

FCC DoC Test Report

Report No.: FD151216D03

Test Model: VMX-200-8

Series Model: Vecow VMX Series, VMX-200-4, VMX-XXXXXXXXXX
(“X” can be 0-9, A-Z or blank for marketing purpose)

Received Date: Dec. 16, 2015

Test Date: Dec. 23 ~ 24, 2015

Issued Date: Jan. 11, 2016

Applicant: Vecow Co., Ltd.

Address: 12F., No. 111, Zhongcheng Rd., Tucheng Dist., New Taipei City 23674
Taiwan (R. O. C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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(R.O.C.)



LAB CODE: 200836-0



Testing Laboratory
2021

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A D T

Release Control Record

Issue No.	Description	Date Issued
FD151216D03	Original release.	Jan. 11, 2016



1 Certificate of Conformity

Product: 4-CH/8-CH, H.264, Mini-PCI Express, Software Compression/Video Capture card

Brand: Vecow

Test Model: VMX-200-8

Series Model: Vecow VMX Series, VMX-200-4, VMX-XXXXXXXXXX
("X" can be 0-9, A-Z or blank for marketing purpose)

Sample Status: Engineering sample

Applicant: Vecow Co., Ltd.

Test Date: Dec. 23 ~ 24, 2015

Standards: 47 CFR FCC Part 15, Subpart B, Class B
ICES-003:2012 Issue 5, Class B
ANSI C63.4:2014

The above equipment 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 : Celia Chen , **Date:** Jan. 11, 2016
Celia Chen / Supervisor

Approved by : Henry Lai , **Date:** Jan. 11, 2016
Henry Lai / Director

2 Summary of Test Results

47 CFR FCC Part 15, Subpart B / ICES-003:2012 Issue 5, Class B

ANSI C63.4:2014

FCC Clause	ICES-003 Clause	Test Item	Result/Remarks	Verdict
15.107	6.1	AC Power Line Conducted Emissions	Minimum passing Class B margin is -0.10 dB at 3.60938 MHz	Pass
15.109	6.2.1	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -1.21 dB at 720.03 MHz	Pass
	6.2.2	Radiated Emissions above 1 GHz	EUT's highest frequency is below 108 MHz	N/A

N/A: Not Applicable

Note: There is no deviation to the applied test methods and requirements covered by the scope of this report.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

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.

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.78 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.34 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Features of EUT

The tests reported herein were performed according to the method specified by Vecow Co., Ltd., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.2 General Description of EUT

Product	4-CH/8-CH, H.264, Mini-PCI Express, Software Compression/Video Capture card
Brand	Vecow
Test Model	VMX-200-8
Series Model	Vecow VMX Series, VMX-200-4, VMX-XXXXXXXXXX ("X" can be 0-9, A-Z or blank for marketing purpose)
Model Difference	For marketing purpose
Sample Status	Engineering sample
Operating Software	Windows, Linux
Power Supply Rating	DC power from host equipment
Accessory Device	N/A
Data Cable Supplied	D-Sub 15 to BNC cable (0.3m)*2

Note: The EUT is a 4-CH/8-CH, H.264, Mini-PCI Express, Software Compression/Video Capture card.

3.3 Operating Modes of EUT and Determination of Worst Case Operating Mode

The EUT consumes power from host, which designed with AC power supply of rating 100-240Vac, 50/60Hz. For radiated emission evaluation, 230Vac/50Hz (for EN 55022), 120Vac/60Hz (for FCC Part 15) had been covered during the pre-test. The worst data was found at **230Vac/50Hz** and recorded in the applied test report. Then the other test items were tested at 120Vac/60Hz.

EUT has been pre-tested under following test modes, and test mode 1 was the worst case for final test.

Mode	Test Condition
1	Audio CH 5 & CH 6
2	Audio CH 1 & CH 2

3.4 Test Program Used and Operation Descriptions

- a. Installed EUT into PC.
- b. Turned on the power of all equipment.
- c. PC ran a test program to enable all functions.
- d. DVD Player sent audio/video signal to PC via EUT.
- e. PC sent "H" messages to LCD monitor. Then displayed "H" patterns on its screen.
- f. PC sent messages to printer and printer printed them out.
- g. PC sent messages to modem.
- h. Repeated steps d-g.

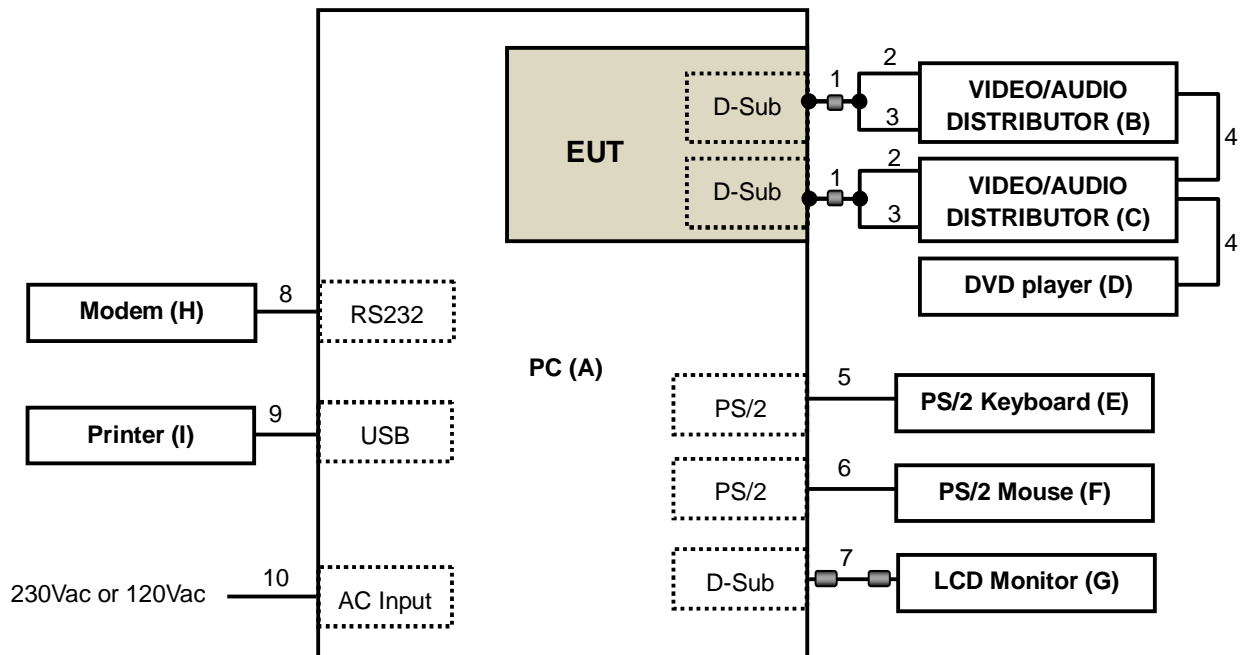
3.5 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 100 MHz, provided by Vecow Co., Ltd., for detailed internal source, please refer to the manufacturer's specifications.

4 Configuration and Connections with EUT

4.1 Connection Diagram of EUT and Peripheral Devices

TEST CONFIGURATION



4.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	PERSONAL COMPUTER	HP	6000ProMT	SGH110SGNJ	FCC DoC Approved	Provided by Lab
B.	VIDEO/AUDIO DISTRIBUTOR	JEBSEE	AV-486	N/A	Verification	Provided by Lab
C.	VIDEO/AUDIO DISTRIBUTOR	Trans Electric	AV-004	V4-010027	Verification	Provided by Lab
D.	DVD player	Pioneer	DV-600AV-S	GJKD006924LS	Verification	Provided by Lab
E.	PS/2 KEYBOARD	HP	KB-0316	BC3520BGAUJ0UZ	FCC DoC Approved	Provided by Lab
F.	PS/2 MOUSE	BTC	M851	N/A	E5XMSM860	Provided by Lab
G.	24" LCD MONITOR	DELL	U2410	CN082WXD728720CC 0KCL	FCC DoC Approved	Provided by Lab
H.	MODEM	ACEEX	1414	980020532	IFAXDM1414	Provided by Lab
I.	PRINTER	LEXMARK	Z33	N/A	FCC DoC Approved	Provided by Lab

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	D-Sub to BNC cable	2	0.3	Y	1	Supplied by client
2.	Video cable	8	1.5	N	0	Provided by Lab
3.	Audio cable	8	1.5	N	0	Provided by Lab
4.	AV cable	2	1.5	N	0	Provided by Lab
5.	PS/2 cable	1	1.8	N	0	Provided by Lab
6.	PS/2 cable	1	1.5	N	0	Provided by Lab
7.	D-Sub cable	1	1.8	Y	2	Provided by Lab
8.	RS232 cable	1	1.0	Y	0	Provided by Lab
9.	USB cable	1	1.8	Y	0	Provided by Lab
10.	AC power cord	1	1.8	N	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

5 Conducted Emissions at Mains Ports

5.1 Limits

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Notes: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.2 Test Instruments

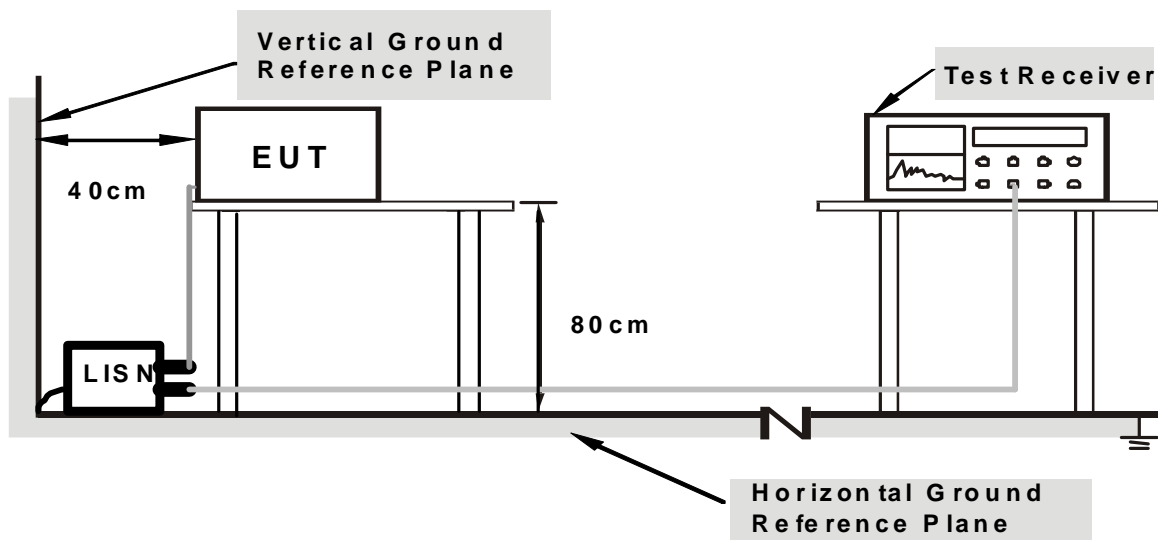
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100290	Dec. 24, 2015	Dec. 23, 2016
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 07, 2015	Dec. 06, 2016
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 07, 2015	Dec. 06, 2016
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Oct. 21, 2015	Oct. 20, 2016
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 06, 2015	May 05, 2016
Software	Cond_V7.3.7	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Feb. 24, 2015	Feb. 23, 2016
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 19, 2015	May 18, 2016
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 13, 2015	Nov. 12, 2016
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 13, 2015	Nov. 12, 2016

Notes: 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 Shielded Room No. 9.
3. The VCCI Site Registration No. C-1312.
4. Tested Date: Dec. 24, 2015.

5.3 Test Arrangement

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.



Note: Support units were connected to second LISN.

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

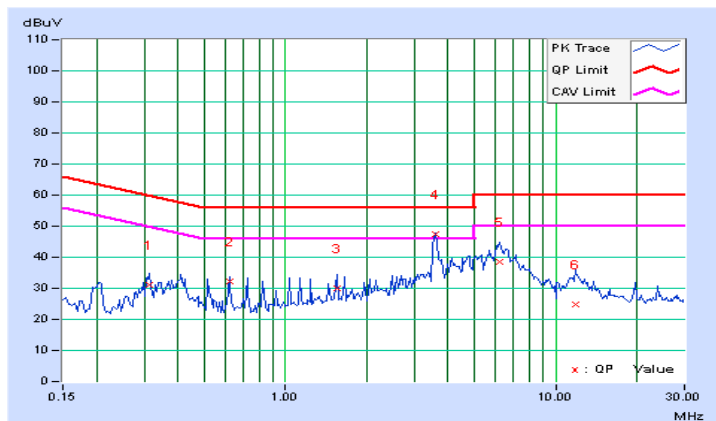
5.4 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz (System)	Environmental Conditions	23°C, 78%RH
Tested by	Ian Chang		
Test Mode	Mode 1		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.31406	10.28	20.95	15.53	31.23	25.81	59.86	49.86	-28.63	-24.05
2	0.61875	10.33	21.90	20.93	32.23	31.26	56.00	46.00	-23.77	-14.74
3	1.54688	10.46	19.50	17.00	29.96	27.46	56.00	46.00	-26.04	-18.54
4	3.60938	10.61	36.62	35.29	47.23	45.90	56.00	46.00	-8.77	-0.10
5	6.23828	10.69	27.81	22.48	38.50	33.17	60.00	50.00	-21.50	-16.83
6	11.84375	10.83	14.06	7.56	24.89	18.39	60.00	50.00	-35.11	-31.61

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

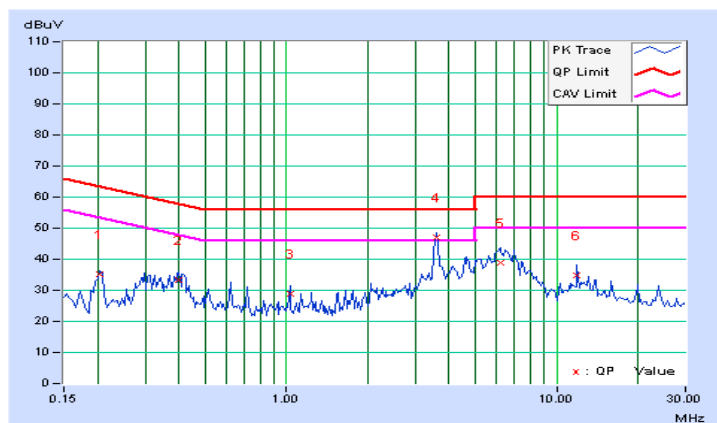


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz (System)	Environmental Conditions	23°C, 78%RH
Tested by	Ian Chang		
Test Mode	Mode 1		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20469	10.24	24.98	24.42	35.22	34.66	63.42	53.42	-28.20	-18.76
2	0.40000	10.30	22.98	17.11	33.28	27.41	57.85	47.85	-24.57	-20.44
3	1.03125	10.39	18.54	15.98	28.93	26.37	56.00	46.00	-27.07	-19.63
4	3.60938	10.61	36.40	34.78	47.01	45.39	56.00	46.00	-8.99	-0.61
5	6.17578	10.68	28.33	22.60	39.01	33.28	60.00	50.00	-20.99	-16.72
6	11.91406	10.76	24.09	12.39	34.85	23.15	60.00	50.00	-25.15	-26.85

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



6 Radiated Emissions up to 1 GHz

6.1 Limits

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

Radiated Emissions Limits at 10 meters (dB μ V/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	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dB μ V/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			57.5	47.5
960-1000	60	54		

- Notes:
1. The lower limit shall apply at the transition frequencies.
 2. Emission level (dB μ V/m) = 20 log Emission level (uV/m).
 3. QP detector shall be applied if not specified.

6.2 Test Instruments

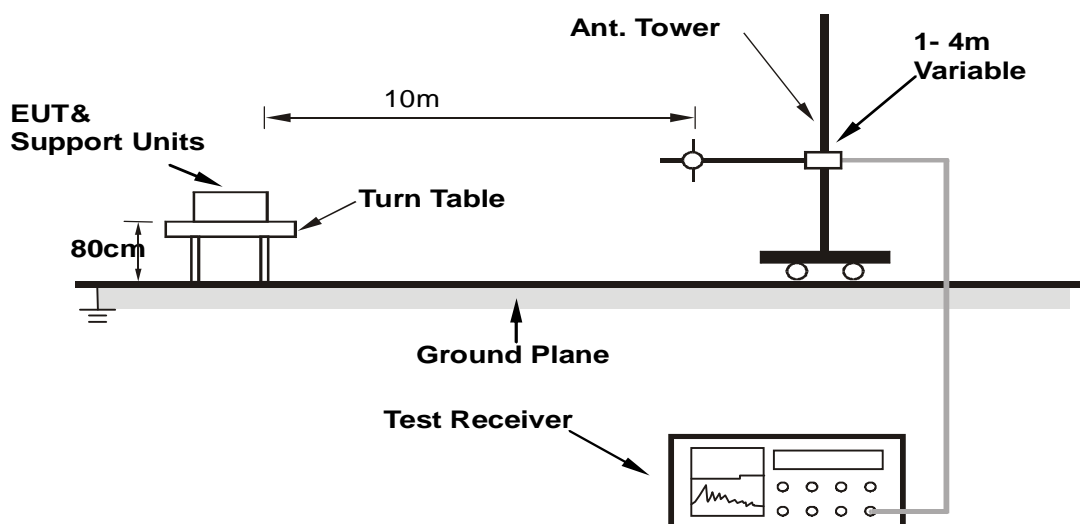
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCI	100412	Aug. 24, 2015	Aug. 23, 2016
Schwarzbeck BILOG Antenna	VULB9168	9168-479	Feb. 02, 2015	Feb. 01, 2016
CT Turn Table	TT100	CT-0055	NA	NA
CT Tower	AT100	CT-0055	NA	NA
Software	Radiated_V7.6.15.9.4	NA	NA	NA
ADT RF Switches BOX	EM-H-01-1	1002	Jun. 17 2015	Jun. 16, 2016
WOKEN RF cable	8D	CABLE-ST6-01	Jun. 17 2015	Jun. 16, 2016

- Notes:
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 Open Site No. 6.
 3. The VCCI Site Registration No. R-728.
 4. The FCC Site Registration No. 90427.
 5. Tested Date: Dec. 23, 2015.

6.3 Test Arrangement

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four 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.
- 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.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is up to 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.



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

6.4 Test Results

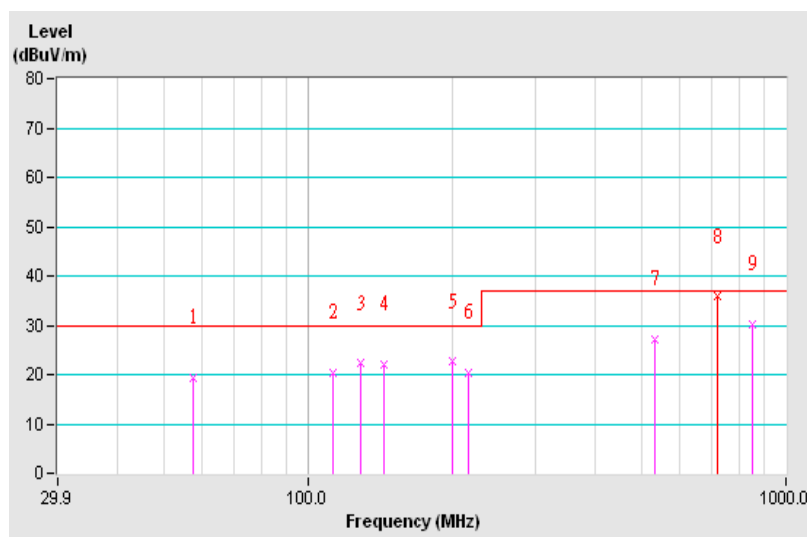
Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested by	Hermes Lin	Environmental Conditions	21°C, 75%RH
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Horizontal at 10 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	57.26	19.33 QP	30.00	-10.67	1.00 H	166	5.09	14.24
2	112.41	20.33 QP	30.00	-9.67	1.00 H	203	8.22	12.11
3	128.69	22.24 QP	30.00	-7.76	1.00 H	359	8.54	13.70
4	144.08	21.97 QP	30.00	-8.03	1.00 H	134	6.73	15.24
5	200.24	22.58 QP	30.00	-7.42	1.00 H	223	10.26	12.32
6	216.00	20.29 QP	30.00	-9.71	1.00 H	169	7.76	12.53
7	531.20	27.17 QP	37.00	-9.83	1.00 H	207	4.27	22.90
8	720.03	35.79 QP	37.00	-1.21	1.55 H	296	9.59	26.20
9	851.50	30.23 QP	37.00	-6.77	1.54 H	262	1.77	28.46

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

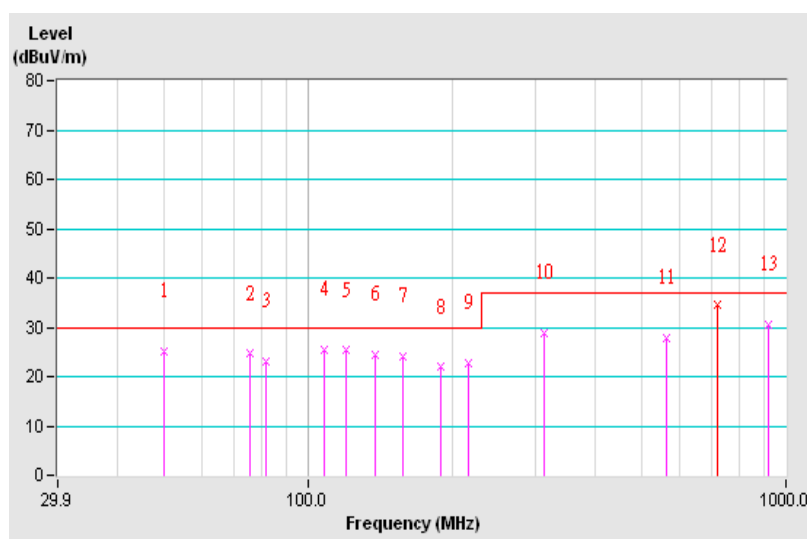


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested by	Hermes Lin	Environmental Conditions	21°C, 75%RH
Test Mode	Mode 1		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	50.01	25.07 QP	30.00	-4.93	1.00 V	164	10.36	14.71
2	75.55	24.60 QP	30.00	-5.40	1.00 V	227	13.10	11.50
3	81.33	22.97 QP	30.00	-7.03	1.00 V	281	12.87	10.10
4	108.27	25.50 QP	30.00	-4.50	1.00 V	57	13.86	11.64
5	120.28	25.26 QP	30.00	-4.74	1.00 V	314	12.36	12.90
6	138.43	24.44 QP	30.00	-5.56	1.00 V	9	9.81	14.63
7	157.52	24.23 QP	30.00	-5.77	1.00 V	250	8.87	15.36
8	190.00	21.88 QP	30.00	-8.12	1.00 V	28	9.16	12.72
9	216.00	22.71 QP	30.00	-7.29	1.00 V	316	10.18	12.53
10	311.81	28.82 QP	37.00	-8.18	1.00 V	0	11.51	17.31
11	563.49	27.82 QP	37.00	-9.18	3.76 V	20	4.36	23.46
12	720.04	34.41 QP	37.00	-2.59	2.39 V	61	8.21	26.20
13	921.00	30.53 QP	37.00	-6.47	1.56 V	145	0.68	29.85

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



7 Pictures of Test Arrangements

7.1 Conducted Emissions at Mains Ports



7.2 Radiated Emissions up to 1 GHz





Appendix – 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/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

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Email: service.adt@tw.bureauveritas.com

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

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