

FCC TEST REPORT

(PART 24)

REPORT NO.: RF121120C26D-1

MODEL NO.: USC7330-T2-K9

FCC ID: D6XUSC7330T2

RECEIVED: Nov. 20, 2012 (Test Mode A, B)
Nov. 05, 2013 (Test Mode C, D)

TESTED: Nov. 27 ~ Dec. 05, 2012 (Test Mode A, B)
Nov. 18, 2013 (Test Mode C, D)

ISSUED: Nov. 19, 2013

APPLICANT: TECOM CO., LTD

ADDRESS: NO. 23, R&D ROAD 2, SCIENCE-BASED
INDUSTRIAL PARK HSINCHU, TAIWAN, R.O.C.

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New
Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim
product certification, approval, or endorsement by TAF or
any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1 CERTIFICATION	4
2 SUMMARY OF TEST RESULTS	5
2.1 MEASUREMENT UNCERTAINTY	5
2.2 TEST SITE AND INSTRUMENTS	7
3 GENERAL INFORMATION	9
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 CONFIGURATION OF SYSTEM UNDER TEST	10
3.3 DESCRIPTION OF SUPPORT UNITS	13
3.4 TEST ITEM AND TEST CONFIGURATION	14
3.5 EUT OPERATING CONDITIONS	15
3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS	15
4 TEST TYPES AND RESULTS	16
4.1 OUTPUT POWER MEASUREMENT	16
4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT	16
4.1.2 TEST PROCEDURES	16
4.1.3 TEST SETUP	17
4.1.4 TEST RESULTS	18
4.2 FREQUENCY STABILITY MEASUREMENT	21
4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT	21
4.2.2 TEST PROCEDURE	21
4.2.3 TEST SETUP	21
4.2.4 TEST RESULTS	22
4.3 OCCUPIED BANDWIDTH MEASUREMENT	23
4.3.1 TEST PROCEDURES	23
4.3.2 TEST SETUP	23
4.3.3 TEST RESULTS	24
4.4 BAND EDGE MEASUREMENT	25
4.4.1 LIMITS OF BAND EDGE MEASUREMENT	25
4.4.2 TEST SETUP	25
4.4.3 TEST PROCEDURES	25
4.4.4 TEST RESULTS	26
4.5 CONDUCTED SPURIOUS EMISSIONS	27
4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT	27
4.5.2 TEST PROCEDURE	27
4.5.3 TEST SETUP	27
4.5.4 TEST RESULTS	28
4.6 RADIATED EMISSION MEASUREMENT	31
4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT	31
4.6.2 TEST PROCEDURES	31
4.6.3 DEVIATION FROM TEST STANDARD	31
4.6.4 TEST SETUP	32
4.6.5 TEST RESULTS	33
5 PHOTOGRAPHS OF THE TEST CONFIGURATION	43
6 INFORMATION ON THE TESTING LABORATORIES	44
7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	45



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121120C26D-1	Original release	Nov. 19, 2013



A D T

1 CERTIFICATION

PRODUCT: 3G Femto Access Point

MODEL: USC7330-T2-K9

BRAND: CISCO

APPLICANT: TECOM CO., LTD

TESTED: Nov. 27 ~ Dec. 05, 2012 (Test Mode A, B)

Nov. 18, 2013 (Test Mode C, D)

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 24, Subpart E

The above equipment (model: USC7330-T2-K9) 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 EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE** : Nov. 19, 2013

Pettie Chen / Senior Specialist

APPROVED BY :  , **DATE** : Nov. 19, 2013

Anderson Chiu / Senior Engineer

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 24.232	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -21.50dB at 3864.8MHz.

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:

For Test Mode A, B (Tested Date: Nov. 27 ~ Dec. 02, 2012)

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB



A D T

For Test Mode C, D (Tested Date: Nov. 18, 2013)

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.2 TEST SITE AND INSTRUMENTS

For Test Mode A, B (Tested Date: Nov. 27 ~ Dec. 02, 2012)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Preamplifier Agilent	8447D	2944A10633	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8449B	3008A01964	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 28, 2012	Aug. 27, 2013
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Mar. 23, 2012	Mar. 22, 2013
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY50266653	Oct. 08, 2012	Oct. 27, 2013
Radio Communication Analyzer	MT8820C	6201127458	May 25, 2012	May 24, 2013

- 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. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.



A D T

For Test Mode C, D (Tested Date: Nov. 18, 2013)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 24, 2013	Oct. 23, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 28, 2013	Oct. 27, 2014
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
Communications Tester-Wireless	E5515C	MY50266628	Nov. 22, 2012	Nov. 21, 2013
Radio Communication Analyzer	MT8820C	6201127458	May 30, 2013	May 29, 2014

- 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. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 460141.
 5. The IC Site Registration No. is IC7450F-4.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	3G Femto Access Point
MODEL NO.	USC7330-T2-K9
POWER SUPPLY	12Vdc (Adapter) 48Vdc (PoE)
MODULATION TYPE	BPSK
FREQUENCY RANGE	UL: 1850-1910 MHz DL: 1930-1990 MHz
MAX. EIRP POWER	328.095mW (25.16dBm)
WCDMA RELEASE VERSION	7
ANTENNA TYPE	Refer to Note
I/O PORTS	Refer to user's manual
DATA CABLE	1.8m non-shielded Ethernet cable
ACCESSORY DEVICES	Adapter

NOTE:

- The EUT with following antenna.

Item	Antenna Type	Antenna Connector	Antenna Gain (dBi)	
			824-849 MHz	1850-1910 MHz
1	PIFA	I-PEX	2.0	2.0
2	Dipole	SMA	3.0	3.5

*The dipole antenna (Model: TMGR-OD-03C) was supplied for optional accessory.

- The EUT uses following adapter & PoE.

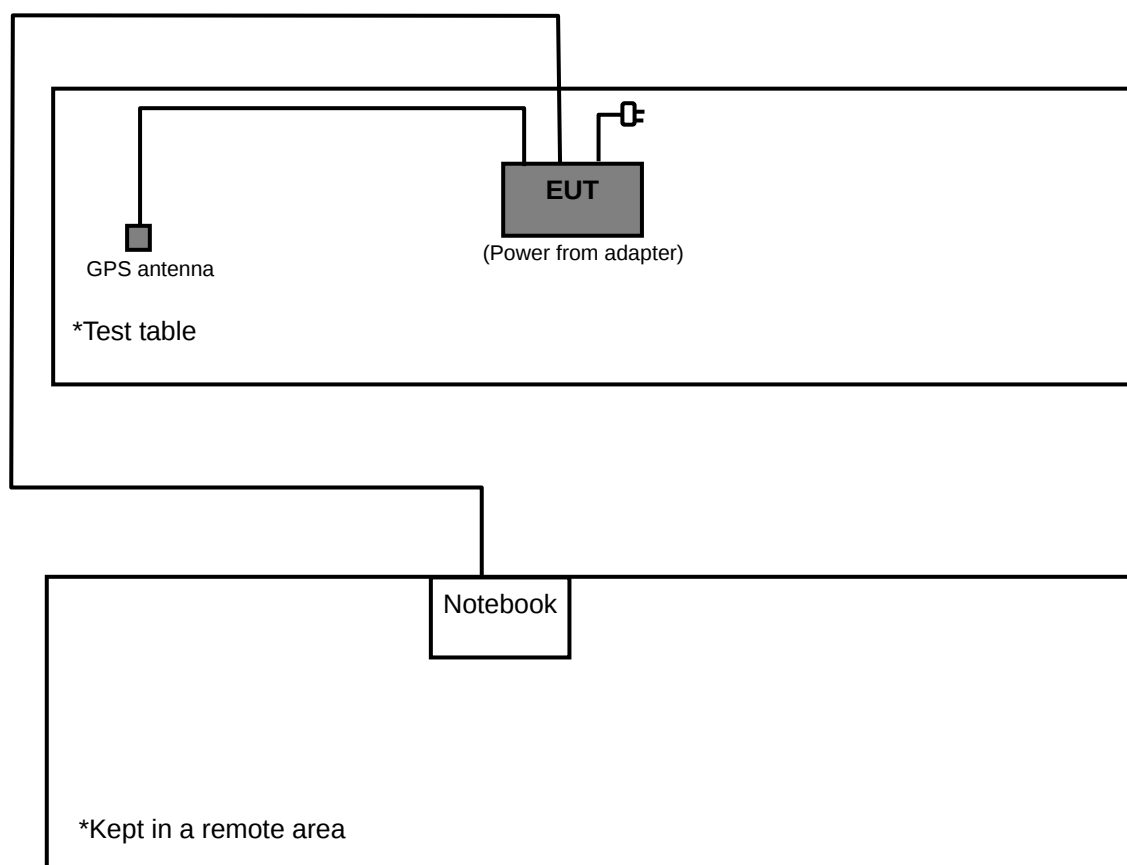
Adapter	
BRAND	I.T.E.
MODEL	MU18-D120150-A1
INPUT POWER	100-240Vac, 50-60Hz, 0.6A
OUTPUT POWER	12Vdc, 1.5A
POWER LINE	1.5m non-shielded cable without core

PoE (Support unit only)	
BRAND	FAIRWAY
MODEL	VE20C-48A
INPUT POWER	100-240Vac~50/60Hz, 0.6A
OUTPUT POWER	48.0Vdc / 20W

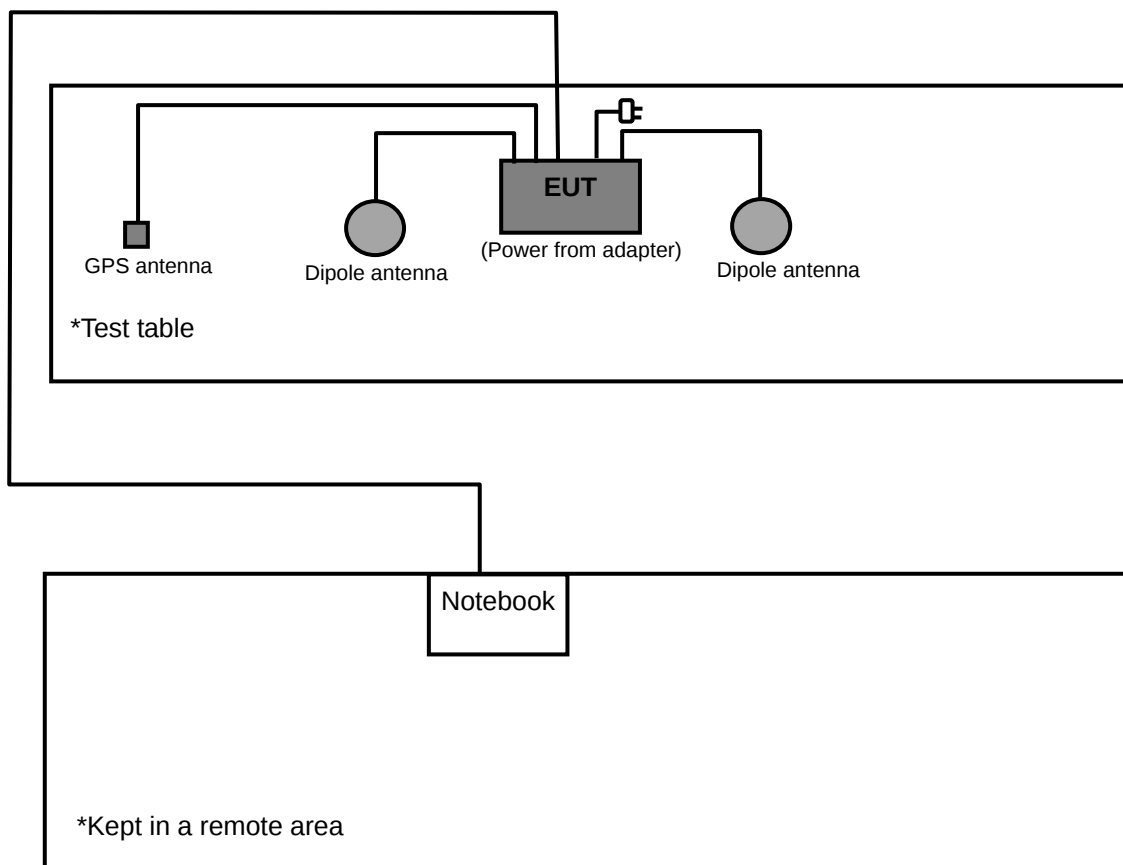
- SW version is BV2.13.0.3A.
- HW version is G3.5.1.
- The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

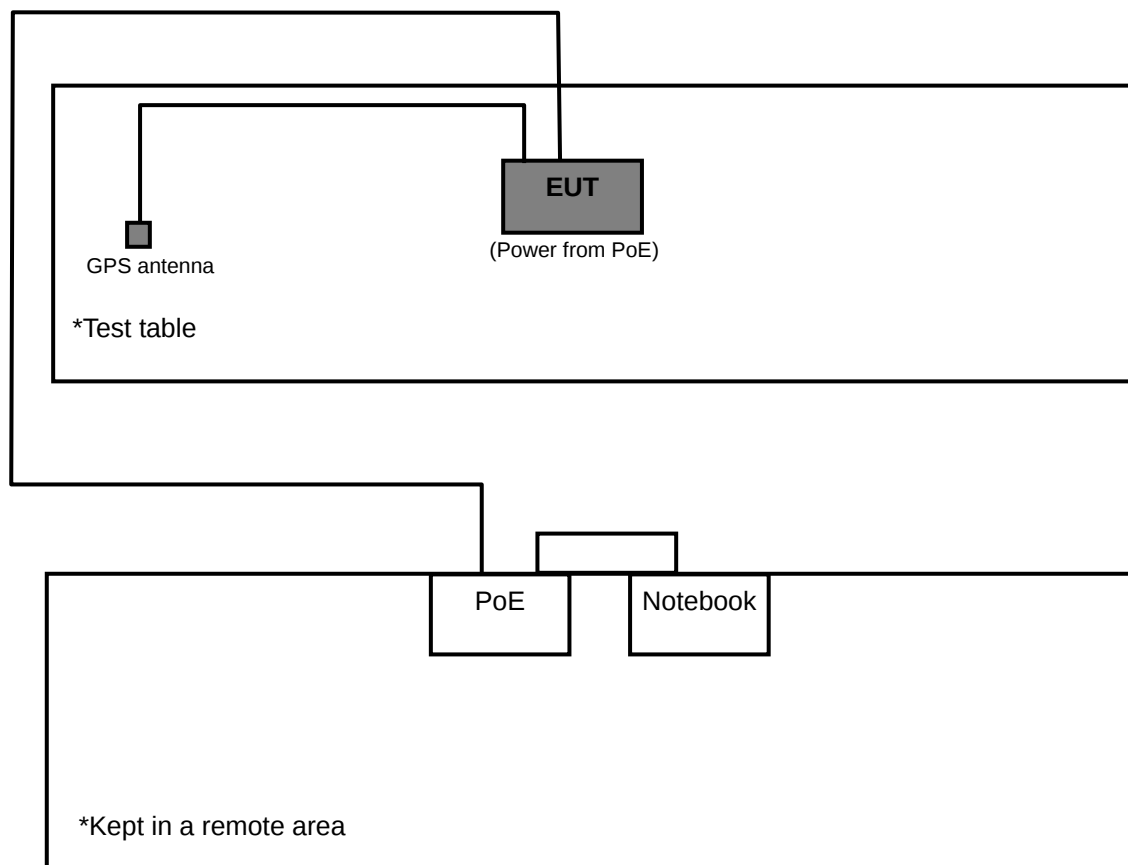
Test Mode A



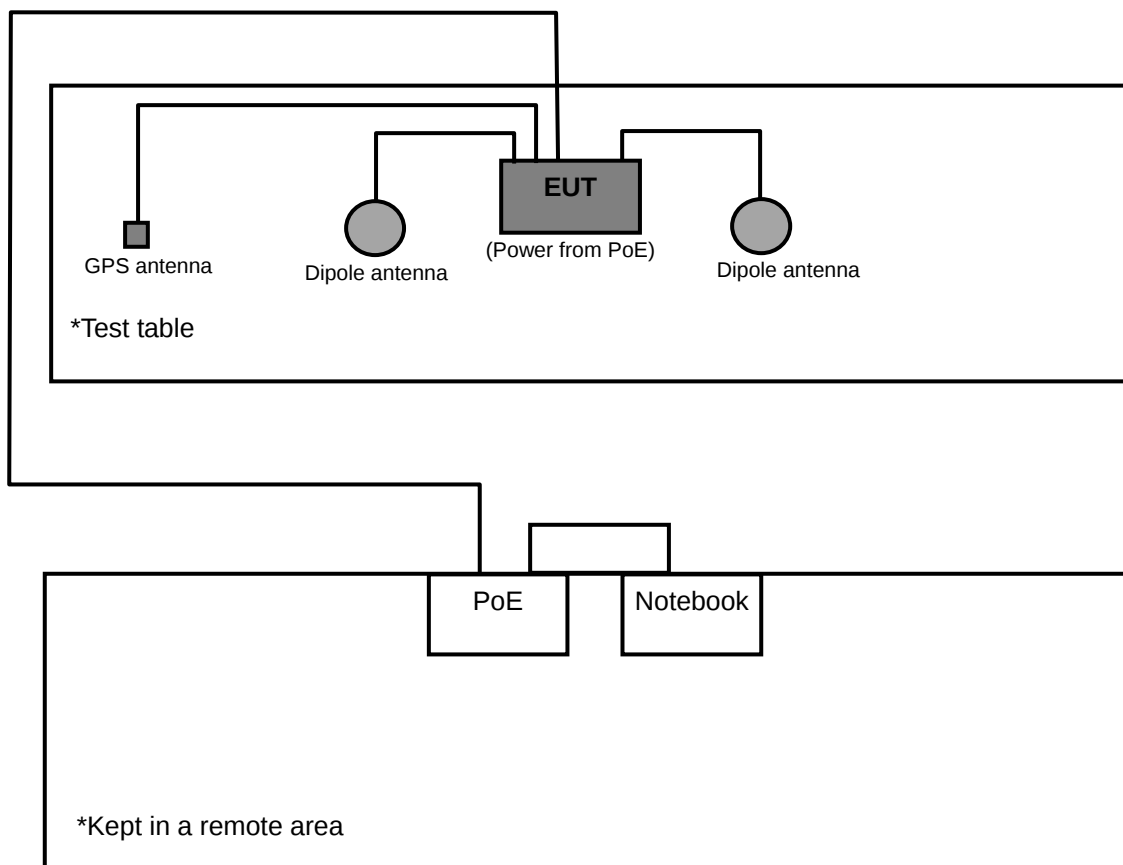
Test Mode B



Test Mode C



Test Mode D



3.3 DESCRIPTION OF SUPPORT UNITS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	D531	CN-0XM006-48643-81U-2610	QDS-BRCM1020
2	GPS antenna	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 cable without core
2	5m cable.

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 act as a communication partner to transfer data.
3. Item 2 was supplied for optional accessory.

3.4 TEST ITEM AND TEST CONFIGURATION

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 X-plane for EIRP and X-axis for radiated emission. 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	Adapter Mode (EUT with PIFA antenna)
B	Adapter Mode (EUT with Dipole antenna)
C	PoE Mode (EUT with PIFA antenna)
D	PoE Mode (EUT with Dipole antenna)

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A, B	EIRP	9662 to 9938	9662, 9880, 9938	WCDMA
B	FREQUENCY STABILITY	9662 to 9938	9800	WCDMA
B	OCCUPIED BANDWIDTH	9662 to 9938	9662, 9880, 9938	WCDMA
B	BAND EDGE	9662 to 9938	9662, 9938	WCDMA
B	CONDCUETED EMISSION	9662 to 9938	9662, 9880, 9938	WCDMA
A, B, C, D	RADIATED EMISSION BELOW 1GHz	9662 to 9938	9662	WCDMA
A, B	RADIATED EMISSION ABOVE 1GHz	9662 to 9938	9662, 9880, 9938	WCDMA

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
FREQUENCY STABILITY	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
OCCUPIED BANDWIDTH	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
BAND EDGE	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
CONDCUETED EMISSION	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
RADIATED EMISSION	24deg. C, 64%RH 22deg. C, 70%RH	120Vac, 60Hz	Match Tsui Jones Chang

3.5 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

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-C 2004

NOTE 1: All test items have been performed and recorded as per the above standards.

NOTE 2: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP

4.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

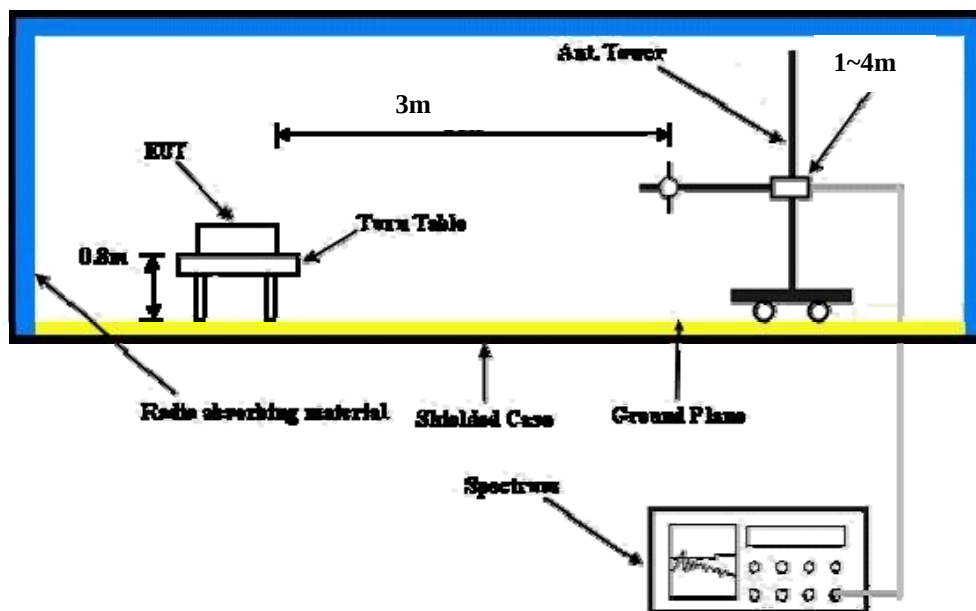
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for WCDMA mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search 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.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

CONDUCTED POWER MEASUREMENT:

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

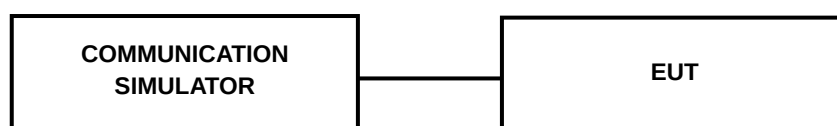
4.1.3 TEST SETUP

EIRP MEASUREMENT:



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

CONDUCTED OUTPUT POWER

Band	WCDMA II		
Channel	9662	9800	9938
Frequency (MHz)	1932.4	1960.0	1987.6
Power (dBm)	23.87	23.98	23.92

EIRP POWER (dBm)

FOR WCDMA MODE:

MODE A

MODE		TX channel 9662					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1932.4	-17.51	21.09	0.77	21.86	33.00	-11.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1932.40	-21.99	15.78	0.77	16.55	33.00	-16.45

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

MODE		TX channel 9880					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1960.00	-16.72	21.88	0.76	22.64	33.00	-10.36
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1960.00	-20.73	17.21	0.76	17.97	33.00	-15.03

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

MODE		TX channel 9938					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1987.60	-14.50	24.09	0.76	24.85	33.00	-8.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1987.60	-19.34	18.76	0.76	19.52	33.00	-13.48

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

MODE B

MODE		TX channel 9662					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1932.40	-22.86	17.38	-0.87	16.51	33.00	-16.49
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1932.40	-13.38	26.03	-0.87	25.16	33.00	-7.84

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

MODE		TX channel 9880					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1960.00	-23.66	16.58	-0.88	15.70	33.00	-17.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1960.00	-14.82	24.76	-0.88	23.88	33.00	-9.12

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

MODE		TX channel 9938					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1987.60	-25.62	14.61	-0.88	13.73	33.00	-19.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1987.60	-16.69	23.05	-0.88	22.17	33.00	-10.83

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

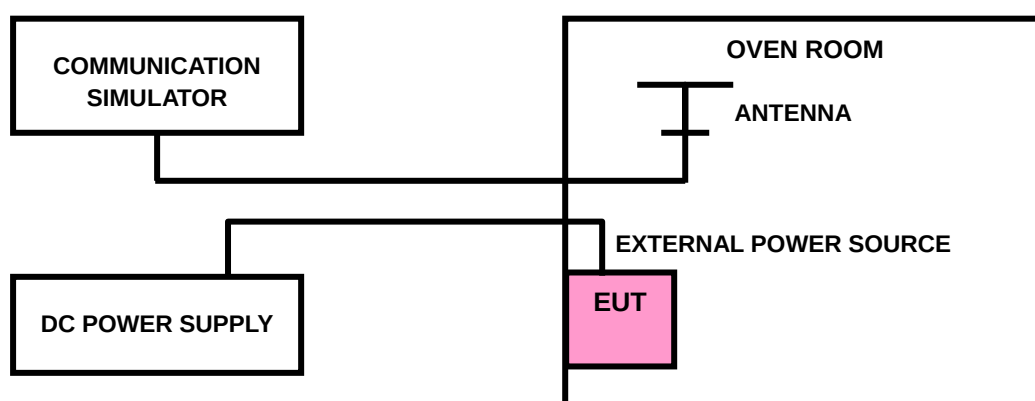
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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 $\pm 0.5^{\circ}\text{C}$ 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)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
	WCDMA	
126.5	-0.015	2.5
93.5	-0.011	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 93.5Vdc to 126.5Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

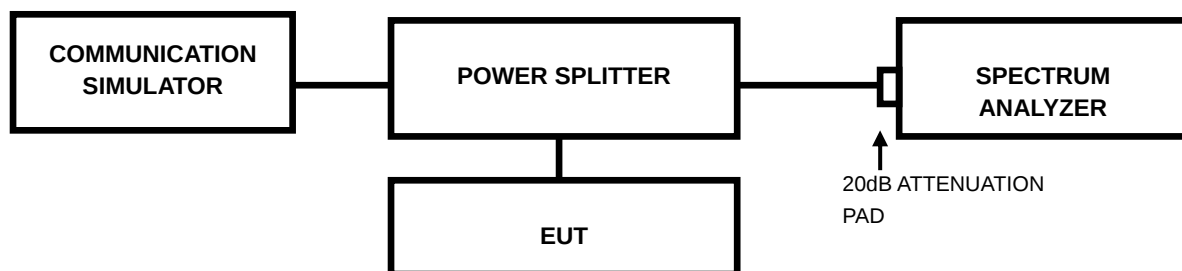
TEMP. (°C)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
	WCDMA	
50	-0.016	2.5
40	-0.019	2.5
30	-0.017	2.5
20	-0.015	2.5
10	-0.016	2.5
0	-0.020	2.5
-10	-0.020	2.5
-20	-0.021	2.5
-30	-0.017	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

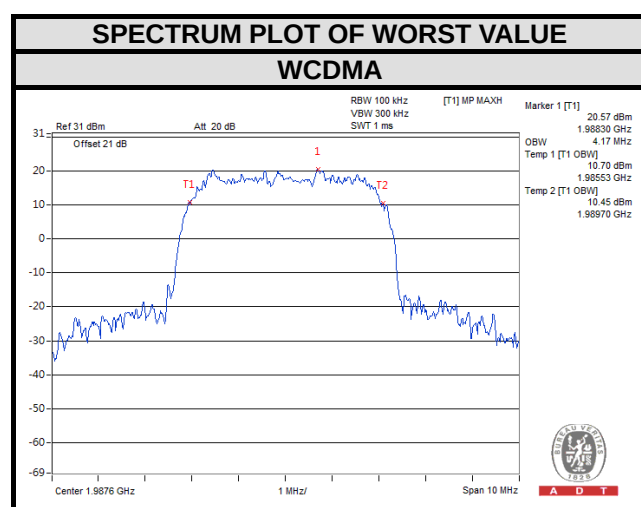
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.2 TEST SETUP



4.3.3 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
		WCDMA
9662	1932.4	4.12
9800	1960.0	4.13
9938	1987.6	4.17

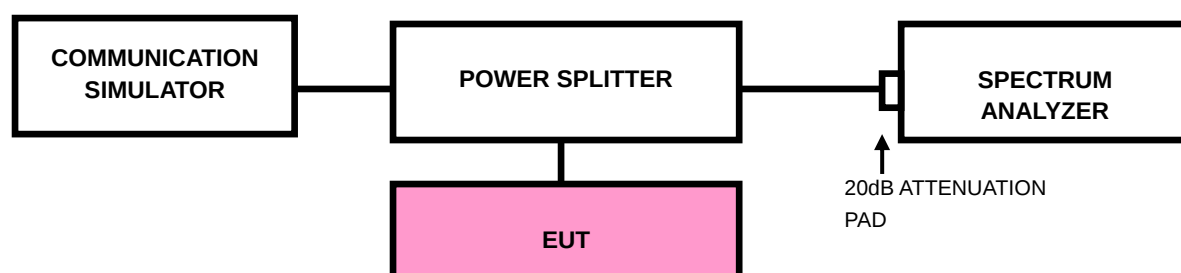


4.4 BAND EDGE MEASUREMENT

4.4.1 LIMITS OF BAND EDGE MEASUREMENT

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

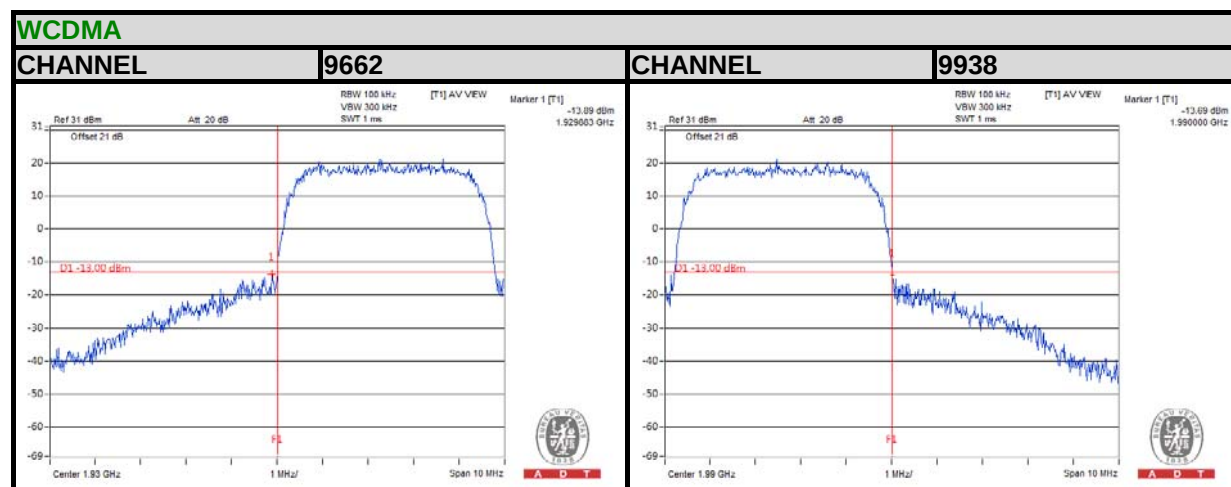
4.4.2 TEST SETUP



4.4.3 TEST PROCEDURES

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
- Record the max trace plot into the test report.

4.4.4 TEST RESULTS



4.5 CONDUCTED SPURIOUS EMISSIONS

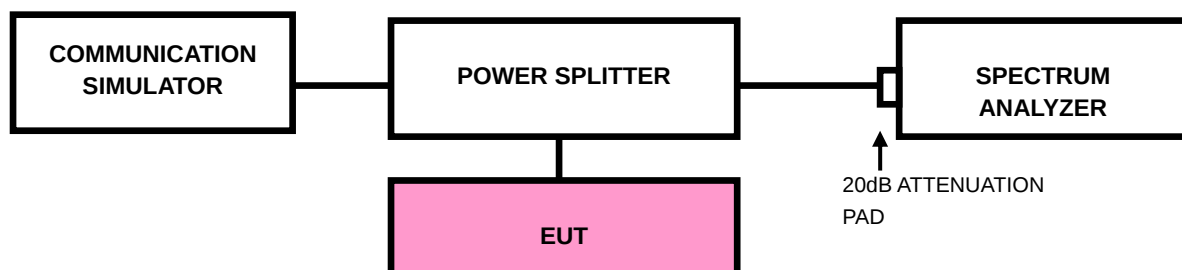
4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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 .

4.5.2 TEST PROCEDURE

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.5.3 TEST SETUP



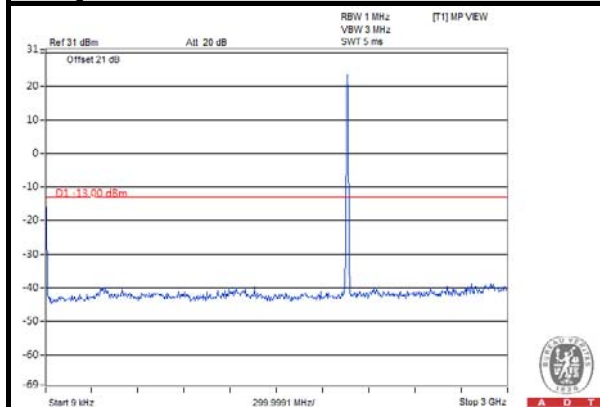
4.5.4 TEST RESULTS



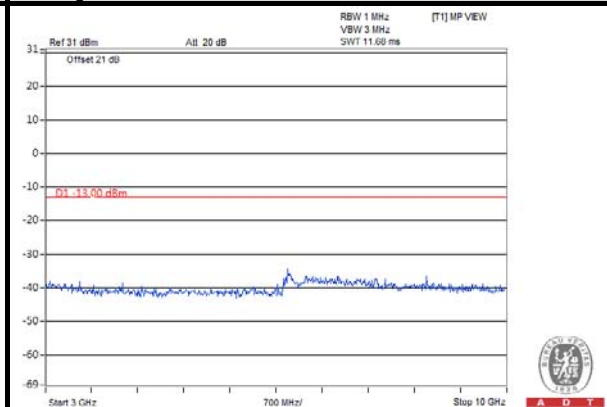
WCDMA

CHANNEL 9800

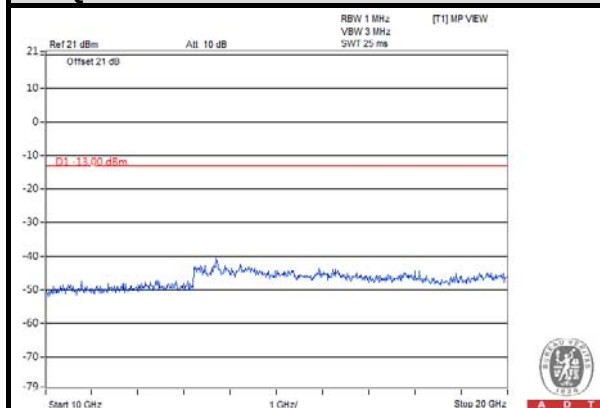
FREQUENCY RANGE : 9kHz~3GHz



FREQUENCY RANGE : 3GHz~10GHz



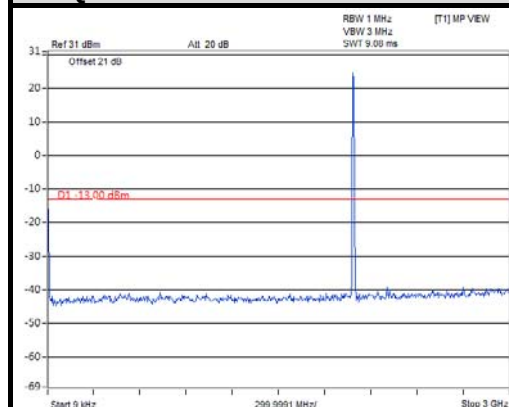
FREQUENCY RANGE : 10GHz~20GHz



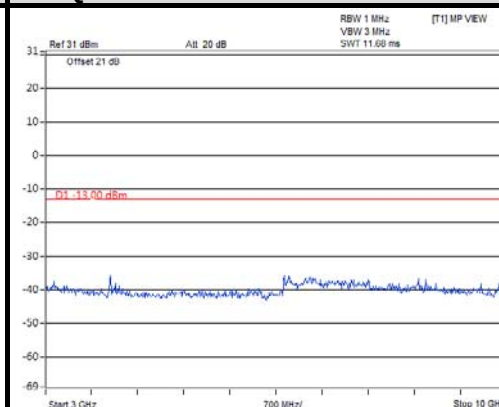
WCDMA

CHANNEL 9938

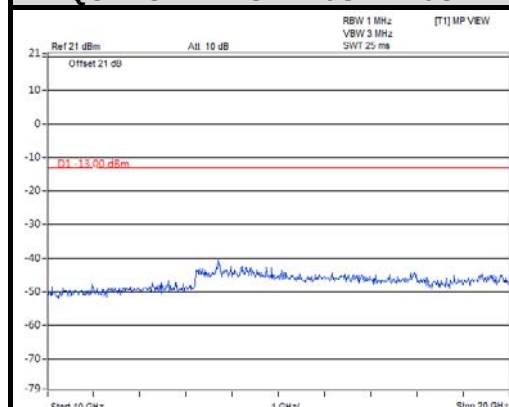
FREQUENCY RANGE : 9kHz~3GHz



FREQUENCY RANGE : 3GHz~10GHz



FREQUENCY RANGE : 10GHz~20GHz



4.6 RADIATED EMISSION MEASUREMENT

4.6.1 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 .

4.6.2 TEST PROCEDURES

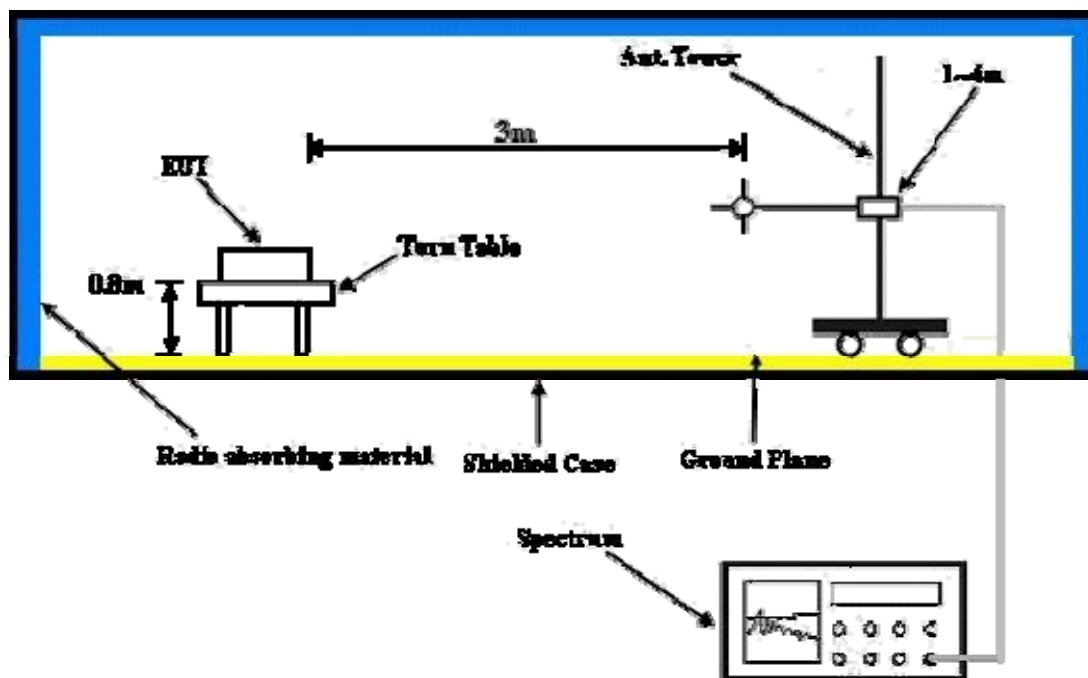
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.R.P power} - 2.15\text{dBi}.$

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.6.3 DEVIATION FROM TEST STANDARD

No deviation

4.6.4 TEST SETUP



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

4.6.5 TEST RESULTS

Below 1GHz

WCDMA-RMC:

MODE	TX channel 9662	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-72.35	-68.40	0.00	-68.40	-13.00	-55.40
2	97.90	-61.91	-66.96	-0.73	-67.69	-13.00	-54.69
3	148.34	-71.91	-74.30	-0.90	-75.20	-13.00	-62.20
4	280.26	-71.97	-74.49	-1.23	-75.72	-13.00	-62.72
5	400.54	-75.77	-73.64	-1.47	-75.11	-13.00	-62.11
6	891.36	-74.71	-64.69	-2.21	-66.90	-13.00	-53.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-64.50	-69.15	0.00	-69.15	-13.00	-56.15
2	59.10	-68.61	-73.91	-0.57	-74.48	-13.00	-61.48
3	140.58	-71.99	-72.22	-0.87	-73.09	-13.00	-60.09
4	280.26	-73.98	-73.83	-1.23	-75.06	-13.00	-62.06
5	449.04	-76.06	-71.54	-1.56	-73.10	-13.00	-60.10
6	864.20	-74.69	-62.09	-2.17	-64.26	-13.00	-51.26

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9662	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-74.80	-70.82	0.00	-70.82	-13.00	-57.82
2	92.08	-67.31	-72.91	-0.71	-73.62	-13.00	-60.62
3	146.40	-74.24	-76.98	-0.89	-77.87	-13.00	-64.87
4	280.26	-72.83	-75.35	-1.23	-76.58	-13.00	-63.58
5	416.06	-75.67	-73.86	-1.50	-75.36	-13.00	-62.36
6	749.74	-75.39	-67.36	-2.04	-69.40	-13.00	-56.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-65.10	-70.43	0.00	-70.43	-13.00	-57.43
2	92.08	-70.31	-73.97	-0.71	-74.68	-13.00	-61.68
3	148.34	-71.29	-70.22	-0.90	-71.12	-13.00	-58.12
4	289.96	-74.06	-73.73	-1.25	-74.98	-13.00	-61.98
5	505.30	-75.74	-71.26	-1.65	-72.91	-13.00	-59.91
6	778.84	-76.01	-64.83	-2.06	-66.89	-13.00	-53.89

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9662	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 70%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	C	TESTED BY	Jones Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	33.88	-53.39	-37.84	-11.68	-49.52	-13.00	-36.52
2	41.64	-51.98	-37.78	-10.62	-48.40	-13.00	-35.40
3	66.86	-45.93	-44.59	-5.82	-50.41	-13.00	-37.41
4	95.96	-45.72	-52.66	0.98	-51.68	-13.00	-38.68
5	148.34	-49.56	-52.66	-0.19	-52.85	-13.00	-39.85
6	274.44	-48.37	-57.83	5.26	-52.57	-13.00	-39.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-33.26	-28.71	-11.93	-40.64	-13.00	-27.64
2	39.70	-42.60	-36.32	-10.93	-47.25	-13.00	-34.25
3	55.22	-41.79	-38.69	-8.63	-47.32	-13.00	-34.32
4	64.92	-36.21	-36.09	-6.32	-42.41	-13.00	-29.41
5	150.28	-47.93	-47.34	-0.14	-47.48	-13.00	-34.48
6	274.44	-50.79	-57.40	5.26	-52.14	-13.00	-39.14

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9662	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 70%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	D	TESTED BY	Jones Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-51.48	-35.51	-12.18	-47.69	-13.00	-34.69
2	51.34	-50.76	-40.30	-9.46	-49.76	-13.00	-36.76
3	64.92	-44.93	-42.46	-6.32	-48.78	-13.00	-35.78
4	95.96	-47.05	-53.99	0.98	-53.01	-13.00	-40.01
5	299.66	-49.63	-58.72	5.13	-53.59	-13.00	-40.59
6	400.54	-55.04	-59.66	5.28	-54.38	-13.00	-41.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-39.54	-34.74	-9.85	-44.59	-13.00	-31.59
2	59.10	-37.53	-35.61	-7.79	-43.40	-13.00	-30.40
3	150.28	-49.67	-49.08	-0.14	-49.22	-13.00	-36.22
4	249.22	-50.60	-58.12	5.40	-52.72	-13.00	-39.72
5	274.44	-51.15	-57.76	5.26	-52.50	-13.00	-39.50
6	400.54	-56.05	-59.40	5.28	-54.12	-13.00	-41.12

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

Above 1GHz

WCDMA:

MODE	TX channel 9662	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3864.80	-52.26	-46.01	7.05	-38.96	-13.00	-25.96
2	5797.20	-59.33	-47.04	6.71	-40.33	-13.00	-27.33
3	7729.60	-58.60	-40.33	4.17	-36.16	-13.00	-23.16
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3864.80	-52.73	-46.66	7.05	-39.61	-13.00	-26.61
2	5797.20	-59.40	-47.96	6.71	-41.25	-13.00	-28.25
3	7729.60	-57.90	-41.50	4.17	-37.33	-13.00	-24.33

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9880	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3920.00	-56.44	-50.12	7.05	-43.07	-13.00	-30.07
2	5880.00	-58.52	-46.09	6.68	-39.41	-13.00	-26.41
3	7840.00	-58.82	-40.24	4.09	-36.15	-13.00	-23.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3920.00	-55.40	-49.25	7.05	-42.20	-13.00	-29.20
2	5880.00	-58.92	-47.27	6.68	-40.59	-13.00	-27.59
3	7840.00	-57.48	-40.96	4.09	-36.87	-13.00	-23.87

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9938	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3975.20	-52.25	-45.83	7.03	-38.80	-13.00	-25.80
2	5962.80	-58.18	-45.61	6.65	-38.96	-13.00	-25.96
3	7950.40	-58.58	-39.71	4.03	-35.68	-13.00	-22.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3975.20	-51.88	-45.63	7.03	-38.60	-13.00	-25.60
2	5962.80	-58.97	-47.12	6.65	-40.47	-13.00	-27.47
3	7950.40	-57.06	-40.43	4.03	-36.40	-13.00	-23.40

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9662	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3864.8	-56.53	-38.51	-4.72	-43.23	-13.00	-30.23
2	7729.6	-59.84	-30.57	-6.83	-37.40	-13.00	-24.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3864.8	-47.62	-29.78	-4.72	-34.50	-13.00	-21.50
2	7729.6	-59.58	-32.18	-6.83	-39.01	-13.00	-26.01

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9880	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3920.00	-61.21	-43.10	-4.74	-47.84	-13.00	-34.84
2	7840.00	-59.53	-29.95	-6.91	-36.86	-13.00	-23.86
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3920.00	-60.37	-42.43	-4.74	-47.17	-13.00	-34.17
2	7840.00	-58.86	-31.34	-6.91	-38.25	-13.00	-25.25

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

MODE	TX channel 9938	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3975.20	-58.12	-39.91	-4.76	-44.67	-13.00	-31.67
2	7950.40	-58.50	-28.63	-6.97	-35.60	-13.00	-22.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3975.20	-51.22	-33.18	-4.76	-37.94	-13.00	-24.94
2	7950.40	-56.43	-28.80	-6.97	-35.77	-13.00	-22.77

REMARKS:

1. Correction Factor = gain of substitution antenna + cable loss



A D T

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 INFORMATION ON 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 accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom 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.



A D T

7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---