FCC Test Report

(PART 27)

Report No.:	RFBFPJ-WTW-P20090646-2
FCC ID:	SWX-RC7611
Test Model:	RC7611U
Received Date:	Sep. 29, 2020
Test Date:	Nov. 17, 2020 ~ Jan. 04, 2021
Issued Date:	Jan. 07, 2021
Applicant:	Ubiquiti Inc.
Address:	685 Third Avenue, New York, New York 10017 USA
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

Testing Laboratory
2021

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBFPJ-WTW-P20090646-2	Original Release	Jan. 07, 2021

1 Certificate of Conformity

Product:	LTE Module
Brand:	
Test Model:	RC7611U
Sample Status:	Engineering Sample
Applicant:	Ubiquiti Inc.
Test Date:	Nov. 17, 2020 ~ Jan. 04, 2021
Standards:	FCC Part 27, Subpart C, H, L

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 : Lena Wang , **Date:** Jan. 07, 2021

Lena Wang / Specialist

Approved by : , **Date:** Jan. 07, 2021

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -38.2 dB at 3465.00 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to note
2.1055 27.54	Frequency Stability	N/A	Refer to note
2.1049	Occupied Bandwidth	N/A	Refer to note
---	Peak to Average Ratio	N/A	Refer to note
27.53(g)	Band Edge Measurements	N/A	Refer to note
2.1051 27.53(g)	Conducted Spurious Emissions	N/A	Refer to note
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -19.5 dB at 1415.00 MHz.

Note:

1. Only Maximum Peak Output Power and Radiated Emissions tests were performed for this addendum. Refer to DEKRA report no.: 19B0422R-HPUSP50V00 for other test data.
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	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 02, 2020	Jul. 01, 2021
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 14, 2020	Jan. 13, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 06, 2020	Nov. 05, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
			Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
			Nov. 22, 2020	Nov. 21, 2021
Loop Antenna EMCI	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 08, 2020	Jun. 07, 2021
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
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 06, 2020	Jun. 05, 2021
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Jul. 01, 2019	Jun. 30, 2021

Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 13, 2020	Feb. 12, 2021
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 09, 2020	Sep. 08, 2021

Note: 1. The calibration interval of the above test instruments is 12 / 24 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			
Test Model	RC7611U		
Status of EUT	Engineering Sample		
Power Supply Rating	24 Vdc (adapter)		
Modulation Type	LTE	QPSK, 16QAM	
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz	
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz	
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz	
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz	
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz	
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz	
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz	
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz	
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz	
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz	
Emission Designator	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09D7W	
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70D7W	
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M50D7W	
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M96D7W	
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M4G7D	
	LTE Band 4 (Channel Bandwidth: 20 MHz)	17M9D7W	
Max. ERP Power		QPSK	16QAM
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	653.131 mW (28.15dBm)	557.186 mW (27.46dBm)
	LTE Band 12 (Channel Bandwidth: 3 MHz)	677.642 mW (28.31dBm)	559.758 mW (27.48dBm)
	LTE Band 12 (Channel Bandwidth: 5 MHz)	654.636 mW (28.16dBm)	555.904 mW (27.45dBm)
	LTE Band 12 (Channel Bandwidth: 10 MHz)	650.130 mW (28.13dBm)	568.853 mW (27.55dBm)
Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	909.913 mW (29.59dBm)	833.681 mW (29.21dBm)
	LTE Band 4 (Channel Bandwidth: 3 MHz)	959.401 mW (29.82dBm)	870.964 mW (29.40dBm)
	LTE Band 4 (Channel Bandwidth: 5 MHz)	954.993 mW (29.80dBm)	857.038 mW (29.33dBm)
	LTE Band 4 (Channel Bandwidth: 10 MHz)	909.913 mW (29.59dBm)	855.067 mW (29.32dBm)
	LTE Band 4 (Channel Bandwidth: 15 MHz)	933.254 mW (29.70dBm)	862.979 mW (29.36dBm)

	LTE Band 4 (Channel Bandwidth: 20 MHz)	959.401 mW (29.82dBm)	887.156 mW (29.48dBm)
Antenna Type	Dish Antenna		
Antenna Gain	LTE Band 4	17.8 dBi	
	LTE Band 12	7.2 dBi	
Accessory Device	Refer to Note as below		
Data Cable Supplied	N/A		

Note:

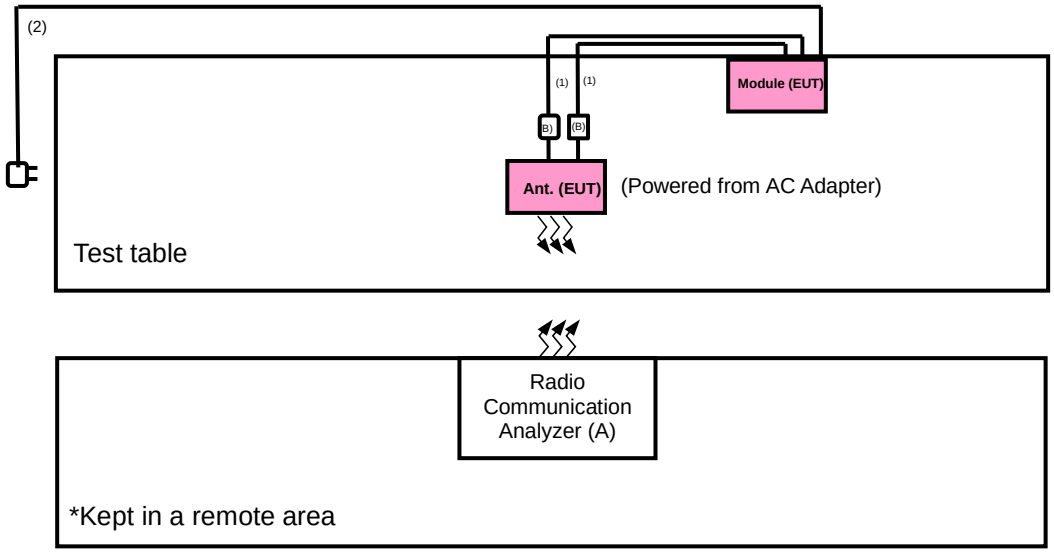
1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to DEKRA report no.: 19B0422R-HPUSP50V00. The difference compared with original report is adding new antenna.
2. The original module supports LTE B2/4/5/12/13/14/25/26/66/71, when use this antenna, the module be disable B13/14/25/26/66/71 by using software, let the module only supports B2/4/5/12. And when use this antenna the power of band 2, 4 are reduced by using software, so retest LTE Band 2, 4 for all test item and recorded. In addition, the antenna gain and the MPE distance have both increased, so RF Exposure needs to be evaluated.
3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	UBIQUITI	GP-A240-050G	I/P: 100-240 Vac, 50/60 Hz, 0.3 A O/P: 24 Vdc, 0.5 A

4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test> & <E.R.P. / E.I.R.P. 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.

No.	Product	Brand	Model No.	Serial No.	FCC ID
A	Radio Communication Analyzer	Anritsu	MT8821C	6261786083	NA
B	SMA Adapter	N/A	N/A	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	SMA Ipex Cable: 0.3m x2
2.	RJ45 Cable: 10m

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. SMA Adapter and SMA Ipex Cable are provided by Lab.
3. The SMA Ipex cable is support units and Ipex clable loss is 0.8 dBm it was added back to the test results.

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, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

The EUT is designed to be positioned on the X-plane only.

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20050 to 20300	20175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20393	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			20385	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			20375	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			20350	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			20325	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			20300	20 MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
-	Conducted Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Greg Lin
Modulation Characteristics	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Frequency Stability	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Occupied Bandwidth	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Band Edge	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Peak to Average Ratio	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Conducted Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tank Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Greg Lin, 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 and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 27
ANSI 63.26-2015

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

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016

Note: All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. (For band 4)

Portable stations (hand-held device) operating in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP. (For band 12)

4.1.2 Test Procedures

EIRP / ERP Measurement:

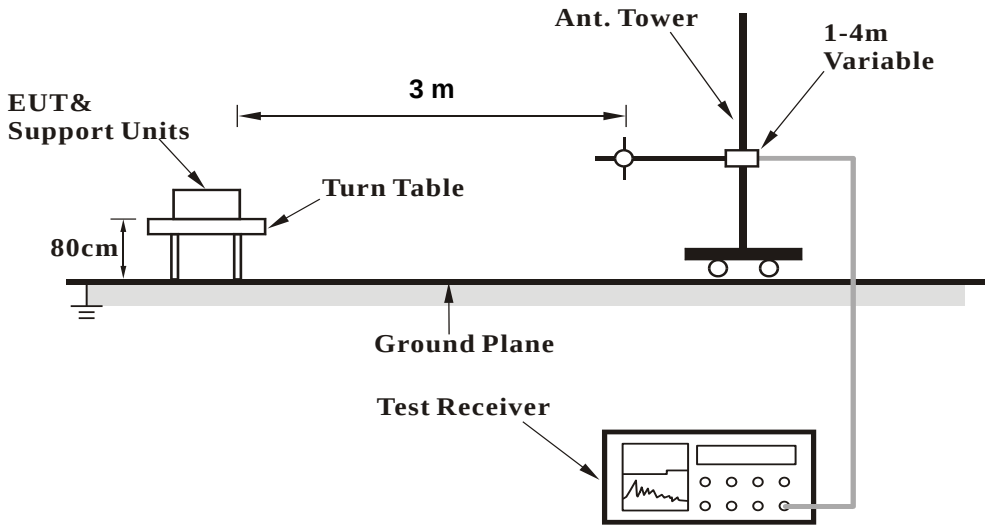
a. All measurements were done at low, middle and high operational frequency range. RBW is 1.4 MHz、5 MHz、10 MHz、15 MHz、 20 MHz for LTE mode, and VBW ≥ 3 x RBW.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
c. 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 - 2.15 dB.

Conducted Power Measurement:

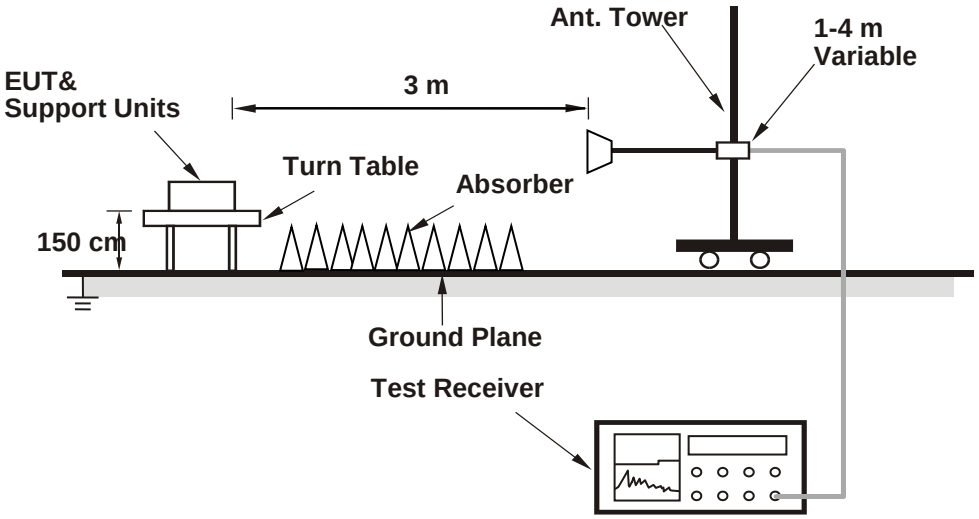
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 4						
BW	**MCS Index**	**Channel**		**19957**	**20175**	**20393**
		Frequency (MHz)		**1710.7**	**1732.5**	**1754.3**
1.4M	QPSK	1	0	11.63	11.66	11.55
		1	2	**11.79**	11.70	11.67
		1	5	11.46	11.57	11.52
		3	0	11.54	11.62	11.56
		3	1	11.69	11.61	11.70
		3	3	11.66	11.65	11.58
		6	0	11.55	11.59	11.57
	16QAM	1	0	11.33	11.35	11.25
		1	2	**11.41**	11.23	11.31
		1	5	11.13	11.13	11.21
		3	0	11.30	11.35	11.26
		3	1	11.25	11.25	11.31
		3	3	11.28	11.35	11.16
		6	0	11.20	11.21	11.31

LTE Band 4						
BW	**MCS Index**	**Channel**		**19965**	**20175**	**20385**
		Frequency (MHz)		**1711.5**	**1732.5**	**1753.5**
3M	QPSK	1	0	11.66	11.48	11.36
		1	7	**12.02**	11.88	11.75
		1	14	11.87	11.65	11.63
		8	0	11.62	11.70	11.54
		8	3	11.64	11.50	11.66
		8	7	11.61	11.62	11.72
		15	0	11.69	11.66	11.70
	16QAM	1	0	11.25	11.00	11.07
		1	7	**11.60**	11.45	11.51
		1	14	11.32	11.29	11.34
		8	0	11.27	11.29	11.14
		8	3	11.37	11.15	11.27
		8	7	11.30	11.25	11.32
		15	0	11.40	11.29	11.37

LTE Band 4						
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	11.57	11.54	11.74
		1	12	11.87	11.89	**12.00**
		1	24	11.66	11.63	11.61
		12	0	11.73	11.66	11.73
		12	6	11.71	11.68	11.72
		12	13	11.76	11.69	11.69
		25	0	11.71	11.75	11.63
	16QAM	1	0	11.14	11.04	11.31
		1	12	**11.53**	11.43	11.51
		1	24	11.31	11.10	11.14
		12	0	11.41	11.30	11.25
		12	6	11.51	11.24	11.46
		12	13	11.45	11.32	11.29
		25	0	11.25	11.38	11.31

LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	11.59	11.55	11.65
		1	24	11.75	11.74	11.78
		1	49	11.51	11.23	11.74
		25	0	11.72	11.57	**11.79**
		25	12	11.68	11.60	11.67
		25	25	11.68	11.69	11.78
		50	0	11.75	11.71	11.65
	16QAM	1	0	11.30	11.21	11.35
		1	24	11.44	11.35	**11.52**
		1	49	11.26	10.86	11.29
		25	0	11.35	11.18	11.31
		25	12	11.37	11.19	11.32
		25	25	11.38	11.23	11.38
		50	0	11.32	11.46	11.23

LTE Band 4						
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	11.55	11.71	11.70
		1	37	**11.90**	11.75	11.86
		1	74	11.52	11.38	11.53
		36	0	11.72	11.74	11.68
		36	19	11.70	11.72	11.73
		36	39	11.80	11.76	11.83
		75	0	11.79	11.75	11.83
	16QAM	1	0	11.21	11.43	11.30
		1	37	11.45	**11.56**	11.51
		1	74	11.22	11.14	11.24
		36	0	11.26	11.43	11.34
		36	19	11.32	11.34	11.30
		36	39	11.51	11.30	11.31
		75	0	11.34	11.24	11.32

LTE Band 4						
BW	MCS Index	Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	11.90	11.99	11.89
		1	50	11.46	11.78	11.92
		1	99	11.34	11.47	11.57
		50	0	11.91	**12.02**	11.79
		50	25	11.96	11.85	11.89
		50	50	11.93	11.92	11.89
		100	0	12.01	11.83	11.88
	16QAM	1	0	11.59	11.57	11.52
		1	50	11.23	11.46	11.39
		1	99	11.01	10.93	11.26
		50	0	11.56	**11.68**	11.44
		50	25	11.49	11.51	11.59
		50	50	11.47	11.49	11.47
		100	0	11.47	11.54	11.38

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.89	22.92	22.84
		1	2	**23.10**	23.01	22.97
		1	5	22.94	22.96	22.79
		3	0	22.97	22.88	22.84
		3	1	22.90	22.89	22.71
		3	3	22.94	22.85	22.75
		6	0	22.12	21.86	22.03
	16QAM	1	0	22.17	21.88	22.21
		1	2	22.30	22.09	**22.41**
		1	5	22.16	21.86	22.26
		3	0	22.17	22.00	22.13
		3	1	22.19	21.98	22.05
		3	3	22.24	21.92	22.11
		6	0	21.27	21.03	21.18

LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.95	22.78	23.04
		1	7	23.17	**23.26**	23.02
		1	14	22.99	22.74	22.88
		8	0	22.09	22.12	22.24
		8	3	22.11	22.09	22.20
		8	7	22.14	22.02	22.15
		15	0	22.15	22.01	22.20
	16QAM	1	0	22.02	21.91	22.29
		1	7	22.34	22.04	**22.43**
		1	14	22.28	21.81	22.37
		8	0	21.25	21.16	21.24
		8	3	21.18	21.12	21.34
		8	7	21.19	21.12	21.36
		15	0	21.16	21.14	21.22

LTE Band 12						
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.86	22.74	22.82
		1	12	23.05	23.05	**23.11**
		1	24	22.85	22.72	22.84
		12	0	22.03	22.04	22.07
		12	6	22.13	22.02	22.12
		12	13	22.10	21.97	22.13
		25	0	22.11	22.00	22.08
	16QAM	1	0	21.72	21.78	22.30
		1	12	22.00	21.83	**22.40**
		1	24	21.85	21.59	22.10
		12	0	21.20	20.99	21.17
		12	6	21.17	21.03	21.09
		12	13	21.10	21.05	21.08
		25	0	21.32	21.06	21.06

LTE Band 12						
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	23.02	**23.08**	23.05
		1	24	23.00	22.97	22.72
		1	49	22.66	22.89	22.71
		25	0	22.11	21.94	21.92
		25	12	22.14	21.95	22.01
		25	25	22.14	21.96	22.05
		50	0	22.10	21.92	22.10
	16QAM	1	0	**22.50**	21.58	22.25
		1	24	22.38	22.05	22.26
		1	49	22.27	21.88	22.11
		25	0	21.02	21.15	21.01
		25	12	21.01	21.07	21.05
		25	25	21.06	21.03	21.09
		50	0	21.14	21.02	21.06

EIRP Power(dBm)

LTE Band 4						
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	29.43	29.46	29.35
		1	2	**29.59**	29.50	29.47
		1	5	29.26	29.37	29.32
		3	0	29.34	29.42	29.36
		3	1	29.49	29.41	29.50
		3	3	29.46	29.45	29.38
		6	0	29.35	29.39	29.37
	16QAM	1	0	29.13	29.15	29.05
		1	2	**29.21**	29.03	29.11
		1	5	28.93	28.93	29.01
		3	0	29.10	29.15	29.06
		3	1	29.05	29.05	29.11
		3	3	29.08	29.15	28.96
		6	0	29.00	29.01	29.11

LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	29.46	29.28	29.16
		1	7	**29.82**	29.68	29.55
		1	14	29.67	29.45	29.43
		8	0	29.42	29.50	29.34
		8	3	29.44	29.30	29.46
		8	7	29.41	29.42	29.52
		15	0	29.49	29.46	29.50
	16QAM	1	0	29.05	28.80	28.87
		1	7	**29.40**	29.25	29.31
		1	14	29.12	29.09	29.14
		8	0	29.07	29.09	28.94
		8	3	29.17	28.95	29.07
		8	7	29.10	29.05	29.12
		15	0	29.20	29.09	29.17

*EIRP = Conducted + antenna gain (17.8dBi)

LTE Band 4						
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	29.37	29.34	29.54
		1	12	29.67	29.69	**29.80**
		1	24	29.46	29.43	29.41
		12	0	29.53	29.46	29.53
		12	6	29.51	29.48	29.52
		12	13	29.56	29.49	29.49
		25	0	29.51	29.55	29.43
	16QAM	1	0	28.94	28.84	29.11
		1	12	**29.33**	29.23	29.31
		1	24	29.11	28.90	28.94
		12	0	29.21	29.10	29.05
		12	6	29.31	29.04	29.26
		12	13	29.25	29.12	29.09
		25	0	29.05	29.18	29.11

LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	29.39	29.35	29.45
		1	24	29.55	29.54	29.58
		1	49	29.31	29.03	29.54
		25	0	29.52	29.37	**29.59**
		25	12	29.48	29.40	29.47
		25	25	29.48	29.49	29.58
		50	0	29.55	29.51	29.45
	16QAM	1	0	29.10	29.01	29.15
		1	24	29.24	29.15	**29.32**
		1	49	29.06	28.66	29.09
		25	0	29.15	28.98	29.11
		25	12	29.17	28.99	29.12
		25	25	29.18	29.03	29.18
		50	0	29.12	29.26	29.03

*EIRP = Conducted + antenna gain (17.8dBi)

LTE Band 4						
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	29.35	29.51	29.50
		1	37	**29.70**	29.55	29.66
		1	74	29.32	29.18	29.33
		36	0	29.52	29.54	29.48
		36	19	29.50	29.52	29.53
		36	39	29.60	29.56	29.63
		75	0	29.59	29.55	29.63
	16QAM	1	0	29.01	29.23	29.10
		1	37	29.25	**29.36**	29.31
		1	74	29.02	28.94	29.04
		36	0	29.06	29.23	29.14
		36	19	29.12	29.14	29.10
		36	39	29.31	29.10	29.11
		75	0	29.14	29.04	29.12

LTE Band 4						
BW	MCS Index	Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	29.70	29.79	29.69
		1	50	29.26	29.58	29.72
		1	99	29.14	29.27	29.37
		50	0	29.71	**29.82**	29.59
		50	25	29.76	29.65	29.69
		50	50	29.73	29.72	29.69
		100	0	29.81	29.63	29.68
	16QAM	1	0	29.39	29.37	29.32
		1	50	29.03	29.26	29.19
		1	99	28.81	28.73	29.06
		50	0	29.36	**29.48**	29.24
		50	25	29.29	29.31	29.39
		50	50	29.27	29.29	29.27
		100	0	29.27	29.34	29.18

*EIRP = Conducted + antenna gain (17.8dBi)

ERP Power (dBm)

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	27.94	27.97	27.89
		1	2	**28.15**	28.06	28.02
		1	5	27.99	28.01	27.84
		3	0	28.02	27.93	27.89
		3	1	27.95	27.94	27.76
		3	3	27.99	27.90	27.80
		6	0	27.17	26.91	27.08
	16QAM	1	0	27.22	26.93	27.26
		1	2	27.35	27.14	**27.46**
		1	5	27.21	26.91	27.31
		3	0	27.22	27.05	27.18
		3	1	27.24	27.03	27.10
		3	3	27.29	26.97	27.16
		6	0	26.32	26.08	26.23

LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	28.00	27.83	28.09
		1	7	28.22	**28.31**	28.07
		1	14	28.04	27.79	27.93
		8	0	27.14	27.17	27.29
		8	3	27.16	27.14	27.25
		8	7	27.19	27.07	27.20
		15	0	27.20	27.06	27.25
	16QAM	1	0	27.07	26.96	27.34
		1	7	27.39	27.09	**27.48**
		1	14	27.33	26.86	27.42
		8	0	26.30	26.21	26.29
		8	3	26.23	26.17	26.39
		8	7	26.24	26.17	26.41
		15	0	26.21	26.19	26.27

*ERP = Conducted + antenna gain (7.2dBi)-2.15

LTE Band 12						
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	27.91	27.79	27.87
		1	12	28.10	28.10	**28.16**
		1	24	27.90	27.77	27.89
		12	0	27.08	27.09	27.12
		12	6	27.18	27.07	27.17
		12	13	27.15	27.02	27.18
		25	0	27.16	27.05	27.13
	16QAM	1	0	26.77	26.83	27.35
		1	12	27.05	26.88	**27.45**
		1	24	26.90	26.64	27.15
		12	0	26.25	26.04	26.22
		12	6	26.22	26.08	26.14
		12	13	26.15	26.10	26.13
		25	0	26.37	26.11	26.11

LTE Band 12						
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	28.07	**28.13**	28.10
		1	24	28.05	28.02	27.77
		1	49	27.71	27.94	27.76
		25	0	27.16	26.99	26.97
		25	12	27.19	27.00	27.06
		25	25	27.19	27.01	27.10
		50	0	27.15	26.97	27.15
	16QAM	1	0	**27.55**	26.63	27.30
		1	24	27.43	27.10	27.31
		1	49	27.32	26.93	27.16
		25	0	26.07	26.20	26.06
		25	12	26.06	26.12	26.10
		25	25	26.11	26.08	26.14
		50	0	26.19	26.07	26.11

*ERP = Conducted + antenna gain (7.2dBi)-2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

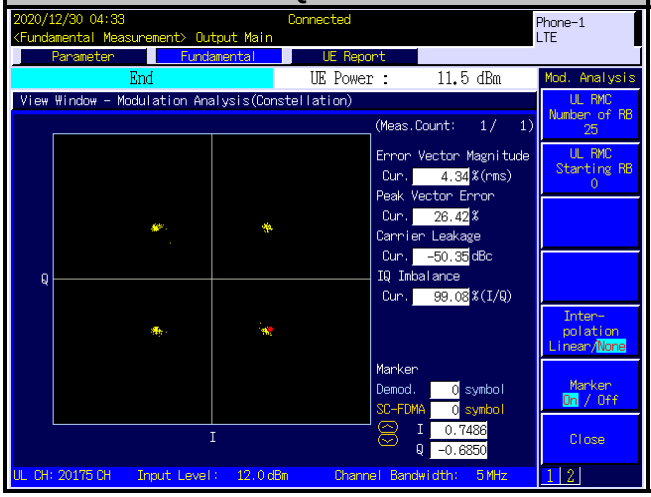
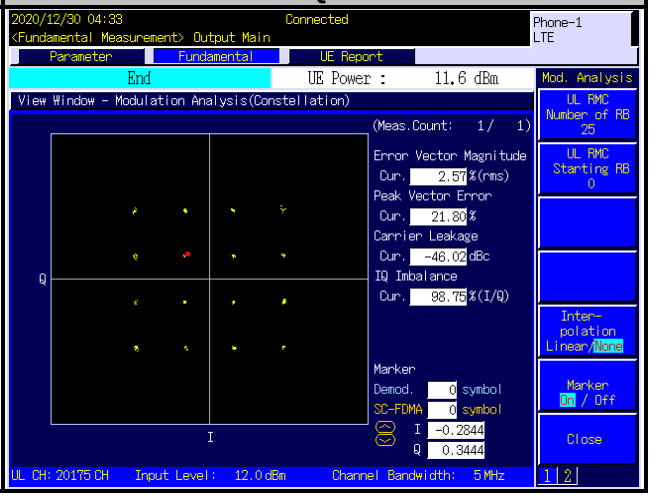
N/A

4.2.2 Test Setup

4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

Spectrum Plot of Measurement	
LTE Band 4	
Channel 20175	
QPSK	16QAM
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

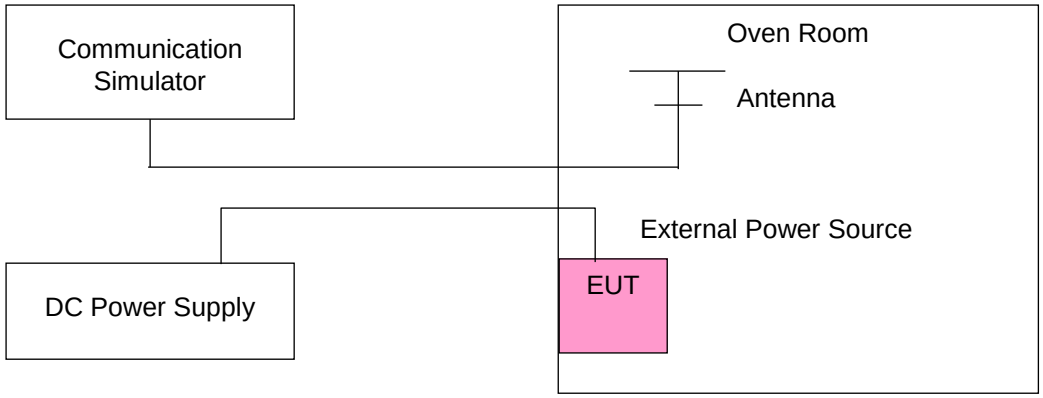
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.3.2 Test Procedure

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1710.700001	0.001	1754.300002	0.001
120	1710.700002	0.001	1754.300001	0.001
102	1710.700003	0.002	1754.300002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700004	0.002	1754.300002	0.001
0	1710.700004	0.002	1754.300004	0.002
10	1710.700002	0.001	1754.300003	0.002
20	1710.699999	-0.001	1754.299996	-0.002
30	1710.699996	-0.002	1754.299997	-0.001
40	1710.699997	-0.002	1754.299997	-0.002
50	1710.699998	-0.001	1754.299996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1711.500004	0.002	1753.500004	0.002
120	1711.500004	0.002	1753.500003	0.001
102	1711.500002	0.001	1753.500003	0.002

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1711.500002	0.001	1753.500002	0.001
0	1711.500003	0.002	1753.500003	0.002
10	1711.499998	-0.001	1753.499997	-0.002
20	1711.499998	-0.001	1753.499998	-0.001
30	1711.499998	-0.001	1753.499999	-0.001
40	1711.499996	-0.002	1753.499996	-0.002
50	1711.499998	-0.001	1753.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1712.500001	0.001	1752.500003	0.002
120	1712.500003	0.002	1752.500003	0.002
102	1712.500001	0.001	1752.500002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1712.500003	0.002	1752.500003	0.001
0	1712.500003	0.002	1752.500002	0.001
10	1712.499998	-0.001	1752.499997	-0.002
20	1712.499997	-0.002	1752.499998	-0.001
30	1712.499997	-0.002	1752.499999	-0.001
40	1712.499996	-0.002	1752.499998	-0.001
50	1712.499997	-0.002	1752.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1715.000004	0.002	1750.000003	0.002
120	1715.000003	0.002	1750.000003	0.002
102	1715.000001	0.001	1750.000004	0.002

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1715.000001	0.001	1750.000003	0.002
0	1715.000001	0.001	1750.000002	0.001
10	1714.999997	-0.002	1749.999999	-0.001
20	1714.999998	-0.001	1749.999998	-0.001
30	1714.999997	-0.002	1749.999998	-0.001
40	1714.999998	-0.001	1749.999997	-0.002
50	1714.999997	-0.002	1749.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1717.500002	0.001	1747.500002	0.001
120	1717.500003	0.002	1747.500003	0.001
102	1717.500002	0.001	1747.500003	0.002

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1717.500002	0.001	1747.500001	0.001
0	1717.500004	0.002	1747.500004	0.002
10	1717.499998	-0.001	1747.499999	-0.001
20	1717.499996	-0.002	1747.499998	-0.001
30	1717.499997	-0.002	1747.499998	-0.001
40	1717.499999	-0.001	1747.499998	-0.001
50	1717.499997	-0.002	1747.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
138	1720.000001	0.001	1745.000003	0.002
120	1720.000002	0.001	1745.000002	0.001
102	1720.000003	0.002	1745.000004	0.002

Note: The applicant defined the normal working voltage of the adapter is from 138 Vdc to 102 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1720.000002	0.001	1745.000001	0.001
0	1720.000002	0.001	1745.000004	0.002
10	1719.999996	-0.002	1744.999998	-0.001
20	1719.999996	-0.002	1744.999999	-0.001
30	1719.999997	-0.002	1744.999997	-0.002
40	1719.999999	-0.001	1744.999999	-0.001
50	1719.999999	-0.001	1744.999999	-0.001

4.4 Occupied Bandwidth Measurement

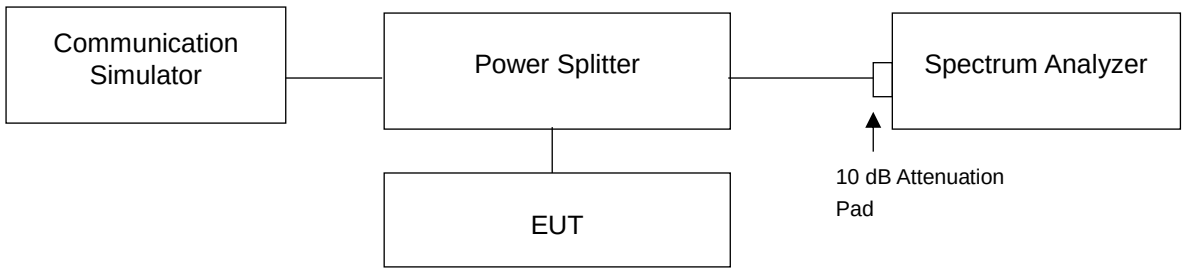
4.4.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.2 Test Procedure

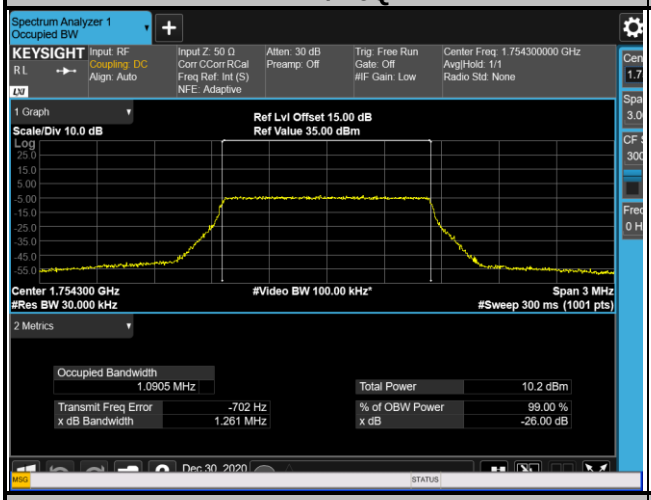
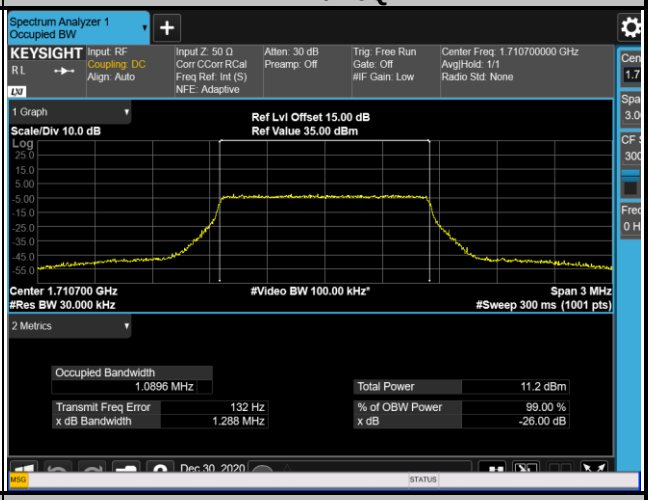
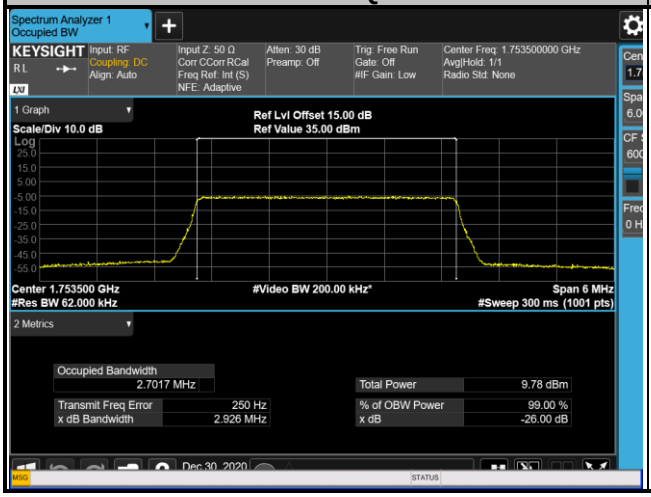
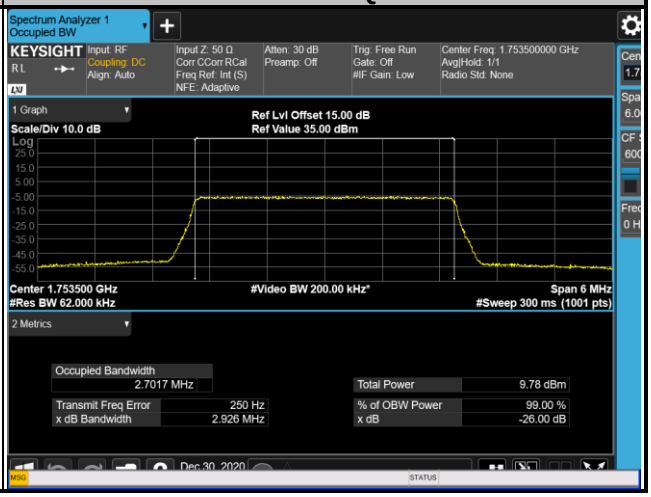
a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.3 Test Setup

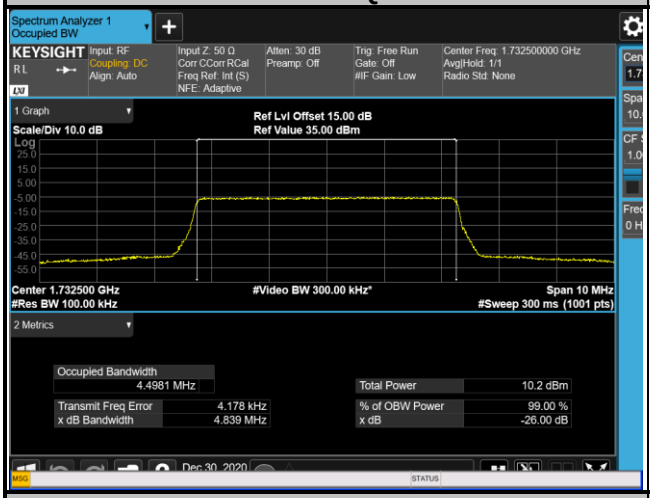
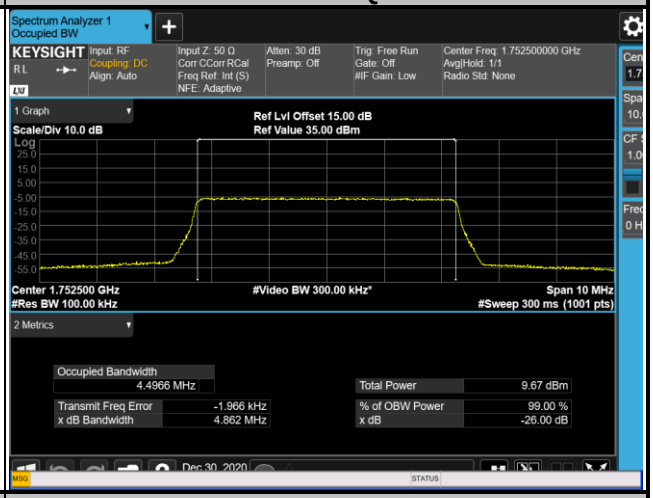
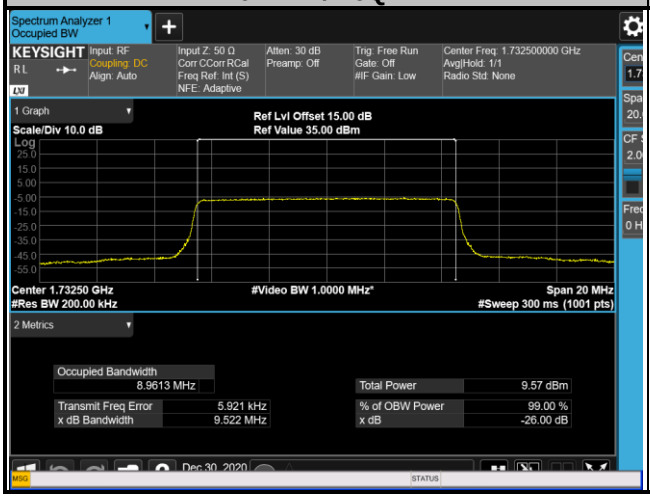
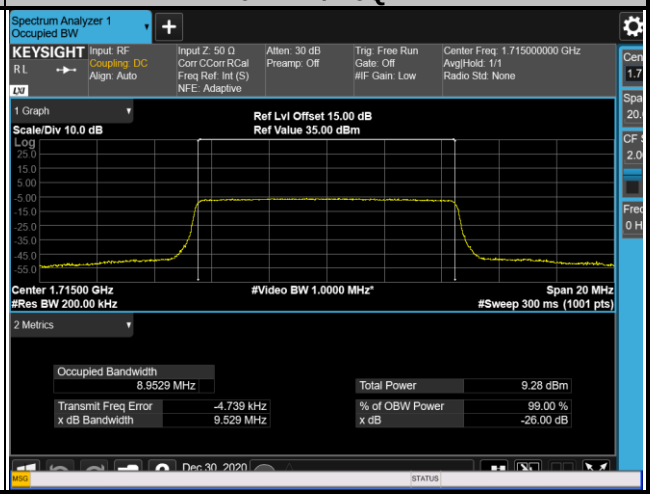


4.4.4 Test Result

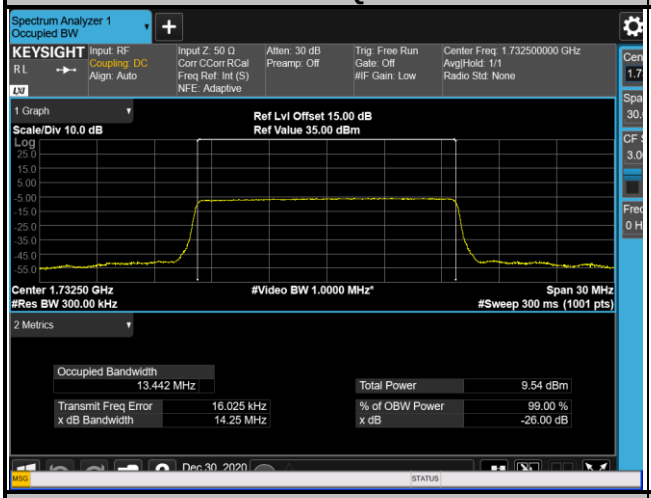
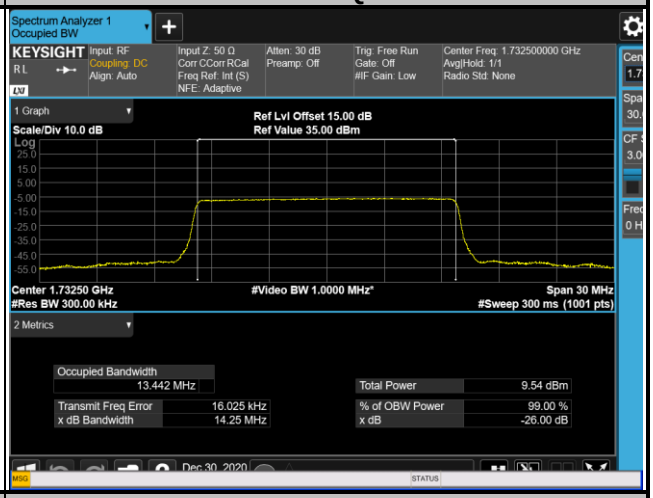
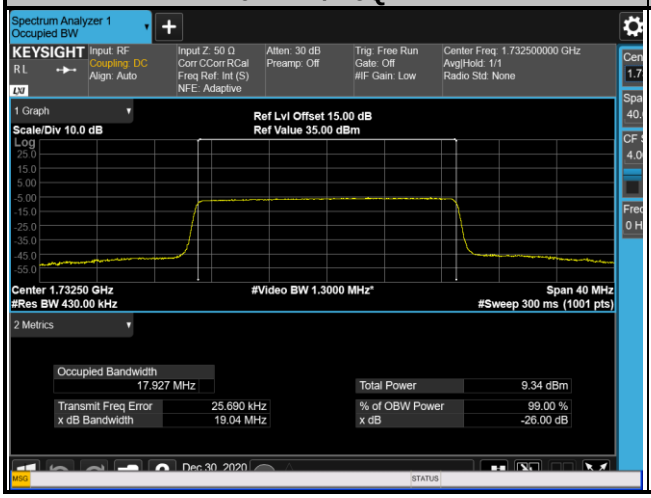
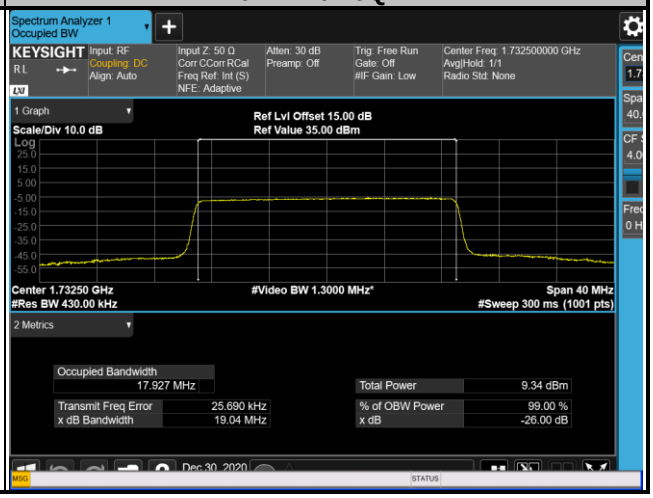
LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
19957	1710.7	1.09	1.09	1.25	1.29
20175	1732.5	1.09	1.09	1.27	1.25
20393	1754.3	1.09	1.09	1.25	1.26
Channel Bandwidth: 3 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
19965	1711.5	2.70	2.70	2.93	2.91
20175	1732.5	2.70	2.70	2.92	2.92
20385	1753.5	2.70	2.70	2.92	2.93

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
1.4 MHz / 16QAM	**1.4 MHz / 16QAM**
	
3 MHz / 16QAM	**3 MHz / 16QAM**
	

LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
19975	1712.5	4.49	4.49	4.82	4.85
20175	1732.5	4.50	4.50	4.83	4.84
20375	1752.5	4.49	4.50	4.82	4.86
Channel Bandwidth: 10 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20000	1715.0	8.95	8.95	9.52	9.53
20175	1732.5	8.95	8.96	9.53	9.52
20350	1750.0	8.96	8.95	9.53	9.51

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
5 MHz / 16QAM	**5 MHz / 16QAM**
	
10 MHz / 16QAM	**10 MHz / 16QAM**
	

LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20025	1717.5	13.43	13.42	14.22	14.23
20175	1732.5	13.44	13.44	14.25	14.23
20325	1747.5	13.41	13.41	14.21	14.22
Channel Bandwidth: 20 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20050	1720.0	17.91	17.90	19.01	19.03
20175	1732.5	17.92	17.93	19.03	19.04
20300	1745.0	17.86	17.86	18.98	18.98

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
15 MHz / QPSK	**15 MHz / QPSK**
	
20 MHz / 16QAM	**20 MHz / 16QAM**
	

4.5 Band Edge Measurement

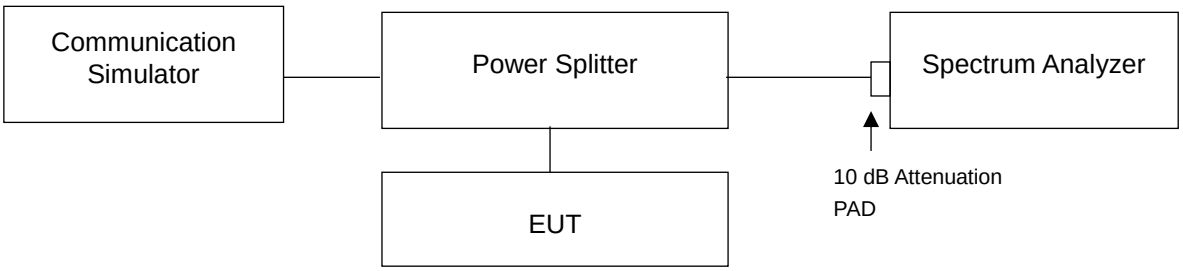
4.5.1 Limits of Band Edge Measurement

For operations in the 698-787 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.
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 746-758 MHz band and the 776-788 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.
On all frequencies between 763-775 MHz and 793-805 MHz, by a factor no less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

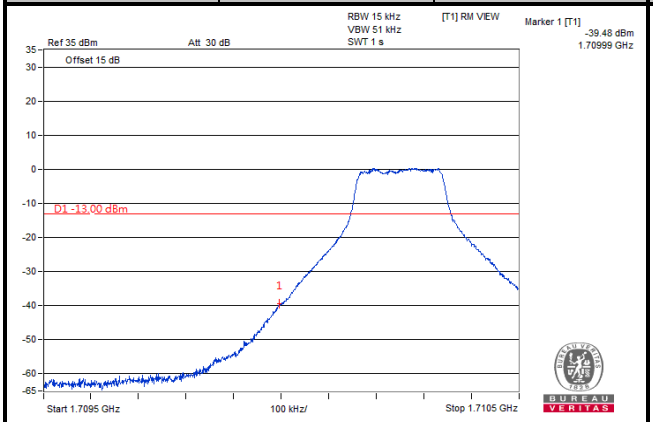
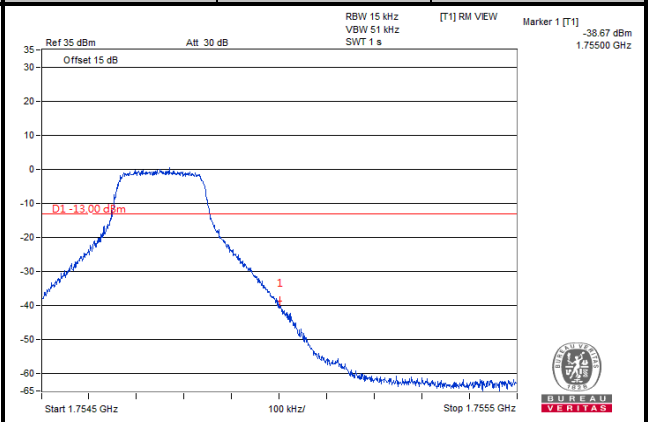
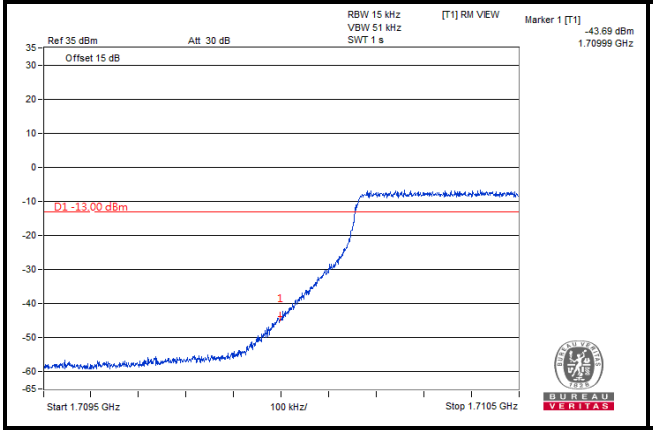
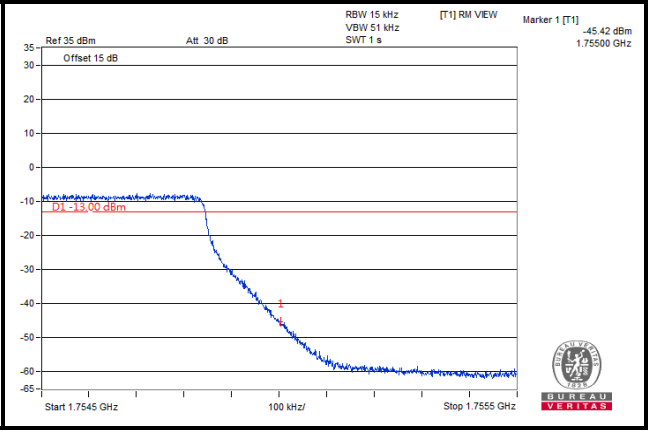
4.5.2 Test Setup

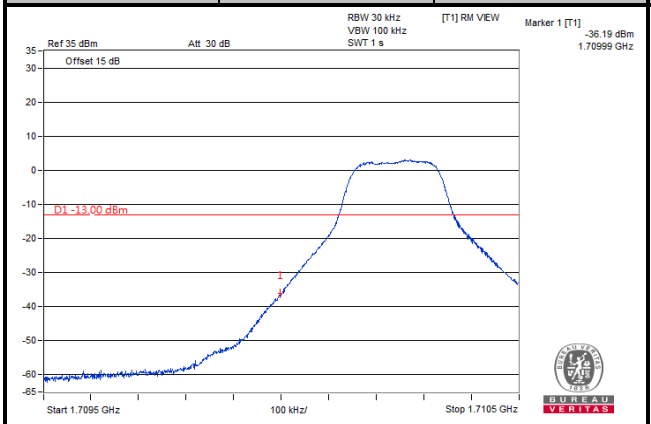
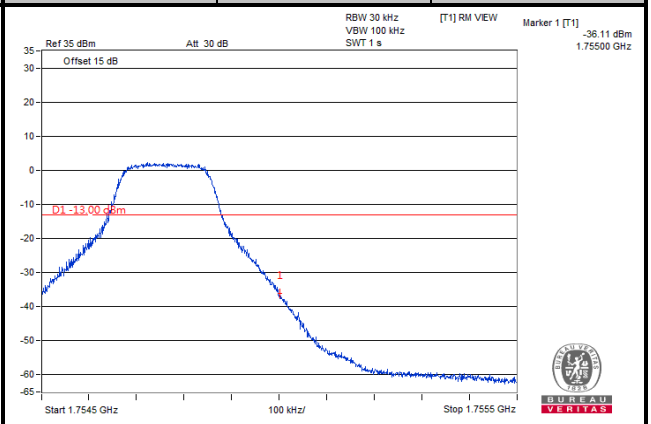
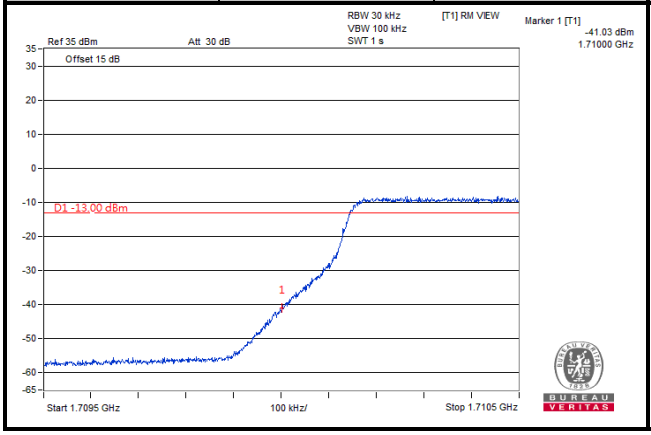
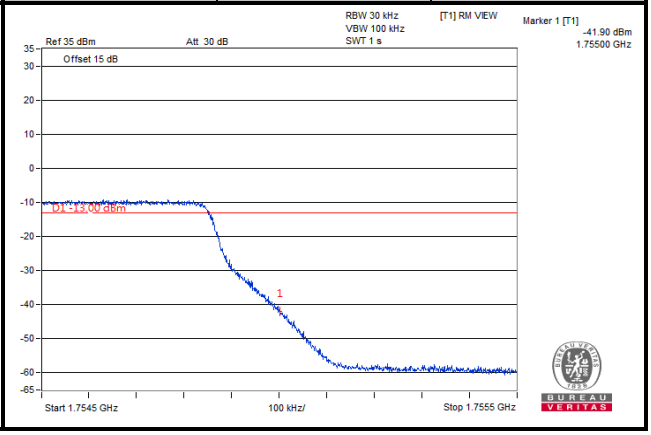


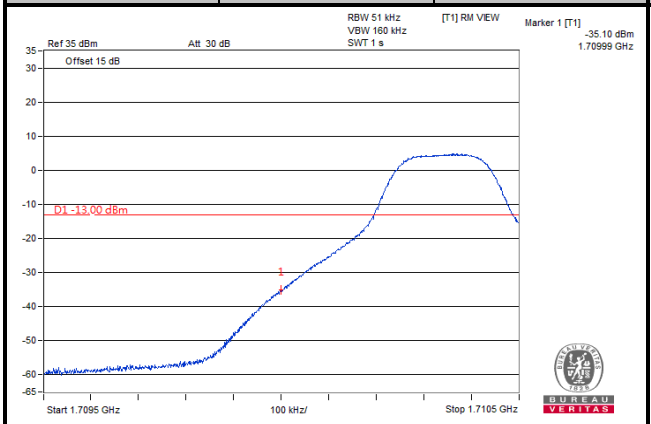
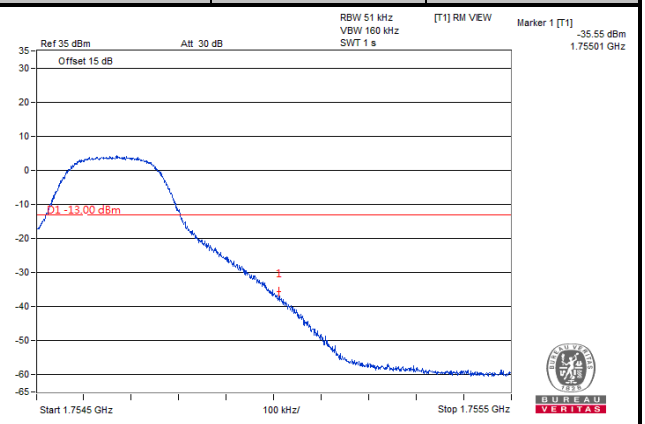
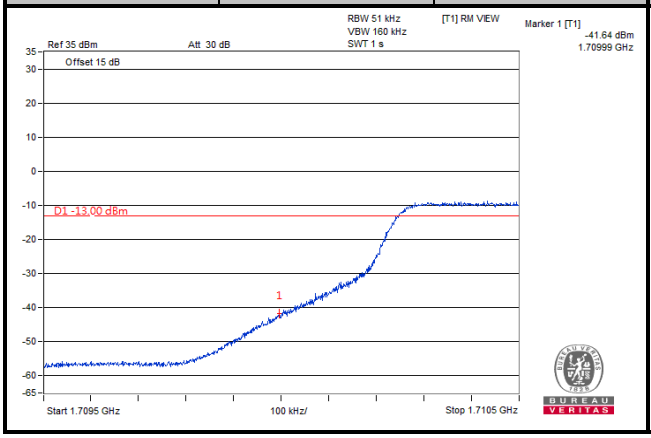
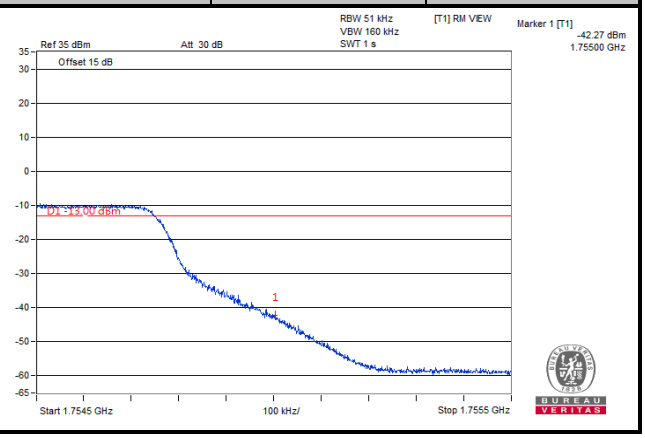
4.5.3 Test Procedures

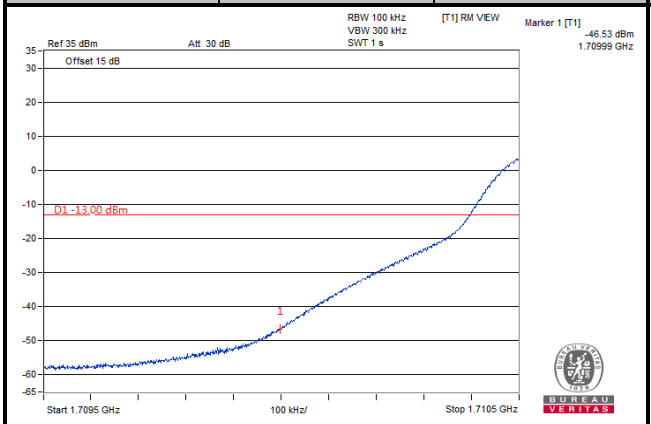
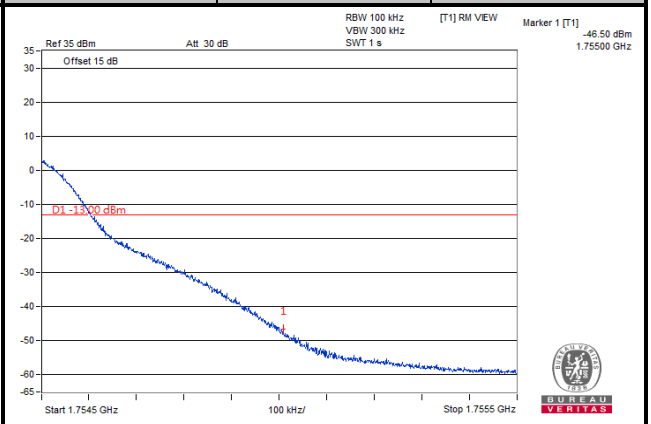
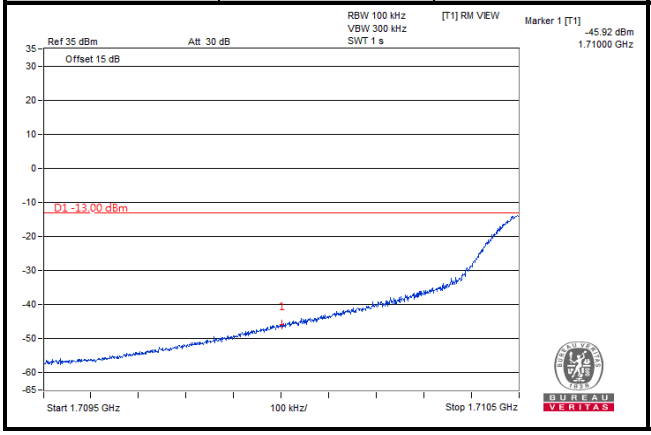
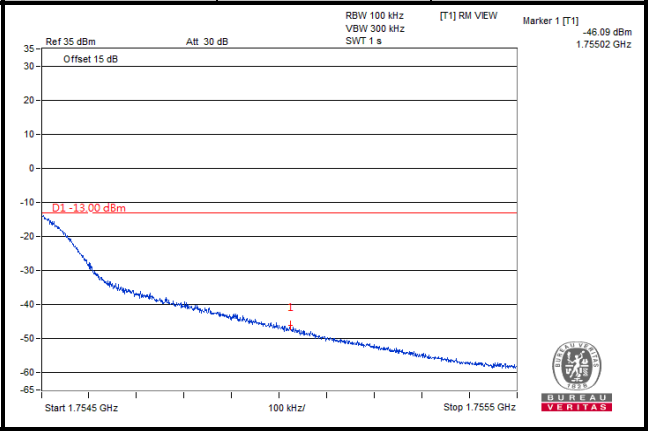
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (LTE Bandwidth 5 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
g. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (LTE Bandwidth 20 MHz).
h. Record the max. trace plot into the test report.

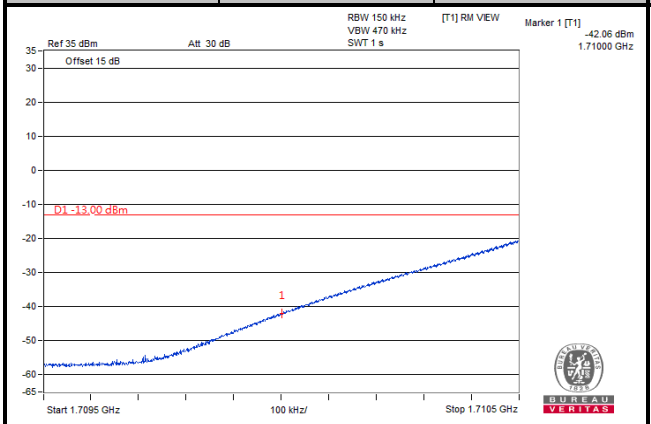
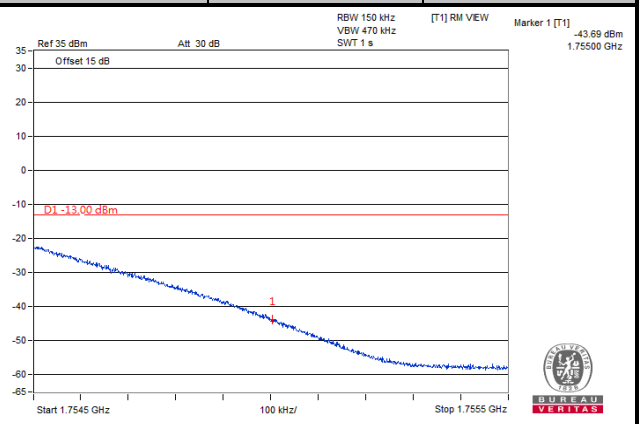
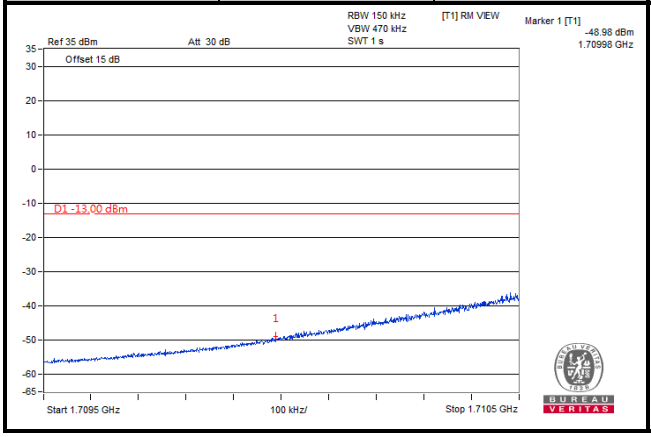
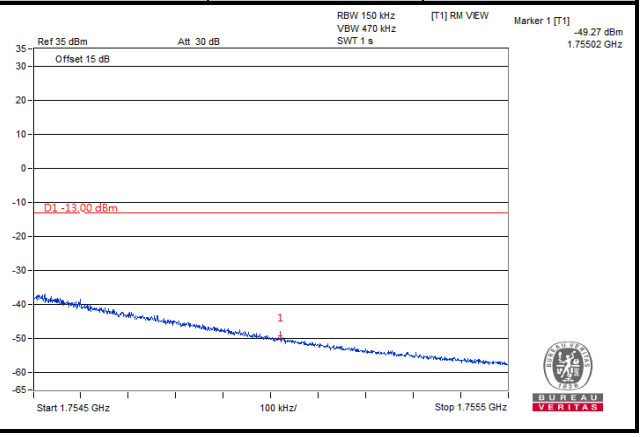
4.5.4 Test Results

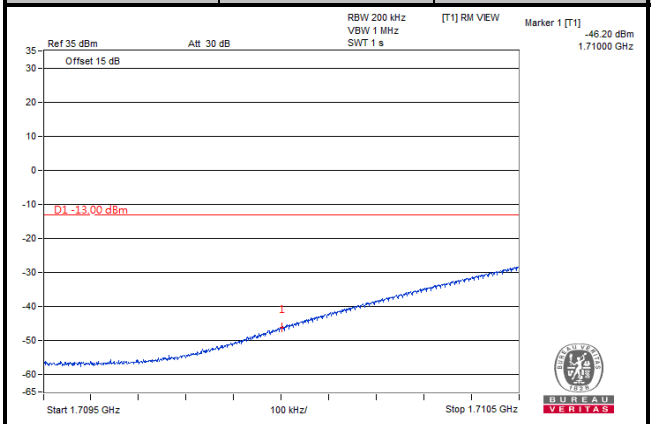
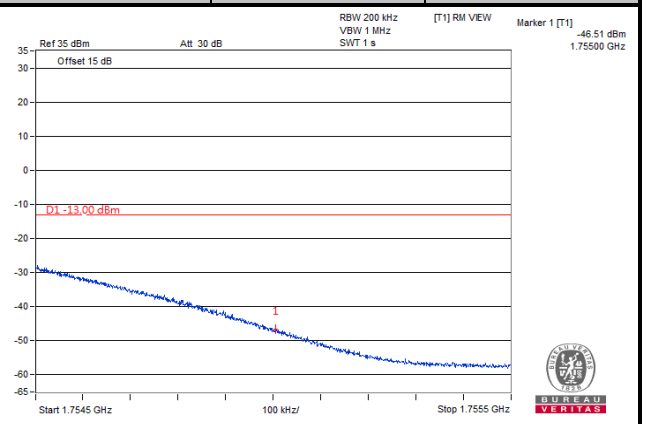
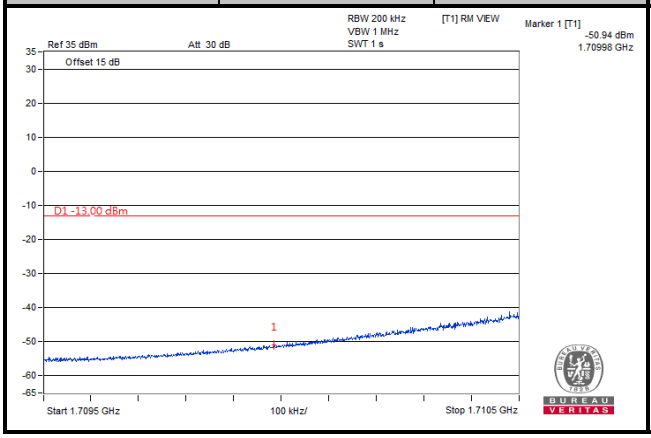
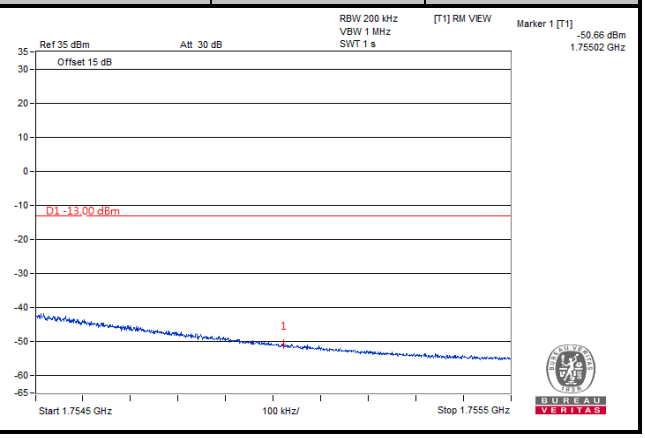
LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	19957	1 RB	Channel	20393	1 RB
					
Channel	19957	6 RB	Channel	20393	6 RB
					

LTE Band 4					
Channel Bandwidth: 3 MHz					
Channel	19965	1 RB	Channel	20385	1 RB
					
Channel	19965	15 RB	Channel	20385	15 RB
					

LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	19975	1 RB	Channel	20375	1 RB
					
Channel	19975	25 RB	Channel	20375	25 RB
					

LTE Band 4					
Channel Bandwidth: 10 MHz					
Channel	20000	1 RB	Channel	20350	1 RB
					
Channel	20000	50 RB	Channel	20350	50 RB
					

LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	20025	1 RB	Channel	20325	1 RB
					
Channel	20025	75 RB	Channel	20325	75 RB
					

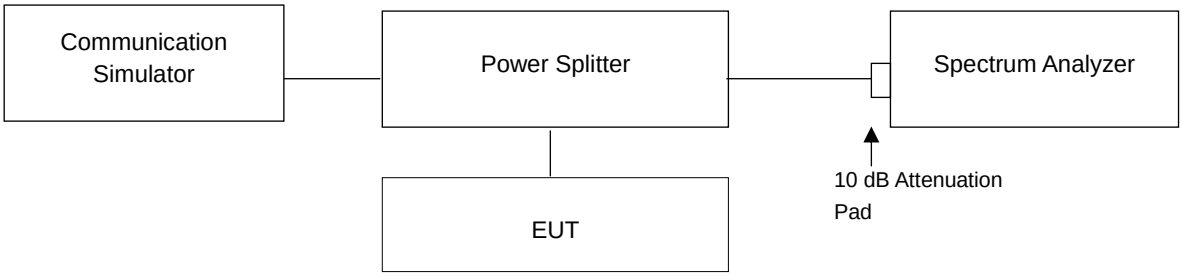
LTE Band 4					
Channel Bandwidth: 20 MHz					
Channel	20050	1 RB	Channel	20300	1 RB
					
Channel	20050	100 RB	Channel	20300	100 RB
					

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.6.2 Test Setup

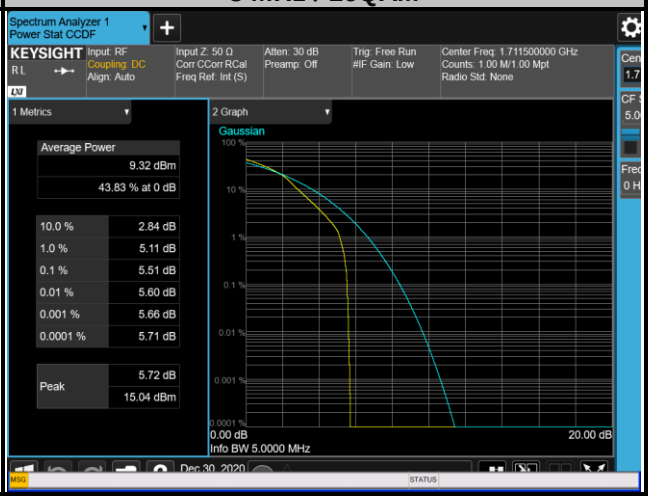


4.6.3 Test Procedures

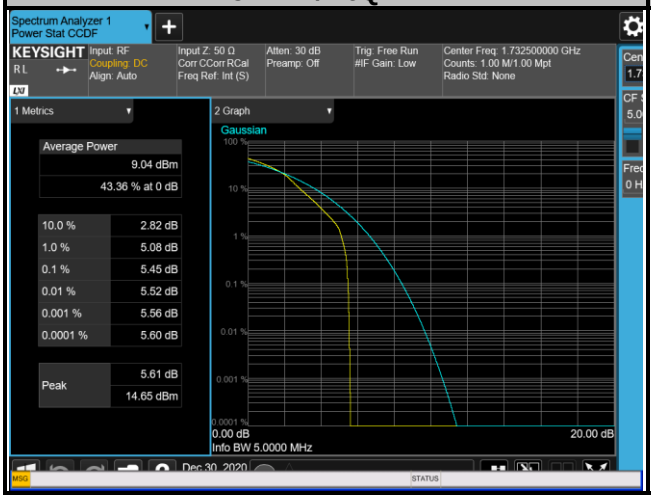
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

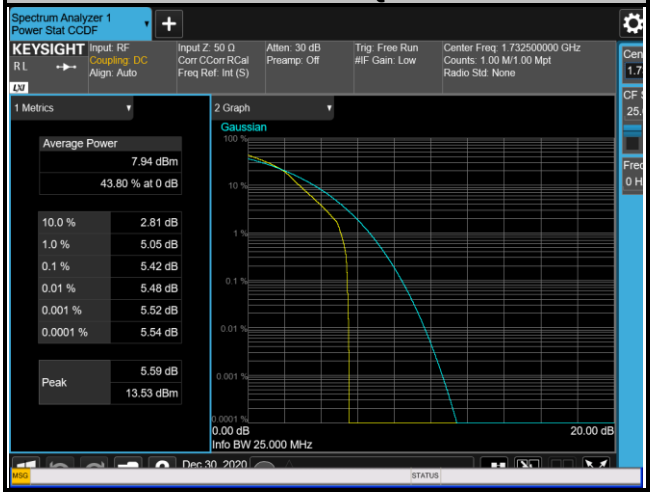
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	4.75	5.45	19965	1711.5	4.76	5.51
20175	1732.5	4.79	5.45	20175	1732.5	4.79	5.50
20393	1754.3	4.87	5.44	20385	1753.5	4.92	5.44

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 16QAM
	

LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.69	5.41	20000	1715.0	4.66	5.36
20175	1732.5	4.72	5.45	20175	1732.5	4.69	5.42
20375	1752.5	4.87	5.38	20350	1750.0	4.85	5.37

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM
	

LTE Band 4							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	4.65	5.34	20050	1720.0	4.62	5.31
20175	1732.5	4.68	5.42	20175	1732.5	4.66	5.44
20325	1747.5	4.68	5.36	20300	1745.0	4.68	5.39

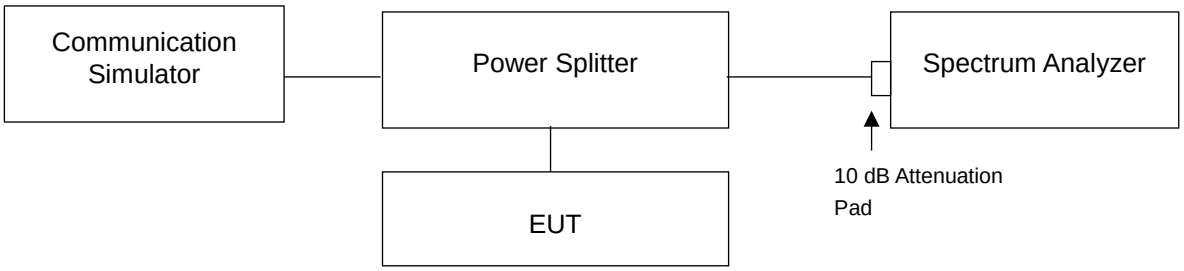
Spectrum Plot of Worst Value	
15 MHz / 16QAM	20 MHz / 16QAM
	

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission is equal to -13 dBm.

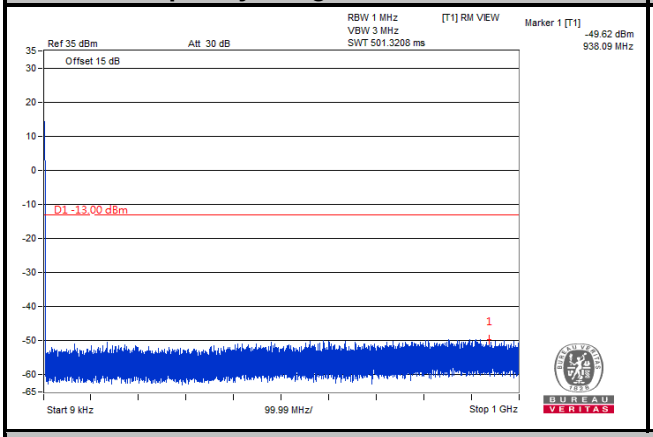
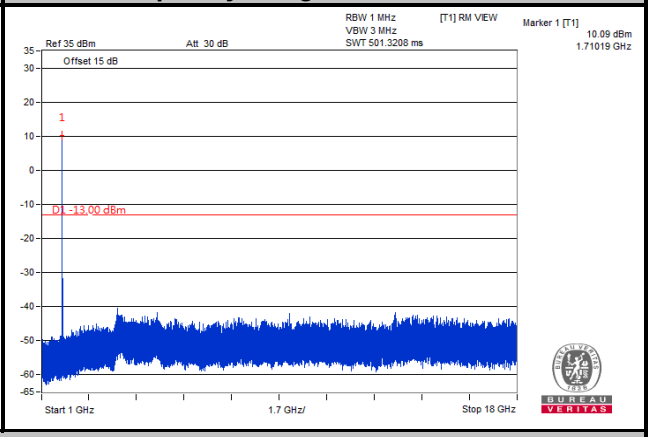
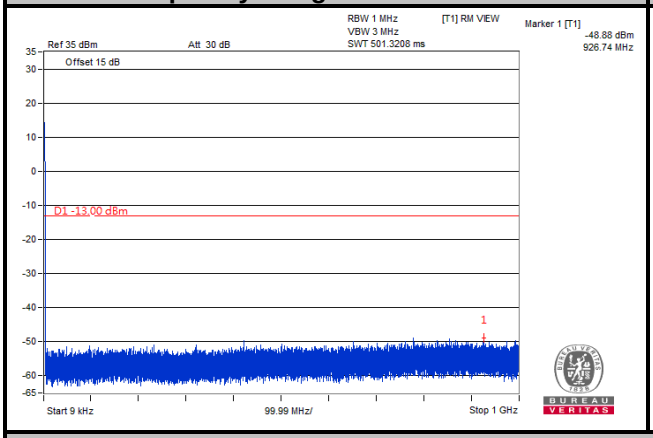
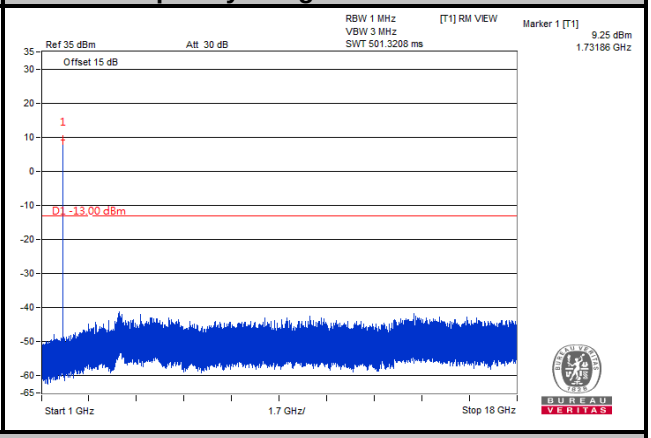
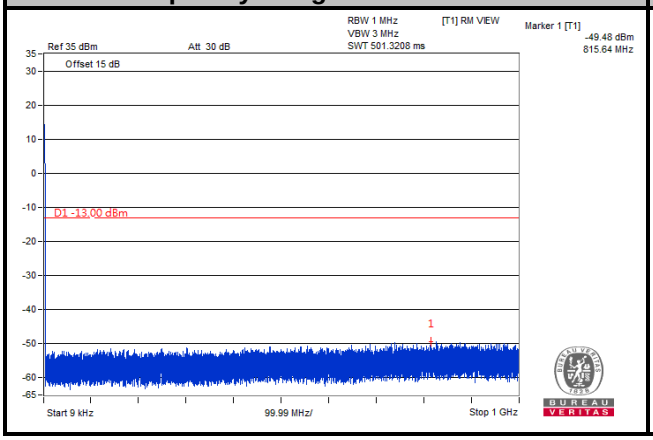
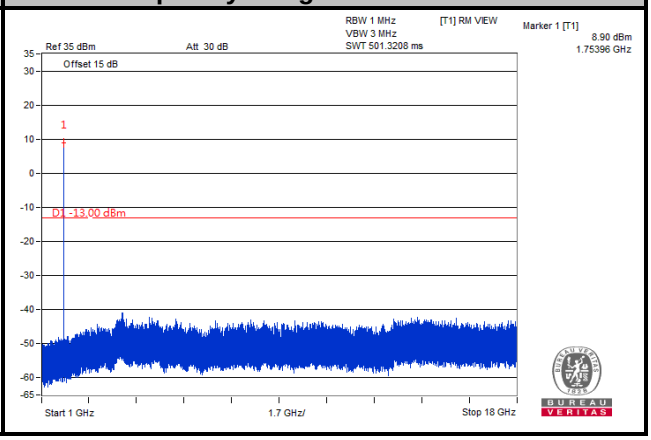
4.7.2 Test Setup



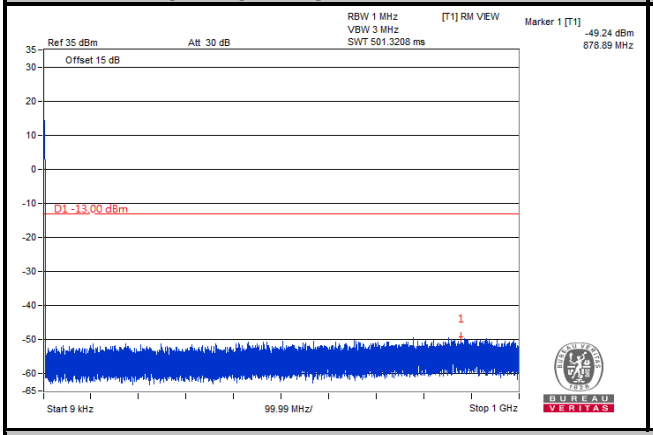
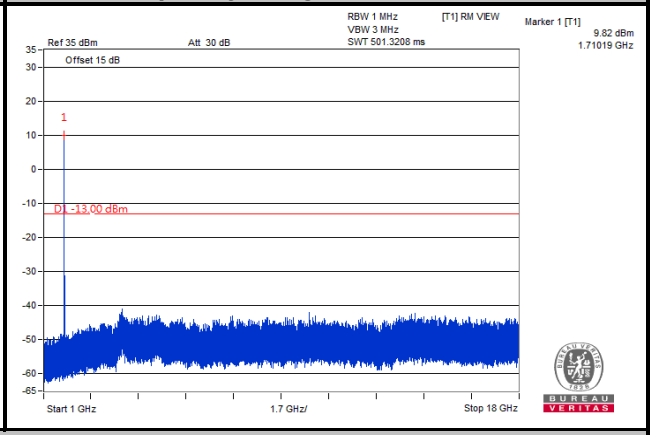
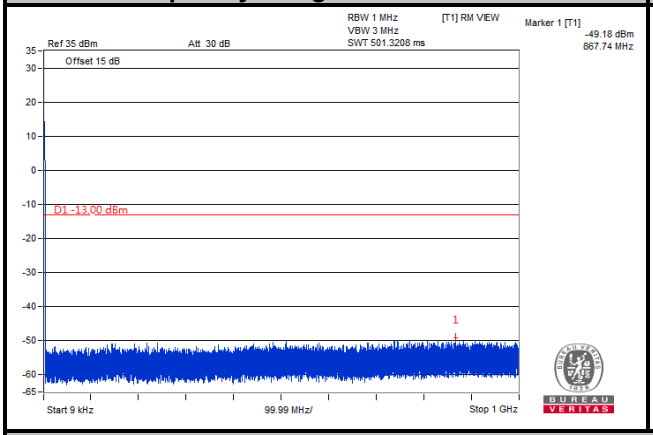
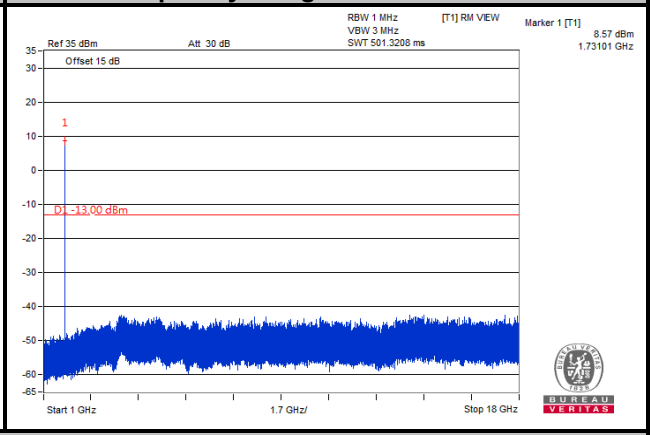
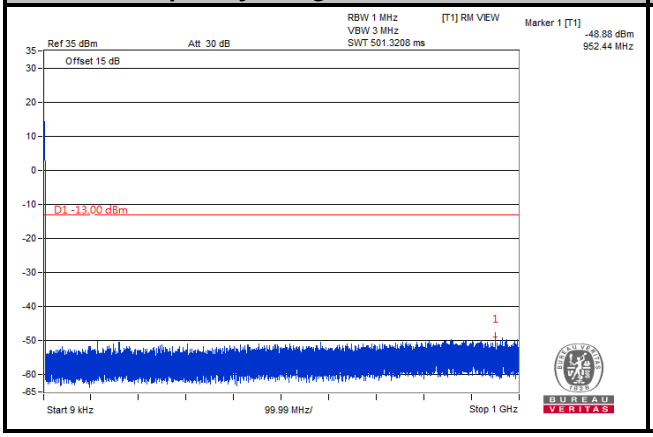
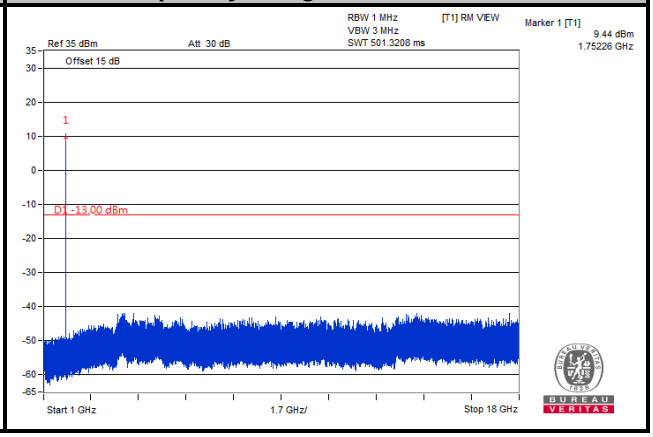
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 18 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

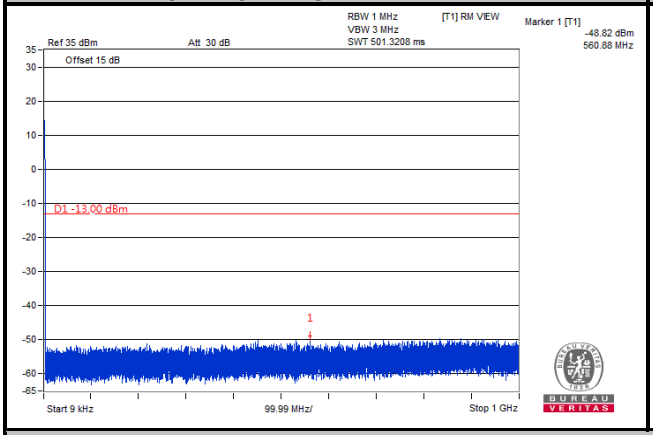
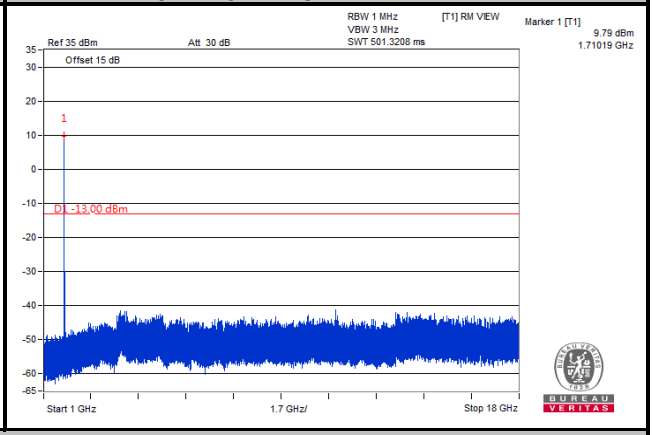
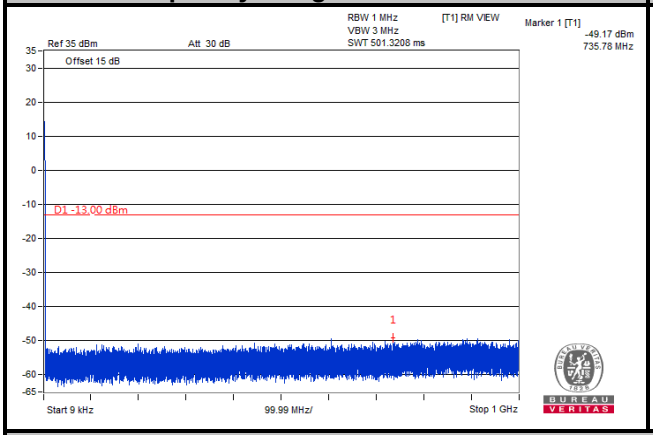
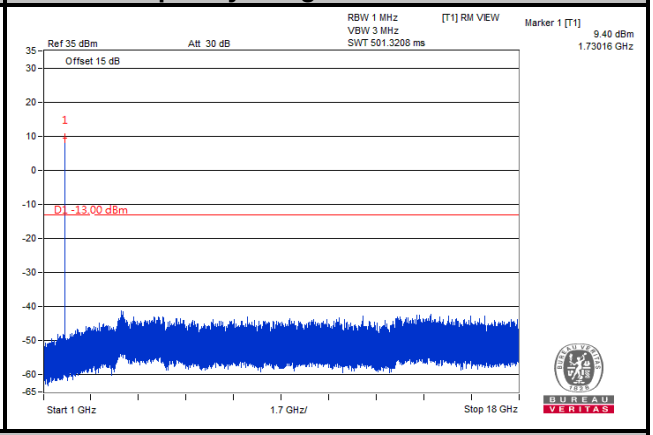
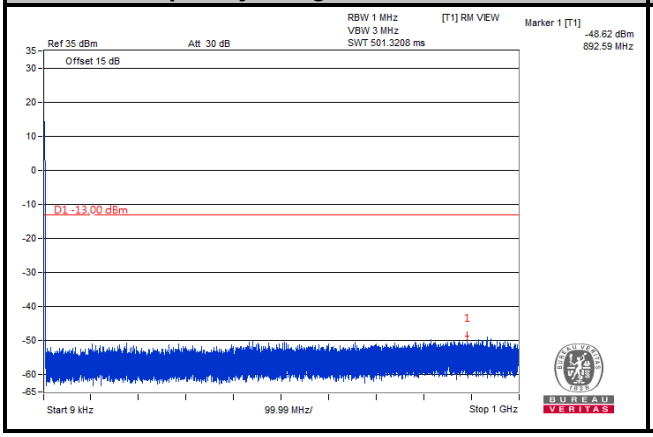
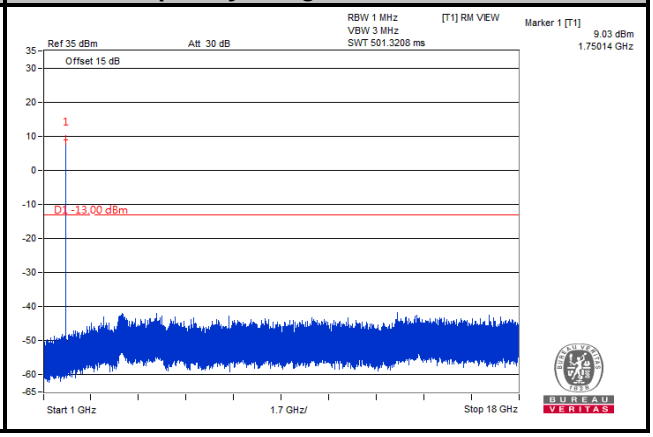
4.7.4 Test Results

LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 19957	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20393	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

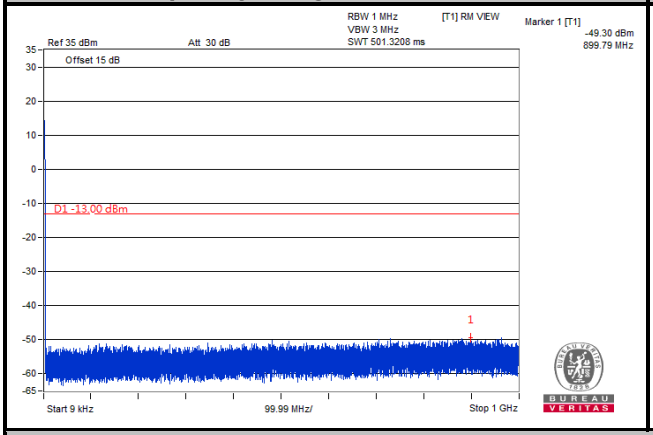
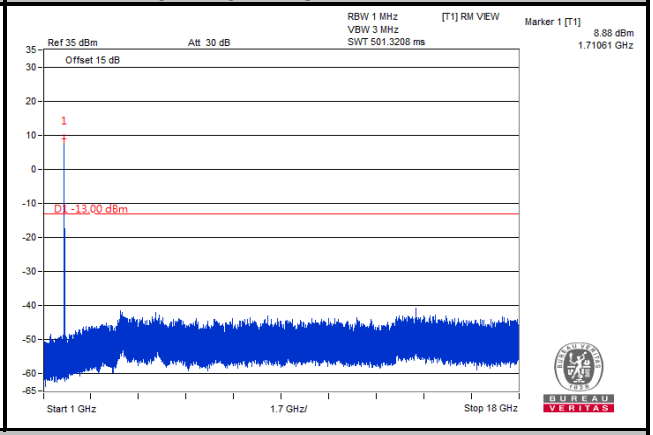
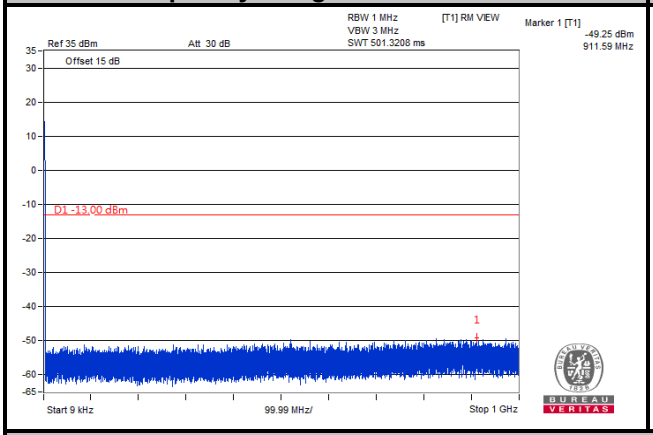
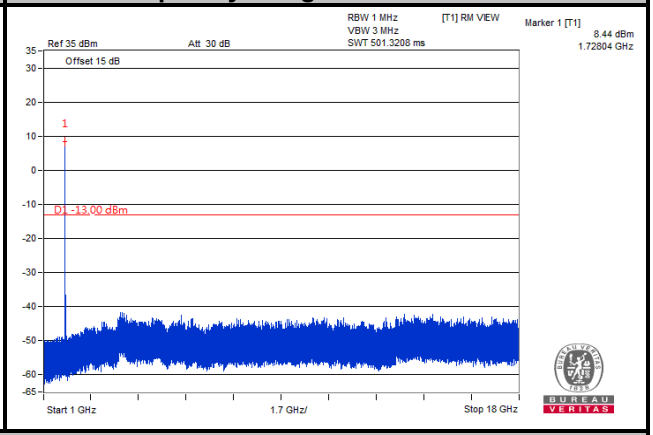
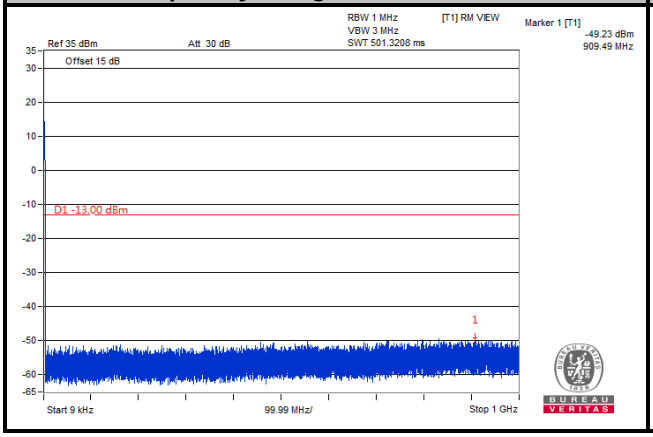
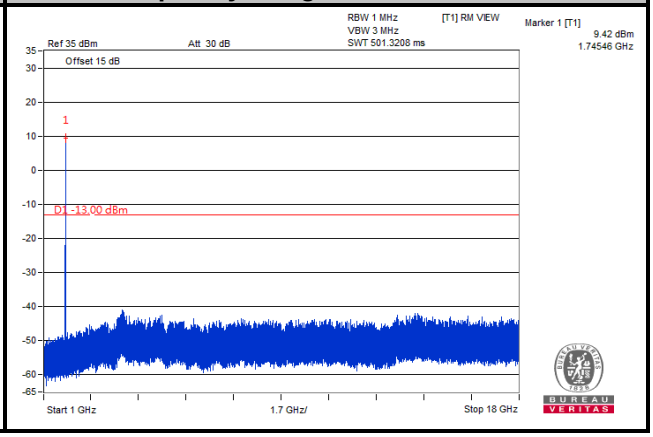
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 19965	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20385	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

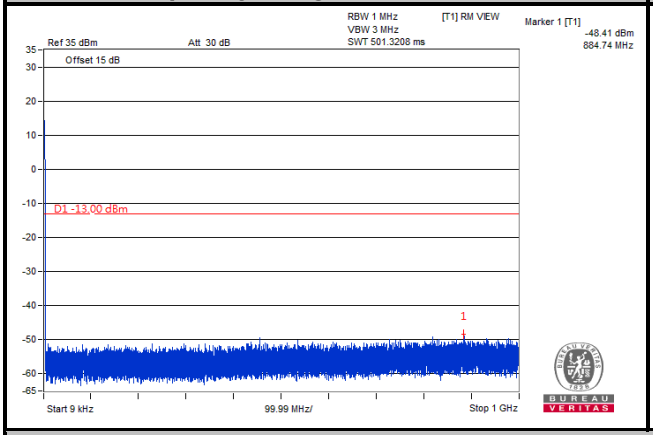
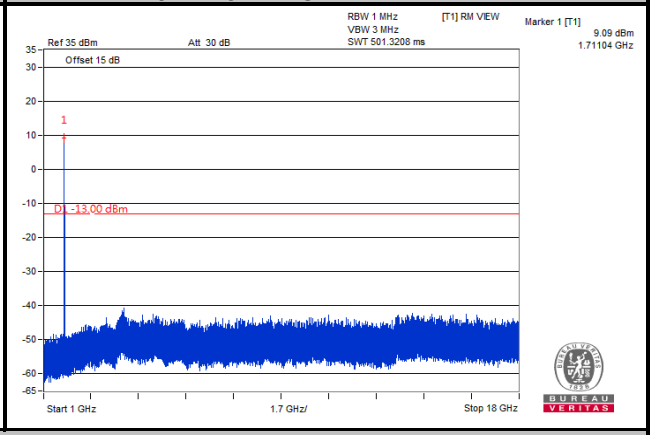
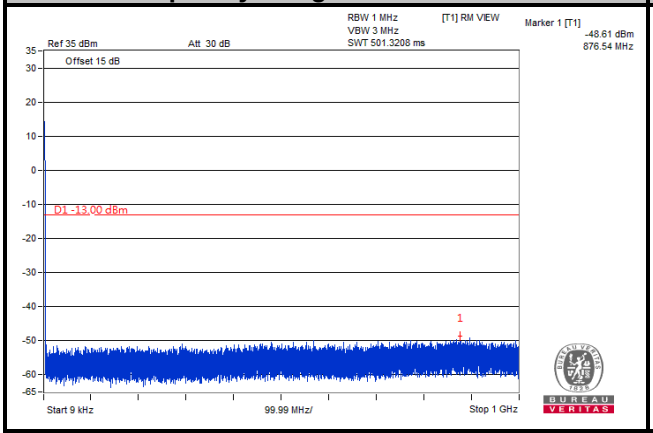
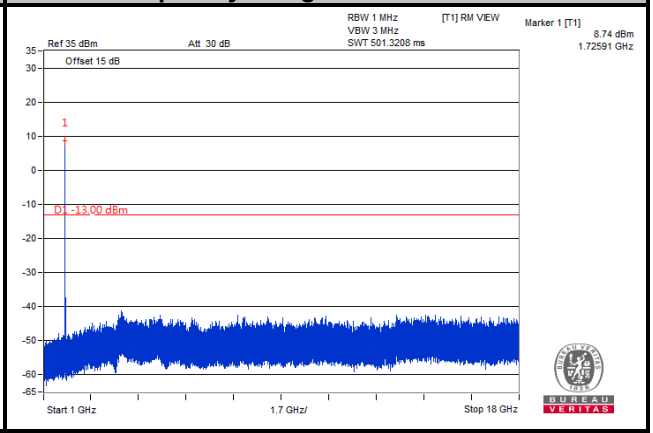
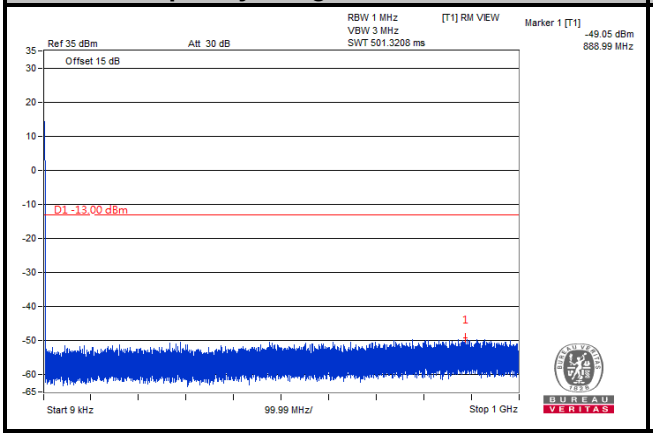
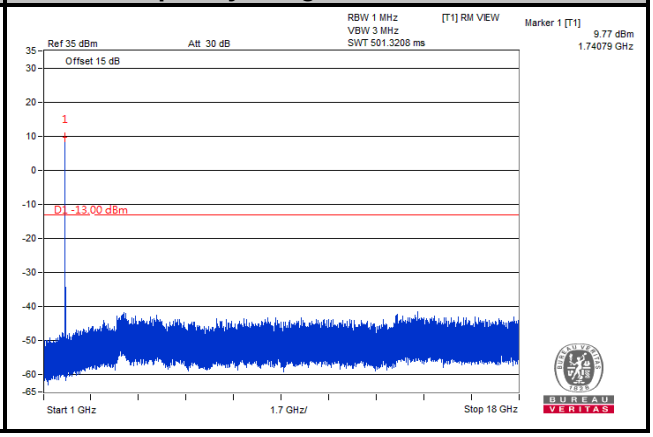
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 19975	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20375	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

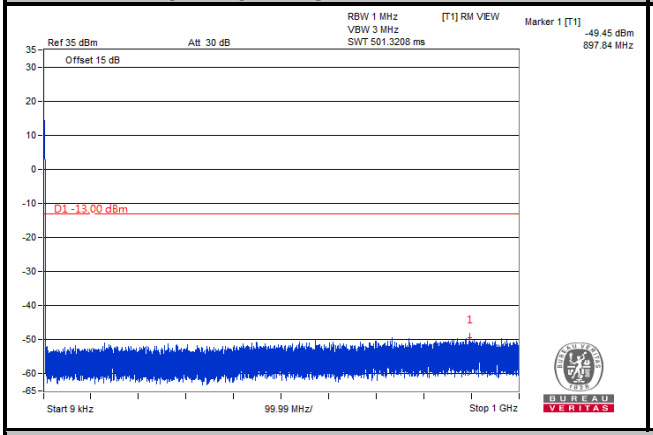
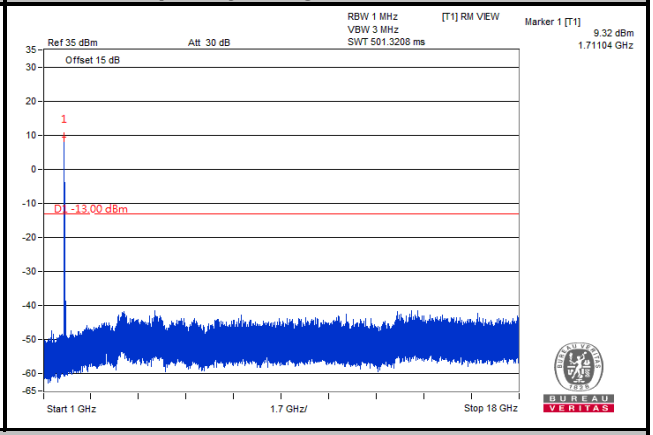
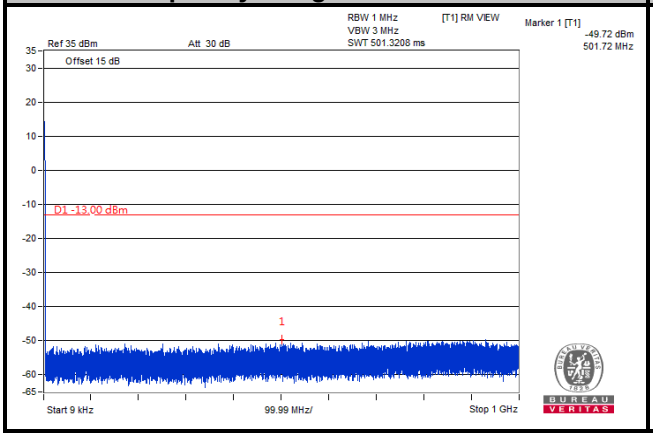
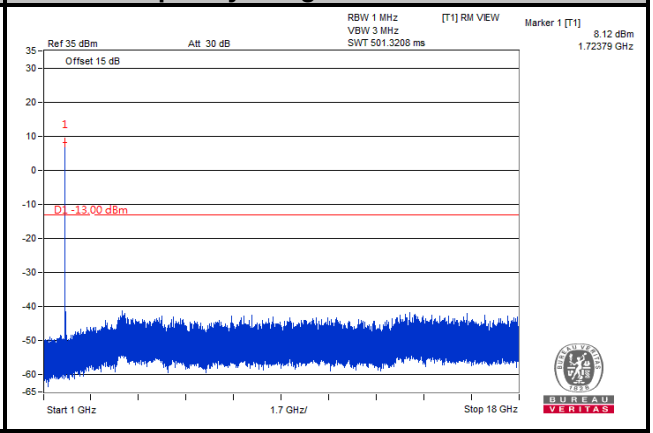
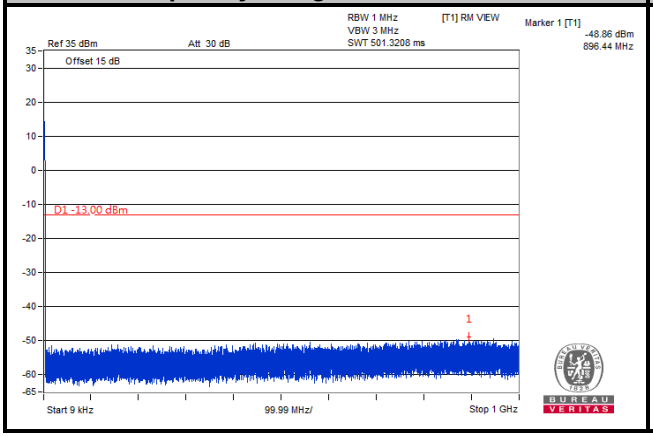
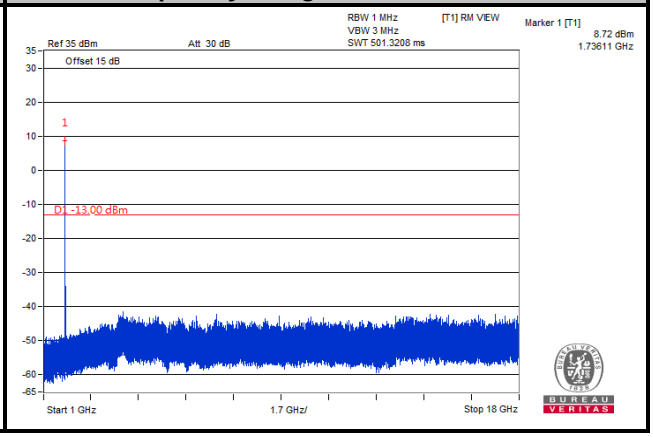
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20000	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20350	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20325	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20050	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20300	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission is equal to -13 dBm.

4.8.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
c. 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 - 2.15 dB.

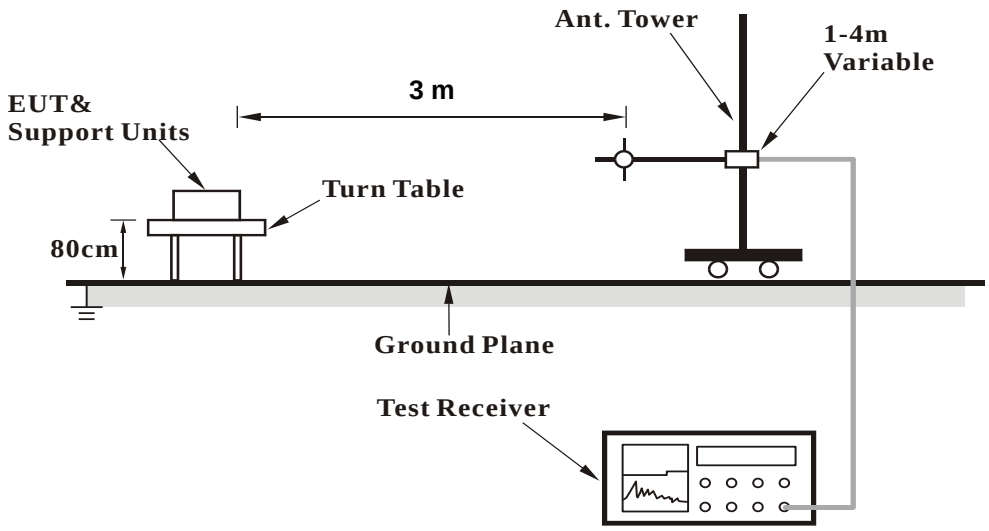
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.3 Deviation from Test Standard

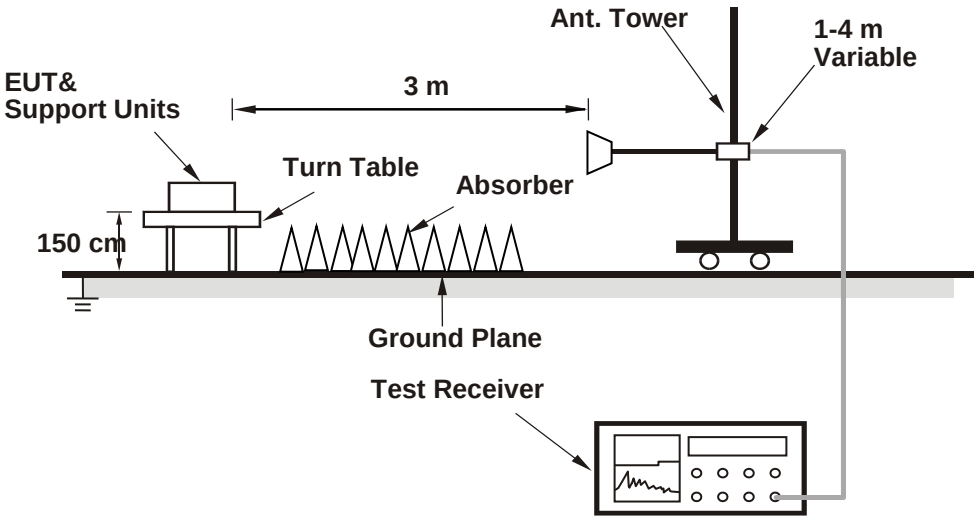
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

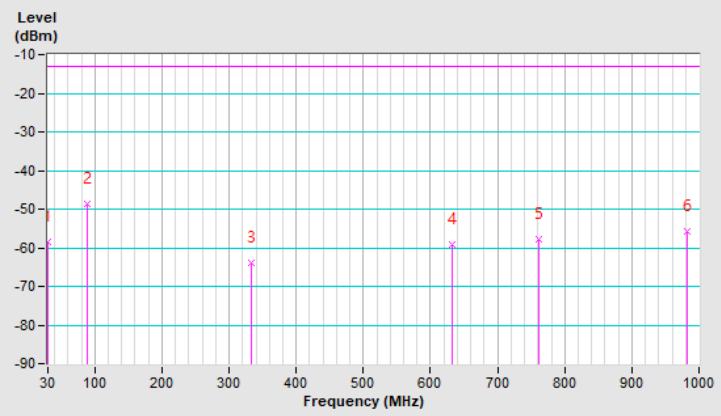
4.8.5 Test Results

Below 1GHz

LTE Band 4, Channel Bandwidth: 5MHz

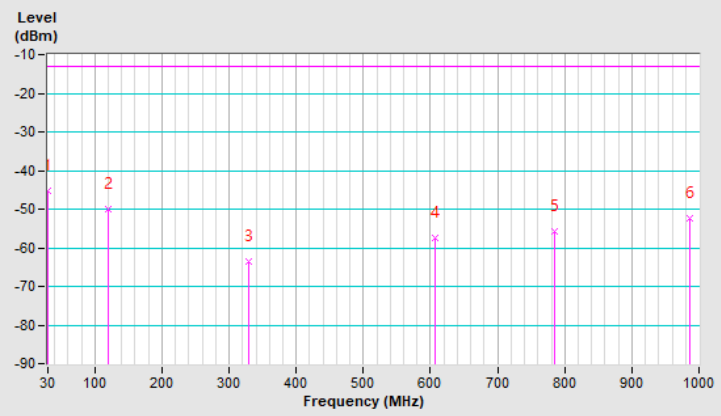
Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-58.6	-13.0	-45.6	1.00 H	256	49.1	-107.8
2	88.20	-48.5	-13.0	-35.5	1.00 H	209	63.2	-111.8
3	332.64	-63.9	-13.0	-50.9	1.25 H	180	39.6	-103.5
4	631.40	-59.0	-13.0	-46.0	1.50 H	15	38.2	-97.2
5	761.38	-57.9	-13.0	-44.9	1.25 H	340	36.9	-94.8
6	982.54	-55.6	-13.0	-42.6	1.50 H	288	35.6	-91.2



Mode	TX channel 20175 (1732.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

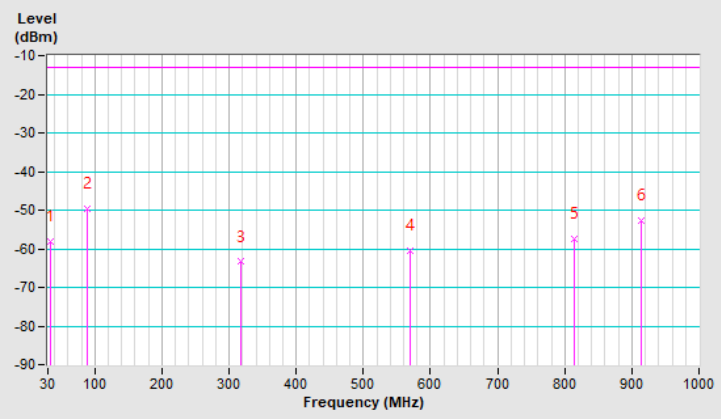
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-45.1	-13.0	-32.1	1.25 V	356	60.5	-105.6
2	119.24	-50.1	-13.0	-37.1	1.25 V	138	56.0	-106.1
3	328.76	-63.7	-13.0	-50.7	1.00 V	15	37.7	-101.4
4	606.18	-57.5	-13.0	-44.5	1.00 V	249	38.2	-95.7
5	784.66	-55.7	-13.0	-42.7	1.50 V	44	36.5	-92.2
6	986.42	-52.5	-13.0	-39.5	1.00 V	284	36.6	-89.1



LTE Band 12, Channel Bandwidth: 10MHz

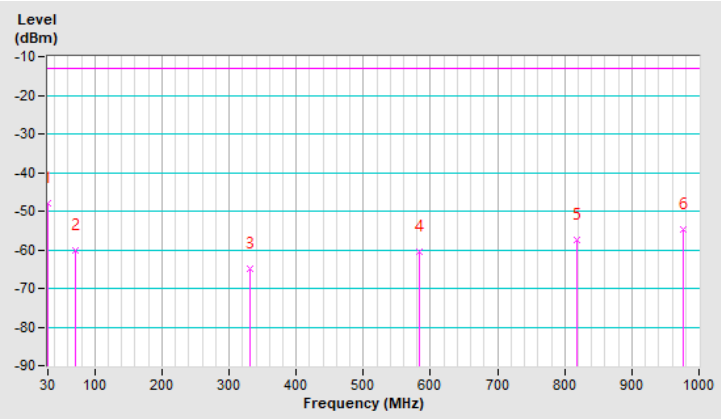
Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	-58.0	-13.0	-45.0	1.25 H	284	49.5	-107.5
2	88.20	-49.6	-13.0	-36.6	1.00 H	272	62.1	-111.8
3	317.12	-63.4	-13.0	-50.4	1.00 H	103	40.4	-103.8
4	569.32	-60.4	-13.0	-47.4	1.50 H	12	38.4	-98.8
5	813.76	-57.4	-13.0	-44.4	1.00 H	292	36.8	-94.2
6	914.64	-52.6	-13.0	-39.6	1.25 H	9	39.4	-92.0



Mode	TX channel 23095 (707.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-47.9	-13.0	-34.9	1.00 V	72	59.9	-107.8
2	70.74	-60.2	-13.0	-47.2	1.25 V	120	48.1	-108.3
3	330.70	-64.8	-13.0	-51.8	1.25 V	308	38.7	-103.5
4	582.90	-60.4	-13.0	-47.4	1.00 V	1	38.1	-98.5
5	817.64	-57.6	-13.0	-44.6	1.50 V	42	36.4	-94.0
6	976.72	-54.8	-13.0	-41.8	1.00 V	252	36.5	-91.3



Above 1GHz
LTE Band 4, Channel Bandwidth: 1.4MHz

Mode	TX channel 19957 (1710.7MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3421.40	-54.7	-13.0	-41.7	1.55 H	24	42.4	-97.1
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3421.40	-52.7	-13.0	-39.7	1.70 V	9	44.4	-97.1

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465.00	-55.3	-13.0	-42.3	1.42 H	32	41.5	-96.8
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465.00	-52.0	-13.0	-39.0	1.64 V	14	44.8	-96.8

Mode	TX channel 20393 (1754.3MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3508.60	-55.9	-13.0	-42.9	1.80 H	8	40.7	-96.6
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3508.60	-54.1	-13.0	-41.1	1.75 V	6	42.5	-96.6

LTE Band 4, Channel Bandwidth: 5MHz

Mode	TX channel 19975 (1712.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3425.00	-56.7	-13.0	-43.7	1.77 H	13	40.3	-97.0
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3425.00	-52.2	-13.0	-39.2	1.96 V	5	44.9	-97.1

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465.00	-55.5	-13.0	-42.5	1.64 H	19	41.3	-96.8
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**3465.00**	**-51.2**	**-13.0**	**-38.2**	**1.73 V**	**6**	**45.6**	**-96.8**

Mode	TX channel 20375 (1752.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3505.00	-54.2	-13.0	-41.2	1.48 H	14	42.4	-96.6
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3505.00	-54.2	-13.0	-41.2	1.82 V	11	42.5	-96.7

LTE Band 4, Channel Bandwidth: 20MHz

Mode	TX channel 20050 (1720.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3440.00	-56.1	-13.0	-43.1	1.60 H	27	40.8	-96.9
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3440.00	-52.4	-13.0	-39.4	1.91 V	5	44.6	-97.0

Mode	TX channel 20175 (1732.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465.00	-55.7	-13.0	-42.7	1.84 H	48	41.1	-96.8
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465.00	-51.8	-13.0	-38.8	1.87 V	6	45.0	-96.8

Mode	TX channel 20300 (1745.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3490.00	-56.3	-13.0	-43.3	1.57 H	47	40.4	-96.7
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3490.00	-51.5	-13.0	-38.5	1.74 V	8	45.2	-96.7

LTE Band 12, Channel Bandwidth: 1.4MHz

Mode	TX channel 23017 (699.7MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1399.40	-32.7	-13.0	-19.7	1.17 H	356	69.5	-102.2
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1399.40	-33.2	-13.0	-20.2	1.34 V	2	69.0	-102.2

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1415.00	-32.6	-13.0	-19.6	1.14 H	359	69.6	-102.2
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1415.00	-33.4	-13.0	-20.4	1.36 V	3	68.8	-102.2

Mode	TX channel 23173 (715.3MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1430.60	-32.8	-13.0	-19.8	1.17 H	354	69.6	-102.4
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1430.60	-33.4	-13.0	-20.4	1.39 V	5	69.0	-102.4

LTE Band 12, Channel Bandwidth: 5MHz

Mode	TX channel 23035 (701.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1403.00	-32.6	-13.0	-19.6	1.13 H	353	69.6	-102.2
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1403.00	-33.5	-13.0	-20.5	1.36 V	4	68.7	-102.2

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1415.00	-32.8	-13.0	-19.8	1.18 H	357	69.4	-102.2
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1415.00	-33.2	-13.0	-20.2	1.38 V	6	69.0	-102.2

Mode	TX channel 23155 (713.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1427.00	-32.9	-13.0	-19.9	1.15 H	355	69.5	-102.4
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1427.00	-33.3	-13.0	-20.3	1.15 V	355	69.1	-102.4

LTE Band 12, Channel Bandwidth: 10MHz

Mode	TX channel 23060 (704MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1408.00	-32.6	-13.0	-19.6	1.14 H	355	69.6	-102.2
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1408.00	-33.0	-13.0	-20.0	1.33 V	4	69.2	-102.2

Mode	TX channel 23095 (707.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**1415.00**	**-32.5**	**-13.0**	**-19.5**	**1.13 H**	**354**	**69.7**	**-102.2**
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1415.00	-32.9	-13.0	-19.9	1.37 V	6	69.2	-102.2

Mode	TX channel 23130 (711MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1422.00	-32.6	-13.0	-19.6	1.21 H	357	69.7	-102.3
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1422.00	-33.1	-13.0	-20.1	1.29 V	5	69.2	-102.3

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 according to ISO/IEC 17025.

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---