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# FCC TEST REPORT (PART 22)

**REPORT NO.:** RF121207C05A-2

**MODEL NO.:** PWS-770xxxxxxxxxxxxxxxxxxx ("X" can be 0-9 or A-Z or blank or any alphanumeric character)

**FCC ID:** M82-PWS-770MC

**RECEIVED:** Mar. 25, 2013

**TESTED:** Apr. 04 ~ Apr. 16, 2013

**ISSUED:** Apr. 22, 2013

**APPLICANT:** ADVANTECH CO., LTD

**ADDRESS:** No. 1, Alley 20, Lane 26, Rueiguang Rd, Neihu District, Taipei, Taiwan 114

**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.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121207C05A-2	Original release	Apr. 22, 2013



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# 1 CERTIFICATION

**PRODUCT:** Computer

**MODEL:** PWS-770xxxxxxxxxxxxxxxxxxxx ("X" can be 0-9 or A-Z or blank  
or any alphanumeric character)

**BRAND:** 

**APPLICANT:** ADVANTECH CO., LTD

**TESTED:** Apr. 04 ~ Apr. 16, 2013

**TEST SAMPLE:** MASS-PRODUCTION

**STANDARDS:** **FCC PART 22, Subpart H**

**FCC PART 2**

**ANSI/TIA/EIA-603-C 2004**

The above equipment (model: PWS-770) 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** : Celine Chou , **DATE** : Apr. 22, 2013  
Celine Chou / Specialist

**APPROVED BY** : Anderson Chiu , **DATE** : Apr. 22, 2013  
Anderson Chiu / Senior Engineer



## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 22.913 (a)	Effective radiated power	PASS	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	PASS	Meet the requirement of limit.
2.1049	Occupied Bandwidth	PASS	Meet the requirement of limit.
22.917	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -26.71dB at 1673.04MHz.

### 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	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

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

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	Jan. 31, 2013	Jan. 30, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Mar. 20, 2013	Mar. 19, 2014
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
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 BV 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 BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 25, 2013	May 24, 2014
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY50266653	Sep. 28, 2012	Sep. 27, 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. The test was performed in HwaYa Chamber 3.
  4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  5. The FCC Site Registration No. is 988962.
  6. The IC Site Registration No. is IC 7450F-3.



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Computer
<b>MODEL NO.</b>	PWS-770xxxxxxxxxxxxxxxxxxx (Refer to note for more details)
<b>POWER SUPPLY</b>	19Vdc (Adapter) 11.1Vdc (Battery)
<b>MODULATION TYPE</b>	QPSK, OQPSK, HPSK
<b>FREQUENCY RANGE</b>	824.7MHz ~ 848.31MHz
<b>MAX. ERP POWER</b>	0.062Watts (17.93dBm)
<b>ANTENNA TYPE</b>	PIFA antenna with -3.79dBi gain
<b>ANTENNA CONNECTOR</b>	IPEX
<b>DATA CABLE</b>	0.3m non-shielded USB cable without core
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Adapter, Touch Pen, Battery

**NOTE:**

1. The following models are identical to each other except their model designation due to marketing requirement.

Brand	Model
ADVANTECH	PWS-770xxxxxxxxxxxxxxxxxxx ("X" can be 0-9 or A-Z or blank or any alphanumeric character)

\* The model of the PWS-770 was chosen for final test.

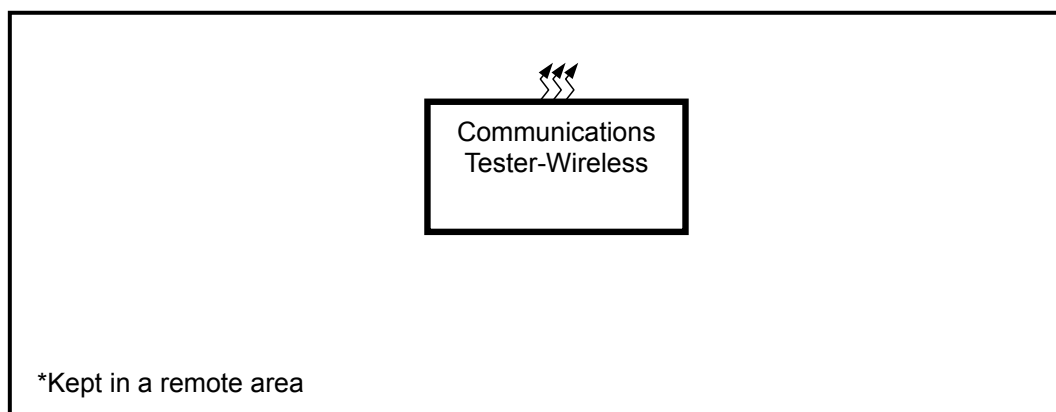
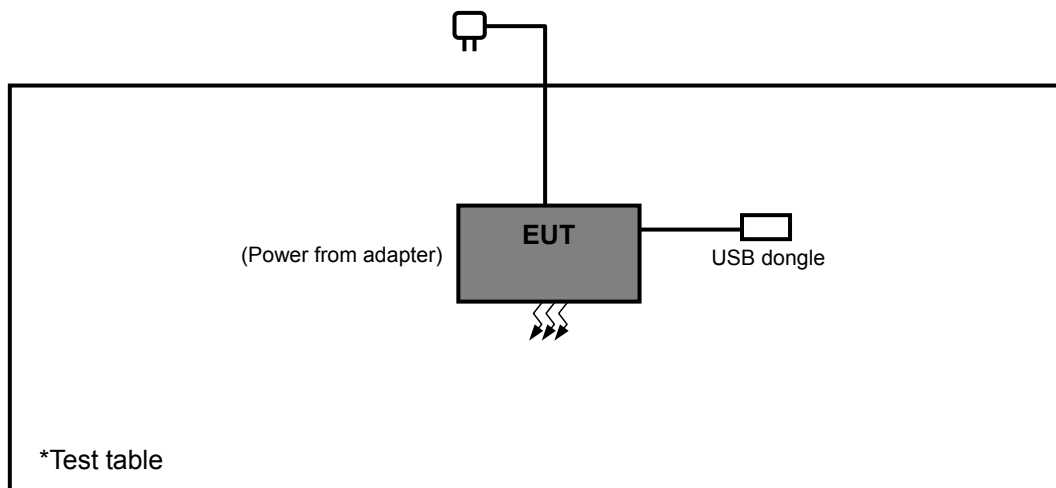
2. The EUT consumes power from the following adapter.

ADAPTER	
<b>BRAND:</b>	FSP GROUP INC.
<b>MODEL:</b>	FSP065-RAB
<b>INPUT:</b>	100-240Vac, 1.5 A, 50-60 Hz
<b>OUTPUT:</b>	19Vdc, 3.42 A
<b>POWER LINE:</b>	DC 1.5m cable with 1 core attached on adapter

BATTERY	
<b>BRAND:</b>	Advantech
<b>MODEL:</b>	46-12318-041
<b>RATING:</b>	11.1Vdc, 1880mAh, 20.87Wh

3. The above EUT information is 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



### 3.3 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
1	USB Dongle	SANDISK	SDCZ6-1024	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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





### 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 ERP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	ERP	1013 to 777	1013, 384, 777	EVDO
-	FREQUENCY STABILITY	1013 to 777	384	EVDO
-	OCCUPIED BANDWIDTH	1013 to 777	1013, 384, 777	CDMA, EVDO
-	BAND EDGE	1013 to 777	1013, 777	CDMA, EVDO
-	CONDCUDED EMISSION	1013 to 777	1013, 384, 777	CDMA, EVDO
-	RADIATED EMISSION<1G	1013 to 777	1013	EVDO
-	RADIATED EMISSION≥1G	1013 to 777	1013, 384, 777	EVDO

\* Due to EVDO's conducted power is higher than CDMA, therefore the ERP, FREQUENCY STABILITY and RADIATED EMISSION tested with EVDO mode only

#### TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
FREQUENCY STABILITY	25deg. C, 65%RH	11.1Vdc	Match Tsui
OCCUPIED BANDWIDTH	25deg. C, 68%RH	11.1Vdc	Match Tsui
BAND EDGE	25deg. C, 68%RH	11.1Vdc	Match Tsui
CONDCUDED EMISSION	25deg. C, 68%RH	11.1Vdc	Match Tsui
RADIATED EMISSION	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin

### 3.5 EUT OPERATING CONDITIONS

The EUT makes a call to the Universal Radio Communication Tester. 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 22**

**ANSI/TIA/EIA-603-C 2004**

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



## 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

##### **EIRP / ERP MEASUREMENT:**

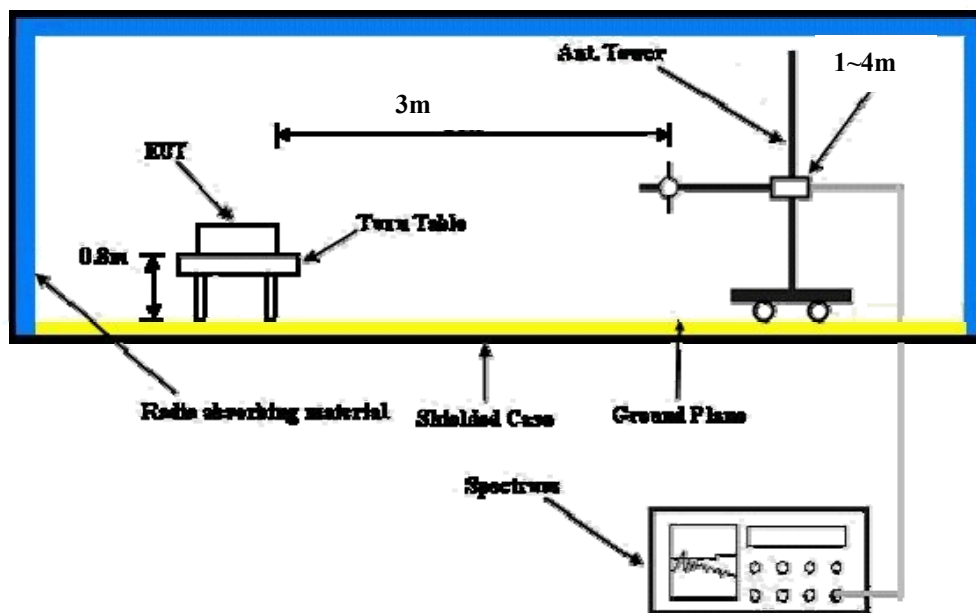
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for CDMA mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$  E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15\text{dBi.}$

##### **CONDUCTED POWER MEASUREMENT:**

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

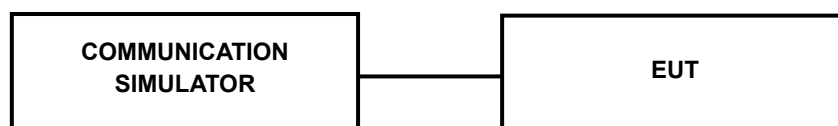
### 4.1.3 TEST SETUP

#### EIRP / ERP 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 (dBm)

Band	CDMA2000 BC0		
Channel	1013	384	777
Frequency (MHz)	824.7	836.52	848.31
1xRTT RC1+SO55	24.05	24.22	24.23
1xRTT RC3+SO55	24.19	24.32	24.26
1xRTT RC3+SO32(+ F-SCH)	24.18	24.31	24.25
1xRTT RC3+SO32(+SCH)	24.25	24.36	24.32
1x EVDO Rev.0 RTAP 153.6	24.24	24.37	24.31
1x EVDO Rev.A RETAP 4096	24.26	24.36	24.28

##### ERP POWER (dBm)

Channel	Freq. (MHz)	Antenna polarity	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1013	824.7	H	-13.26	17.91	0.02	17.93	38.45	-20.52
1013	824.7	V	-17.70	11.63	0.02	11.65	38.45	-26.80
384	836.52	H	-12.74	17.56	0.29	17.85	38.45	-20.60
384	836.52	V	-16.43	13.41	0.29	13.70	38.45	-24.75
777	848.31	H	-13.10	17.11	0.50	17.61	38.45	-20.84
777	848.31	V	-18.64	12.08	0.50	12.58	38.45	-25.87

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

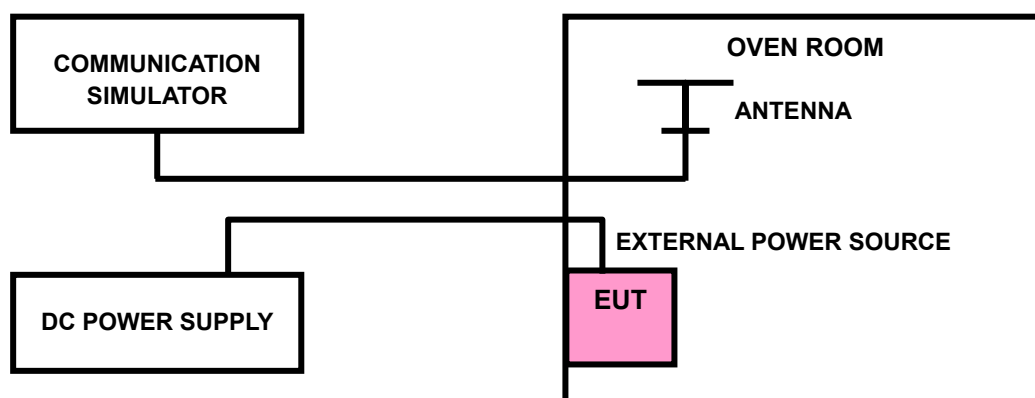
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 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)
12.76	-0.025	2.5
11.1	-0.020	2.5
9.43	-0.027	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from 9.43Vdc to 12.76Vdc.

##### FREQUENCY ERROR vs. TEMPERATURE.

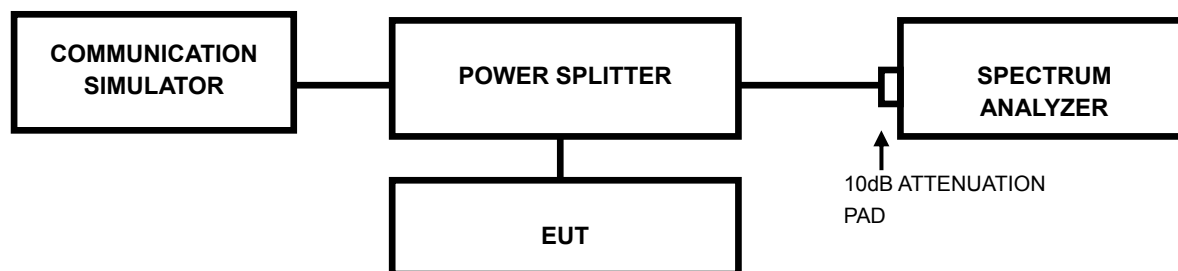
TEMP. (°C)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
50	-0.037	2.5
40	-0.029	2.5
30	-0.024	2.5
20	-0.020	2.5
10	-0.026	2.5
0	-0.032	2.5
-10	-0.041	2.5
-20	-0.044	2.5

### 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

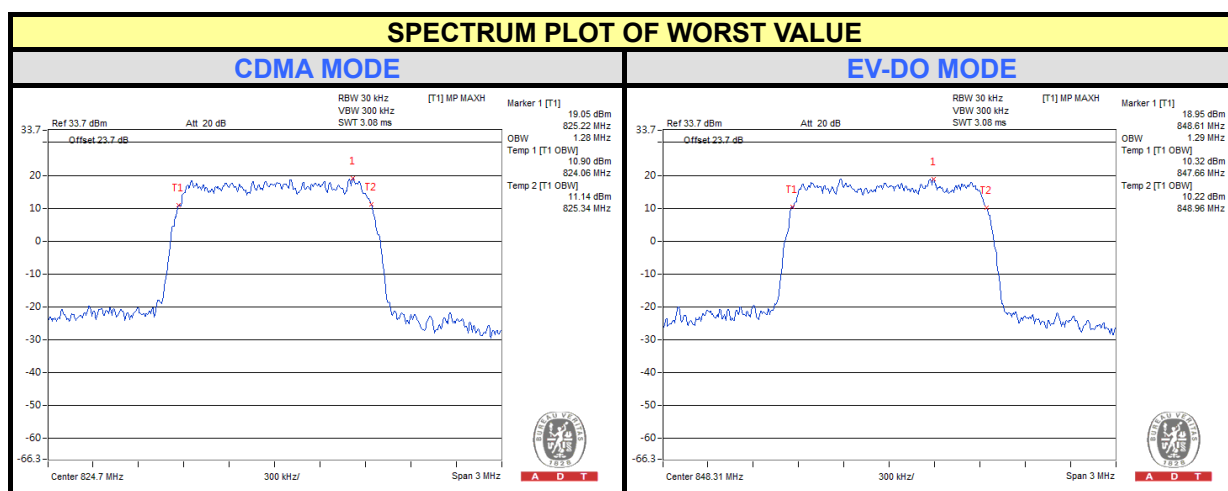




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### 4.3.3 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		CDMA MODE	EV-DO MODE
1013	824.70	1.28	1.28
384	836.52	1.28	1.28
777	848.31	1.28	1.29

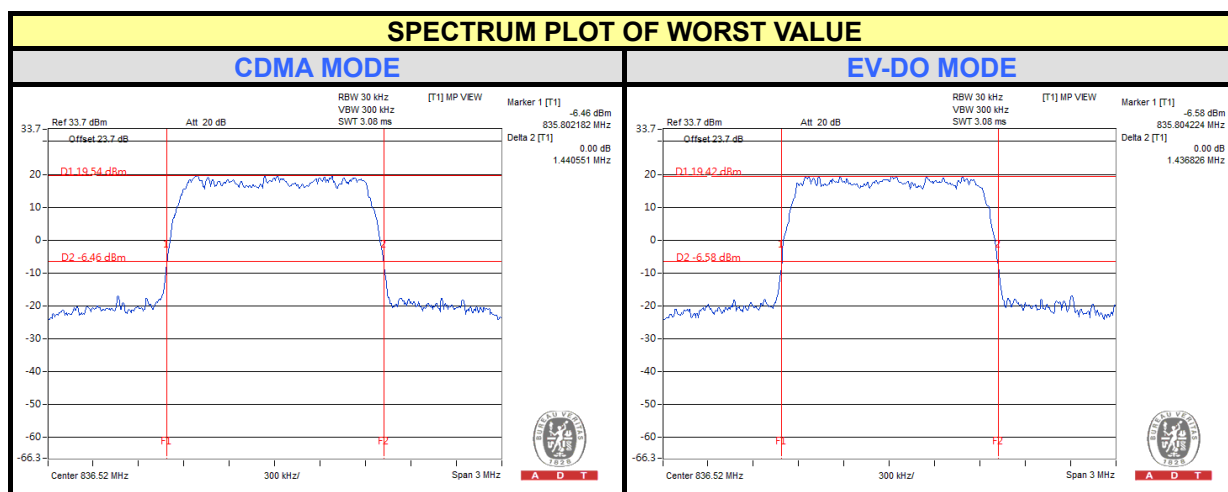






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CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (MHz)	
		CDMA MODE	EV-DO MODE
1013	824.70	1.43	1.43
384	836.52	1.44	1.44
777	848.31	1.43	1.43

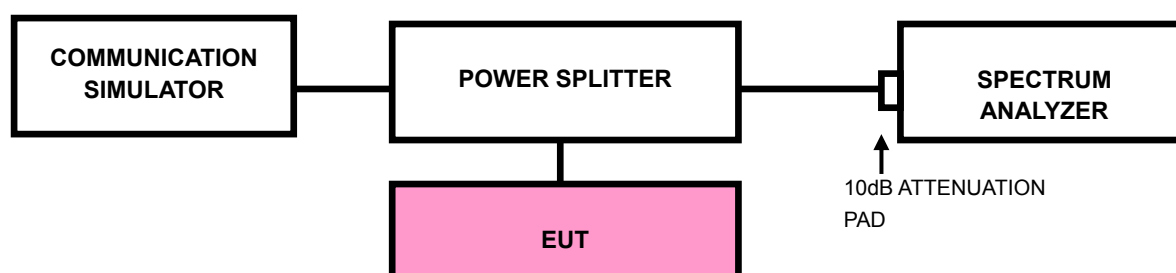


## 4.4 BAND EDGE MEASUREMENT

### 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



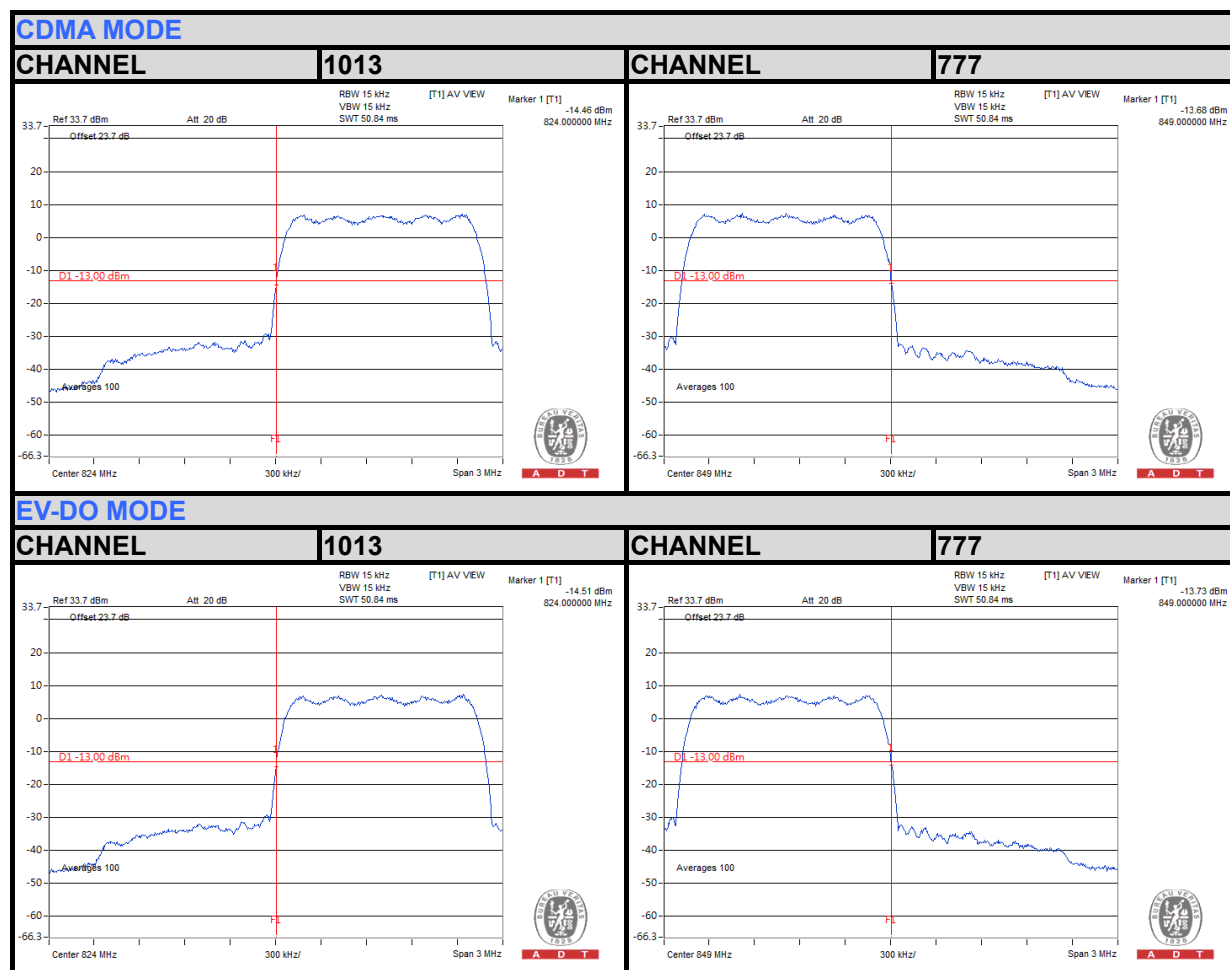
### 4.4.3 TEST PROCEDURES

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 2 MHz. RB of the spectrum is 15kHz and VB of the spectrum is 15kHz.
- Record the max trace plot into the test report.



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### 4.4.4 TEST RESULTS



## 4.5 CONDUCTED SPURIOUS EMISSIONS

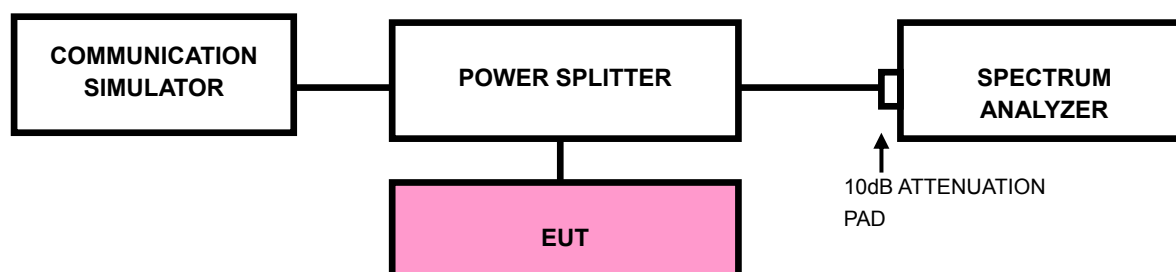
### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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  $-13\text{dBm}$ .

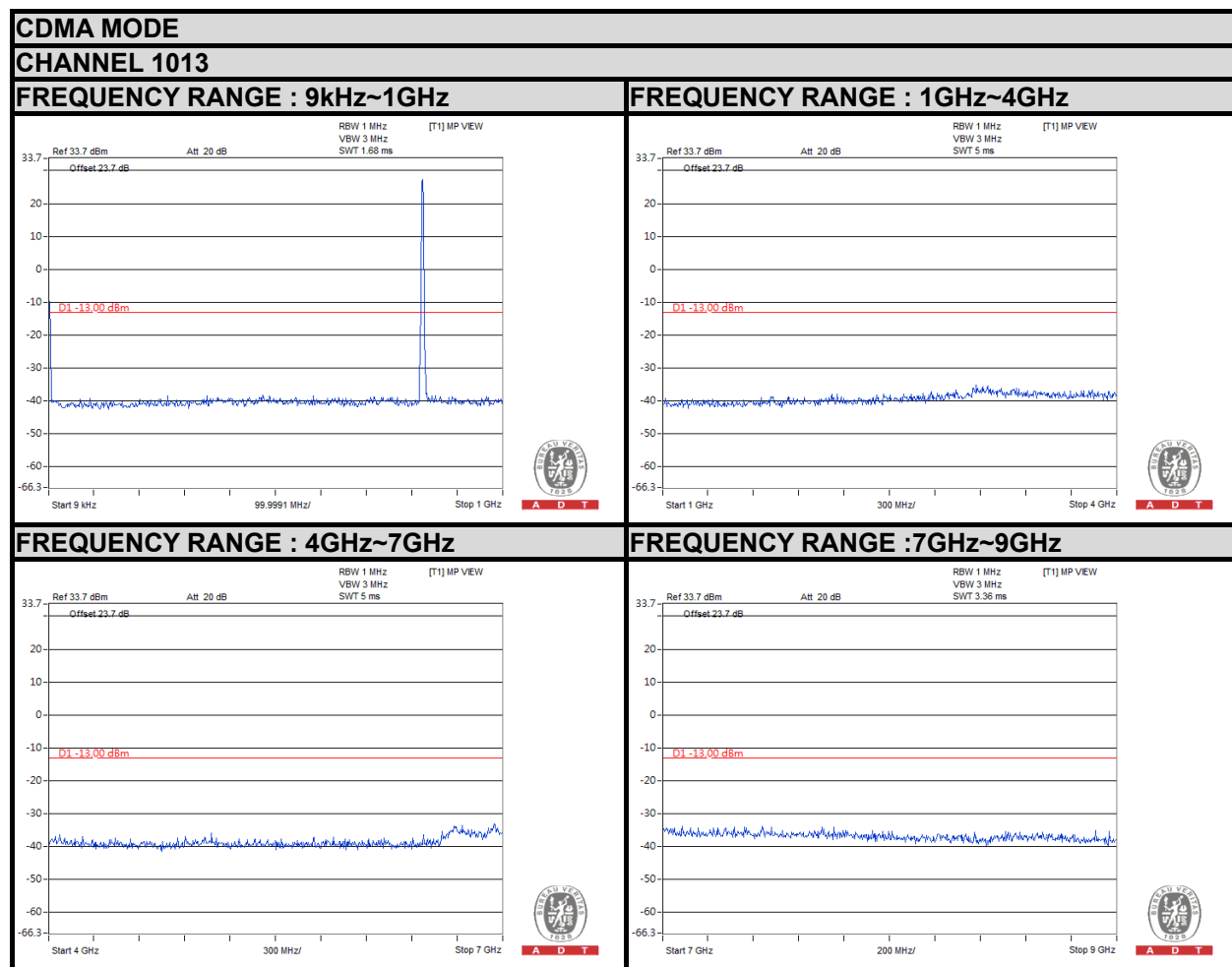
### 4.5.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 9kHz to 9GHz. 10dB 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

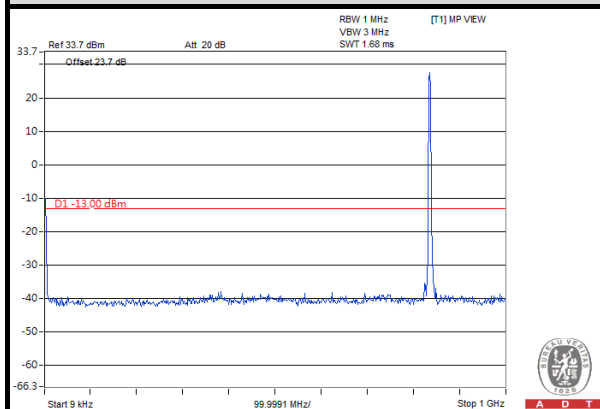




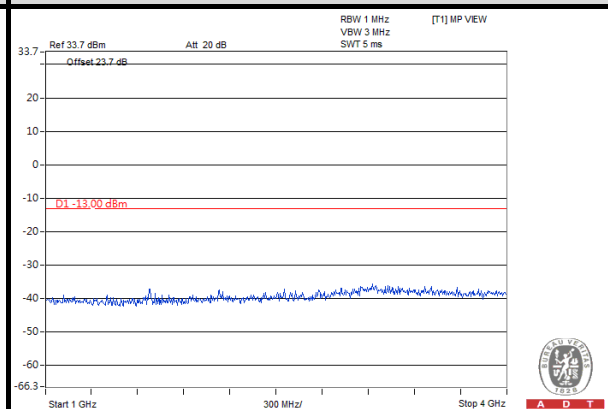
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### CHANNEL 384

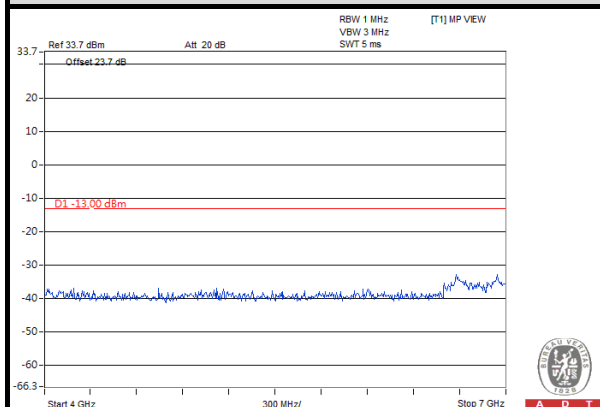
#### FREQUENCY RANGE : 9kHz~1GHz



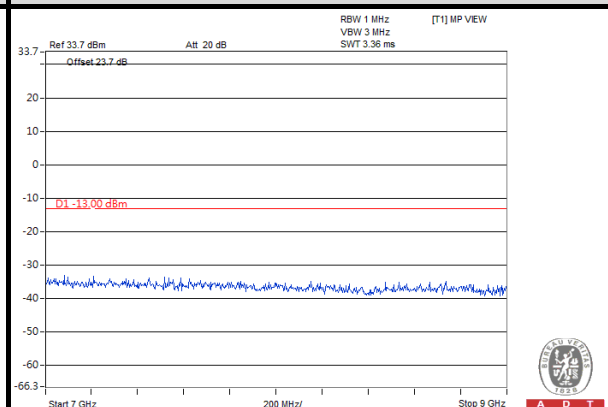
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz

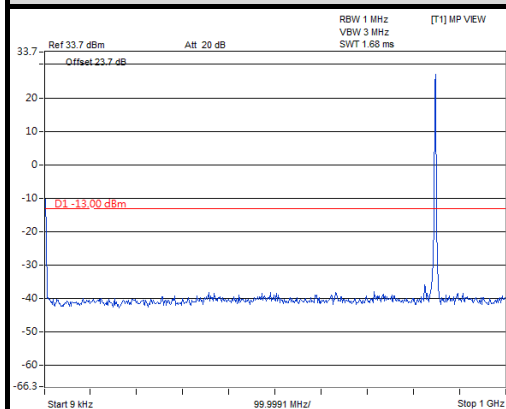




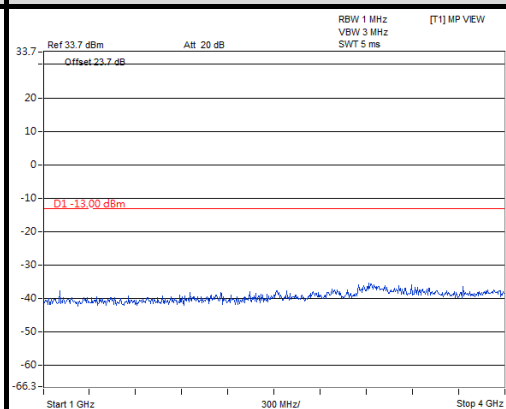
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### CHANNEL 777

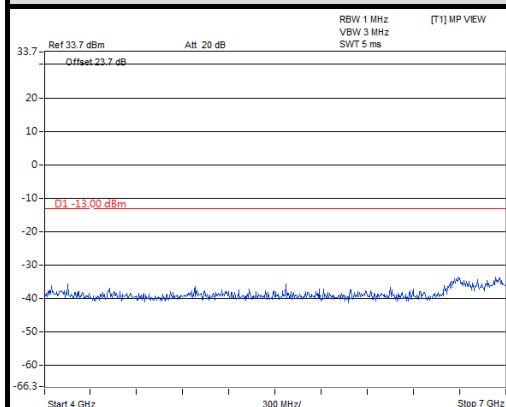
#### FREQUENCY RANGE : 9kHz~1GHz



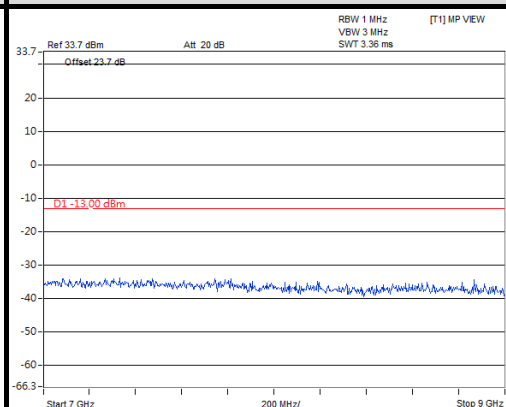
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



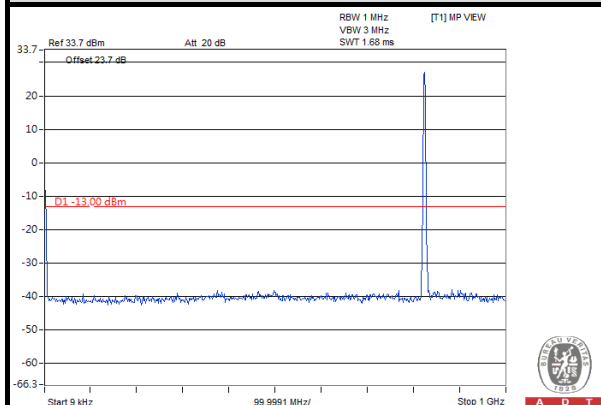


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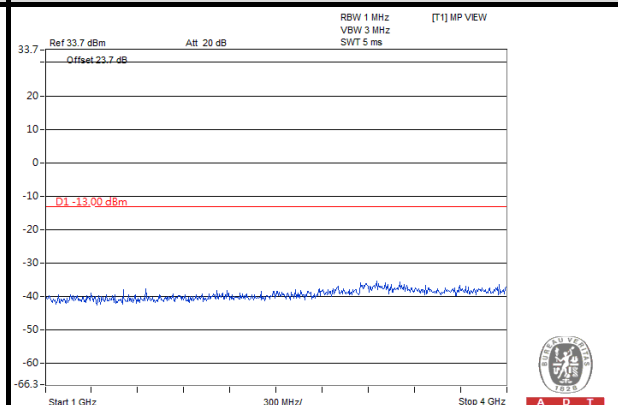
### EV-DO MODE

### CHANNEL 1013

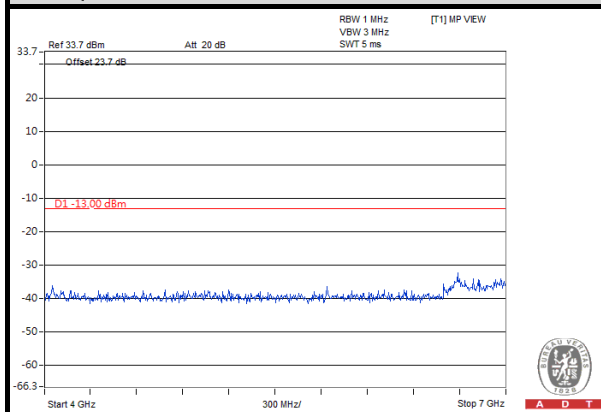
#### FREQUENCY RANGE : 9kHz~1GHz



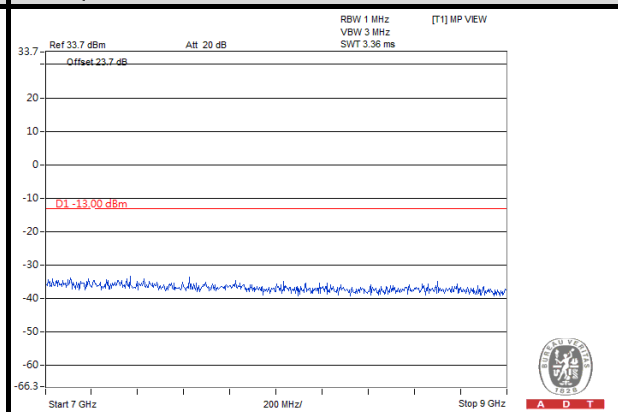
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



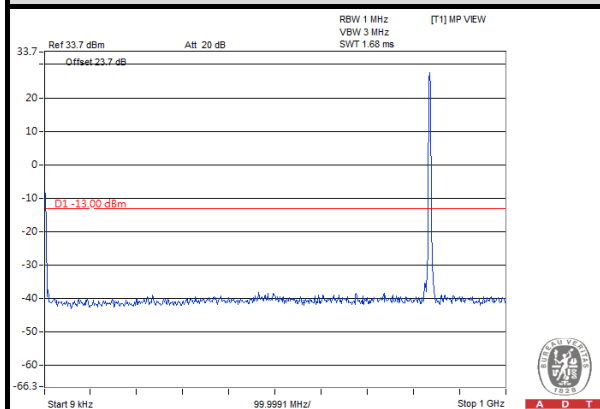




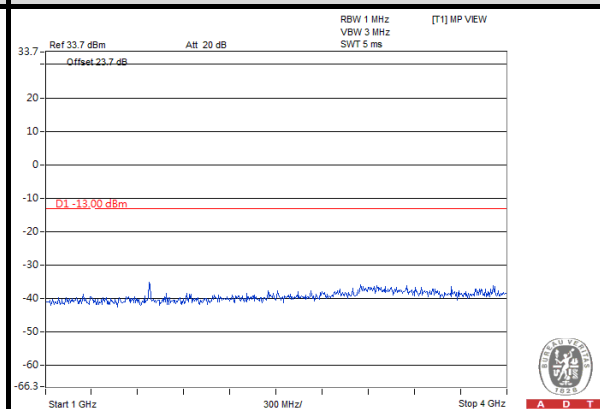
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### CHANNEL 384

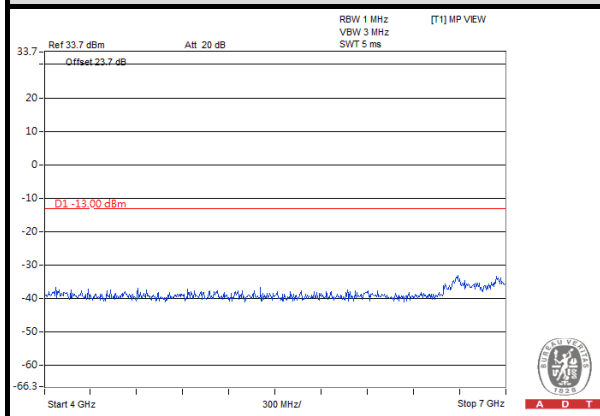
#### FREQUENCY RANGE : 9kHz~1GHz



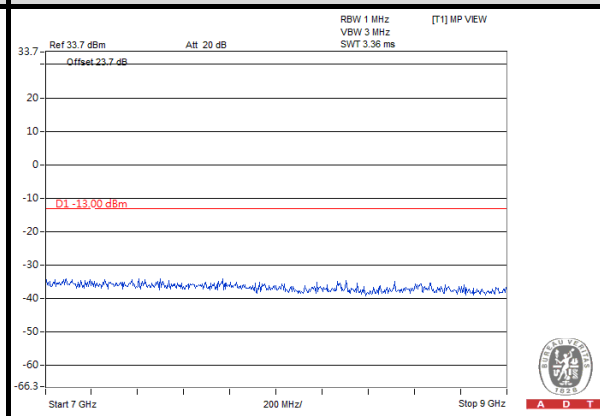
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz

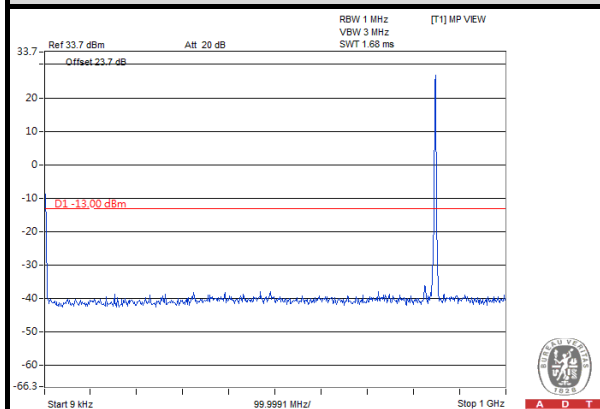




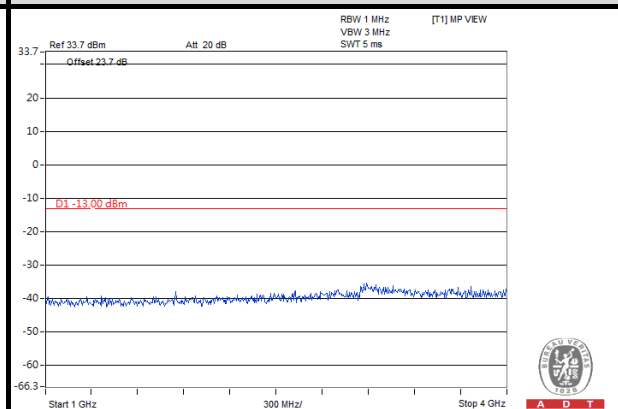
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### CHANNEL 777

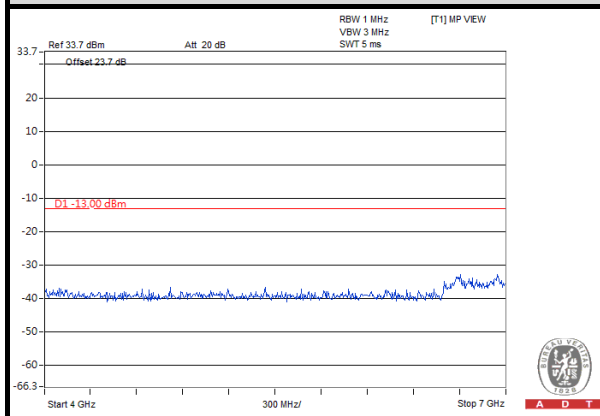
#### FREQUENCY RANGE : 9kHz~1GHz



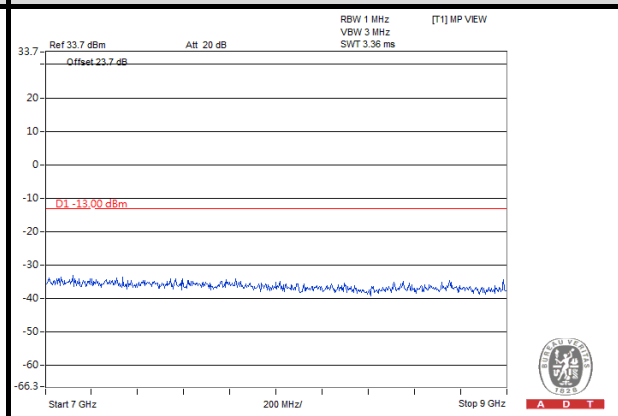
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz





## 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  $-13\text{dBm}$ .

### 4.6.2 TEST PROCEDURES

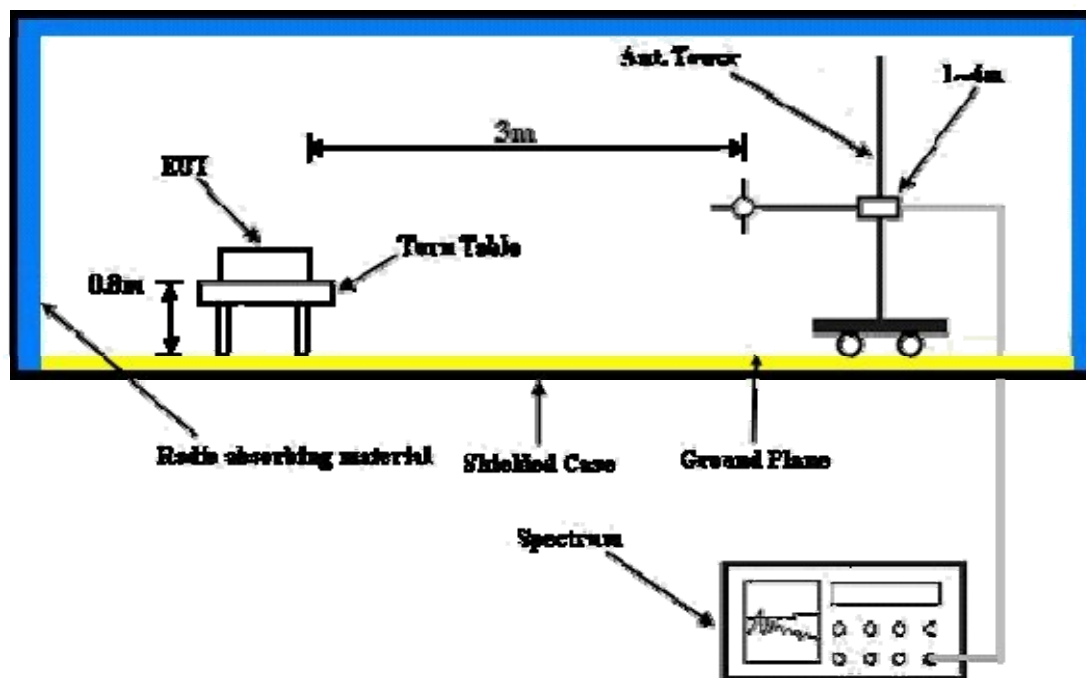
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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

## FOR EVDO MODE:

## Below 1GHz

<b>MODE</b>	TX channel 1013	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-56.71	-42.31	-12.61	-54.92	-13.00	-41.92
2	45.55	-55.29	-44.20	-10.47	-54.67	-13.00	-41.67
3	168.02	-51.28	-59.11	1.40	-57.71	-13.00	-44.71
4	203.01	-54.79	-68.15	5.47	-62.68	-13.00	-49.68
5	311.86	-57.15	-68.13	5.15	-62.98	-13.00	-49.98
6	399.34	-63.77	-71.25	5.28	-65.97	-13.00	-52.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	43.61	-43.35	-40.56	-10.79	-51.35	-13.00	-38.35
2	55.27	-42.43	-42.13	-8.62	-50.75	-13.00	-37.75
3	86.37	-43.49	-48.90	0.13	-48.77	-13.00	-35.77
4	123.31	-47.90	-54.73	0.01	-54.72	-13.00	-41.72
5	173.85	-53.59	-57.64	2.13	-55.51	-13.00	-42.51
6	467.37	-63.61	-69.39	5.01	-64.38	-13.00	-51.38

## REMARKS:

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



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**Above 1GHz**

<b>MODE</b>	Channel 1013	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH
<b>TESTED BY</b>	Sun Lin		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-44.10	-46.83	5.48	-41.35	-13.00	-28.35
2	2474.10	-52.80	-52.75	6.43	-46.32	-13.00	-33.32
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-46.80	-51.46	5.48	-45.98	-13.00	-32.98
2	2474.10	-51.10	-50.90	6.43	-44.47	-13.00	-31.47

**REMARKS:**

1.  $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$ .
2. Correction Factor = gain of substitution antenna + cable loss



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<b>MODE</b>	Channel 384	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH
<b>TESTED BY</b>	Sun Lin		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.04	-42.42	-45.25	5.54	-39.71	-13.00	-26.71
2	2509.56	-47.20	-47.00	6.45	-40.55	-13.00	-27.55
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.04	-44.20	-48.83	5.54	-43.29	-13.00	-30.29
2	2509.56	-47.60	-47.37	6.45	-40.92	-13.00	-27.92

**REMARKS:**

1.  $ERP(dBm) = S.G\ Power\ Value\ (dBm) + Correction\ Factor\ (dB)$ .
2. Correction Factor = gain of substitution antenna + cable loss



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<b>MODE</b>	Channel 777	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH
<b>TESTED BY</b>	Sun Lin		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.62	-45.78	-48.70	5.59	-43.11	-13.00	-30.11
2	2544.93	-48.62	-48.17	6.44	-41.73	-13.00	-28.73
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.62	-46.70	-51.29	5.59	-45.70	-13.00	-32.70
2	2544.93	-48.82	-48.66	6.44	-42.22	-13.00	-29.22

**REMARKS:**

1.  $ERP(dBm) = S.G\ Power\ Value\ (dBm) + Correction\ Factor\ (dB)$ .
2. Correction Factor = gain of substitution antenna + cable loss





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## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 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:

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Fax: 886-2-26051924

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Fax: 886-3-5935342

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Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://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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## **7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

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

**---END---**