

FCC Test Report

(PART 22)

Report No.: RFBFPJ-WTW-P20090646

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

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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

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

1 Certificate of Conformity

Product: LTE Module

Brand:  or  UBIQUITI

Test Model: RC7611U

Sample Status: Engineering Sample

Applicant: Ubiquiti Inc.

Test Date: Nov. 17, 2020 ~ Jan. 04, 2021

Standards: FCC Part 22, Subpart H

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:** 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 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to note
22.913 (d)	Peak to Average Ratio	N/A	Refer to note
2.1055 22.355	Frequency Stability	N/A	Refer to note
2.1049	Occupied Bandwidth	N/A	Refer to note
22.917	Band Edge Measurements	N/A	Refer to note
2.1051 22.917	Conducted Spurious Emissions	N/A	Refer to note
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -37.4 dB at 1688.00 MHz.

Note:

- Only Effective Radiated Power and Radiated Emissions tests were performed for this addendum. Refer to DEKRA report no.: 19B0422R-HPUSP50V00 for other test data.
- 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 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz	
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz	
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz	
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz	
Max. ERP Power		QPSK	16QAM
	LTE 5 (Channel Bandwidth: 1.4 MHz)	883.080 mW (29.46dBm)	776.247 mW (28.90dBm)
	LTE 5 (Channel Bandwidth: 3 MHz)	920.450 mW (29.64dBm)	824.138 mW (29.16dBm)
	LTE 5 (Channel Bandwidth: 5 MHz)	868.960 mW (29.39dBm)	779.830 mW (28.92dBm)
	LTE 5 (Channel Bandwidth: 10 MHz)	935.406 mW (29.71dBm)	807.235 mW (29.07dBm)
Antenna Type	Dish Antenna with 8.7 dBi gain		
Accessory Device	Refer to Note as below		
Data Cable Supplied	N/A		

Note:

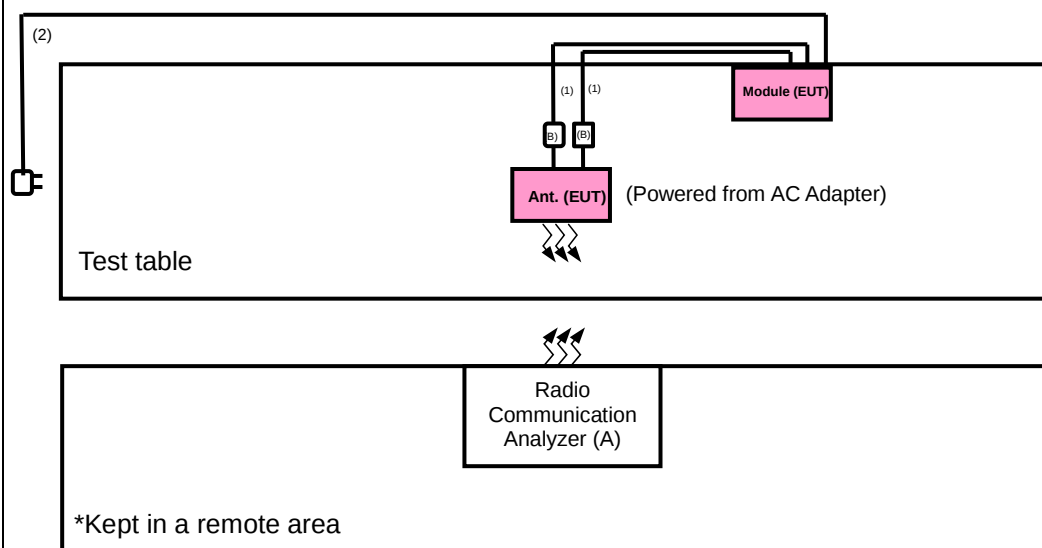
1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to DEKRA report no.: 19B0422R-HPUSP50V00. The difference compared with original report is adding new antenna.
2. The original module supports LTE B2/4/5/12/13/14/25/26/66/71, when use this antenna, 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. 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 cable 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 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	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.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Greg Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Greg Lin

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 22

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

Mobile / Portable station are limited to 7 watts e.r.p.

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 for LTE mode, and VBW $\geq 3 \times$ 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.

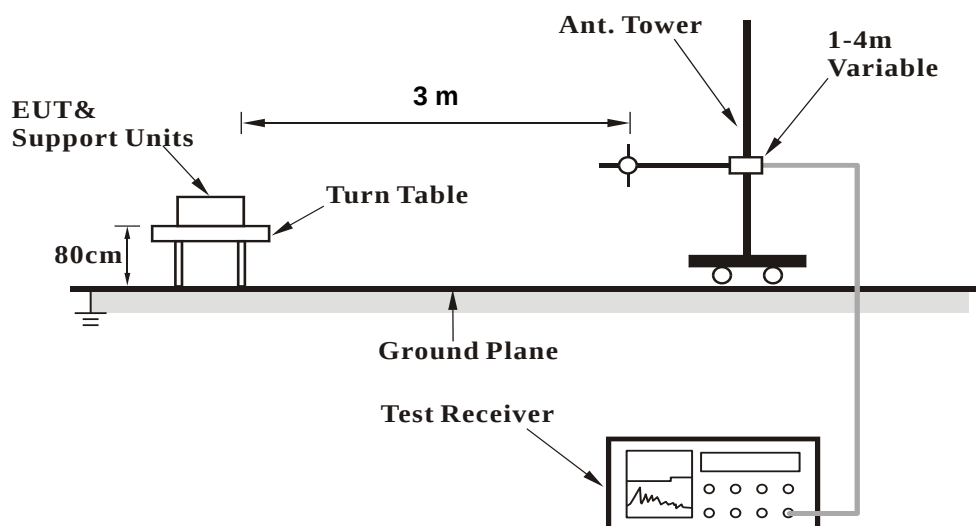
Conducted Power Measurement:

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

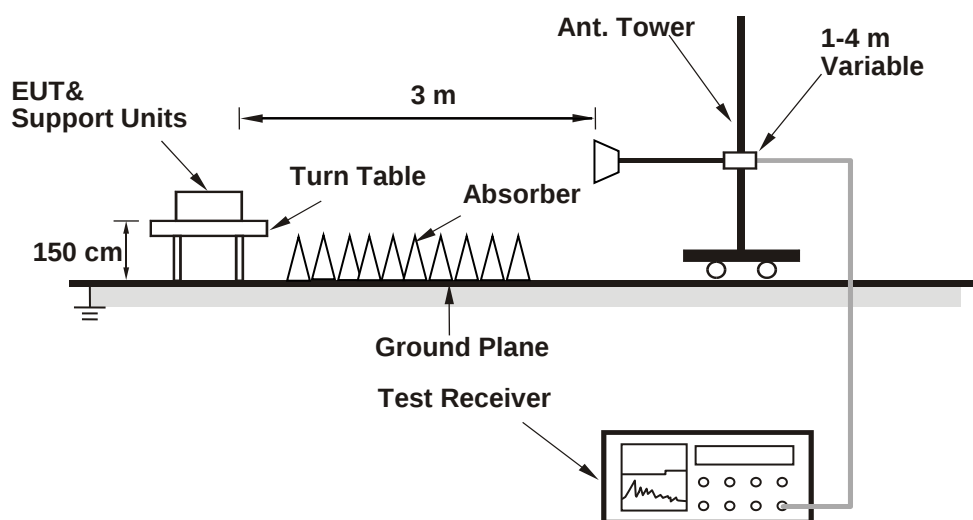
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

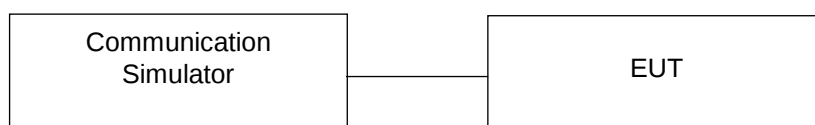


<Radiated Emission above 1 GHz>



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 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	22.88	22.69	22.76
		1	2	22.87	22.66	22.60
		1	5	22.91	22.64	22.64
		3	0	22.88	22.52	22.90
		3	1	22.90	22.65	22.89
		3	3	22.89	22.59	22.90
		6	0	22.18	22.10	22.12
	16QAM	1	0	22.25	22.24	22.24
		1	2	22.26	22.33	22.35
		1	5	22.14	22.10	22.20
		3	0	22.24	22.09	22.24
		3	1	22.21	22.17	22.08
		3	3	22.20	22.15	22.01
		6	0	21.13	21.08	21.09

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	22.84	22.63	22.72
		1	7	23.09	22.81	22.30
		1	14	22.65	22.59	22.61
		8	0	21.76	21.60	21.69
		8	3	21.75	21.59	21.65
		8	7	21.86	21.78	21.62
		15	0	21.74	21.54	21.54
	16QAM	1	0	22.31	22.19	22.04
		1	7	22.24	22.28	22.61
		1	14	22.06	22.21	22.16
		8	0	21.01	21.40	21.24
		8	3	21.27	21.38	21.16
		8	7	21.14	21.21	21.17
		15	0	21.20	21.14	21.07

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	22.81	22.62	22.61
		1	12	22.84	22.68	22.82
		1	24	22.70	22.60	22.59
		12	0	21.78	21.55	21.74
		12	6	21.62	21.62	21.69
		12	13	21.65	21.72	21.73
		25	0	21.99	21.54	21.57
	16QAM	1	0	22.37	22.03	22.07
		1	12	22.28	22.28	22.08
		1	24	22.06	22.06	22.13
		12	0	21.16	21.15	21.17
		12	6	21.19	21.17	21.16
		12	13	21.17	21.18	21.32
		25	0	21.16	21.19	21.11

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	23.11	23.16	23.08
		1	24	22.80	22.57	22.67
		1	49	22.52	22.39	22.50
		25	0	21.23	21.63	21.60
		25	12	21.63	21.58	21.53
		25	25	21.60	21.51	21.74
		50	0	21.59	21.63	21.67
	16QAM	1	0	22.52	22.10	22.29
		1	24	22.03	22.18	22.16
		1	49	22.11	22.02	22.11
		25	0	21.16	21.13	21.17
		25	12	21.05	21.29	21.19
		25	25	21.18	21.18	21.25
		50	0	21.05	21.07	21.14

ERP Power (dBm)

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	29.43	29.24	29.31
		1	2	29.42	29.21	29.15
		1	5	29.46	29.19	29.19
		3	0	29.43	29.07	29.45
		3	1	29.45	29.20	29.44
		3	3	29.44	29.14	29.45
		6	0	28.73	28.65	28.67
	16QAM	1	0	28.80	28.79	28.79
		1	2	28.81	28.88	28.90
		1	5	28.69	28.65	28.75
		3	0	28.79	28.64	28.79
		3	1	28.76	28.72	28.63
		3	3	28.75	28.70	28.56
		6	0	27.68	27.63	27.64

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	29.39	29.18	29.27
		1	7	29.64	29.36	28.85
		1	14	29.20	29.14	29.16
		8	0	28.31	28.15	28.24
		8	3	28.30	28.14	28.20
		8	7	28.41	28.33	28.17
		15	0	28.29	28.09	28.09
	16QAM	1	0	28.86	28.74	28.59
		1	7	28.79	28.83	29.16
		1	14	28.61	28.76	28.71
		8	0	27.56	27.95	27.79
		8	3	27.82	27.93	27.71
		8	7	27.69	27.76	27.72
		15	0	27.75	27.69	27.62

*ERP = Conducted + antenna gain (8.7dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	29.36	29.17	29.16
		1	12	29.39	29.23	29.37
		1	24	29.25	29.15	29.14
		12	0	28.33	28.10	28.29
		12	6	28.17	28.17	28.24
		12	13	28.20	28.27	28.28
		25	0	28.54	28.09	28.12
	16QAM	1	0	28.92	28.58	28.62
		1	12	28.83	28.83	28.63
		1	24	28.61	28.61	28.68
		12	0	27.71	27.70	27.72
		12	6	27.74	27.72	27.71
		12	13	27.72	27.73	27.87
		25	0	27.71	27.74	27.66

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	29.66	29.71	29.63
		1	24	29.35	29.12	29.22
		1	49	29.07	28.94	29.05
		25	0	27.78	28.18	28.15
		25	12	28.18	28.13	28.08
		25	25	28.15	28.06	28.29
		50	0	28.14	28.18	28.22
	16QAM	1	0	29.07	28.65	28.84
		1	24	28.58	28.73	28.71
		1	49	28.66	28.57	28.66
		25	0	27.71	27.68	27.72
		25	12	27.60	27.84	27.74
		25	25	27.73	27.73	27.80
		50	0	27.60	27.62	27.69

*ERP = Conducted + antenna gain (8.7dBi)-2.15

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit is equal to -13 dBm.

4.2.2 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:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:

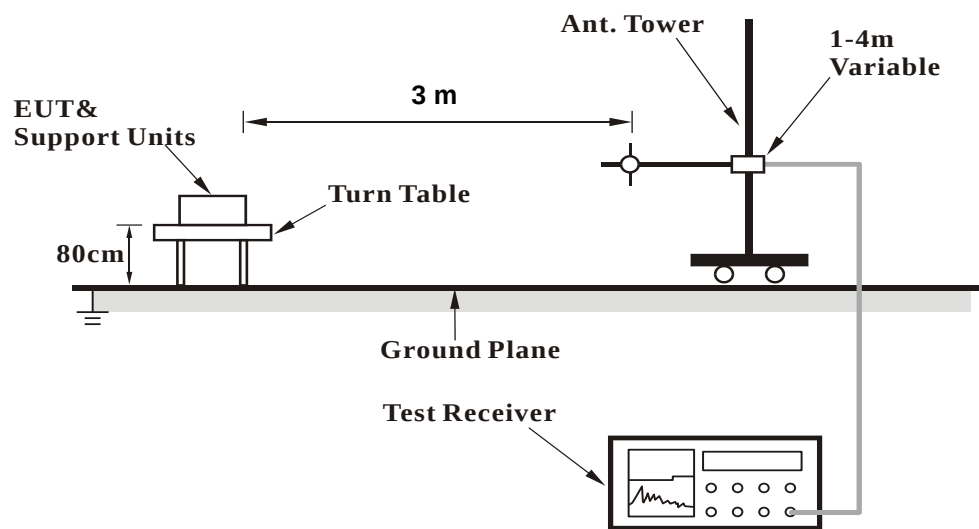
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

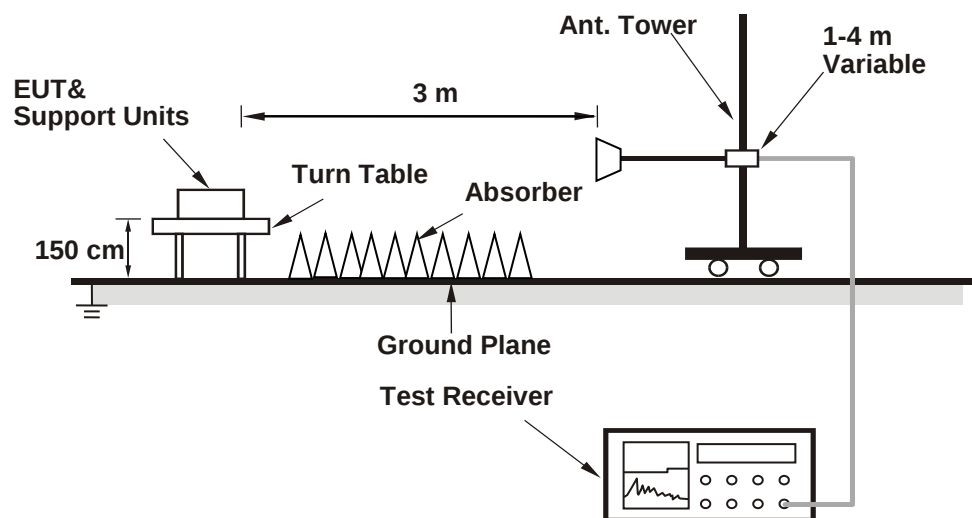
No deviation.

4.2.4 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).

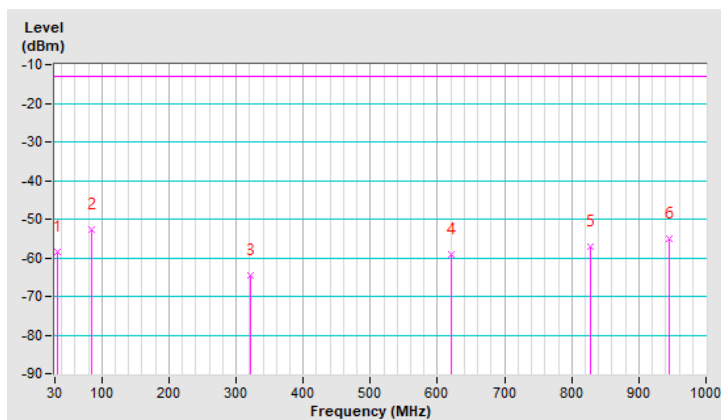
4.2.5 Test Results

Below 1GHz

LTE Band 5, Channel Bandwidth: 10MHz

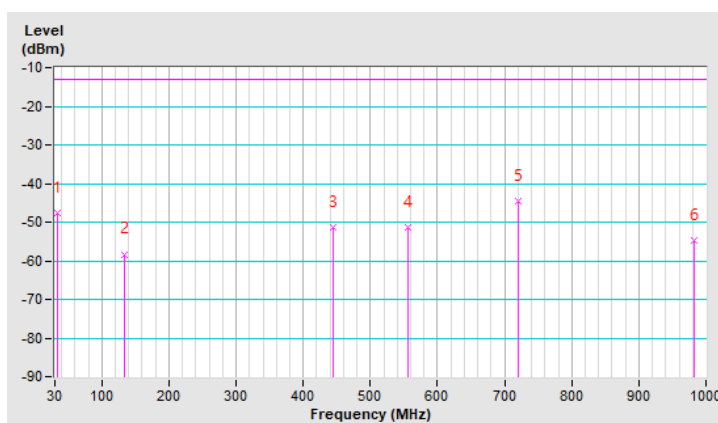
Mode	TX channel 20600 (844.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-58.6	-13.0	-45.6	1.25 H	103	48.9	-107.5
2	84.32	-52.7	-13.0	-39.7	1.25 H	205	58.9	-111.6
3	321.00	-64.6	-13.0	-51.6	1.00 H	219	39.1	-103.7
4	619.76	-59.3	-13.0	-46.3	1.50 H	93	38.3	-97.6
5	827.34	-57.1	-13.0	-44.1	1.25 H	235	36.7	-93.8
6	945.68	-55.0	-13.0	-42.0	1.00 H	15	36.7	-91.7



Mode	TX channel 20600 (844.0MHz)	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	33.88	-47.5	-13.0	-34.5	1.25 V	18	60.0	-107.5
2	132.82	-58.3	-13.0	-45.3	1.00 V	44	48.5	-106.8
3	445.16	-51.5	-13.0	-38.5	1.50 V	88	49.7	-101.2
4	555.74	-51.3	-13.0	-38.3	1.25 V	88	47.9	-99.2
5	720.64	-44.5	-13.0	-31.5	1.00 V	18	51.5	-96.0
6	982.54	-54.6	-13.0	-41.6	1.25 V	332	36.6	-91.2



Above 1GHz

LTE Band 5, Channel Bandwidth: 1.4MHz

Mode	TX channel 20407 (824.7MHz)	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	1649.40	-50.7	-13.0	-37.7	1.28 H	4	52.6	-103.3
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	1649.40	-51.7	-13.0	-38.7	1.31 V	6	51.6	-103.3

Mode	TX channel 20525 (836.5MHz)	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	1673.00	-50.6	-13.0	-37.6	1.30 H	5	52.7	-103.3
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	1673.00	-51.5	-13.0	-38.5	1.32 V	7	51.8	-103.3

Mode	TX channel 20643 (848.3MHz)	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	1696.60	-50.9	-13.0	-37.9	1.29 H	7	52.4	-103.3
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	1696.60	-51.8	-13.0	-38.8	1.32 V	6	51.5	-103.3

LTE Band 5, Channel Bandwidth: 5MHz

Mode	TX channel 20425 (826.5MHz)	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	1653.00	-50.5	-13.0	-37.5	1.27 H	5	52.8	-103.3
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	1653.00	-51.5	-13.0	-38.5	1.32 V	6	51.8	-103.3

Mode	TX channel 20525 (836.5MHz)	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	1673.00	-50.6	-13.0	-37.6	1.26 H	6	52.7	-103.3
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	1673.00	-51.6	-13.0	-38.6	1.33 V	7	51.7	-103.3

Mode	TX channel 20625 (846.5MHz)	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	1693.00	-50.7	-13.0	-37.7	1.30 H	5	52.6	-103.3
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	1693.00	-51.4	-13.0	-38.4	1.32 V	6	51.9	-103.3

LTE Band 5, Channel Bandwidth: 10MHz

Mode	TX channel 20450 (829.0MHz)	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	1658.00	-50.8	-13.0	-37.8	1.29 H	7	52.5	-103.3
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	1658.00	-51.7	-13.0	-38.7	1.33 V	5	51.6	-103.3

Mode	TX channel 20525 (836.5MHz)	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	1673.00	-50.9	-13.0	-37.9	1.29 H	8	52.4	-103.3
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	1673.00	-51.7	-13.0	-38.7	1.33 V	6	51.6	-103.3

Mode	TX channel 20600 (844.0MHz)	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	1688.00	-50.4	-13.0	-37.4	1.27 H	6	52.9	-103.3
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	1688.00	-51.3	-13.0	-38.3	1.32 V	7	52.0	-103.3

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.

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

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