

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart B, Class A

ANSI C63.4-2014

ANSI C63.4a-2017

Report No.: FDBDBO-WTW-P24060079

Product: Rugged Embedded System

Brand: Vecow

Model No.: RES-5000

Series Model: RES-5XXXXXXXXXXXXXXXXX ("X" can be 0-9, A-Z, - or blank for marketing purpose)

Received Date: 2024/06/05

Test Date: 2024/6/8 ~ 2024/6/11

Issued Date: 2024/11/25

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

FCC Registration /

Designation Number: 418586 / TW1078

Approved by: _____

Jim Hsiang

Jim Hsiang / Associate Technical Manager

Date: _____

2024/11/25

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Prepared by : Annie Chang / Senior Specialist



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Release Control Record

Issue No.	Description	Date Issued
FDBDBO-WTW-P24060079	Original release.	2024/11/25

1 Certificate

Product: Rugged Embedded System

Brand: Vecow

Test Model: RES-5000

Series Model: RES-5XXXXXXXXXXXXXXXXX ("X" can be 0-9, A-Z, - or blank for marketing purpose)

Sample Status: Engineering sample

Applicant: Vecow Co., Ltd.

Test Date: 2024/6/8 ~ 2024/6/11

Standard: 47 CFR FCC Part 15, Subpart B, Class A
ANSI C63.4–2014
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 / Clause	Test Item	Result	Remark
FCC Part 15.107	Conducted Emissions from Power Ports	Pass	Minimum passing Class A margin is -25.79 dB at 16.83469 MHz
FCC Part 15.109	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class A margin is -6.92 dB at 108.70 MHz
FCC Part 15.109	Radiated Emissions above 1 GHz	Pass	Minimum passing Class A margin is -20.21 dB at 6524.64 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	2.9 dB	3.4 dB (U_{CISPR})
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	3m : 5.44 dB 10m : 4.00 dB	6.3 dB (U_{CISPR})
	1 GHz ~ 6 GHz	4.44 dB	5.2 dB (U_{CISPR})
Radiated Emissions above 1 GHz	6 GHz ~ 18 GHz	4.66 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	Rugged Embedded System
Brand	Vecow
Test Model	RES-5000
Series Model	RES-5XXXXXXXXXXXXXXXXX ("X" can be 0-9, A-Z, - or blank for marketing purpose)
Model Difference	Marketing Differentiation
Sample Status	Engineering sample
Operating Software	Window 10, Burintest
Power Supply Rating	Refer to note as below

Note:

The EUT consumes power from the following adapter.

Brand	Model	Specification
LITEON	PA-1121-24	AC Input: 100-240Vac, 2.0A, 50-60Hz DC Output: 24V, 5.0A, 120W Non-shielded DC cable (3.5m, with a core) Non-shielded AC 2-Pin cable (1.0m)

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 2.8 GHz, 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:

Item	Description
CPU	11th Gen Intel Core i7-1185G7E @2.80GHz
RAM	Innodisk 32GB DDR4 3200 W/T SODIMM
SSD	Innodisk 2.5" SSD 3TE7 512GB
M.2	Innodisk M.2(P42) 3TE6 512GB

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

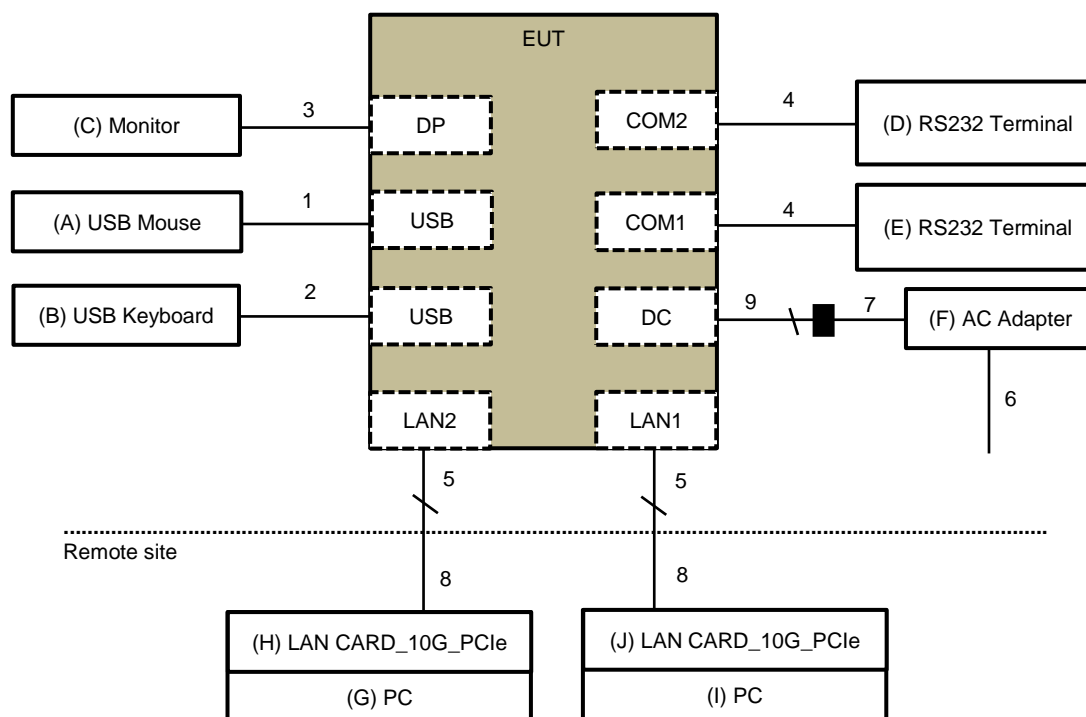
Test modes are presented in the report as below.

Test Condition	
Mode	Conducted Emissions from Power Ports
A	Full system, DP:3840*2160,60Hz,LAN link + Input Power(120 Vac, 60 Hz)
B	Full system, DP:3840*2160,60Hz,LAN link + Input Power(240 Vac, 60 Hz)
Mode	Radiated Emissions up to 1 GHz
A	Full system, DP:3840*2160,60Hz,LAN link + Input Power(120 Vac, 60 Hz)
Mode	Radiated Emissions above 1 GHz
A	Full system, DP:3840*2160,60Hz,LAN link + 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 (BurnIntest) to enable all functions.
- c. EUT read and write messages to/ from internal storage devices.
- d. PC's (kept in a remote area) sent and received messages to/ from EUT via LAN cable.
- e. EUT sent (H) message to monitor and then displayed on its screen.
- f. Steps c-e 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	USB Mouse	DELL	MOCZUL	CN-049TWY-PRC00-77B-0083	N/A	Provided by Lab
B	USB Keyboard	Dell	KB216t	CN-0W33XP-LO300-7CL-191E	N/A	Provided by Lab
C	Monitor	ASUS	PA279CV	M7LMTF235958	DoC	Provided by Lab
D	RS232 Terminal	N/A	N/A	N/A	N/A	Supplied by applicant
E	RS232 Terminal	N/A	N/A	N/A	N/A	Supplied by applicant
F	AC Adapter	LITEON	PA-1121-24	N/A	DoC	Supplied by applicant
G	PC	DELL	VOSTRO 470	N/A	DoC	Provided by Lab
H	LAN CARD_10G_PClE	ASUS	XG-C100C	N/A	DoC	Provided by Lab
I	PC	DELL	VOSTRO 470	N/A	DoC	Provided by Lab
J	LAN CARD_10G_PClE	ASUS	XG-C100C	N/A	DoC	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB	1	1.8	Y	0	Provided by Lab
2	USB	1	1.8	Y	0	Provided by Lab
3	DP	1	1.8	Y	0	Provided by Lab
4	Data	2	2	Y	0	Supplied by applicant
5	Data	2	1	Y	0	Supplied by applicant
6	Power	1	1	N	0	Supplied by applicant
7	Power	1	1.5	N	1	Supplied by applicant
8	Cat. 5e	2	10	Y	0	Provided by Lab
9	Power	1	2	Y	0	Supplied by applicant

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 resistance LYNICS	0900510	E1-01-299	2024/1/3	2025/1/2
		E1-011286	2023/9/21	2024/9/20
EMI Test Receiver R&S	ESCI	100412	2023/8/23	2024/8/22
	ESCS 30	100288	2023/12/28	2024/12/27
	ESR3	102414	2023/12/12	2024/12/11
Fixed Attenuator STI	STI02-2200-10	NO.2	2023/7/17	2024/7/16
LISN R&S	ESH2-Z5	100104	2023/12/12	2024/12/11
	ESH3-Z5	847265/023	2023/10/23	2024/10/22
LISN Schwarzbeck	NNLK 8121	8121-00759	2023/8/21	2024/8/20
	NNLK 8129	8129229	2023/6/27	2024/6/26
RF Coaxial Cable PEWC	5D-FB	Cable-CO9-01	2023/7/17	2024/7/16
Software BVADT	Cond_V7.4.1.0	N/A	N/A	N/A

Notes:

1. The test was performed in Linkou Conduction 9.
2. The VCCI Site Registration No. C-11312.
3. Tested Date: 2024/6/11

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
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-303	2023/10/17	2024/10/16
Coupling / Decoupling Network Schwarzbeck	CDNE-M2	00097	2024/5/28	2025/5/27
	CDNE-M3	00091	2024/5/28	2025/5/27
EMI Test Receiver R&S	ESCS 30	100276	2024/4/24	2025/4/23
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ST2-01	2023/10/20	2024/10/19
Preamplifier Agilent	8447D	2944A11062	2024/2/7	2025/2/6
RF Coaxial Cable Pacific	8D-FB	Cable-ST2-01	2023/11/7	2024/11/6
Software BVADT	Radiated_V8.8.09	N/A	N/A	N/A

Notes:

1. The test was performed in Linkou Open Site2 , The test site validated date: 2023/7/15 (NSA)
2. The VCCI Site Registration No. R-10237.
3. Tested Date: 2024/6/11

4.3 Radiated Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fix tool for Boresight antenna tower BV	BAF-01	9	N/A	N/A
Fixed Attenuator Mini-Circuits	BW-K3-2W44+	PAD-CH7-03	2023/7/6	2024/7/5
	BW-N4W5+	PAD-CH10-02	2023/7/6	2024/7/5
Horn Antenna EMCO	3115	6714	2023/11/12	2024/11/11
Horn Antenna ETS-Lindgren	3117-PA	00215857	2023/11/12	2024/11/11
Horn Antenna Schwarzbeck	BBHA-9170	BBHA9170190	2023/11/12	2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60112260	2024/5/29	2025/5/28
Notch Filter Micro-Tronics	BRC50703-01	010	2024/5/24	2025/5/23
	BRM17690	005	2024/5/24	2025/5/23
Preamplifier EMCI	EMC0126545	980076	2024/2/15	2025/2/14
	EMC184045B	980235	2024/2/15	2025/2/14
Preamplifier HP	8449B	3008A01292	2024/2/15	2025/2/14
PSA Spectrum Analyzer Agilent	E4446A	MY51100009	2023/6/21	2024/6/20
RF Coaxial Cable EMCI	EMC102-KM-KM-1000	200310	2024/3/11	2025/3/10
	EMC102-KM-KM-3000	200312	2024/3/11	2025/3/10
Software BVADT	Radiated_V8.8.09	N/A	N/A	N/A
Turn Table & Tower Max Full	MF7802	MF780208216	N/A	N/A

Notes:

1. The test was performed in Linkou 966 Chamber 3 (CH 10).
2. The VCCI Site Registration No. G-10427.
3. Tested Date: 2024/6/8

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 (dB μ V/m)				
Frequencies (MHz)	FCC 15B, Class A	FCC 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39.1	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

Radiated Emissions Limits at 3 meters (dB μ V/m)				
Frequencies (MHz)	FCC 15B, Class A	FCC 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40.0	50.5	40.5
88-216	54.0	43.5		
216-230	56.9	46.0		
230-960				
960-1000	60.0	54.0	57.5	47.5

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

5.3 Radiated Emissions above 1 GHz

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

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

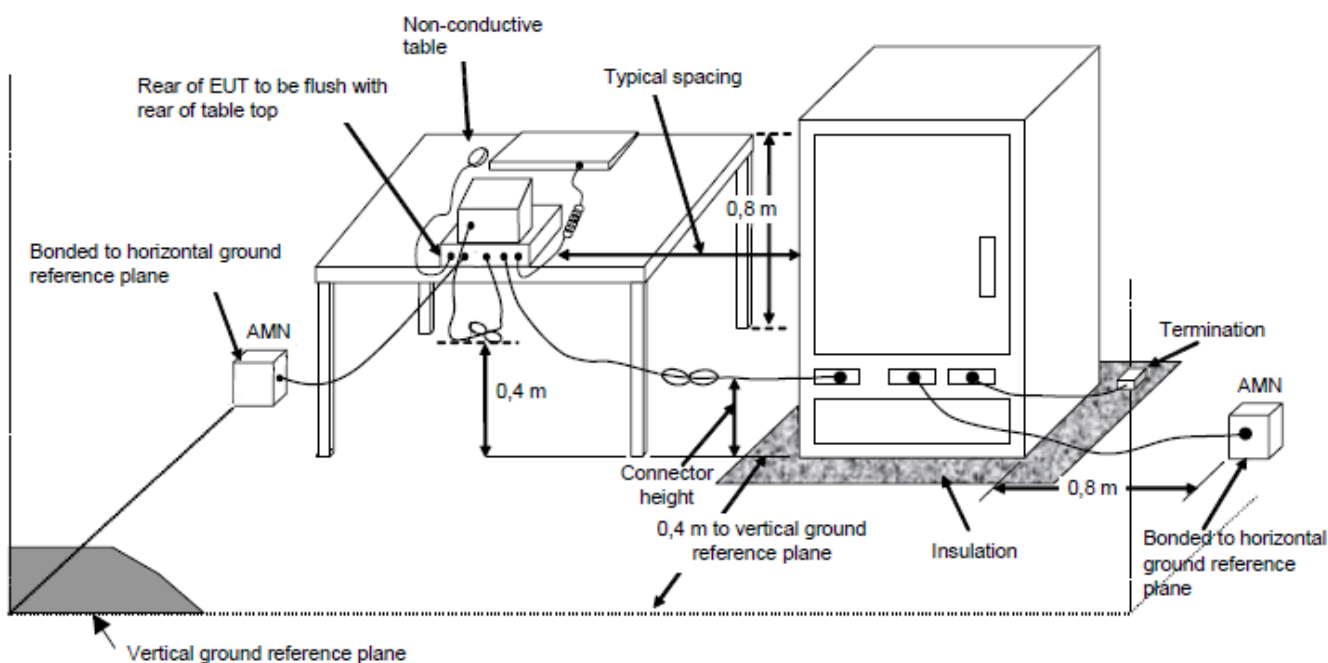
Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far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

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.

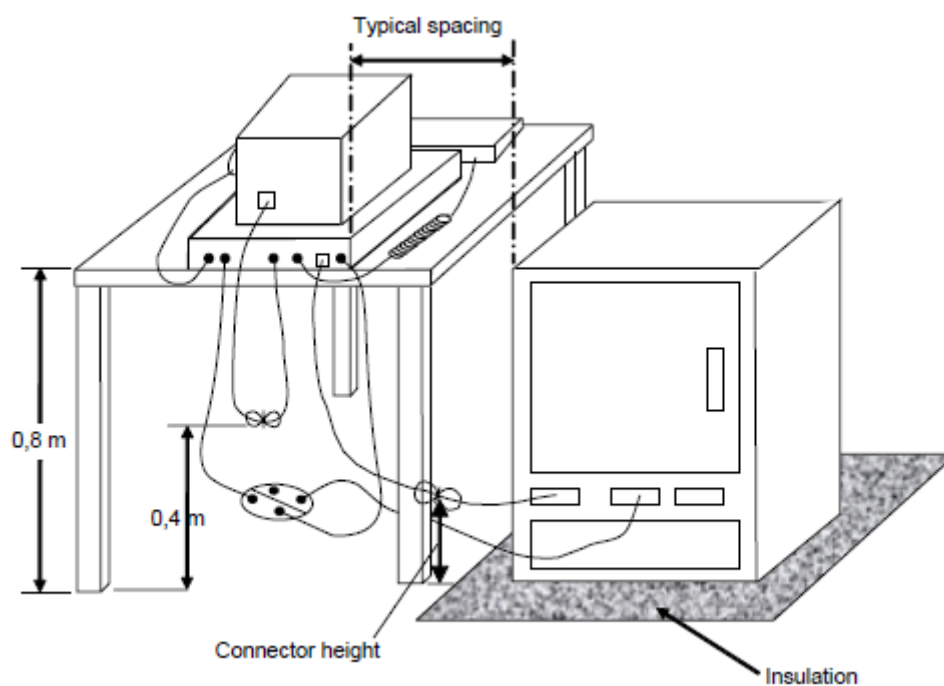


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

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.

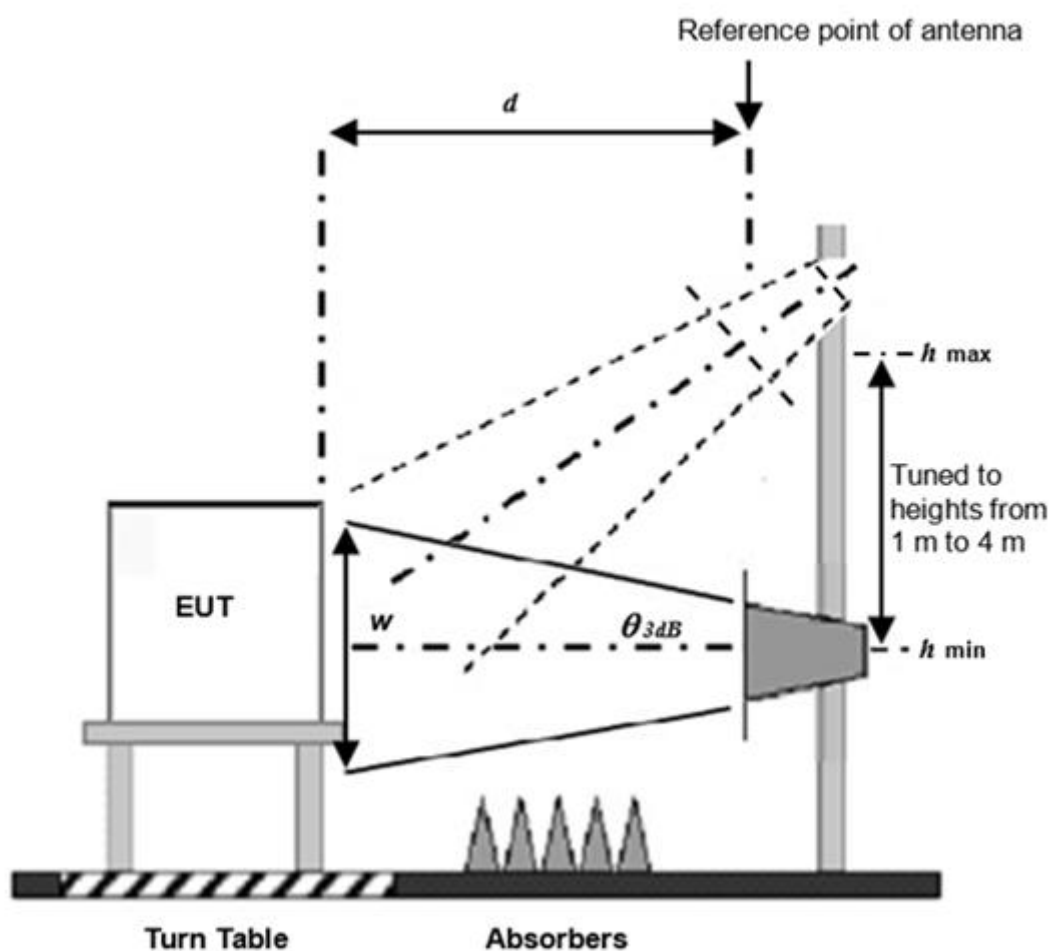


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

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

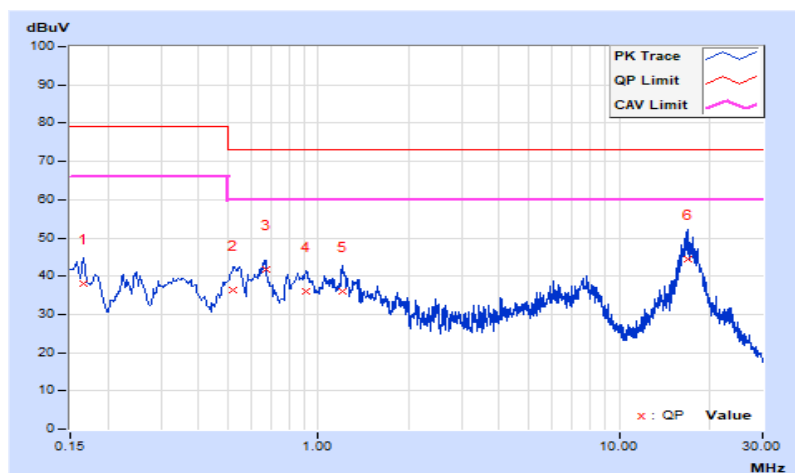
Mode A

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24 °C, 70 % RH, 996.6 mbar
Tested by	Perry Yang		

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	0.16564	9.96	28.09	22.39	38.05	32.35	79.00	66.00	-40.95	-33.65
2	0.51955	10.01	26.43	12.32	36.44	22.33	73.00	60.00	-36.56	-37.67
3	0.67584	10.02	31.77	19.91	41.79	29.93	73.00	60.00	-31.21	-30.07
4	0.90899	10.04	25.93	15.42	35.97	25.46	73.00	60.00	-37.03	-34.54
5	1.21232	10.06	25.81	12.61	35.87	22.67	73.00	60.00	-37.13	-37.33
6	16.83469	10.40	33.91	23.81	44.31	34.21	73.00	60.00	-28.69	-25.79

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

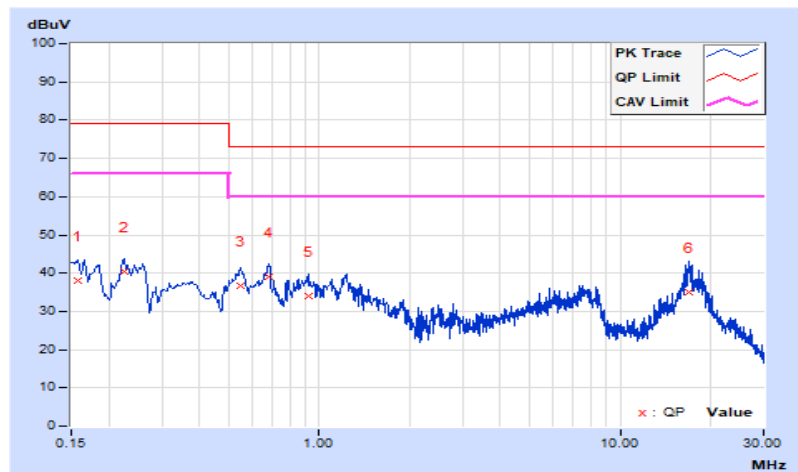


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24 °C, 70 % RH, 996.6 mbar
Tested by	Perry Yang		

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	0.15760	9.95	28.01	13.66	37.96	23.61	79.00	66.00	-41.04	-42.39
2	0.22431	9.97	30.36	16.33	40.33	26.30	79.00	66.00	-38.67	-39.70
3	0.54664	10.01	26.85	12.80	36.86	22.81	73.00	60.00	-36.14	-37.19
4	0.68382	10.02	28.88	15.39	38.90	25.41	73.00	60.00	-34.10	-34.59
5	0.91848	10.04	23.99	14.62	34.03	24.66	73.00	60.00	-38.97	-35.34
6	16.97939	10.39	24.47	16.18	34.86	26.57	73.00	60.00	-38.14	-33.43

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



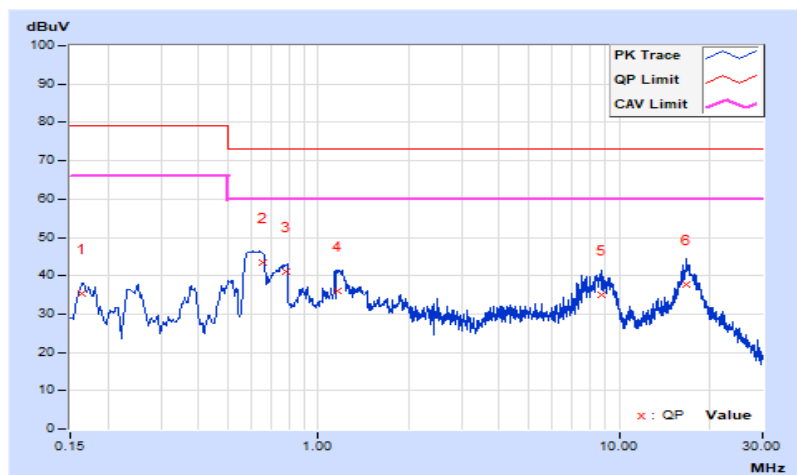
Mode B

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	240 Vac, 60 Hz	Environmental Conditions	24 °C, 70 % RH, 996.6 mbar
Tested by	Perry Yang		

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	0.16482	9.96	25.44	21.18	35.40	31.14	79.00	66.00	-43.60	-34.86
2	0.65287	10.02	33.38	19.43	43.40	29.45	73.00	60.00	-29.60	-30.55
3	0.78663	10.03	31.12	17.35	41.15	27.38	73.00	60.00	-31.85	-32.62
4	1.15530	10.06	26.07	11.29	36.13	21.35	73.00	60.00	-36.87	-38.65
5	8.80149	10.28	24.81	17.70	35.09	27.98	73.00	60.00	-37.91	-32.02
6	16.80731	10.40	27.32	20.81	37.72	31.21	73.00	60.00	-35.28	-28.79

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

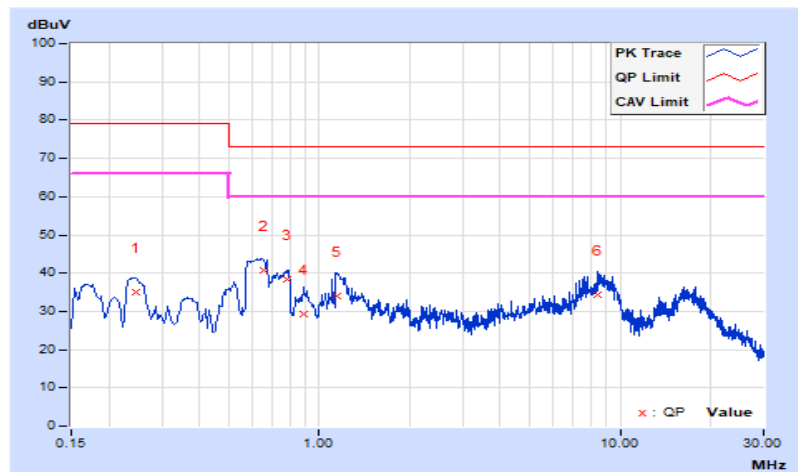


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	240 Vac, 60 Hz	Environmental Conditions	24 °C, 70 % RH, 996.6 mbar
Tested by	Perry Yang		

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	0.24671	9.98	25.18	14.89	35.16	24.87	79.00	66.00	-43.84	-41.13
2	0.65351	10.02	30.84	17.52	40.86	27.54	73.00	60.00	-32.14	-32.46
3	0.78524	10.03	28.36	14.58	38.39	24.61	73.00	60.00	-34.61	-35.39
4	0.88719	10.04	19.22	10.04	29.26	20.08	73.00	60.00	-43.74	-39.92
5	1.14532	10.06	24.08	9.84	34.14	19.90	73.00	60.00	-38.86	-40.10
6	8.44559	10.27	24.10	17.40	34.37	27.67	73.00	60.00	-38.63	-32.33

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

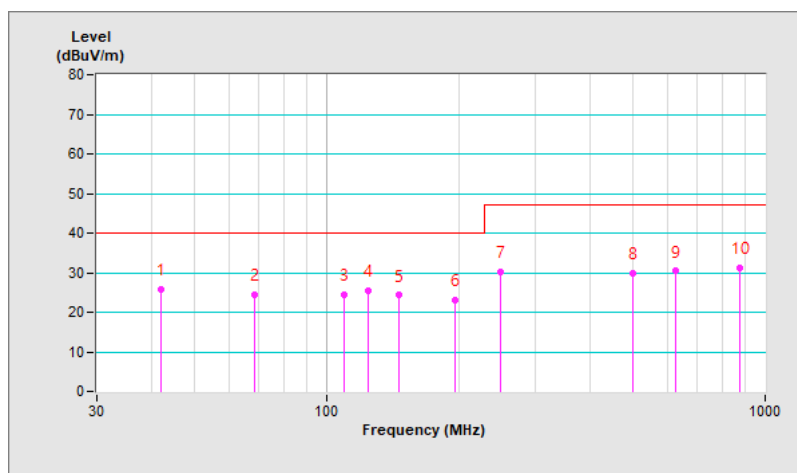
Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	28 °C, 62 % RH, 1000 mbar
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	41.89	25.72 QP	40.00	-14.28	4.00 H	66	34.32	-8.60
2	68.57	24.39 QP	40.00	-15.61	4.00 H	126	34.72	-10.33
3	109.72	24.57 QP	40.00	-15.43	4.00 H	299	35.54	-10.97
4	124.98	25.51 QP	40.00	-14.49	4.00 H	148	34.98	-9.47
5	146.64	24.26 QP	40.00	-15.74	4.00 H	139	31.84	-7.58
6	196.81	23.01 QP	40.00	-16.99	4.00 H	251	33.71	-10.70
7	250.00	30.15 QP	47.00	-16.85	3.71 H	146	38.26	-8.11
8	500.00	30.00 QP	47.00	-17.00	1.92 H	360	32.40	-2.40
9	625.02	30.41 QP	47.00	-16.59	1.42 H	116	29.95	0.46
10	874.98	31.25 QP	47.00	-15.75	1.00 H	98	26.35	4.90

Remarks:

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

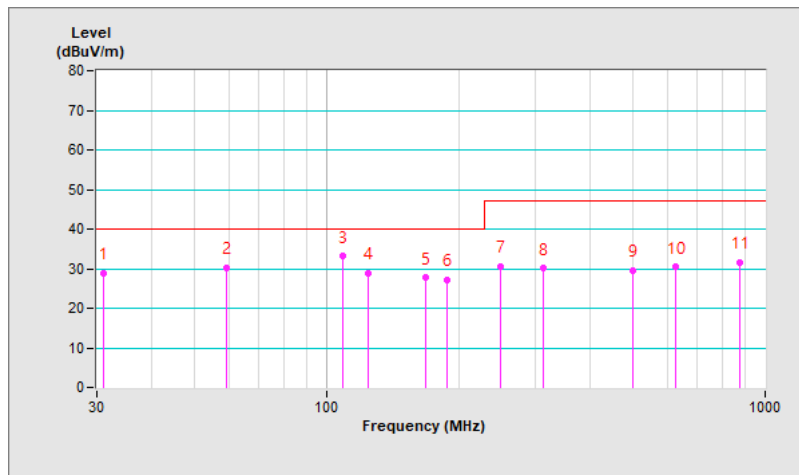


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	28 °C, 62 % RH, 1000 mbar
Tested By	Paul Chen		

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	31.16	28.89 QP	40.00	-11.11	1.18 V	55	45.02	-16.13
2	59.29	30.14 QP	40.00	-9.86	1.46 V	138	38.98	-8.84
3	108.70	33.08 QP	40.00	-6.92	1.00 V	294	44.08	-11.00
4	125.00	28.97 QP	40.00	-11.03	1.00 V	307	38.44	-9.47
5	168.00	27.64 QP	40.00	-12.36	1.00 V	77	35.36	-7.72
6	188.13	27.11 QP	40.00	-12.89	1.00 V	119	37.18	-10.07
7	250.00	30.53 QP	47.00	-16.47	1.00 V	128	38.64	-8.11
8	312.60	30.08 QP	47.00	-16.92	1.00 V	22	35.81	-5.73
9	500.01	29.59 QP	47.00	-17.41	1.00 V	315	31.99	-2.40
10	624.99	30.37 QP	47.00	-16.63	3.28 V	84	29.92	0.45
11	875.06	31.64 QP	47.00	-15.36	2.38 V	131	26.74	4.90

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. Margin value = Emission level – Limit value
4. The other emission levels were very low against the limit.



7.3 Radiated Emissions above 1 GHz

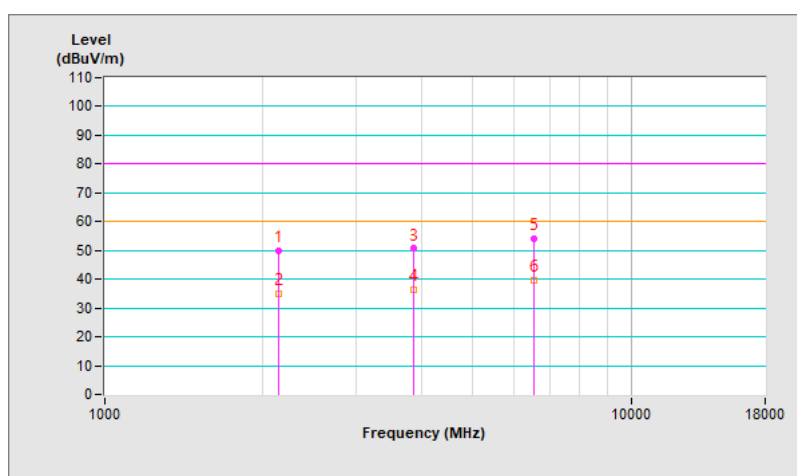
Mode A

Frequency Range	1 GHz ~ 14 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH, 998.7 mbar
Tested By	Peter 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	2136.42	49.82 PK	80.00	-30.18	1.19 H	228	63.09	-13.27
2	2136.42	34.93 AV	60.00	-25.07	1.19 H	228	48.20	-13.27
3	3869.46	50.62 PK	80.00	-29.38	1.66 H	252	60.44	-9.82
4	3869.46	36.50 AV	60.00	-23.50	1.66 H	252	46.32	-9.82
5	6524.64	54.04 PK	80.00	-25.96	1.54 H	360	61.64	-7.60
6	6524.64	39.79 AV	60.00	-20.21	1.54 H	360	47.39	-7.60

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. Margin value = Emission level – Limit value
4. The other emission levels were very low against the limit.

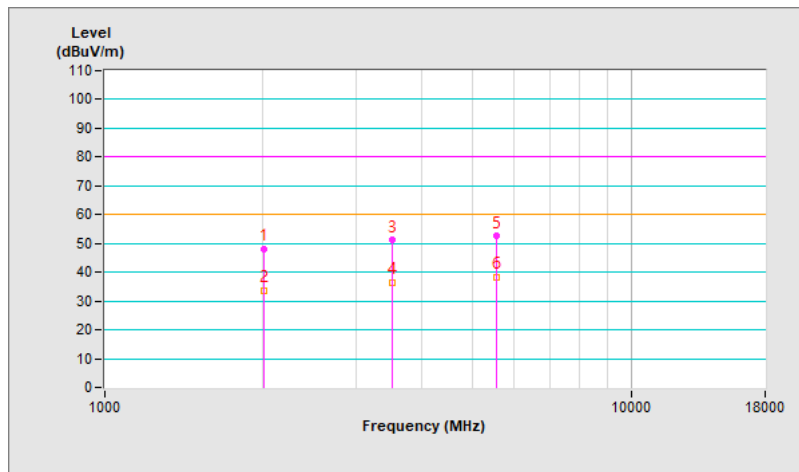


Frequency Range	1 GHz ~ 14 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH, 998.7 mbar
Tested By	Peter Lin		

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	2001.22	47.92 PK	80.00	-32.08	1.92 V	0	61.95	-14.03
2	2001.22	33.54 AV	60.00	-26.46	1.92 V	0	47.57	-14.03
3	3511.14	51.11 PK	80.00	-28.89	2.03 V	32	61.10	-9.99
4	3511.14	36.43 AV	60.00	-23.57	2.03 V	32	46.42	-9.99
5	5547.37	52.49 PK	80.00	-27.51	1.74 V	0	61.19	-8.70
6	5547.37	38.15 AV	60.00	-21.85	1.74 V	0	46.85	-8.70

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. Margin value = Emission level – Limit value
4. The other emission levels were very low against the limit.



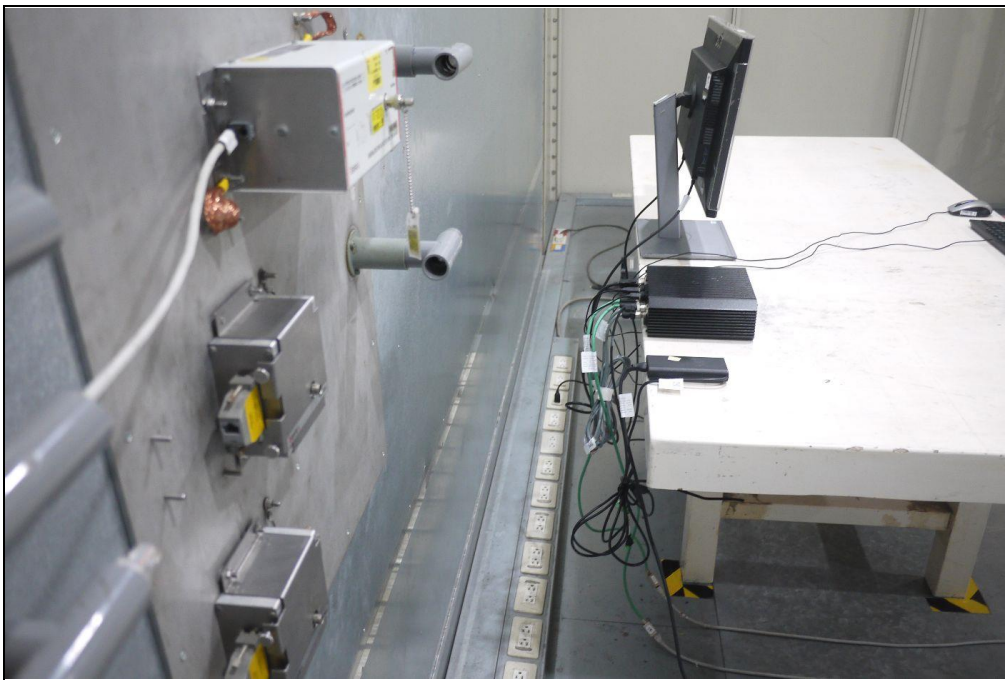
8 Pictures of Test Arrangements

8.1 Conducted Emissions from Power Ports

Mode A



Mode B



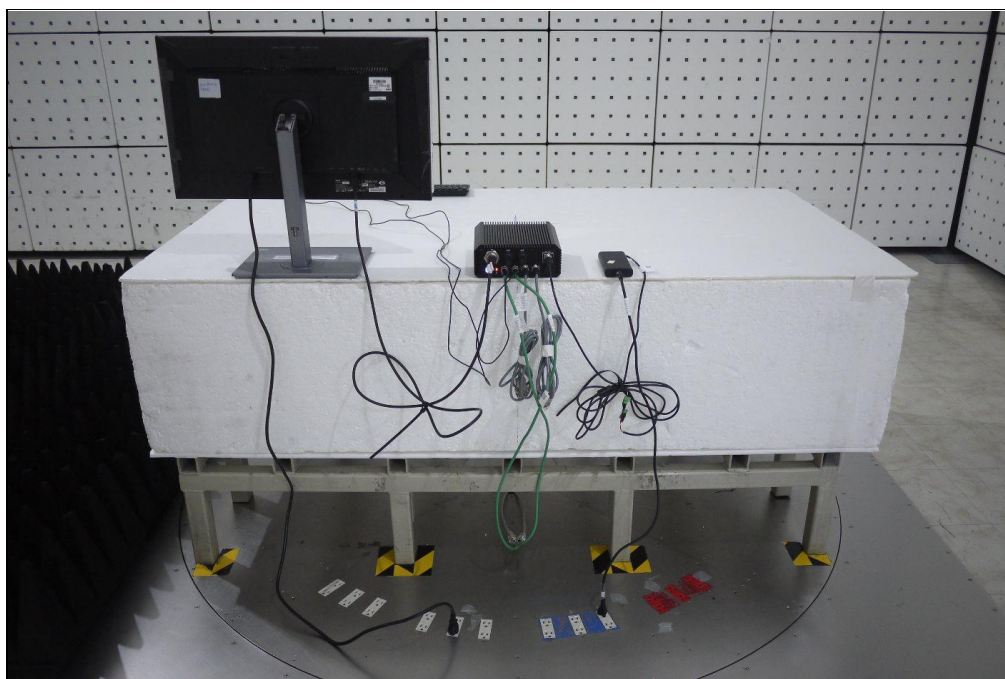
8.2 Radiated Emissions up to 1 GHz

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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