



FCC RF Test Report

APPLICANT : Copeland Cold Chain LP.
EQUIPMENT : GO Tracker 2.2
BRAND NAME : Copeland
MODEL NAME : GO Tracker 2.2
FCC ID : AMH101020
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(F), 27(H)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TEST DATE(S) : May 13, 2024 ~ May 17, 2024

This product installed a RF module (Brand Name: Queclink, Model Name: QLC300NA, FCC ID: YQD-QLC300NA) during the test, only Conducted Power, ERP/EIRP and worse case of RSE from RF module report test items are tested in this report, all the other test results are leveraged from module RF report.

We, Sporton International Inc. (ShenZhen), 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.

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

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

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People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG431808	Rev. 01	Initial issue of report	Jun. 05, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	-	Report Only	-
	§22.913(a)(5)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 13)	ERP < 3 Watt	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	EIRP < 2Watt	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt	PASS	-
-	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	1
-	§2.1049	Occupied Bandwidth	-	Report 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)	< 43+10log ₁₀ (P[Watts])	PASS	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)	< 43+10log ₁₀ (P[Watts])	PASS	1
-	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	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)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 12.58 dB at 1564.500 MHz

Remark :

- The conducted test items were leverage from module RF reports which can refer to Report No. FG371703.

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Copeland Cold Chain LP.

6223 N Discovery Way, Park Pointe Center 1 , Suite 120 Boise ID 83713 United States

1.2 Manufacturer

Queclink Wireless Solutions Co., Ltd.

No.30, Lane 500, Xinlong Road , Minhang District, Shanghai, China, 201101

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GO Tracker 2.2
Brand Name	Copeland
Model Name	GO Tracker 2.2
FCC ID	AMH101020
SN Code	Radiation:7800002284 Conducted: 7700000941
HW Version	V2.02
SW Version	R00A01V16
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
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
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
Maximum Output Power to Antenna	LTE Band 2 : 23.30 dBm LTE Band 4 : 22.92 dBm LTE Band 5 : 23.20 dBm LTE Band 12 : 23.17 dBm



	LTE Band 13 : 23.11 dBm
Antenna Type	PIFA Antenna
Antenna Gain	LTE Band 2 : 2.56 dBi LTE Band 4 : 3.13 dBi LTE Band 5 : 0.85 dBi LTE Band 12 : 0.33 dBi LTE Band 13 : 1.49 dBi
Type of Modulation	QPSK / 16QAM

Remark: This device support LTE category 1 bits.

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP

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	0.3436	-	0.2805	-
3	1851.5 ~ 1908.5	0.3532	-	0.2818	-
5	1852.5 ~ 1907.5	0.3499	-	0.2805	-
10	1855.0 ~ 1905.0	0.3556	-	0.2891	-
15	1857.5 ~ 1902.5	0.3499	-	0.2805	-
20	1860.0 ~ 1900.0	0.3855	-	0.3097	-
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	0.3811	-	0.3443	-
3	1711.5 ~ 1753.5	0.3802	-	0.3420	-
5	1712.5 ~ 1752.5	0.3873	-	0.3396	-
10	1715.0 ~ 1750.0	0.3926	-	0.3508	-
15	1717.5 ~ 1747.5	0.3793	-	0.3467	-
20	1720.0 ~ 1745.0	0.4027	-	0.3184	-



LTE Band 5		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	824.7 ~ 848.3	0.1442	-	0.1119	-
3	825.5 ~ 847.5	0.1459	-	0.1122	-
5	826.5 ~ 846.5	0.1469	-	0.1140	-
10	829.0 ~ 844.0	0.1549	-	0.1151	-
LTE Band 12		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	699.7 ~ 715.3	0.1349	-	0.1194	-
3	700.5 ~ 714.5	0.1349	-	0.1211	-
5	701.5 ~ 713.5	0.1321	-	0.1191	-
10	704.0 ~ 711.0	0.1365	-	0.1222	-
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	0.1213	-	0.0946	-
10	782.0	0.1758	-	0.0962	-

1.7 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	TH01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24

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: All test items were verified and recorded according to the standards and without any deviation during the test.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

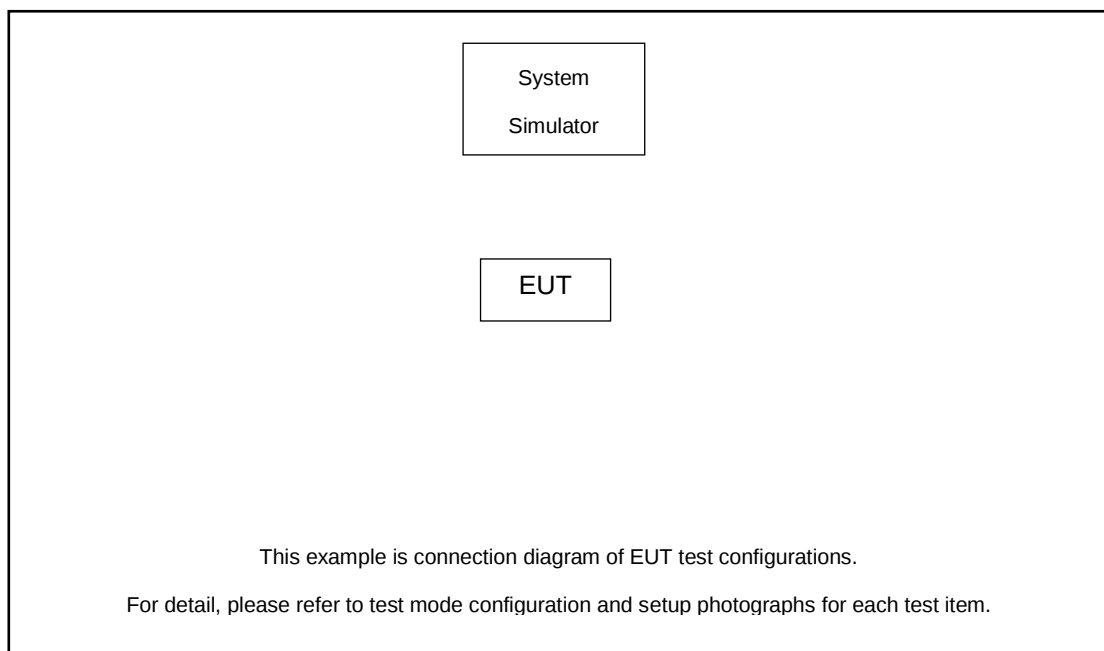
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes(X/Y/Z Plane) to find the maximum emission(Y Plane).

LTE Category-1 bits:

EUT Category 1 BRS																
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
Max. Output Power	2	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
	5	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
	13	-	-	v	v	-	-	v	v	-	v	v	v	v	v	v
E.R.P / E.I.R.P	2	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
	5	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
	13	-	-	v	v	-	-	v	v	-	v	v	v	v	v	v
Radiated Spurious Emission	2	Worst Case												v	v	v
	4	Worst Case												v	v	v
	5	Worst Case												v	v	v
	12	Worst Case												v	v	v
	13	Worst Case												v	v	v
Note	1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. 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.															

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m



2.4 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3



LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5

3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 Conducted Output Power



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 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 5.

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

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

The EIRP of mobile transmitters must not exceed 1 Watts for LTE 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

3.4.2 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.

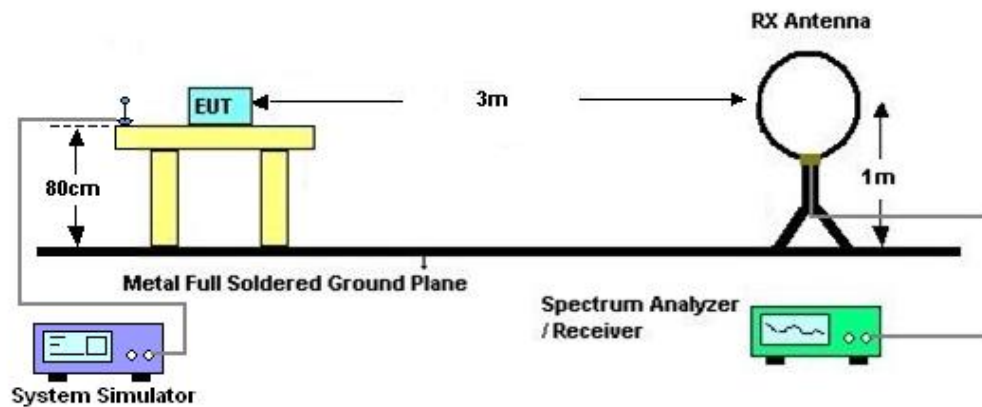
4 Radiated Test Items

4.1 Measuring Instruments

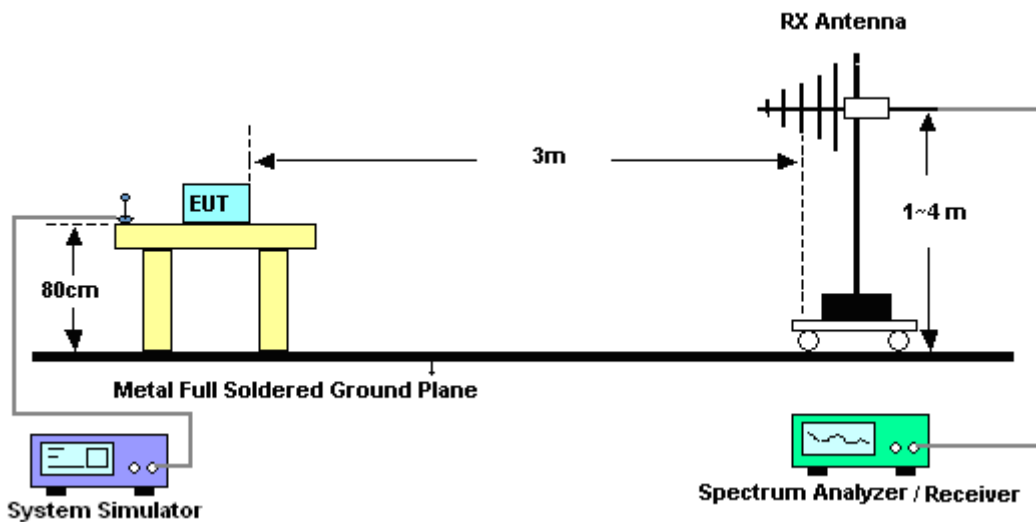
See list of measuring instruments of this test report.

4.2 Test Setup

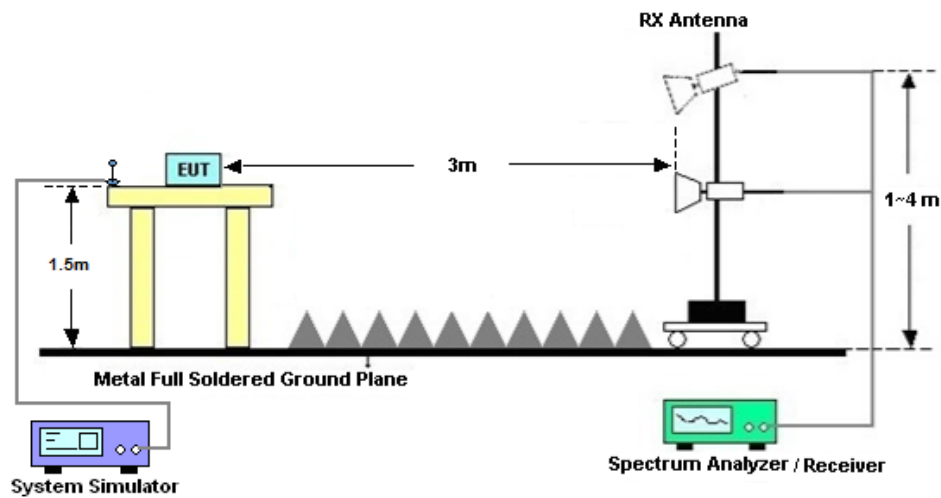
4.2.1 For radiated test below 30MHz



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. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11. $\text{ERP (dBm)} = \text{EIRP} - 2.15$
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
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	May 17, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2023	May 17, 2024	Dec. 24, 2024	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 09, 2024	May 13, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	May 13, 2024	Jun. 27, 2024	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 09, 2024	May 13, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Aug. 20, 2023	May 13, 2024	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 09, 2024	May 13, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	May 13, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 07, 2023	May 13, 2024	Jul.06, 2024	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 09, 2024	May 13, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 27, 2023	May 13, 2024	Dec. 26, 2024	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	N/A	Oct. 18, 2023	May 13, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	May 13, 2024	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	May 13, 2024	NCR	Radiation (03CH03-SZ)

NCR: No Calibration Required

6 Measurement Uncertainty

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 Conducted Measurement

Test Item	Uncertainty
Conducted Power	±1.34 dB

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.0dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.6dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.8dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and ERP/EIRP

LTE Band 2

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				18700	18900	19100			
Frequency (MHz)				1860	1880	1900	L	M	H
20	QPSK	1	0	22.45	21.87	23.10	0.3170	0.2773	0.3681
20	QPSK	1	49	22.01	22.69	22.29	0.2864	0.3350	0.3055
20	QPSK	1	99	21.58	23.30	22.18	0.2594	0.3855	0.2979
20	QPSK	50	0	21.18	21.18	21.60	0.2366	0.2366	0.2606
20	QPSK	50	24	21.09	21.60	21.35	0.2317	0.2606	0.2460
20	QPSK	50	50	20.73	22.00	20.71	0.2133	0.2858	0.2123
20	QPSK	100	0	20.64	21.87	20.63	0.2089	0.2773	0.2084
20	16QAM	1	0	21.61	21.49	22.35	0.2612	0.2541	0.3097
Channel				18675	18900	19125	EIRP(W)		
Frequency (MHz)				1857.5	1880	1902.5	L	M	H
15	QPSK	1	0	22.88	22.55	22.38	0.3499	0.3243	0.3119
15	16QAM	1	0	21.92	21.65	21.59	0.2805	0.2636	0.2600
Channel				18650	18900	19150	EIRP(W)		
Frequency (MHz)				1855	1880	1905	L	M	H
10	QPSK	1	0	22.95	22.64	22.45	0.3556	0.3311	0.3170
10	16QAM	1	0	22.05	21.74	21.67	0.2891	0.2692	0.2649
Channel				18625	18900	19175	EIRP(W)		
Frequency (MHz)				1852.5	1880	1907.5	L	M	H
5	QPSK	1	0	22.88	22.49	22.31	0.3499	0.3199	0.3069
5	16QAM	1	0	21.92	21.68	21.60	0.2805	0.2655	0.2606
Channel				18615	18900	19185	EIRP(W)		
Frequency (MHz)				1851.5	1880	1908.5	L	M	H
3	QPSK	1	0	22.92	22.54	22.38	0.3532	0.3236	0.3119
3	16QAM	1	0	21.94	21.60	21.56	0.2818	0.2606	0.2582
Channel				18607	18900	19193	EIRP(W)		
Frequency (MHz)				1850.7	1880	1909.3	L	M	H
1.4	QPSK	1	0	22.80	22.53	22.41	0.3436	0.3228	0.3141
1.4	16QAM	1	0	21.92	21.68	21.64	0.2805	0.2655	0.2630



LTE Band 4

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				20050	20175	20300			
Frequency (MHz)				1720	1732.5	1745	L	M	H
20	QPSK	1	0	21.82	22.16	22.26	0.3126	0.3381	0.3459
20	QPSK	1	49	21.41	22.92	20.88	0.2844	0.4027	0.2518
20	QPSK	1	99	22.60	21.26	20.88	0.3741	0.2748	0.2518
20	QPSK	50	0	20.36	21.71	20.71	0.2234	0.3048	0.2421
20	QPSK	50	24	20.63	21.84	20.07	0.2377	0.3141	0.2089
20	QPSK	50	50	21.21	21.30	19.66	0.2716	0.2773	0.1901
20	QPSK	100	0	21.12	21.26	19.56	0.2661	0.2748	0.1858
20	16QAM	1	0	21.31	21.10	21.90	0.2780	0.2649	0.3184
Channel				20025	20175	20325	EIRP(W)		
Frequency (MHz)				1717.5	1732.5	1747.5	L	M	H
15	QPSK	1	0	21.92	22.66	20.88	0.3199	0.3793	0.2518
15	16QAM	1	0	21.53	22.27	19.95	0.2924	0.3467	0.2032
Channel				20000	20175	20350	EIRP(W)		
Frequency (MHz)				1715	1732.5	1750	L	M	H
10	QPSK	1	0	22.02	22.81	21.02	0.3273	0.3926	0.2600
10	16QAM	1	0	21.60	22.32	20.10	0.2972	0.3508	0.2104
Channel				19975	20175	20375	EIRP(W)		
Frequency (MHz)				1712.5	1732.5	1752.5	L	M	H
5	QPSK	1	0	21.94	22.75	20.89	0.3214	0.3873	0.2523
5	16QAM	1	0	21.54	22.18	20.05	0.2931	0.3396	0.2080
Channel				19965	20175	20385	EIRP(W)		
Frequency (MHz)				1711.5	1732.5	1753.5	L	M	H
3	QPSK	1	0	21.95	22.67	20.91	0.3221	0.3802	0.2535
3	16QAM	1	0	21.54	22.21	19.99	0.2931	0.3420	0.2051
Channel				19950	20175	20393	EIRP(W)		
Frequency (MHz)				1710	1732.5	1754.3	L	M	H
1.4	QPSK	1	0	21.90	22.68	20.94	0.3184	0.3811	0.2553
1.4	16QAM	1	0	21.55	22.24	19.95	0.2938	0.3443	0.2032



LTE Band 5

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				20450	20525	20600			
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	22.21	22.34	23.03	0.1233	0.1271	0.1489
10	QPSK	1	25	21.83	23.20	21.88	0.1130	0.1549	0.1143
10	QPSK	1	49	22.86	22.64	22.30	0.1432	0.1361	0.1259
10	QPSK	25	0	20.57	21.82	21.26	0.0845	0.1127	0.0991
10	QPSK	25	12	20.88	22.18	20.94	0.0908	0.1225	0.0920
10	QPSK	25	25	21.01	21.89	20.87	0.0935	0.1146	0.0906
10	QPSK	50	0	20.93	21.95	20.89	0.0918	0.1161	0.0910
10	16QAM	1	0	21.76	21.88	21.91	0.1112	0.1143	0.1151
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	22.13	22.32	22.97	0.1211	0.1265	0.1469
5	16QAM	1	0	21.72	21.82	21.87	0.1102	0.1127	0.1140
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	22.17	22.19	22.94	0.1222	0.1227	0.1459
3	16QAM	1	0	21.62	21.74	21.80	0.1076	0.1107	0.1122
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	22.13	22.27	22.89	0.1211	0.1250	0.1442
1.4	16QAM	1	0	21.62	21.78	21.79	0.1076	0.1117	0.1119



LTE Band 12

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23060	23095	23130			
Frequency (MHz)				704	707.5	711	L	M	H
10	QPSK	1	0	23.17	22.68	22.37	0.1365	0.1219	0.1135
10	QPSK	1	25	22.68	22.56	23.16	0.1219	0.1186	0.1361
10	QPSK	1	49	22.78	22.93	22.57	0.1247	0.1291	0.1189
10	QPSK	25	0	21.71	21.30	21.57	0.0975	0.0887	0.0944
10	QPSK	25	12	21.71	21.56	21.97	0.0975	0.0942	0.1035
10	QPSK	25	25	21.41	21.80	21.73	0.0910	0.0995	0.0979
10	QPSK	50	0	21.81	21.41	21.53	0.0998	0.0910	0.0935
10	16QAM	1	0	22.69	22.22	21.51	0.1222	0.1096	0.0931
Channel				23035	23095	23155	ERP(W)		
Frequency (MHz)				701.5	707.5	713.5	L	M	H
5	QPSK	1	0	23.03	22.54	22.26	0.1321	0.1180	0.1107
5	16QAM	1	0	22.58	22.15	21.43	0.1191	0.1079	0.0914
Channel				23025	23095	23165	ERP(W)		
Frequency (MHz)				700.5	707.5	714.5	L	M	H
3	QPSK	1	0	23.12	22.56	22.34	0.1349	0.1186	0.1127
3	16QAM	1	0	22.65	22.16	21.36	0.1211	0.1081	0.0899
Channel				23017	23095	23173	ERP(W)		
Frequency (MHz)				699.7	707.5	715.3	L	M	H
1.4	QPSK	1	0	23.12	22.66	22.34	0.1349	0.1213	0.1127
1.4	16QAM	1	0	22.59	22.15	21.45	0.1194	0.1079	0.0918

**LTE Band 13**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23230					
Frequency (MHz)				782				M	
10	QPSK	1	0		21.52			0.1219	
10	QPSK	1	25		23.11			0.1758	
10	QPSK	1	49		21.59			0.1239	
10	QPSK	25	0		21.28			0.1153	
10	QPSK	25	12		22.44			0.1507	
10	QPSK	25	25		21.85			0.1315	
10	QPSK	50	0		22.08			0.1387	
10	16QAM	1	0		20.49			0.0962	
Channel				23205	23230	23255	ERP(W)		
Frequency (MHz)				779.5	782	784.5	L	M	H
5	QPSK	1	0	21.50	21.38	21.47	0.1213	0.1180	0.1205
5	16QAM	1	0	20.42	20.40	20.37	0.0946	0.0942	0.0935



Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Shunping You	Temperature :	22~25°C
		Relative Humidity :	48~52%

LTE Band 2 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3702.18	-46.47	-13	-33.47	-61.01	-53.23	5.82	12.58	H
	5553.27	-61.15	-13	-48.15	-78.68	-66.87	7.28	13.00	H
	7404.36	-55.24	-13	-42.24	-77.95	-58.40	8.32	11.48	H
	3702.18	-44.61	-13	-31.61	-59.44	-51.37	5.82	12.58	V
	5553.27	-58.58	-13	-45.58	-76.16	-64.30	7.28	13.00	V
	7404.36	-55.55	-13	-42.55	-78.3	-58.71	8.32	11.48	V
Middle	3742.18	-41.25	-13	-28.25	-55.88	-48.00	5.85	12.60	H
	5613.27	-56.16	-13	-43.16	-73.88	-61.96	7.30	13.10	H
	7484.36	-55.93	-13	-42.93	-78.34	-59.08	8.35	11.50	H
	3742.18	-45.38	-13	-32.38	-60.22	-52.13	5.85	12.60	V
	5613.27	-56.18	-13	-43.18	-73.81	-61.98	7.30	13.10	V
	7484.36	-56.09	-13	-43.09	-78.43	-59.24	8.35	11.50	V
Highest	3782.18	-44.39	-13	-31.39	-59.09	-51.13	5.88	12.62	H
	5673.27	-57.78	-13	-44.78	-75.65	-63.59	7.32	13.13	H
	7564.36	-55.12	-13	-42.12	-77.32	-58.28	8.38	11.54	H
	3782.18	-44.45	-13	-31.45	-59.28	-51.19	5.88	12.62	V
	5673.27	-56.62	-13	-43.62	-74.46	-62.43	7.32	13.13	V
	7564.36	-55.79	-13	-42.79	-77.81	-58.95	8.38	11.54	V

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



LTE Band 4 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3422.18	-54.38	-13	-41.38	-66.64	-61.26	5.60	12.48	H
	5133.27	-56.95	-13	-43.95	-74.44	-62.63	7.10	12.78	H
	6844.36	-58.78	-13	-45.78	-79.23	-62.17	8.38	11.77	H
	3422.18	-54.00	-13	-41.00	-66.82	-60.88	5.60	12.48	V
	5133.27	-57.69	-13	-44.69	-75.12	-63.37	7.10	12.78	V
	6844.36	-58.08	-13	-45.08	-78.29	-61.47	8.38	11.77	V
Middle	3447.18	-54.05	-13	-41.05	-66.59	-60.90	5.65	12.50	H
	5170.77	-57.80	-13	-44.80	-75.33	-63.47	7.13	12.80	H
	6894.36	-58.63	-13	-45.63	-79.31	-62.03	8.40	11.80	H
	3447.18	-54.40	-13	-41.40	-67.49	-61.25	5.65	12.50	V
	5170.77	-57.29	-13	-44.29	-74.77	-62.96	7.13	12.80	V
	6894.36	-58.81	-13	-45.81	-79.4	-62.21	8.40	11.80	V
Highest	3472.18	-59.58	-13	-46.58	-72.40	-66.42	5.68	12.52	H
	5208.27	-58.75	-13	-45.75	-76.21	-64.42	7.15	12.82	H
	6944.36	-58.57	-13	-45.57	-79.48	-62.00	8.42	11.85	H
	3472.18	-55.22	-13	-42.22	-68.59	-62.06	5.68	12.52	V
	5208.27	-60.43	-13	-47.43	-77.84	-66.10	7.15	12.82	V
	6944.36	-58.58	-13	-45.58	-79.54	-62.01	8.42	11.85	V

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



LTE Band 5 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1649.18	-49.04	-13	-36.04	-55.30	-52.27	3.98	9.36	H
	2473.77	-56.05	-13	-43.05	-66.40	-59.60	4.85	10.55	H
	3298.36	-54.94	-13	-41.94	-67.35	-59.87	5.50	12.58	H
	4122.95	-61.83	-13	-48.83	-77.41	-66.30	5.98	12.60	H
	1649.18	-42.97	-13	-29.97	-49.11	-46.20	3.98	9.36	V
	2473.77	-51.72	-13	-38.72	-62.43	-55.27	4.85	10.55	V
	3298.36	-50.72	-13	-37.72	-63.59	-55.65	5.50	12.58	V
	4122.95	-60.39	-13	-47.39	-76.08	-64.86	5.98	12.60	V
Middle	1664.18	-43.72	-13	-30.72	-49.97	-46.97	4.00	9.40	H
	2496.27	-57.61	-13	-44.61	-67.90	-61.18	4.88	10.60	H
	3328.36	-53.52	-13	-40.52	-65.69	-58.45	5.52	12.60	H
	4160.45	-62.53	-13	-49.53	-78.19	-67.00	6.00	12.62	H
	1664.18	-40.24	-13	-27.24	-46.26	-43.49	4.00	9.40	V
	2496.27	-53.29	-13	-40.29	-63.92	-56.86	4.88	10.60	V
	3328.36	-52.81	-13	-39.81	-65.39	-57.74	5.52	12.60	V
	4160.45	-61.32	-13	-48.32	-77.15	-65.79	6.00	12.62	V
Highest	1679.18	-44.91	-13	-31.91	-51.19	-48.08	4.10	9.42	H
	2518.77	-58.35	-13	-45.35	-68.63	-61.93	4.90	10.63	H
	3358.36	-54.85	-13	-41.85	-66.87	-59.77	5.55	12.62	H
	4197.95	-62.99	-13	-49.99	-78.78	-67.47	6.02	12.65	H
	1679.18	-40.16	-13	-27.16	-46.18	-43.33	4.10	9.42	V
	2518.77	-55.41	-13	-42.41	-66.02	-58.99	4.90	10.63	V
	3358.36	-54.89	-13	-41.89	-67.33	-59.81	5.55	12.62	V
	4197.95	-61.46	-13	-48.46	-77.42	-65.94	6.02	12.65	V

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



LTE Band 12 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1399	-49.12	-13	-36.12	-57.26	-52.35	3.98	9.36	H
	2098.5	-54.50	-13	-41.50	-64.08	-58.05	4.85	10.55	H
	2798	-59.35	-13	-46.35	-71.33	-64.28	5.50	12.58	H
	3496	-63.02	-13	-50.02	-76.11	-67.49	5.98	12.60	H
	1399	-50.42	-13	-37.42	-58.62	-53.65	3.98	9.36	V
	2098.5	-54.79	-13	-41.79	-64.75	-58.34	4.85	10.55	V
	2798	-57.82	-13	-44.82	-70.04	-62.75	5.50	12.58	V
	3496	-62.04	-13	-49.04	-75.67	-66.51	5.98	12.60	V
Middle	1406	-47.66	-13	-34.66	-55.74	-50.91	4.00	9.40	H
	2109	-55.97	-13	-42.97	-65.73	-59.54	4.88	10.60	H
	2812	-59.77	-13	-46.77	-71.79	-64.70	5.52	12.60	H
	3512	-63.40	-13	-50.40	-76.69	-67.87	6.00	12.62	H
	1406	-49.07	-13	-36.07	-57.23	-52.32	4.00	9.40	V
	2109	-54.63	-13	-41.63	-64.76	-58.20	4.88	10.60	V
	2812	-61.49	-13	-48.49	-73.75	-66.42	5.52	12.60	V
	3512	-62.37	-13	-49.37	-76.19	-66.84	6.00	12.62	V
Highest	1413	-48.66	-13	-35.66	-56.66	-51.83	4.10	9.42	H
	2119.5	-57.03	-13	-44.03	-66.99	-60.61	4.90	10.63	H
	2826	-59.41	-13	-46.41	-71.47	-64.33	5.55	12.62	H
	3536	-62.15	-13	-49.15	-75.71	-66.63	6.02	12.65	H
	1413	-46.42	-13	-33.42	-54.50	-49.59	4.10	9.42	V
	2119.5	-53.68	-13	-40.68	-64.01	-57.26	4.90	10.63	V
	2826	-58.01	-13	-45.01	-70.32	-62.93	5.55	12.62	V
	3536	-62.22	-13	-49.22	-76.30	-66.70	6.02	12.65	V

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



LTE Band 13 / 5MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1554.5	-59.61	-13	-46.61	-66.45	-62.84	3.98	9.36	H
	2331.75	-50.28	-13	-37.28	-61.09	-53.83	4.85	10.55	H
	3109	-53.20	-13	-40.20	-66.05	-58.13	5.50	12.58	H
	1554.5	-59.22	-13	-46.22	-66.26	-62.45	3.98	9.36	V
	2331.75	-49.52	-13	-36.52	-60.72	-53.07	4.85	10.55	V
	3109	-53.10	-13	-40.10	-66.45	-58.03	5.50	12.58	V
Middle	1559.5	-57.56	-42.15	-15.41	-64.34	-60.81	4.00	9.40	H
	2339.25	-50.73	-13	-37.73	-61.52	-54.30	4.88	10.60	H
	3119	-53.59	-13	-40.59	-66.48	-58.52	5.52	12.60	H
	1559.5	-55.69	-42.15	-13.54	-62.68	-58.94	4.00	9.40	V
	2339.25	-49.03	-13	-36.03	-60.21	-52.60	4.88	10.60	V
	3119	-52.22	-13	-39.22	-65.62	-57.15	5.52	12.60	V
Highest	1564.5	-57.00	-42.15	-14.85	-63.72	-60.17	4.10	9.42	H
	2346.75	-57.48	-13	-44.48	-68.23	-61.06	4.90	10.63	H
	3129	-53.54	-13	-40.54	-66.46	-58.46	5.55	12.62	H
	1564.5	-54.73	-42.15	-12.58	-61.67	-57.90	4.10	9.42	V
	2346.75	-54.84	-13	-41.84	-65.98	-58.42	4.90	10.63	V
	3129	-53.22	-13	-40.22	-66.67	-58.14	5.55	12.62	V

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

LTE Band 13 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1559.5	-58.73	-42.15	-16.58	-65.51	-61.98	4.00	9.40	H
	2339.25	-49.18	-13	-36.18	-59.97	-52.75	4.88	10.60	H
	3119	-51.46	-13	-38.46	-64.35	-56.39	5.52	12.60	H
	1559.5	-59.29	-42.15	-17.14	-66.28	-62.54	4.00	9.40	V
	2339.25	-49.30	-13	-36.30	-60.48	-52.87	4.88	10.60	V
	3119	-53.35	-13	-40.35	-66.75	-58.28	5.52	12.60	V

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