



# FCC TEST REPORT (PART 24)

**REPORT NO.:** RF111221C21-6

**MODEL NO.:** PJ53100

**FCC ID:** NM8PJ53100

**RECEIVED:** Dec. 21, 2011

**TESTED:** Jan. 05 ~ Jan. 09, 2012

**ISSUED:** Jan. 19, 2012

**APPLICANT:** HTC Corporation

**ADDRESS:** 23, Xinghua Rd., Taoyuan 330, 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.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Jan. 19, 2012



# 1 CERTIFICATION

**PRODUCT:** Smartphone  
**MODEL NO.:** PJ53100  
**BRAND:** HTC  
**APPLICANT:** HTC Corporation  
**TEST SAMPLE:** Production Unit  
**TESTED:** Jan. 05 ~ Jan. 09, 2012  
**TEST STANDARDS:** **FCC Part 24, Subpart E**  
ANSI C63.4-2003

The above equipment (model: PJ53100) 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 : Jan. 19, 2012  
Pettie Chen / Specialist

APPROVED BY :  , DATE : Jan. 19, 2012  
Gary Chang / Technical Manager

## 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 AND LIMIT	RESULT	REMARK
2.1046 24.232	Maximum Peak Output Power Limit: max. 2 watts e.i.r.p peak power	PASS	Meet the requirement of limit. Max. e.i.r.p is 24.49dBm at 1880.0 MHz.
2.1055 24.235	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. +/-2.5ppm	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 -17.38dB at 3760.00MHz.

### 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	9kHz~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.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Smartphone	
<b>MODEL NO.</b>	PJ53100	
<b>FCC ID</b>	NM8PJ53100	
<b>POWER SUPPLY</b>	5.0Vdc (adapter or host equipment) 3.7Vdc or 3.8Vdc (Li-ion battery)	
<b>MODULATION TYPE</b>	<b>CDMA</b>	QPSK, OQPSK, HPSK
<b>FREQUENCY RANGE</b>	<b>CDMA</b>	1851.25MHz ~ 1908.75MHz
<b>MAX. EIRP POWER</b>	<b>CDMA</b>	0.28Watts
<b>ANTENNA TYPE</b>	Fixed Internal antenna with -1dBi gain	
<b>I/O PORTS</b>	Refer to users' manual	
<b>DATA CABLE</b>	Refer to Note as below	
<b>ACCESSORY DEVICES</b>	Refer to Note as below	

**NOTE:**

1. The EUT's accessories list refers to Ext Pho\_NM8PJ53100.
2. 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 DESCRIPTION OF TEST MODES

The device includes CDMA and EV-DO transmitter. CDMA transmitter only supports 1x RTT without EV-DO mode. EV-DO transmitter only supports EV-DO without 1x RTT mode.

	CHANNEL	FREQUENCY	TX MODE
LOW	25	1851.25 MHz	1xEVDO Rev. 0 & Rev. A
MIDDLE	600	1880.00 MHz	1xEVDO Rev. 0 & Rev. A
HIGH	1175	1908.75 MHz	1xEVDO Rev. 0 & Rev. A

**NOTE:**

1. Below 1 GHz, the channel 25, 600 and 1175 were pre-tested in chamber. The channel 600 was the worst case and chosen for final test.
2. Above 1 GHz, the channel 600 was tested individually.
3. The channel space is 0.05MHz.

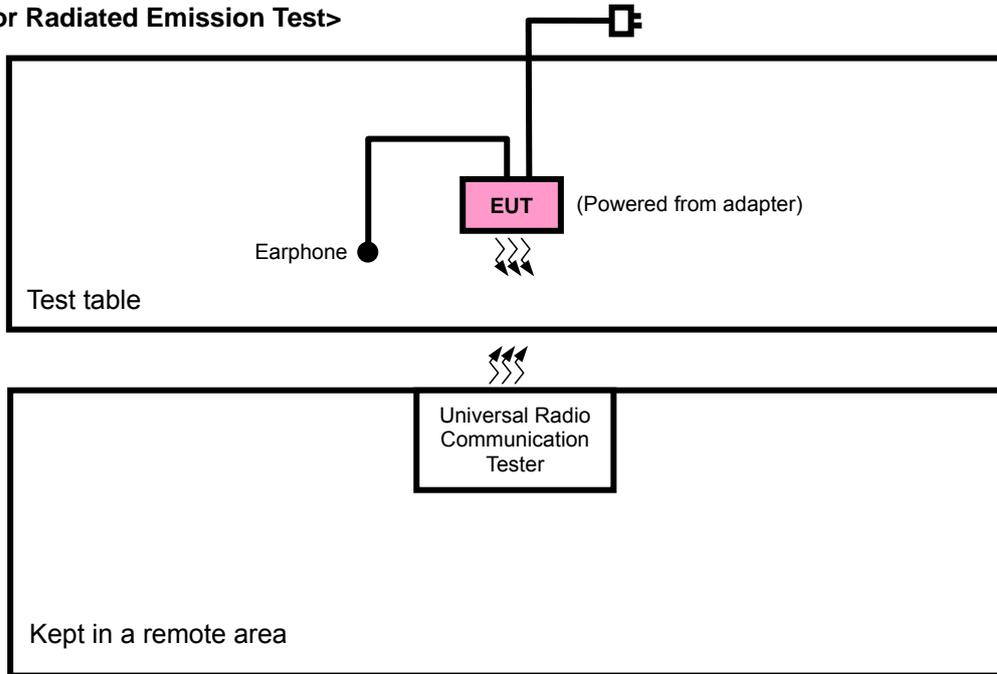
	CHANNEL	FREQUENCY	TX MODE
LOW	25	1851.25 MHz	CDMA2000
MIDDLE	600	1880.00 MHz	CDMA2000
HIGH	1175	1908.75 MHz	CDMA2000

**NOTE:**

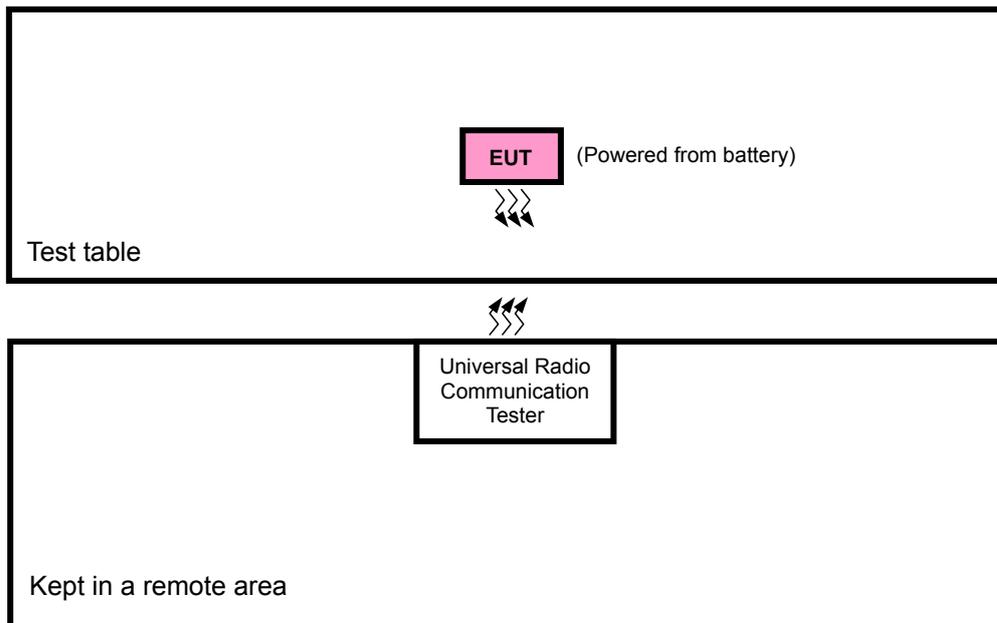
1. Below 1 GHz, the channel 25, 600 and 1175 were pre-tested in chamber. The channel 600 was the worst case and chosen for final test.
2. Above 1 GHz, the channel 600 was tested individually.
3. The channel space is 0.05MHz.

### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

#### <For Radiated Emission Test>



#### <For Output Power Test>





### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

**FOR CDMA:**

EUT CONFIGURE MODE	APPLICABLE TO						DESCRIPTION
	OP	FS	OB	BE	CE	RE	
-	√	√	√	√	√	√	-

Where **OP:** Output power **FS:** Frequency stability  
**OB:** Occupied bandwidth **BE:** Band edge  
**CE:** Conducted spurious emissions **RE:** Radiated emission

**OUTPUT POWER MEASUREMENT:**

- 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 (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS
25 to 1175	25, 600, 1175	CDMA	Z
25 to 1175	25, 600, 1175	1xEVDO Rev. 0	Y

**FREQUENCY STABILITY MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
25 to 1175	600	CDMA

**OCCUPIED BANDWIDTH MEASUREMENT:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
25 to 1175	25, 600, 1175	CDMA

**BAND EDGE MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
25 to 1175	25, 1175	CDMA

**CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
25 to 1175	600	CDMA

**RADIATED EMISSION MEASUREMENT:**

- 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 (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS
25 to 1175	600	CDMA, 1xEVDO Rev. 0	X

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
OP	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
FS	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
OB	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
EM	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
BE	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
CE	25deg. C, 53%RH	3.8Vdc	Phoenix Chen
RE	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu



### 3.3 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 C63.4-2003**

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

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

### 3.4 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	Universal Radio Communication Tester	R&S	CMU200	104484	NA
2	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	NA

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

**NOTE 1:** All power cords of the above support units are non shielded (1.8m).

**NOTE 2:** Item 1-2 acted as a communication partners to transfer data.

## 4 TEST TYPES AND RESULTS

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 24.232(b) that “Mobile / Portable station are limited to 2 watts e.i.r.p” and 24.232(c) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 02, 2011	Aug. 01, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Jul. 21, 2011	Jul. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 13, 2011	Apr. 12, 2012
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2011	Aug. 24, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 20, 2011	Jul. 19, 2012
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 30, 2011	Aug. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 30, 2011	Aug. 29, 2012
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

- 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.

### 4.1.3 TEST PROCEDURES

#### **EIRP MEASUREMENT:**

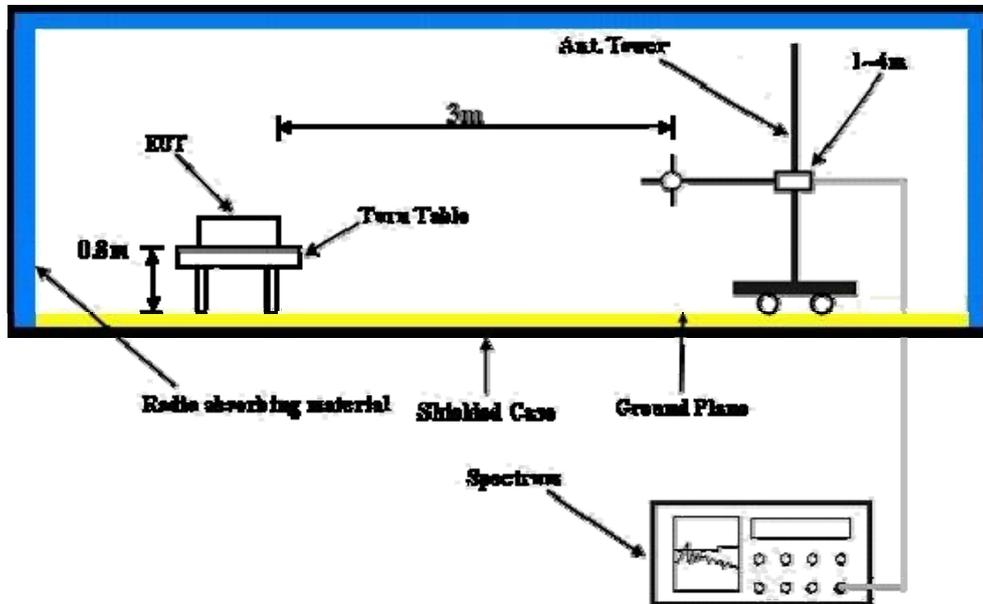
- a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 25, 600 and 1175 (CDMA) (low, middle and high operational frequency range.)
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, 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 c. 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:**

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

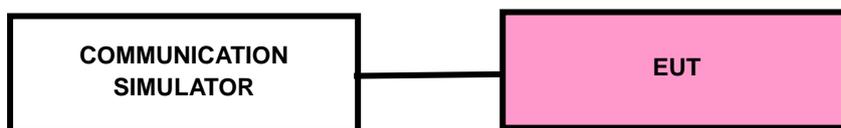
#### 4.1.4 TEST SETUP

##### EIRP POWER 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).

#### 4.1.5 EUT OPERATING CONDITIONS

- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

#### 4.1.6 TEST RESULTS

##### CONDUCTED OUTPUT POWER (dBm)

Band	CDMA2000 BC1		
Channel	25	600	1175
Frequency	1851.25	1880	1908.75
RC1+SO55	24.63	24.71	24.70
RC3+SO55	24.64	<b>24.72</b>	24.68
RC3+SO32(+ F-SCH)	24.58	24.66	24.63
RC3+SO32(+SCH)	24.65	24.69	24.63
RTAP 153.6	24.54	24.66	24.64
RETAP 4096	24.55	24.58	24.57

##### EIRP POWER

##### FOR CDMA MODE

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(W)	Polarization (H/V)
Z	25	1851.25	-16.06	38.19	22.13	0.16	H
	600	1880.0	-16.16	38.70	22.54	0.18	H
	1175	1908.75	-17.34	39.35	22.01	0.16	H
	25	1851.25	-16.82	38.48	21.66	0.15	V
	600	1880.0	-18.05	38.59	20.54	0.11	V
	1175	1908.75	-18.66	38.87	20.21	0.10	V

##### FOR 1xEVDO Rev. 0 MODE

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	ERP(W)	Polarization (H/V)
Y	25	1851.25	-23.10	38.19	15.09	0.03	H
	600	1880.0	-22.78	38.70	15.92	0.04	H
	1175	1908.75	-23.92	39.35	15.43	0.03	H
	25	1851.25	-14.02	38.48	24.46	0.28	V
	600	1880.0	-14.10	38.59	24.49	0.28	V
	1175	1908.75	-14.51	38.87	24.36	0.27	V

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

According to the FCC part 24.235 shall be tested the frequency stability. The rule is defined that” The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.” The frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 2.5ppm of the received frequency from the base station.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer Agilent	E4446A	MY43360128	Feb. 22, 2011	Feb. 21, 2012
Hewlett Packard RF cable	8120-6192	01428251	NA	NA
RF cable	SUCOFLEX 104	257029	Sep. 11, 2011	Sep. 10, 2012
WIT Standard Temperature & Humidity Chamber	MHU-225AU	920842	Jun. 15, 2011	Jun. 14, 2012

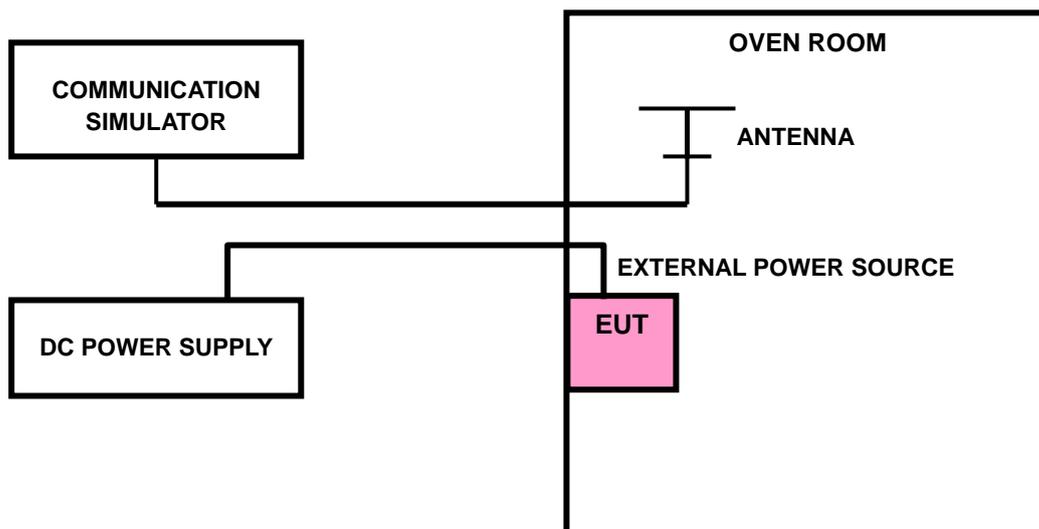
**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.2.3 TEST PROCEDURE

- a. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the CDMA link mode. This is accomplished with the use of the R&S CMU200 simulator station. The oven room could control the temperatures and humidity. The CDMA link channel is the 600.
- b. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- c. EUT is connected the external power supply to control the DC input power. The various Volts from the minimum 3.6Volts to 4.2Volts. Each step shall be record the frequency error rate.
- d. 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.
- e. 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 GSM simulator.

#### 4.2.4 TEST SETUP



## 4.2.5 TEST RESULTS

### FOR CDMA:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
3.8	2.63	0.00	2.5
3.6	4.35	0.00	2.5
4.2	-8.31	0.00	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.2Vdc.

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
-10	-3.46	0.00	2.5
0	-2.85	0.00	2.5
10	-2.73	0.00	2.5
20	-2.78	0.00	2.5
30	1.42	0.00	2.5
40	-3.14	0.00	2.5
50	-5.29	0.00	2.5
55	-4.77	0.00	2.5

### 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

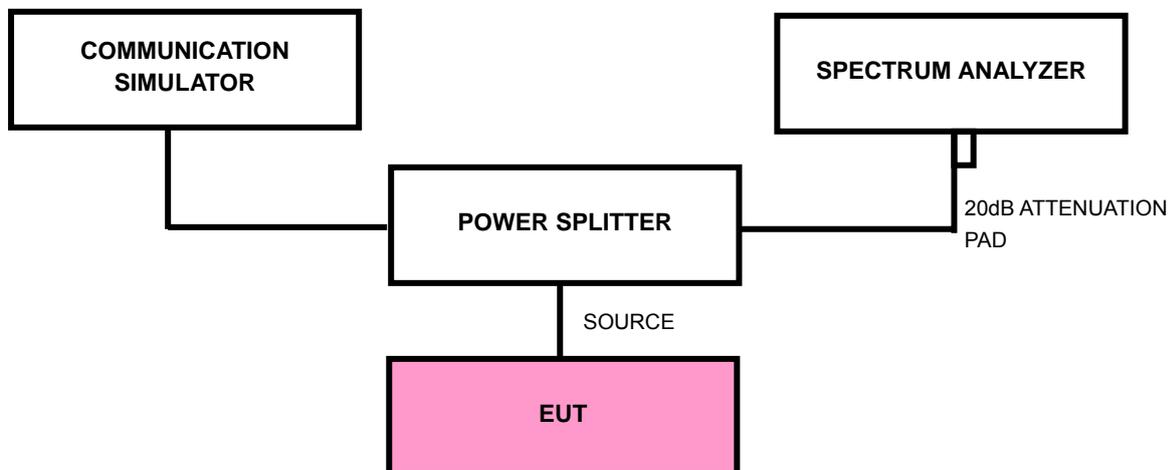
The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 25, 2011	May 24, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2011	Aug. 19, 2012
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2011	Aug. 18, 2012
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2011	Aug. 18, 2012
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST SETUP



#### 4.3.4 TEST PROCEDURES

- a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 25, 600 and 1175 (CDMA) (low, middle and high operational frequency range.)
- b. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. 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.

#### 4.3.5 EUT OPERATING CONDITION

- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled a EUT to export maximum and minimum output power under transmission mode and specific channel frequency.



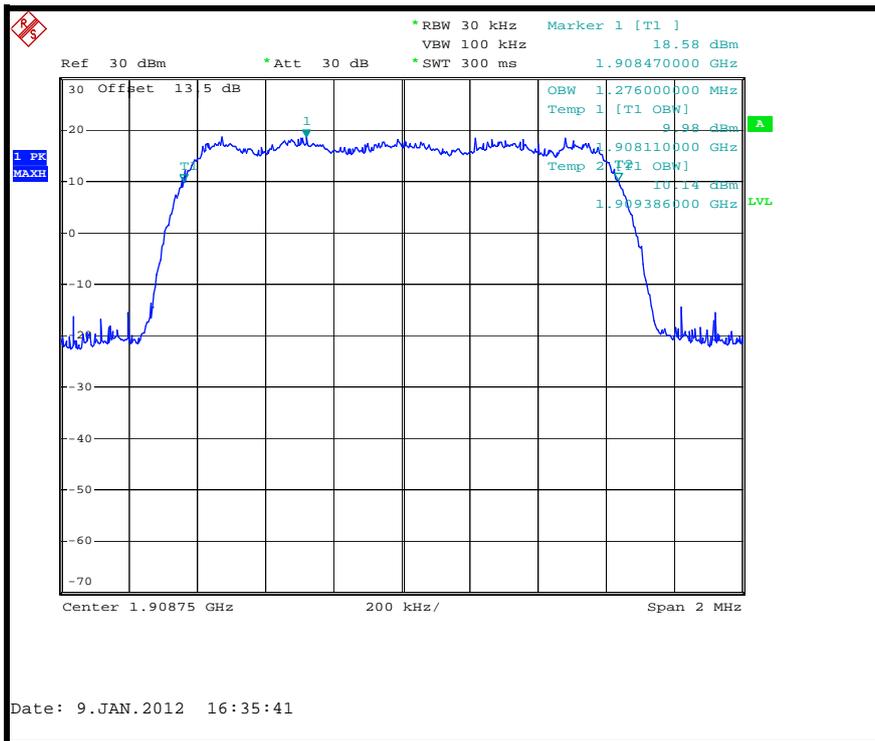
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### 4.3.6 TEST RESULTS

#### FOR CDMA MODE

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
25	1851.25	1.276
600	1880.00	1.272
1175	1908.75	1.276

#### CH 1175



## 4.4 BAND EDGE MEASUREMENT

### 4.4.1 LIMITS OF BAND EDGE MEASUREMENT

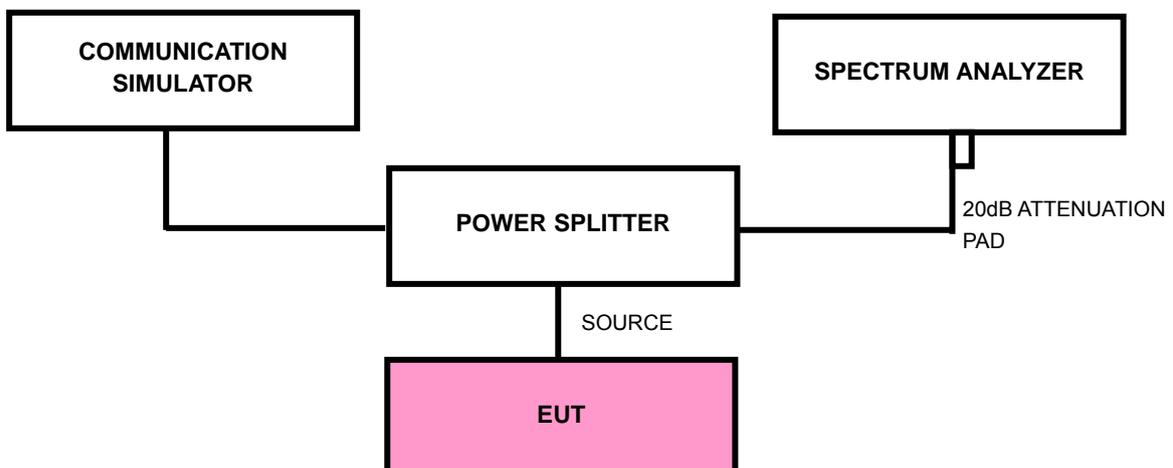
According to FCC 24.238(a) specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 25, 2011	May 24, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2011	Aug. 19, 2012
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2011	Aug. 18, 2012
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2011	Aug. 18, 2012
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST SETUP



#### 4.4.4 TEST PROCEDURES

- a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, 25 and 1175 (CDMA) (low and high operational frequency range.)
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 3 MHz. RB of the spectrum is 15kHz and VB of the spectrum is 15kHz (CDMA).
- d. Record the max trace plot into the test report.

#### 4.4.5 EUT OPERATING CONDITION

- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

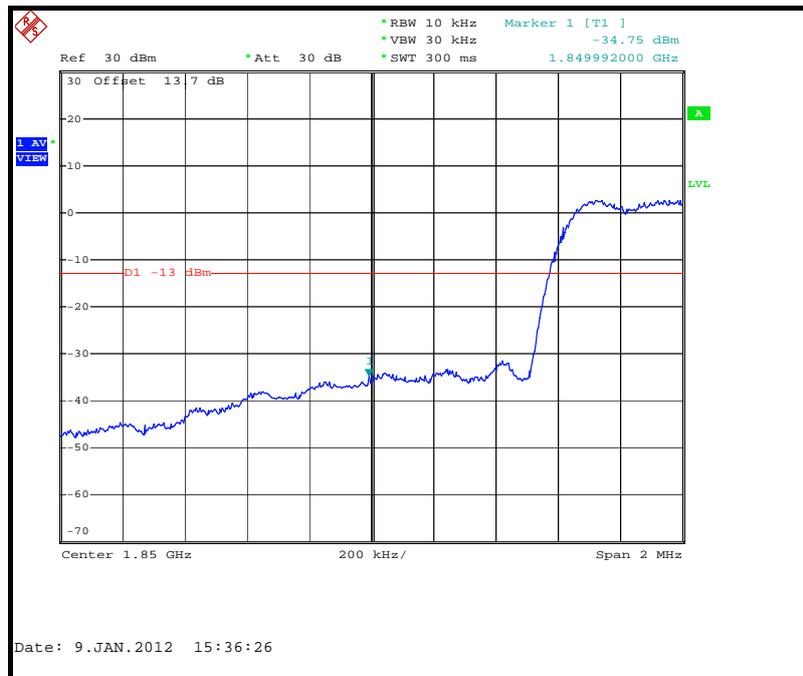


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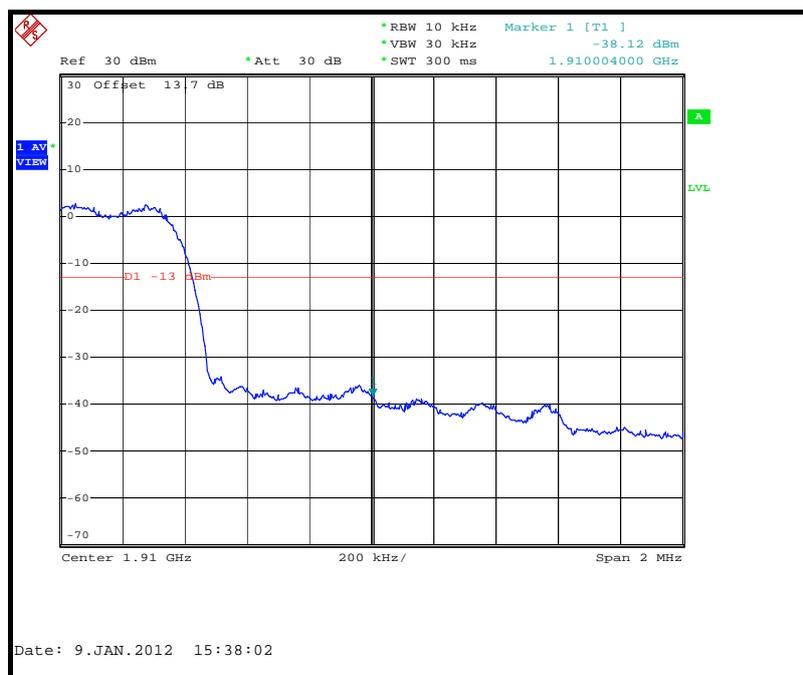
## 4.4.6 TEST RESULTS

### FOR CDMA MODE

#### LOWER BAND EDGE



#### HIGHER BAND EDGE





## 4.5 CONDUCTED SPURIOUS EMISSIONS

### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the limit of emission equal to  $-13\text{dBm}$ .

### 4.5.2 TEST INSTRUMENTS

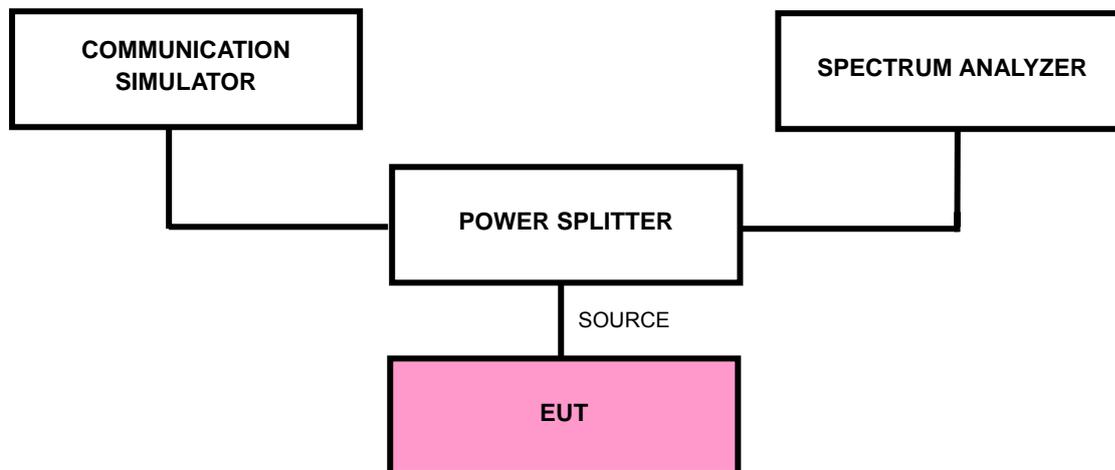
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 25, 2011	May 24, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2011	Aug. 19, 2012
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2011	Aug. 18, 2012
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2011	Aug. 18, 2012
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.5.3 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at channel 600 (CDMA).
- b. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. Measuring frequency range is from 30 MHz to 19.1GHz. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

#### 4.5.4 TEST SETUP



#### 4.5.5 EUT OPERATING CONDITIONS

- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

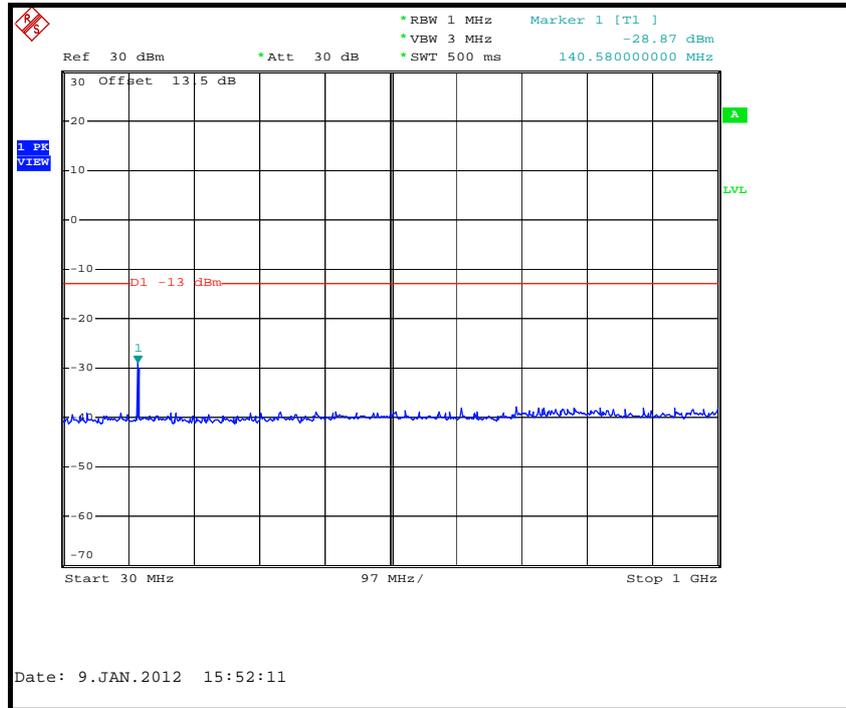


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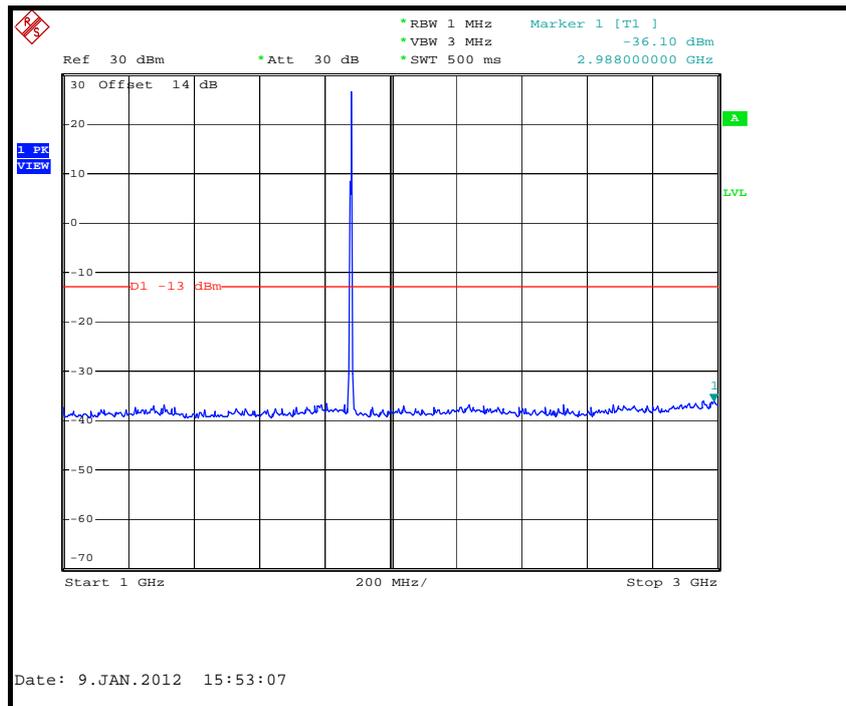
## 4.5.6 TEST RESULTS

FOR CDMA:

CH 600: 30MHz ~ 1GHz



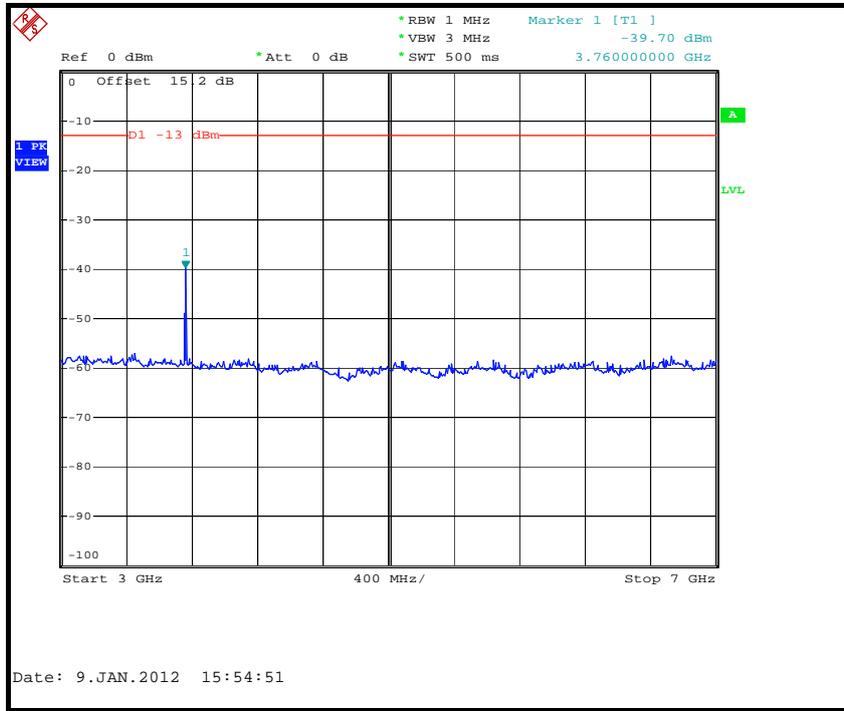
1GHz ~ 3GHz



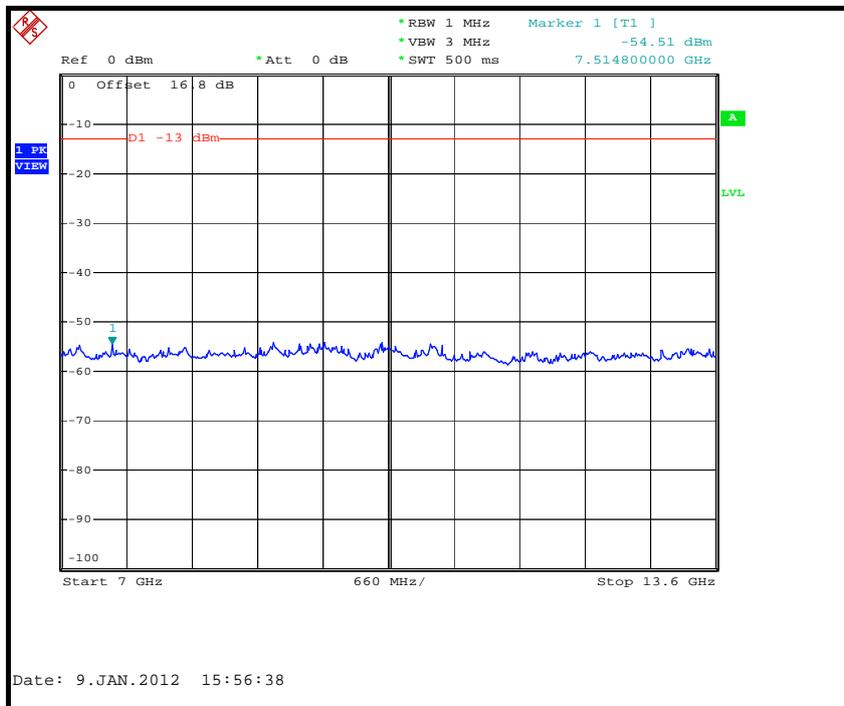


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### 3GHz ~ 7GHz



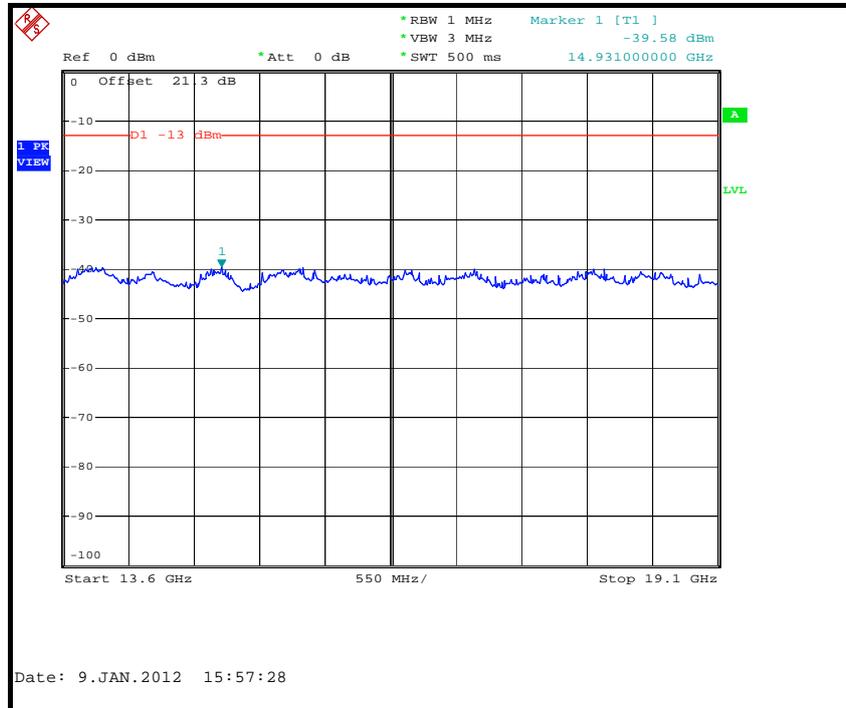
### 7GHz ~ 13.6GHz





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### 13.6GHz ~ 19.1GHz



## 4.6 RADIATED EMISSION MEASUREMENT

### 4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The emission of limit equal to  $-13\text{dBm}$ .

### 4.6.2 TEST INSTRUMENTS

Same as 4.1.2.

### 4.6.3 TEST PROCEDURES

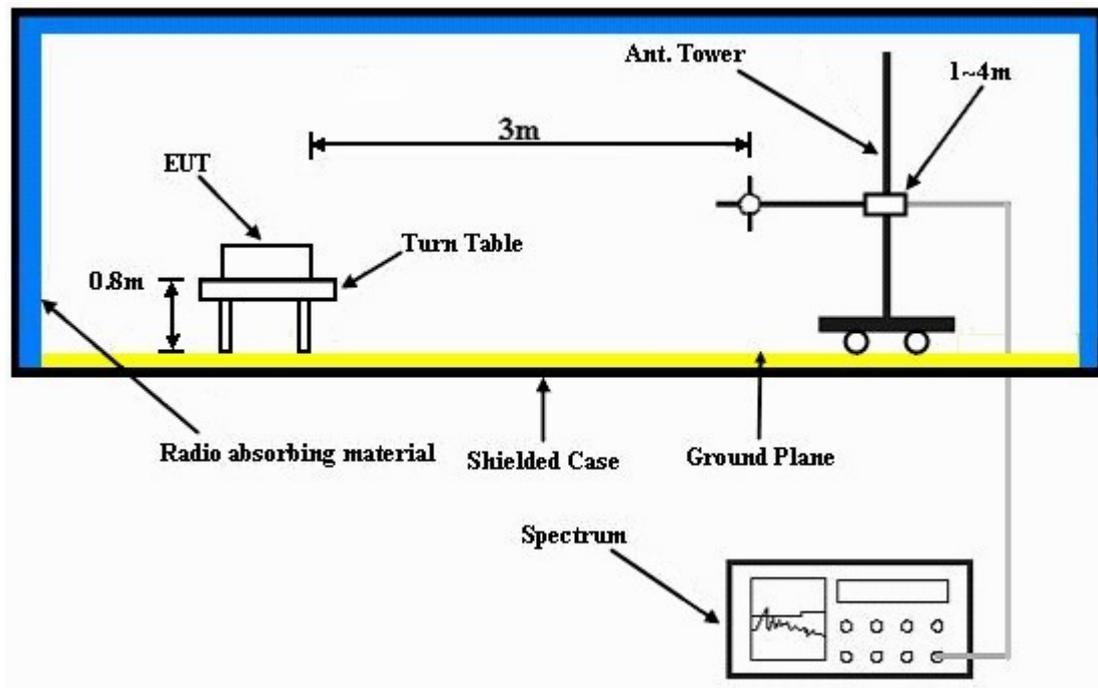
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .

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

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.5 TEST SETUP



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

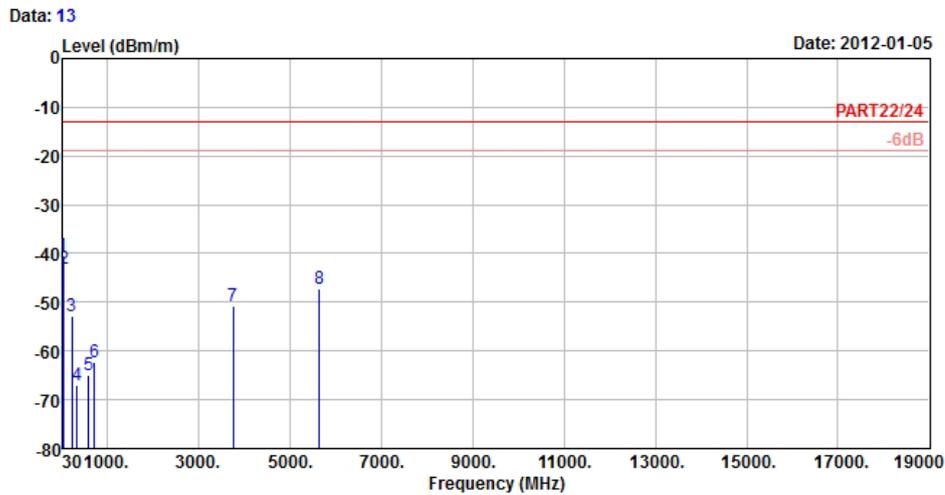
#### 4.6.6 EUT OPERATING CONDITIONS

- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

### 4.6.7 TEST RESULTS

#### FOR CDMA:

<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Kay Wu	<b>POLARIZATION</b>	Horizontal



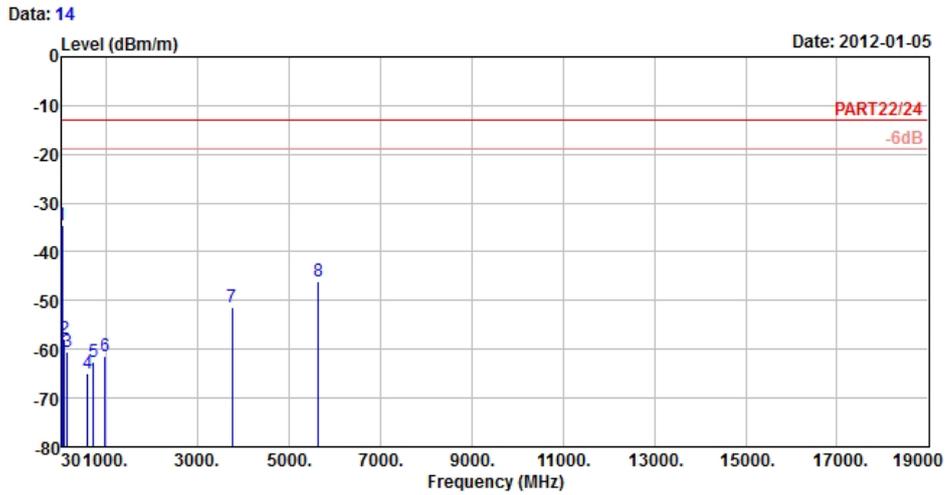
Site : 966 Chamber 2  
 Condition: PART22/24 3m EIRP\_RSE \_1~19G HORIZONTAL  
 EUT : RJ53100  
 Mode : CDMA1900 link CH600  
 Plane : X  
 Sample No: C111229-022-027-010

	Freq	Level	Limit	Read	Over	
	MHz	dBm/m	dBm/m	dBm	dB	dB/m
1 pp	33.24	-40.41	-13.00	-39.30	-27.41	-1.11 Peak
2	43.50	-43.05	-13.00	-41.79	-30.05	-1.26 Peak
3	218.46	-52.81	-13.00	-45.69	-39.81	-7.12 Peak
4	344.10	-67.02	-13.00	-60.97	-54.02	-6.05 Peak
5	598.90	-65.05	-13.00	-64.65	-52.05	-0.40 Peak
6	714.40	-62.26	-13.00	-63.81	-49.26	1.55 Peak
7	3760.00	-50.70	-13.00	-42.62	-37.70	-8.08 Peak
8	5640.00	-47.25	-13.00	-45.73	-34.25	-1.52 Peak



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<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Kay Wu	<b>POLARIZATION</b>	Vertical



Site : 966 Chamber 2  
 Condition: PART22/24 3m EIRP\_RSE \_1~19G VERTICAL  
 EUT : RJ53100  
 Mode : CDMA1900 link CH600  
 Plane : X  
 Sample No: C111229-022-027-010

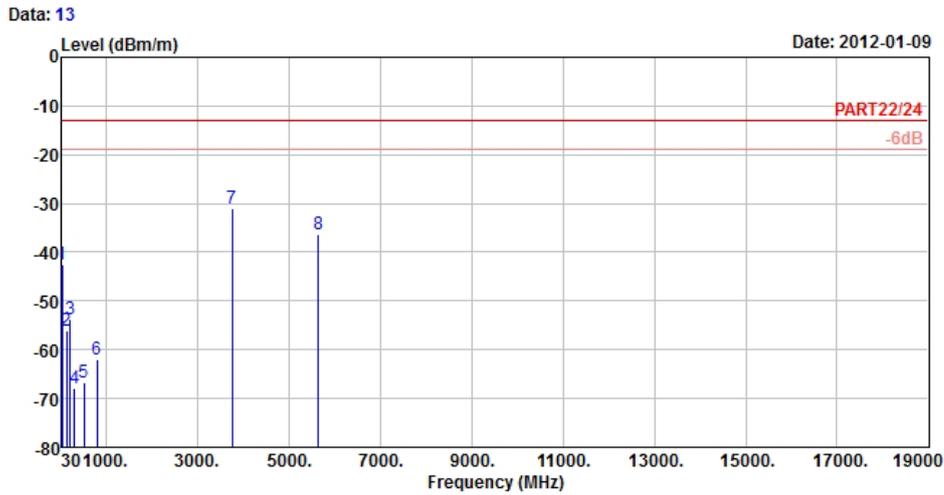
	Freq	Level	Limit	Read	Over		
	MHz	dBm/m	dBm/m	dBm	dB	dB/m	Remark
1	pp	30.81	-34.46	-13.00	-34.80	-21.46	0.34 Peak
2		89.40	-57.99	-13.00	-47.44	-44.99	-10.55 Peak
3		150.42	-60.49	-13.00	-54.13	-47.49	-6.36 Peak
4		591.90	-64.93	-13.00	-64.34	-51.93	-0.59 Peak
5		714.40	-62.70	-13.00	-64.25	-49.70	1.55 Peak
6		975.50	-61.37	-13.00	-65.56	-48.37	4.19 Peak
7		3760.00	-51.33	-13.00	-43.25	-38.33	-8.08 Peak
8		5640.00	-46.14	-13.00	-44.62	-33.14	-1.52 Peak



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FOR 1xEVDO Rev. 0:

ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Kay Wu	POLARIZATION	Horizontal



Site : 966 Chamber 2  
 Condition: PART22/24 3m EIRP\_RSE\_1G~19G HORIZONTAL  
 EUT : RJ53100  
 Mode : 1xEVDO 1900 link CH600  
 Plane : X  
 Sample No: C111229-022-027-010

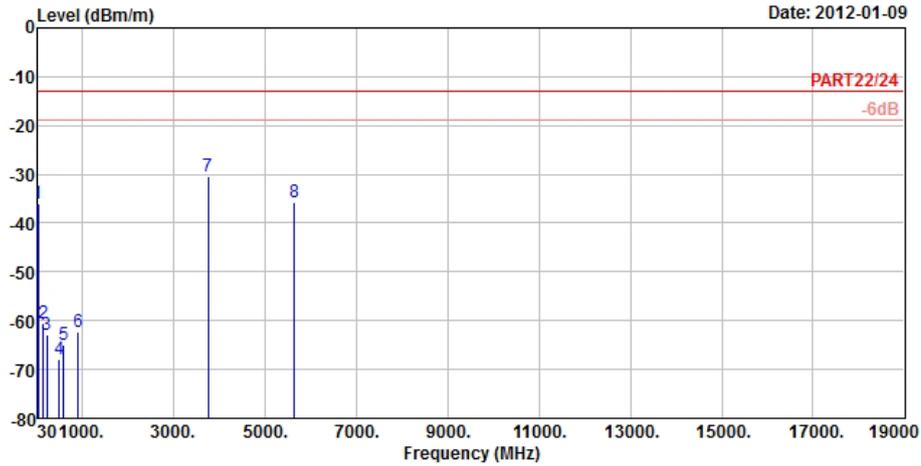
	Freq	Level	Limit	Read	Over		
	MHz	dBm/m	dBm/m	dBm	dB	dB/m	
1	35.94	-42.51	-13.00	-40.15	-29.51	-2.36	Peak
2	137.46	-56.13	-13.00	-49.94	-43.13	-6.19	Peak
3	213.87	-53.67	-13.00	-46.37	-40.67	-7.30	Peak
4	305.60	-67.92	-13.00	-61.58	-54.92	-6.34	Peak
5	517.70	-66.74	-13.00	-64.13	-53.74	-2.61	Peak
6	804.70	-62.12	-13.00	-64.28	-49.12	2.16	Peak
7 pp	3760.00	-30.86	-13.00	-22.78	-17.86	-8.08	Peak
8	5640.00	-36.17	-13.00	-34.65	-23.17	-1.52	Peak



A D T

<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Kay Wu	<b>POLARIZATION</b>	Vertical

Data: 14



Site : 966 Chamber 2  
 Condition: PART22/24 3m EIRP\_RSE \_1G~19G VERTICAL  
 EUT : RJ53100  
 Mode : 1XEVD0 1900 link CH600  
 Plane : X  
 Sample No: C111229-022-027-010

	Freq	Level	Limit	Read	Over		Remark
	MHz	dBm/m	dBm/m	dBm	dB	dB/m	
1	35.13	-35.93	-13.00	-33.36	-22.93	-2.57	Peak
2	150.42	-60.49	-13.00	-54.13	-47.49	-6.36	Peak
3	219.00	-62.87	-13.00	-55.79	-49.87	-7.08	Peak
4	499.50	-68.03	-13.00	-64.92	-55.03	-3.11	Peak
5	591.90	-64.93	-13.00	-64.34	-51.93	-0.59	Peak
6	909.00	-62.25	-13.00	-65.12	-49.25	2.87	Peak
7 pp	3760.00	-30.38	-13.00	-22.30	-17.38	-8.08	Peak
8	5640.00	-35.69	-13.00	-34.17	-22.69	-1.52	Peak



## 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.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

[www.adt.com.tw/index.5.phtml](http://www.adt.com.tw/index.5.phtml). 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: 886-3-3185050

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

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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

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

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

---END---