PARTIAL FCC TEST REPORT

(PART 27)

REPORT NO.:	RF130513C11-2
MODEL NO.:	CB2U
Host FCC ID:	HFS-Y
Module FCC ID:	PKRNVWE396
RECEIVED:	May 13, 2013
TESTED:	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
RF130513C11-2	Original release	Jun. 03, 2013

1 CERTIFICATION

PRODUCT:	Laptop
MODEL NO.:	CB2U
APPLICANT:	Quanta Computer Inc.
TESTED:	May 22, 2013
TEST SAMPLE:	Production Unit
TEST STANDARDS:	**FCC Part 27, Subpart C, L** **FCC Part 2** ANSI C63.4-2003

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:

WCDMA Band 4			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
2.1046 27.50(d)(4)	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	N/A	Refer to NOTE below.
2.1049 27.53(h)	Occupied Bandwidth	N/A	Refer to NOTE below.
27.50(d)(5)	Peak to average ratio	N/A	Refer to NOTE below.
27.53(h)	Band Edge Measurements	N/A	Refer to NOTE below.
2.1051 27.53(h)	Conducted Spurious Emissions	N/A	Refer to NOTE below.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -27.20dB at 42.69MHz.

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

PRODUCT	Laptop
MODEL NO.	CB2U
POWER SUPPLY	5.25Vdc (adapter) 11.1Vdc (battery)
MODULATION TECHNOLOGY	QPSK, BPSK
FREQUENCY RANGE	1712.4MHz ~1752.6MHz
MAX. EIRP POWER (mW)	378.44mW
ANTENNA TYPE	PIFA Antenna
DATA CABLE	Refer to Note as below
I/O PORTS	Refer to users' manual
ACCESSORY DEVICES	Refer to Note as below

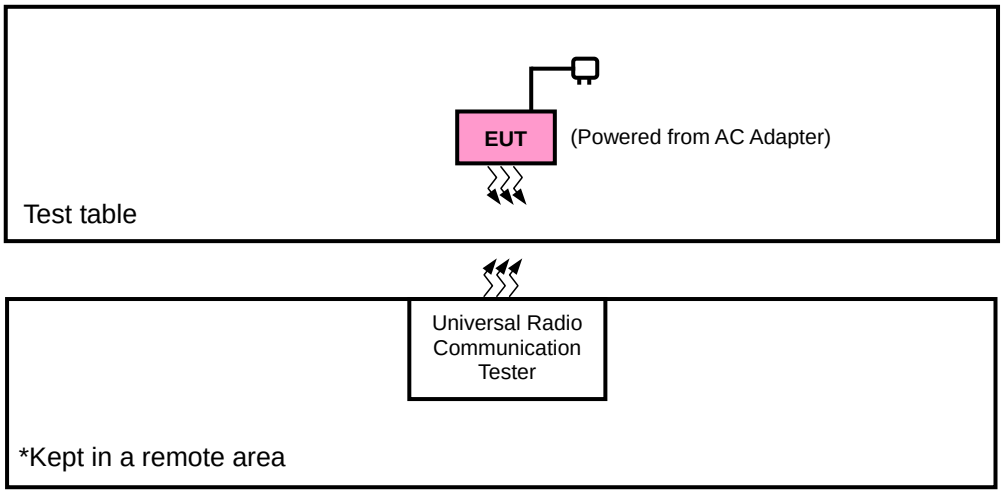
NOTE:

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 DESCRIPTION OF TEST MODES

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

WCDMA Band 4

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
RADIATED EMISSION	1312 to 1513	1413	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 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 27

ANSI C63.4-2003

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

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt 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

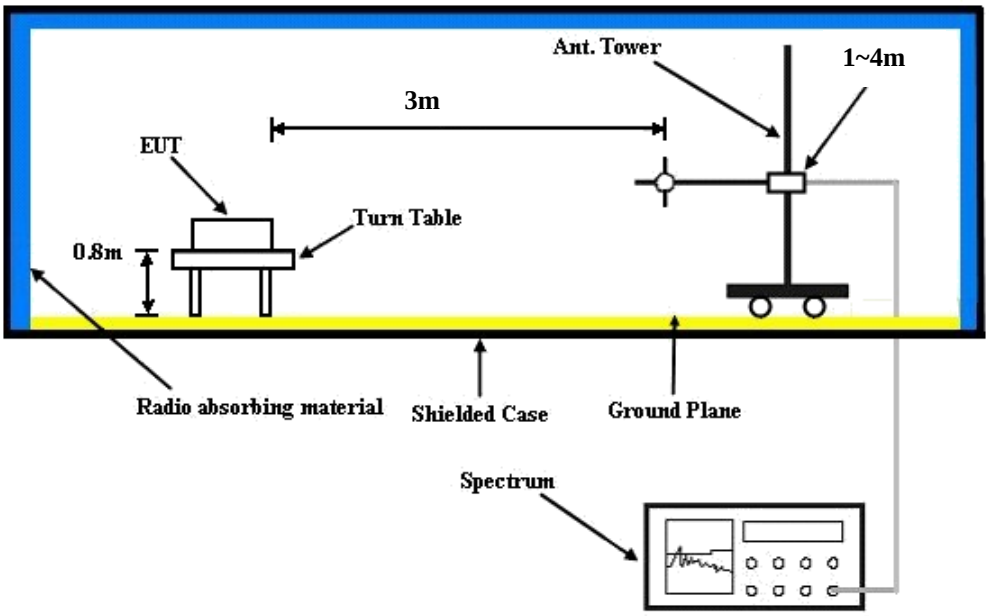
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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.

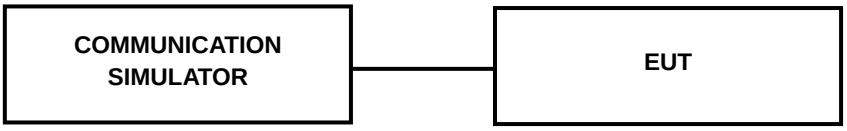
4.1.3 TEST SETUP

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

AVERAGE CONDUCTED OUTPUT POWER (dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	**24.18**	24.12	23.96
HSDPA Subtest-1	23.56	23.62	23.46
HSDPA Subtest-2	23.57	23.63	23.47
HSDPA Subtest-3	23.14	23.20	23.04
HSDPA Subtest-4	23.10	23.16	23.00
HSUPA Subtest-1	23.20	23.26	23.10
HSUPA Subtest-2	22.05	22.11	21.95
HSUPA Subtest-3	22.41	22.47	22.31
HSUPA Subtest-4	22.31	22.37	22.21
HSUPA Subtest-5	23.61	23.67	23.51

AVERAGE EIRP (dBm)

WCDMA BAND 4

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
1312	1712.4	-12.12	37.90	25.78	378.44	H
1413	1732.6	-12.92	37.99	25.07	321.37	H
1513	1752.6	-13.44	38.31	24.87	306.90	H
1312	1712.4	-20.72	37.81	17.09	51.17	V
1413	1732.6	-20.56	37.40	16.84	48.31	V
1513	1752.6	-20.87	38.22	17.35	54.33	V

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

For operations in the 746 – 763 MHz, 775 – 793 MHz, and 805 – 806 MHz bands, emissions in the band 1559 – 1610 MHz shall be limited to – 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

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.

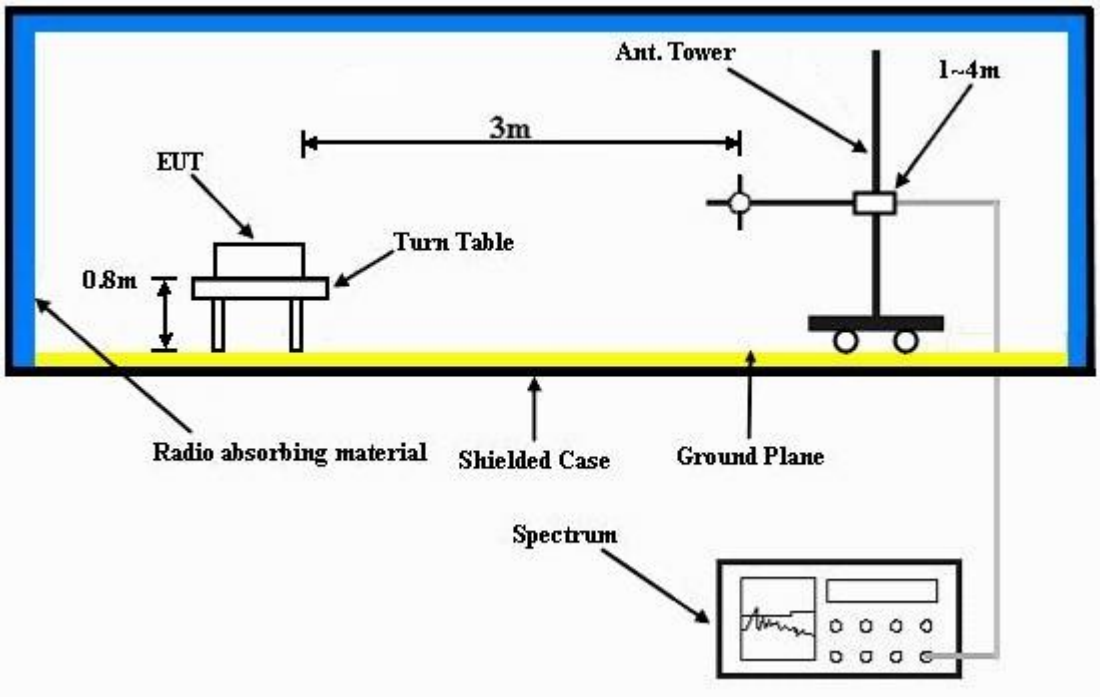
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

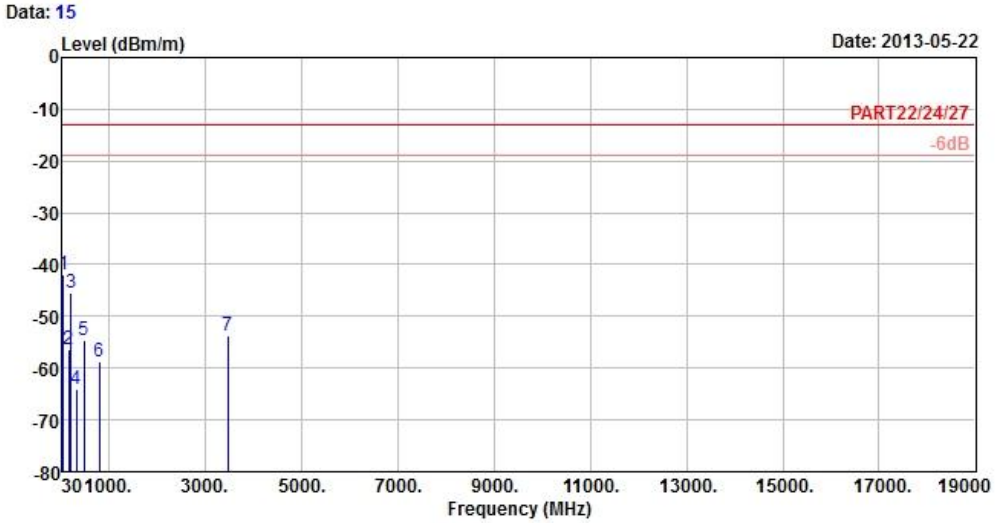
4.2.4 TEST SETUP



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

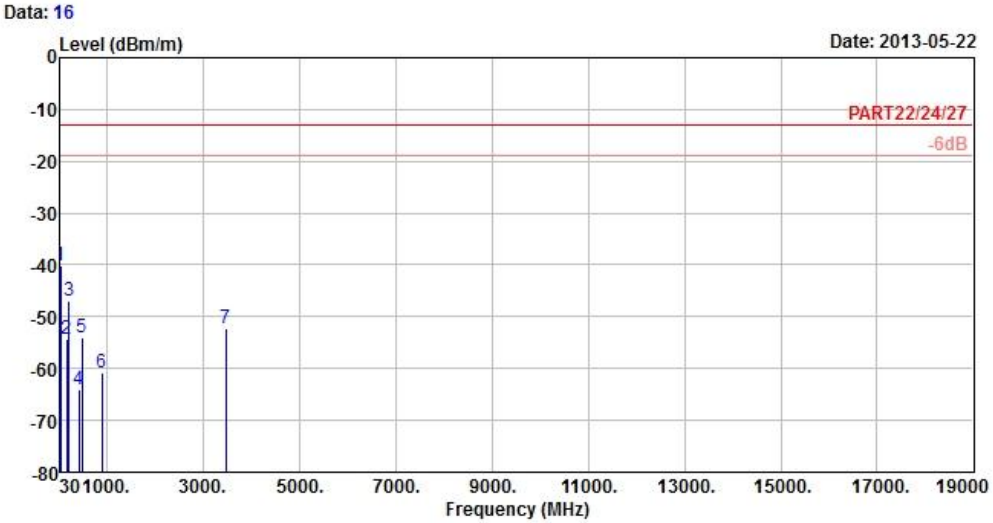
4.2.5 TEST RESULTS

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : PART22/24/27 3m HORIZONTAL
Brand/Model: OC1
Remark : Band IV 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	47.82	-41.90	-39.01	-13.00	-28.90	-2.89	Peak
2	157.17	-56.32	-49.85	-13.00	-43.32	-6.47	Peak
3	210.90	-45.37	-37.90	-13.00	-32.37	-7.47	Peak
4	317.50	-63.92	-57.67	-13.00	-50.92	-6.25	Peak
5	480.60	-54.70	-51.12	-13.00	-41.70	-3.58	Peak
6	800.50	-58.81	-60.94	-13.00	-45.81	2.13	Peak
7	3465.00	-53.58	-45.95	-13.00	-40.58	-7.63	Peak



Site : 966 Chamber 5
Condition : PART22/24/27 3m VERTICAL
Brand/Model: OC1
Remark : Band IV 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	42.69	-40.20	-38.87	-13.00	-27.20	-1.33	Peak
2	165.27	-54.30	-47.70	-13.00	-41.30	-6.60	Peak
3	212.52	-47.00	-39.62	-13.00	-34.00	-7.38	Peak
4	423.90	-64.18	-59.15	-13.00	-51.18	-5.03	Peak
5	480.60	-54.07	-50.49	-13.00	-41.07	-3.58	Peak
6	887.30	-60.77	-63.40	-13.00	-47.77	2.63	Peak
7	3465.00	-52.14	-44.51	-13.00	-39.14	-7.63	Peak

5 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
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Fax: 886-3-3270892

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.

6 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.

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