TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 15, Subpart B, Class A** **ANSI C63.4:2014**
Report No.:	FDBDBO-WTW-P22010294
Model No.:	AIC-110
Series Model:	AIC-100 Series, AIC-1XXXXXXXXXXXXXXX (“X” can be 0-9, A-Z or blank for marketing purpose)
Received Date:	2022/1/8
Test Date:	2022/1/14 ~ 2022/1/17
Issued Date:	2022/2/18
Applicant:	Vecow Co., Ltd.
Address:	3F., No.10, Jiankang Rd., Zhonghe Dist., New Taipei City 23586, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
FCC Registration / Designation Number:	418586 / TW1078

Approved by: Jim Hsiang , **Date:** 2022/2/18

Jim Hsiang / Associate Technical Manager

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Prepared by : Ivy Lin / Specialist

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
FDBDBO-WTW-P22010294	Original release.	2022/2/18

1 Certificate

Product:	Arm-based IoT Gateway System
Brand:	Vecow
Test Model:	AIC-110
Variant Model:	AIC-100 Series, AIC-1XXXXXXXXXXXXXX (“X” can be 0-9, A-Z or blank for marketing purpose)
Sample Status:	Engineering sample
Applicant:	Vecow Co., Ltd.
Test Date:	2022/1/14 ~ 2022/1/17
Standard:	47 CFR FCC Part 15, Subpart B, Class A 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.

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 / Clause	Test Item	Result	Remark
FCC Part 15.107	Conducted Emissions from Power Ports	Pass	Minimum passing Class A margin is -21.86 dB at 17.61638 MHz
FCC Part 15.109	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class A margin is -0.39 dB at 396.00 MHz
FCC Part 15.109	Radiated Emissions above 1 GHz	Pass	Minimum passing Class A margin is -26.04 dB at 3714.69 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	150 kHz ~ 30 MHz	2.94dB	3.4 dB (U_{cispr})
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	3m : 5.64dB 10m : 4.30dB	6.3 dB (U_{cispr})
Radiated Emissions above 1 GHz	1 GHz ~ 6 GHz	4.64dB	5.2 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	Arm-based IoT Gateway System
Brand	Vecow
Test Model	AIC-110
Variant Model	AIC-100 Series, AIC-1XXXXXXXXXXXXXXX (“X” can be 0-9, A-Z or blank for marketing purpose)
Model Difference	For marketing purposes
Sample Status	Engineering sample
Operating Software	Debian Stretch R01
Power Supply Rating	Refer to Note as below
Accessory Device	Adapter
Data Cable Supplied	Shielded USB cable (1.0m)

Note:

The EUT uses following adapter.

Brand	Model	Specification
LITEON	PA-1121-24	AC Input : 100-240V, 2A, 50-60 Hz DC Output : 24V, 5.0A, 120W Power Cord: Non-shielded DC cable (1.5m) with one 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 900 MHz, provided by Vecow Co., Ltd., for detailed internal source, please refer to the manufacturer's specifications.

3.3 Features of EUT

1. 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.

2. The EUT was configured with the following key components:

Component	Vendor / Model No. /Spec
CPU	NXP i.MX6ULL Arm® Cortex® -A7, up to 900MHz
RAM	DDR3L SDRAM, 512MB

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

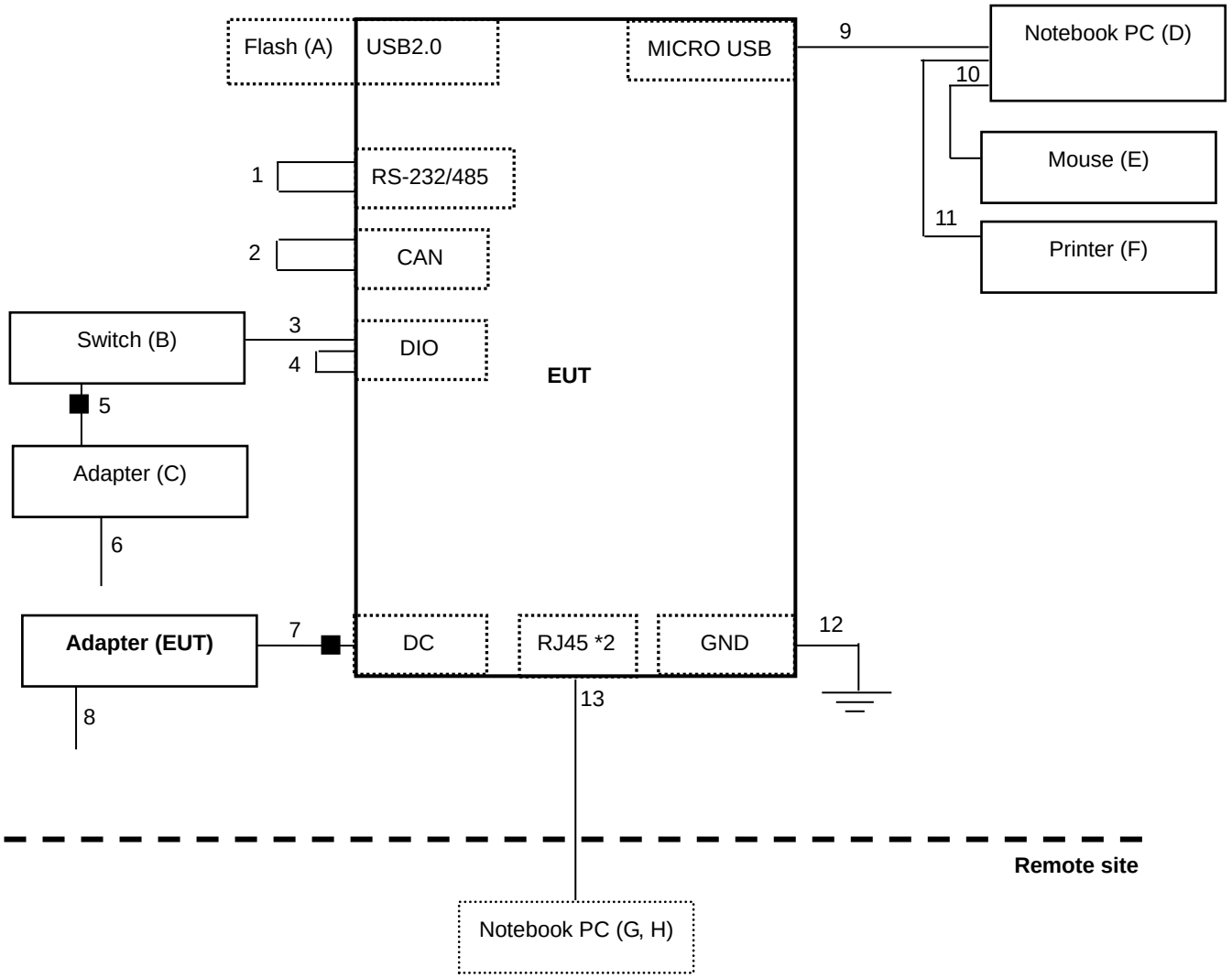
Test modes are presented in the report as below.

Test Condition	
Mode	Conducted Emissions from Power Ports
A	Input Power (AC 120V 60Hz) + Full system + LAN Ping
B	Input Power (AC 240V 60Hz) + Full system + LAN Ping
Mode	Radiated Emissions up to 1 GHz
A	Input Power (AC 120V 60Hz) + Full system + LAN Ping
Mode	Radiated Emissions above 1 GHz
A	Input Power (AC 120V 60Hz) + Full system + LAN Ping

3.5 Test Program Used and Operation Descriptions

a. Turned on the power of all equipment.
b. Notebook ran a test program to enable all functions of EUT.
c. Notebook read and wrote messages from USB Flash Drive via EUT.
d. Notebook sent and received messages to/from two Notebooks (kept in a remote area) via EUT (command “PING”) with two STP LAN cables (10m each).
e. Steps c-d 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	FLASH	SP	MOBILE C31	N/A	N/A	Provided by Lab
B	SWITCH	N/A	N/A	N/A	N/A	Supplied by applicant
C	ADAPTER	CWT	KPL-060F-VI	N/A	N/A	Supplied by applicant
D	Notebook PC	DELL	P41G	FT4W952	N/A	Provided by Lab
E	USB Mouse	DELL	MOCZUL	CN-049TWY-PRC00-77B-007R	N/A	Provided by Lab
F	PRINTER	HP	HP Officejet Pro 251dw	CN62OCV0JN	B94SDGOB1191	Provided by Lab
G	Notebook PC	SONY	SVS151A12P	275548477001024	N/A	Provided by Lab
H	Notebook PC	ASUS	PU401L	ECNXBC012528528	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	I/O cable	2	0.01	No	0	Supplied by applicant
2	I/O cable	2	0.05	No	0	Supplied by applicant
3	DC power cable	3	0.1	No	0	Supplied by applicant
4	I/O cable	8	0.01	No	0	Supplied by applicant
5	DC power cable	1	1.2	No	1	Supplied by applicant
6	AC power cable	1	1.8	No	0	Provided by Lab
7	DC power cable	1	1.5	No	1	Supplied by applicant
8	AC power cable	1	1.8	No	0	Provided by Lab
9	Micro USB cable	1	1	Yes	0	Supplied by applicant
10	USB 2.0 cable	1	1.8	Yes	0	Provided by Lab
11	USB 2.0 cable	1	1.8	Yes	0	Provided by Lab
12	GND cable	1	1.5	No	0	Provided by Lab
13	RJ45 Cable	2	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	E1-011484	2021/5/25	2022/5/24
Attenuator STI	STI02-2200-10	NO.1	2021/9/15	2022/9/14
DC LISN Schwarzbeck	NNLK 8121	8121-808	2021/4/18	2022/4/17
DC LISN R&S	ESH3-Z6	100219	2021/7/25	2022/7/24
Isolation Transformer Erika Fiedler	D-65396	017	2021/9/9	2022/9/8
LISN R&S	ENV216	101195	2021/5/25	2022/5/24
		101197	2021/6/23	2022/6/22
LISN Schwarzbeck	NNLK8129	8129229	2021/5/20	2022/5/19
	NNLK 8121	8121-731	2021/4/28	2022/4/27
LISN R&S	ENV216	101196	2021/4/26	2022/4/25
	ESH3-Z6	844950/018	2021/7/25	2022/7/24
RF Coaxial Cable Commate	5D-FB	Cable-CO10-01	2021/2/10	2022/2/9
Software BVADT	Cond_V7.3.7.4	NA	NA	NA
Test Receiver R&S	ESR3	102414	2021/12/20	2022/12/19

Notes:

1. The test was performed in Linkou Conduction 10.
2. Tested Date: 2022/1/17

4.2 Radiated Emissions up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
ADT. Tower	AT100	0205	NA	NA
ADT. Turn Table	TT100	0205	NA	NA
Attenuator Mini-Circuits	UNAT-5+	PAD-ST2-01	2021/10/22	2022/10/21
Bi-log Broadband Antenna Schwarzbeck	VULB9168	9168-303	2021/10/29	2022/10/28
Pre_Amplifier HP	8447D	2944A08119	2021/2/18	2022/2/17
RF Coaxial Cable Pacific	8D-FB	Cable-ST2-01	2021/10/22	2022/10/21
Software BVADT	Radiated_V7.6.15.9.5	NA	NA	NA
TEST RECEIVER R&S	ESCS 30	100292	2021/9/1	2022/8/31
	ESCS 30	100276	2021/4/15	2022/4/14

Notes:

1. The test was performed in Linkou Open Site2 , The test site validated date: 2021/07/30 (NSA)
2. Tested Date: 2022/1/14

4.3 Radiated Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Attenuator Mini-Circuits	BW-N4W5+	PAD-CH10-02	2021/7/8	2022/7/7
	BW-K3-2W44+	PAD-CH7-03	2021/7/8	2022/7/7
BandPass Filter MICRO-TRONICS	BRM17690	005	2021/5/28	2022/5/27
Fix tool for Boresight antenna tower BV	BAF-01	9	NA	NA
Horn Antenna ETS-Lindgren	3117-PA	00215857	2021/11/14	2022/11/13
Horn Antenna EMCO	3115	6714	2021/11/14	2022/11/13
Horn Antenna Schwarzbeck	BBHA 9170	212	2021/10/13	2022/10/12
Notch filter MICRO-TRONICS	BRC50703-01	010	2021/5/28	2022/5/27
Pre_Amplifier EMCI	EMC0126545	980076	2021/2/19	2022/2/18
Pre_Amplifier MITEQ	AMF-6F-260400-33-8P	892164	2021/2/19	2022/2/18
Pre_Amplifier EMCI	EMC184045B	980235	2021/2/19	2022/2/18
Pre-amplifier HP	8449B	3008A01292	2021/2/19	2022/2/18
RF Coaxial Cable Rosnol	K1K50-UP0279-K1K50-3000	Cable-CH10(3m)-04	2021/7/8	2022/7/7
RF Coaxial Cable WOKEN	WC01	Cable-CH10-03	2021/7/8	2022/7/7
Software BVADT	Radiated_V8.7.08	NA	NA	NA
Spectrum Keysight	N9020B	MY60110438	2021/12/8	2022/12/7
Spectrum Analyzer Agilent	E4446A	MY51100009	2021/6/29	2022/6/28
Test Receiver Agilent	N9038A	MY51210137	2021/6/16	2022/6/15
Turn Table & Tower Max Full	MF7802	MF780208216	NA	NA

Notes:

1. The test was performed in Linkou 966 Chamber 3 (CH 10).
2. Tested Date: 2022/1/15

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

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)	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 (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			57.5	47.5
960-1000	60	54		

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

5.3 Radiated Emissions above 1 GHz

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)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 49.5 Peak: 69.5	Avg: 43.5 Peak: 63.5	Not defined	Not defined
Above 3000			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
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

Notes:
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.

Frequency Range (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

6 Test Arrangements

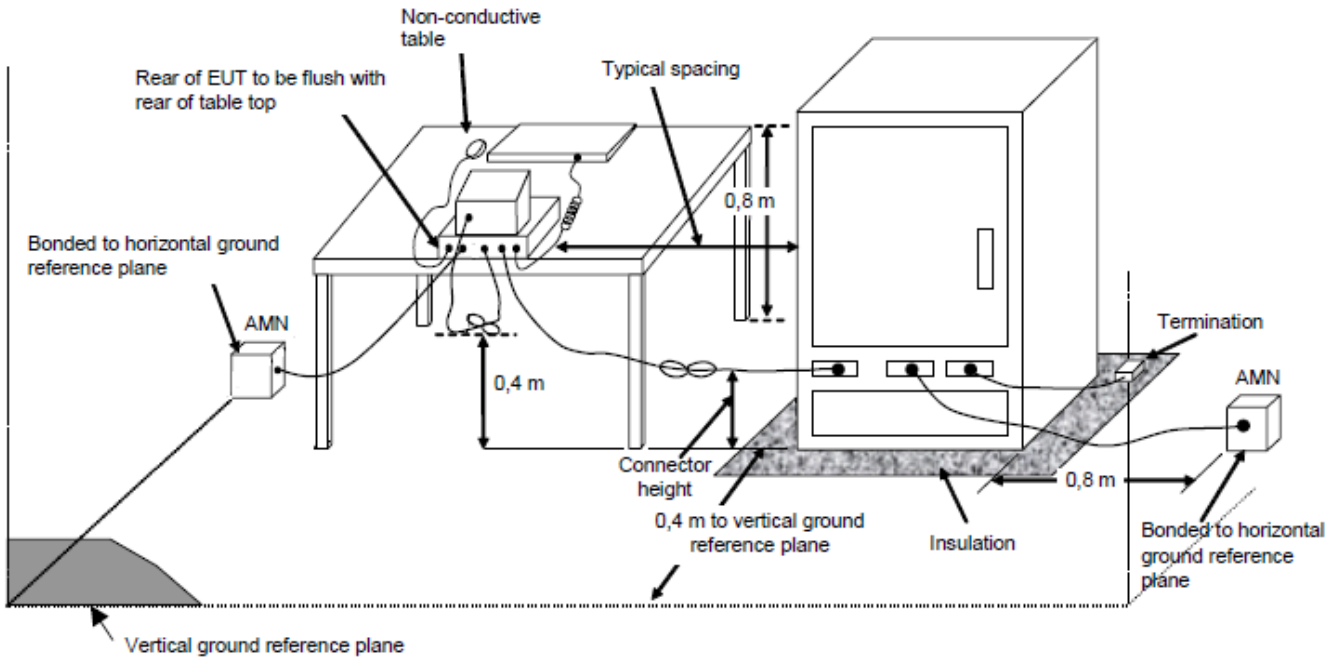
6.1 Conducted Emissions from Power Ports

a. For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. 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.

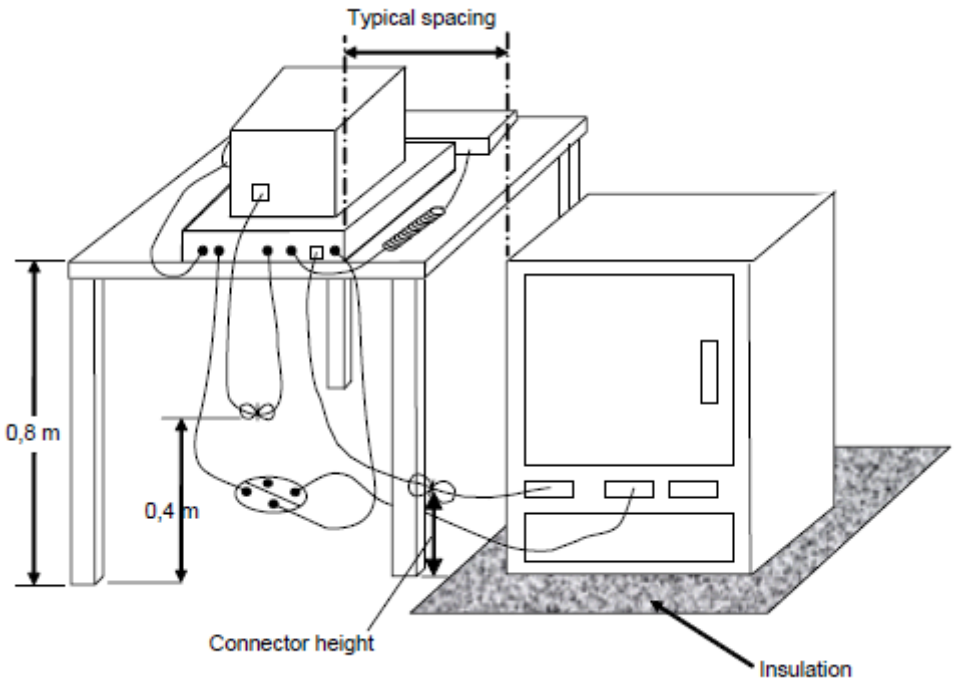


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.2 Radiated Emissions up to 1 GHz

a. For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the 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.
b. The EUT was set 10 meters for 0.03 GHz to 1 GHz away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
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 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.

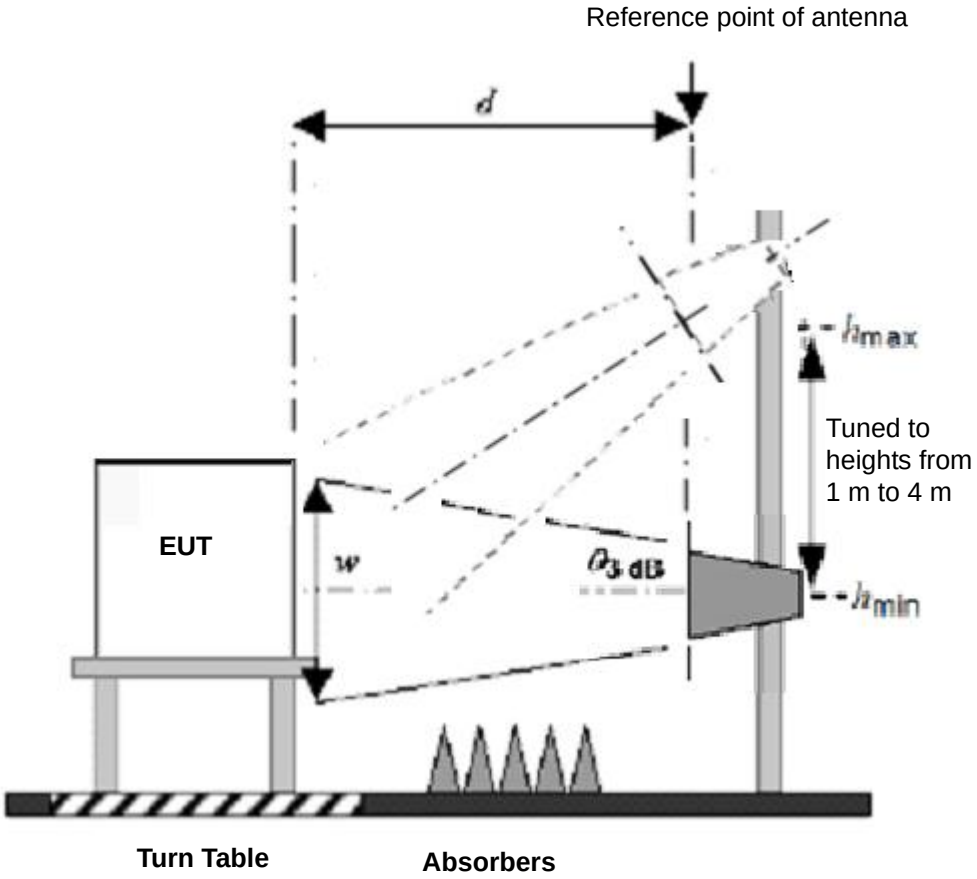


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.3 Radiated Emissions above 1 GHz

a. For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the 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.
b. The EUT was set *d* = 3 meters for 1 GHz to 5 GHz away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. 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

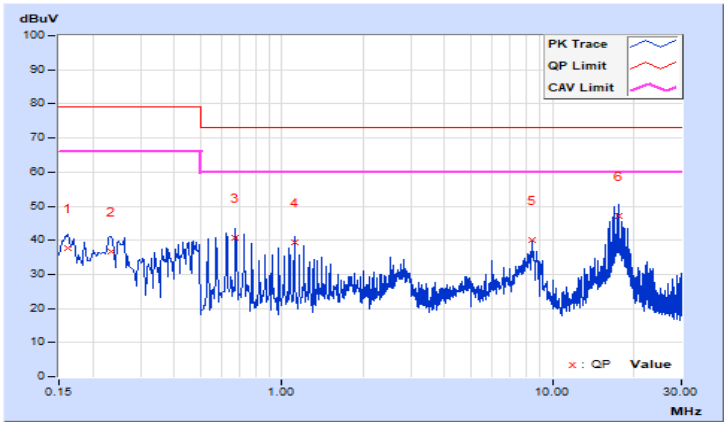
Mode A

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	17 °C, 66 % RH
Tested by	John Liao		

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	0.16102	9.63	28.19	20.43	37.82	30.06	79.00	66.00	-41.18	-35.94
2	0.23288	9.63	27.23	19.67	36.86	29.30	79.00	66.00	-42.14	-36.70
3	0.67556	9.65	31.20	24.82	40.85	34.47	73.00	60.00	-32.15	-25.53
4	1.11047	9.67	29.65	23.36	39.32	33.03	73.00	60.00	-33.68	-26.97
5	8.46332	9.83	30.23	25.11	40.06	34.94	73.00	60.00	-32.94	-25.06
6	**17.61638**	**9.94**	**37.23**	**28.20**	**47.17**	**38.14**	**73.00**	**60.00**	**-25.83**	**-21.86**

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

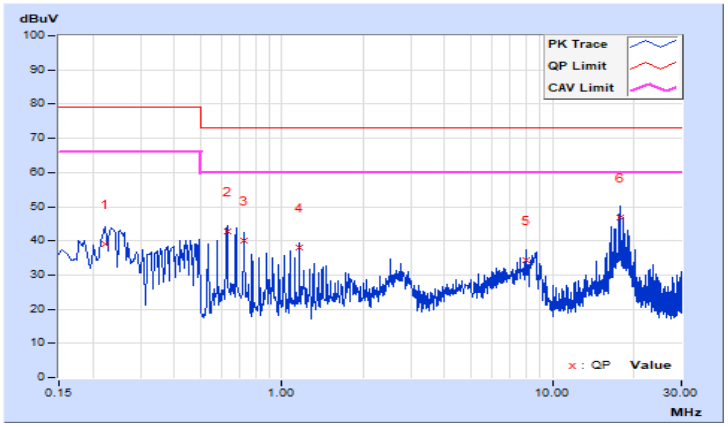


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	17 °C, 66 % RH
Tested by	John Liao		

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	0.22182	9.63	29.36	24.55	38.99	34.18	79.00	66.00	-40.01	-31.82
2	0.62768	9.65	33.26	26.32	42.91	35.97	73.00	60.00	-30.09	-24.03
3	0.72344	9.66	30.25	24.88	39.91	34.54	73.00	60.00	-33.09	-25.46
4	1.16235	9.68	28.32	24.16	38.00	33.84	73.00	60.00	-35.00	-26.16
5	7.99649	9.84	24.49	20.23	34.33	30.07	73.00	60.00	-38.67	-29.93
6	17.87972	10.02	36.85	28.02	46.87	38.04	73.00	60.00	-26.13	-21.96

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



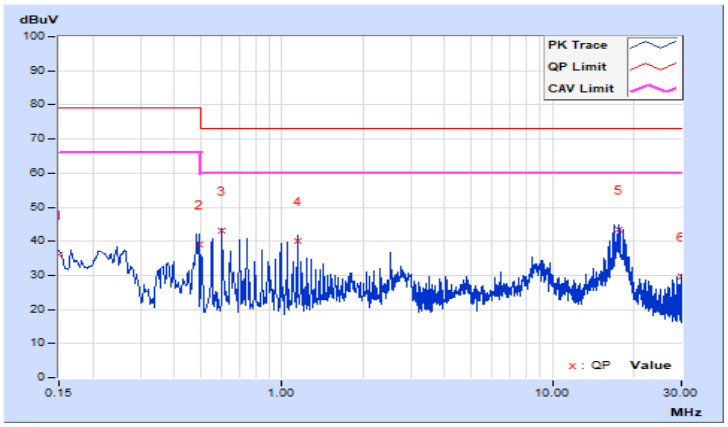
Mode B

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	**Environmental Conditions**	17 °C, 66 % RH
Tested by	John Liao		

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	0.15001	9.63	26.35	19.28	35.98	28.91	79.00	66.00	-43.02	-37.09
2	0.49315	9.64	29.35	25.13	38.99	34.77	79.00	66.00	-40.01	-31.23
3	0.59975	9.65	33.32	26.20	42.97	35.85	73.00	60.00	-30.03	-24.15
4	1.14239	9.68	30.25	23.82	39.93	33.50	73.00	60.00	-33.07	-26.50
5	17.58439	9.94	33.65	27.85	43.59	37.79	73.00	60.00	-29.41	-22.21
6	29.86568	10.15	19.52	19.36	29.67	29.51	73.00	60.00	-43.33	-30.49

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

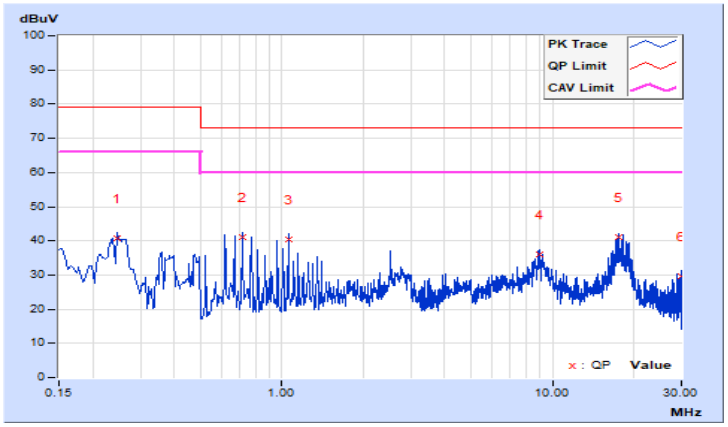


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	**Environmental Conditions**	17 °C, 66 % RH
Tested by	John Liao		

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	0.24687	9.63	31.20	22.65	40.83	32.28	79.00	66.00	-38.17	-33.72
2	0.71546	9.66	31.56	24.87	41.22	34.53	73.00	60.00	-31.78	-25.47
3	1.05862	9.67	30.85	22.47	40.52	32.14	73.00	60.00	-32.48	-27.86
4	8.98202	9.85	26.32	20.12	36.17	29.97	73.00	60.00	-36.83	-30.03
5	17.68821	10.02	30.99	27.10	41.01	37.12	73.00	60.00	-31.99	-22.88
6	29.86568	10.17	19.58	19.20	29.75	29.37	73.00	60.00	-43.25	-30.63

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

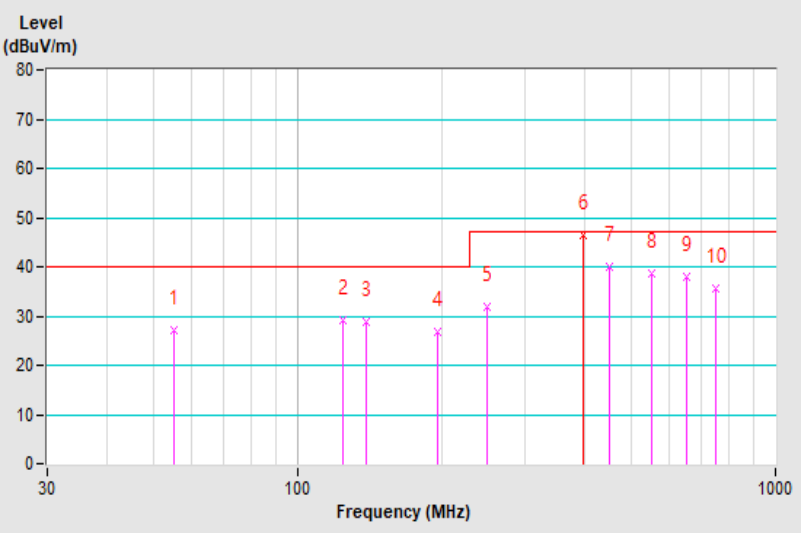
Mode A

Frequency Range	30MHz ~ 1GHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	16 °C, 73 % 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	55.09	27.20 QP	40.00	-12.80	4.00 H	119	37.76	-10.56
2	124.98	29.00 QP	40.00	-11.00	4.00 H	191	40.41	-11.41
3	139.63	28.82 QP	40.00	-11.18	4.00 H	256	38.92	-10.10
4	196.08	26.76 QP	40.00	-13.24	4.00 H	72	39.34	-12.58
5	250.00	31.80 QP	47.00	-15.20	3.76 H	306	41.74	-9.94
6	**396.00**	**46.61 QP**	**47.00**	**-0.39**	**3.09 H**	**2**	**52.12**	**-5.51**
7	450.00	40.14 QP	47.00	-6.86	2.05 H	135	44.35	-4.21
8	549.99	38.48 QP	47.00	-8.52	1.62 H	177	40.55	-2.07
9	650.00	37.85 QP	47.00	-9.15	1.27 H	178	37.57	0.28
10	750.01	35.61 QP	47.00	-11.39	1.13 H	297	32.65	2.96

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

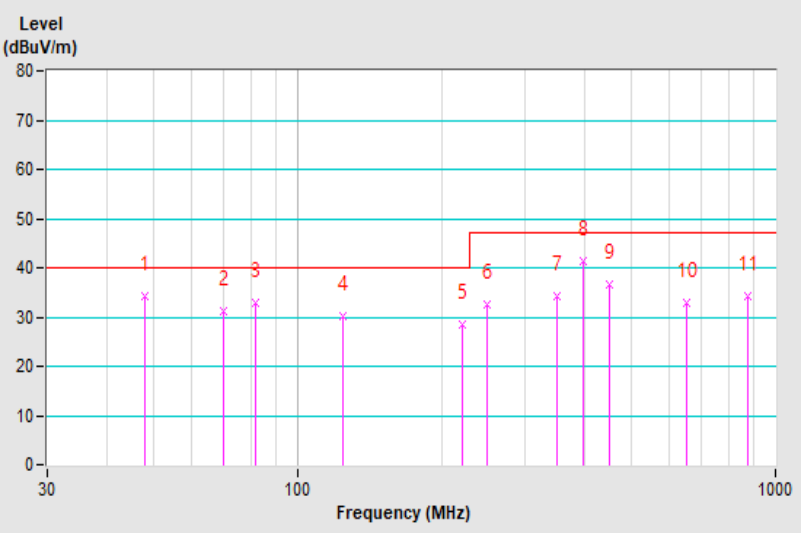


Frequency Range	30MHz ~ 1GHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	16 °C, 73 % RH
Tested By	Paul Chen		

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	47.97	34.36 QP	40.00	-5.64	1.33 V	280	44.64	-10.28
2	69.87	31.31 QP	40.00	-8.69	1.59 V	168	43.93	-12.62
3	81.62	32.93 QP	40.00	-7.07	1.67 V	137	48.53	-15.60
4	125.00	30.23 QP	40.00	-9.77	1.00 V	114	41.64	-11.41
5	220.72	28.54 QP	40.00	-11.46	1.00 V	252	40.69	-12.15
6	250.06	32.38 QP	47.00	-14.62	1.00 V	177	42.32	-9.94
7	350.14	34.09 QP	47.00	-12.91	1.00 V	266	40.81	-6.72
8	396.00	41.34 QP	47.00	-5.66	1.00 V	216	46.85	-5.51
9	450.14	36.72 QP	47.00	-10.28	1.00 V	251	40.92	-4.20
10	650.03	32.72 QP	47.00	-14.28	3.36 V	213	32.44	0.28
11	875.01	34.40 QP	47.00	-12.60	2.38 V	286	28.81	5.59

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

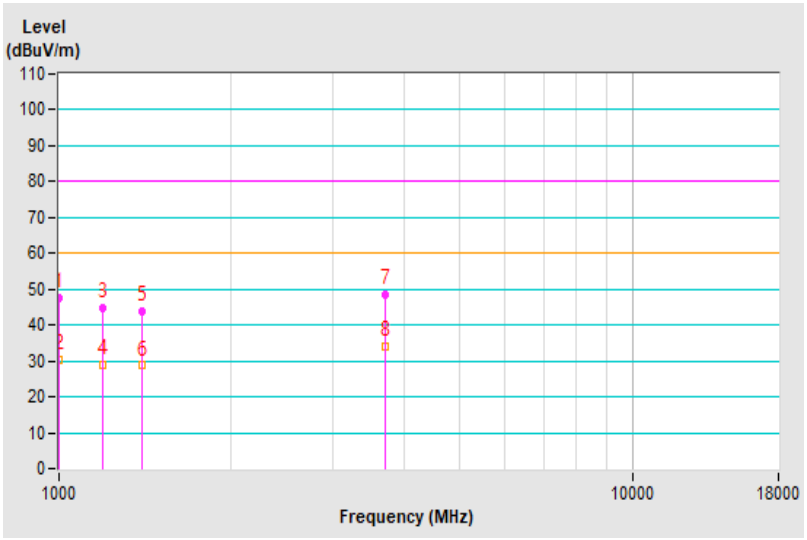
Mode A

Frequency Range	1GHz ~ 5GHz	**Detector Function & Resolution Bandwidth**	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	24 °C, 69 % RH
Tested By	Chin-Wen Wang		

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	1000.30	47.58 PK	80.00	-32.42	2.25 H	256	51.83	-4.25
2	1000.30	30.20 AV	60.00	-29.80	2.25 H	256	34.45	-4.25
3	1195.09	44.76 PK	80.00	-35.24	1.74 H	70	49.30	-4.54
4	1195.09	29.04 AV	60.00	-30.96	1.74 H	70	33.58	-4.54
5	1394.34	43.90 PK	80.00	-36.10	1.00 H	122	47.86	-3.96
6	1394.34	28.79 AV	60.00	-31.21	1.00 H	122	32.75	-3.96
7	3714.69	48.41 PK	80.00	-31.59	1.30 H	333	44.30	4.11
8	**3714.69**	**33.96 AV**	**60.00**	**-26.04**	**1.30 H**	**333**	**29.85**	**4.11**

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

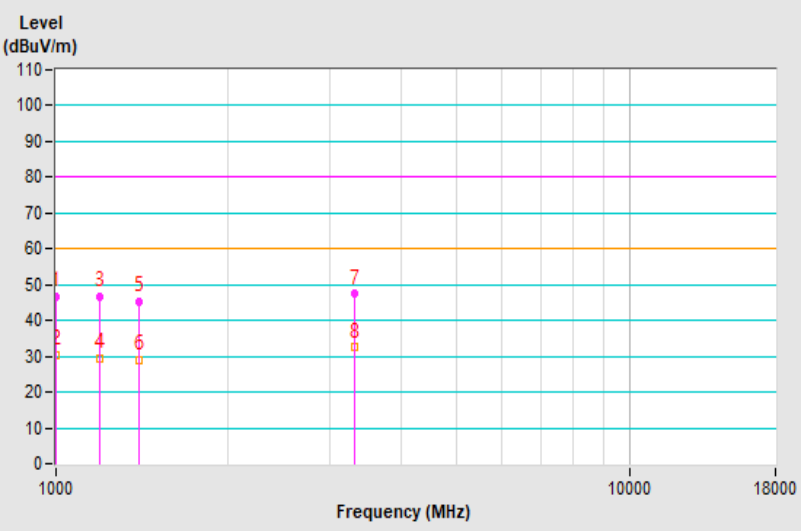


Frequency Range	1GHz ~ 5GHz	**Detector Function & Resolution Bandwidth**	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	24 °C, 69 % RH
Tested By	Chin-Wen Wang		

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	1000.17	46.61 PK	80.00	-33.39	1.62 V	344	50.86	-4.25
2	1000.17	30.40 AV	60.00	-29.60	1.62 V	344	34.65	-4.25
3	1195.09	46.60 PK	80.00	-33.40	2.10 V	49	51.14	-4.54
4	1195.09	29.26 AV	60.00	-30.74	2.10 V	49	33.80	-4.54
5	1396.41	45.39 PK	80.00	-34.61	1.72 V	322	49.35	-3.96
6	1396.41	28.95 AV	60.00	-31.05	1.72 V	322	32.91	-3.96
7	3318.28	47.34 PK	80.00	-32.66	2.35 V	305	44.90	2.44
8	3318.28	32.42 AV	60.00	-27.58	2.35 V	305	29.98	2.44

Remarks:

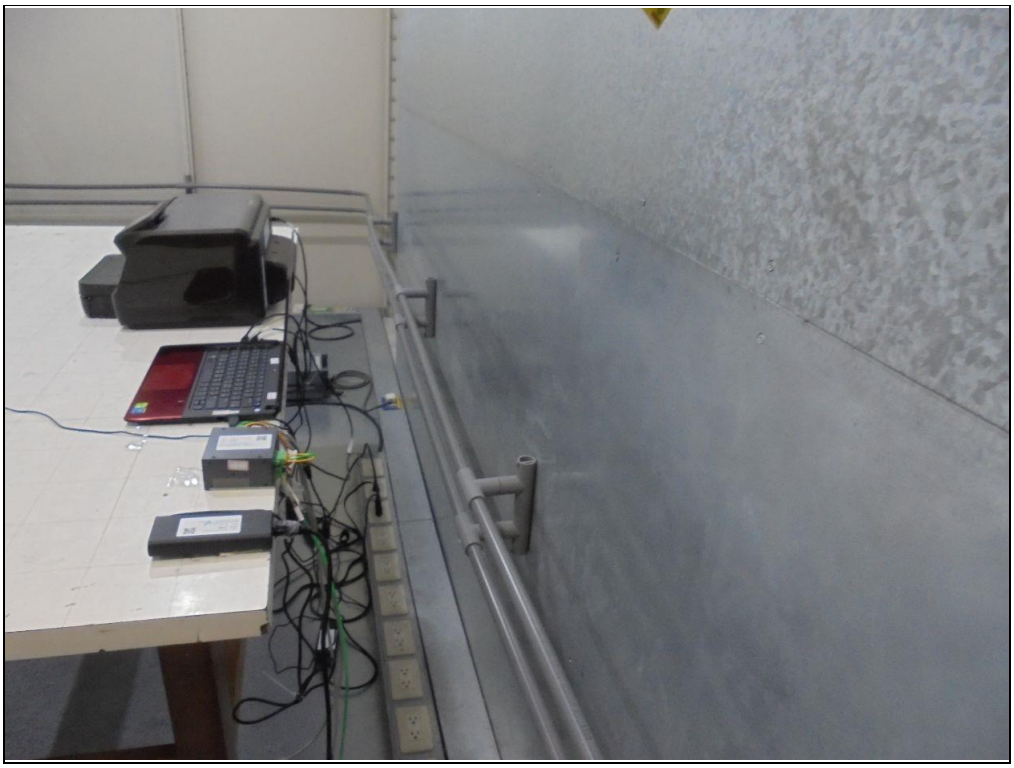
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



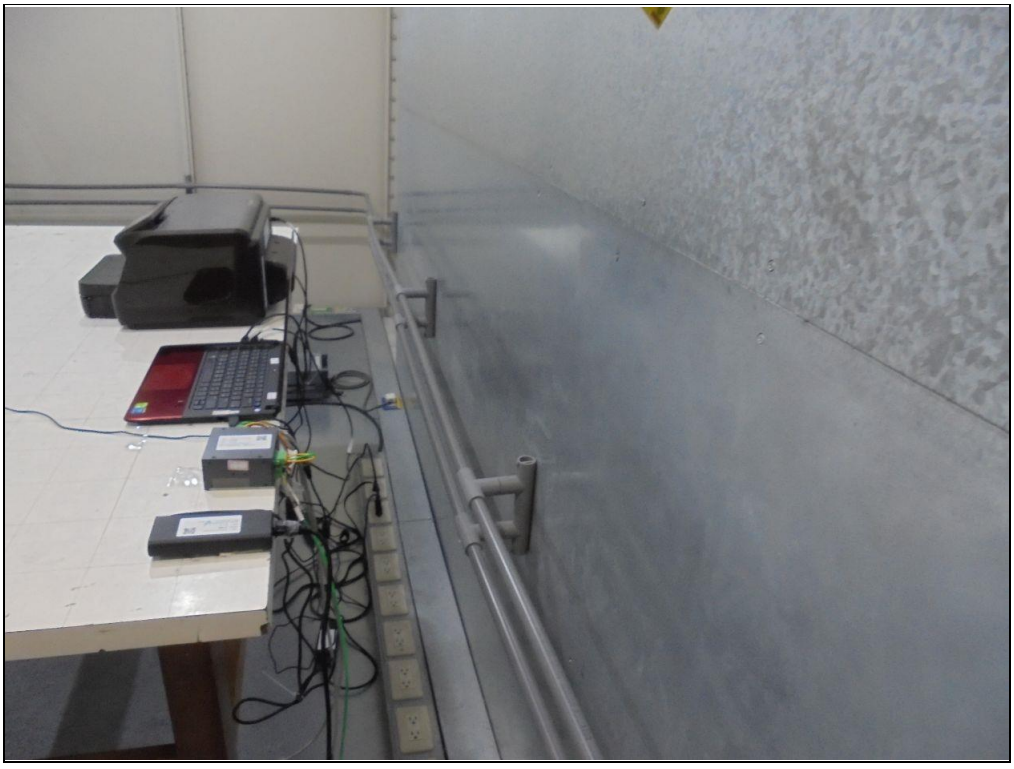
8 Pictures of Test Arrangements

8.1 Conducted Emissions from Power Ports

Mode A



Mode B

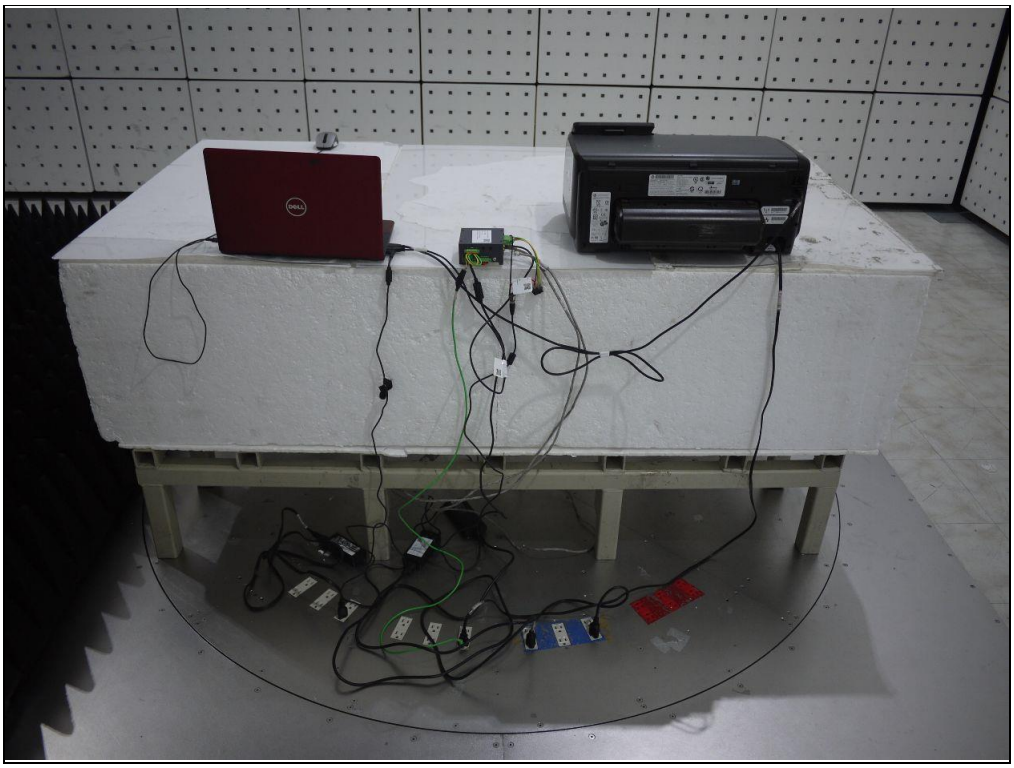


8.2 Radiated Emissions up to 1 GHz

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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