Partial FCC Test Report
(Part 27)

Report No.: RF190925C38-8

FCC ID: WIYQSC20A

Original FCC ID: XMR201706SC20A

Test Model: SC20-A

Received Date: Sep. 25, 2019

Test Date: Sep. 27 ~ Oct. 07, 2019

Issued Date: Oct. 30, 2019

Applicant: CASTLES TECHNOLOGY CO., LTD.

Address: 6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 23143, TAIWAN (R. O. C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN

FCC Registration / Designation Number: 788550 / TW0003

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The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencie

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Release Control Record

Issue No.	Description	Date Issued
RF190925C38-8	Original release	Oct. 30, 2019

1 Certificate of Conformity

Product: LTE module

Brand: Quectel

Test Model: SC20-A

Sample Status: Identical Prototype

Applicant: CASTLES TECHNOLOGY CO., LTD.

Test Date: Sep. 27 ~ Oct. 07, 2019

Standards: FCC Part 27, Subpart C, L, H, F, M

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Oct. 30, 2019
Polly Chien / Specialist

Approved by : _____ , **Date:** Oct. 30, 2019
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2						
FCC Clause				Test Item	Result	Remarks
WCDMA B4 / LTE B4	LTE B12	LTE B13	LTE B7			
2.1046 27.50 (d)(4)	2.1046 27.50 (c)(10)	2.1046 27.50 (b)(10)	2.1046 27.50 (h)(2)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1046 27.50 (d)(4)	2.1046 27.50 (c)(10)	2.1046 27.50 (b)(10)	2.1046 27.50 (h)(2)	Conducted Output Power	N/A	Refer to Note 1
27.50 (d)(5)	----	----	----	Peak To Average Ratio	N/A	Refer to Note 1
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	N/A	Refer to Note 1
2.1049	2.1049 27.53 (m)(6)	2.1049 27.53 (m)(6)	2.1049 27.53 (m)(6)	Emission Bandwidth	N/A	Refer to Note 1
2.1051 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)	2.1051 27.53 (m)(4)(6)	Band Edge Measurements	N/A	Refer to Note 1
2.1051 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)	2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	N/A	Refer to Note 1
2.1053 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)	2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -23.2dB at 5070.00MHz.

Note:

1. This report is a partial report. Therefore, only test item of Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to Sporton International (KunShan) INC. report no.: FR741007A & FR741007B for module (Brand: Quectel, Model: SC20-A).
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 04, 2019	Jun. 03, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jul. 11, 2019	Jul. 10, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 19, 2019	Feb. 18, 2020
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jul. 11, 2019	Jul. 10, 2020
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2018	Nov. 13, 2019

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	LTE module		
Brand	Quectel		
Test Model	SC20-A		
Status of EUT	Identical Prototype		
Power Supply Rating	9Vdc~48Vdc, 1.5A~0.5A 3Vdc (Battery)		
Modulation Type	WCDMA: QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM		
Operating Frequency	WCDMA Band 4		1712.4MHz ~ 1752.6MHz
	LTE Band 4	Channel Bandwidth 1.4MHz	1710.7MHz ~ 1754.3MHz
		Channel Bandwidth 3MHz	1711.5MHz ~ 1753.5MHz
		Channel Bandwidth 5MHz	1712.5MHz ~ 1752.5MHz
		Channel Bandwidth 10MHz	1715.0MHz ~ 1750.0MHz
		Channel Bandwidth 15MHz	1717.5MHz ~ 1747.5MHz
		Channel Bandwidth 20MHz	1720.0MHz ~ 1745.0MHz
	LTE Band 7	Channel Bandwidth 5MHz	2502.5MHz ~ 2567.5MHz
		Channel Bandwidth 10MHz	2505.0MHz ~ 2565.0MHz
		Channel Bandwidth 15MHz	2507.5MHz ~ 2562.5MHz
		Channel Bandwidth 20MHz	2510.0MHz ~ 2560.0MHz
	LTE Band 12	Channel Bandwidth 1.4MHz	699.7MHz ~ 715.3MHz
		Channel Bandwidth 3MHz	700.5MHz ~ 714.5MHz
		Channel Bandwidth 5MHz	701.5MHz ~ 713.5MHz
		Channel Bandwidth 10MHz	704.0MHz ~ 711.0MHz
	LTE Band 13	Channel Bandwidth 5MHz	779.5MHz ~ 784.5MHz
		Channel Bandwidth 10MHz	782.0MHz
Max. EIRP Power	WCDMA Band 4		363.078mW (25.6dBm)
			QPSK
	LTE Band 4	Channel Bandwidth 1.4MHz	154.882mW (21.9dBm)
		Channel Bandwidth 3MHz	162.181mW (22.1dBm)
		Channel Bandwidth 5MHz	147.911mW (21.7dBm)
		Channel Bandwidth 10MHz	165.959mW (22.2dBm)
		Channel Bandwidth 15MHz	147.911mW (21.7dBm)
		Channel Bandwidth 20MHz	169.824mW (22.3dBm)
	LTE Band 7	Channel Bandwidth 5MHz	190.546mW (22.8dBm)
		Channel Bandwidth 10MHz	186.209mW (22.7dBm)
		Channel Bandwidth 15MHz	181.970mW (22.6dBm)
		Channel Bandwidth 20MHz	194.984mW (22.9dBm)

Max. ERP Power			QPSK
	LTE Band 12	Channel Bandwidth 1.4MHz	181.970mW (22.6dBm)
		Channel Bandwidth 3MHz	190.546mW (22.8dBm)
		Channel Bandwidth 5MHz	199.526mW (23.0dBm)
		Channel Bandwidth 10MHz	204.174mW (23.1dBm)
	LTE Band 13	Channel Bandwidth 5MHz	199.526mW (23.0dBm)
		Channel Bandwidth 10MHz	208.930mW (23.2dBm)
Antenna Type	Refer to Note		
Antenna Connector	Refer to Note		
Accessory Device	Refer to note		
Cable Supplied	NA		

Note:

1. This report is a partial report. Therefore, only test item of Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to Sporton International (KunShan) INC. report no.: FR741007A & FR741007B for module (Brand: Quectel, Model: SC20-A).
2. The EUT uses following antennas.

Antenna Type	Antenna Connector	Frequency	Antenna Gain (dBi)
Dipole	SMA PLUG	698-791MHz	0.85
		1710-2170MHz	-0.08
		2500-2700MHz	0.59

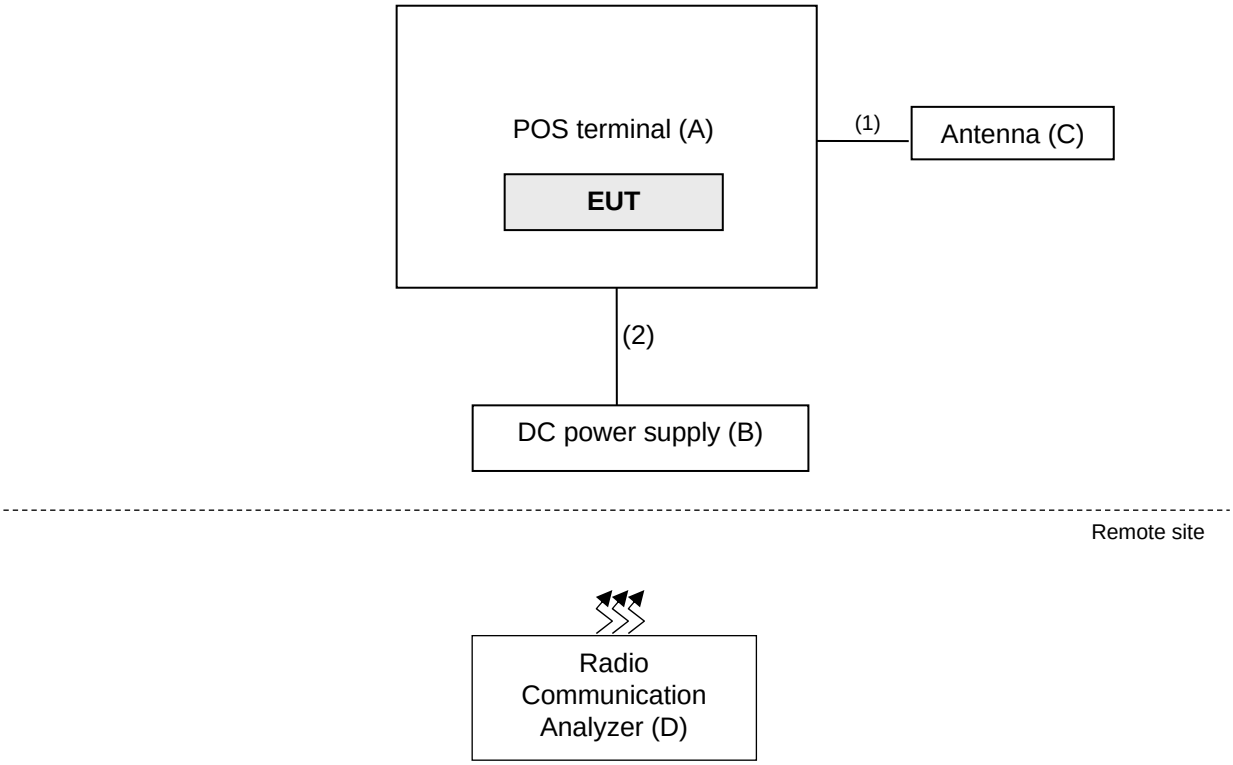
3. The EUT was installed in a specific End-product.

Product	Brand	Model
POS Terminal	CASTLES TECHNOLOGY	SATURN1000-E UPT

4. The End-product contains following accessory device.

Product	Brand	Model	Description
Battery	MITSUBISHI Lithium Manganese Dioxide Battery	CR2032	3Vdc, 210mAh

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	POS terminal	CASTLES TECHNOLOGY	SATURN1000-E UPT	NA	FCC DoC Approved	Provided by client.
B.	DC power supply	Keysight	U8002A	MY56330015	NA	-
C.	Antenna	ARISTOTLE ENTERPRISES INC.	RFA-LTE-T100-41-3M	NA	NA	Provided by client.
D.	Radio Communication Analyzer	Anritsu	MT8860C	1702001	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item D acted as a communication partner to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Antenna cable	1	3	N	0	Provided by client.
2.	Power cable	1	1	N	0	Provided by client.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below.

WCDMA Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312(1712.4MHz), 1413(1732.6MHz), 1513(1752.6MHz)	WCDMA
-	Radiated Emission Below 1GHz	1312 to 1513	1413(1732.6MHz)	WCDMA
-	Radiated Emission Above 1GHz	1312 to 1513	1312(1712.4MHz), 1413(1732.6MHz), 1513(1752.6MHz)	WCDMA

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	20175(1732.5MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
		19965 to 20385	20175(1732.5MHz)	3MHz	QPSK	1 RB / 14 RB Offset
		19975 to 20375	20175(1732.5MHz)	5MHz	QPSK	1 RB / 24 RB Offset
		20000 to 20350	20175(1732.5MHz)	10MHz	QPSK	1 RB / 49 RB Offset
		20025 to 20325	20175(1732.5MHz)	15MHz	QPSK	1 RB / 74 RB Offset
		20050 to 20300	20175(1732.5MHz)	20MHz	QPSK	1 RB / 99 RB Offset
-	Radiated Emission Below 1GHz	19957 to 20393	20175(1732.5MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
		19975 to 20375	20175(1732.5MHz)	5MHz	QPSK	1 RB / 24 RB Offset
		20050 to 20300	20175(1732.5MHz)	20MHz	QPSK	1 RB / 99 RB Offset
-	Radiated Emission Above 1GHz	19957 to 20393	20175(1732.5MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
		19965 to 20385	20175(1732.5MHz)	3MHz	QPSK	1 RB / 14 RB Offset
		19975 to 20375	20175(1732.5MHz)	5MHz	QPSK	1 RB / 24 RB Offset
		20000 to 20350	20175(1732.5MHz)	10MHz	QPSK	1 RB / 49 RB Offset
		20025 to 20325	20175(1732.5MHz)	15MHz	QPSK	1 RB / 74 RB Offset
		20050 to 20300	20175(1732.5MHz)	20MHz	QPSK	1 RB / 99 RB Offset

LTE Band 7

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	2775 to 3425	21100(2535.0MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		2800 to 3400	21100(2535.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		2825 to 3375	21100(2535.0MHz)	15MHz	QPSK	1 RB / 0 RB Offset
		2850 to 3350	21100(2535.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	2775 to 3425	21100(2535.0MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		2850 to 3350	21100(2535.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	2775 to 3425	21100(2535.0MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		2800 to 3400	21100(2535.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		2825 to 3375	21100(2535.0MHz)	15MHz	QPSK	1 RB / 0 RB Offset
		2850 to 3350	21100(2535.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

LTE Band 12

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23095(707.5MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095(707.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095(707.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095(707.5MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	23017 to 23173	23095(707.5MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095(707.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095(707.5MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23017 to 23173	23095(707.5MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095(707.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095(707.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095(707.5MHz)	10MHz	QPSK	1 RB / 0 RB Offset

LTE Band 13

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23230(782.0MHz),	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	23205 to 23255	23230(782.0MHz),	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23205 to 23255	23230(782.0MHz),	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset

Note:
1. For radiated emission below 1GHz, low, mid and high channels were pre-tested in chamber. Low channel was the worst case for all final tests.
2. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
ERP	22deg. C, 66%RH	12Vdc	Han Wu
Radiated Emission	22deg. C, 66%RH	12Vdc	Han Wu

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

Note: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 1 watts e.i.r.p for WCDMA, LTE Band 4, 2 watts e.i.r.p for LTE Band 7, and 3 watts e.r.p for LTE Band 12, Band 13.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for WCDMA mode, 10MHz for LTE mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Where:

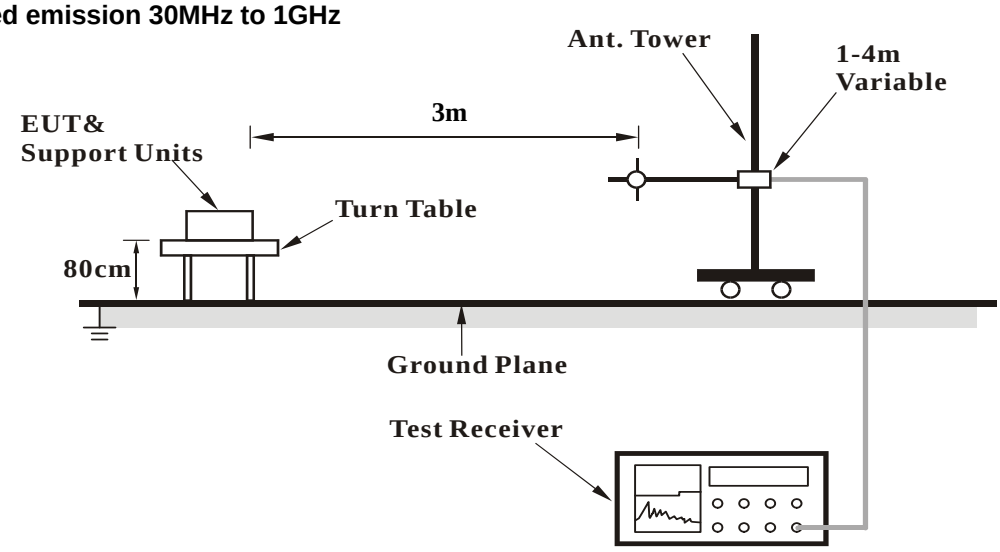
$ERP/EIRP = P_{Meas} + G_T - L_C$

P_{Meas} : Measure transmitter output power.
G_T : Gain of the transmitting antenna.
L_C : signal attenuation in the connecting cable between the transmitter and antenna.

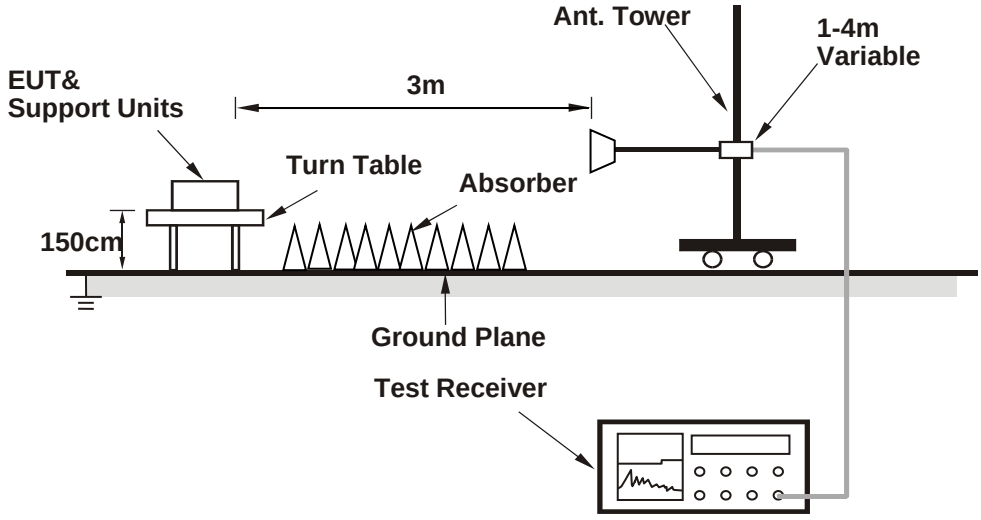
4.1.3 Test Setup

EIRP / ERP Measurement:

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

EIRP Power

WCDMA Band 4 Mode

Mode		TX channel 1312					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.40	-25.3	13.5	0.5	14.0	30.0	-16.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.40	-14.4	23.4	0.7	24.1	30.0	-5.9

Mode		TX channel 1413					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.60	-25.5	12.9	0.6	13.5	30.0	-16.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.60	-15.7	22.7	0.6	23.3	30.0	-6.7

Mode		TX channel 1513					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1752.60	-25.2	13.6	0.5	14.1	30.0	-15.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1752.60	-13.7	25.1	0.5	**25.6**	30.0	-4.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: QPSK

LTE Band 4, Channel Bandwidth: 1.4MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-30.0	8.4	0.6	9.0	30.0	-21.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-17.0	21.3	0.6	**21.9**	30.0	-8.1

LTE Band 4, Channel Bandwidth: 3MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-29.8	8.6	0.6	9.2	30.0	-20.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-16.8	21.5	0.6	**22.1**	30.0	-7.9

LTE Band 4, Channel Bandwidth: 5MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-29.6	8.8	0.6	9.4	30.0	-20.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-17.2	21.1	0.6	**21.7**	30.0	-8.3

LTE Band 4, Channel Bandwidth: 10MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-29.7	8.7	0.6	9.3	30.0	-20.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-16.7	21.6	0.6	**22.2**	30.0	-7.8

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 15MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-30.0	8.4	0.6	9.0	30.0	-21.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-17.2	21.1	0.6	**21.7**	30.0	-8.3

LTE Band 4, Channel Bandwidth: 20MHz

Mode		TX channel 20175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-29.4	9.0	0.6	9.6	30.0	-20.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1732.50	-16.6	21.7	0.6	**22.3**	30.0	-7.7

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 7, Channel Bandwidth: 5MHz

Mode		TX channel 21100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-25.6	16.1	0.2	16.3	33.0	-16.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-21.0	22.6	0.2	**22.8**	33.0	-10.2

LTE Band 7, Channel Bandwidth: 10MHz

Mode		TX channel 21100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-25.9	15.8	0.2	16.0	33.0	-17.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-21.1	22.5	0.2	**22.7**	33.0	-10.3

LTE Band 7, Channel Bandwidth: 15MHz

Mode		TX channel 21100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-25.5	16.2	0.2	16.4	33.0	-16.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-21.2	22.4	0.2	**22.6**	33.0	-10.4

LTE Band 7, Channel Bandwidth: 20MHz

Mode		TX channel 21100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-25.3	16.4	0.2	16.6	33.0	-16.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2535.00	-20.9	22.7	0.2	**22.9**	33.0	-10.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12, Channel Bandwidth: 1.4MHz

MODE		TX channel 23095					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-18.6	6.2	3.5	9.7	34.8	-25.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-8.6	19.1	3.5	**22.6**	34.8	-12.2

LTE Band 12, Channel Bandwidth: 3MHz

MODE		TX channel 23095					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-18.4	6.3	3.5	9.8	34.8	-25.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-8.4	19.3	3.5	**22.8**	34.8	-12.0

LTE Band 12, Channel Bandwidth: 5MHz

MODE		TX channel 23095					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-18.6	6.1	3.5	9.6	34.8	-25.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-8.2	19.5	3.5	**23.0**	34.8	-11.8

LTE Band 12, Channel Bandwidth: 10MHz

MODE		TX channel 23095					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-18.1	6.6	3.5	10.1	34.8	-24.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-8.1	19.6	3.5	**23.1**	34.8	-11.7

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 5MHz

MODE		TX channel 23230					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-14.7	11.3	4.0	15.3	34.8	-19.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-8.9	19.0	4.0	**23.0**	34.8	-11.8

LTE Band 13, Channel Bandwidth: 10MHz

MODE		TX channel 23230					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-14.5	11.5	4.0	15.5	34.8	-19.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-8.7	19.2	4.0	**23.2**	34.8	-11.6

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

For WCDMA Band 4, LTE Band 4
According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P) dB.

For LTE Band 7
In the FCC 27.53(m) (4)(6),On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB. The emission limit equal to –25dBm.

For LTE Band 12
According to FCC 27.53(g) for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

For LTE Band 13
According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm

4.2.2 Test Procedure

a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

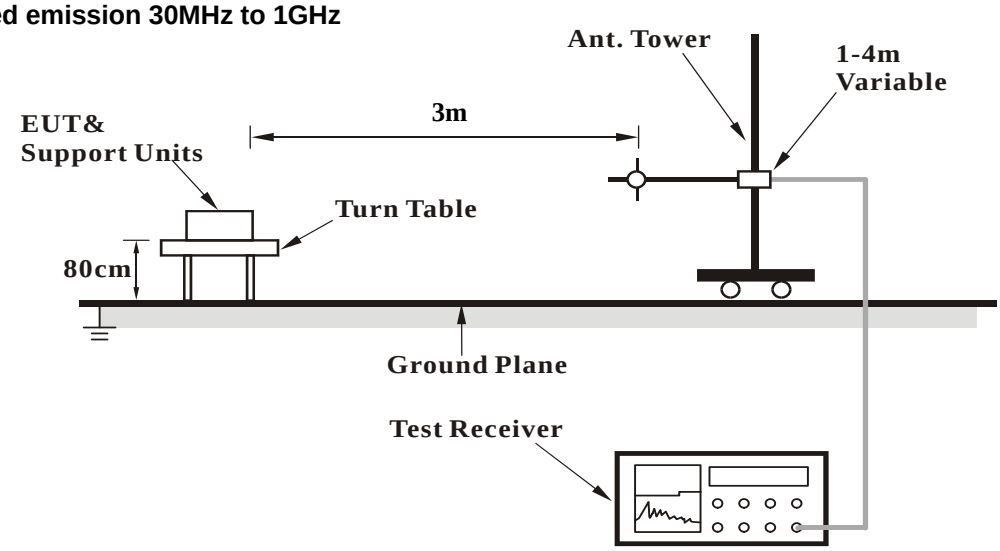
Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.2.3 Deviation from Test Standard

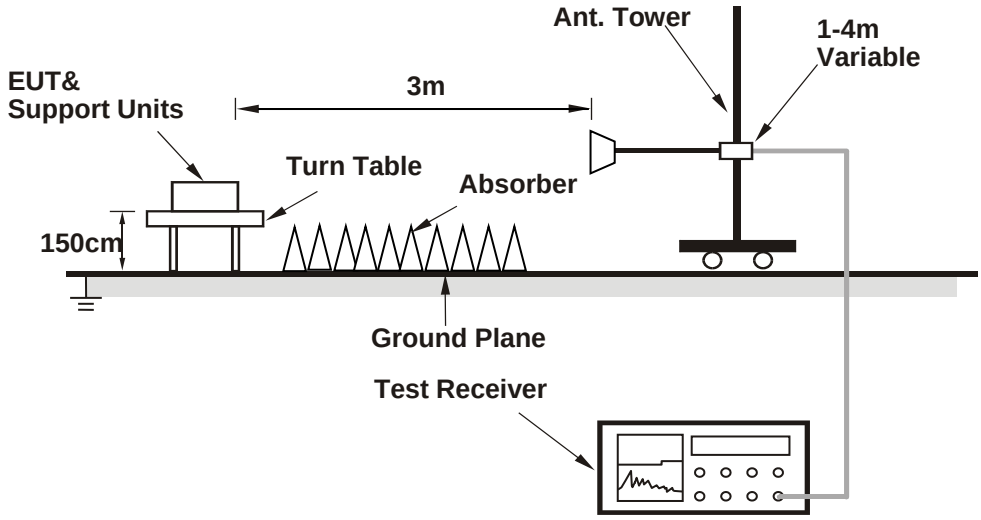
No deviation.

4.2.4 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

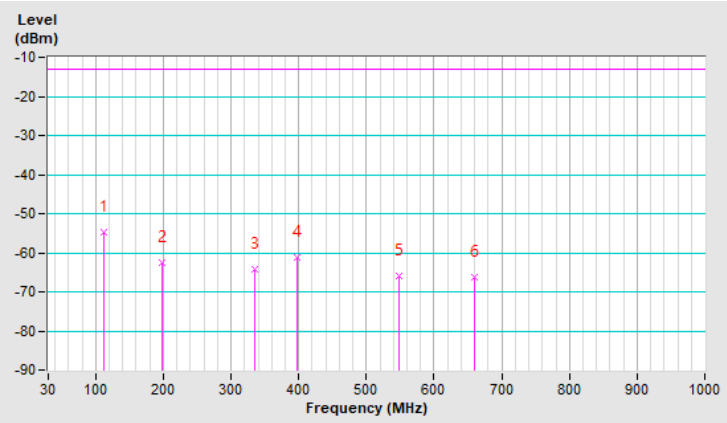
4.2.5 Test Results

Below 1GHz
WCDMA Band 4

Mode	TX channel 1413 (1732.6MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-46.9	-52.1	-2.5	-54.6	-13.0	-41.6
2	198.78	-54.0	-60.0	-2.4	-62.4	-13.0	-49.4
3	334.58	-60.6	-68.3	4.0	-64.3	-13.0	-51.3
4	398.60	-60.5	-64.5	3.3	-61.2	-13.0	-48.2
5	547.98	-66.2	-69.6	3.8	-65.8	-13.0	-52.8
6	660.50	-68.7	-70.0	3.7	-66.3	-13.0	-53.3

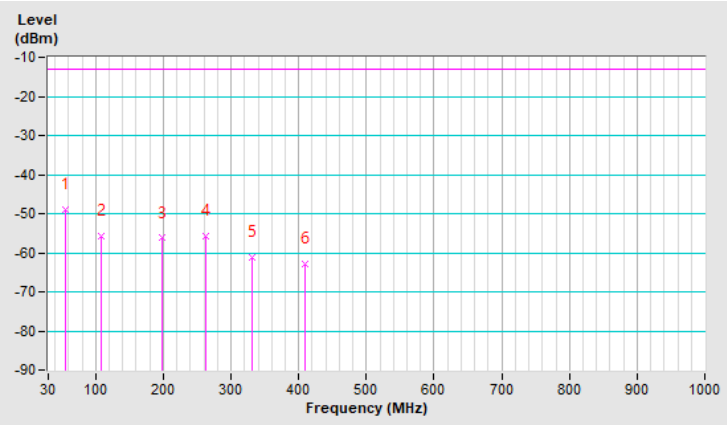
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 1413 (1732.6MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	55.22	-42.1	-43.6	-5.4	-49.0	-13.0	-36.0
2	107.60	-47.6	-53.6	-2.3	-55.9	-13.0	-42.9
3	198.78	-55.3	-53.9	-2.4	-56.3	-13.0	-43.3
4	262.80	-56.8	-54.2	-1.6	-55.8	-13.0	-42.8
5	330.70	-60.7	-65.2	4.0	-61.2	-13.0	-48.2
6	410.24	-62.4	-66.2	3.3	-62.9	-13.0	-49.9

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

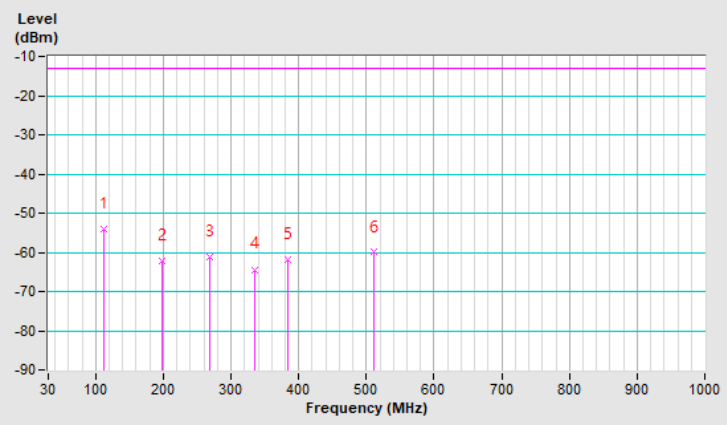


LTE Band 4, Channel Bandwidth: 1.4MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-46.5	-51.7	-2.5	-54.2	-13.0	-41.2
2	198.78	-53.8	-59.8	-2.4	-62.2	-13.0	-49.2
3	268.62	-57.1	-59.7	-1.5	-61.2	-13.0	-48.2
4	334.58	-60.7	-68.4	4.0	-64.4	-13.0	-51.4
5	383.08	-60.8	-65.4	3.5	-61.9	-13.0	-48.9
6	511.12	-60.1	-63.8	3.8	-60.0	-13.0	-47.0

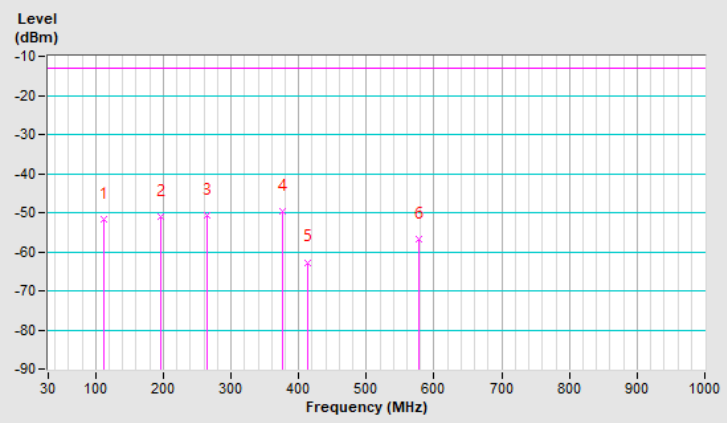
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-44.0	-49.2	-2.5	-51.7	-13.0	-38.7
2	196.84	-50.0	-48.4	-2.5	-50.9	-13.0	-37.9
3	264.74	-51.6	-49.0	-1.6	-50.6	-13.0	-37.6
4	375.32	-49.2	-53.3	3.7	-49.6	-13.0	-36.6
5	414.12	-62.3	-66.1	3.4	-62.7	-13.0	-49.7
6	577.08	-58.9	-60.6	3.7	-56.9	-13.0	-43.9

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

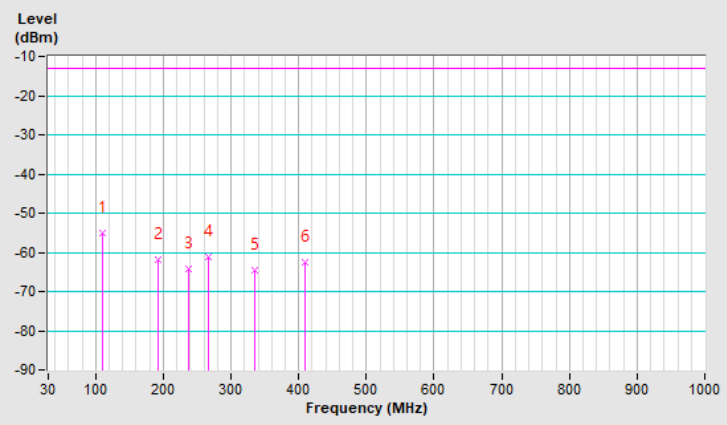


LTE Band 4, Channel Bandwidth: 5MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	109.54	-47.2	-52.6	-2.5	-55.1	-13.0	-42.1
2	192.96	-53.6	-59.4	-2.6	-62.0	-13.0	-49.0
3	237.58	-57.2	-62.8	-1.4	-64.2	-13.0	-51.2
4	266.68	-56.9	-59.6	-1.6	-61.2	-13.0	-48.2
5	334.58	-60.9	-68.6	4.0	-64.6	-13.0	-51.6
6	410.24	-62.4	-65.9	3.3	-62.6	-13.0	-49.6

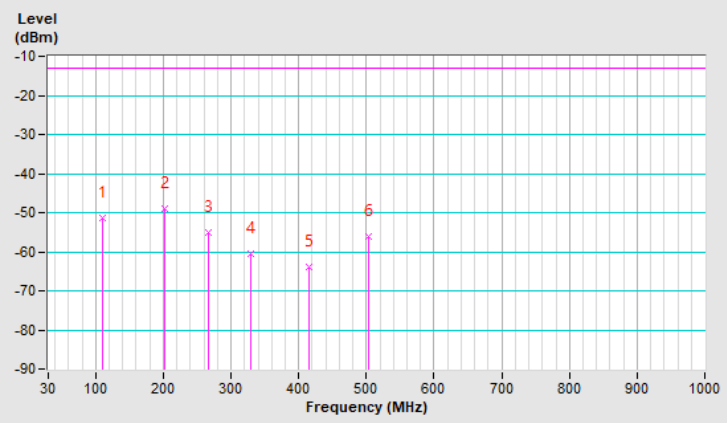
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	109.54	-43.2	-48.9	-2.5	-51.4	-13.0	-38.4
2	202.66	-47.5	-46.9	-2.1	-49.0	-13.0	-36.0
3	266.68	-56.3	-53.4	-1.6	-55.0	-13.0	-42.0
4	328.76	-60.2	-64.6	4.1	-60.5	-13.0	-47.5
5	416.06	-63.5	-67.3	3.4	-63.9	-13.0	-50.9
6	503.36	-56.1	-60.0	3.8	-56.2	-13.0	-43.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

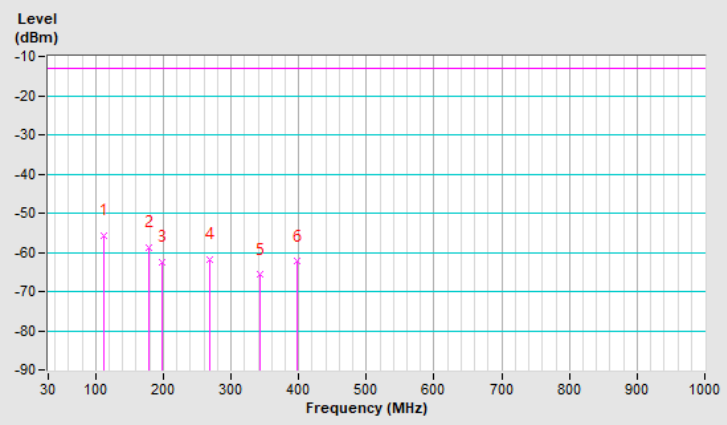


LTE Band 4, Channel Bandwidth: 20MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-48.2	-53.4	-2.5	-55.9	-13.0	-42.9
2	179.38	-51.0	-56.0	-2.9	-58.9	-13.0	-45.9
3	198.78	-54.2	-60.2	-2.4	-62.6	-13.0	-49.6
4	268.62	-57.7	-60.3	-1.5	-61.8	-13.0	-48.8
5	342.34	-62.3	-69.7	3.9	-65.8	-13.0	-52.8
6	398.60	-61.7	-65.7	3.3	-62.4	-13.0	-49.4

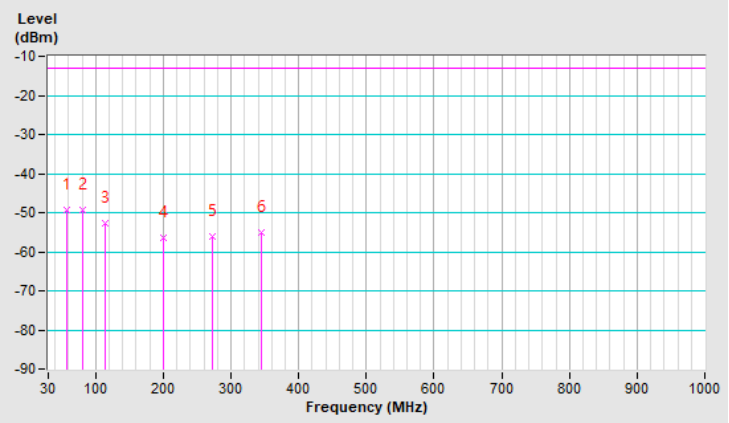
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	57.16	-42.3	-44.5	-4.7	-49.2	-13.0	-36.2
2	80.44	-44.7	-49.9	0.5	-49.4	-13.0	-36.4
3	113.42	-45.3	-50.0	-2.7	-52.7	-13.0	-39.7
4	200.72	-55.4	-54.3	-2.3	-56.6	-13.0	-43.6
5	272.50	-58.6	-54.7	-1.5	-56.2	-13.0	-43.2
6	344.28	-54.5	-59.1	4.0	-55.1	-13.0	-42.1

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

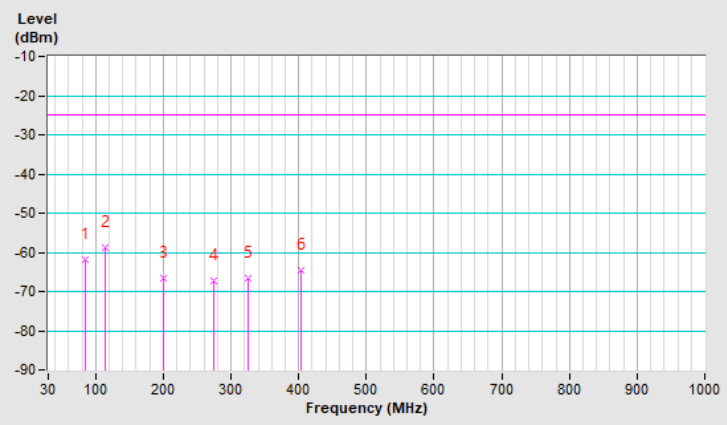


LTE Band 7, Channel Bandwidth: 5MHz

Mode	TX channel 21100 (2535.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	84.32	-55.9	-62.3	0.4	-61.9	-25.0	-36.9
2	113.42	-51.2	-56.2	-2.7	-58.9	-25.0	-33.9
3	200.72	-58.2	-64.2	-2.3	-66.5	-25.0	-41.5
4	274.44	-62.9	-65.8	-1.6	-67.4	-25.0	-42.4
5	324.88	-62.7	-70.7	4.1	-66.6	-25.0	-41.6
6	404.42	-64.0	-67.9	3.3	-64.6	-25.0	-39.6

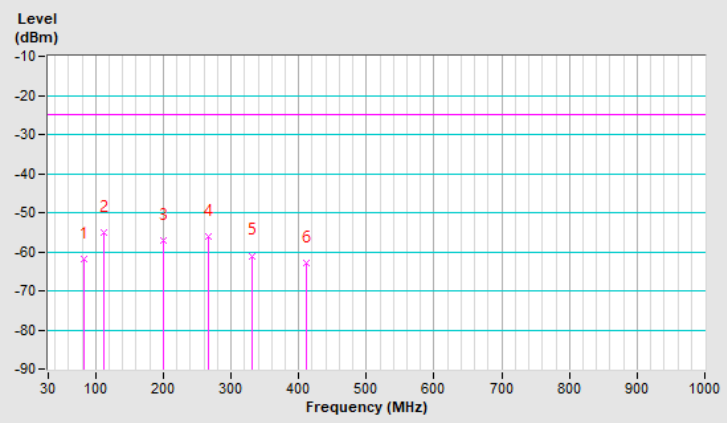
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 21100 (2535.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-57.4	-62.3	0.4	-61.9	-25.0	-36.9
2	111.48	-47.3	-52.5	-2.5	-55.0	-25.0	-30.0
3	200.72	-56.0	-54.9	-2.3	-57.2	-25.0	-32.2
4	266.68	-57.3	-54.4	-1.6	-56.0	-25.0	-31.0
5	330.70	-60.5	-65.0	4.0	-61.0	-25.0	-36.0
6	412.18	-62.6	-66.3	3.3	-63.0	-25.0	-38.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

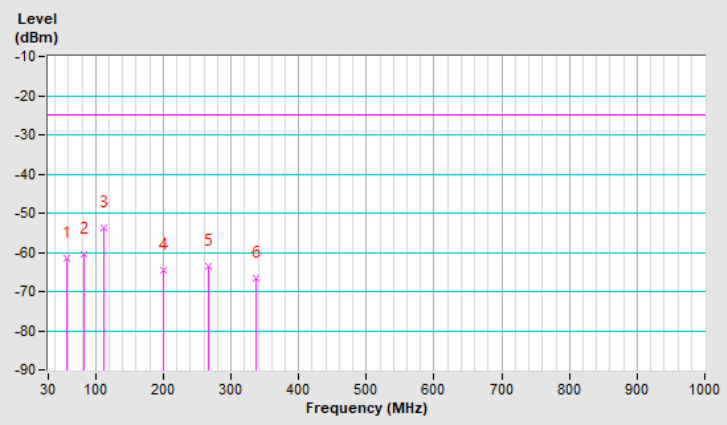


LTE Band 7, Channel Bandwidth: 20MHz

Mode	TX channel 21100 (2535.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	57.16	-57.8	-56.7	-4.7	-61.4	-25.0	-36.4
2	82.38	-55.1	-60.9	0.4	-60.5	-25.0	-35.5
3	111.48	-45.9	-51.1	-2.5	-53.6	-25.0	-28.6
4	200.72	-56.4	-62.4	-2.3	-64.7	-25.0	-39.7
5	266.68	-59.1	-61.8	-1.6	-63.4	-25.0	-38.4
6	336.52	-62.9	-70.6	4.0	-66.6	-25.0	-41.6

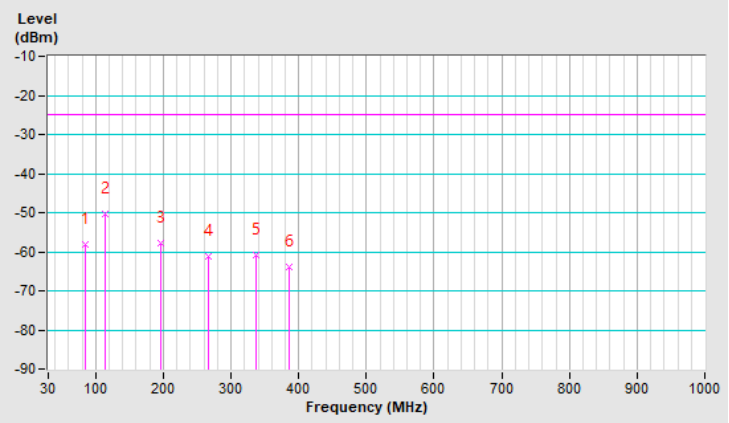
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 21100 (2535.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	84.32	-53.2	-58.6	0.4	-58.2	-25.0	-33.2
2	113.42	-42.8	-47.5	-2.7	-50.2	-25.0	-25.2
3	196.84	-57.0	-55.4	-2.5	-57.9	-25.0	-32.9
4	266.68	-62.4	-59.5	-1.6	-61.1	-25.0	-36.1
5	336.52	-60.2	-64.8	4.0	-60.8	-25.0	-35.8
6	385.02	-63.6	-67.5	3.5	-64.0	-25.0	-39.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

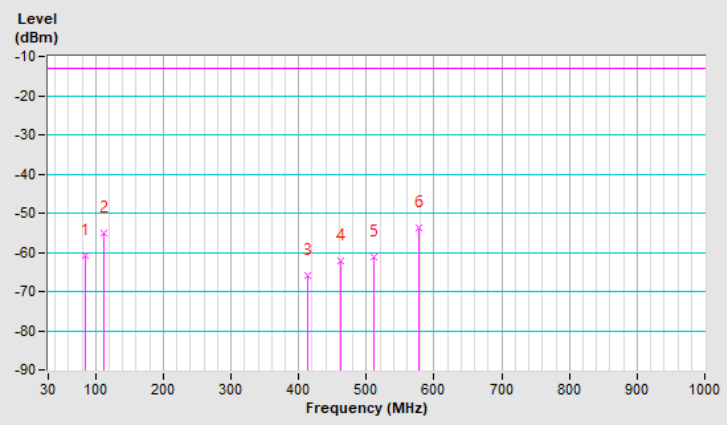


LTE Band 12, Channel Bandwidth: 1.4MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	84.32	-52.9	-61.4	0.4	-61.0	-13.0	-48.0
2	111.48	-45.2	-52.6	-2.5	-55.1	-13.0	-42.1
3	414.12	-63.7	-69.3	3.4	-65.9	-13.0	-52.9
4	462.62	-59.9	-65.5	3.4	-62.1	-13.0	-49.1
5	511.12	-59.2	-65.1	3.8	-61.3	-13.0	-48.3
6	577.08	-52.6	-57.4	3.7	-53.7	-13.0	-40.7

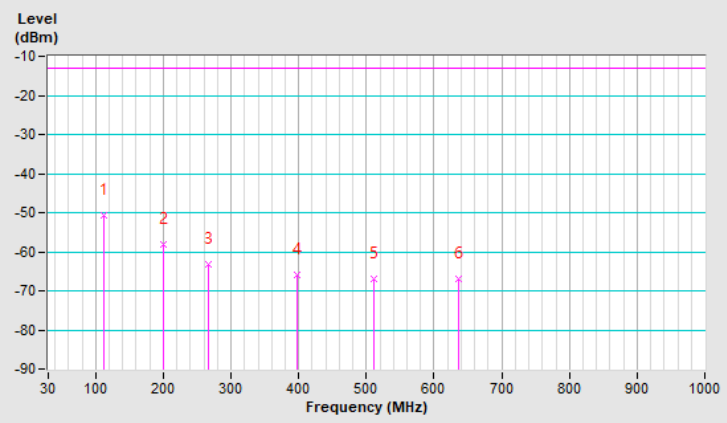
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-40.8	-48.1	-2.5	-50.6	-13.0	-37.6
2	200.72	-54.6	-55.7	-2.3	-58.0	-13.0	-45.0
3	266.68	-62.4	-61.6	-1.6	-63.2	-13.0	-50.2
4	398.60	-63.0	-69.2	3.3	-65.9	-13.0	-52.9
5	511.12	-65.1	-70.9	3.8	-67.1	-13.0	-54.1
6	635.28	-69.6	-70.6	3.7	-66.9	-13.0	-53.9

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

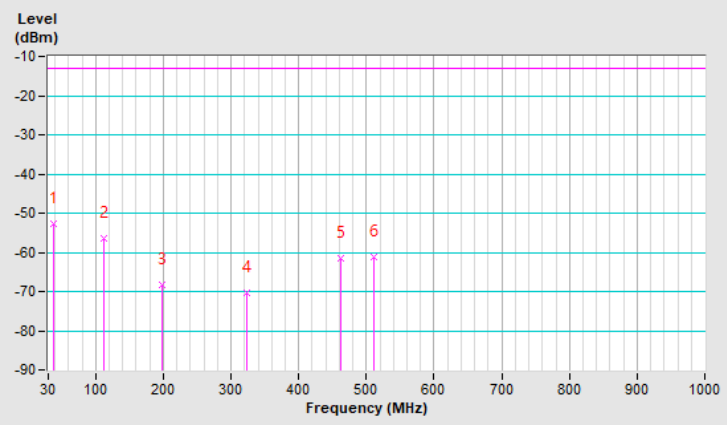


LTE Band 12, Channel Bandwidth: 5MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-53.8	-37.9	-14.7	-52.6	-13.0	-39.6
2	111.48	-46.5	-53.9	-2.5	-56.4	-13.0	-43.4
3	198.78	-57.8	-65.9	-2.4	-68.3	-13.0	-55.3
4	322.94	-64.2	-74.4	4.1	-70.3	-13.0	-57.3
5	462.62	-59.4	-65.0	3.4	-61.6	-13.0	-48.6
6	511.12	-59.2	-65.1	3.8	-61.3	-13.0	-48.3

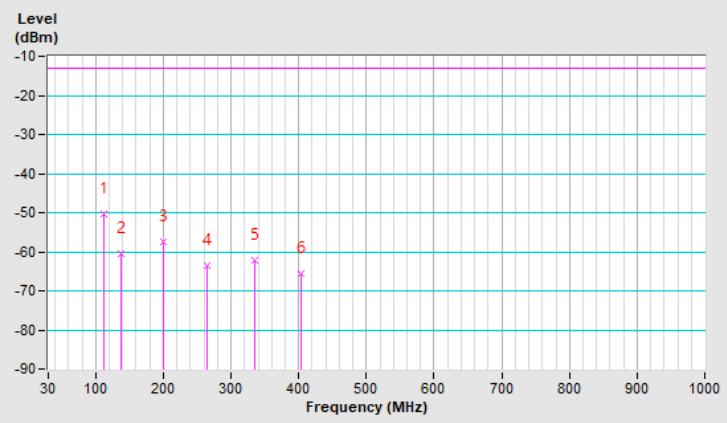
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-40.5	-47.9	-2.5	-50.4	-13.0	-37.4
2	136.70	-55.0	-57.2	-3.2	-60.4	-13.0	-47.4
3	200.72	-54.2	-55.3	-2.3	-57.6	-13.0	-44.6
4	264.74	-62.5	-62.0	-1.6	-63.6	-13.0	-50.6
5	334.58	-59.5	-66.2	4.0	-62.2	-13.0	-49.2
6	404.42	-62.8	-68.9	3.3	-65.6	-13.0	-52.6

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

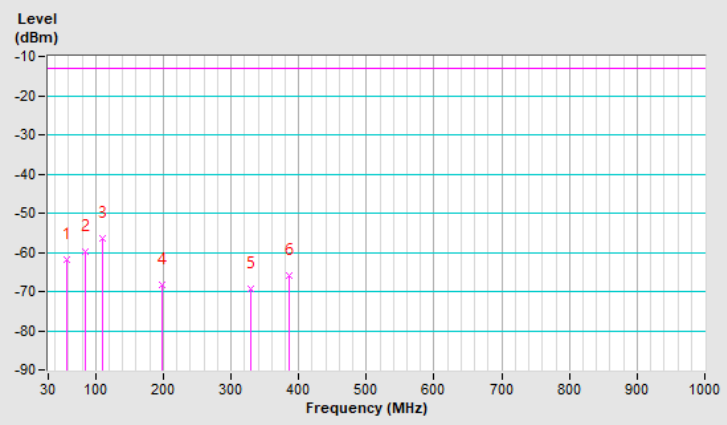


LTE Band 12, Channel Bandwidth: 10MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	57.16	-56.1	-57.2	-4.7	-61.9	-13.0	-48.9
2	84.32	-51.8	-60.3	0.4	-59.9	-13.0	-46.9
3	109.54	-46.5	-54.1	-2.5	-56.6	-13.0	-43.6
4	198.78	-57.9	-66.0	-2.4	-68.4	-13.0	-55.4
5	328.76	-63.2	-73.3	4.1	-69.2	-13.0	-56.2
6	385.02	-62.9	-69.4	3.5	-65.9	-13.0	-52.9

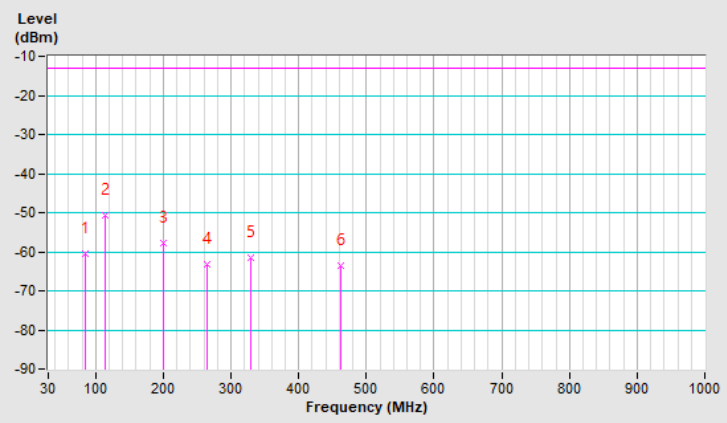
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	84.32	-53.2	-60.8	0.4	-60.4	-13.0	-47.4
2	113.42	-41.2	-48.1	-2.7	-50.8	-13.0	-37.8
3	200.72	-54.4	-55.5	-2.3	-57.8	-13.0	-44.8
4	264.74	-62.0	-61.5	-1.6	-63.1	-13.0	-50.1
5	328.76	-58.9	-65.5	4.1	-61.4	-13.0	-48.4
6	462.62	-61.1	-66.8	3.4	-63.4	-13.0	-50.4

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

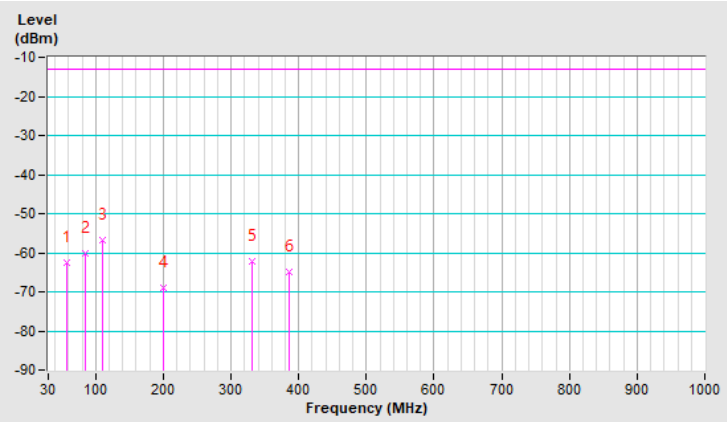


LTE Band 13, Channel Bandwidth: 5MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	57.16	-56.6	-57.7	-4.7	-62.4	-13.0	-49.4
2	84.32	-52.1	-60.7	0.4	-60.3	-13.0	-47.3
3	109.54	-46.8	-54.3	-2.5	-56.8	-13.0	-43.8
4	200.72	-58.5	-66.6	-2.3	-68.9	-13.0	-55.9
5	330.70	-56.2	-66.2	4.0	-62.2	-13.0	-49.2
6	385.02	-61.9	-68.4	3.5	-64.9	-13.0	-51.9

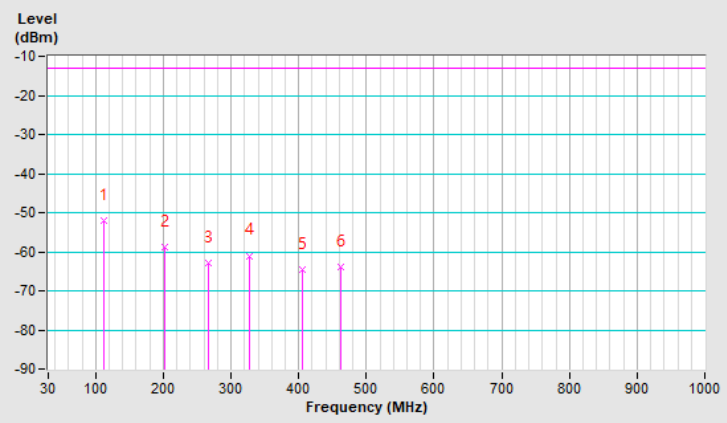
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	111.48	-42.1	-49.5	-2.5	-52.0	-13.0	-39.0
2	202.66	-55.1	-56.7	-2.1	-58.8	-13.0	-45.8
3	266.68	-62.1	-61.4	-1.6	-63.0	-13.0	-50.0
4	326.82	-58.6	-65.1	4.1	-61.0	-13.0	-48.0
5	406.36	-62.0	-68.0	3.3	-64.7	-13.0	-51.7
6	462.62	-61.8	-67.4	3.4	-64.0	-13.0	-51.0

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

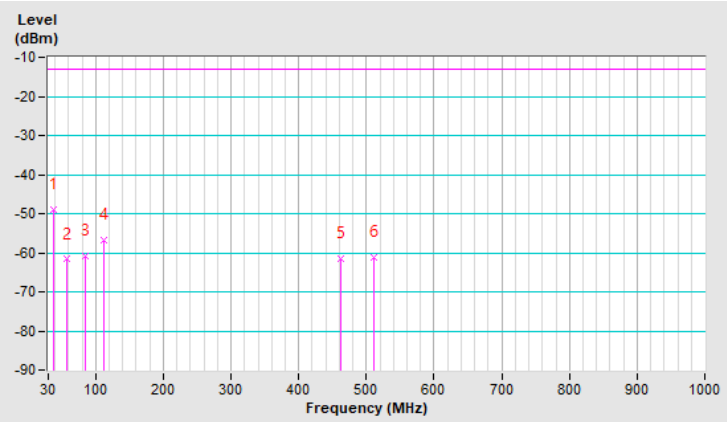


LTE Band 13, Channel Bandwidth: 10MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-50.1	-34.3	-14.7	-49.0	-13.0	-36.0
2	57.16	-56.0	-57.0	-4.7	-61.7	-13.0	-48.7
3	84.32	-52.6	-61.2	0.4	-60.8	-13.0	-47.8
4	111.48	-46.9	-54.2	-2.5	-56.7	-13.0	-43.7
5	462.62	-59.1	-64.8	3.4	-61.4	-13.0	-48.4
6	511.12	-59.1	-64.9	3.8	-61.1	-13.0	-48.1

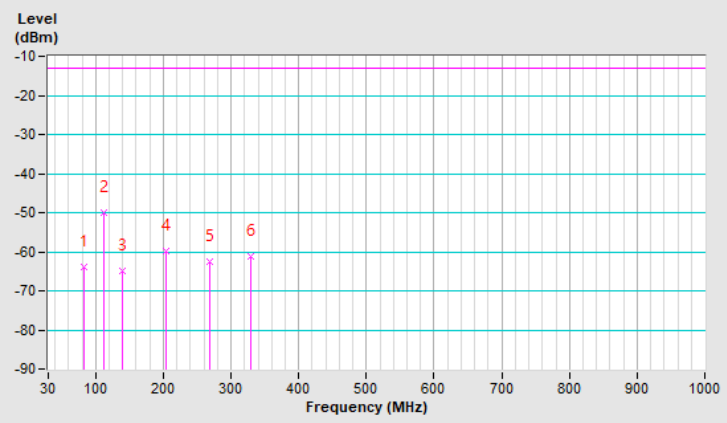
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-57.4	-64.4	0.4	-64.0	-13.0	-51.0
2	111.48	-40.1	-47.5	-2.5	-50.0	-13.0	-37.0
3	138.64	-59.6	-61.6	-3.2	-64.8	-13.0	-51.8
4	204.60	-55.9	-57.9	-2.0	-59.9	-13.0	-46.9
5	268.62	-62.1	-61.1	-1.5	-62.6	-13.0	-49.6
6	328.76	-58.8	-65.3	4.1	-61.2	-13.0	-48.2

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Above 1GHz
WCDMA Band 4

Mode	TX channel 1312 (1712.4MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3424.80	-54.9	-46.3	1.3	-45.0	-13.0	-32.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3424.80	-57.4	-49.3	1.3	-48.0	-13.0	-35.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 1413 (1732.6MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.20	-54.6	-46.2	1.4	-44.8	-13.0	-31.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.20	-57.4	-49.6	1.4	-48.2	-13.0	-35.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 1513 (1752.6MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3505.20	-54.5	-46.3	1.5	-44.8	-13.0	-31.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3505.20	-57.1	-49.5	1.5	-48.0	-13.0	-35.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 1.4MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.4	-49.0	1.4	-47.6	-13.0	-34.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.6	-49.8	1.4	-48.4	-13.0	-35.4

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 3MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.7	-49.3	1.4	-47.9	-13.0	-34.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.8	-50.0	1.4	-48.6	-13.0	-35.6

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 5MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.3	-48.9	1.4	-47.5	-13.0	-34.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.4	-49.6	1.4	-48.2	-13.0	-35.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 10MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.5	-49.1	1.4	-47.7	-13.0	-34.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.7	-49.9	1.4	-48.5	-13.0	-35.5

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 15MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.9	-49.5	1.4	-48.1	-13.0	-35.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.4	-49.6	1.4	-48.2	-13.0	-35.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 4, Channel Bandwidth: 20MHz

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.2	-48.8	1.4	-47.4	-13.0	-34.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3465.00	-57.4	-49.6	1.4	-48.2	-13.0	-35.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 7, Channel Bandwidth: 5MHz

Mode	TX channel 21100 (2535MHz)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-62.5	-50.0	1.4	-48.6	-25.0	-23.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-62.7	-51.3	1.4	-49.9	-25.0	-24.9

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 7, Channel Bandwidth: 10MHz

Mode	TX channel 21100 (2535MHz)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-62.2	-49.7	1.4	-48.3	-25.0	-23.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-62.8	-51.4	1.4	-50.0	-25.0	-25.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 7, Channel Bandwidth: 15MHz

Mode	TX channel 21100 (2535MHz)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**5070.00**	**-62.1**	**-49.6**	**1.4**	**-48.2**	**-25.0**	**-23.2**
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-63.2	-51.8	1.4	-50.4	-25.0	-25.4

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 7, Channel Bandwidth: 20MHz

Mode	TX channel 21100 (2535MHz)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-62.6	-50.1	1.4	-48.7	-25.0	-23.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5070.00	-63.1	-51.7	1.4	-50.3	-25.0	-25.3

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 12, Channel Bandwidth: 1.4MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-59.2	-52.7	0.9	-51.8	-13.0	-38.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-58.0	-52.7	0.9	-51.8	-13.0	-38.8

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 12, Channel Bandwidth: 3MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-59.3	-52.8	0.9	-51.9	-13.0	-38.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-57.9	-52.5	0.9	-51.6	-13.0	-38.6

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 12, Channel Bandwidth: 5MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-59.5	-53.0	0.9	-52.1	-13.0	-39.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-58.0	-52.6	0.9	-51.7	-13.0	-38.7

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 12, Channel Bandwidth: 10MHz

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-59.2	-52.6	0.9	-51.7	-13.0	-38.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00	-57.8	-52.4	0.9	-51.5	-13.0	-38.5

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 13, Channel Bandwidth: 5MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1564.00	-56.2	-48.4	1.2	-47.2	-13.0	-34.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1564.00	-57.5	-50.6	1.2	-49.4	-13.0	-36.4

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 13, Channel Bandwidth: 10MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	12Vdc
Tested By	Han Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1564.00	-56.1	-48.3	1.2	-47.1	-13.0	-34.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1564.00	-57.4	-50.5	1.2	-49.3	-13.0	-36.3

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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