VARIANT FCC TEST REPORT

(PART 22)

REPORT NO.:	RF111221C21A-4
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.

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF111221C21A-4	Original Release	Mar. 08, 2012

1 CERTIFICATION

PRODUCT: Smartphone
MODEL: PJ53100
BRAND: HTC
APPLICANT: HTC Corporation
TESTED : Feb. 22 ~ Feb. 24, 2012
TEST SAMPLE: Production Unit
STANDARDS : **FCC Part 22, Subpart H**
ANSI C63.4-2003

This report is issued as a supplementary report of RF111221C21-5. This report shall be used by combining with its original report.

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

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

NOTE: The radiated emission tests and e.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 22 & Part 2			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
2.1046 22.913 (a)	Maximum Peak Output Power Limit: max. 7 watts e.r.p peak power	PASS	Meet the requirement of limit. Max. e.r.p is 19.37dBm at 824.70MHz.
2.1055	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. ±2.5ppm	NA	Refer to Note
2.1049 (h)	Occupied Bandwidth	NA	Refer to Note
22.917	Band Edge Measurements	NA	Refer to Note
2.1051 22.917	Conducted Spurious Emissions	NA	Refer to Note
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is –18.04dB at 1672.80MHz.

NOTE: The radiated emission tests and e.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

EUT	Smartphone	
MODEL NO.	PJ53100	
FCC ID	NM8PJ53100	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc or 3.8Vdc (Li-ion battery)	
MODULATION TYPE	**CDMA**	QPSK, OQPSK, HPSK
FREQUENCY RANGE	**CDMA**	824.7MHz ~ 848.31MHz
MAX. ERP POWER	**CDMA**	0.09Watts
ANTENNA TYPE	Fixed Internal antenna with -3dBi gain	
I/O PORTS	Refer to users' manual	
DATA CABLE	Refer to Note as below	
ACCESSORY DEVICES	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.: RF111221C21-5. The difference compared with the original report is adding an inductive cover. Therefore, radiated emission tests and e.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	1013	824.70 MHz	1xEVDO Rev. 0 & Rev. A
MIDDLE	384	836.52 MHz	1xEVDO Rev. 0 & Rev. A
HIGH	777	848.31 MHz	1xEVDO Rev. 0 & Rev. A

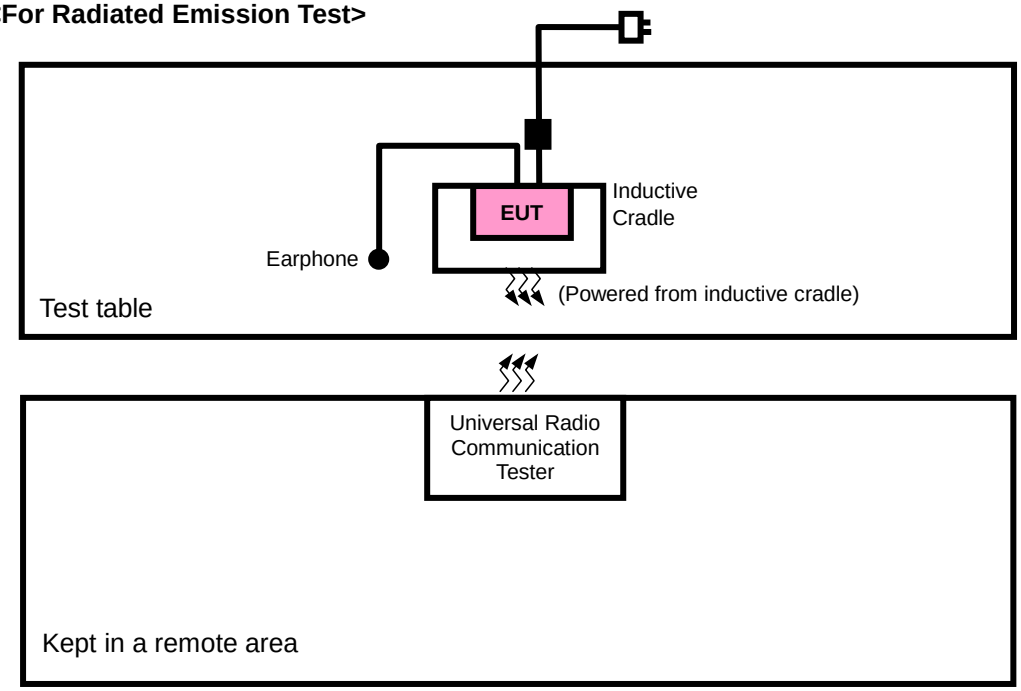
NOTE: The channel space is 0.03MHz.

	CHANNEL	FREQUENCY	TX MODE
LOW	1013	824.70 MHz	CDMA2000
MIDDLE	384	836.52 MHz	CDMA2000
HIGH	777	848.31 MHz	CDMA2000

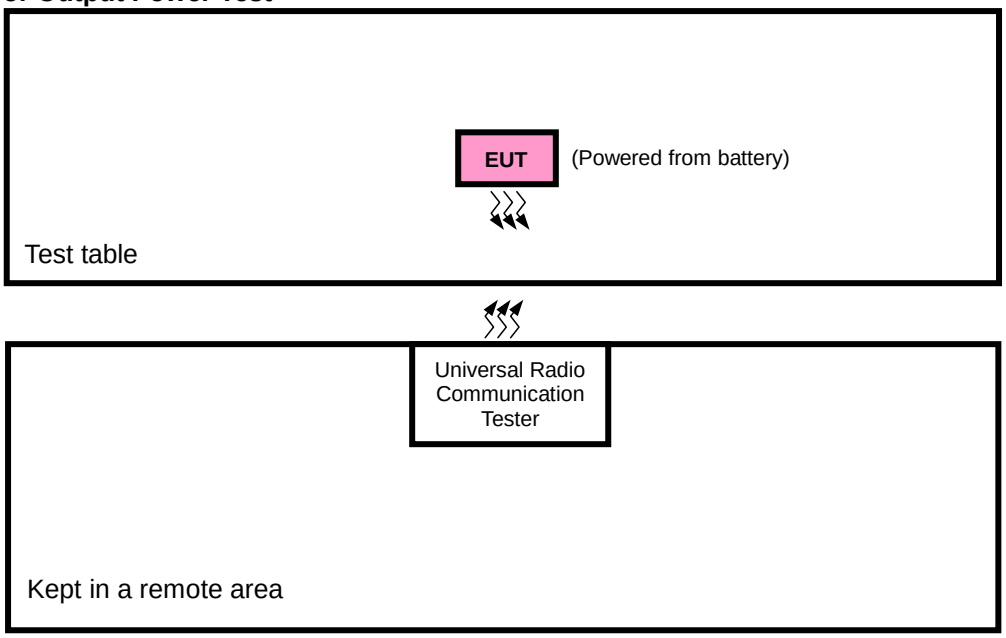
NOTE: The channel space is 0.03MHz.

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
1013 to 777	1013, 384, 777	CDMA	X

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
1013 to 777	384	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 22

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 22.913 (a) that “Mobile / Portable station are limited to 7 watts e.r.p”.

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 / ERP MEASUREMENT:

a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 1013, 384 and 777 (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.

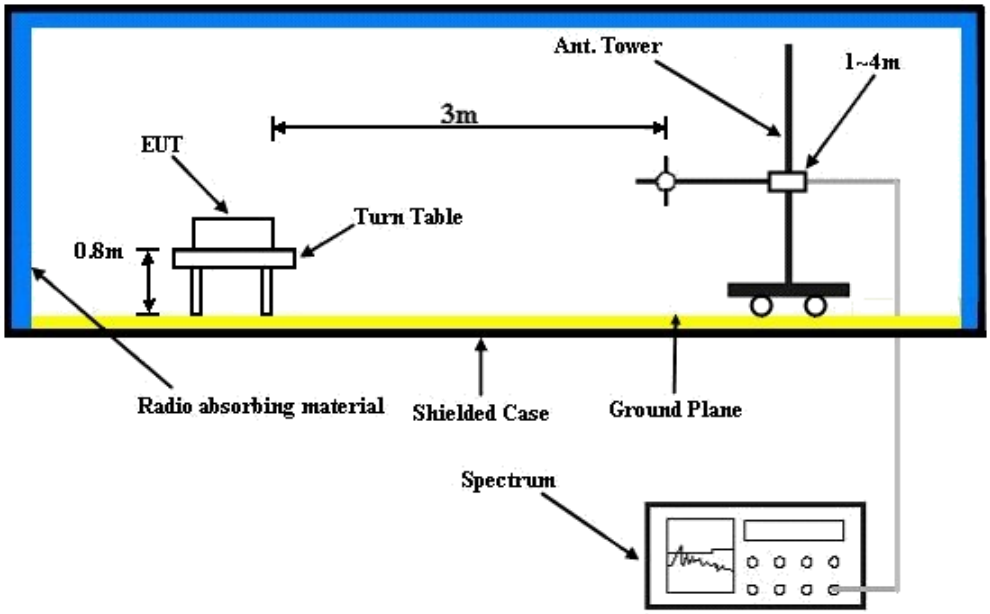
c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step c. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

e. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

4.1.4 TEST SETUP

EIRP / ERP 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 a EUT to export maximum output power under transmission mode and specific channel frequency.

4.1.6 TEST RESULTS

ERP POWER

FOR CDMA MODE

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(W)	Polarization (H/V)
X	1013	824.70	-8.72	30.24	19.37	0.09	H
	384	836.52	-8.50	29.94	19.29	0.08	H
	777	848.31	-9.61	30.66	18.90	0.08	H
	1013	824.70	-18.15	30.80	10.50	0.01	V
	384	836.52	-19.08	31.50	10.27	0.01	V
	777	848.31	-19.55	31.46	9.76	0.01	V

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 22.917 (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 limit equal to –13dBm.

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. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

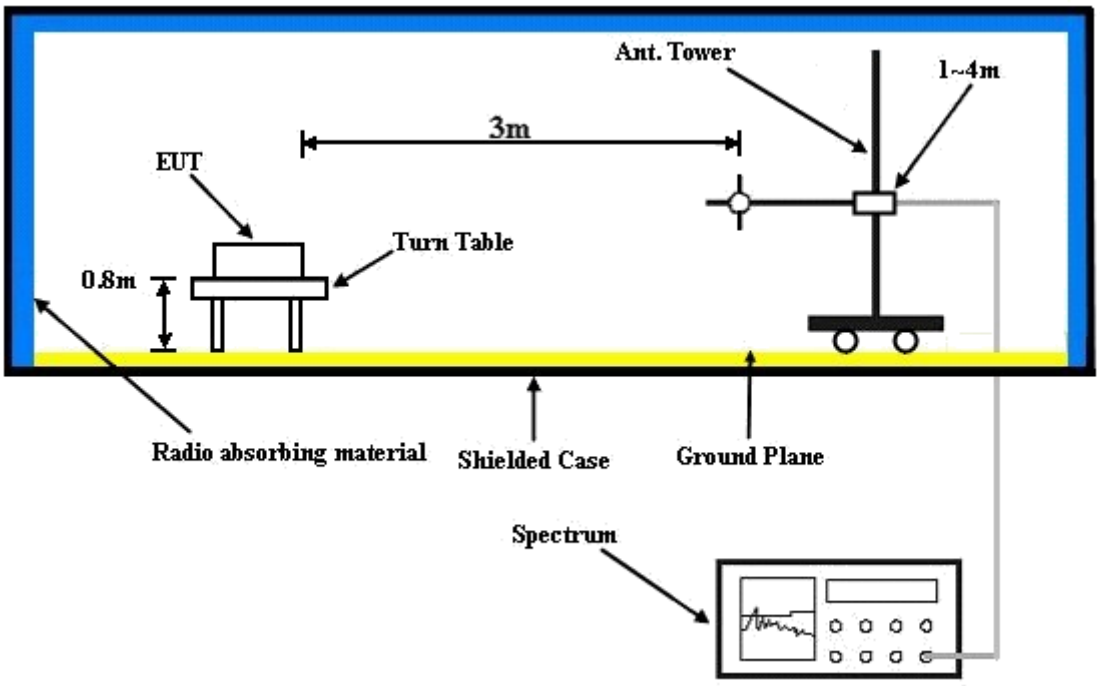
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

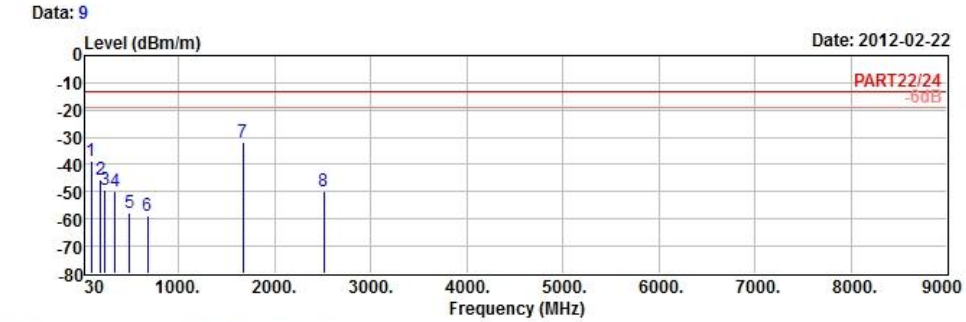
a. The EUT makes a call to the communication simulator.

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

4.2.7 TEST RESULTS

FOR 1xEVDO Rev.0:

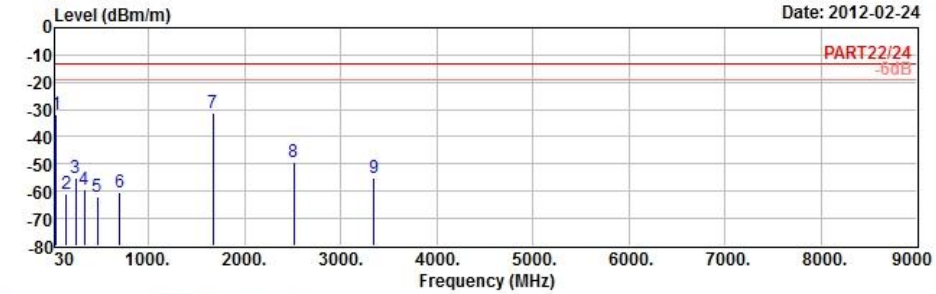
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G HORIZONTAL
Brand/Model: PJ53100
Remark : 1xEVDO850 Link
Tested by : Kay Wu
Temprature : 25℃
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	90.21	-38.45	-27.87	-13.00	-25.45	-10.58	Peak
2	188.49	-45.34	-38.76	-13.00	-32.34	-6.58	Peak
3	233.58	-49.04	-42.62	-13.00	-36.04	-6.42	Peak
4	337.80	-49.87	-43.77	-13.00	-36.87	-6.10	Peak
5	489.00	-57.98	-54.60	-13.00	-44.98	-3.38	Peak
6	680.80	-58.78	-59.88	-13.00	-45.78	1.10	Peak
7 pp	1672.80	-31.62	-17.90	-13.00	-18.62	-13.72	Peak
8	2509.20	-49.68	-39.40	-13.00	-36.68	-10.28	Peak

Data: 10



Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G VERTICAL
Brand/Model: PJ53100
Remark : 1xEVDO850 Link
Tested by : Kay Wu
Temprature : 25℃
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	40.53	-31.77	-30.31	-13.00	-18.77	-1.46	Peak
2	145.29	-60.82	-54.77	-13.00	-47.82	-6.05	Peak
3	239.79	-55.26	-49.10	-13.00	-42.26	-6.16	Peak
4	334.30	-59.11	-52.99	-13.00	-46.11	-6.12	Peak
5	466.60	-61.83	-57.88	-13.00	-48.83	-3.95	Peak
6	700.40	-60.34	-61.79	-13.00	-47.34	1.45	Peak
7 pp	1672.80	-31.04	-17.32	-13.00	-18.04	-13.72	Peak
8	2509.20	-49.46	-39.18	-13.00	-36.46	-10.28	Peak
9	3345.60	-55.18	-46.10	-13.00	-42.18	-9.08	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. 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
Web Site: 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---