Partial FCC Test Report

(PART 90S)

Report No.:	RFBHDI-WTW-P21060617-4
FCC ID:	2ATM8EG25G
Test Model:	EG25G MINPCIE
Received Date:	Jun. 21, 2021
Test Date:	Jun. 28 ~ Jul. 22, 2021
Issued Date:	Jul. 30, 2021
Applicant:	Hawkeye Tech Co., Ltd.
Address:	13F. No.736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan
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

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Release Control Record

Issue No.	Description	Date Issued
RFBHDI-WTW-P21060617-4	Original Release	Jul. 30, 2021

1 Certificate of Conformity

Product:	LTE Module
Brand:	Quectel
Test Model:	EG25G MINPCIE
Sample Status:	Engineering Sample
Applicant:	Hawkeye Tech Co., Ltd.
Test Date:	Jun. 28 ~ Jul. 22, 2021
Standards:	FCC Part 90, Subpart I, S FCC Part 2

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:** Jul. 30, 2021

Lena Wang / Specialist

Approved by : , **Date:** Jul. 30, 2021

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (LTE 26)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 90.635 (b)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
2.1055 90.213	Frequency Stability	N/A	Refer to Note
2.1049 90.209	Occupied Bandwidth	N/A	Refer to Note
2.1051 90.691	Emission Masks	N/A	Refer to Note
2.1051 90.691	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 90.691	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -34.0 dB at 30.00 MHz.

Note:

1. This report is a partial report. Therefore, only test item of Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to SGS report no.: HR/2019/1001601 for module (Brand: Quectel, Model: EG25G MINPCIE).
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. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 10, 2021	Jun. 09, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 05, 2021	Jun. 04, 2022
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 17, 2021	Feb. 16, 2022
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	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
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2021	May 31, 2022
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2020	Dec. 27, 2021
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 09, 2020	Sep. 08, 2021
DC Power Supply Topward	33010D	807748	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	LTE Module		
Brand	Quectel		
Test Model	EG25G MINPCIE		
Status of EUT	Engineering Sample		
Power Supply Rating	48 Vdc (POE)		
Modulation Type	LTE	QPSK, 16QAM	
Frequency Range	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	814.7 ~ 823.3 MHz	
	LTE Band 26 (Channel Bandwidth: 3 MHz)	815.5 ~ 822.5 MHz	
	LTE Band 26 (Channel Bandwidth: 5 MHz)	816.5 ~ 821.5 MHz	
	LTE Band 26 (Channel Bandwidth: 10 MHz)	819 MHz	
Max. ERP Power		QPSK	16QAM
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	213.304 mW (23.29dBm)	151.356 mW (21.80dBm)
	LTE Band 26 (Channel Bandwidth: 3 MHz)	207.970 mW (23.18dBm)	153.109 mW (21.85dBm)
	LTE Band 26 (Channel Bandwidth: 5 MHz)	204.644 mW (23.11dBm)	149.624 mW (21.75dBm)
	LTE Band 26 (Channel Bandwidth: 10 MHz)	206.063 mW (23.14dBm)	136.144 mW (21.34dBm)
Antenna Type	Dipole Antenna with 1.6 dBi gain		
Accessory Device	Refer to Note as below		
Data Cable Supplied	Refer to Note as below		

Note:

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

Product	Brand	Model	FCC ID
veeaHub	veeaHub	VHE10XXXXX (X=A-Z, 0-9, blank or "-")	2ARXKVHE10

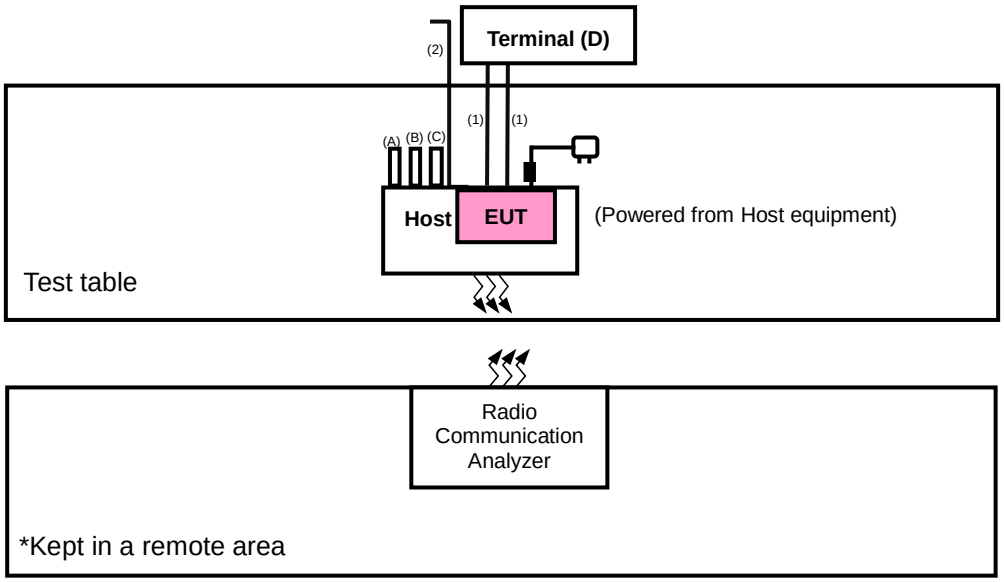
2. The End-product contains following accessory devices.

Product	Brand	Model	Description
AC Adapter	EDACPOWER ELEC.	EA1062SGR-480	I/P: 100-240 Vac, 50/60 Hz, 2.5 A O/P: 48 Vdc, 1.35 A 1.2m DC cable with 1 core

3. 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.
4. 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	FLASH	HP	v250W	09	N/A
B	FLASH	HP	v250W	05	N/A
C	FLASH	HP	v250W	03	N/A
D	Terminal	N/A	N/A	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	LAN Cable: 1.5m
2.	RS232 to A Cable: 1.6m

Note:

1. All power cords of the above support units are non-shielded (1.8m).

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

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

Band	Radiated Emission
LTE Band 26	X-axis

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	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	Rex Wang
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Rex Wang

3.4 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 90
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
KDB 971168 D02 Misc Rev Approv License Devices v02r01
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

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw) ERP.

4.1.2 Test Procedures

EIRP / ERP Measurement:

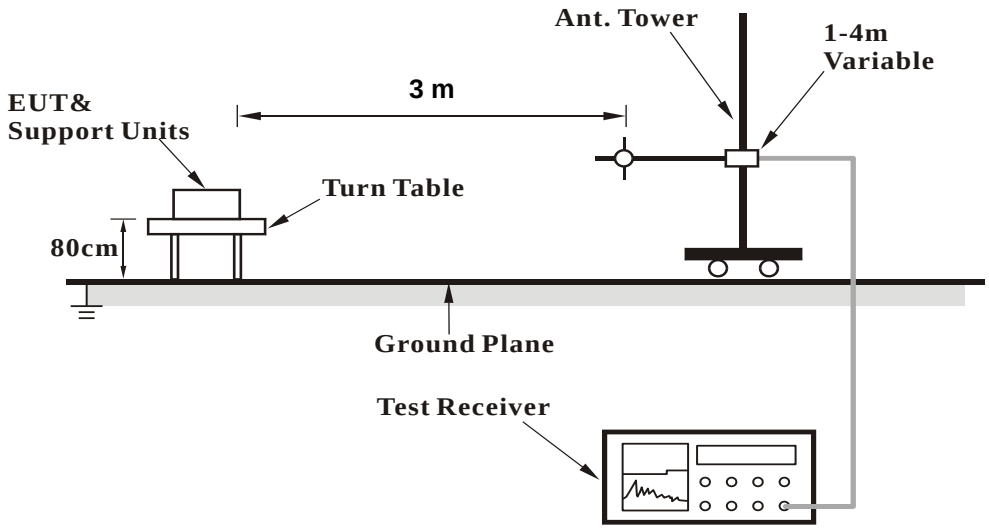
a. All measurements were done at low, middle and high operational frequency range. RBW is 5 MHz for 1.4 MHz、5 MHz、10 MHz for LTE mode, and VBW ≥ 3 x RBW.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 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.P.R power - 2.15 dB.

Conducted Power Measurement:

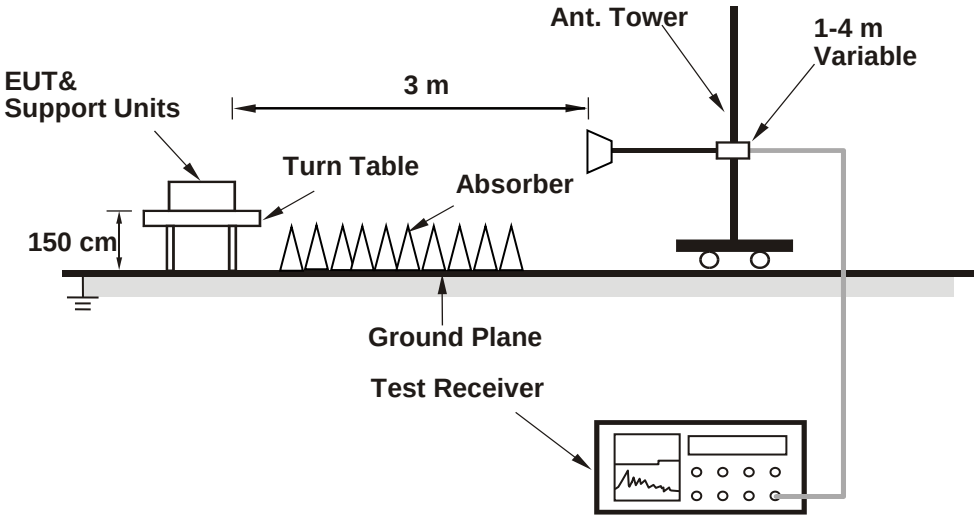
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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 26						
BW	**MCS Index**	**RB Size**	**RB Offset**	**Low**	**Mid**	**High**
		Channel		**26697**	**26740**	**26783**
		Frequency (MHz)		**814.7**	**819**	**823.3**
1.4M	QPSK	1	0	23.59	23.00	**23.84**
		1	2	23.80	23.48	23.83
		1	5	23.41	23.46	23.62
		3	0	22.81	22.21	22.35
		3	1	22.60	22.52	22.58
		3	3	22.80	22.60	22.31
		6	0	22.45	22.41	22.57
	16QAM	1	0	**22.35**	21.94	21.84
		1	2	22.02	21.94	22.07
		1	5	22.19	21.86	22.16
		3	0	21.51	21.22	21.43
		3	1	21.39	21.28	21.46
		3	3	21.63	21.38	21.41
		6	0	21.43	21.20	21.66
BW	**MCS Index**	**Channel**		**26705**	**26740**	**26775**
		Frequency (MHz)		**815.5**	**819**	**822.5**
3M	QPSK	1	0	**23.73**	23.12	23.67
		1	7	23.71	23.59	23.70
		1	14	23.67	23.64	23.49
		8	0	22.78	22.35	22.38
		8	3	22.82	22.17	22.50
		8	7	22.59	22.60	22.38
		15	0	22.48	22.45	22.43
	16QAM	1	0	22.31	22.18	22.22
		1	7	**22.40**	21.91	22.24
		1	14	22.25	22.17	22.09
		8	0	21.81	21.17	21.46
		8	3	21.49	21.22	21.48
		8	7	21.59	21.34	21.22
		15	0	21.49	21.10	21.34

LTE Band 26						
BW	MCS Index	Channel		26715	26740	26765
		Frequency (MHz)		816.5	819	821.5
5M	QPSK	1	0	23.63	23.03	23.58
		1	12	**23.66**	23.52	23.60
		1	24	23.37	23.55	23.50
		12	0	22.62	22.10	22.44
		12	6	22.76	22.52	22.58
		12	13	22.55	22.60	22.57
		25	0	22.47	22.36	22.59
	16QAM	1	0	**22.30**	22.03	22.13
		1	12	22.11	21.70	21.98
		1	24	22.24	22.12	22.28
		12	0	21.67	21.14	21.21
		12	6	21.61	20.97	21.53
		12	13	21.51	21.28	21.12
		25	0	21.58	21.35	21.48

BW	MCS Index	Channel		26740
		Frequency (MHz)		819
10M	QPSK	1	0	23.15
		1	24	23.62
		1	49	**23.69**
		25	0	22.16
		25	12	22.30
		25	25	22.47
		50	0	22.14
	16QAM	1	0	**21.89**
		1	24	21.88
		1	49	21.84
		25	0	21.07
		25	12	20.98
		25	25	21.35
		50	0	21.07

ERP Power (dBm)

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26697	26740	26783
		Frequency (MHz)		814.7	819	823.3
1.4M	QPSK	1	0	23.04	22.45	**23.29**
		1	2	23.25	22.93	23.28
		1	5	22.86	22.91	23.07
		3	0	22.26	21.66	21.80
		3	1	22.05	21.97	22.03
		3	3	22.25	22.05	21.76
		6	0	21.90	21.86	22.02
	16QAM	1	0	**21.80**	21.39	21.29
		1	2	21.47	21.39	21.52
		1	5	21.64	21.31	21.61
		3	0	20.96	20.67	20.88
		3	1	20.84	20.73	20.91
		3	3	21.08	20.83	20.86
		6	0	20.88	20.65	21.11
BW	MCS Index	Channel		26705	26740	26775
		Frequency (MHz)		815.5	819	822.5
3M	QPSK	1	0	**23.18**	22.57	23.12
		1	7	23.16	23.04	23.15
		1	14	23.12	23.09	22.94
		8	0	22.23	21.80	21.83
		8	3	22.27	21.62	21.95
		8	7	22.04	22.05	21.83
		15	0	21.93	21.90	21.88
	16QAM	1	0	21.76	21.63	21.67
		1	7	**21.85**	21.36	21.69
		1	14	21.70	21.62	21.54
		8	0	21.26	20.62	20.91
		8	3	20.94	20.67	20.93
		8	7	21.04	20.79	20.67
		15	0	20.94	20.55	20.79

*ERP = Conducted + antenna gain (1.6dBi)-2.15

LTE Band 26						
BW	MCS Index	Channel		26715	26740	26765
		Frequency (MHz)		816.5	819	821.5
5M	QPSK	1	0	23.08	22.48	23.03
		1	12	**23.11**	22.97	23.05
		1	24	22.82	23.00	22.95
		12	0	22.07	21.55	21.89
		12	6	22.21	21.97	22.03
		12	13	22.00	22.05	22.02
		25	0	21.92	21.81	22.04
	16QAM	1	0	**21.75**	21.48	21.58
		1	12	21.56	21.15	21.43
		1	24	21.69	21.57	21.73
		12	0	21.12	20.59	20.66
		12	6	21.06	20.42	20.98
		12	13	20.96	20.73	20.57
		25	0	21.03	20.80	20.93
BW	MCS Index	Channel		26740		
		Frequency (MHz)		819		
10M	QPSK	1	0	22.60		
		1	24	23.07		
		1	49	**23.14**		
		25	0	21.61		
		25	12	21.75		
		25	25	21.92		
		50	0	21.59		
	16QAM	1	0	**21.34**		
		1	24	21.33		
		1	49	21.29		
		25	0	20.52		
		25	12	20.43		
		25	25	20.80		
		50	0	20.52		

*ERP = Conducted + antenna gain (1.6dBi)-2.15

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

(1) 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.

4.2.2 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.P.R power - 2.15 dB.

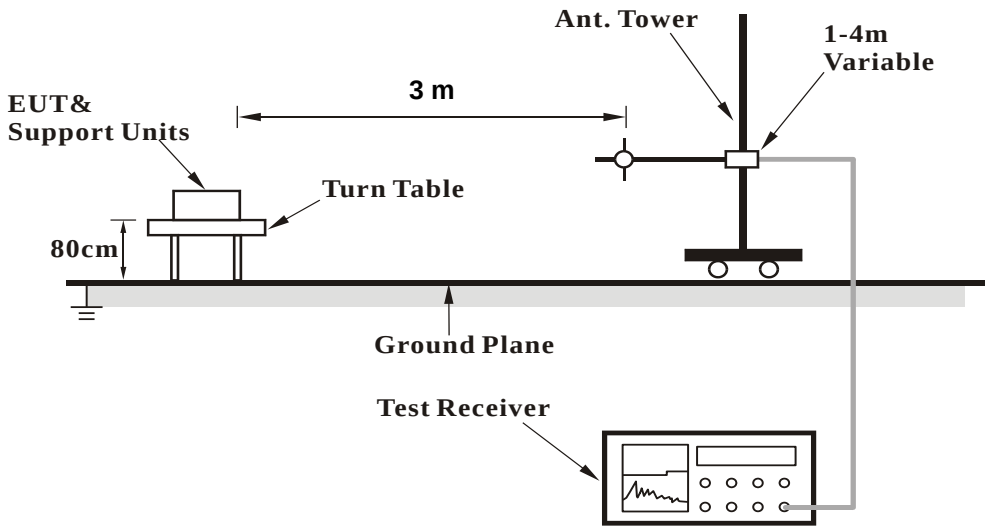
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

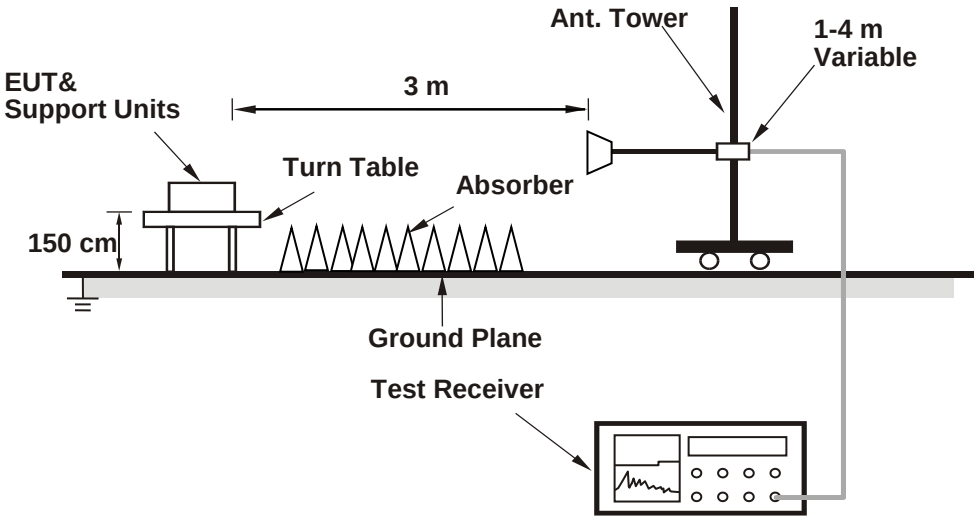
No deviation.

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

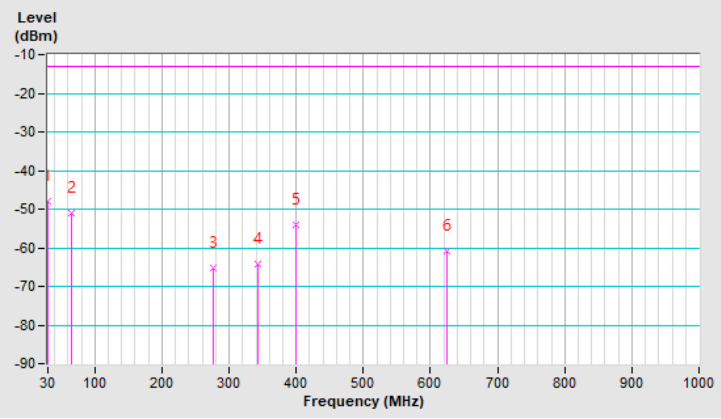
Below 1GHz

RF Mode	TX LTE Band XXVI-5MHz	Channel	CH 26740：819 MHz
Frequency Range	30MHz ~ 1GHz		

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	-48.1	-13.0	-35.1	1.25 H	93	69.3	-117.4
2	65.89	-50.9	-13.0	-37.9	2.00 H	175	66.8	-117.7
3	276.38	-65.3	-13.0	-52.3	1.50 H	189	50.6	-115.9
4	342.34	-64.4	-13.0	-51.4	1.00 H	329	49.8	-114.1
5	399.57	-54.0	-13.0	-41.0	1.25 H	0	58.8	-112.8
6	624.61	-60.9	-13.0	-47.9	1.00 H	252	46.8	-107.8

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

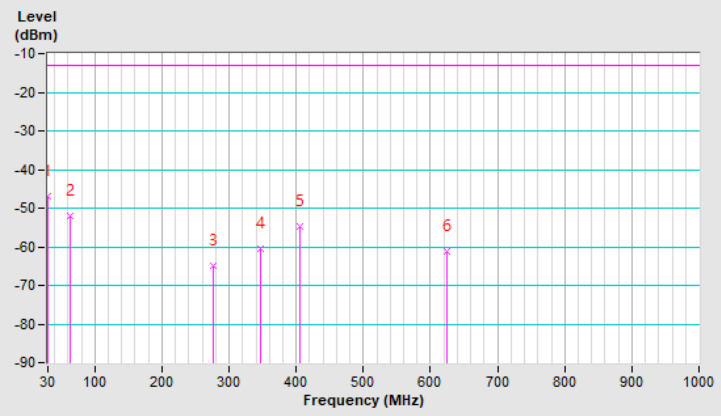


RF Mode	TX LTE Band XXVI-5MHz	Channel	CH 26740：819 MHz
Frequency Range	30MHz ~ 1GHz		

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**	**-47.0**	**-13.0**	**-34.0**	**1.00 V**	**96**	**70.4**	**-117.4**
2	62.98	-52.1	-13.0	-39.1	1.00 V	185	65.0	-117.0
3	277.35	-64.9	-13.0	-51.9	1.50 V	203	50.9	-115.9
4	347.19	-60.7	-13.0	-47.7	1.00 V	320	53.5	-114.1
5	406.36	-54.7	-13.0	-41.7	1.00 V	353	58.0	-112.7
6	624.61	-61.3	-13.0	-48.3	1.50 V	142	46.5	-107.8

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.



Above 1GHz

RF Mode	TX LTE Band XXVI-1.4MHz	Channel	CH 26697：814.7 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1629.40	-52.6	-13.0	-39.6	3.29 H	92	50.8	-103.4
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	1629.40	-49.5	-13.0	-36.5	2.02 V	197	53.9	-103.4

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-1.4MHz	Channel	CH 26740：819 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1638.00	-52.9	-13.0	-39.9	3.32 H	88	50.5	-103.4
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	1638.00	-49.3	-13.0	-36.3	2.10 V	193	54.1	-103.4

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-1.4MHz	Channel	CH 26783：823.3 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1646.60	-52.2	-13.0	-39.2	3.26 H	90	51.3	-103.5
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	1646.60	-49.3	-13.0	-36.3	2.06 V	194	54.2	-103.5

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-5MHz	Channel	CH 26715：816.5 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1633.00	-52.2	-13.0	-39.2	3.32 H	92	51.2	-103.4
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	1633.00	-49.7	-13.0	-36.7	2.00 V	193	53.7	-103.4

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-5MHz	Channel	CH 26740：819 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1638.00	-51.2	-13.0	-38.2	3.30 H	91	52.2	-103.4
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	1638.00	-49.2	-13.0	-36.2	2.05 V	193	54.3	-103.4

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-5MHz	Channel	CH 26765：821.5 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1643.00	-52.1	-13.0	-39.1	3.35 H	88	51.4	-103.5
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	1643.00	-50.1	-13.0	-37.1	2.05 V	196	53.4	-103.5

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band XXVI-10MHz	Channel	CH 26740：819 MHz
Frequency Range	1GMHz ~ 20GHz		

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	1638.00	-52.0	-13.0	-39.0	3.33 H	91	51.5	-103.4
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	1638.00	-50.1	-13.0	-37.1	2.05 V	196	53.4	-103.4

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

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.

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