

Variant FCC Test Report (Part 90)

Report No.: RFBEEKK-WTW-P20080111A-4

FCC ID: 2AARN-DLWPH-8M

Test Model: DLWPH-8M-RW

Series Model: DLWPH-8M

Received Date: Dec. 22, 2021

Test Date: Jan. 11 ~ Mar. 29, 2022

Issued Date: Mar. 30, 2022

Applicant: PHIHONG TECHNOLOGY CO. LTD.

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

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33383, Taiwan

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



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Release Control Record

Issue No.	Description	Date Issued
RFBEKK-WTW-P20080111A-4	Original Release	Mar. 30, 2022

1 Certificate of Conformity

Product: EV charging system module 4G with WI-FI

Brand: Phihong Technology Co., Ltd.

Test Model: DLWPH-8M-RW

Series Model: DLWPH-8M

Sample Status: Engineering Sample

Applicant: PHIHONG TECHNOLOGY CO. LTD.

Test Date: Jan. 11 ~ Mar. 29, 2022

Standards: FCC Part 90, Subpart I, R

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:** Mar. 30, 2022
Lena Wang / Specialist

Approved by : Jeremy Lin, **Date:** Mar. 30, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

LTE Band 14

Applied Standard: FCC Part 90 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 90.542 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to note
2.1055 90.539 (e)	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	N/A	Refer to note
90.210 (n) & (b)	Emission Masks	N/A	Refer to note
2.1051 90.543 (e) (2) & (3)	Band Edge Measurements	N/A	Refer to note
2.1051 90.543 (c) & (f)	Conducted Spurious Emissions	N/A	Refer to note
2.1053 90.543 (c) & (f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -14.41 dB at 1586.00 MHz.

Note:

1. This report is a partial report, only test item of Effective Radiated Power, Radiated Spurious Emissions and Frequency Stability test was performed for this report. Other testing data please refer to original report.
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) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 30, 2021	Dec. 29, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 15, 2021	Sep. 14, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 01, 2021	Oct. 31, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Oct. 26, 2021	Oct. 25, 2022
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jun. 05, 2021	Jun. 04, 2022
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 05, 2021	Jun. 04, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH4-01	Jul. 24, 2021	Jul. 23, 2022
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Jul. 24, 2021	Jul. 23, 2022
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Jul. 24, 2021	Jul. 23, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jun. 05, 2021	Jun. 04, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 4.

3 General Information

3.1 General Description of EUT

Product	EV charging system module 4G with WI-FI		
Brand	Phihong Technology Co., Ltd.		
Test Model	DLWPH-8M-RW		
Series Model	DLWPH-8M		
Model Difference	Refer to Note as below		
Sample Status	Engineering Sample		
Power Supply Rating	5Vdc (for DC power supply or host equipment)		
Modulation Type	QPSK, 16QAM		
Operating Frequency	LTE Band 14 (Channel Bandwidth 5MHz)	790.5MHz ~ 795.5MHz	
	LTE Band 14 (Channel Bandwidth 10MHz)	793MHz	
Max. ERP Power		QPSK	16QAM
	LTE Band 14 (Channel Bandwidth 5MHz)	63.533mW (18.03dBm)	46.881mW (16.71dBm)
	LTE Band 14 (Channel Bandwidth 10MHz)	61.944mW (17.92dBm)	54.576mW (17.37dBm)
Antenna Type	Refer to Note as below		
Antenna Connector	Refer to Note as below		
Accessory Device	NA		
Cable Supplied	NA		

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to BV CPS report no. RFBEEK-WTW-P20080111-4. The difference compared with original report is changing the motherboard design and adding external antenna, therefore only Effective Radiated Power, Radiated Spurious Emissions and Frequency Stability tests had been performed and recorded in this report.

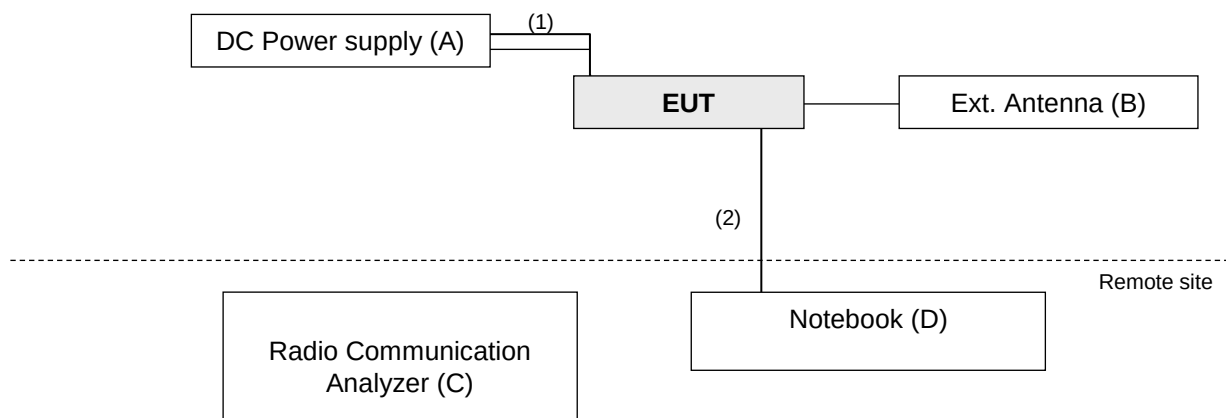
2. All models are listed as below.

Brand	Model	Difference of WLAN Antenna type
Phihong Technology Co., Ltd.	DLWPH-8M	internal antenna
	DLWPH-8M-RW	external antenna

3. The following antennas were provided to the EUT. (New antenna is marked in gray)

Brand	Model	Antenna Gain(dBi)	Antenna Type	Connector Type
Gortec	DR0727-4201BSM	-3.11	PCB	SMA Male
Aristotle	RFA-LTE-JP187-79B300	1.8	PCB	SMA PLUG

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	DC Power Supply	JIN YIH TECHNOLOGY CO., LTD.	ODP3033	ODP30332027416	NA	-
B.	Ext. Antenna	Aristotle	RFA-LTE-JP187-79B300	NA	NA	Provided by client
C.	Notebook	DELL	E5430	2RL3YW1	NA	-
D.	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	2	N	0	-
2.	LAN Cable	1	5	Y	0	Provided by client

3.3 Test Mode Applicability and Tested Channel Detail

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

LTE Band 14

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23305 to 23355	23305(790.5MHz), 23330(793.0MHz), 23355(795.5MHz)	5MHz	QPSK / 16QAM	1 RB / 12 RB Offset
		23330	23330(793.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	23305 to 23355	23305(790.5MHz), 23355(795.5MHz)	5MHz	QPSK	25RB / 0RB Offset
		23330	23330(793.0MHz)	10MHz	QPSK	50RB / 0RB Offset
-	Radiated Emission below 1GHz	23305 to 23355	23330(793.0MHz)	5MHz	QPSK	1 RB / 12 RB Offset
-	Radiated Emission above 1GHz	23305 to 23355	23305(790.5MHz), 23330(793.0MHz), 23355(795.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		23330	23330(793.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset

Note:

1. The conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only ERP had been tested under QPSK and 16QAM modes, the other test items were performed under QPSK mode only.
2. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel for final testing.
3. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	22deg. C, 69%RH	120Vac, 60Hz	Rex Wang
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Radiated Emission	23deg. C, 66%RH	120Vac, 60Hz	Titan Hsu

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:

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 90

ANSI 63.26-2015

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

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

LTE Band 14:

Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

4.1.2 Test Procedures

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dB}$.

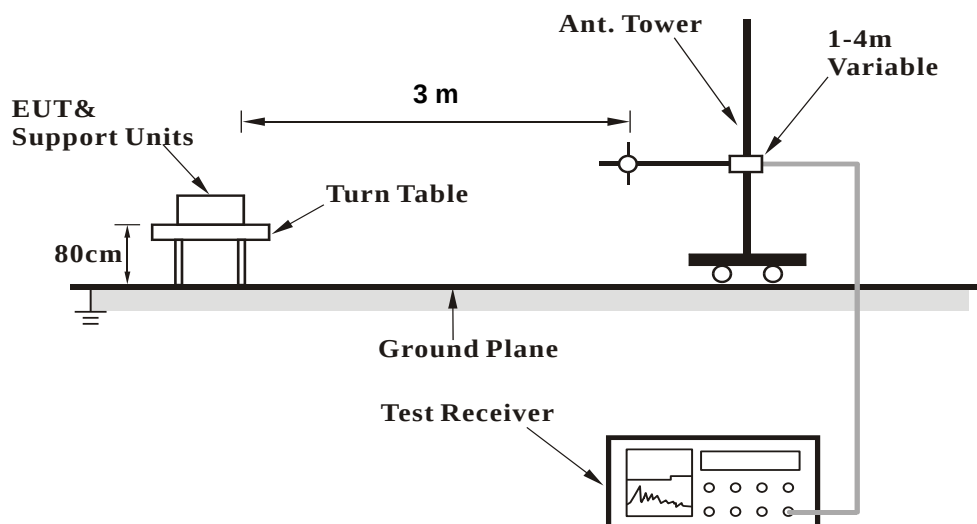
Conducted Power Measurement:

- a. The EUT was set up for the maximum power with CDMA and 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.

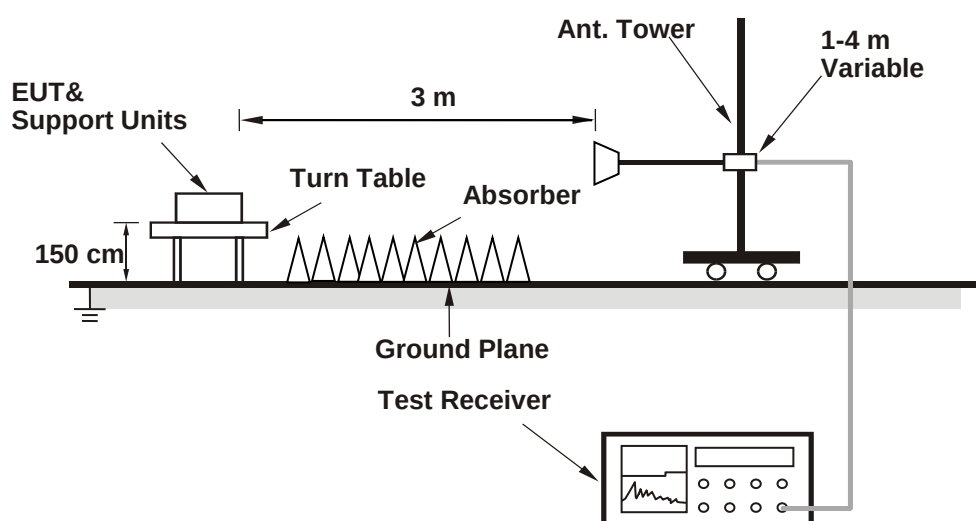
4.1.3 Test Setup

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:



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

4.1.4 Test Results

ERP Power (dBm)

Modulation Type: QPSK

LTE Band 14, Channel Bandwidth 5MHz

Mode		TX channel 23305, 23330, 23355						
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	790.50	16.33	34.77	-18.44	1.00 H	136	82.27	-65.94
2	793.00	16.28	34.77	-18.49	1.04 H	142	82.18	-65.90
3	795.50	16.34	34.77	-18.43	1.05 H	136	82.18	-65.84
Antenna Polarity & Test Distance : Vertical 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	790.50	17.95	34.77	-16.82	1.54 V	334	83.89	-65.94
2	793.00	17.99	34.77	-16.78	1.55 V	336	83.89	-65.90
3	795.50	18.03	34.77	-16.74	1.56 V	329	83.87	-65.84

Remarks:

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

LTE Band 14, Channel Bandwidth 10MHz

Mode		TX channel 23330						
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	793.00	16.36	34.77	-18.41	1.04 H	136	82.26	-65.90
Antenna Polarity & Test Distance : Vertical 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	793.00	17.92	34.77	-16.85	1.58 V	332	83.82	-65.90

Remarks:

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

Modulation Type: 16QAM

LTE Band 14, Channel Bandwidth 5MHz

Mode		TX channel 23305, 23330, 23355						
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	790.50	15.23	34.77	-19.54	1.03 H	136	81.17	-65.94
2	793.00	15.28	34.77	-19.49	1.04 H	139	81.18	-65.90
3	795.50	15.31	34.77	-19.46	1.00 H	145	81.15	-65.84
Antenna Polarity & Test Distance : Vertical 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	790.50	16.68	34.77	-18.09	1.55 V	341	82.62	-65.94
2	793.00	16.69	34.77	-18.08	1.53 V	335	82.59	-65.90
3	795.50	16.71	34.77	-18.06	1.55 V	338	82.55	-65.84

Remarks:

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

LTE Band 14, Channel Bandwidth 10MHz

Mode		TX channel 23330						
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	793.00	16.28	34.77	-18.49	1.05 H	146	82.18	-65.90
Antenna Polarity & Test Distance : Vertical 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	793.00	17.37	34.77	-17.40	1.54 V	330	83.27	-65.90

Remarks:

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

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

LTE Band 14:

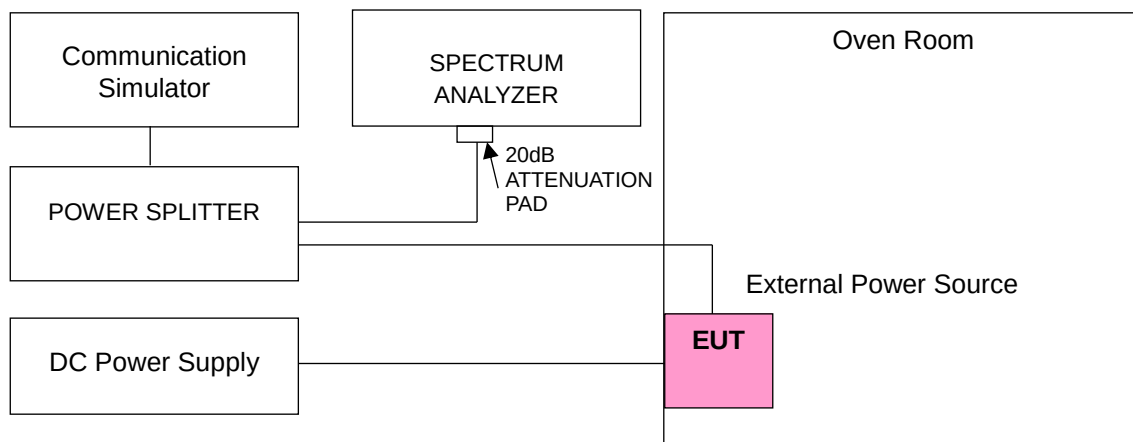
The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

4.2.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C 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.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 14			
	Channel Bandwidth: 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
5	790.500003	0.003	795.500003	0.004
4.25	790.500004	0.004	795.500003	0.003
5.75	790.500003	0.004	795.500004	0.005

Note: The applicant defined the normal working voltage is from 5Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 14			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	790.500004	0.005	795.500004	0.005
-30	790.500003	0.003	795.500004	0.005
-20	790.500001	0.002	795.500004	0.005
-10	790.500004	0.005	795.500003	0.004
0	790.500001	0.002	795.500004	0.005
10	790.500004	0.005	795.500003	0.004
20	790.499998	-0.002	795.499999	-0.002
30	790.499997	-0.004	795.499998	-0.003
40	790.499998	-0.003	795.499999	-0.002
50	790.499997	-0.004	795.499996	-0.005
60	790.499996	-0.005	795.499997	-0.004
70	790.499996	-0.005	795.499997	-0.004
80	790.499996	-0.005	795.499998	-0.002
85	790.499996	-0.005	795.499997	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 14	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
5	793.000001	0.001
4.25	793.000002	0.002
5.75	793.000004	0.005

Note: The applicant defined the normal working voltage is from 5Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 14	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-40	793.000002	0.002
-30	793.000001	0.001
-20	793.000003	0.004
-10	793.000003	0.003
0	793.000003	0.003
10	793.000002	0.003
20	792.999998	-0.003
30	792.999997	-0.004
40	792.999999	-0.002
50	792.999998	-0.003
60	792.999999	-0.002
70	792.999997	-0.003
80	792.999997	-0.004
85	792.999999	-0.001

4.3 Radiated Emission Measurement

4.3.1 Limits of Radiated Emission Measurement

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

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz . The limit of emissions is equal to -40 dBm .

4.3.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m (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 1m to 4m 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 - 2.15dBi.

NOTE:

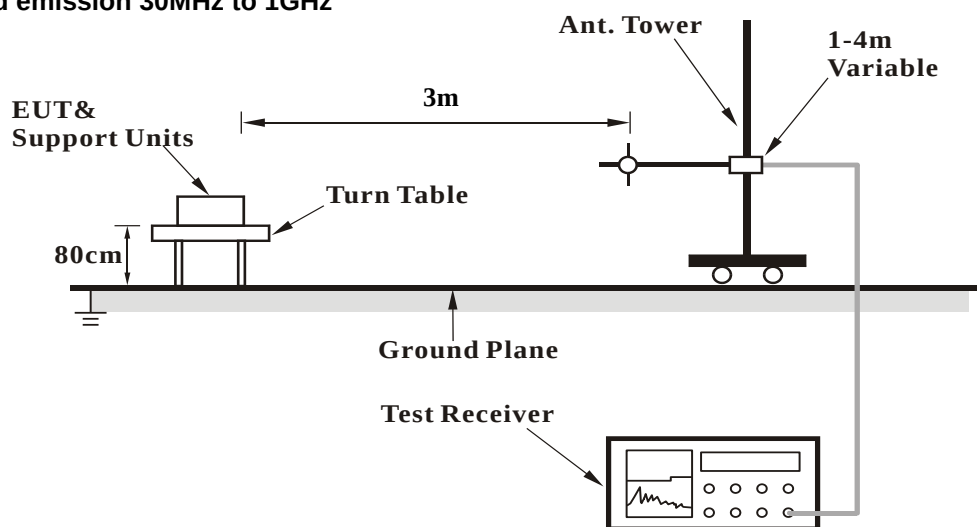
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.3.3 Deviation from Test Standard

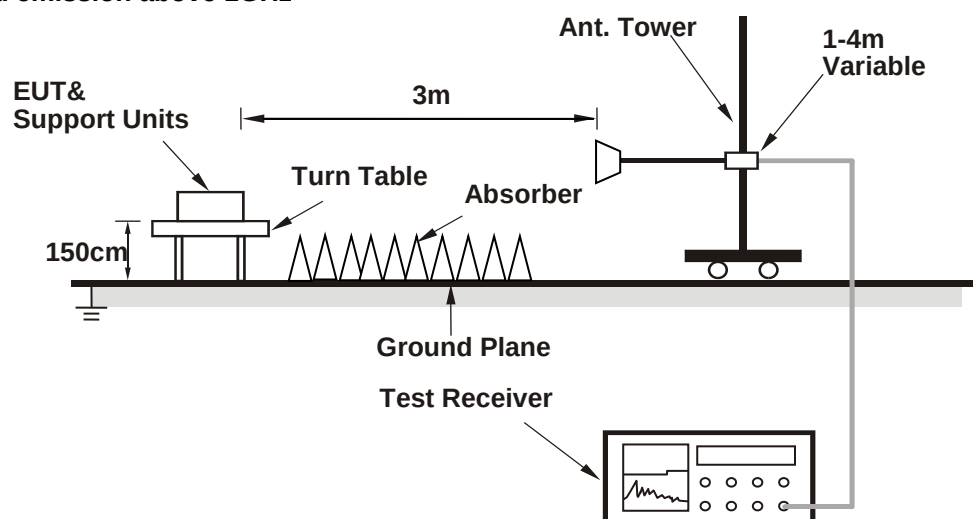
No deviation.

4.3.4 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



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

4.3.5 Test Results

Below 1GHz

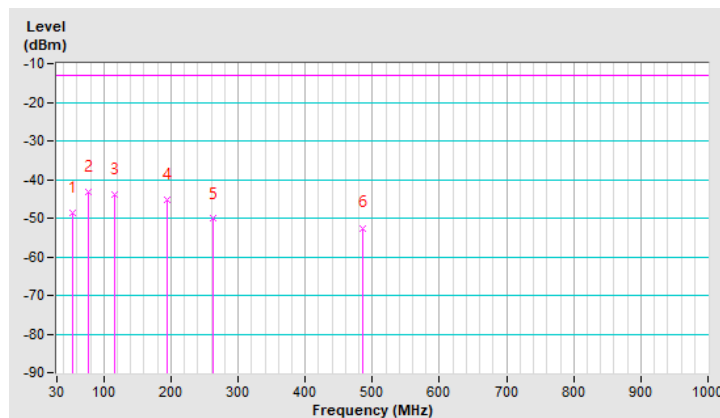
LTE Band 14

RF Mode	TX LTE Band XIV-5MHz	Channel	CH 23330 :793.0MHz
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	53.28	-48.5	-13.0	-35.5	1.50 H	283	57.7	-106.2
2	76.56	-43.1	-13.0	-30.1	1.50 H	288	66.5	-109.6
3	115.36	-43.9	-13.0	-30.9	1.50 H	286	65.2	-109.1
4	194.90	-45.2	-13.0	-32.2	1.50 H	337	63.8	-109.0
5	262.80	-50.2	-13.0	-37.2	1.50 H	148	56.1	-106.3
6	485.90	-52.5	-13.0	-39.5	1.50 H	149	49.2	-101.8

Remarks:

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

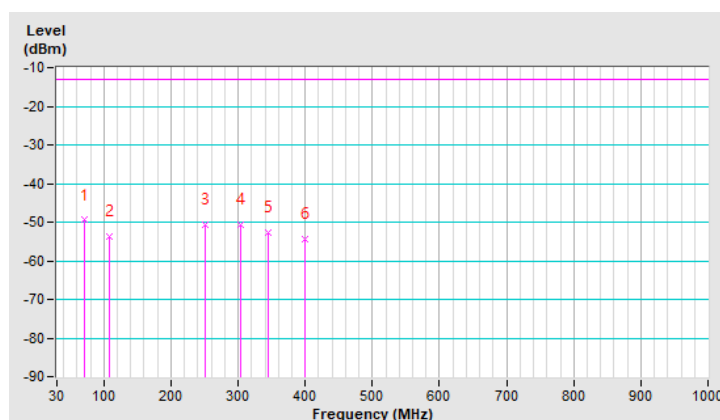


RF Mode	TX LTE Band XIV-5MHz	Channel	CH 23330 :793.0MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical 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	70.74	-49.5	-13.0	-36.5	1.50 V	214	58.8	-108.2
2	107.60	-53.7	-13.0	-40.7	1.50 V	261	56.0	-109.7
3	251.16	-50.6	-13.0	-37.6	1.50 V	203	56.2	-106.8
4	303.54	-50.6	-13.0	-37.6	1.50 V	212	54.3	-104.9
5	344.28	-52.6	-13.0	-39.6	1.50 V	212	51.6	-104.2
6	400.54	-54.3	-13.0	-41.3	1.50 V	159	49.2	-103.5

Remarks:

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



Above 1GHz
LTE Band 14

RF Mode	TX LTE Band XIV-5MHz	Channel	CH 23305 :790.5MHz
Frequency Range	1GMHz ~ 18GHz		

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	1581.00	-56.41	-40.00	-16.41	2.27 H	25	40.99	-97.40
Antenna Polarity & Test Distance : Vertical 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	1581.00	-55.16	-40.00	-15.16	1.62 V	242	42.24	-97.40

Remarks:

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

RF Mode	TX LTE Band XIV-5MHz	Channel	CH 23330: 793.0MHz
Frequency Range	1GMHz ~ 18GHz		

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	1586.00	-56.70	-40.00	-16.70	2.32 H	26	40.69	-97.39
Antenna Polarity & Test Distance : Vertical 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	1586.00	-54.41	-40.00	-14.41	1.62 V	243	42.98	-97.39

Remarks:

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

RF Mode	TX LTE Band XIV-5MHz	Channel	CH 23355 :795.5MHz
Frequency Range	1GMHz ~ 18GHz		

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	1591.00	-56.80	-40.00	-16.80	2.31 H	19	40.57	-97.37
Antenna Polarity & Test Distance : Vertical 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	1591.00	-55.02	-40.00	-15.02	1.65 V	247	42.35	-97.37

Remarks:

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

RF Mode	TX LTE Band XIV-10MHz	Channel	CH 23330 :793.0MHz
Frequency Range	1GMHz ~ 18GHz		

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	1586.00	-56.73	-40.00	-16.73	2.31 H	23	40.66	-97.39
Antenna Polarity & Test Distance : Vertical 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	1586.00	-55.27	-40.00	-15.27	1.61 V	242	42.12	-97.39

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. Margin value = EIRP – Limit value
4. The other EIRP 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 and approved according to ISO/IEC 17025.

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Web Site: www.bureauveritas-adt.com

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

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