1.91	19.26	2.15	22.40	173.780	Vertical	Pass
		714.5	6.82	1.93	19.34	2.15	22.08	161.436	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mi d	701.5	6.97	1.91	19.23	2.15	22.14	163.682	Vertical	Pass
		707.5	6.87	1.91	19.26	2.15	22.07	161.065	Vertical	Pass
		713.5	6.95	1.92	19.33	2.15	22.21	166.341	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mi d	704	7.20	1.91	19.25	2.15	22.39	173.380	Vertical	Pass
		707.5	6.97	1.91	19.26	2.15	22.17	164.816	Vertical	Pass
		711	7.51	1.92	19.32	2.15	22.76	188.799	Vertical	Pass
1.4MHz Band 16 QAM	1/#Mi d	699.7	6.87	1.91	19.21	2.15	22.02	159.221	Horizontal	Pass
		707.5	7.11	1.91	19.26	2.15	22.31	170.216	Horizontal	Pass
		715.3	7.13	1.93	19.34	2.15	22.39	173.380	Horizontal	Pass
3.0MHz Band 16 QAM	1/#Mi d	700.5	7.38	1.91	19.21	2.15	22.53	179.061	Horizontal	Pass
		707.5	7.05	1.91	19.26	2.15	22.25	167.880	Horizontal	Pass
		714.5	7.40	1.93	19.34	2.15	22.66	184.502	Horizontal	Pass
5.0MHz Band 16 QAM	1/#Mi d	701.5	7.44	1.91	19.23	2.15	22.61	182.390	Horizontal	Pass
		707.5	7.25	1.91	19.26	2.15	22.45	175.792	Horizontal	Pass
		713.5	6.73	1.92	19.33	2.15	21.99	158.125	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mi d	704	7.13	1.91	19.25	2.15	22.32	170.608	Horizontal	Pass
		707.5	7.66	1.91	19.26	2.15	22.86	193.375	Horizontal	Pass
		711	7.15	1.92	19.32	2.15	22.40	173.780	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

8.6 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/ RB Position	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	
5.0MHz Band QPSK	1/#Mid	706.5	7.31	1.91	19.23	2.15	22.48	177.011	Vertical	Pass
		710	7.90	1.91	19.26	2.15	23.10	204.174	Vertical	Pass
		713.5	7.89	1.92	19.33	2.15	23.15	206.538	Vertical	Pass
10.0MHz Band QPSK	1/#Mid	709	6.62	1.91	19.25	2.15	21.81	151.705	Vertical	Pass
		710	7.59	1.91	19.26	2.15	22.79	190.108	Vertical	Pass
		711	8.39	1.92	19.32	2.15	23.64	231.206	Vertical	Pass
5.0MHz Band QPSK	1/#Mid	706.5	7.90	1.91	19.23	2.15	23.07	202.768	Horizontal	Pass
		710	8.39	1.91	19.26	2.15	23.59	228.560	Horizontal	Pass
		713.5	7.40	1.92	19.33	2.15	22.66	184.502	Horizontal	Pass
10.0MHz Band QPSK	1/#Mid	709	8.19	1.91	19.25	2.15	23.38	217.771	Horizontal	Pass
		710	8.17	1.91	19.26	2.15	23.37	217.270	Horizontal	Pass
		711	8.54	1.92	19.32	2.15	23.79	239.332	Horizontal	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/ RB Positi on	Frequenc y	Result							Conclusio n
			SG Level (dBm)	Cable Loss (dBm)	Antenn a Gain (dB)	Correcti on (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	1/#Mid	706.5	7.59	1.91	19.23	2.15	22.76	188.799	Vertical	Pass
		710	7.61	1.91	19.26	2.15	22.81	190.985	Vertical	Pass
		713.5	7.43	1.92	19.33	2.15	22.69	185.780	Vertical	Pass
10.0MHz Band 16 QAM	1/#Mid	709	7.14	1.91	19.25	2.15	22.33	171.002	Vertical	Pass
		710	6.47	1.91	19.26	2.15	21.67	146.893	Vertical	Pass
		711	7.32	1.92	19.32	2.15	22.57	180.717	Vertical	Pass
5.0MHz Band 16 QAM	1/#Mid	706.5	6.54	1.91	19.23	2.15	21.71	148.252	Horizontal	Pass
		710	7.70	1.91	19.26	2.15	22.90	194.984	Horizontal	Pass
		713.5	6.82	1.92	19.33	2.15	22.08	161.436	Horizontal	Pass
10.0MHz Band 16 QAM	1/#Mid	709	7.07	1.91	19.25	2.15	22.26	168.267	Horizontal	Pass
		710	7.86	1.91	19.26	2.15	23.06	202.302	Horizontal	Pass
		711	7.57	1.92	19.32	2.15	22.82	191.426	Horizontal	Pass

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

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

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

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

LIMIT

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

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

TEST PROCEDURE

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

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

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

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

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

MODES TESTED

- ☐ LTE Band 2
LTE Band 4
- ☐ LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-48.57	4.04	33.51	-19.10	-13	-6.10	Horizontal
3701.4	-54.22	4.04	33.51	-24.75	-13	-11.75	Vertical
5552.1	-50.78	5.24	35.84	-20.18	-13	-7.18	Vertical
5552.1	-50.03	5.24	35.84	-19.43	-13	-6.43	Horizontal
269.4	-43.91	1.54	18.00	-27.45	-13	-14.45	Vertical
163.5	-41.14	1.75	16.52	-26.37	-13	-13.37	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-53.57	4.04	33.56	-24.05	-13	-11.05	Horizontal
3760.0	-50.07	4.04	33.56	-20.55	-13	-7.55	Vertical
5640.0	-46.48	5.24	35.91	-15.81	-13	-2.81	Vertical
5640.0	-56.90	5.24	35.91	-26.23	-13	-13.23	Horizontal
259.2	-41.79	1.54	16.07	-27.26	-13	-14.26	Vertical
255.8	-47.27	1.42	15.74	-32.95	-13	-19.95	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-54.02	4.04	34.00	-24.06	-13	-11.06	Horizontal
3818.6	-51.54	4.04	34.00	-21.58	-13	-8.58	Vertical
5727.9	-56.58	5.24	36.04	-25.78	-13	-12.78	Vertical
5727.9	-52.37	5.24	36.04	-21.57	-13	-8.57	Horizontal
136.5	-45.59	1.35	15.84	-31.10	-13	-18.10	Vertical
196.9	-42.65	1.44	16.74	-27.35	-13	-14.35	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	-48.55	4.07	33.54	-19.08	-13	-6.08	Horizontal
3720.0	-55.03	4.07	33.54	-25.56	-13	-12.56	Vertical
5580.0	-54.71	5.28	35.86	-24.13	-13	-11.13	Vertical
5580.0	-51.65	5.28	35.86	-21.07	-13	-8.07	Horizontal
242.4	-41.70	1.64	16.92	-26.42	-13	-13.42	Vertical
137.5	-40.81	1.39	15.72	-26.48	-13	-13.48	Horizontal
Test Results for Mid Channel 1880MHz							
3760.0	-47.98	4.04	33.56	-18.46	-13	-5.46	Horizontal
3760.0	-53.39	4.04	33.56	-23.87	-13	-10.87	Vertical
5640.0	-49.58	5.24	35.91	-18.91	-13	-5.91	Vertical
5640.0	-58.59	5.24	35.91	-27.92	-13	-14.92	Horizontal
232.2	-47.44	1.57	17.24	-31.77	-13	-18.77	Vertical
116.5	-40.67	1.60	16.02	-26.25	-13	-13.25	Horizontal
Test Results for High Channel 1900MHz							
3800.0	-52.06	4.04	34.00	-22.10	-13	-9.10	Horizontal
3800.0	-50.21	4.04	34.00	-20.25	-13	-7.25	Vertical
5700.0	-55.06	5.24	36.04	-24.26	-13	-11.26	Vertical
5700.0	-54.60	5.24	36.04	-23.80	-13	-10.80	Horizontal
159.6	-47.19	1.37	16.79	-31.77	-13	-18.77	Vertical
82.8	-42.61	1.51	16.71	-27.41	-13	-14.41	Horizontal

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

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

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

9.2 LTE BAND 4

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

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3421.4	-49.67	4.02	29.80	-23.89	-13	-10.89	Horizontal
3421.4	-50.41	4.02	29.80	-24.63	-13	-11.63	Vertical
5132.1	-54.77	5.24	35.84	-24.17	-13	-11.17	Vertical
5132.1	-53.52	5.24	35.84	-22.92	-13	-9.92	Horizontal
191.1	-38.35	1.53	15.81	-24.07	-13	-11.07	Vertical
104.1	-46.96	1.48	17.16	-31.28	-13	-18.28	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-46.56	4.03	30.00	-20.59	-13	-7.59	Horizontal
3465.0	-49.18	4.03	30.00	-23.21	-13	-10.21	Vertical
5197.5	-55.68	5.25	35.86	-25.07	-13	-12.07	Vertical
5197.5	-52.34	5.25	35.86	-21.73	-13	-8.73	Horizontal
132.8	-45.77	1.60	15.72	-31.65	-13	-18.65	Vertical
169.9	-42.69	1.75	16.44	-28.00	-13	-15.00	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-48.52	4.05	30.01	-22.56	-13	-9.56	Horizontal
3508.6	-51.38	4.05	30.01	-25.42	-13	-12.42	Vertical
5262.9	-54.66	5.26	35.86	-24.06	-13	-11.06	Vertical
5262.9	-56.07	5.26	35.86	-25.47	-13	-12.47	Horizontal
174.1	-40.79	1.45	17.00	-25.24	-13	-12.24	Vertical
258.3	-45.16	1.31	15.68	-30.79	-13	-17.79	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	-49.11	4.02	29.80	-23.33	-13	-10.33	Horizontal
3440.0	-47.46	4.02	29.80	-21.68	-13	-8.68	Vertical
5160.0	-47.41	5.24	35.84	-16.81	-13	-3.81	Vertical
5160.0	-52.20	5.24	35.84	-21.60	-13	-8.60	Horizontal
224.6	-43.06	1.43	16.46	-28.03	-13	-15.03	Vertical
141.0	-40.74	1.65	17.25	-25.14	-13	-12.14	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-49.10	4.03	30.00	-23.13	-13	-10.13	Horizontal
3465.0	-46.37	4.03	30.00	-20.40	-13	-7.40	Vertical
5197.5	-51.26	5.25	35.86	-20.65	-13	-7.65	Vertical
5197.5	-49.11	5.25	35.86	-18.50	-13	-5.50	Horizontal
163.9	-42.93	1.53	16.74	-27.72	-13	-14.72	Vertical
136.1	-43.04	1.65	15.98	-28.71	-13	-15.71	Horizontal
Test Results for High Channel 1745MHz							
3490.0	-48.63	2.91	27.68	-23.86	-13	-10.86	Horizontal
3490.0	-54.65	2.91	27.68	-29.88	-13	-16.88	Vertical
5235.0	-55.52	5.26	35.86	-24.92	-13	-11.92	Vertical
5235.0	-51.39	5.26	35.86	-20.79	-13	-7.79	Horizontal
169.4	-46.00	1.33	15.68	-31.65	-13	-18.65	Vertical
178.5	-41.36	1.68	16.73	-26.31	-13	-13.31	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	-53.75	2.78	27.50	-29.03	-13	-16.03	Horizontal
1649.4	-54.09	2.78	27.50	-29.37	-13	-16.37	Vertical
2474.1	-49.43	2.90	27.80	-24.53	-13	-11.53	Vertical
2474.1	-49.90	2.90	27.80	-25.00	-13	-12.00	Horizontal
265.7	-44.81	1.64	15.22	-31.23	-13	-18.23	Vertical
126.4	-46.12	1.60	17.78	-29.94	-13	-16.94	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-49.10	2.80	27.48	-24.42	-13	-11.42	Horizontal
1673.0	-48.49	2.80	27.48	-23.81	-13	-10.81	Vertical
2509.5	-51.45	2.91	27.70	-26.66	-13	-13.66	Vertical
2509.5	-53.90	2.91	27.70	-29.11	-13	-16.11	Horizontal
194.1	-42.35	1.70	16.38	-27.67	-13	-14.67	Vertical
128.8	-44.97	1.51	15.17	-31.31	-13	-18.31	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-51.26	2.82	27.43	-26.65	-13	-13.65	Horizontal
1696.6	-52.86	2.82	27.43	-28.25	-13	-15.25	Vertical
2544.9	-50.13	2.92	27.74	-25.31	-13	-12.31	Vertical
2544.9	-49.37	2.92	27.74	-24.55	-13	-11.55	Horizontal
172.9	-47.89	1.72	17.64	-31.97	-13	-18.97	Vertical
251.8	-41.51	1.52	15.33	-27.70	-13	-14.70	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	-53.28	2.78	27.50	-28.56	-13	-15.56	Horizontal
1658.0	-55.47	2.78	27.50	-30.75	-13	-17.75	Vertical
2487.0	-54.73	2.90	27.80	-29.83	-13	-16.83	Vertical
2487.0	-54.06	2.90	27.80	-29.16	-13	-16.16	Horizontal
145.4	-42.69	1.54	17.83	-26.40	-13	-13.40	Vertical
91.7	-45.62	1.35	16.70	-30.27	-13	-17.27	Horizontal
Test Results for Mid Channel 836.5MHz							
1673.0	-49.32	2.80	27.48	-24.64	-13	-11.64	Horizontal
1673.0	-55.66	2.80	27.48	-30.98	-13	-17.98	Vertical
2509.5	-53.70	2.91	27.70	-28.91	-13	-15.91	Vertical
2509.5	-54.69	2.91	27.70	-29.90	-13	-16.90	Horizontal
85.0	-43.42	1.45	16.18	-28.69	-13	-15.69	Vertical
251.3	-48.14	1.42	17.18	-32.38	-13	-19.38	Horizontal
Test Results for High Channel 844MHz							
1688.0	-54.79	2.82	27.43	-30.18	-13	-17.18	Horizontal
1688.0	-52.12	2.82	27.43	-27.51	-13	-14.51	Vertical
2532.0	-58.36	2.92	27.74	-33.54	-13	-20.54	Vertical
2532.0	-54.09	2.92	27.74	-29.27	-13	-16.27	Horizontal
201.2	-44.10	1.63	16.84	-28.89	-13	-15.89	Vertical
87.8	-44.46	1.66	15.49	-30.63	-13	-17.63	Horizontal

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

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

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

9.4 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005.0	-63.89	5.23	35.81	-33.31	-25	-8.31	Horizontal
5005.0	-62.94	5.23	35.81	-32.36	-25	-7.36	Vertical
7507.5	-59.88	5.67	36.85	-28.70	-25	-3.70	Vertical
7507.5	-59.46	5.67	36.85	-28.28	-25	-3.28	Horizontal
251.1	-53.88	1.68	17.99	-37.57	-25	-12.57	Vertical
196.4	-57.97	1.36	16.32	-43.01	-25	-18.01	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-58.51	5.23	35.82	-27.92	-25	-2.92	Horizontal
5070.0	-65.24	5.23	35.82	-34.65	-25	-9.65	Vertical
7605.0	-59.37	5.67	36.85	-28.19	-25	-3.19	Vertical
7605.0	-65.28	5.67	36.85	-34.10	-25	-9.10	Horizontal
179.2	-48.93	1.48	15.33	-35.08	-25	-10.08	Vertical
138.6	-50.12	1.63	15.21	-36.54	-25	-11.54	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-62.19	5.24	35.83	-31.60	-25	-6.60	Horizontal
5135.0	-60.29	5.24	35.83	-29.70	-25	-4.70	Vertical
7702.5	-61.00	5.68	36.87	-29.81	-25	-4.81	Vertical
7702.5	-60.16	5.68	36.87	-28.97	-25	-3.97	Horizontal
375.4	-56.69	1.63	17.22	-41.10	-25	-16.10	Vertical
356.2	-53.37	1.54	15.31	-39.60	-25	-14.60	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020.0	-64.05	5.23	35.82	-33.46	-25	-8.46	Horizontal
5020.0	-64.52	5.23	35.82	-33.93	-25	-8.93	Vertical
7530.0	-61.83	5.67	36.86	-30.64	-25	-5.64	Vertical
7530.0	-64.86	5.67	36.86	-33.67	-25	-8.67	Horizontal
242.0	-56.21	1.51	17.12	-40.60	-25	-15.60	Vertical
291.9	-53.90	1.58	17.35	-38.13	-25	-13.13	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-59.66	5.23	35.82	-29.07	-25	-4.07	Horizontal
5070.0	-61.89	5.23	35.82	-31.30	-25	-6.30	Vertical
7605.0	-63.60	5.67	36.85	-32.42	-25	-7.42	Vertical
7605.0	-59.34	5.67	36.85	-28.16	-25	-3.16	Horizontal
126.9	-58.64	1.63	15.33	-44.94	-25	-19.94	Vertical
406.0	-50.52	1.79	16.34	-35.97	-25	-10.97	Horizontal
Test Results for High Channel 2560MHz							
5120.0	-59.91	5.24	35.83	-29.32	-25	-4.32	Horizontal
5120.0	-62.64	5.24	35.83	-32.05	-25	-7.05	Vertical
7680.0	-65.08	5.70	36.88	-33.90	-25	-8.90	Vertical
7680.0	-64.04	5.70	36.88	-32.86	-25	-7.86	Horizontal
121.5	-53.81	1.32	17.99	-37.14	-25	-12.14	Vertical
444.2	-52.04	1.53	15.28	-38.29	-25	-13.29	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.

9.5 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-58.97	2.60	27.20	-34.37	-13	-21.37	Horizontal
1399.4	-48.93	2.60	27.20	-24.33	-13	-11.33	Vertical
2099.1	-49.76	2.85	27.54	-25.07	-13	-12.07	Vertical
2099.1	-56.77	2.85	27.54	-32.08	-13	-19.08	Horizontal
165.0	-44.96	1.71	15.66	-31.01	-13	-18.01	Vertical
279.0	-46.46	1.66	17.29	-30.83	-13	-17.83	Horizontal
Test Results For Mid Channel 707.5MHz							
1415.0	-56.52	2.61	27.28	-31.85	-13	-18.85	Horizontal
1415.0	-48.96	2.61	27.28	-24.29	-13	-11.29	Vertical
2122.5	-58.63	2.87	27.59	-33.91	-13	-20.91	Vertical
2122.5	-57.10	2.87	27.59	-32.38	-13	-19.38	Horizontal
130.9	-44.58	1.59	16.50	-29.67	-13	-16.67	Vertical
160.9	-42.47	1.63	15.61	-28.49	-13	-15.49	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-52.66	2.63	27.28	-28.01	-13	-15.01	Horizontal
1430.6	-49.61	2.63	27.28	-24.96	-13	-11.96	Vertical
2145.9	-58.81	2.88	27.60	-34.09	-13	-21.09	Vertical
2145.9	-53.98	2.88	27.60	-29.26	-13	-16.26	Horizontal
144.7	-43.42	1.38	15.20	-29.60	-13	-16.60	Vertical
82.1	-39.10	1.51	17.14	-23.47	-13	-10.47	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408.0	-49.45	2.61	27.26	-24.80	-13	-11.80	Horizontal
1408.0	-49.30	2.61	27.26	-24.65	-13	-11.65	Vertical
2112.0	-50.72	2.87	27.58	-26.01	-13	-13.01	Vertical
2112.0	-48.66	2.87	27.58	-23.95	-13	-10.95	Horizontal
246.5	-43.85	1.50	15.73	-29.62	-13	-16.62	Vertical
184.7	-44.15	1.56	16.42	-29.29	-13	-16.29	Horizontal
Test Results for Mid Channel 707.5MHz							
1415.0	-47.18	2.61	27.28	-22.51	-13	-9.51	Horizontal
1415.0	-54.66	2.61	27.28	-29.99	-13	-16.99	Vertical
2122.5	-44.39	2.87	27.59	-19.67	-13	-6.67	Vertical
2122.5	-49.18	2.87	27.59	-24.46	-13	-11.46	Horizontal
197.2	-43.20	1.57	17.95	-26.82	-13	-13.82	Vertical
98.9	-41.54	1.70	17.73	-25.51	-13	-12.51	Horizontal
Test Results for High Channel 711MHz							
1422.0	-55.67	2.62	27.28	-31.01	-13	-18.01	Horizontal
1422.0	-49.85	2.62	27.28	-25.19	-13	-12.19	Vertical
2133.0	-49.70	2.87	27.60	-24.97	-13	-11.97	Vertical
2133.0	-52.43	2.87	27.60	-27.70	-13	-14.70	Horizontal
149.7	-42.32	1.75	16.94	-27.13	-13	-14.13	Vertical
242.0	-38.81	1.46	16.55	-23.72	-13	-10.72	Horizontal

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

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

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

9.6 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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1413.0	-55.57	2.61	27.28	-30.90	-13	-17.90	Horizontal
1413.0	-52.12	2.61	27.28	-27.45	-13	-14.45	Vertical
2119.5	-54.79	2.87	27.59	-30.07	-13	-17.07	Vertical
2119.5	-54.31	2.87	27.59	-29.59	-13	-16.59	Horizontal
102.7	-38.40	1.49	16.12	-23.77	-13	-10.77	Vertical
142.2	-41.13	1.40	15.18	-27.35	-13	-14.35	Horizontal
Test Results For Mid Channel 710MHz							
1420.0	-48.02	2.62	27.30	-23.34	-13	-10.34	Horizontal
1420.0	-48.75	2.62	27.30	-24.07	-13	-11.07	Vertical
2130.0	-51.23	2.87	27.62	-26.48	-13	-13.48	Vertical
2130.0	-58.78	2.87	27.62	-34.03	-13	-21.03	Horizontal
103.2	-43.99	1.40	17.25	-28.14	-13	-15.14	Vertical
111.6	-46.45	1.44	15.57	-32.32	-13	-19.32	Horizontal
Test Results for High Channel 713.5MHz							
1427.0	-49.16	2.66	27.28	-24.54	-13	-11.54	Horizontal
1427.0	-51.06	2.66	27.28	-26.44	-13	-13.44	Vertical
2140.5	-51.99	2.88	27.60	-27.27	-13	-14.27	Vertical
2140.5	-56.80	2.88	27.60	-32.08	-13	-19.08	Horizontal
142.2	-41.79	1.32	15.93	-27.18	-13	-14.18	Vertical
189.4	-46.72	1.36	17.29	-30.79	-13	-17.79	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 Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1418.0	-55.27	2.62	27.30	-30.59	-13	-17.59	Horizontal
1418.0	-50.76	2.62	27.30	-26.08	-13	-13.08	Vertical
2127.0	-56.49	2.87	27.62	-31.74	-13	-18.74	Vertical
2127.0	-54.56	2.87	27.62	-29.81	-13	-16.81	Horizontal
260.4	-38.33	1.74	15.25	-24.82	-13	-11.82	Vertical
267.5	-39.47	1.60	17.96	-23.11	-13	-10.11	Horizontal
Test Results for Mid Channel 710MHz							
1420.0	-51.36	2.62	27.30	-26.68	-13	-13.68	Horizontal
1420.0	-52.49	2.62	27.30	-27.81	-13	-14.81	Vertical
2130.0	-53.15	2.87	27.62	-28.40	-13	-15.40	Vertical
2130.0	-56.72	2.87	27.62	-31.97	-13	-18.97	Horizontal
113.5	-39.53	1.52	16.20	-24.85	-13	-11.85	Vertical
132.9	-48.78	1.36	17.23	-32.91	-13	-19.91	Horizontal
Test Results for High Channel 711MHz							
1422.0	-50.88	2.62	27.30	-26.20	-13	-13.20	Horizontal
1422.0	-52.71	2.62	27.30	-28.03	-13	-15.03	Vertical
2133.0	-52.74	2.87	27.62	-27.99	-13	-14.99	Vertical
2133.0	-54.50	2.87	27.62	-29.75	-13	-16.75	Horizontal
111.1	-44.49	1.33	15.09	-30.73	-13	-17.73	Vertical
178.3	-41.35	1.69	15.02	-28.02	-13	-15.02	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.

10. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. = -30° to $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.4V, Normal, DC 3.85V and High voltage, DC 4.2V.

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
- LTE Band 4
- ☐ LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 17

RESULTS

See the following pages.

10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-5.68	-0.003021	2.5
3.85	1880	-4.28	-0.002277	2.5
4.2	1880	-3.77	-0.002005	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	0.25	0.000133	2.5
Extreme (50C)	1880	-3.96	-0.002106	2.5
Extreme (40C)	1880	-3.68	-0.001957	2.5
Extreme (30C)	1880	-7.70	-0.004096	2.5
Extreme (10C)	1880	-1.07	-0.000569	2.5
Extreme (0C)	1880	-4.02	-0.002138	2.5
Extreme (-10C)	1880	-5.74	-0.003053	2.5
Extreme (-20C)	1880	-0.59	-0.000314	2.5
Extreme (-30C)	1880	-1.63	-0.000867	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1880	-5.43	-0.002888	2.5
3.85	1880	-11.16	-0.005936	2.5
4.2	1880	-9.52	-0.005064	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-12.92	-0.006872	2.5
Extreme (50C)	1880	-4.65	-0.002473	2.5
Extreme (40C)	1880	-12.86	-0.006840	2.5
Extreme (30C)	1880	-6.59	-0.003505	2.5
Extreme (10C)	1880	-11.59	-0.006165	2.5
Extreme (0C)	1880	-7.14	-0.003798	2.5
Extreme (-10C)	1880	-5.85	-0.003112	2.5
Extreme (-20C)	1880	-5.60	-0.002979	2.5
Extreme (-30C)	1880	-12.18	-0.006479	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	8.05	0.004646	2.5
3.85	1732.5	6.52	0.003763	2.5
4.2	1732.5	2.00	0.001154	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	5.11	0.002949	2.5
Extreme (50C)	1732.5	6.87	0.003965	2.5
Extreme (40C)	1732.5	8.81	0.005085	2.5
Extreme (30C)	1732.5	6.17	0.003561	2.5
Extreme (10C)	1732.5	4.27	0.002465	2.5
Extreme (0C)	1732.5	7.84	0.004525	2.5
Extreme (-10C)	1732.5	7.58	0.004375	2.5
Extreme (-20C)	1732.5	4.39	0.002534	2.5
Extreme (-30C)	1732.5	-0.17	-0.000098	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	1732.5	0.65	0.000375	2.5
3.85	1732.5	0.84	0.000485	2.5
4.2	1732.5	7.32	0.004225	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	2.89	0.001668	2.5
Extreme (50C)	1732.5	0.21	0.000121	2.5
Extreme (40C)	1732.5	4.59	0.002649	2.5
Extreme (30C)	1732.5	8.17	0.004716	2.5
Extreme (10C)	1732.5	1.90	0.001097	2.5
Extreme (0C)	1732.5	-0.92	-0.000531	2.5
Extreme (-10C)	1732.5	0.99	0.000571	2.5
Extreme (-20C)	1732.5	0.92	0.000531	2.5
Extreme (-30C)	1732.5	-0.23	-0.000133	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-8.83	-0.010556	2.5
3.85	836.5	-10.89	-0.013019	2.5
4.2	836.5	-2.58	-0.003084	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-5.75	-0.006874	2.5
Extreme (50C)	836.5	-9.68	-0.011572	2.5
Extreme (40C)	836.5	-5.85	-0.006993	2.5
Extreme (30C)	836.5	-7.24	-0.008655	2.5
Extreme (10C)	836.5	-5.84	-0.006981	2.5
Extreme (0C)	836.5	-6.77	-0.008093	2.5
Extreme (-10C)	836.5	-10.21	-0.012206	2.5
Extreme (-20C)	836.5	-8.66	-0.010353	2.5
Extreme (-30C)	836.5	-4.02	-0.004806	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	836.5	-1.2	-0.001435	2.5
3.85	836.5	-6.23	-0.007448	2.5
4.2	836.5	-8.73	-0.010436	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-3.48	-0.004160	2.5
Extreme (50C)	836.5	-8.10	-0.009683	2.5
Extreme (40C)	836.5	-6.03	-0.007209	2.5
Extreme (30C)	836.5	-2.23	-0.002666	2.5
Extreme (10C)	836.5	-6.10	-0.007292	2.5
Extreme (0C)	836.5	-8.14	-0.009731	2.5
Extreme (-10C)	836.5	-2.29	-0.002738	2.5
Extreme (-20C)	836.5	-3.01	-0.003598	2.5
Extreme (-30C)	836.5	-0.67	-0.000801	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

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	-12.39	-0.004888	2.5
3.85	2535	-5.70	-0.002249	2.5
4.2	2535	-5.98	-0.002359	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-10.53	-0.004154	2.5
Extreme (50C)	2535	-13.22	-0.005215	2.5
Extreme (40C)	2535	-7.75	-0.003057	2.5
Extreme (30C)	2535	-9.40	-0.003708	2.5
Extreme (10C)	2535	-14.35	-0.005661	2.5
Extreme (0C)	2535	-7.88	-0.003108	2.5
Extreme (-10C)	2535	-8.83	-0.003483	2.5
Extreme (-20C)	2535	-6.35	-0.002505	2.5
Extreme (-30C)	2535	-14.67	-0.005787	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.4	2535	-3.77	-0.001487	2.5
3.85	2535	-3.38	-0.001333	2.5
4.2	2535	-5.60	-0.002209	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	1.03	0.000406	2.5
Extreme (50C)	2535	-5.16	-0.002036	2.5
Extreme (40C)	2535	-5.07	-0.002000	2.5
Extreme (30C)	2535	-6.07	-0.002394	2.5
Extreme (10C)	2535	-6.13	-0.002418	2.5
Extreme (0C)	2535	2.70	0.001065	2.5
Extreme (-10C)	2535	2.42	0.000955	2.5
Extreme (-20C)	2535	-3.16	-0.001247	2.5
Extreme (-30C)	2535	-2.78	-0.001097	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	-3.74	-0.005286	2.5
3.85	707.5	-7.83	-0.011067	2.5
4.2	707.5	-2.65	-0.003746	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-8.69	-0.012283	2.5
Extreme (50C)	707.5	-8.50	-0.012014	2.5
Extreme (40C)	707.5	-4.07	-0.005753	2.5
Extreme (30C)	707.5	-3.87	-0.005470	2.5
Extreme (10C)	707.5	-3.62	-0.005117	2.5
Extreme (0C)	707.5	-0.78	-0.001102	2.5
Extreme (-10C)	707.5	-4.48	-0.006332	2.5
Extreme (-20C)	707.5	-4.07	-0.005753	2.5
Extreme (-30C)	707.5	-6.16	-0.008707	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	707.5	-0.52	-0.000735	2.5
3.85	707.5	-1.50	-0.002120	2.5
4.2	707.5	-1.26	-0.001781	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-1.61	-0.002276	2.5
Extreme (50C)	707.5	-0.69	-0.000975	2.5
Extreme (40C)	707.5	-0.99	-0.001399	2.5
Extreme (30C)	707.5	-7.01	-0.009908	2.5
Extreme (10C)	707.5	-8.60	-0.012155	2.5
Extreme (0C)	707.5	-3.99	-0.005640	2.5
Extreme (-10C)	707.5	-8.64	-0.012212	2.5
Extreme (-20C)	707.5	-3.41	-0.004820	2.5
Extreme (-30C)	707.5	-0.22	-0.000311	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

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	-5.64	-0.007944	2.5
3.85	710.0	3.40	0.004789	2.5
4.2	710.0	-5.78	-0.008141	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	1.59	0.002239	2.5
Extreme (50C)	710.0	-5.44	-0.007662	2.5
Extreme (40C)	710.0	-5.35	-0.007535	2.5
Extreme (30C)	710.0	-5.31	-0.007479	2.5
Extreme (10C)	710.0	2.90	0.004085	2.5
Extreme (0C)	710.0	1.51	0.002127	2.5
Extreme (-10C)	710.0	1.58	0.002225	2.5
Extreme (-20C)	710.0	-4.96	-0.006986	2.5
Extreme (-30C)	710.0	-4.04	-0.005690	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.4	710.0	-7.1	-0.010000	2.5
3.85	710.0	-2.32	-0.003268	2.5
4.2	710.0	-9.71	-0.013676	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	-9.31	-0.013113	2.5
Extreme (50C)	710.0	-7.85	-0.011056	2.5
Extreme (40C)	710.0	-8.17	-0.011507	2.5
Extreme (30C)	710.0	-8.00	-0.011268	2.5
Extreme (10C)	710.0	-4.02	-0.005662	2.5
Extreme (0C)	710.0	-9.08	-0.012789	2.5
Extreme (-10C)	710.0	-10.00	-0.014085	2.5
Extreme (-20C)	710.0	-5.77	-0.008127	2.5
Extreme (-30C)	710.0	-4.00	-0.005634	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.

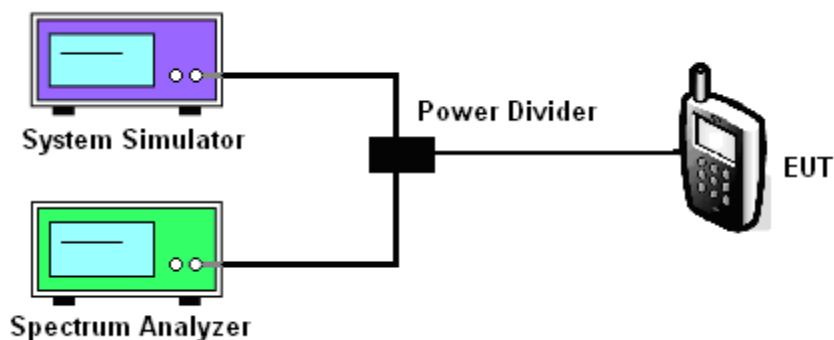
11.2 Measuring Instruments

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 GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS 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----