PARTIAL FCC TEST REPORT

(PART 24)

REPORT NO.:	RF130513C11-1
MODEL NO.:	CB2U
Host FCC ID:	HFS-Y
Module FCC ID:	PKRNVWE396
RECEIVED:	May 13, 2013
TESTED:	May 21, 2013 ~ May 22, 2013
ISSUED:	Jun. 03, 2013

APPLICANT: Quanta Computer Inc.

ADDRESS: No. 188, Wen Hwa 2nd RD., Kuei Shan Hsiang, Tao Yuan Shien, Taiwan

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

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

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

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130513C11-1	Original release	Jun. 03, 2013

1 CERTIFICATION

PRODUCT:	Laptop
MODEL:	CB2U
APPLICANT:	Quanta Computer Inc.
TESTED:	May 21, 2013 ~ May 22, 2013
TEST SAMPLE:	Production Unit
STANDARDS:	**FCC Part 24, Subpart E**

The above equipment (model: CB2U) 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 : Vera Huang **, DATE :** Jun. 03, 2013

Vera Huang / Specialist

APPROVED BY : Sam chen **, DATE :** Jun. 03, 2013

Sam Chen / Assistant 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**	**RESULT**	**REMARK**
2.1046 24.232	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	N/A	Refer to NOTE below.
2.1049 24.238(b)	Occupied Bandwidth	N/A	Refer to NOTE below.
24.232(d)	Peak to average ratio	N/A	Refer to NOTE below.
24.238(b)	Band Edge Measurements	N/A	Refer to NOTE below.
2.1051 24.238	Conducted Spurious Emissions	N/A	Refer to NOTE below.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -25.41dB at 30.54MHz.

NOTE: Test items for radiated emission test and equivalent isotropically radiated power were performed for this report. Other testing data please refer to module (Brand: QUALCOMM, Model: Gobi3000, FCC ID: J9CGOBI3000) Report No.: 80-N2162-203 Rev B

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	2.93 dB
	200MHz ~1000MHz	2.95 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	ESCI	100424	Aug. 21, 2012	Aug. 20, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 07, 2013	Jan. 06, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 184045	980116	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable Worken	RG-213	NA	Dec. 29, 2012	Dec. 28, 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 10.
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 690701.
5. The IC Site Registration No. is IC 7450F-10.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Laptop	
MODEL NO.	CB2U	
POWER SUPPLY	5.25Vdc (adapter) 11.1Vdc (battery)	
MODULATION TYPE	**GPRS**	GMSK
	EDGE	8PSK
	WCDMA	BPSK
FREQUENCY RANGE	**GPRS/EDGE**	1850.2MHz ~ 1909.8MHz
	WCDMA	1852.4MHz ~ 1907.6MHz
MAX. EIRP POWER	**GPRS**	671.74mW
	EDGE	361.74mW
	WCDMA	293.36mW
MULTI-SLOTS CLASS	10	
WCDMA RELEASE VERSION	6	
ANTENNA TYPE	PIFA Antenna	
I/O PORTS	Refer to users' manual	
DATA CABLE	Refer to NOTE as below	
ACCESSORY DEVICES	Refer to NOTE as below	

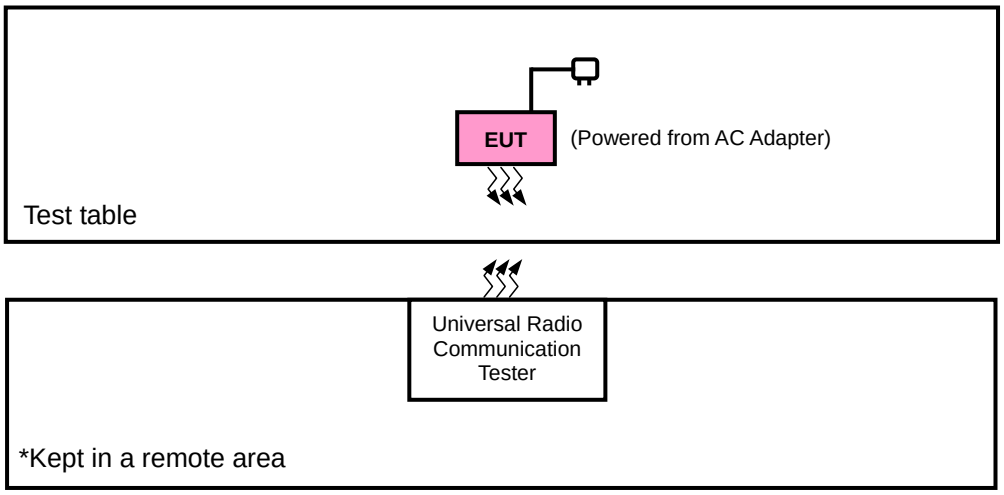
NOTE:

1. The EUT has following accessories.

ITEM	BRAND	MODEL	DESCRIPTION
AC Adapter	LEI	MU15-N1052-A00S	I/P: 100-240Vac, 0.5A, 50-60Hz O/P: 5.25Vdc, 3A
Li-ion Battery	SMP	SQU-1208	Rating: 11.1Vdc, 2700mAh
WWAN Module	NOVATEL	E396U	--
WLAN+Bluetooth	AZUREWAVE	AW-AH397	--
Camera	Lite-on	12P2SF004	--
11.6" LCD Panel	LG	LP116WH6	--
Battery Pack	SMP	SQU-1208	--
CPU	Samsung	Exynos 5250	--
Memory Capacity	N/A	N/A	2GB

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 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.

3.4 TEST ITEM AND TEST CONFIGURATION

Following channel(s) was (were) selected for the final test as listed below:

GSM MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
EIRP	512 to 810	512, 661, 810	GPRS, EDGE
RADIATED EMISSION	512 to 810	661	GPRS, EDGE

WCDMA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
RADIATED EMISSION	9262 to 9538	9400	WCDMA

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 65%RH	11.1Vdc	Howard Kao
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	David Huang

3.5 EUT OPERATING CONDITIONS

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

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-C 2004

NOTE: 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 and portable stations are limited to 2 watts EIRP

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 1MHz for GSM, GPRS & EDGE, 5MHz for WCDMA and 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

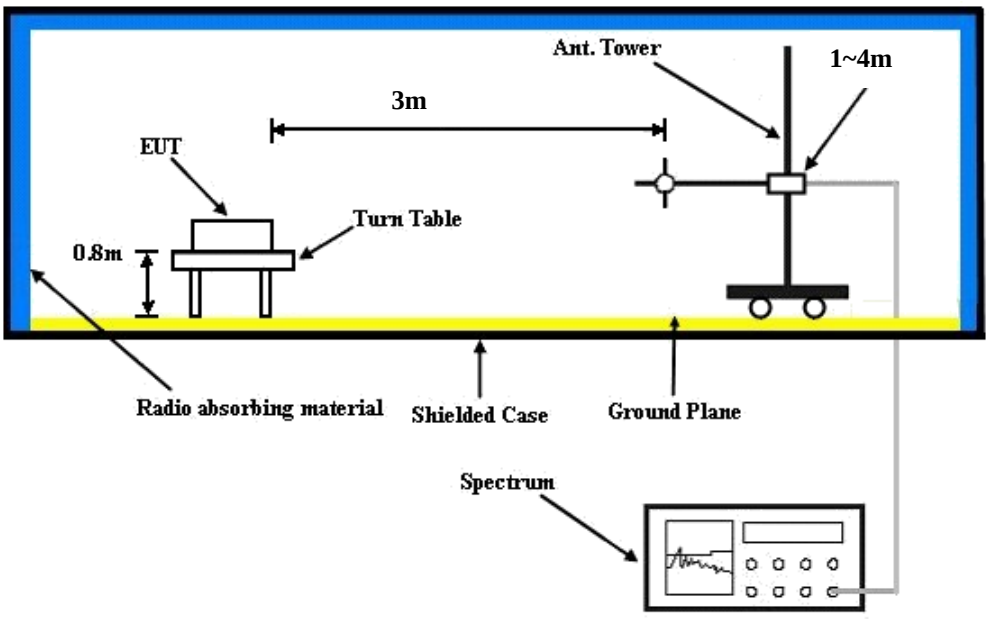
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA & 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.

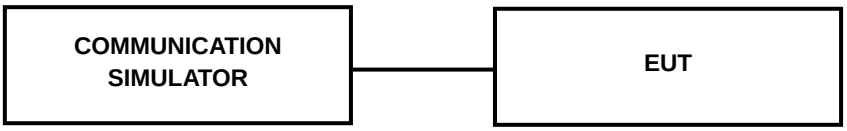
4.1.3 TEST SETUP

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	GPRS1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GPRS 8 (GMSK, 1 slot)	29.04	29.08	**29.24**
GPRS 10 (GMSK, 2 slot)	28.83	28.87	29.04
EDGE 8 (GMSK, 1 Uplink)	29.11	29.15	29.17
EDGE 10 (GMSK, 2 Uplink)	28.91	28.95	28.96
EDGE 8 (8PSK, 1 Uplink)	25.33	25.37	25.46
EDGE 10 (8PSK, 2 Uplink)	25.24	25.28	25.37

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	24.15	**24.48**	23.98
HSDPA Subtest-1	23.51	23.84	23.34
HSDPA Subtest-2	23.56	23.89	23.39
HSDPA Subtest-3	23.07	23.40	22.90
HSDPA Subtest-4	23.06	23.39	22.89
HSUPA Subtest-1	23.33	23.66	23.16
HSUPA Subtest-2	22.04	22.37	21.87
HSUPA Subtest-3	22.21	22.54	22.04
HSUPA Subtest-4	22.50	22.83	22.33
HSUPA Subtest-5	23.55	23.88	23.38

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-8.30	36.57	28.27	671.74	H
661	1880.0	-9.19	37.22	28.03	635.92	H
810	1909.8	-9.13	37.18	28.05	638.56	H
512	1850.2	-14.83	37.65	22.82	191.47	V
661	1880.0	-15.21	37.58	22.37	172.70	V
810	1909.8	-15.24	37.48	22.24	167.49	V

EDGE

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-11.47	36.57	25.10	323.74	H
661	1880.0	-11.64	37.22	25.58	361.74	H
810	1909.8	-12.04	37.18	25.14	326.74	H
512	1850.2	-16.77	37.65	20.88	122.49	V
661	1880.0	-16.74	37.58	20.84	121.42	V
810	1909.8	-17.09	37.48	20.39	109.40	V

WCDMA

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-12.41	36.57	24.16	260.74	H
9400	1880.0	-12.55	37.22	24.67	293.36	H
9538	1907.6	-12.88	37.18	24.30	269.28	H
9262	1852.4	-18.70	37.65	18.95	78.54	V
9400	1880.0	-18.84	37.58	18.74	74.87	V
9538	1907.6	-19.09	37.48	18.39	69.02	V

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

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

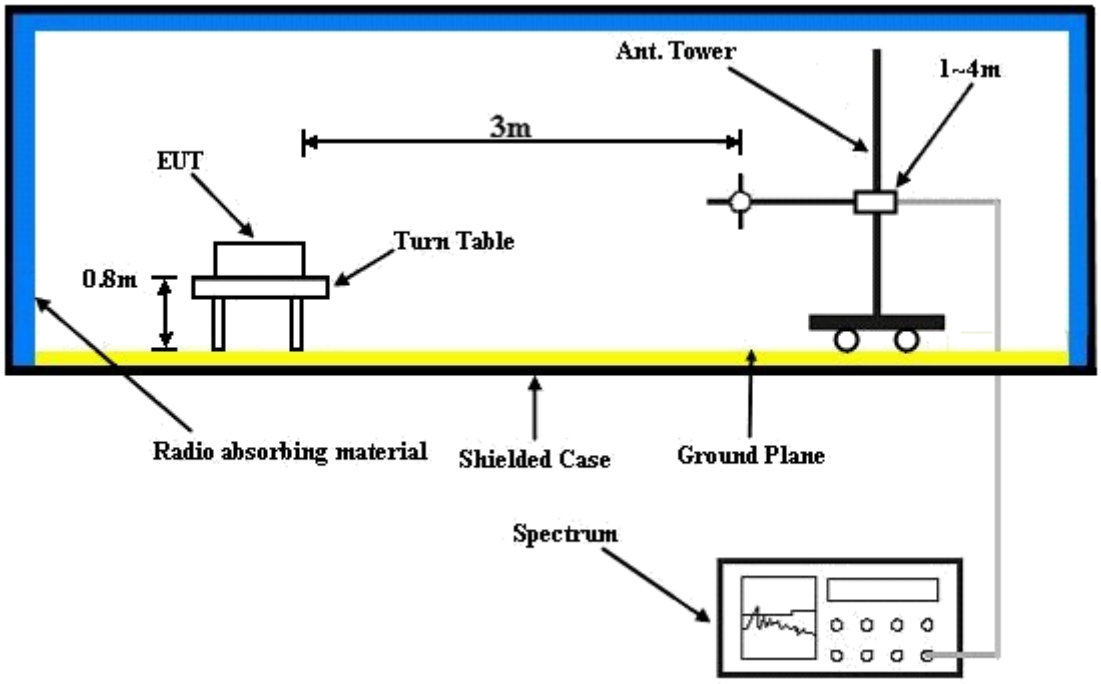
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

4.2.4 TEST SETUP



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

4.2.5 TEST RESULTS

GPRS:

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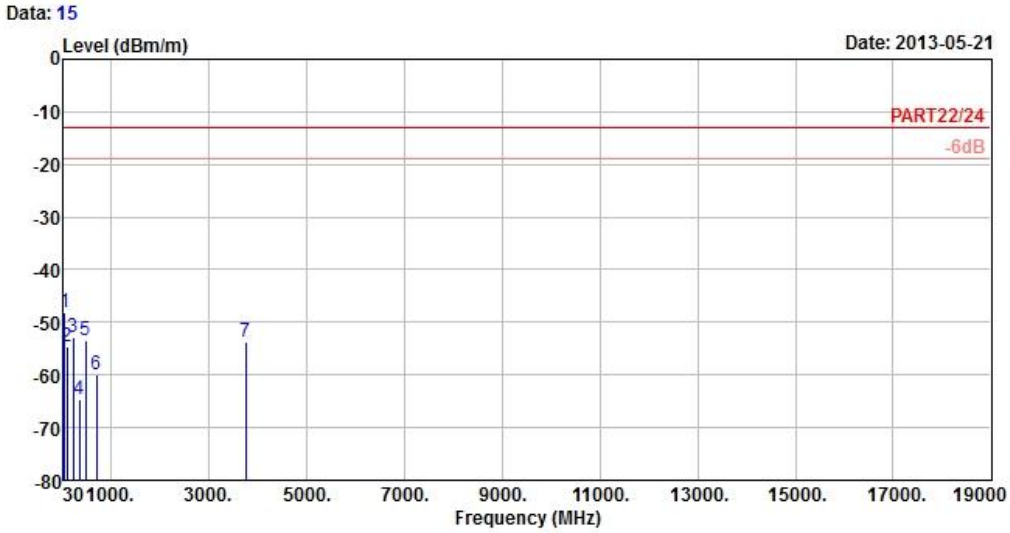
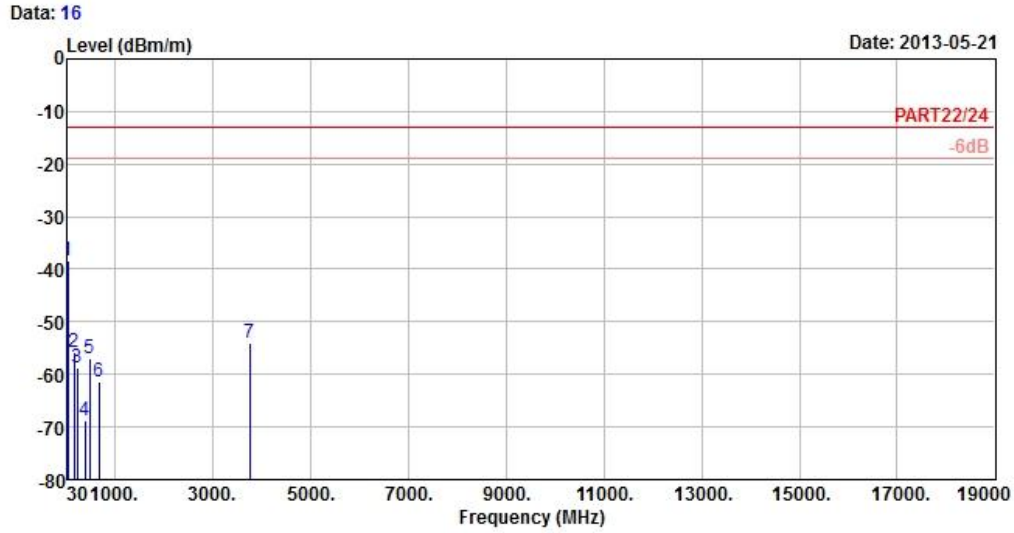


Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: OC1
Remark : GPRS1900 Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	56.19	-48.19	-42.69	-13.00	-35.19	-5.50	Peak
2	105.33	-54.50	-43.97	-13.00	-41.50	-10.53	Peak
3	231.42	-52.90	-46.39	-13.00	-39.90	-6.51	Peak
4	353.20	-64.57	-58.59	-13.00	-51.57	-5.98	Peak
5	480.60	-53.57	-49.99	-13.00	-40.57	-3.58	Peak
6	700.40	-60.03	-61.48	-13.00	-47.03	1.45	Peak
7	3760.00	-53.87	-47.14	-13.00	-40.87	-6.73	Peak



Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: OC1
Remark : GPRS1900 Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	30.54	-38.41	-38.75	-13.00	-25.41	0.34	Peak
2	164.73	-55.69	-49.09	-13.00	-42.69	-6.60	Peak
3	230.34	-58.77	-52.22	-13.00	-45.77	-6.55	Peak
4	385.40	-68.79	-63.04	-13.00	-55.79	-5.75	Peak
5	479.90	-57.01	-53.41	-13.00	-44.01	-3.60	Peak
6	676.60	-61.53	-62.56	-13.00	-48.53	1.03	Peak
7	3760.00	-54.10	-47.37	-13.00	-41.10	-6.73	Peak

EDGE:

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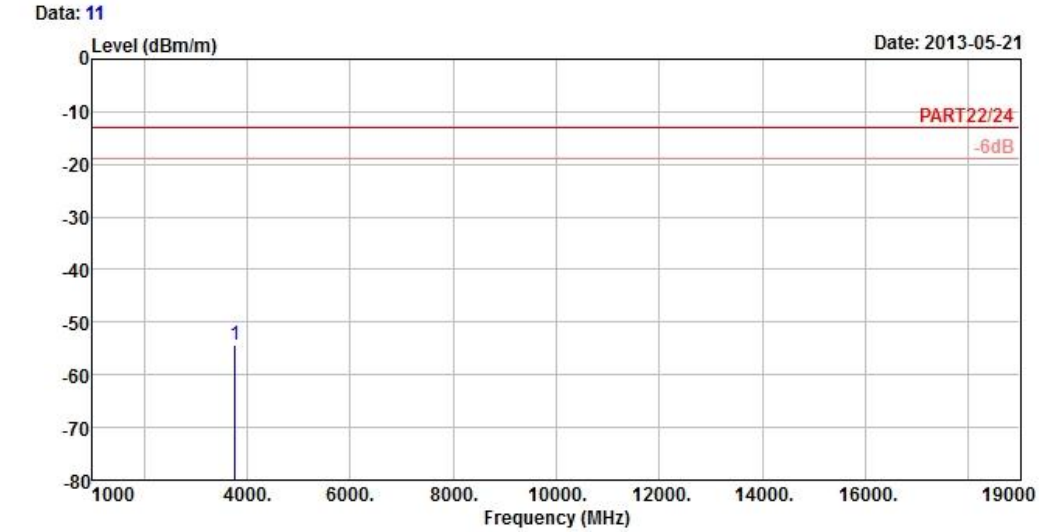
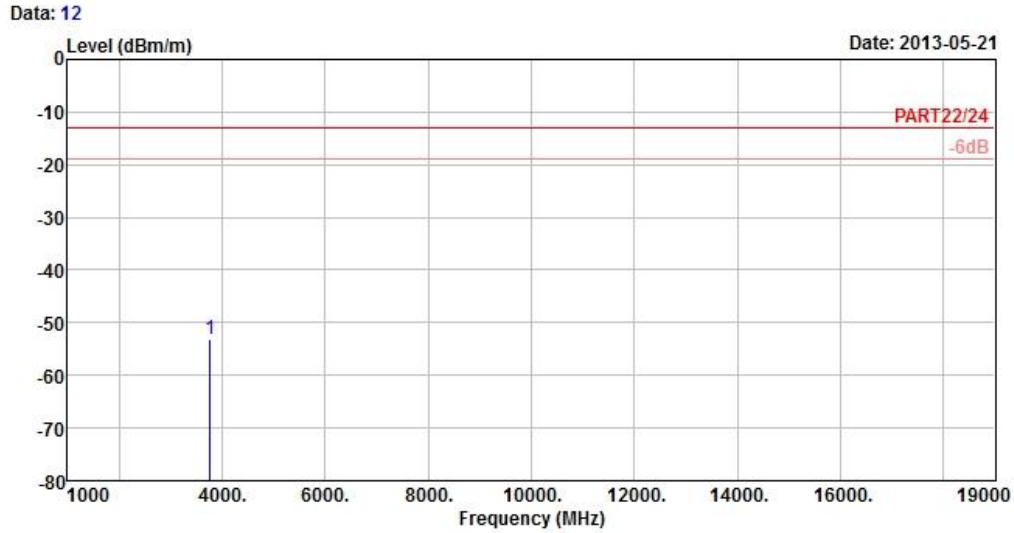


Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: OC1
Remark : EDGE1900 Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3760.00	-54.27	-47.54	-13.00	-41.27	-6.73	Peak



Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: OC1
Remark : EDGES1900 Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3760.00	-53.03	-46.30	-13.00	-40.03	-6.73	Peak

WCDMA:

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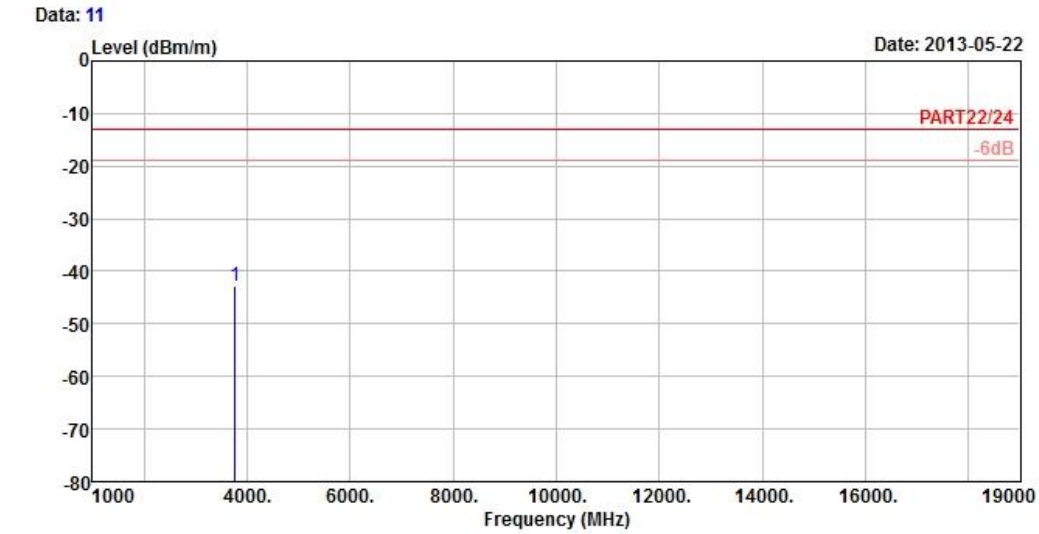
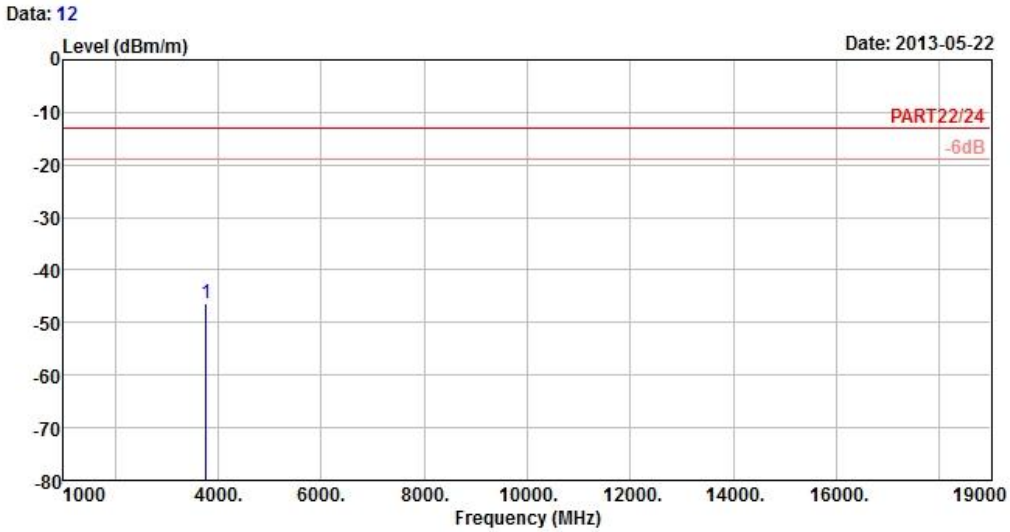


Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: OC1
Remark : Band II Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3760.00	-42.66	-35.93	-13.00	-29.66	-6.73	Peak



Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: OC1
Remark : Band II Link
Tested by : David Huang
Temprature : 25℃
Humidity : 65%

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3760.00	-46.35	-39.62	-13.00	-33.35	-6.73	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.

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

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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---