



# VARIANT FCC TEST REPORT (PART 24)

**REPORT NO.:** RF111221C21A-5

**MODEL NO.:** PJ53100

**FCC ID:** NM8PJ53100

**RECEIVED:** Feb. 01, 2012

**TESTED:** Feb. 22 ~ Feb. 24, 2012

**ISSUED:** Mar. 08, 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
RF111221C21A-5	Original release	Mar. 08, 2012



## 1 CERTIFICATION

**PRODUCT:** Smartphone  
**MODEL NO.:** PJ53100  
**BRAND:** HTC  
**APPLICANT:** HTC Corporation  
**TEST SAMPLE:** Production Unit  
**TESTED:** Feb. 22 ~ Feb. 24, 2012  
**TEST STANDARDS:** **FCC Part 24, Subpart E**  
ANSI C63.4-2003

This report is issued as a supplementary report of RF111221C21-6. This report shall be used by combining with its original report.

**PREPARED BY** : Ivonne Wu , **DATE** : Mar. 08, 2012  
Ivonne Wu / Senior Specialist

**APPROVED BY** : Gary Chang , **DATE** : Mar. 08, 2012  
Gary Chang / Technical Manager

**NOTE:** The radiated emission tests and e.i.r.p. peak power were performed for the addendum. Refer to original report for the other test data.

## 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 23.06dBm at 1851.25 MHz.
2.1055 24.235	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. +/-2.5ppm	NA	Refer to Note
2.1049 24.238(b)	Occupied Bandwidth	NA	Refer to Note
24.238(b)	Band Edge Measurements	NA	Refer to Note
2.1051 24.238	Conducted Spurious Emissions	NA	Refer to Note
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -15.78dB at 3760.00MHz.

**NOTE:** The radiated emission tests and e.i.r.p. peak power were performed for the addendum. Refer to original report for the other test data.

### 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
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>	0.20Watts
<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. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of BV ADT report No.: RF111221C21-6. The difference compared with the original report is adding an inductive cover. Therefore, radiated emission tests and e.i.r.p. peak power were performed and presented in the test report.
2. The EUT's accessories list refers to Ext Pho\_NM8PJ53100.
3. 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

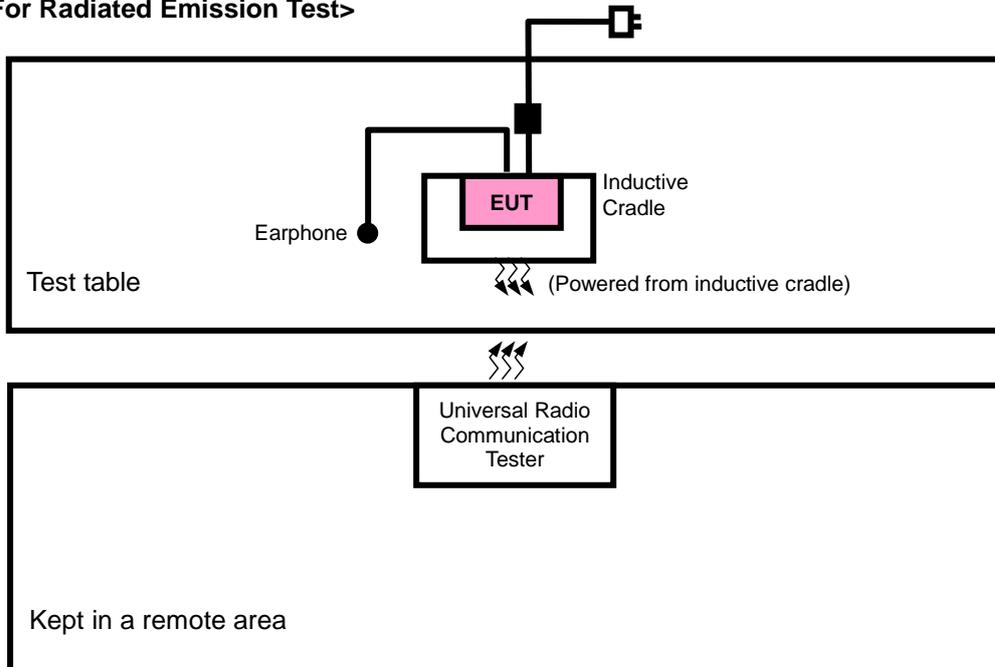
**NOTE:** The channel space is 0.05MHz.

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

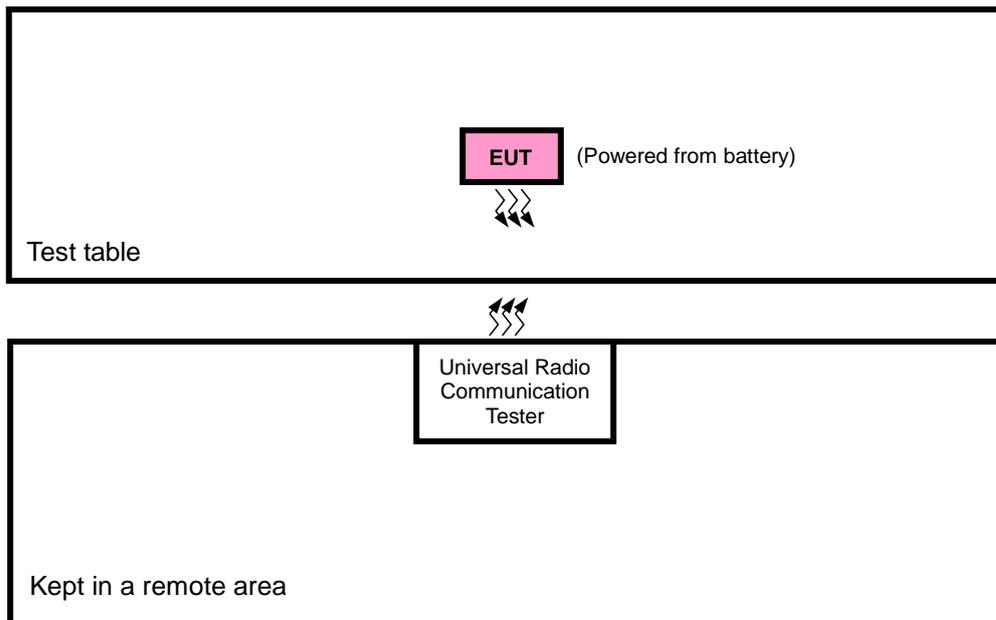
**NOTE:** The channel space is 0.05MHz.

### 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	RE	
-	√	√	-

Where OP: Output power 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	1xEVDO Rev. 0	Z

#### **RADIATED EMISSION MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	1xEVDO Rev. 0

#### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
OP	25deg. C, 65%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
3	Inductive Cradle	Energizer	IC2B	NA	NA

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

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

**NOTE 2:** Item 1-3 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 Agilent	N9038A	MY51210203	Dec. 22, 2011	Dec. 21, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2011	Dec. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 20, 2011	Dec. 19, 2012
Preamplifier EMCI	EMC 012645	980115	Dec. 30, 2011	Dec. 29, 2012
Preamplifier EMCI	EMC 330H	980112	Dec. 30, 2011	Dec. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 21, 2011	Oct. 20, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Jan. 02, 2012	Jan. 01, 2013
RF signal cable Worken	RG-213	NA	Jan. 02, 2012	Jan. 01, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	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 9.
  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 IC 7450F-4.

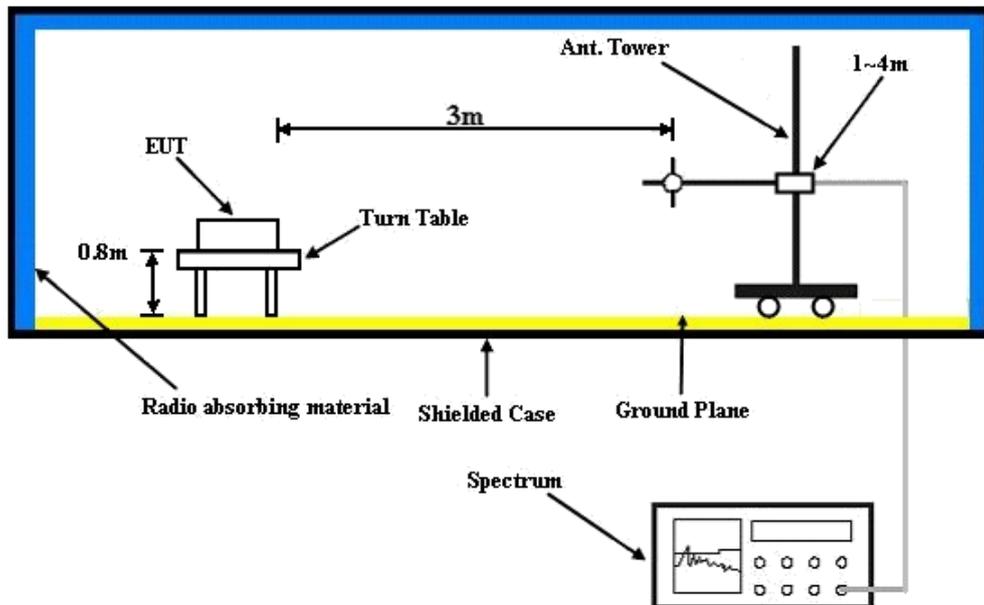
### 4.1.3 TEST PROCEDURES

#### **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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$

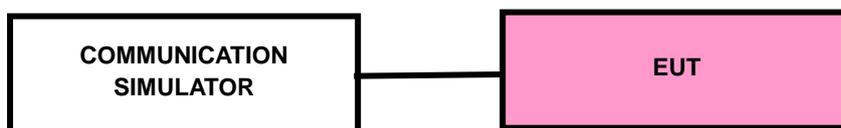
#### 4.1.4 TEST SETUP

##### 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

##### EIRP POWER

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

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	ERP(W)	Polarization (H/V)
Z	25	1851.25	-15.13	38.19	23.06	0.20	H
	600	1880.0	-16.54	38.70	22.16	0.16	H
	1175	1908.75	-17.82	39.35	21.53	0.14	H
	25	1851.25	-18.59	38.48	19.89	0.10	V
	600	1880.0	-19.32	38.59	19.27	0.08	V
	1175	1908.75	-20.86	38.87	18.01	0.06	V

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 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  $-13\text{dBm}$ .

### 4.2.2 TEST INSTRUMENTS

Same as 4.1.2.

### 4.2.3 TEST PROCEDURES

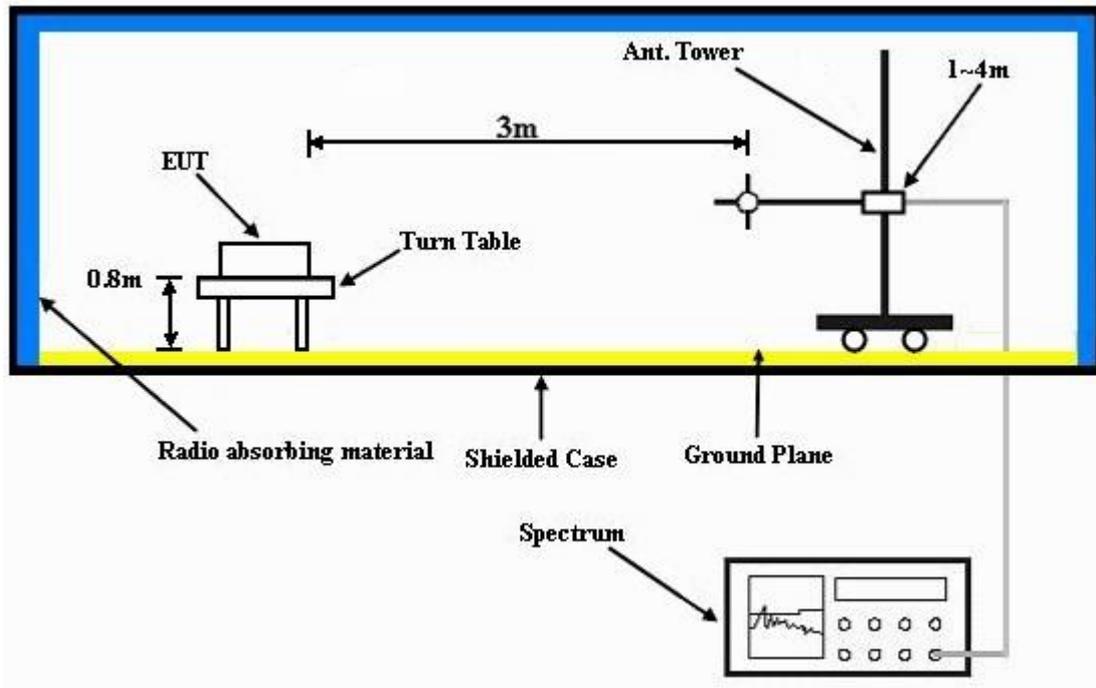
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from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

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 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.



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### 4.2.7 TEST RESULTS

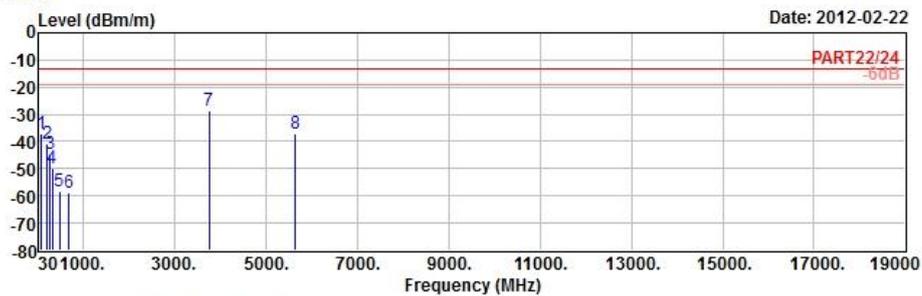
#### FOR 1xEVDO Rev. 0:



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Data: 13



Site : 966 Chamber 5  
 Condition : PART22/24 3m EIRP\_RSE\_1G~19G HORIZONTAL  
 Brand/Model: PJ53100  
 Remark : 1xEVDO1900 Link  
 Tested by : Kay Wu  
 Temperature : 25°C  
 Humidity : 65%  
 Plane : X(無線充電)

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	90.48	-37.28	-26.70	-13.00	-24.28	-10.58	Peak
2	210.09	-40.55	-33.08	-13.00	-27.55	-7.47	Peak
3	275.70	-44.55	-38.51	-13.00	-31.55	-6.04	Peak
4	321.70	-49.61	-43.40	-13.00	-36.61	-6.21	Peak
5	484.80	-58.15	-54.67	-13.00	-45.15	-3.48	Peak
6	688.50	-58.93	-60.17	-13.00	-45.93	1.24	Peak
7 pp	3760.00	-28.78	-20.70	-13.00	-15.78	-8.08	Peak
8	5640.00	-37.33	-35.81	-13.00	-24.33	-1.52	Peak



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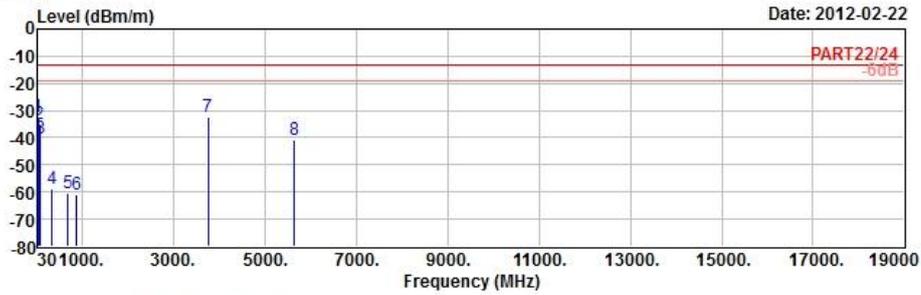


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Data: 14

Date: 2012-02-22



Site : 966 Chamber 5  
 Condition : PART22/24 3m EIRP\_RSE\_1G~19G VERTICAL  
 Brand/Model: PJ53100  
 Remark : 1xEVD01900 Link  
 Tested by : Kay Wu  
 Temperature : 25°C  
 Humidity : 65%  
 Plane : X(無線充電)

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	41.34	-32.18	-30.79	-13.00	-19.18	-1.39 Peak
2	65.10	-35.07	-27.35	-13.00	-22.07	-7.72 Peak
3	89.40	-40.21	-29.66	-13.00	-27.21	-10.55 Peak
4	341.30	-58.54	-52.47	-13.00	-45.54	-6.07 Peak
5	692.70	-60.56	-61.87	-13.00	-47.56	1.31 Peak
6	876.10	-60.73	-63.29	-13.00	-47.73	2.56 Peak
7	3760.00	-32.54	-24.46	-13.00	-19.54	-8.08 Peak
8	5640.00	-40.53	-39.01	-13.00	-27.53	-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:

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**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---