

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: ICES-003: 2020 Issue 7, Class A

ICES-Gen: 2018 Issue 1 +A1:2021

ANSI C63.4-2014 amended as per ANSI C63.4a-2017

Report No.: CIBDBO-WTW-P22120968

Product: High-Performance Fanless System

Brand: Vecow

Model No.: ECX-3000-PoE

Series Model: ECX-3XXXXXXXXXXXXX ("X" can be 0-9, A-Z or blank for marketing purpose)

Received Date: 2022/12/30

Test Date: 2023/1/4 ~ 2023/1/6

Issued Date: 2023/5/24

Applicant: Vecow Co., Ltd.

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

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Test Location: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Approved by: _____

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Date: _____

2023/5/24

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Prepared by : Vivian Chen / Senior Specialist



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Release Control Record

Issue No.	Description	Date Issued
CIBDBO-WTW-P22120968	Original release.	2023/5/24

1 Certificate

Product: High-Performance Fanless System

Brand: Vecow

Test Model: ECX-3000-PoE

Series Model: ECX-3XXXXXXXXXXXXX ("X" can be 0-9, A-Z or blank for marketing purpose)

Sample Status: Engineering sample

Applicant: Vecow Co., Ltd.

Test Date: 2023/1/4 ~ 2023/1/6

Standard: ICES-003: 2020 Issue 7, Class A
ICES-Gen: 2018 Issue 1 +A1:2021
ANSI C63.4-2014 amended as per ANSI C63.4a-2017

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.

2 Summary of Test Results

The test items that the EUT need to perform in accordance with its interfaces, evaluated functions, are as follows:

Standard	Test Item	Result	Remark
ICES-003	Conducted Emissions from Power Ports	Pass	Minimum passing Class A margin is -11.10 dB at 0.16403 MHz
ICES-003	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class A margin is -1.19 dB at 616.03 MHz
ICES-003	Radiated Emissions above 1 GHz	Pass	Minimum passing Class A margin is -8.83 dB at 1625.01 MHz

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	Specification	Expanded Uncertainty (k=2) (±)	Maximum allowable uncertainty (±)
Conducted Emissions from Power Ports	9 kHz ~ 30 MHz	3.00 dB	3.4 dB (U_{CISPR})
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	3m : 5.72 dB 10m : 4.38 dB	6.3 dB (U_{CISPR})
	1 GHz ~ 6 GHz	4.94 dB	5.2 dB (U_{CISPR})
Radiated Emissions above 1 GHz	6 GHz ~ 18 GHz	4.60 dB	5.5 dB (U_{CISPR})

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 Description of EUT

Product	High-Performance Fanless System
Brand	Vecow
Test Model	ECX-3000-PoE
Series Model	ECX-3XXXXXXXXXXXXX ("X" can be 0-9, A-Z or blank for marketing purpose)
Model Difference	For marketing purpose.
Sample Status	Engineering sample
Operating Software	WIN 10, Burnintest
Power Supply Rating	DC from Adapter
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT uses following adapter.

Brand	FSP
Model	FSP120-AABN2
Specification	AC Input: 100-240Vac, 1.8A, 50-60Hz DC Output: 24V, 5A, 120W DC Output Cable: 1.5m with one ferrite core

3.2 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 1.4GHz, provided by Vecow Co., Ltd., for detailed internal source, please refer to the manufacturer's specifications.

3.3 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.

Please refer to appendix of the report if the applicant has provided additional descriptions of the EUT.

The EUT configured with the following key components:

Components	Brand	Model	Specification
CPU	Intel	i7-12700TE	1.40GHz
RAM	SMART	-	DDR4 3200 WT 16GB*2
SSD	INNODISK	-	128GB 2.5" SATA SSD 3ME4

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

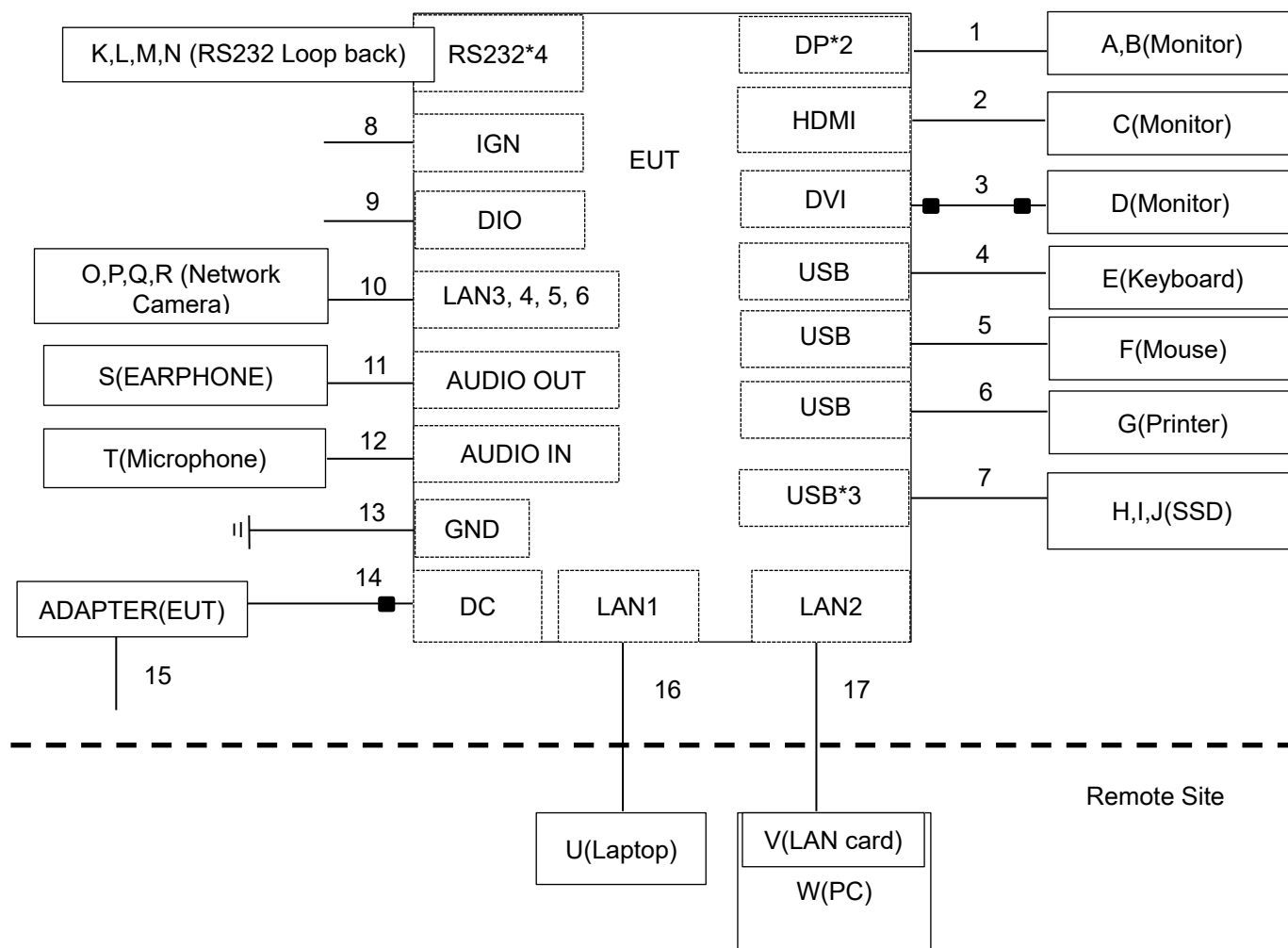
1. The EUT is designed with AC power of rating 100-240Vac, 50-60Hz.
For radiated emission evaluation, 230Vac/50Hz (for EN 50155), 120Vac/60Hz (for FCC Part 15 & ICES-003) had been covered during the pre-test. The worst data was found at **120Vac/60Hz** and recorded in the applied test report.
2. Test modes are presented in the report as below.

Test Condition	
Mode	Conducted Emissions from Power Ports
A	Full System+Input Power (120 Vac, 60 Hz)
B	Full System+Input Power (240 Vac, 60 Hz)
Mode	Radiated Emissions up to 1 GHz
A	Full System+Input Power (120 Vac, 60 Hz)
Mode	Radiated Emissions above 1 GHz
A	Full System+Input Power (120 Vac, 60 Hz)

3.5 Test Program Used and Operation Descriptions

- a. Turned on the power of all equipment.
- b. EUT ran a test program to enable all functions.
- c. EUT read and wrote messages to/ from internal storage drives, and external storage drives.
- d. Network camera captured video / audio signal to EUT.
- e. EUT sent and received ping messages to/ from the Laptops (kept in a remote area) via two STP LAN cables (10m each).
- f. EUT sent "H" messages to LCD monitors. Then they displayed messages on their screens simultaneously.
- g. EUT sent messages to printer and printed them out.
- h. EUT sent "1kHz audio" signal to earphone.
- i. Set EUT's RS-232 in loop back mode and enable it under transmission/receiving by itself.
- j. Steps c-i were repeated.

3.6 Connection Diagram of EUT and Peripheral Devices



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Monitor	ASUS	PA279CV	M7LMTF235958	DoC	Provided by Lab
B	Monitor	ASUS	PA279CV	M7LMTF236012	DoC	Provided by Lab
C	Monitor	ASUS	PA279CV	M7LMTF235960	DoC	Provided by Lab
D	Monitor	DELL	U2410	CN082WXD728720CC10NL	DoC	Provided by Lab
E	USB Keyboard	Dell	KB216t	CN-0W33XP-LO300-7CL-191E	N/A	Provided by Lab
F	USB Mouse	DELL	MOCZUL	CN-049TWY-PRC00-77B-007R	N/A	Provided by Lab
G	Printer	HP	HP Officejet Pro 251dW	N/A	B94SDGOB1191	Provided by Lab
H	USB 3.1 SSD	Crucial	CT500X8SSD9	1941E323D093	N/A	Provided by Lab
I	USB 3.1 SSD	Crucial	CT500X8SSD9	1943E3201B6D	N/A	Provided by Lab
J	USB 3.1 SSD	Crucial	CT500X8SSD9	1940E3200CFB	N/A	Provided by Lab
K	RS232 loop back	N/A	N/A	N/A	N/A	Supplied by applicant
L	RS232 loop back	N/A	N/A	N/A	N/A	Supplied by applicant
M	RS232 loop back	N/A	N/A	N/A	N/A	Supplied by applicant
N	RS232 loop back	N/A	N/A	N/A	N/A	Supplied by applicant
O	Network Camera	MESSOA Technologies Inc.	MBL030A-ORZ0310	T52671337	DOC	Supplied by applicant
P	Network Camera	MESSOA Technologies Inc.	MBL030A-ORZ0310	T52671344	DOC	Supplied by applicant
Q	Network Camera	MESSOA Technologies Inc.	MBL030A-ORZ0310	T52671343	DOC	Supplied by applicant
R	Network Camera	MESSOA Technologies Inc.	MBL030A-ORZ0310	T52671345	DOC	Supplied by applicant
S	EARPHONE	PHILIPS	SBC HL145	N/A	N/A	Provided by Lab
T	Microphone	E-books	E-EPB099	N/A	N/A	Provided by Lab
U	Laptop	LENOVO	T480	PF1EK03U	N/A	Provided by Lab
V	LAN card	ASUS	XG-C100C	N/A	DoC	Provided by Lab
W	PC	DELL	VOSTRO 470	7VBJYBX	DoC	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DP cable	2	1.8	Yes	0	Provided by Lab
2	HDMI cable	1	2	Yes	0	Provided by Lab
3	DVI cable	1	1.8	Yes	2	Provided by Lab
4	USB cable	1	1.8	Yes	0	Provided by Lab
5	USB cable	1	1.8	Yes	0	Provided by Lab
6	USB cable	1	1.8	Yes	0	Provided by Lab
7	USB Type A to C cable	3	1	Yes	0	Provided by Lab
8	Data cable	1	0.8	No	0	Provided by Lab
9	Data cable	3	0.4	No	0	Provided by Lab
10	RJ45 (Cat. 5e) cable	4	2	Yes	0	Provided by Lab
11	Audio (3.5") cable	1	1.2	No	0	Provided by Lab
12	Audio (3.5") cable	1	2	No	0	Provided by Lab
13	GND (PE) cable	1	1.5	No	0	Provided by Lab
14	DC power cable	1	1.5	No	1	Accessory of EUT
15	AC power(3pin) cable	1	1.8	No	0	Provided by Lab
16	RJ45 (Cat. 5e) cable	1	10	Yes	0	Provided by Lab
17	RJ45 (Cat. 5e) cable	1	10	Yes	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Conducted Emissions from Power Ports

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal LYNICS	0900510	E1-011285	2022/9/19	2023/9/18
		E1-011286	2022/9/19	2023/9/18
50 Ohms Terminator LYNICS	0900510	E1-01-305	2022/2/9	2023/2/8
Attenuator STI	STI02-2200-10	NO.3	2022/10/21	2023/10/20
Coupling/Dcoupling Network Schwarzbeck	CDNE-M2	00097	2022/6/1	2023/5/31
	CDNE-M3	00091	2022/6/1	2023/5/31
Coupling/Dcoupling Network TESEQ	CDN A201A	44601	2022/12/14	2023/12/13
DC LISN R&S	ESH3-Z6	100219	2022/8/2	2023/8/1
		844950/018	2022/8/2	2023/8/1
DC LISN Schwarzbeck	NNLK 8121	8121-808	2022/4/29	2023/4/28
High Voltage Probe Schwarzbeck	TK9420	00982	2022/12/14	2023/12/13
Isolation Transformer Erika Fiedler	D-65396	017	2022/9/8	2023/9/7
LISN EMCO	3825/2	9204-1964	2022/6/17	2023/6/16
		9504-2359	2022/8/2	2023/8/1
LISN R&S	ENV216	101195	2022/8/1	2023/7/31
		101196	2022/5/24	2023/5/23
		101197	2022/7/5	2023/7/4
LISN Schwarzbeck	NNLK 8121	8121-00759	2022/8/18	2023/8/17
		8121-731	2022/5/26	2023/5/25
	NNLK8129	8129229	2022/6/8	2023/6/7
RF Coaxial Cable Commate	5D-FB	Cable-CO3-01	2022/9/14	2023/9/13
Software BVADT	Cond_V7.3.7.4	N/A	N/A	N/A
Test Receiver R&S	ESR3	102413	2022/2/11	2023/2/10

Notes:

1. The test was performed in Linkou Conduction 3.
2. The VCCI Site Registration No. C-10274.
3. Tested Date: 2023/1/4

4.2 Radiated Emissions up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
ADT. Tower	AT100	0205	N/A	N/A
ADT. Turn Table	TT100	0205	N/A	N/A
Attenuator Mini-Circuits	UNAT-5+	PAD-ST2-01	2022/10/21	2023/10/20
Bi-log Broadband Antenna Schwarzbeck	VULB9168	9168-303	2022/10/25	2023/10/24
Coupling/Dcoupling Network Schwarzbeck	CDNE-M2	00097	2022/6/1	2023/5/31
	CDNE-M3	00091	2022/6/1	2023/5/31
Preamplifier Agilent	8447D	2944A11062	2022/2/16	2023/2/15
Pre_Amplifier EMCI	EMC9135	980711	2022/3/19	2023/3/18
Pre_Amplifier HP	8447D	2944A08313	2022/2/16	2023/2/15
RF Coaxial Cable Pacific	8D-FB	Cable-ST2-01	2022/10/21	2023/10/20
Software BVADT	Radiated_V7.6.15.9.5	N/A	N/A	N/A
TEST RECEIVER R&S	ESCS 30	100276	2022/4/19	2023/4/18
		100292	2022/8/30	2023/8/29

Notes:

1. The test was performed in Linkou Open Site2 , The test site validated date: 2022/7/16 (NSA)
2. The VCCI Site Registration No. R-10237.
3. Tested Date: 2023/1/4

4.3 Radiated Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Attenuator Mini-Circuits	BW-K3-2W44+	PAD-CH7-03	2022/7/7	2023/7/6
	BW-N4W5+	PAD-CH7-02	2022/7/7	2023/7/6
Band Pass Filter MICRO-TRONICS	BRM17690	005	2022/5/26	2023/5/25
Fix tool for Boresight antenna tower BV	BAF-01	4	N/A	N/A
Horn Antenna EMCO	3115	9312-4192	2022/11/13	2023/11/12
Horn Antenna ETS-Lindgren	3117-PA	00215857	2022/11/13	2023/11/12
Horn Antenna Schwarzbeck	BBHA-9170	BBHA9170190	2022/11/13	2023/11/12
Notch Filter MICRO-TRONICS	BRC50703-01	010	2022/5/26	2023/5/25
Pre-amplifier HP	8449B	3008A01292	2022/2/17	2023/2/16
Pre-amplifier (18GHz-40GHz) EMCI	EMC184045B	980175	2022/9/3	2023/9/2
Pre_Amplifier EMCI	EMC0126545	980076	2022/2/17	2023/2/16
	EMC184045B	980235	2022/2/17	2023/2/16
RF Coaxial Cable HUBER SUHNER	SF-102	Cable-CH7(3.6M)-02	2022/7/7	2023/7/6
Software BVADT	Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Keysight	N9020B	MY60110438	2022/12/6	2023/12/5
		MY60112260	2022/5/21	2023/5/20
Test Receiver Agilent	N9038A	MY50010135	2022/8/30	2023/8/29
		MY51210114	2022/1/10	2023/1/9
Turn Table & Tower Max Full	MF7802	MF780208103	N/A	N/A

Notes:

1. The test was performed in Linkou 966 Chamber 2 (CH 7).
2. The VCCI Site Registration No. G-10039.
3. Tested Date: 2023/1/5 ~ 2023/1/6

5 Limits of Test Items

5.1 Conducted Emissions from Power Ports

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 Radiated Emissions up to 1 GHz

Frequency range (MHz)	Class A (3 m) Quasi-peak dB μ V/m	Class A (10 m) Quasi-peak dB μ V/m	Class B (3 m) Quasi-peak dB μ V/m	Class B (10 m) Quasi-peak dB μ V/m
30-88	50.0	40.0	40.0	30.0
88-216	54.0	43.5	43.5	33.1
216-230	56.9	46.4	46.0	35.6
230-960	57.0	47.0	47.0	37.0
960-1000	60.0	49.5	54.0	43.5

Notes: 1. The lower limit shall apply at the transition frequencies.

5.3 Radiated Emissions above 1 GHz

Required highest measurement frequency

Highest internal frequency (F_x)	Highest measurement frequency (F_M) (GHz)
$F_x \leq 108$ MHz	1
108 MHz < $F_x \leq 500$ MHz	2
500 MHz < $F_x \leq 1$ GHz	5
$F_x > 1$ GHz	5 x F_x up to a maximum of 40 GHz

F_x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.

Radiated Emissions Limits at 3 meters (dB μ V/m)		
Frequency range (GHz)	Class A	Class B
1 - F_M	Avg: 60 Peak: 80	Avg: 54 Peak: 74

Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far field of the ITE or digital apparatus under test.

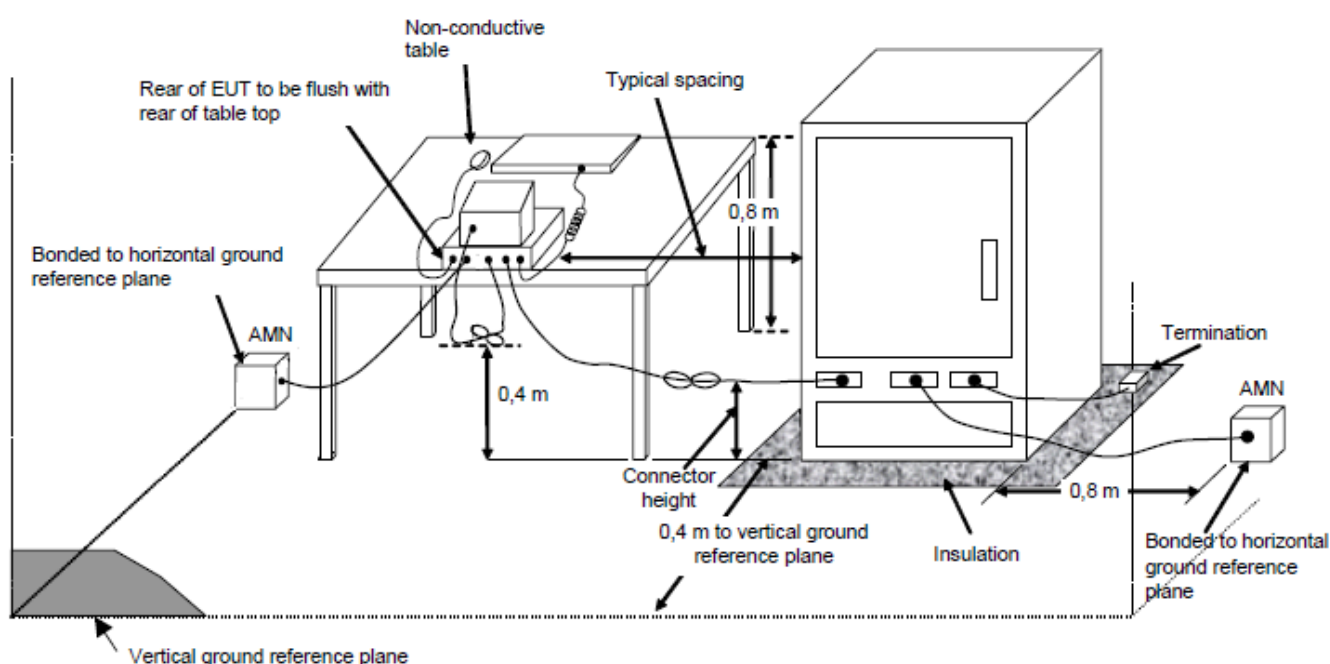
At and above 1 GHz, if the ITE or digital apparatus is an outdoor unit of home satellite receiving systems, it shall comply with the limits in Table A.7 in clause A.2 of CAN/CSA-CISPR 32:17 (in Annex A therein). For these types of ITE or digital apparatus, the highest measurement frequency shall be 18 GHz.

6 Test Arrangements

6.1 Conducted Emissions from Power Ports

- For the table-top EUT is placed on a 0.8 meter insulation table; for the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The EUT is 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 are connected to the power mains through another LISN. They provide 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.

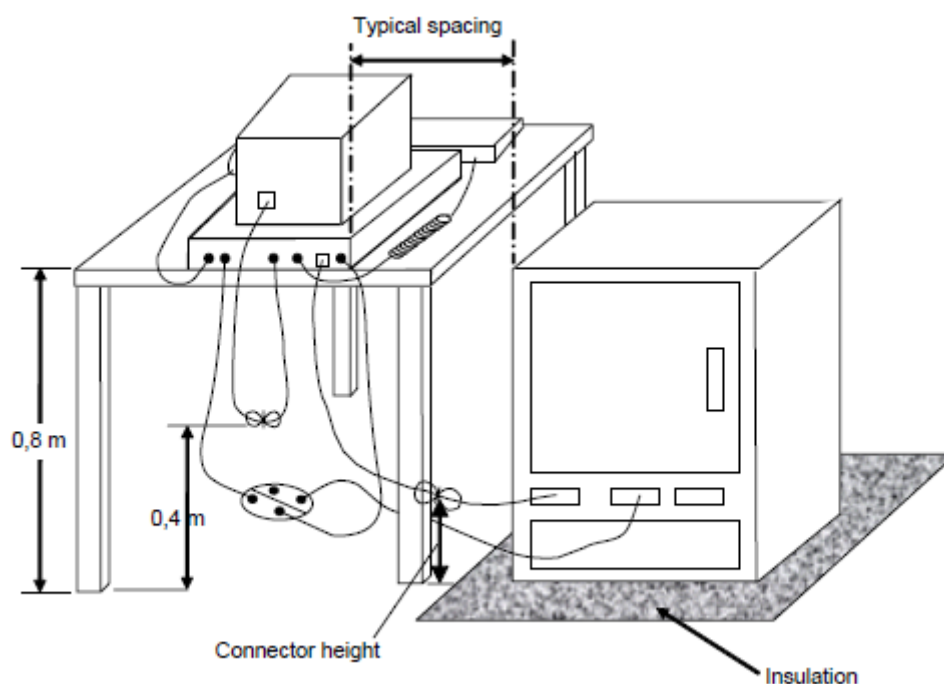


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.2 Radiated Emissions up to 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- 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.

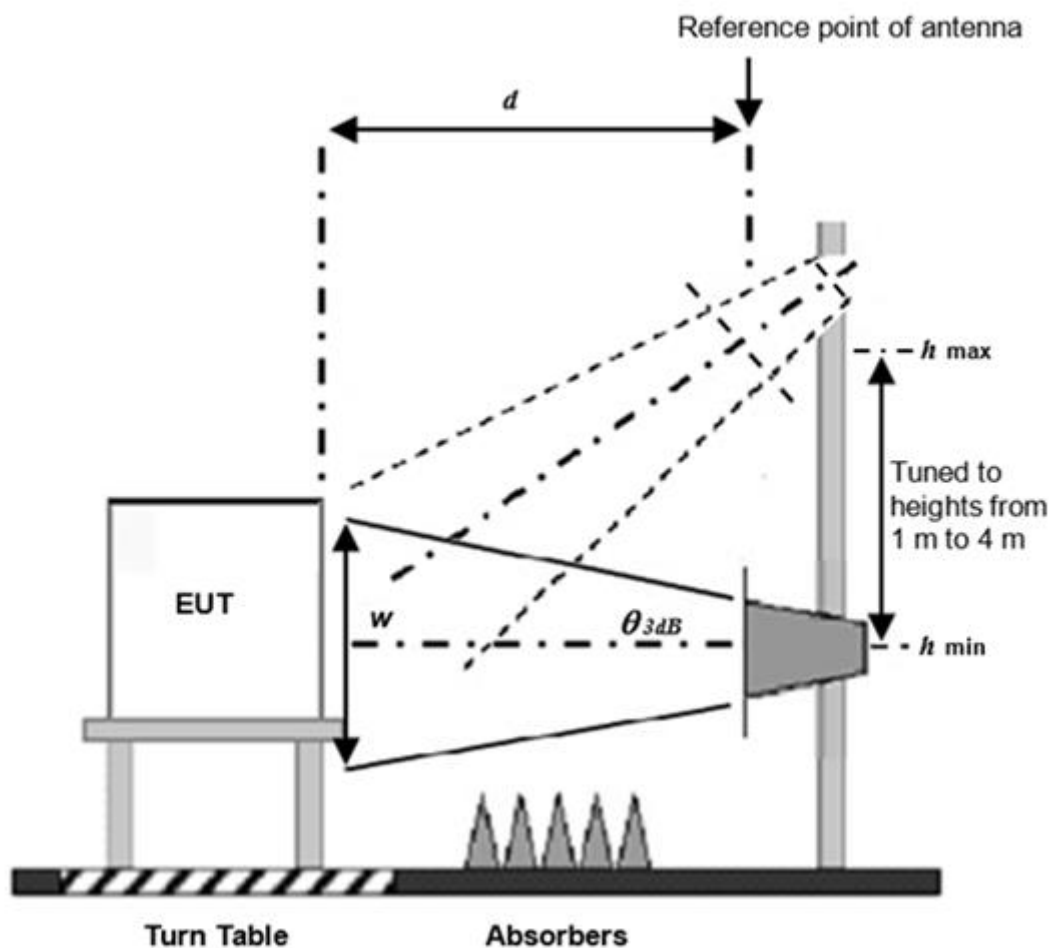


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.3 Radiated Emissions above 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set $d = 3$ meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The spectrum analyzer system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.



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

7 Test Results of Test Item

7.1 Conducted Emissions from Power Ports

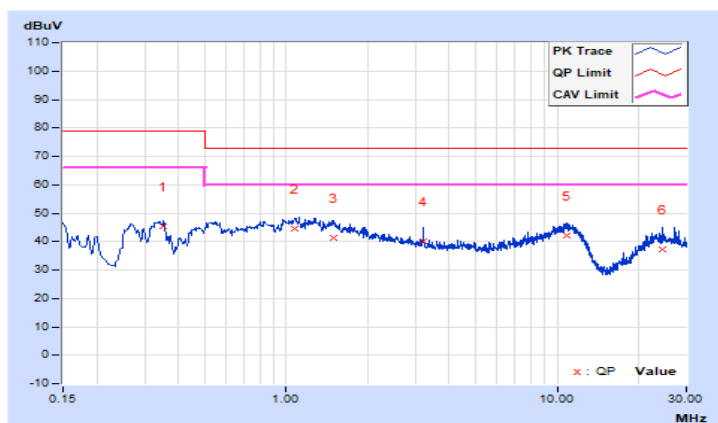
Mode A

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	20°C, 70% RH
Tested by	Paul Chen		

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	0.35337	9.65	35.62	29.82	45.27	39.47	79.00	66.00	-33.73	-26.53
2	1.07313	9.66	34.72	26.97	44.38	36.63	73.00	60.00	-28.62	-23.37
3	1.49731	9.68	31.81	25.45	41.49	35.13	73.00	60.00	-31.51	-24.87
4	3.22206	9.73	30.39	27.07	40.12	36.80	73.00	60.00	-32.88	-23.20
5	10.80784	9.85	32.08	26.58	41.93	36.43	73.00	60.00	-31.07	-23.57
6	24.38683	10.10	27.12	21.22	37.22	31.32	73.00	60.00	-35.78	-28.68

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

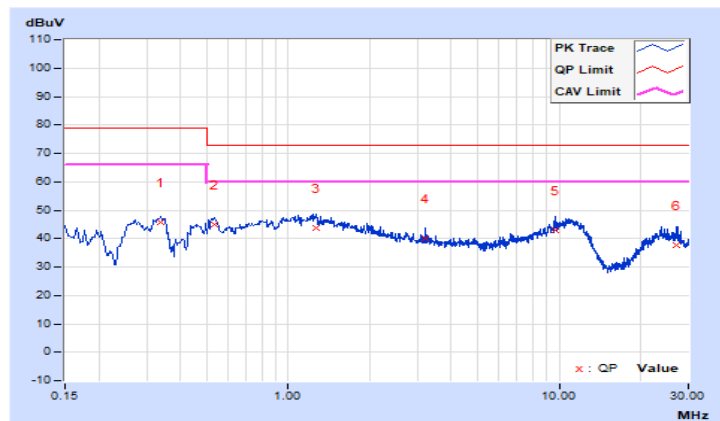


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	20°C, 70% RH
Tested by	Paul Chen		

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	0.33773	9.65	36.14	29.60	45.79	39.25	79.00	66.00	-33.21	-26.75
2	0.53129	9.65	35.29	28.10	44.94	37.75	73.00	60.00	-28.06	-22.25
3	1.26265	9.68	34.01	26.51	43.69	36.19	73.00	60.00	-29.31	-23.81
4	3.21814	9.74	30.37	27.13	40.11	36.87	73.00	60.00	-32.89	-23.13
5	9.65018	9.87	33.07	27.93	42.94	37.80	73.00	60.00	-30.06	-22.20
6	27.11670	10.24	27.47	20.86	37.71	31.10	73.00	60.00	-35.29	-28.90

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



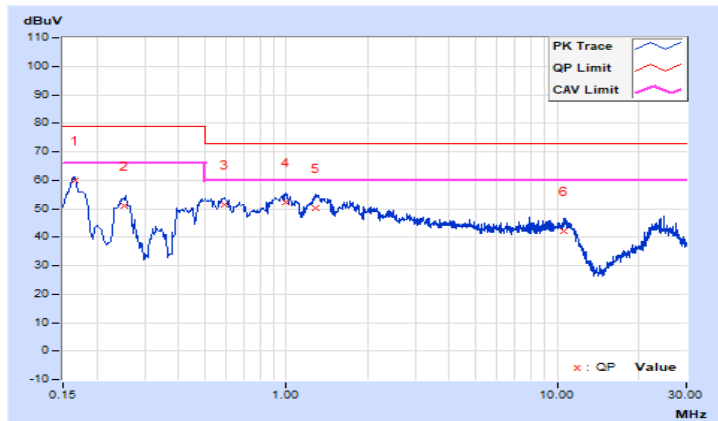
Mode B

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240 Vac, 60 Hz	Environmental Conditions	20°C, 70% RH
Tested by	Paul Chen		

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	0.16526	9.65	50.26	43.79	59.91	53.44	79.00	66.00	-19.09	-12.56
2	0.25259	9.65	41.26	34.87	50.91	44.52	79.00	66.00	-28.09	-21.48
3	0.58849	9.65	41.76	34.68	51.41	44.33	73.00	60.00	-21.59	-15.67
4	0.99279	9.66	42.68	35.21	52.34	44.87	73.00	60.00	-20.66	-15.13
5	1.29002	9.67	40.51	33.08	50.18	42.75	73.00	60.00	-22.82	-17.25
6	10.53407	9.85	32.33	26.76	42.18	36.61	73.00	60.00	-30.82	-23.39

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

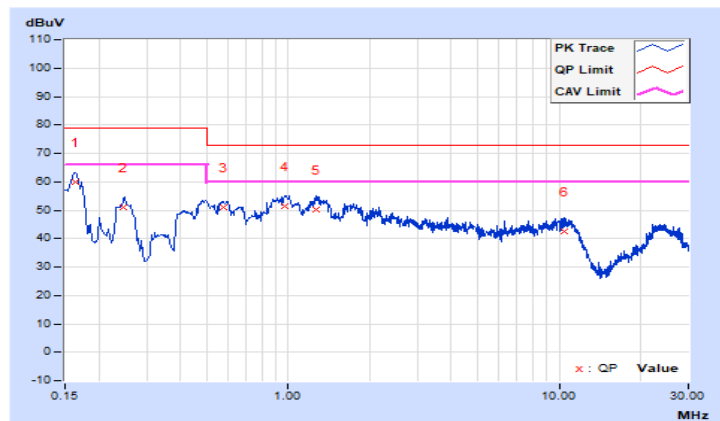


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240 Vac, 60 Hz	Environmental Conditions	20°C, 70% RH
Tested by	Paul Chen		

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	0.16403	9.65	50.42	45.25	60.07	54.90	79.00	66.00	-18.93	-11.10
2	0.24777	9.65	41.33	37.11	50.98	46.76	79.00	66.00	-28.02	-19.24
3	0.57774	9.66	41.46	35.33	51.12	44.99	73.00	60.00	-21.88	-15.01
4	0.97323	9.67	41.85	34.61	51.52	44.28	73.00	60.00	-21.48	-15.72
5	1.27026	9.68	40.34	32.74	50.02	42.42	73.00	60.00	-22.98	-17.58
6	10.46367	9.89	32.81	27.25	42.70	37.14	73.00	60.00	-30.30	-22.86

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



7.2 Radiated Emissions up to 1 GHz

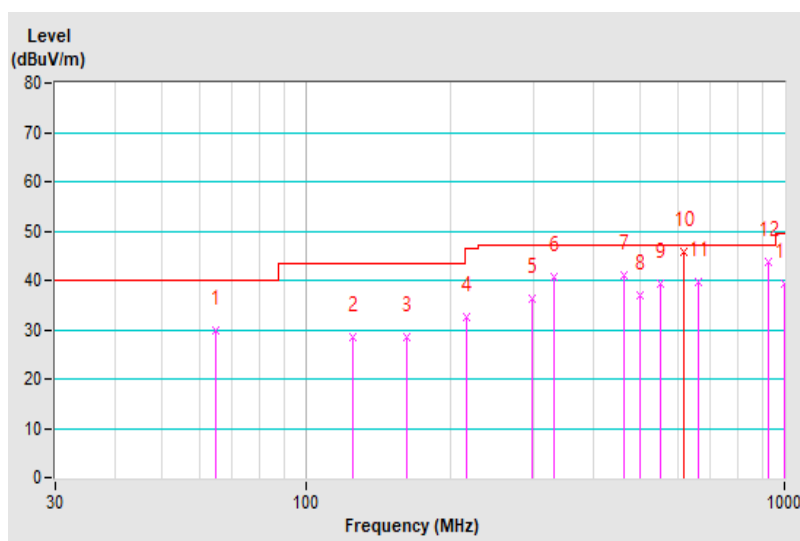
Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	18°C, 68% RH
Tested By	Paul Chen		

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	65.09	29.92 QP	40.00	-10.08	4.00 H	242	39.73	-9.81
2	125.04	28.44 QP	43.50	-15.06	4.00 H	182	38.22	-9.78
3	162.32	28.46 QP	43.50	-15.04	4.00 H	248	36.24	-7.78
4	216.03	32.40 QP	46.40	-14.00	4.00 H	180	42.74	-10.34
5	297.12	36.26 QP	47.00	-10.74	3.67 H	7	42.41	-6.15
6	331.24	40.84 QP	47.00	-6.16	3.28 H	109	46.03	-5.19
7	462.02	41.12 QP	47.00	-5.88	2.22 H	152	43.28	-2.16
8	500.00	36.78 QP	47.00	-10.22	1.96 H	281	38.42	-1.64
9	550.14	39.42 QP	47.00	-7.58	1.94 H	94	39.92	-0.50
10	616.03	45.81 QP	47.00	-1.19	1.46 H	196	44.02	1.79
11	662.51	39.66 QP	47.00	-7.34	1.22 H	274	36.84	2.82
12	924.03	43.59 QP	47.00	-3.41	1.00 H	270	35.01	8.58
13	999.98	39.49 QP	49.50	-10.01	1.00 H	103	29.77	9.72

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

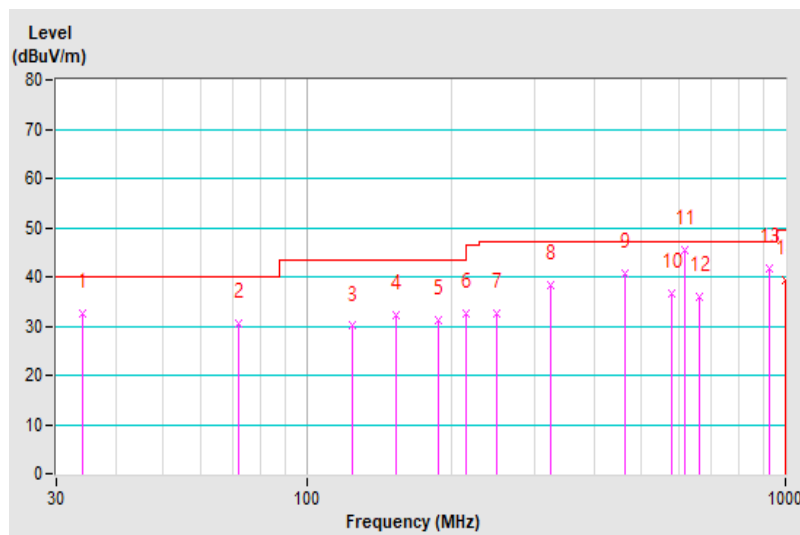


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	18°C, 68% RH
Tested By	Paul Chen		

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	34.06	32.42 QP	40.00	-7.58	1.23 V	64	42.19	-9.77
2	72.10	30.60 QP	40.00	-9.40	1.64 V	225	41.88	-11.28
3	124.98	30.00 QP	43.50	-13.50	1.00 V	272	39.81	-9.81
4	154.00	32.10 QP	43.50	-11.40	1.00 V	237	39.81	-7.71
5	189.04	31.19 QP	43.50	-12.31	1.00 V	20	41.54	-10.35
6	216.00	32.57 QP	46.40	-13.83	1.00 V	310	42.91	-10.34
7	249.97	32.43 QP	47.00	-14.57	1.00 V	293	40.49	-8.06
8	324.00	38.34 QP	47.00	-8.66	1.00 V	7	43.67	-5.33
9	462.05	40.73 QP	47.00	-6.27	1.00 V	96	42.89	-2.16
10	577.55	36.70 QP	47.00	-10.30	3.41 V	219	36.21	0.49
11	616.06	45.35 QP	47.00	-1.65	3.08 V	143	43.56	1.79
12	662.50	35.87 QP	47.00	-11.13	2.84 V	287	33.06	2.81
13	924.04	41.55 QP	47.00	-5.45	2.33 V	193	32.97	8.58
14	999.97	39.31 QP	49.50	-10.19	2.24 V	20	29.59	9.72

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



7.3 Radiated Emissions above 1 GHz

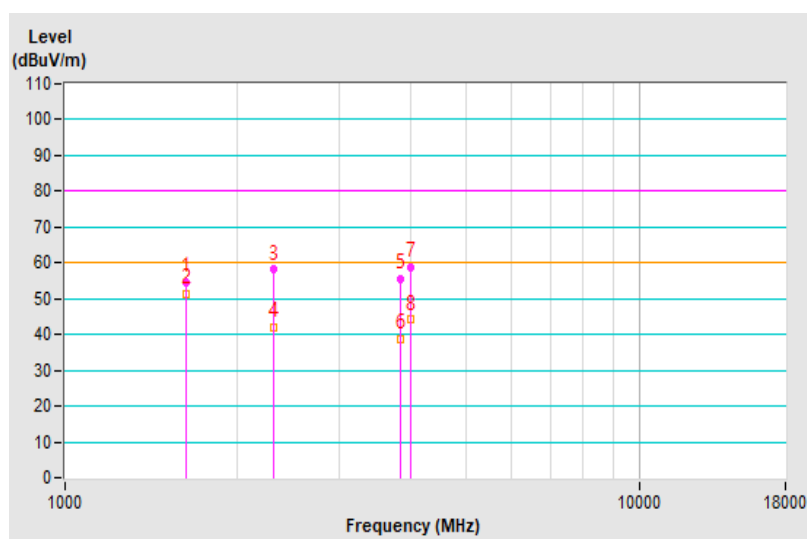
Mode A

Frequency Range	1 GHz ~ 7 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	20°C, 63% RH
Tested By	Vincent Lin		

Antenna Polarity & Test Distance : Horizontal at 3 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	1625.01	54.62 PK	80.00	-25.38	1.00 H	220	58.88	-4.26
2	1625.01	51.17 AV	60.00	-8.83	1.00 H	220	55.43	-4.26
3	2309.98	58.15 PK	80.00	-21.85	2.55 H	90	60.36	-2.21
4	2309.98	41.97 AV	60.00	-18.03	2.55 H	90	44.18	-2.21
5	3850.33	55.62 PK	80.00	-24.38	1.12 H	231	53.53	2.09
6	3850.33	38.91 AV	60.00	-21.09	1.12 H	231	36.82	2.09
7	4004.26	58.92 PK	80.00	-21.08	2.43 H	336	56.69	2.23
8	4004.26	44.08 AV	60.00	-15.92	2.43 H	336	41.85	2.23

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

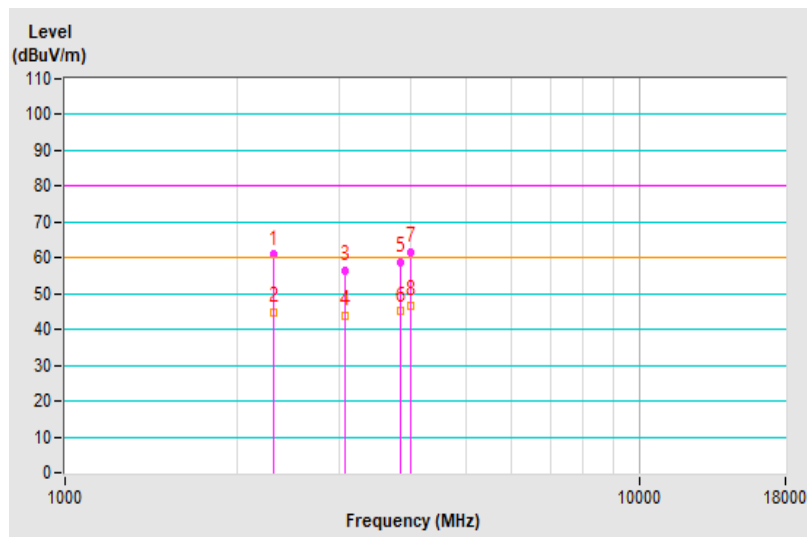


Frequency Range	1 GHz ~ 7 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	20°C, 63% RH
Tested By	Vincent Lin		

Antenna Polarity & Test Distance : Vertical at 3 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	2310.15	60.84 PK	80.00	-19.16	1.52 V	148	63.06	-2.22
2	2310.15	44.71 AV	60.00	-15.29	1.52 V	148	46.93	-2.22
3	3080.16	56.55 PK	80.00	-23.45	2.86 V	55	56.24	0.31
4	3080.16	43.72 AV	60.00	-16.28	2.86 V	55	43.41	0.31
5	3850.24	58.91 PK	80.00	-21.09	2.10 V	116	56.82	2.09
6	3850.24	45.02 AV	60.00	-14.98	2.10 V	116	42.93	2.09
7	4004.15	61.42 PK	80.00	-18.58	1.62 V	50	59.19	2.23
8	4004.15	46.58 AV	60.00	-13.42	1.62 V	50	44.35	2.23

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



8 Pictures of Test Arrangements

8.1 Conducted Emissions from Power Ports

Mode A



Mode B



8.2 Radiated Emissions up to 1 GHz

Mode A



8.3 Radiated Emissions above 1 GHz

Mode A



9 Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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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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