

# FCC CERTIFICATION TEST REPORT

**REPORT NO.:** FC130927C01

**MODEL NO.:** ODM Zinc alloy model

**FCC ID:** 2ACAXGC212942

**RECEIVED:** Sep. 26, 2013

**TESTED:** Oct. 02, 2013

**ISSUED:** Oct. 03, 2013

**APPLICANT:** Promerchant GmbH

**ADDRESS:** Waldstrasse 19, 63179 Obertshausen, Germany

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

**LAB ADDRESS:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FC130927C01	Original release.	Oct. 03, 2013

## 1 CERTIFICATION

**PRODUCT:** BMW I USB STICK, 16 GB  
**MODEL NO.:** ODM Zinc alloy model  
**APPLICANT:** Promerchant GmbH  
**TESTED:** Oct. 02, 2013  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARD:** **FCC Part 15, Subpart B, Class B**  
**ICES-003:2012, Class B**  
**ANSI C63.4-2009**

The above equipment (Model: ODM Zinc alloy model) 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 :** Polly Chen , **DATE :** Oct. 03, 2013  
Polly Chen / Specialist

**APPROVED BY :** David Liu , **DATE :** Oct. 03, 2013  
David Liu / Technical Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications.

Standard	Test Type	Result	Remarks
FCC Part 15, Subpart B, Class B	Conducted emission test	PASS	Meet the requirement of limit. Minimum passing margin is -18.73dB at 4.62695MHz.
ICES-003:2012, Class B	Radiated emission test (30MHz~1GHz)	PASS	Meet the requirement of limit. Minimum passing margin is -5.32dB at 30.00MHz.

### 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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Measurement	Frequency	Uncertainty
Conducted emission	150kHz ~ 30MHz	2.44 dB
Radiated emission	30MHz ~ 1GHz	4.12 dB

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	BMW I USB STICK, 16 GB
<b>MODEL NO.</b>	ODM Zinc alloy model
<b>POWER SUPPLY</b>	5Vdc (from host equipment)
<b>DATA CABLE</b>	NA
<b>ACCESSORY DEVICE</b>	NA

**NOTE:**

1. The EUT's highest operating frequency is 12MHz, therefore the radiated emission is tested up to 1GHz.
2. The above EUT information is declared by manufacturer and for more detailed feature description, please refer to the manufacturer's specifications or user's manual.

### 3.2 DESCRIPTION OF TEST MODES

The EUT was tested under working mode.

### 3.3 DESCRIPTION OF SUPPORT UNITS

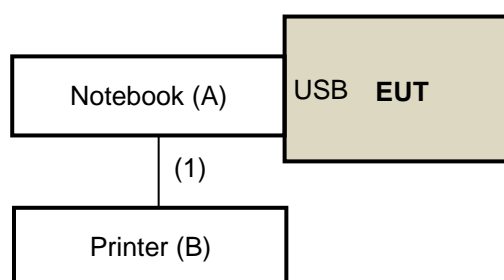
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	Notebook	Lenovo	S430	MP-2DBFW	PD92230BNHU	-
B	Printer	EPSON	T22	MEEZ070388	FCC DoC Approved	-

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	USB cable	1	1.8	Y	0	-

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST



## 4 EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

**TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)**

**ICES-003:2012 Issue 5 (section: 6.1)**

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15-0.5	79	66	66-56	56-46
0.5-5	73	60	56	46
5-30	73	60	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 04, 2013	Feb. 03, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	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 Shielded Room 1.
  3. The VCCI Site Registration No. is C-2040.



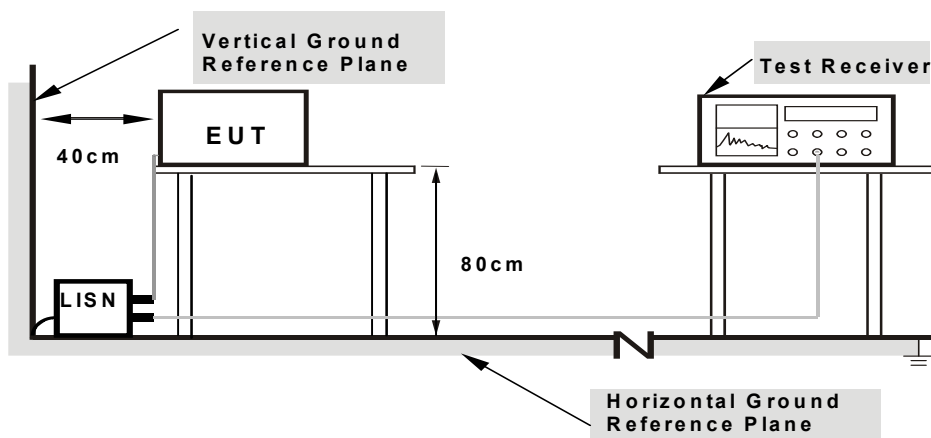
#### **4.1.3 TEST PROCEDURE**

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit - 20dB) was not reported.

#### **4.1.4 DEVIATION FROM TEST STANDARD**

No deviation.

#### 4.1.5 TEST SETUP



**Note:** 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

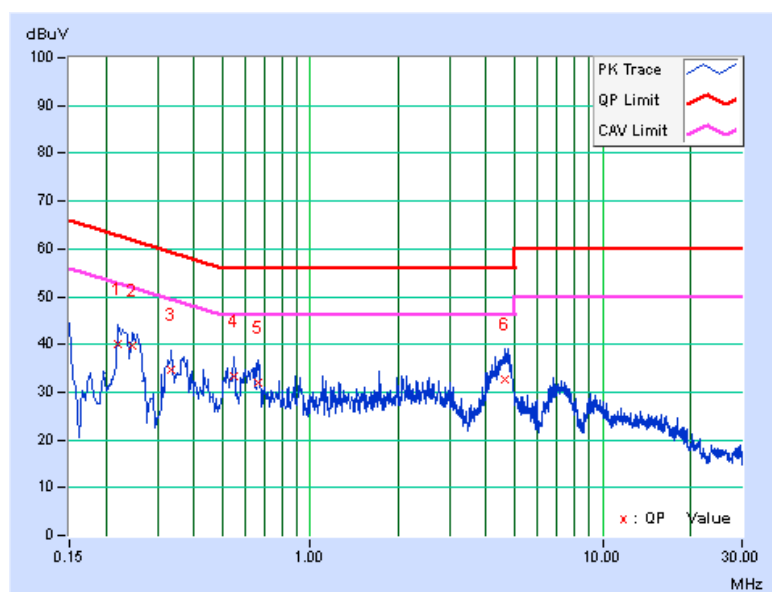
- Plugged the EUT into notebook and placed it on the test table.
- The notebook ran “H” patterns and displayed them.
- The notebook perform R/W function through the EUT.
- The notebook sent “H” patterns to the printer and the printer printed “H” patterns out.
- Steps b ~ d were repeated.

#### 4.1.7 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH	PHASE	Line 1
TESTED BY	Felix Chen		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22038	0.17	39.89	25.83	40.06	26.00	62.80	52.80	-22.75	-26.81
2	0.24775	0.18	39.53	25.30	39.71	25.48	61.83	51.83	-22.13	-26.36
3	0.33396	0.21	34.54	20.73	34.75	20.94	59.35	49.35	-24.61	-28.42
4	0.54882	0.23	33.00	19.76	33.23	19.99	56.00	46.00	-22.77	-26.01
5	0.66605	0.24	31.83	18.52	32.07	18.76	56.00	46.00	-23.93	-27.24
6	4.62695	0.43	32.29	26.84	32.72	27.27	56.00	46.00	-23.28	-18.73

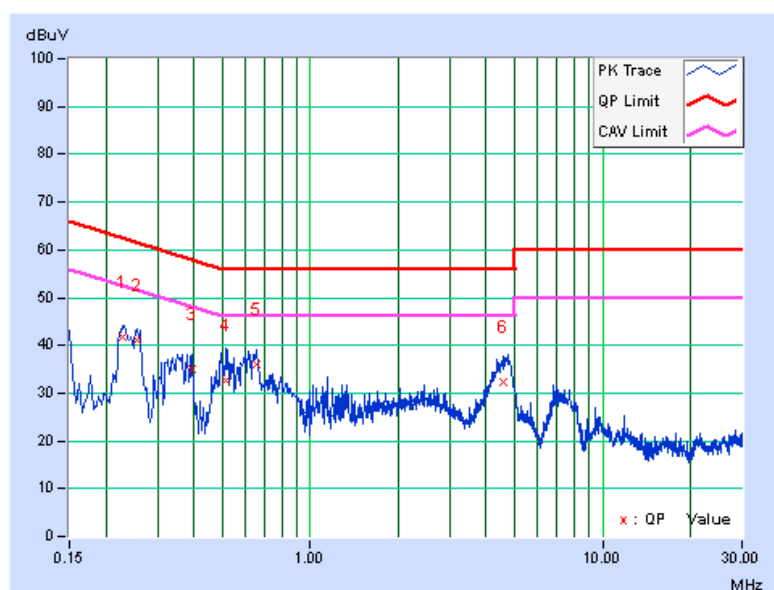
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. The emission levels of other frequencies were very low against the limit.
  3. Margin value = Emission level - Limit value
  4. Correction factor = Insertion loss + Cable loss
  5. Emission Level = Correction Factor + Reading Value



<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65% RH	<b>PHASE</b>	Line 2
<b>TESTED BY</b>	Felix Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22851	0.18	41.48	28.01	41.66	28.19	62.50	52.50	-20.84	-24.31
2	0.25557	0.19	41.01	26.54	41.20	26.73	61.57	51.57	-20.37	-24.84
3	0.39219	0.24	34.94	17.88	35.18	18.12	58.02	48.02	-22.84	-29.90
4	0.51754	0.24	32.42	17.26	32.66	17.50	56.00	46.00	-23.34	-28.50
5	0.65439	0.24	35.65	19.80	35.89	20.04	56.00	46.00	-20.11	-25.96
6	4.60349	0.40	31.85	26.31	32.25	26.71	56.00	46.00	-23.75	-19.29

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. The emission levels of other frequencies were very low against the limit.
  3. Margin value = Emission level - Limit value
  4. Correction factor = Insertion loss + Cable loss
  5. Emission Level = Correction Factor + Reading Value



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

**TEST STANDARD: FCC Part 15, Subpart B (section: 15.109)**  
**ICES-003:2012 Issue 5 (section: 6.2)**

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	<i>FCC 15B/ ICES-003, Class A</i>	<i>FCC 15B / ICES-003, Class B</i>	<i>CISPR 22, Class A</i>	<i>CISPR 22, Class B</i>
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960				
960-1000	49.5	43.5	47	37
1000-3000	Avg: 49.5	Avg: 43.5	Not defined	Not defined
Above 3000	Peak: 69.5	Peak: 63.5	Not defined	Not defined

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960				
960-1000	60	54	57.5	47.5
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000			Avg: 60 Peak: 80	Avg: 54 Peak: 74

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
  3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
  4. QP detector shall be applied if not specified.

# **FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)**

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

## 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ (V)	ESIB7	100187	Dec. 27, 2012	Dec. 26, 2013
Test Receiver ROHDE & SCHWARZ (H)	ESIB7	100188	May 21, 2013	May 20, 2014
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-148	Mar. 19, 2013	Mar. 18, 2014
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-149	Mar. 19, 2013	Mar. 19, 2014
Preamplifier Agilent (V)	8447D	2944A10636	Oct. 20, 2012	Oct. 19, 2013
Preamplifier Agilent (H)	8447D	2944A10637	Oct. 20, 2012	Oct. 19, 2013
Preamplifier Agilent	8449B	3008A01959	Oct. 25, 2012	Oct. 24, 2013
RF signal cable Woken (V)	8D-FB	Cable-Hych1-01	Oct. 26, 2012	Oct. 25, 2013
RF signal cable Woken (H)	8D-FB	Cable-Hych1-02	Oct. 26, 2012	Oct. 25, 2013
Software BV ADT	BV ADT_Radiated_ V 7.7.03.8	NA	NA	NA
Antenna Tower (V)	MFA-440	9707	NA	NA
Antenna Tower (H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller (V)	MF7802	074	NA	NA
Controller (H)	MF7802	08093	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 1.
3. The FCC Site Registration No. is 477732.
4. The IC Site Registration No. is IC 7450F-1.
5. The VCCI Site Registration No. is R-1893, G-113.

#### 4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

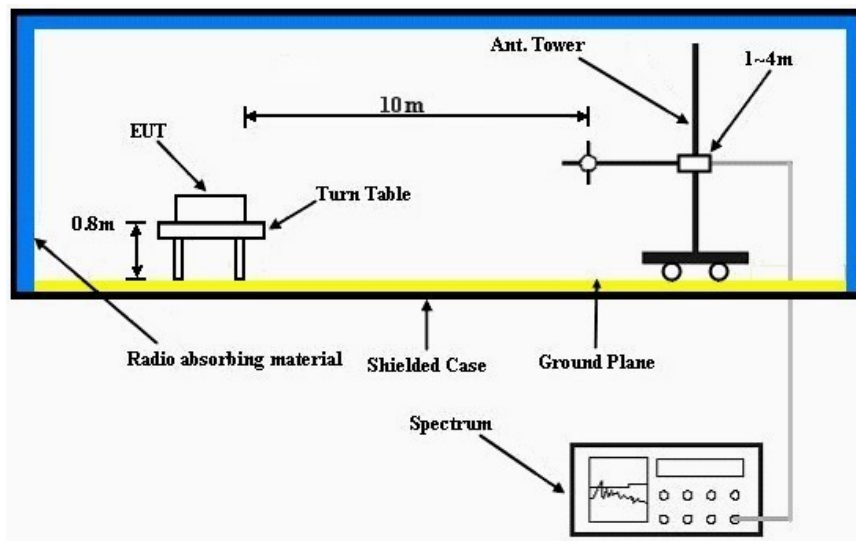
**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-Peak (QP) detection at frequency below 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



## 4.2.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

## 4.2.6 EUT OPERATING CONDITIONS

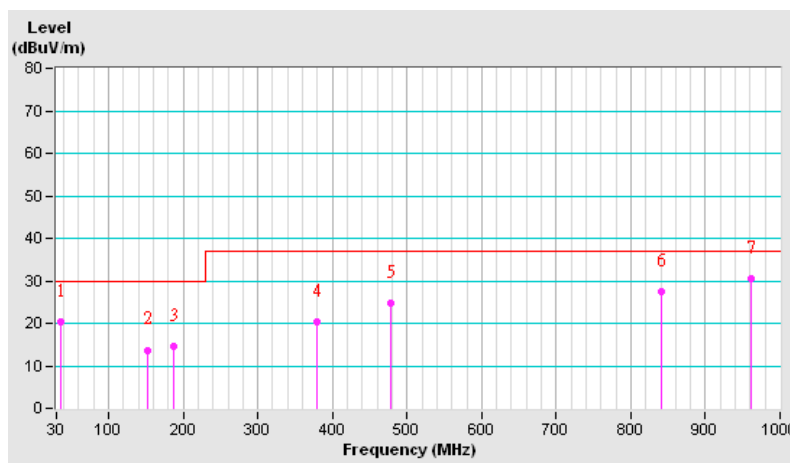
Same as 4.1.6.

#### 4.2.7 TEST RESULTS

INPUT POWER (SYSTEM)	120 Vac, 60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rolan Zheng		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.83	20.28 QP	30.00	-9.72	3.50 H	48	35.16	-14.88
2	152.46	13.73 QP	30.00	-16.27	3.50 H	184	26.88	-13.15
3	187.45	14.54 QP	30.00	-15.46	2.00 H	8	29.69	-15.15
4	379.90	20.38 QP	37.00	-16.62	2.50 H	80	30.19	-9.81
5	479.04	24.68 QP	37.00	-12.32	2.00 H	96	32.51	-7.83
6	840.60	27.44 QP	37.00	-9.56	1.00 H	76	28.27	-0.83
7	961.12	30.43 QP	37.00	-6.57	1.00 H	61	29.02	1.41

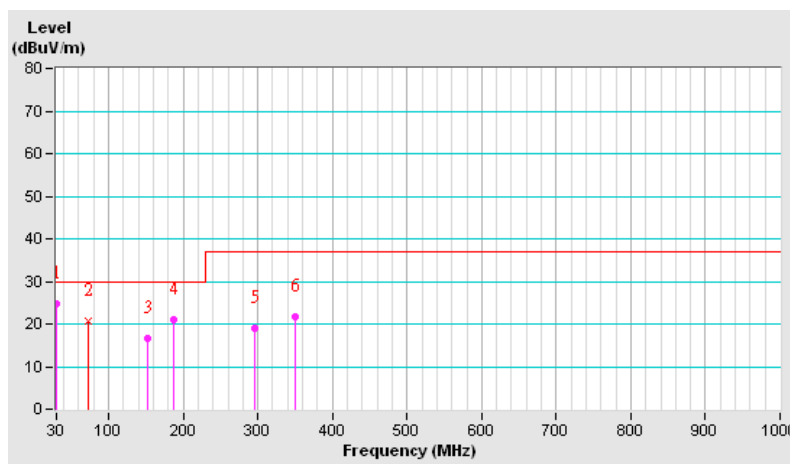
- REMARKS:**
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission Level – Limit value



INPUT POWER (SYSTEM)	120 Vac, 60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rolan Zheng		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	24.68 QP	30.00	-5.32	1.00 V	88	40.26	-15.58
2	72.52	20.60 QP	30.00	-9.40	2.00 V	61	36.63	-16.03
3	152.46	16.64 QP	30.00	-13.36	1.00 V	138	29.58	-12.94
4	187.45	20.97 QP	30.00	-9.03	1.50 V	70	35.79	-14.82
5	296.31	19.13 QP	37.00	-17.87	2.00 V	20	30.47	-11.34
6	350.74	21.72 QP	37.00	-15.28	1.50 V	360	31.92	-10.20

- REMARKS:**
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission Level – Limit value



## 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

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab**

Tel: 886-3-5935343

Fax: 886-3-5935342

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

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.

**---END---**