



FCC RF Test Report

APPLICANT : Positioning Universal Inc
EQUIPMENT : GPS TRACK
BRAND NAME : Positioning Universal
MODEL NAME : FT2200MA
FCC ID : 2AHRH-FT2200MA
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H), 27(F)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TEST DATE(S) : Jul. 29, 2021

We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

This product installed a RF module (Brand Name: Quectel, Model Name: BG95-M5, FCC ID: XMR202005BG95M5) during the test, only ERP/EIRP and RSE test items are tested in this report, all the other test results are quoted on module RF report.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

Approved by: Alex Wang / Manager



Sporton International (Kunshan) Inc.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG171213B	Rev. 01	Initial issue of report	Aug. 30, 2021



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	—	Report Only	2
	§22.913(a)(5)	Effective Radiated Power (Band 5) (Band 26)	ERP < 7 Watt	PASS	-
	§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 85)	ERP < 3 Watt	PASS	-
	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2) (Band 25)	EIRP < 2Watt	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)	EIRP < 1Watt	PASS	-
-	§24.232(d)	Peak-to-Average Ratio	<13 dB	-	1
-	§2.1049	Occupied Bandwidth	Reporting Only	-	1
-	§2.1051 §22.917(a) §24.238(a) §27.53(c)(2)(4) §27.53(g) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 25) (Band 26) (Band 66) (Band 85)	< 43+10log ₁₀ (P[Watts])	-	1
-	§2.1051 §22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 25) (Band 26) (Band 66) (Band 85)	< 43+10log ₁₀ (P[Watts])	-	1
-	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	-	1
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(c)(2) §27.53(f) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 25) (Band 26) (Band 66) (Band 85)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 9.19 dB at 1560.00 MHz

Remark:

- This product only support LTE Cat M1, RF conducted test results were leveraged from module RF report which can refer to Report No. R2005A0283-R1V1, R2005A0283-R2V1, R2005A0283-R4V1.
- The output power has been verified and consistent with the original module power, thus the module power is quoted to calculate ERP/EIRP in this report



Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



1 General Description

1.1 Applicant

Positioning Universal Inc

4660 La Jolla Village Drive, Suite 1100, SanDiego , CA92122

1.2 Manufacturer

Positioning Universal Inc

4660 La Jolla Village Drive, Suite 1100, SanDiego , CA92122

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GPS TRACK
Brand Name	Positioning Universal
Model Name	FT2200MA
FCC ID	2AHRH-FT2200MA
HW Version	P2.1
SW Version	A0.13.8
EUT Stage	Production Unit

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 824 MHz ~ 849 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 85: 698 MHz ~ 716 MHz
Rx Frequency	LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 869 MHz ~ 894 MHz LTE Band 66 : 2110 MHz~ 2180 MHz LTE Band 85: 728 MHz ~ 746 MHz
LTE Category	M1
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz



	LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 13 : 5MHz / 10MHz LTE Band 25 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 26 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz LTE Band 66 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 85 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 23.64 dBm LTE Band 4 : 23.76 dBm LTE Band 5 : 23.98 dBm LTE Band 12 : 23.60 dBm LTE Band 13 : 23.33 dBm LTE Band 25 : 23.65 dBm LTE Band 26 : 23.99 dBm LTE Band 66 : 23.89 dBm LTE Band 85 : 23.41 dBm
Antenna Gain	LTE Band 2 : -2.50 dBi LTE Band 4 : -2.50 dBi LTE Band 5 : -3.00 dBi LTE Band 12 : -3.00 dBi LTE Band 13 : -3.00 dBi LTE Band 25 : -2.50 dBi LTE Band 26 : -3.00 dBi LTE Band 66 : -2.50 dBi LTE Band 85 : -3.00 dBi
Type of Modulation	QPSK / 16QAM

Remark:

The output power has been verified and consistent with the original module power, thus the module power is quoted to calculate ERP/EIRP in this report.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.



1.6 Maximum ERP/EIRP Power

Only the Maximum BW and Highest power are reported here.

LTE Band 2		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1850.7 ~ 1909.3	0.1259	-	-	-
10	1855.0 ~ 1905.0	-	-	0.1300	-
20	1860.0 ~ 1900.0	0.1151	-	0.1189	-
LTE Band 25		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
10	1855.0 ~ 1910.0	0.1288	-	-	-
20	1860.0 ~ 1905.0	0.1236	-	0.1303	-
LTE Band 4		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1710.7 ~ 1754.3	0.1315	-	-	-
5	1712.5 ~ 1752.5	-	-	0.1337	-
20	1720.0 ~ 1745.0	0.1282	-	0.1291	-
LTE Band 5		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	826.5 ~ 846.5	0.0764	-	-	-
10	829.0 ~ 844.0	0.0759	-	0.0764	-
LTE Band 12		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
3	700.5 ~ 714.5	0.0700	-	-	-
10	704.0 ~ 711.0	0.0658	-	0.0640	-
LTE Band 13		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	779.5 ~ 784.5	0.0653	-	0.0658	-



10	782.0	0.0646	-	0.0592	-
LTE Band 26		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
3	825.5 ~ 847.5	0.0766	-	-	-
15	831.5 ~ 841.5	0.0752	-	0.0762	-
CH26765	821.5	0.0662	-	0.0598	-
LTE Band 66		QPSK		16QAM/64QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
3	1711.5 ~ 1778.5	0.1377	-	-	-
15	1717.5 ~ 1772.5	-	-	0.1337	-
20	1720.0 ~ 1770.0	0.1276	-	0.1334	-
LTE Band 85		QPSK		16QAM/64QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	700.5 ~ 713.5	0.0670	-	0.0656	-
10	703.0 ~ 711.0	0.0656	-	0.0635	-



1.7 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-KS TH01-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H), 27(F)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

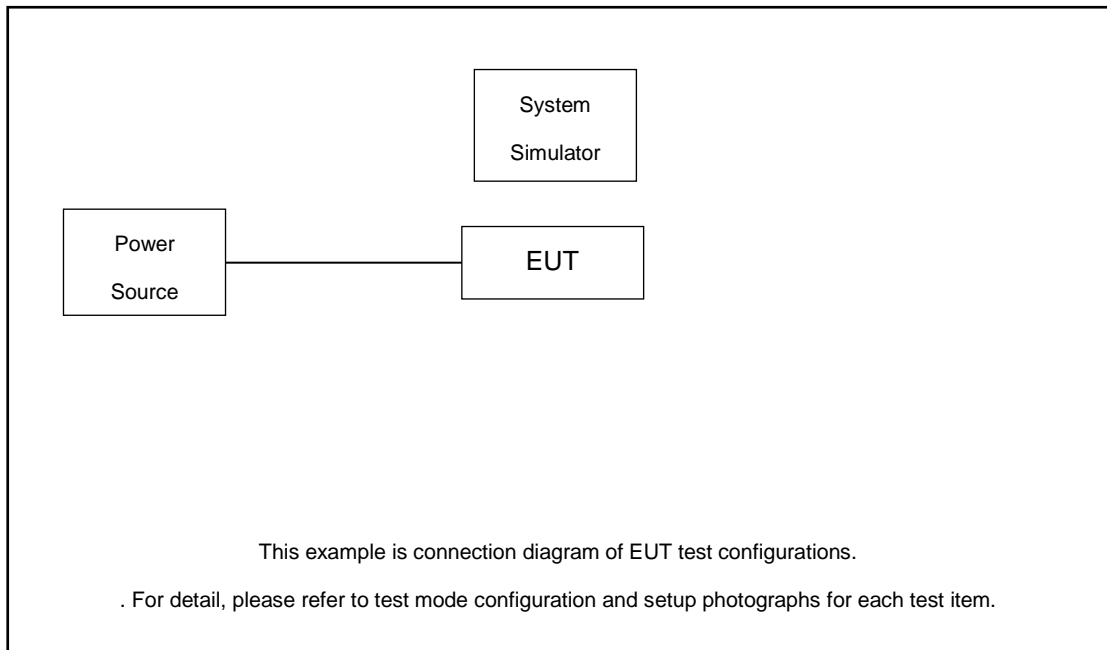
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel			
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H	
E.R.P / E.I.R.P	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v	
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v	
	13	-	-	v	v	-	-	v	v	v	v	v	v	v	v	v	
	25	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v	v	
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	85	-	-	v	v			v	v	v	v	v	v	v	v	v	
Radiated Spurious Emission	12	Worst Case														v	
	13	Worst Case														v	
	25	Worst Case														v	
	26	Worst Case														v	
	66	Worst Case														v	
	85	Worst Case														v	
Note	<ol style="list-style-type: none"> The mark "v" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. LTE Band 26 overlaps the entire frequency range of LTE Band 5. Therefore, the RSE test results provided in this report covers Band 5 and the portion of Band 26 subject to Part 22. LTE Band 66 overlaps the entire frequency range of LTE Band 4. Therefore, the RSE test results provided in this report covers Band 66 as well as Band 4. LTE Band 25 overlaps the entire frequency range of LTE Band 2. Therefore, the test RSE results provided in this report covers Band 25 as well as Band 2. 																

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Adapter	N/A	N/A	N/A	N/A	Unshielded, 0.8 m
2.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

3 Conducted Test Items

3.1 Conducted Output Power and ERP/EIRP

3.1.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 26, Band 5.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12, Band 13 and Band 85.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 25, Band 2.

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 66, Band 4.

According to KDB 412172 D01 Power Approach,

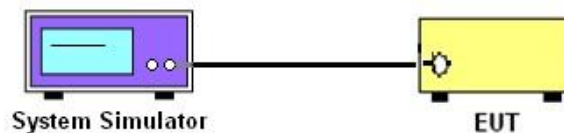
$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.1.2 Test Setup



3.1.3 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.1.4 Test Results

Please refer to Appendix A.

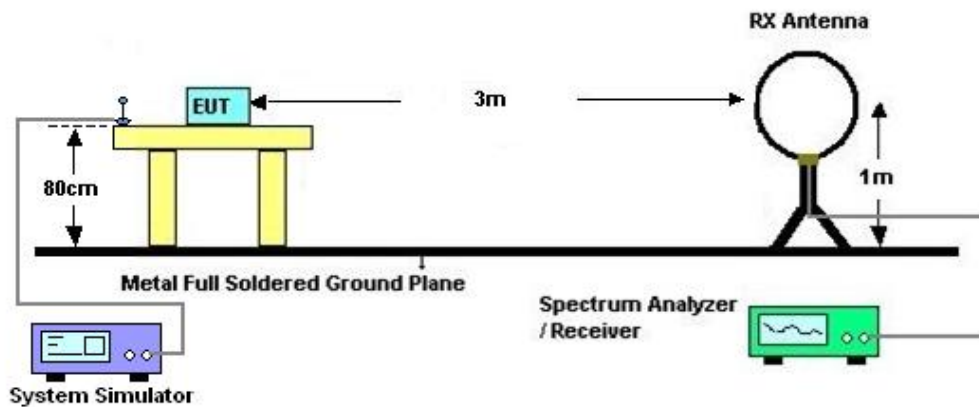
4 Radiated Test Items

4.1 Measuring Instruments

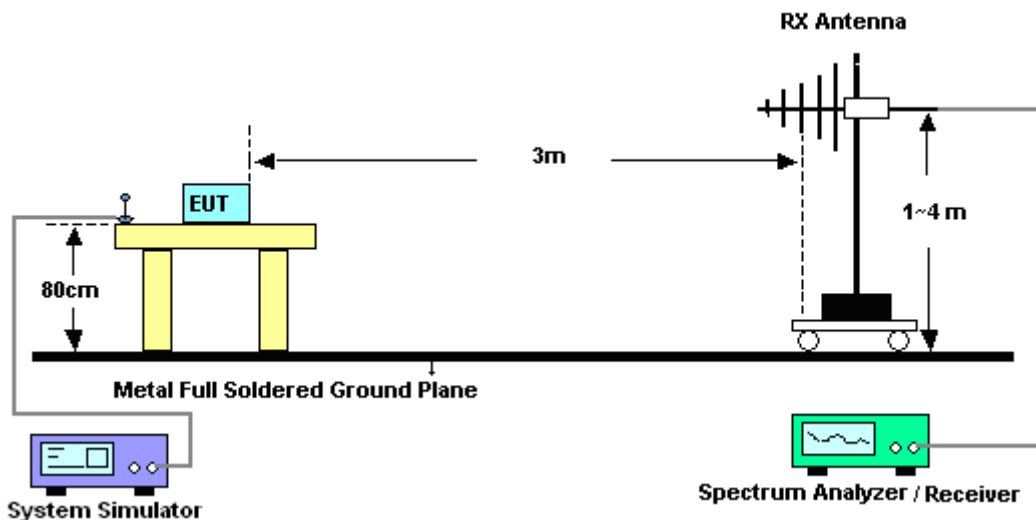
See list of measuring instruments of this test report.

4.2 Test Setup

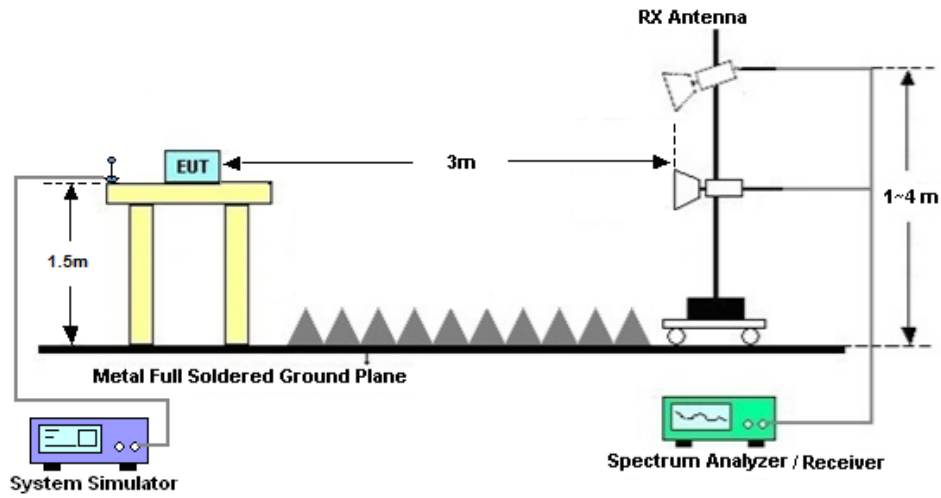
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.



4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMW500	150792	2G/3G/4G	Jan. 07, 2021	Jul. 29, 2021	Jan. 06, 2022	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 13, 2021	Jul. 29, 2021	Apr. 12, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 01, 2020	Jul. 29, 2021	Oct. 31, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 30, 2021	Jul. 29, 2021	May 29, 2022	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 18, 2021	Jul. 29, 2021	Apr. 17, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Jan. 06, 2021	Jul. 29, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	Jul. 29, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 07, 2021	Jul. 29, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jan. 06, 2021	Jul. 29, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	Jul. 29, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 29, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 29, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 29, 2021	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.



6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.3dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)and ERP/EIRP

LTE Band 2	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		EIRP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	18607/1850.7	0	1#0	23.05	22.25	20.55	19.75
		0	6#0	21.13	21.11	18.63	18.61
	18900/1880	0	1#0	23.09	22	20.59	19.5
		0	6#0	20.96	21.02	18.46	18.52
	19193/1909.3	0	1#5	23.5	23.58	21	21.08
		0	6#0	21.57	21.72	19.07	19.22
3MHz	18615/1851.5	0	1#0	23.44	22.05	20.94	19.55
		0	6#0	21.12	21.33	18.62	18.83
	18900/1880	0	1#0	23.32	22.01	20.82	19.51
		0	6#0	20.96	21.26	18.46	18.76
	19185/1908.5	1	1#5	23.01	21.99	20.51	19.49
		1	6#0	20.91	20.88	18.41	18.38
5MHz	18625/1852.5	3	1#0	23.14	23.31	20.64	20.81
		0	6#0	22.07	21.11	19.57	18.61
	18900/1880	0	1#0	23	23.14	20.5	20.64
		0	6#0	21.93	21.03	19.43	18.53
	19175/1907.5	0	1#5	23.37	23.35	20.87	20.85
		3	6#0	22.54	21.55	20.04	19.05
10MHz	18650/1855	3	1#0	23.03	23.24	20.53	20.74
		0	4#0	23.08	21.81	20.58	19.31
	18900/1880	0	1#0	23.07	23.23	20.57	20.73
		0	4#0	23.05	21.89	20.55	19.39
	19150/1905	4	1#5	23.3	23.64	20.8	21.14
		7	4#2	23.45	22.51	20.95	20.01
15MHz	18675/1857.5	3	1#0	23.08	23.22	20.58	20.72
		0	6#0	23.14	23.24	20.64	20.74
	18900/1880	0	1#0	23.09	23.17	20.59	20.67
		0	6#0	23.03	23.06	20.53	20.56
	19125/1902.5	8	1#5	23.01	22.96	20.51	20.46
		11	6#0	23.01	23.15	20.51	20.65
20MHz	18700/1860	3	1#0	23.11	23.25	20.61	20.75
		0	6#0	23.11	23.17	20.61	20.67
	18900/1880	0	1#0	23.1	23.24	20.6	20.74
		0	6#0	23	23.08	20.5	20.58
	19100/1900	12	1#5	23.01	22.61	20.51	20.11
		15	6#0	22.96	23.07	20.46	20.57



LT E Band 4	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		EIRP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	1 9957/1710. 7	0	1#0	23.48	22.74	20.98	20.24
		0	6#0	21.52	21.4	19.02	18.9
	2 0175/1732. 5	0	1#0	23.69	22.52	21.19	20.02
		0	6#0	21.37	21.56	18.87	19.06
	2 0393/1754. 3	0	1#5	23.12	22.42	20.62	19.92
		0	6#0	21.41	21.13	18.91	18.63
3MHz	1 9965/1711. 5	0	1#0	23.62	22.85	21.12	20.35
		0	6#0	21.55	21.54	19.05	19.04
	2 0175/1732. 5	0	1#0	23.42	22.5	20.92	20
		0	6#0	21.36	21.24	18.86	18.74
	2 0385/1753. 5	1	1#5	23.25	22.63	20.75	20.13
		1	6#0	21.41	21.24	18.91	18.74
5MHz	1 9975/1712. 5	3	1#0	23.56	23.76	21.06	21.26
		0	6#0	22.54	21.42	20.04	18.92
	2 0175/1732. 5	0	1#0	23.43	23.15	20.93	20.65
		0	6#0	22.38	21.48	19.88	18.98
	2 0375/1752. 5	0	1#5	23.27	23.11	20.77	20.61
		3	6#0	22.44	21.51	19.94	19.01
1 0 MHz	20000/171 5	3	1#0	23.66	23.37	21.16	20.87
		0	4#0	23.66	22.62	21.16	20.12
	2 0175/1732. 5	0	1#0	23.41	23.62	20.91	21.12
		0	4#0	23.4	22.17	20.9	19.67
	20350/175 0	4	1#5	23.26	23.14	20.76	20.64
		7	4#2	23.54	22.55	21.04	20.05
15MHz	2 0025/1717. 5	3	1#0	23.62	23.27	21.12	20.77
		0	6#0	23.64	23.65	21.14	21.15
	2 0175/1732. 5	0	1#0	23.55	23.17	21.05	20.67
		0	6#0	23.54	23.58	21.04	21.08
	2 0325/1747. 5	8	1#5	23.27	23.12	20.77	20.62
		11	6#0	23.47	23.49	20.97	20.99
20MHz	20050/172 0	3	1#0	23.58	23.36	21.08	20.86
		0	6#0	23.55	23.61	21.05	21.11
	2 0175/1732. 5	0	1#0	23.57	23.17	21.07	20.67
		0	6#0	23.57	23.56	21.07	21.06
	20300/174 5	12	1#5	23.31	23.16	20.81	20.66
		15	6#0	23.41	23.45	20.91	20.95



LTE Band 5	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		ERP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	20407/824.7	0	1#0	23.22	23.04	18.07	17.89
		0	6#0	21.57	21.33	16.42	16.18
	20525/836.5	0	1#0	23.04	22.58	17.89	17.43
		0	6#0	21.27	21.13	16.12	15.98
	20643/848.3	0	1#5	23.64	23.13	18.49	17.98
		0	6#0	21.97	21.9	16.82	16.75
3MHz	20415/825.5	0	1#0	23.57	23	18.42	17.85
		0	6#0	21.46	21.58	16.31	16.43
	20525/836.5	0	1#0	23.65	22.32	18.5	17.17
		0	6#0	21.24	21.7	16.09	16.55
	20635/847.5	1	1#5	23.75	23.21	18.6	18.06
		1	6#0	22.01	22.02	16.86	16.87
5MHz	20425/826.5	3	1#0	23.42	23.65	18.27	18.5
		0	6#0	22.67	21.66	17.52	16.51
	20525/836.5	0	1#0	23.36	23.04	18.21	17.89
		0	6#0	22.41	21.73	17.26	16.58
	20625/846.5	0	1#5	23.98	23.55	18.83	18.4
		3	6#0	22.99	22.51	17.84	17.36
10MHz	20450/829	3	1#0	23.6	23.16	18.45	18.01
		0	4#0	23.65	23.03	18.5	17.88
	20525/836.5	0	1#0	23.51	23.1	18.36	17.95
		0	4#0	23.41	22.85	18.26	17.7
	20600/844	4	1#5	23.81	23.98	18.66	18.83
		7	4#2	23.95	23.24	18.8	18.09



LTE Band 12	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		ERP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	2 3017/699. 7	0	1#0	23	22.41	17.85	17.26
		0	6#0	21.23	21.09	16.08	15.94
	2 3095/707. 5	0	1#0	23.01	22.28	17.86	17.13
		0	6#0	21.13	20.89	15.98	15.74
	2 3173/715. 3	0	1#5	23.03	22.21	17.88	17.06
0		6#0	21.14	20.98	15.99	15.83	
3MHz	2 3025/700. 5	0	1#0	23.6	22.23	18.45	17.08
		0	6#0	21.16	21.56	16.01	16.41
	2 3095/707. 5	0	1#0	23.41	22.05	18.26	16.9
		0	6#0	21.08	21.45	15.93	16.3
	2 3165/714. 5	1	1#5	23.3	22.02	18.15	16.87
1		6#0	21.12	21.51	15.97	16.36	
5MHz	2 3035/701. 5	3	1#0	23.24	23.12	18.09	17.97
		0	6#0	22.26	21.58	17.11	16.43
	2 3095/707. 5	0	1#0	23.18	22.98	18.03	17.83
		0	6#0	22.19	21.47	17.04	16.32
	2 3155/713. 5	0	1#5	23.14	22.83	17.99	17.68
3		6#0	22.01	20.63	16.86	15.48	
10MHz	23060/704	3	1#0	23.23	23.02	18.08	17.87
		0	4#0	23.33	22.56	18.18	17.41
	2 3095/707. 5	0	1#0	23.25	23.04	18.1	17.89
		0	4#0	23.18	22.72	18.03	17.57
	23130/711	4	1#5	23.03	23.21	17.88	18.06
7		4#2	23.16	21.81	18.01	16.66	

LTE Band 13	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		ERP (dBm)	
				QPSK	16QAM	QPSK	16QAM
5MHz	2 3205/779. 5	3	1#0	23.08	23.33	17.93	18.18
		0	6#0	22.32	21.27	17.17	16.12
	23230/782	0	1#0	23.3	22.91	18.15	17.76
		0	6#0	22.28	21.65	17.13	16.5
	2 3255/784. 5	0	1#5	23.02	22.7	17.87	17.55
3		6#0	22.22	21.47	17.07	16.32	
10MHz	23230/782	0	1#0	23.25	22.87	18.1	17.72
		0	4#0	23.23	22.59	18.08	17.44



LTE Band 25	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		EIRP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	26047/1850.7	0	1#0	23.23	22.67	20.73	20.17
		0	6#0	21.44	21.34	18.94	18.84
	26365/1882.5	0	1#0	23.08	22.45	20.58	19.95
		0	6#0	21.22	21.14	18.72	18.64
	26683/1914.3	0	1#5	23	22.1	20.5	19.6
		0	6#0	21.04	20.81	18.54	18.31
3MHz	26055/1851.5	0	1#0	23.5	22.67	21	20.17
		0	6#0	21.33	21.34	18.83	18.84
	26365/1882.5	0	1#0	23.23	22.34	20.73	19.84
		0	6#0	21.23	21.12	18.73	18.62
	26675/1913.5	1	1#5	23.25	21.84	20.75	19.34
		1	6#0	21.02	21.33	18.52	18.83
5MHz	26065/1852.5	3	1#0	23.44	23.63	20.94	21.13
		0	6#0	22.46	21.35	19.96	18.85
	26365/1882.5	0	1#0	23.39	23.06	20.89	20.56
		0	6#0	22.28	21.53	19.78	19.03
	26665/1912.5	0	1#5	23.03	22.71	20.53	20.21
		3	6#0	22.07	21.2	19.57	18.7
10MHz	26090/1855	3	1#0	23.59	23.19	21.09	20.69
		0	4#0	23.6	22.68	21.1	20.18
	26365/1882.5	0	1#0	23.48	23.04	20.98	20.54
		0	4#0	23.44	22.78	20.94	20.28
	26640/1910	4	1#5	23.02	23.13	20.52	20.63
		7	4#2	22.94	21.83	20.44	19.33
15MHz	26115/1857.5	3	1#0	23.52	23.21	21.02	20.71
		0	6#0	22.48	22.59	19.98	20.09
	26365/1882.5	0	1#0	23.38	23.06	20.88	20.56
		0	6#0	22.27	22.47	19.77	19.97
	26615/1907.5	8	1#5	23.01	23.22	20.51	20.72
		11	6#0	22.94	23.16	20.44	20.66
20MHz	26140/1860	3	1#0	23.36	23.65	20.86	21.15
		0	6#0	23.42	23.55	20.92	21.05
	26365/1882.5	0	1#0	23.34	23.41	20.84	20.91
		0	6#0	23.27	23.39	20.77	20.89
	26590/1905	12	1#5	23.03	22.71	20.53	20.21
		15	6#0	22.94	23.18	20.44	20.68



LTE Band 26	Channel/Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		ERP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	26797/824.7	0	1#0	23.15	22.6	18	17.45
		0	6#0	21.32	21.14	16.17	15.99
	26915/836.5	0	1#0	23.54	22.95	18.39	17.8
		0	6#0	21.52	21.51	16.37	16.36
	27033/848.3	0	1#5	23.99	22.61	18.84	17.46
		0	6#0	21.8	22.52	16.65	17.37
3MHz	26805/825.5	0	1#0	23.84	22.45	18.69	17.3
		0	6#0	21.22	21.62	16.07	16.47
	26915/836.5	0	1#0	23.98	22.58	18.83	17.43
		0	6#0	21.54	21.95	16.39	16.8
	27025/847.5	1	1#5	23.99	22.61	18.84	17.46
		1	6#0	21.7	22.24	16.55	17.09
5MHz	26815/826.5	3	1#0	23.5	23.35	18.35	18.2
		0	6#0	22.46	21.82	17.31	16.67
	26915/836.5	0	1#0	23.55	23.74	18.4	18.59
		0	6#0	22.53	21.53	17.38	16.38
	27015/846.5	0	1#5	23.9	23.41	18.75	18.26
		3	6#0	22.87	22.16	17.72	17.01
10MHz	26840/829	3	1#0	23.47	23.25	18.32	18.1
		0	4#0	23.4	22.89	18.25	17.74
	26915/836.5	0	1#0	23.39	23.74	18.24	18.59
		0	4#0	23.57	22.68	18.42	17.53
	26990/844	4	1#5	23.78	23.38	18.63	18.23
		7	4#2	23.91	23.23	18.76	18.08
15MHz	26865/831.5	3	1#0	23.44	23.34	18.29	18.19
		0	6#0	23.3	23.61	18.15	18.46
	26915/836.5	0	1#0	23.49	23.25	18.34	18.1
		0	6#0	23.41	23.75	18.26	18.6
	26965/841.5	8	1#5	23.86	23.39	18.71	18.24
		11	6#0	23.91	23.97	18.76	18.82



LTE Band 66	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		EIRP (dBm)	
				QPSK	16QAM	QPSK	16QAM
1.4MHz	13 1 979/1710. 7	0	1#0	23.37	22.56	20.87	20.06
		0	6#0	21.38	21.31	18.88	18.81
	1 3 2322/1745	0	1#0	23.41	22.38	20.91	19.88
		0	6#0	21.17	21.38	18.67	18.88
	13 2 665/1779. 3	0	1#5	23.11	22.98	20.61	20.48
		0	6#0	21.69	21.42	19.19	18.92
3MHz	13 1 987/1711. 5	0	1#0	23.56	22.23	21.06	19.73
		0	6#0	21.49	21.71	18.99	19.21
	1 3 2322/1745	0	1#0	23.31	21.98	20.81	19.48
		0	6#0	21.25	21.47	18.75	18.97
	13 2 657/1778. 5	1	1#5	23.89	22.41	21.39	19.91
		1	6#0	21.54	22.09	19.04	19.59
5MHz	13 1 997/1712. 5	3	1#0	23.55	23.24	21.05	20.74
		0	6#0	22.4	21.49	19.9	18.99
	1 3 2322/1745	0	1#0	23.23	23.02	20.73	20.52
		0	6#0	22.23	21.31	19.73	18.81
	13 2 647/1777. 5	0	1#5	23.49	23.08	20.99	20.58
		3	6#0	22.71	22.03	20.21	19.53
10MHz	1 3 2022/1715	3	1#0	23.43	23.17	20.93	20.67
		0	4#0	23.55	22.71	21.05	20.21
	1 3 2022/1745	0	1#0	23.02	23.26	20.52	20.76
		0	4#0	23.12	22.41	20.62	19.91
	1 3 2622/1775	4	1#5	23.36	22.97	20.86	20.47
		7	4#2	23.69	23.31	21.19	20.81
15MHz	13 2 047/1717. 5	3	1#0	23.48	23.22	20.98	20.72
		0	6#0	23.47	23.48	20.97	20.98
	1 3 2322/1745	0	1#0	23.13	23.41	20.63	20.91
		0	6#0	23.1	23.18	20.6	20.68
	13 2 597/1772. 5	8	1#5	23.52	23.07	21.02	20.57
		11	6#0	23.55	23.76	21.05	21.26
20MHz	1 3 2072/1720	3	1#0	23.42	23.25	20.92	20.75
		0	6#0	23.36	23.4	20.86	20.9
	1 3 2322/1745	0	1#0	23.21	22.97	20.71	20.47
		0	6#0	23.18	23.21	20.68	20.71
	1 3 2572/1770	12	1#5	23	22.54	20.5	20.04
		15	6#0	23.56	23.75	21.06	21.25



LTE Band 85	Channel/ Frequency(MHz)	Index	RB# RBstart	Conducted Power (dBm)		ERP (dBm)	
				QPSK	16QAM	QPSK	16QAM
5MHz	134027/700.5	3	1#0	23.41	23.32	18.26	18.17
		0	6#0	22.19	21.03	17.04	15.88
	134092/707	0	1#0	23.02	22.85	17.87	17.70
		0	6#0	21.92	20.73	16.77	15.58
	134157/713.5	0	1#5	23.08	23.00	17.93	17.85
		3	6#0	22.10	20.88	16.95	15.73
10MHz	134052/703	3	1#0	23.32	23.14	18.17	17.99
		0	4#0	23.07	22.26	17.92	17.11
	134092/707	0	1#0	23.12	23.02	17.97	17.87
		0	4#0	23.05	21.87	17.90	16.72
	134132/711	4	1#5	23.09	23.18	17.94	18.03
		7	4#2	22.82	21.74	17.67	16.59



Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

LTE Band 12 / 10MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1406	-63.81	-13	-50.81	-70.78	1.58	10.70	H
	2110	-55.14	-13	-42.14	-63.39	2.10	12.50	H
	2812	-59.91	-13	-46.91	-68.80	2.86	13.90	H
	1406	-65.96	-13	-52.96	-72.93	1.58	10.70	V
	2110	-57.41	-13	-44.41	-65.66	2.10	12.50	V
	2812	-59.69	-13	-46.69	-68.58	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 13 / 5MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1560	-53.13	-42.15	-10.98	-55.76	1.09	5.87	H
	2340	-35.51	-13	-22.51	-37.91	1.37	5.92	H
	3120	-59.98	-13	-46.98	-63.87	1.64	7.68	H
	1560	-51.34	-42.15	-9.19	-53.97	1.09	5.87	V
	2339.52	-59.56	-13	-46.56	-61.96	1.37	5.92	V
	3120	-59.72	-13	-46.72	-63.61	1.64	7.68	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 13 / 10MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1556	-56.22	-13	-43.22	-58.85	1.09	5.87	H
	2334	-55.25	-13	-42.25	-57.65	1.37	5.92	H
	3108	-60.15	-13	-47.15	-64.04	1.64	7.68	H
	1556	-54.50	-13	-41.50	-57.13	1.09	5.87	V
	2334	-55.57	-13	-42.57	-57.97	1.37	5.92	V
	3108	-60.30	-13	-47.30	-64.19	1.64	7.68	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 25 / 20MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3747	-56.98	-13	-43.98	-69.24	2.64	14.90	H
	5622	-52.96	-13	-39.96	-64.82	2.94	14.80	H
	7500	-52.61	-13	-39.61	-62.38	3.39	13.16	H
	3747	-54.38	-13	-41.38	-66.64	2.64	14.90	V
	5622	-48.45	-13	-35.45	-60.31	2.94	14.80	V
	7500	-52.50	-13	-39.50	-62.27	3.39	13.16	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 26 / 15MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1660	-49.38	-13	-36.38	-56.35	1.58	10.70	H
	2490	-56.17	-13	-43.17	-64.42	2.10	12.50	H
	3318	-60.52	-13	-47.52	-69.41	2.86	13.90	H
	1660	-52.72	-13	-39.72	-59.69	1.58	10.70	V
	2490	-55.24	-13	-42.24	-63.49	2.10	12.50	V
	3318	-60.81	-13	-47.81	-69.70	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 66 / 20MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3474	-54.03	-13	-41.03	-64.77	2.604	13.34	H
	5211	-44.21	-13	-31.21	-54.72	3.011	13.52	H
	6948	-54.29	-13	-41.29	-64.49	3.271	13.47	H
	3474	-51.78	-13	-38.78	-62.52	2.604	13.34	V
	5211	-53.77	-13	-40.77	-64.28	3.011	13.52	V
	6948	-54.47	-13	-41.47	-64.67	3.271	13.47	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 85 / 10MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1406	-67.02	-13	-54.02	-73.99	1.58	10.70	H
	2108	-36.54	-13	-23.54	-44.79	2.10	12.50	H
	2810	-59.87	-13	-46.87	-68.76	2.86	13.90	H
	1406	-66.02	-13	-53.02	-72.99	1.58	10.70	V
	2108	-56.00	-13	-43.00	-64.25	2.10	12.50	V
	2810	-58.98	-13	-45.98	-67.87	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.