

Partial FCC Test Report (Part 22)

Report No.: RF200428C03H

FCC ID: PZWBHTM80QWG

Test Model: BHT-M80-QWG

Received Date: Feb. 04, 2021

Test Date: Mar. 19, 2021

Issued Date: Mar. 25, 2021

Applicant: DENSO WAVE INCORPORATED

Address: 1 Yoshiike Kusagi Agui-cho, Chita-gun Aichi 470-2297, Japan

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 / 788550 / TW0003

Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF200428C03H	Original release	Mar. 25, 2021

1 Certificate of Conformity

Product: 2D Code Handy Terminal

Brand: DENSO

Test Model: BHT-M80-QWG

Sample Status: Engineering sample

Applicant: DENSO WAVE INCORPORATED

Test Date: Mar. 19, 2021

Standards: FCC Part 22, Subpart H

This report is issued as a supplementary report of RF200428C03. This report shall be used combined together with its original report.

Prepared by : Polly Chien , **Date:** Mar. 25, 2021
Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Mar. 25, 2021
Bruce Chen / Senior Project Engineer

Note: Radiated spurious emissions below 1G are performed for the addendum. Refer to original report for the other test data.

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	NA	Refer to Note 1
2.1047	Modulation Characteristics	NA	Refer to Note 1
22.913 (d)	Peak To Average Ratio	NA	Refer to Note 1
2.1055 22.355	Frequency Stability	NA	Refer to Note 1
2.1049	Occupied Bandwidth	NA	Refer to Note 1
22.917	Band Edge Measurements	NA	Refer to Note 1
2.1051 22.917	Conducted Spurious Emissions	NA	Refer to Note 1
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -37.2dB at 212.7536MHz.

Note:

1. Radiated spurious emissions below 1G are performed for the addendum. Refer to original report for the other test data.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM -SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
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
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 12, 2019	Dec. 11, 2020
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 06, 2020	Jun. 05, 2021

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	2D Code Handy Terminal		
Brand	DENSO		
Test Model	BHT-M80-QWG		
Sample Status	Engineering sample		
Power Supply Rating	3.85Vdc (Battery) 5.0Vdc / 9.0Vdc / 12.0Vdc (from adapter)		
Modulation Type	GSM, GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM		
Operating Frequency	GSM/GPRS/EDGE	824.2~848.8MHz	
	WCDMA Band 5	826.4~846.6MHz	
	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7~848.3MHz	
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5~847.5MHz	
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5~846.5MHz	
	LTE Band 5 (Channel Bandwidth 10MHz)	829.0~844.0MHz	
Max. ERP Power	GSM	954.993mW (29.8dBm)	
	WCDMA Band 5	213.796mW (23.3dBm)	
		QPSK	16QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	154.882mW (21.9dBm)	128.825mW (21.1dBm)
	LTE Band 5 (Channel Bandwidth 3MHz)	154.882mW (21.9dBm)	125.893mW (21.0dBm)
	LTE Band 5 (Channel Bandwidth 5MHz)	158.489mW (22.0dBm)	131.826mW (21.2dBm)
	LTE Band 5 (Channel Bandwidth 10MHz)	154.882mW (21.9dBm)	117.490mW (20.7dBm)
Emission Designator	GSM/GPRS	264KGXW	
	EDGE	261KG7W	
	WCDMA Band 5	4M15F9W	
		QPSK	16QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 5 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 5 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W
	LTE Band 5 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W
Antenna Type	Refer to note		
Antenna Connector	Refer to note		
Accessory Device	Refer to note		
Cable Supplied	Refer to note		

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of the original BV CPS report no.: RF200428C03. The differences compared with original report are adding large battery, WPC battery and updating S/W. Therefore, only Radiated spurious emissions below 1G are performed for the addendum. Refer to original report for the other test data.
2. The EUT contains following accessory devices. (Battery 3, 4 are new)

Battery 1	
Brand	DENSO
Model	BT1
Rating	3.85Vdc, 4020mAh, 15.47Wh

Battery 2	
Brand	DENSO
Model	BT1S
Rating	3.85Vdc, 2900mAh, 11.16Wh

Battery 3 (New)	
Brand	DENSO
Model	BT1L
Rating	3.85Vdc, 5800mAh, 22.33Wh

Battery 4 for WPC (New)	
Brand	DENSO
Model	BT1S-W
Rating	3.85Vdc, 2900mAh, 11.16Wh

Adapter	
Brand	CHANNEL WELL TECHNOLOGY
Model	2ACP0183C
Input Power	100-240Vac~0.5A , 50/60Hz
Output Power	5.0Vdc / 3.0A, 15.0W 9.0Vdc / 2.0A, 18.0W 12.0Vdc / 1.5A, 18.0W
Data Cable	1.45 m shielded USB cable without core

Cradle 1: QC3.0 charge single Cradle (Option)	
Brand	DENSO
Model	CU-M80UQ
Adapter	
Brand	CHANNEL WELL TECHNOLOGY
Model	2ACP0183C
Input Power	100-240Vac, 50/60Hz, 0.5A
Output Power	5.0Vdc / 3.0A, 15.0W 9.0Vdc / 2.0A, 18.0W 12.0Vdc / 1.5A, 18.0W
Data Cable	1.45 m shielded USB cable without core

Cradle 2: USB Cradle with spare battery charge (Option)	
Brand	DENSO
Model	CU-M80U
Adapter	
Brand	Sunny
Model	SYS1548-5012-T3
Input Power	100-240Vac, 1.5A MAX, 50-60Hz
Output Power	+12.0Vdc, 4.16A
Power cable	DC: 1.16m cable with one core AC: 1.71m non-shielded cable without core
Data Cable	1.45 m shielded USB cable without core

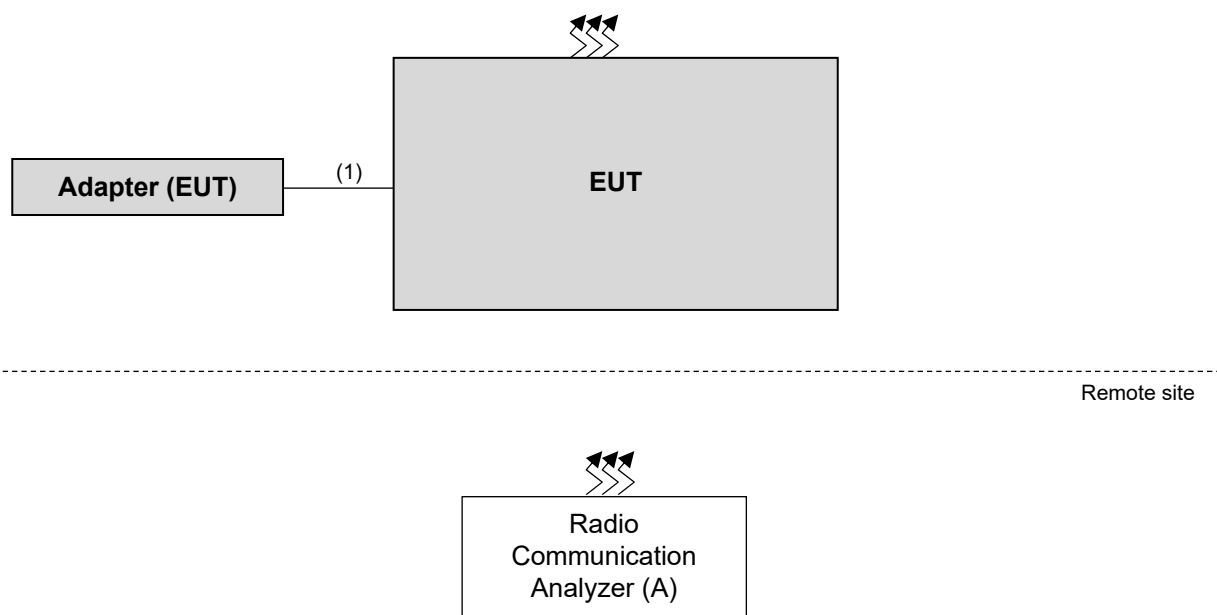
3. The EUT uses the following antennas.

Ant. Type	PIFA		
Ant. Connector	Spring		
GSM850/WCDMA Band 5/LTE Band 5			
Frequency (MHz)	824	836	849
Peak Gain (dBi)	0.18	0.35	0.69

* The max. gain was chosen for final tests.

* 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.

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.	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	1.45	Y	0	Accessory of EUT

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.

Test results are presented in the report as below.

Test Mode	Test Condition
A	EUT + Battery 3 + Adapter
B	EUT + Battery 4 + Adapter

GSM Mode

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A, B	Radiated Emission Below 1GHz	128 to 251	189(836.4MHz)	GSM

Note: For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.

WCDMA Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A, B	Radiated Emission Below 1GHz	4132 to 4233	4132 (826.4MHz)	WCDMA

Note: For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.

LTE Band 5

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
A, B	Radiated Emission Below 1GHz	20425 to 20625	20625(846.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset

Note: For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power (system)	Tested By
Radiated Emission	23deg. C, 66%RH	120Vac, 60Hz	Edison Lee

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

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

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

4 Test Types and Results

4.1 Radiated Emission Measurement

4.1.1 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 equal to -13dBm .

4.1.2 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.
 - $\text{EIRP (dBm)} = E (\text{dB}\mu\text{V/m}) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
 - $\text{ERP (dBm)} = E (\text{dB}\mu\text{V/m}) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note:

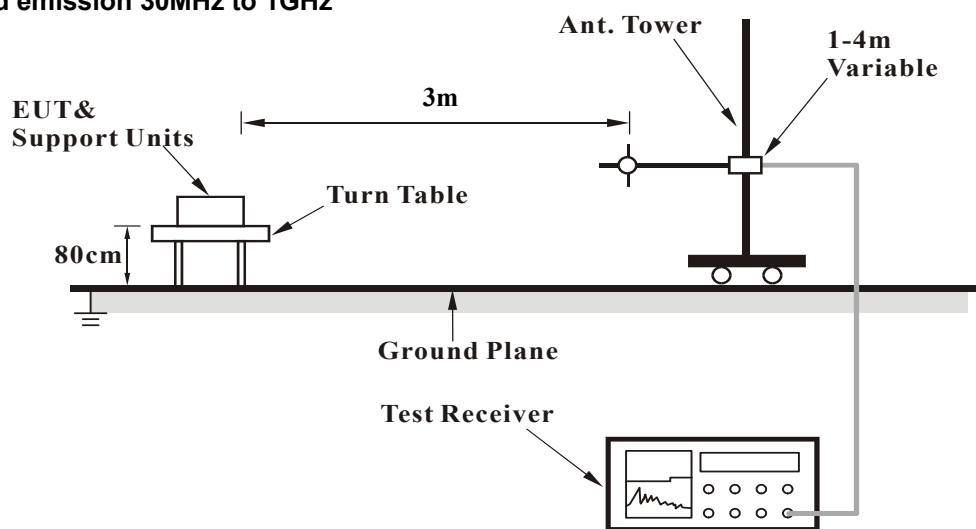
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.1.3 Deviation from Test Standard

No deviation.

4.1.4 Test Setup

For radiated emission 30MHz to 1GHz



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

4.1.5 Test Results

9 kHz ~ 30 MHz Data:

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

Below 1GHz

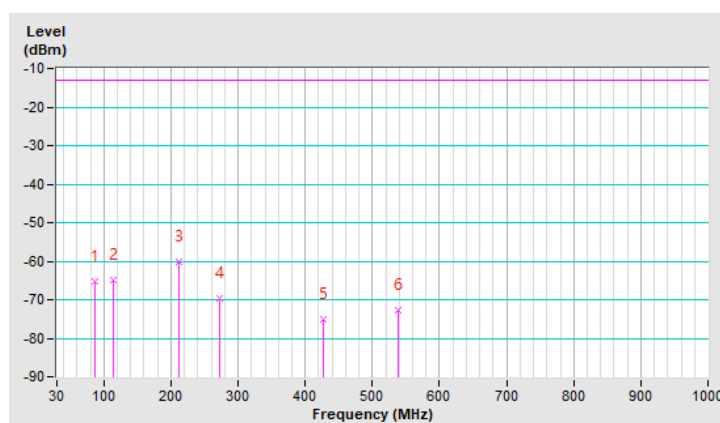
GSM Mode

Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	87.6377	-65.3	-13.0	-52.3	2.00 H	14	46.5	-111.8
2	114.3478	-65.0	-13.0	-52.0	1.50 H	171	44.1	-109.1
3	212.7536	-60.0	-13.0	-47.0	1.00 H	274	48.2	-108.2
4	273.2029	-69.5	-13.0	-56.5	1.50 H	311	35.2	-104.7
5	427.8406	-75.1	-13.0	-62.1	2.00 H	1	26.1	-101.2
6	538.8986	-72.7	-13.0	-59.7	1.50 H	173	26.1	-98.8

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.

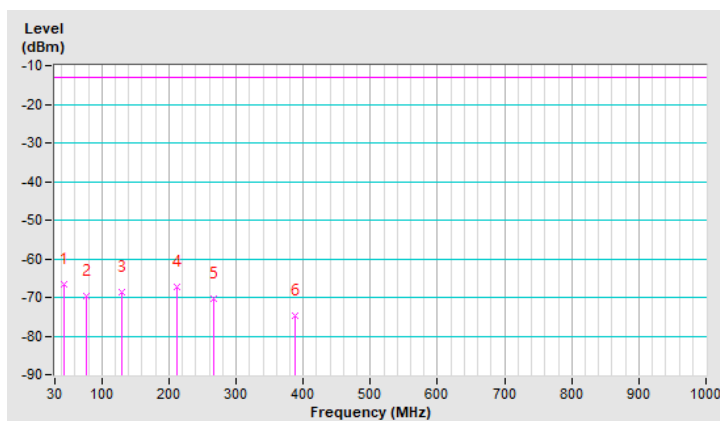


Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	44.0580	-66.5	-13.0	-53.5	1.00 V	13	40.2	-106.7
2	77.7971	-69.8	-13.0	-56.8	1.50 V	293	40.5	-110.2
3	129.8116	-68.5	-13.0	-55.5	1.50 V	232	39.0	-107.5
4	211.3478	-67.3	-13.0	-54.3	2.00 V	215	41.0	-108.3
5	267.5797	-70.2	-13.0	-57.2	1.50 V	194	34.9	-105.1
6	388.4783	-74.8	-13.0	-61.8	1.50 V	331	27.6	-102.4

Remarks:

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

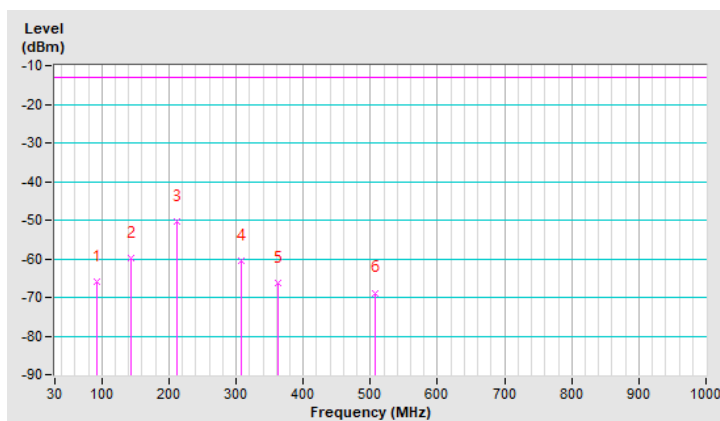


Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	91.8551	-65.9	-13.0	-52.9	1.50 H	4	45.8	-111.7
2	143.8696	-59.9	-13.0	-46.9	1.00 H	113	46.4	-106.3
3	212.7536	-50.2	-13.0	-37.2	1.50 H	260	58.0	-108.2
4	308.3478	-60.4	-13.0	-47.4	1.00 H	70	43.5	-103.9
5	363.1739	-66.4	-13.0	-53.4	1.00 H	60	36.3	-102.8
6	507.9710	-68.8	-13.0	-55.8	1.00 H	282	31.0	-99.8

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.

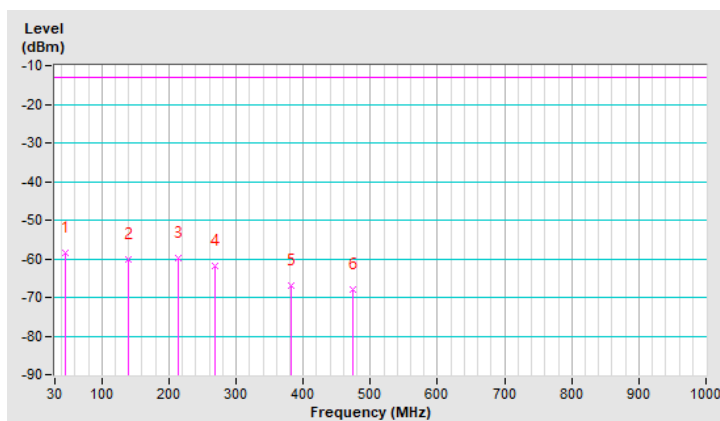


Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	45.4638	-58.6	-13.0	-45.6	1.50 V	304	48.0	-106.6
2	139.6522	-60.3	-13.0	-47.3	1.00 V	291	46.2	-106.5
3	214.1594	-59.9	-13.0	-46.9	1.00 V	214	48.4	-108.2
4	268.9855	-61.9	-13.0	-48.9	1.00 V	186	43.1	-105.0
5	381.4493	-66.9	-13.0	-53.9	2.00 V	189	35.5	-102.5
6	474.2319	-68.0	-13.0	-55.0	1.50 V	332	32.2	-100.2

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.



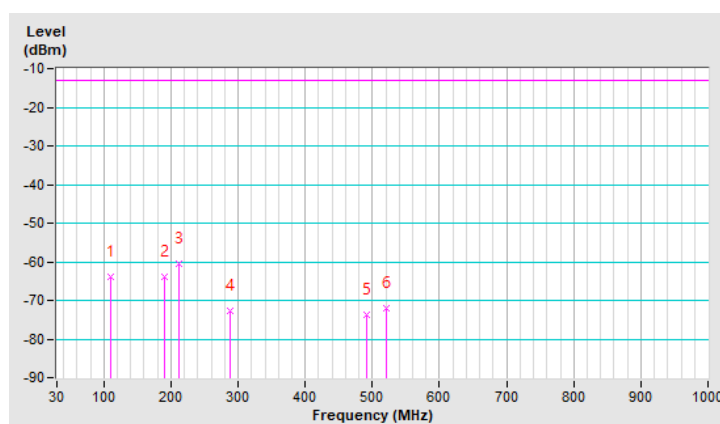
WCDMA Band 5

Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	110.1304	-63.9	-13.0	-50.9	2.00 H	197	45.5	-109.4
2	190.2609	-63.9	-13.0	-50.9	1.50 H	283	44.4	-108.3
3	212.7536	-60.5	-13.0	-47.5	1.00 H	266	47.8	-108.2
4	288.6667	-72.6	-13.0	-59.6	1.50 H	311	31.6	-104.2
5	491.1014	-73.7	-13.0	-60.7	1.00 H	12	26.2	-99.9
6	520.6232	-72.1	-13.0	-59.1	1.50 H	168	27.2	-99.3

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.

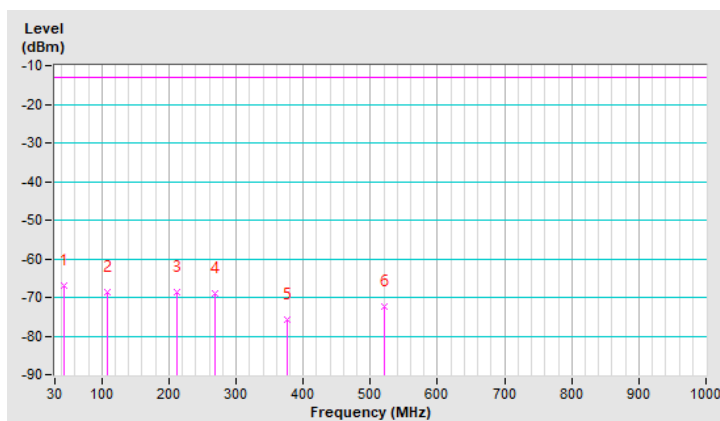


Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	44.0580	-67.0	-13.0	-54.0	2.00 V	114	39.7	-106.7
2	108.7246	-68.6	-13.0	-55.6	1.50 V	338	40.8	-109.4
3	211.3478	-68.7	-13.0	-55.7	1.50 V	237	39.6	-108.3
4	268.9855	-68.9	-13.0	-55.9	1.00 V	181	36.1	-105.0
5	375.8261	-75.7	-13.0	-62.7	1.50 V	186	26.8	-102.5
6	520.6232	-72.4	-13.0	-59.4	1.00 V	284	26.9	-99.3

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.

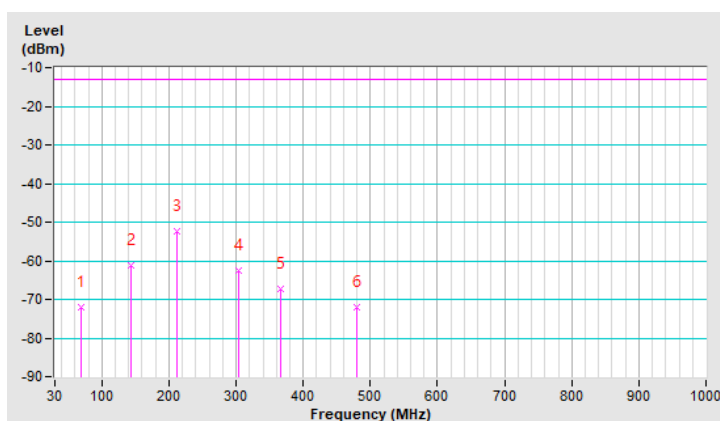


Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	69.3623	-72.1	-13.0	-59.1	1.50 H	170	36.4	-108.5
2	142.4638	-61.3	-13.0	-48.3	1.00 H	101	45.1	-106.4
3	211.3478	-52.4	-13.0	-39.4	1.50 H	261	55.9	-108.3
4	304.1304	-62.5	-13.0	-49.5	1.00 H	70	41.5	-104.0
5	365.9855	-67.2	-13.0	-54.2	2.00 H	59	35.4	-102.6
6	479.8551	-71.9	-13.0	-58.9	1.00 H	231	28.2	-100.1

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.

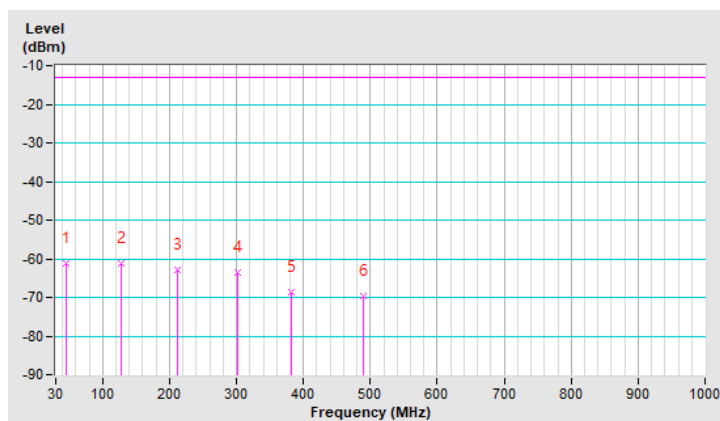


Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	45.4638	-61.2	-13.0	-48.2	1.50 V	311	45.4	-106.6
2	128.4058	-61.1	-13.0	-48.1	1.00 V	250	46.5	-107.6
3	211.3478	-62.9	-13.0	-49.9	1.50 V	206	45.4	-108.3
4	302.7246	-63.6	-13.0	-50.6	1.00 V	167	40.4	-104.0
5	382.8551	-68.5	-13.0	-55.5	2.00 V	193	34.0	-102.5
6	489.6957	-69.8	-13.0	-56.8	1.00 V	164	30.1	-99.9

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.



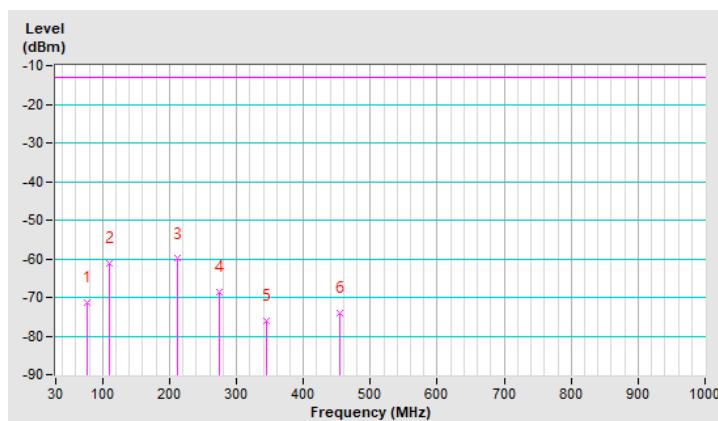
LTE Band 5, Channel Bandwidth: 5MHz

Mode	TX channel 20625 (846.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	77.7971	-71.2	-13.0	-58.2	1.00 H	345	39.0	-110.2
2	110.1304	-61.2	-13.0	-48.2	1.50 H	166	48.2	-109.4
3	211.3478	-60.0	-13.0	-47.0	1.50 H	84	48.3	-108.3
4	274.6087	-68.6	-13.0	-55.6	2.00 H	312	36.1	-104.7
5	344.8986	-76.0	-13.0	-63.0	1.50 H	215	27.2	-103.2
6	454.5507	-74.2	-13.0	-61.2	1.00 H	267	26.4	-100.6

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.

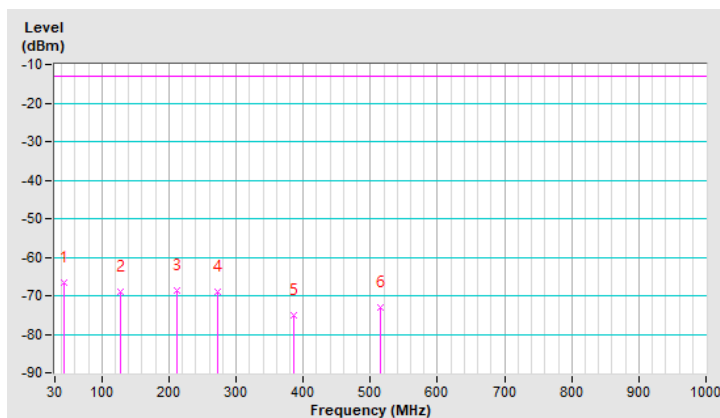


Mode	TX channel 20625 (846.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	A

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	44.0580	-66.6	-13.0	-53.6	1.00 V	16	40.1	-106.7
2	128.4058	-68.9	-13.0	-55.9	1.50 V	250	38.7	-107.6
3	212.7536	-68.8	-13.0	-55.8	1.50 V	228	39.5	-108.2
4	273.2029	-69.1	-13.0	-56.1	2.00 V	189	35.6	-104.7
5	385.6667	-75.1	-13.0	-62.1	1.50 V	145	27.3	-102.4
6	515.0000	-73.1	-13.0	-60.1	2.00 V	16	26.4	-99.5

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.

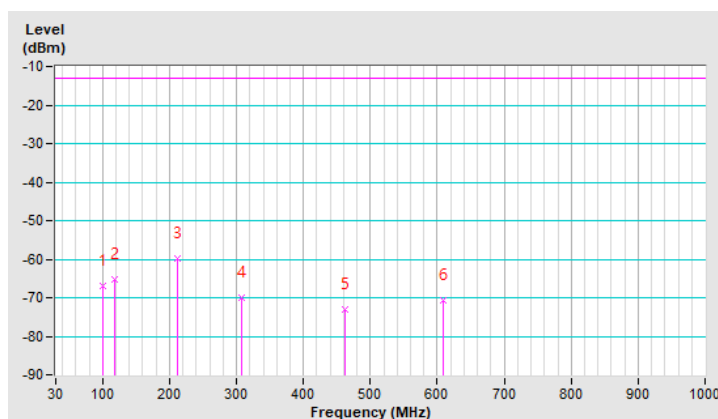


Mode	TX channel 20625 (846.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	100.2899	-66.8	-13.0	-53.8	1.00 H	219	43.9	-110.7
2	118.5652	-65.3	-13.0	-52.3	1.50 H	7	43.2	-108.5
3	211.3478	-59.9	-13.0	-46.9	1.50 H	260	48.4	-108.3
4	306.9420	-70.1	-13.0	-57.1	1.00 H	70	33.8	-103.9
5	461.5797	-73.2	-13.0	-60.2	1.50 H	303	27.3	-100.5
6	609.1884	-70.6	-13.0	-57.6	2.00 H	69	26.3	-96.9

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.

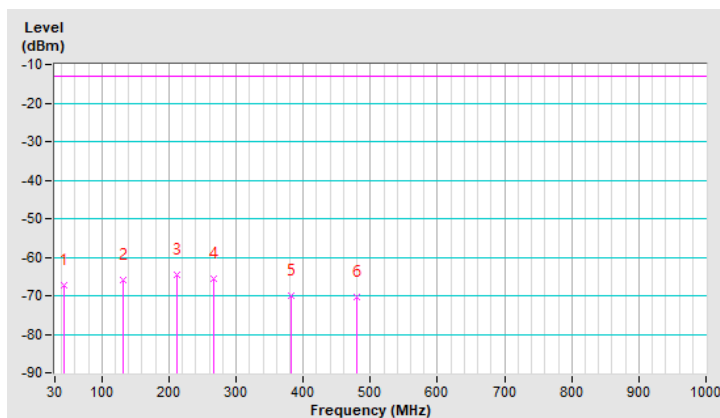


Mode	TX channel 20625 (846.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee	Test Mode	B

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	44.0580	-67.2	-13.0	-54.2	1.00 V	84	39.5	-106.7
2	131.2174	-66.0	-13.0	-53.0	1.50 V	256	41.4	-107.4
3	211.3478	-64.6	-13.0	-51.6	1.50 V	231	43.8	-108.3
4	267.5797	-65.6	-13.0	-52.6	1.50 V	174	39.5	-105.1
5	381.4493	-70.1	-13.0	-57.1	1.00 V	3	32.4	-102.5
6	479.8551	-70.2	-13.0	-57.2	1.50 V	342	29.9	-100.1

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 and approved 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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