

Partial FCC Test Report

(PART 22)

Report No.: RFBBGM-WTW-P22090842-4

FCC ID: WIYSLM758A

Test Model: SLM758

Received Date: Sep. 26, 2022

Test Date: Oct. 18, 2022

Issued Date: Nov. 18, 2022

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33383, Taiwan

FCC Registration /
Designation Number: 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RFBBGM-WTW-P22090842-4	Original Release	Nov. 18, 2022

1 Certificate of Conformity

Product: Smart module

Brand:  CASTLES
TECHNOLOGY

Test Model: SLM758

Sample Status: Identical Prototype

Applicant: CASTLES TECHNOLOGY CO., LTD.

Test Date: Oct. 18, 2022

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 : Vera Huang, **Date:** Nov. 18, 2022
Vera Huang / Specialist

Approved by : Jeremy Lin, **Date:** Nov. 18, 2022
Jeremy Lin / 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 -31.96 dB at 1693.20 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 Sporton lab report no.: FG970101A (for WCDMA) and FG970101B (for LTE).
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	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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	2022/07/01	2023/06/30
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	2022/04/11	2023/04/10
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	2021/10/29	2022/10/28
HORN Antenna SCHWARZBECK	9120D	209	2021/11/14	2022/11/13
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	2021/11/14	2022/11/13
Loop Antenna TESEQ	HLA 6121	45745	2022/07/27	2023/07/26
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	2022/07/09	2023/07/08
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	2022/03/19	2023/03/18
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	2022/05/14	2023/05/13
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	2022/07/09	2023/07/08
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104- SM-SM-8000	Cable-CH3-03 (309224+170907)	2022/07/09	2023/07/08
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Feb. 16, 2022	Feb. 15, 2023

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 3.

3 General Information

3.1 General Description of EUT

Product	Smart module		
Brand			
Test Model	SLM758		
Status of EUT	Identical Prototype		
Power Supply Rating	5.0 Vdc (host equipment)		
Modulation Type	WCDMA	BPSK (Uplink)	
	HSDPA/DC-HSDPA	QPSK (Uplink)	
	HSUPA	QPSK (Uplink)	
	HSPA+	16QAM (16QAM Uplink is not supported)	
	DC-HSDPA	64QAM	
	LTE	QPSK, 16QAM	
Frequency Range	WCDMA Band 5	826.4 ~ 846.6 MHz	
	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	WCDMA Band 5	92.151 mW (19.645dBm)	
		QPSK	16QAM
	LTE 5 (Channel Bandwidth: 1.4 MHz)	77.893 mW (18.915dBm)	60.464 mW (17.815dBm)
	LTE 5 (Channel Bandwidth: 3 MHz)	80.816 mW (19.075dBm)	63.168 mW (18.005dBm)
	LTE 5 (Channel Bandwidth: 5 MHz)	81.190 mW (19.095dBm)	62.734 mW (17.975dBm)
	LTE 5 (Channel Bandwidth: 10 MHz)	90.678 mW (19.575dBm)	64.640 mW (18.105dBm)
Antenna Type	Refer to Note as below		
Accessory Device	Refer to Note as below		
Data Cable Supplied	Refer to Note as below		

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of Sporton lab report no.: FG970101A (for WCDMA) and FG970101B (for LTE). The differences from the original report are adding an End-product (POS Terminal (Brand:  CASTLES TECHNOLOGY, Model: S1E2)), changing antenna type & gain, and disable BLE, UNII-2A, UNII-2C function via software. Therefore, only Effective Radiated Power and Radiated Spurious Emissions tests were verified and recorded in this report. Other testing data please refer to the original Sporton lab report no.: FG970101A (for WCDMA) and FG970101B (for LTE).
2. The EUT was installed in POS Terminal (Brand:  CASTLES TECHNOLOGY, Model: S1E2).
3. The POS Terminal contains following accessory devices.

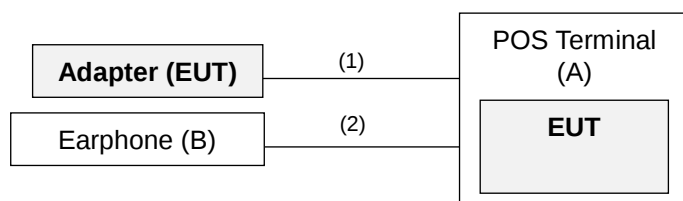
Product	Brand	Model	Description
Adapter	 CASTLES TECHNOLOGY	1A52-UB52A	I/P: 100-240 Vac, 50-60 Hz, 0.3 A O/P: 5 Vdc, 2 A
Battery	 CASTLES TECHNOLOGY	S1E	3.75 Vdc
USB Cable	N/A	N/A	2m shielded cable w/o core

4. The antenna information of POS Terminal is listed as below.

Ant. Type	PIFA antenna									
Band	WCDMA			LTE						
	II	IV	V	2	4	5	7	12	13	17
Gain (dBi)	0.077	-6.906	-0.985	0.077	-6.906	-0.985	2.622	-1.054	-0.031	-1.054

5. Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.
6. 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.
7. BT & WWAN & NFC (FCC ID: WIYS1E2001) technology can transmit at same time.
8. WLAN 2.4G & WWAN & NFC (FCC ID: WIYS1E2001) technology can transmit at same time.
9. WLAN 5G & WWAN & NFC (FCC ID: WIYS1E2001) technology can transmit at same time.

3.2 Configuration of System under Test



Remote site



Radio Communication
Analyzer (C)

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	POS Terminal	 CASTLES TECHNOLOGY	S1E2	N/A	N/A
B	Earphone	APPLE	MB77PFEB	N/A	N/A
C	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	N/A

Note: Items C acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	2	Y	0	Provided by client
2.	Audio Cable	1	1.2	N	0	Provided by Lab

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 Y-plane. Following channel(s) was (were) selected for the final test as listed below.

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSUPA HSDPA
-	Radiated Emission	4132 to 4233	4233	WCDMA

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 Half Full
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 Half Full
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 Half Full
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 Half Full
-	Radiated Emission	20450 to 20600	20600	10 MHz	QPSK	1

Note: For radiated emissions, 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	Wayne Lin
Radiated Emission	23 deg. C, 67 % RH	120 Vac, 60 Hz	Adair Peng

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

Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA and 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.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

$$\text{ERP} = P_{\text{Meas}} + G_T - 2.15$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	22.36	22.39	22.78
HSDPA Subtest-1	21.58	21.72	21.78
HSDPA Subtest-2	21.52	21.67	21.7
HSDPA Subtest-3	21.03	21.23	21.37
HSDPA Subtest-4	21.01	21.19	21.31
DC-HSDPA Subtest-1	21.49	21.62	21.85
DC-HSDPA Subtest-2	21.43	21.58	21.74
DC-HSDPA Subtest-3	20.96	21.12	21.43
DC-HSDPA Subtest-4	20.91	21.09	21.41
HSUPA Subtest-1	21.56	21.61	21.92
HSUPA Subtest-2	19.56	19.72	19.92
HSUPA Subtest-3	20.59	20.67	20.94
HSUPA Subtest-4	19.65	19.63	19.96
HSUPA Subtest-5	21.7	21.73	21.89

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	21.7	21.68	22
		1	2	21.63	21.78	22.05
		1	5	21.58	21.74	21.99
		3	0	21.75	21.93	21.89
		3	1	21.52	21.69	21.77
		3	3	21.53	21.57	21.66
		6	0	20.61	20.81	20.86
	16QAM	1	0	20.64	20.71	20.95
		1	2	20.53	20.54	20.7
		1	5	20.61	20.53	20.57
		3	0	20.54	20.71	20.83
		3	1	20.58	20.51	20.64
		3	3	20.59	20.52	20.67
		6	0	19.57	19.56	19.73
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	21.77	21.94	22.15
		1	7	21.77	21.98	22.21
		1	14	21.74	21.9	22.1
		8	0	21.9	22.02	22.12
		8	3	21.68	21.78	22.01
		8	7	21.56	21.77	21.87
		15	0	20.72	20.95	21.04
	16QAM	1	0	20.74	20.88	21.14
		1	7	20.64	20.69	20.9
		1	14	20.52	20.6	20.79
		8	0	20.79	20.9	21.1
		8	3	20.55	20.68	20.88
		8	7	20.54	20.67	20.8
		15	0	19.58	19.72	19.86

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	21.82	22	22.23
		1	12	21.78	22.02	22.15
		1	24	21.75	21.91	22.07
		12	0	21.85	22.03	22.14
		12	6	21.72	21.85	21.98
		12	13	21.6	21.72	21.91
		25	0	20.69	20.9	21.04
	16QAM	1	0	20.79	20.95	21.04
		1	12	20.63	20.72	20.89
		1	24	20.51	20.63	20.71
		12	0	20.79	20.87	21.11
		12	6	20.5	20.72	20.91
		12	13	20.53	20.7	20.85
		25	0	19.54	19.69	19.88
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	22.69	22.61	22.71
		1	24	21.94	22.15	22.31
		1	49	21.92	22.08	22.26
		25	0	22.02	22.15	22.26
		25	12	21.85	21.98	22.17
		25	25	21.71	21.87	22.01
		50	0	20.89	21.08	21.18
	16QAM	1	0	20.9	21.06	21.24
		1	24	20.76	20.88	21.03
		1	49	20.6	20.78	20.89
		25	0	20.89	21.05	21.22
		25	12	20.68	20.86	21.04
		25	25	20.64	20.84	20.95
		50	0	19.71	19.89	20.01

ERP Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	19.225	19.255	19.645
HSDPA Subtest-1	18.445	18.585	18.645
HSDPA Subtest-2	18.385	18.535	18.565
HSDPA Subtest-3	17.895	18.095	18.235
HSDPA Subtest-4	17.875	18.055	18.175
DC-HSDPA Subtest-1	18.355	18.485	18.715
DC-HSDPA Subtest-2	18.295	18.445	18.605
DC-HSDPA Subtest-3	17.825	17.985	18.295
DC-HSDPA Subtest-4	17.775	17.955	18.275
HSUPA Subtest-1	18.425	18.475	18.785
HSUPA Subtest-2	16.425	16.585	16.785
HSUPA Subtest-3	17.455	17.535	17.805
HSUPA Subtest-4	16.515	16.495	16.825
HSUPA Subtest-5	18.565	18.595	18.755

*ERP = Conducted + antenna gain (-0.985dBi)-2.15

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	18.565	18.545	18.865
		1	2	18.495	18.645	18.915
		1	5	18.445	18.605	18.855
		3	0	18.615	18.795	18.755
		3	1	18.385	18.555	18.635
		3	3	18.395	18.435	18.525
		6	0	17.475	17.675	17.725
	16QAM	1	0	17.505	17.575	17.815
		1	2	17.395	17.405	17.565
		1	5	17.475	17.395	17.435
		3	0	17.405	17.575	17.695
		3	1	17.445	17.375	17.505
		3	3	17.455	17.385	17.535
		6	0	16.435	16.425	16.595
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	18.635	18.805	19.015
		1	7	18.635	18.845	19.075
		1	14	18.605	18.765	18.965
		8	0	18.765	18.885	18.985
		8	3	18.545	18.645	18.875
		8	7	18.425	18.635	18.735
		15	0	17.585	17.815	17.905
	16QAM	1	0	17.605	17.745	18.005
		1	7	17.505	17.555	17.765
		1	14	17.385	17.465	17.655
		8	0	17.655	17.765	17.965
		8	3	17.415	17.545	17.745
		8	7	17.405	17.535	17.665
		15	0	16.445	16.585	16.725

*ERP = Conducted + antenna gain (-0.985dBi)-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	18.685	18.865	19.095
		1	12	18.645	18.885	19.015
		1	24	18.615	18.775	18.935
		12	0	18.715	18.895	19.005
		12	6	18.585	18.715	18.845
		12	13	18.465	18.585	18.775
		25	0	17.555	17.765	17.905
	16QAM	1	0	17.655	17.815	17.905
		1	12	17.495	17.585	17.755
		1	24	17.375	17.495	17.575
		12	0	17.655	17.735	17.975
		12	6	17.365	17.585	17.775
		12	13	17.395	17.565	17.715
		25	0	16.405	16.555	16.745
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	19.555	19.475	19.575
		1	24	18.805	19.015	19.175
		1	49	18.785	18.945	19.125
		25	0	18.885	19.015	19.125
		25	12	18.715	18.845	19.035
		25	25	18.575	18.735	18.875
		50	0	17.755	17.945	18.045
	16QAM	1	0	17.765	17.925	18.105
		1	24	17.625	17.745	17.895
		1	49	17.465	17.645	17.755
		25	0	17.755	17.915	18.085
		25	12	17.545	17.725	17.905
		25	25	17.505	17.705	17.815
		50	0	16.575	16.755	16.875

*ERP = Conducted + antenna gain (-0.985dBi)-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. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- d. Following C63.26 section 5.5 and 5.2.7
 $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
 $ERP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

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:

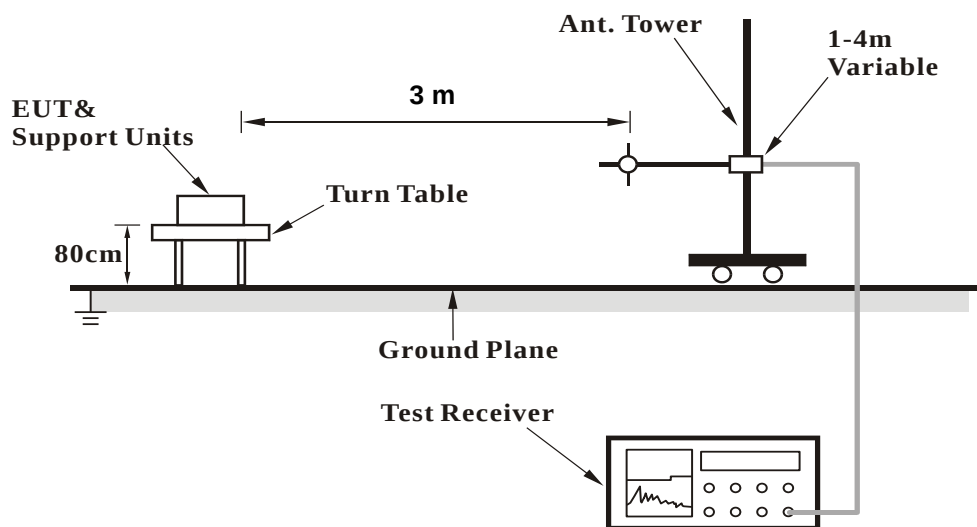
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

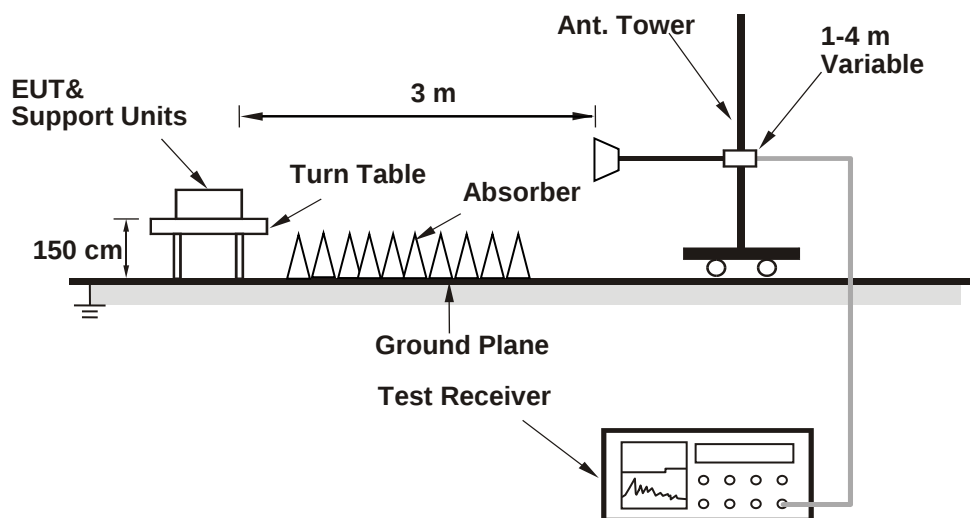
No deviation.

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

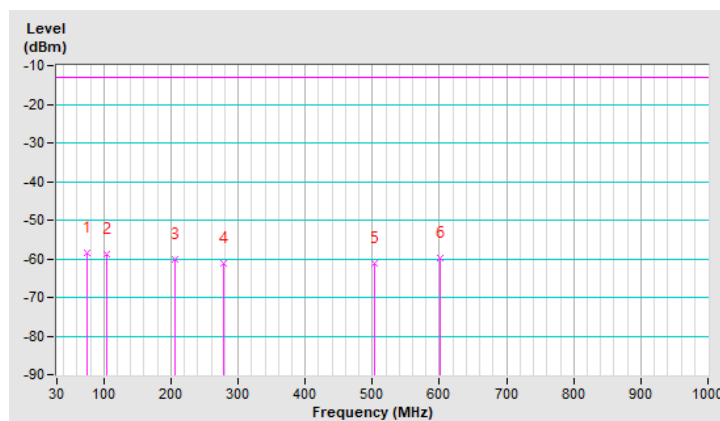
WCDMA Band 5

RF Mode	TX WCDMA Band V	Channel	CH 4233 : 846.6 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	75.59	-58.48	-13.00	-45.48	2.00 H	153	51.38	-109.86
2	104.69	-58.75	-13.00	-45.75	1.00 H	260	51.53	-110.28
3	206.54	-60.02	-13.00	-47.02	1.50 H	66	48.87	-108.89
4	279.29	-61.14	-13.00	-48.14	1.50 H	92	43.76	-104.90
5	503.36	-61.12	-13.00	-48.12	1.00 H	69	38.77	-99.89
6	601.33	-59.77	-13.00	-46.77	1.00 H	349	37.97	-97.74

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.

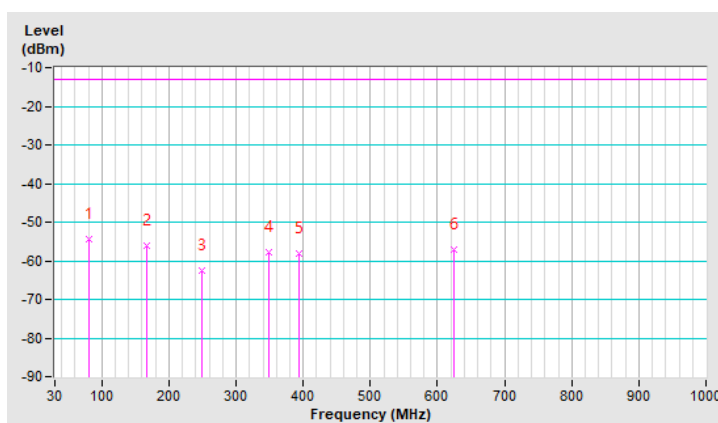


RF Mode	TX WCDMA Band V	Channel	CH 4233 : 846.6 MHz
Frequency Range	30MHz ~ 1GHz		

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	81.41	-54.49	-13.00	-41.49	1.50 V	81	56.81	-111.30
2	167.74	-56.13	-13.00	-43.13	1.00 V	86	50.21	-106.34
3	249.22	-62.69	-13.00	-49.69	2.00 V	81	43.70	-106.39
4	348.16	-57.94	-13.00	-44.94	1.50 V	131	45.58	-103.52
5	392.78	-58.12	-13.00	-45.12	2.00 V	84	44.36	-102.48
6	624.61	-56.98	-13.00	-43.98	1.00 V	131	40.38	-97.36

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.



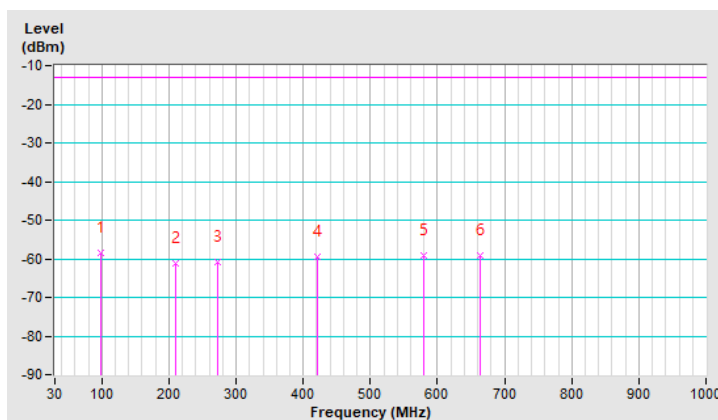
LTE Band 5, Channel Bandwidth: 10MHz

RF Mode	TX LTE Band V-10MHz	Channel	CH 20600 : 844 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	98.87	-58.55	-13.00	-45.55	2.00 H	137	52.69	-111.24
2	209.45	-61.26	-13.00	-48.26	1.50 H	56	47.54	-108.80
3	273.47	-60.94	-13.00	-47.94	1.00 H	182	44.21	-105.15
4	421.88	-59.47	-13.00	-46.47	2.00 H	328	42.18	-101.65
5	579.99	-59.28	-13.00	-46.28	1.00 H	265	38.90	-98.18
6	663.41	-59.10	-13.00	-46.10	1.00 H	69	37.90	-97.00

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.

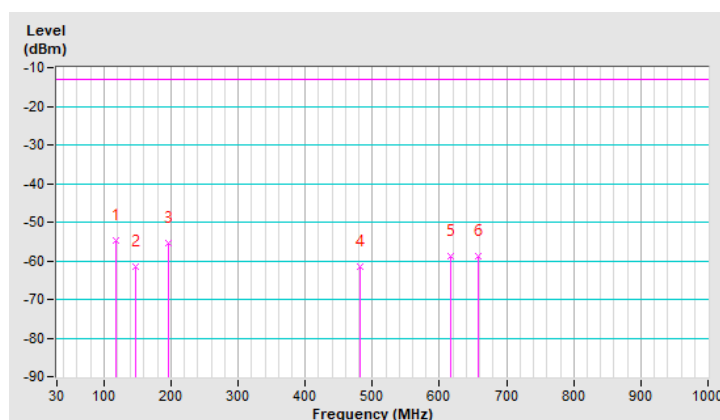


RF Mode	TX LTE Band V-10MHz	Channel	CH 20600 : 844 MHz
Frequency Range	30MHz ~ 1GHz		

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	117.30	-54.88	-13.00	-41.88	1.00 V	114	54.03	-108.91
2	147.37	-61.55	-13.00	-48.55	1.50 V	114	44.72	-106.27
3	195.87	-55.51	-13.00	-42.51	1.50 V	114	53.52	-109.03
4	481.05	-61.45	-13.00	-48.45	1.00 V	18	38.95	-100.40
5	616.85	-58.98	-13.00	-45.98	1.00 V	276	38.56	-97.54
6	657.59	-58.77	-13.00	-45.77	1.50 V	59	38.31	-97.08

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

WCDMA Band 5

RF Mode	TX WCDMA Band V	Channel	CH 4233 : 846.6 MHz
Frequency Range	1GMHz ~ 18GHz		

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	1693.20	-46.76	-13.00	-33.76	2.96 H	238	55.72	-102.48
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	1693.20	-44.96	-13.00	-31.96	1.91 V	118	57.52	-102.48

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 5, Channel Bandwidth: 10MHz

RF Mode	TX LTE Band V-10MHz	Channel	CH 20600 : 844 MHz
Frequency Range	1GMHz ~ 18GHz		

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	-46.95	-13.00	-33.95	2.85 H	229	55.53	-102.48
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	1688.00	-45.03	-13.00	-32.03	1.77 V	106	57.45	-102.48

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.

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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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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