

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standard:** ICES-003:2020 Issue 7, Class B

ICES-Gen:2018 Issue 1+A1:2021

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

**Report No.:** CICDBM-WTW-P22030865

**Model No.:** MGM240P22A, MGM240P32A, MGM240P32N  
(refer to item 3.1 for more details)

**Series Model:** BGM240P22A, BGM240P32A, BGM240P32N  
(refer to item 3.1 for more details)

**Received Date:** 2022/3/22

**Test Date:** 2022/3/28 ~ 2022/4/1

**Issued Date:** 2022/6/16

**Applicant:** Silicon Laboratories Finland Oy

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FINLAND

**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. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kewi Shan Dist., Taoyuan City 33383, Taiwan



**Approved by:** \_\_\_\_\_, **Date:** 2022/6/16  
Ace Wu / Project Engineer

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Prepared by : Anna Lee / Specialist



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This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

## Release Control Record

Issue No.	Description	Date Issued
CICDBM-WTW-P22030865	Original release.	2022/6/16

## 1 Certificate

**Product:** Bluetooth Low Energy and 802.15.4 wireless radio module

**Brand:** Silicon Labs

**Test Model:** MGM240P22A, MGM240P32A, MGM240P32N  
(refer to item 3.1 for more details)

**Variant Model:** BGM240P22A, BGM240P32A, BGM240P32N  
(refer to item 3.1 for more details)

**Sample Status:** Engineering samples fully representing the production modules

**Applicant:** Silicon Laboratories Finland Oy

**Test Date:** 2022/3/28 ~ 2022/4/1

**Standard:** ICES-003:2020 Issue 7, Class B  
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 B margin is -15.46 dB at 2.87400 MHz
ICES-003	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class B margin is -4.06 dB at 33.31 MHz
ICES-003	Radiated Emissions above 1 GHz	Pass	Minimum passing Class B margin is -11.78 dB at 6346.46 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	2.79 dB	3.4 dB ( $U_{\text{CISPR}}$ )
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	4.14 dB	6.3 dB ( $U_{\text{CISPR}}$ )
Radiated Emissions above 1 GHz	1 GHz ~ 6 GHz	5.04 dB	5.2 dB ( $U_{\text{CISPR}}$ )
	6 GHz ~ 18 GHz	4.94 dB	5.5 dB ( $U_{\text{CISPR}}$ )

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	Bluetooth Low Energy and 802.15.4 wireless radio module
Brand	Silicon Labs
Test Model	MGM240P22A, MGM240P32A, MGM240P32N
Variant Model	BGM240P22A, BGM240P32A, BGM240P32N
Model Difference	Refer to note
Sample Status	Engineering samples fully representing the production modules
Operating Software	N/A
Power Supply Rating	1.8V to 3.8V, with nominal supply voltage of 3.0V for the low-power variants and 3.3V for the high-power variants
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The following models are provided to this EUT.

Sample 1 : MGM240P22A

Sample 2 : MGM240P32A

Sample 3 : MGM240P32N

Product Spec	Model		
	MGM240P22A (covers BGM240P22A)	MGM240P32A (covers BGM240P32A)	MGM240P32N (covers BGM240P32N)
	Low-Power/ Bluetooth Low Energy and 802.15.4 (802.15.4 being disabled for BGM240P22A)	High-Power/ Bluetooth Low Energy and 802.15.4 (802.15.4 being disabled for BGM240P32A)	High-Power/ Bluetooth Low Energy and 802.15.4 (802.15.4 being disabled for BGM240P32N)
Max nominal RF TX power, as declared by manufacturer	10dBm	20dBm	20dBm
Antenna type	integral antenna	integral antenna	RF pin
Hardware	<p>MGM240P22A (and BGM240P22A) --&gt; hardware variants with integral antenna and 10dBm max power, to be tested as DTS for both 802.15.4 and Bluetooth Low Energy</p> <p>MGM240P32A (and BGM240P32A) --&gt; hardware variants with integral antenna and 20dBm max power, to be tested as DTS for 802.15.4 and FHSS for Bluetooth Low Energy</p> <p>MGM240P32N (and BGM240P32N) --&gt; hardware variants with RF pin and 20dBm max power, to be tested as DTS for 802.15.4 and FHSS for Bluetooth Low Energy</p> <p>These three hardware variants should be RF tested separately, because PAs are configured differently and also antenna matching components are different between them, meaning for example that conducted RF measurements cannot be assumed to deliver the exact same results across the three samples.</p> <p>MGM modules are the ones under testing as they support both 802.15.4 and Bluetooth Low Energy, whereas the BGM modules are the series models because they are exactly the same except for the 802.15.4 being disabled.</p>		

#### 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 2.48 GHz, provided by Silicon Laboratories Finland Oy, 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 Silicon Laboratories Finland Oy, 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.

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

The EUT has been pre-tested under following test modes.

Test Condition	
Mode	Conducted Emissions from Power Ports
1	EUT 1 (MGM240P22A)+BT link with MGM240P32A+USB link Notebook
2	EUT 1 (MGM240P22A)+802.15.4 link with MGM240P32A+USB link Notebook
3	EUT 2 (MGM240P32A)+BT link with MGM240P22A+USB link Notebook
<b>4</b>	<b>EUT 3 (MGM240P32N)+BT link with MGM240P32A+USB link Notebook</b>
Note: The worst case is that mode 4 is shown in bold.	
Mode	Radiated Emissions up to 1 GHz
1	EUT 1 (MGM240P22A)+BT link with MGM240P32A+USB link Notebook
2	EUT 1 (MGM240P22A)+802.15.4 link with MGM240P32A+USB link Notebook
3	EUT 2 (MGM240P32A)+BT link with MGM240P22A+USB link Notebook
<b>4</b>	<b>EUT 3 (MGM240P32N)+BT link with MGM240P32A+USB link Notebook</b>
Note: The worst case is that mode 4 is shown in bold.	

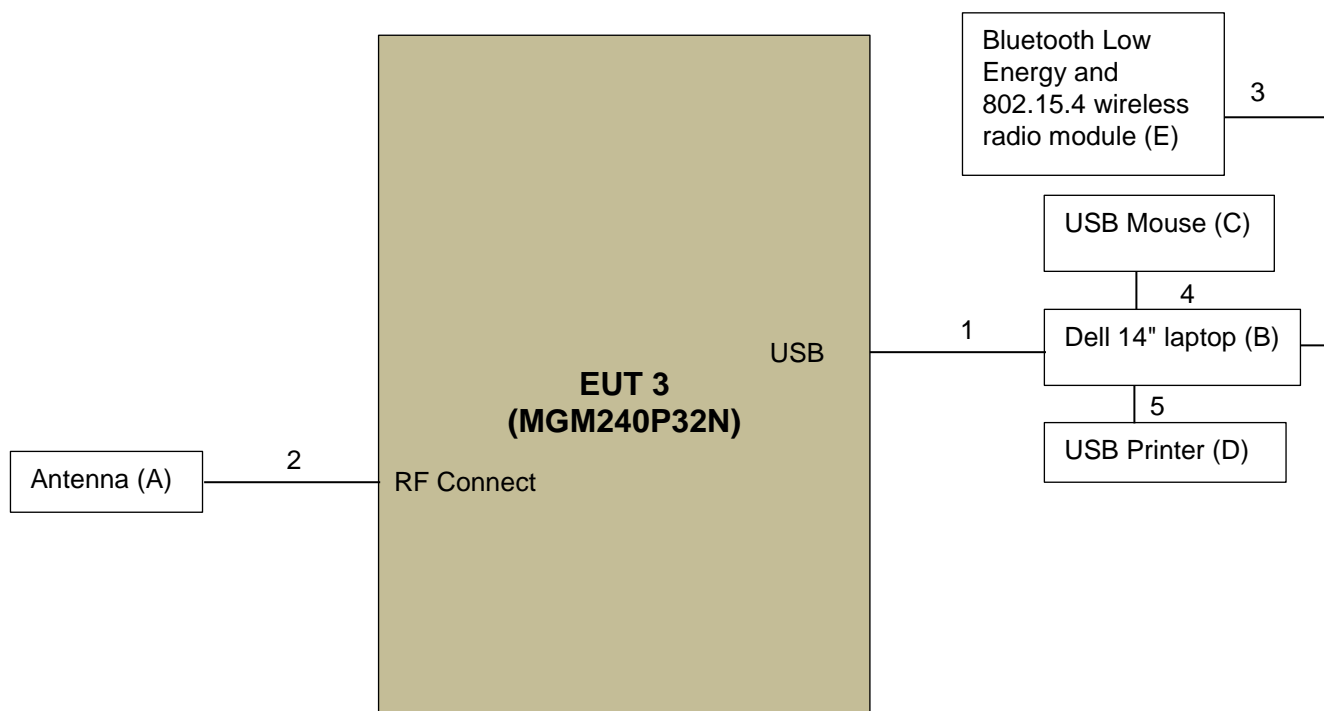
Test modes are presented in the report as below.

Test Condition	
Mode	Conducted Emissions from Power Ports
A	EUT 3 (MGM240P32N)+BT link with MGM240P32A+USB link Notebook
Mode	Radiated Emissions up to 1 GHz
A	EUT 3 (MGM240P32N)+BT link with MGM240P32A+USB link Notebook
Mode	Radiated Emissions above 1 GHz
A	EUT 3 (MGM240P32N)+BT link with MGM240P32A+USB link Notebook

### 3.5 Test Program Used and Operation Descriptions

- The EUT 3 (MGM240P32N) connects to the MGM240P32A (EUT 2) via Bluetooth.
- The EUT 3 (MGM240P32N) connects to the Notebook via USB.
- The EUT 3 (MGM240P32N) connects to the Antenna via RF Cable.
- The MGM240P32A (EUT 2) connects to the Notebook via USB.

### 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	Antenna	N/A	N/A	N/A	N/A	Supplied by applicant
B	Dell 14" laptop	Dell	E5420	FHP55S1	FCC DoC Approved	-
C	USB Mouse	DELL	MOCZUL	CN-049TWY-PRC00-79E-02FW	FCC DoC Approved	-
D	USB PRINTER	EPSON	T22	MEEZ070388	FCC DoC Approved	-
E	Bluetooth Low Energy and 802.15.4 wireless radio module	Silicon Labs	MGM240P32A	N/A	N/A	Supplied by applicant

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB Cable	1	1	Yes	0	Supplied by applicant
2	RF Cable	1	0.1	Yes	0	Supplied by applicant
3	USB Cable	1	1	Yes	0	-
4	USB Cable	1	1.8	Yes	0	-
5	USB Cable	1	1.8	Yes	0	-

## 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
DC LISN R&S	ESH3-Z6	100219	2021/7/25	2022/7/24
		844950/018	2021/7/25	2022/7/24
DC-LISN SCHWARZBECK MESS- ELETRONIK	NNBM 8126G	8126G-069	2021/11/10	2022/11/9
LISN ROHDE & SCHWARZ	ENV216	101826	2022/3/14	2023/3/13
LISN R&S	ESH3-Z5	100311	2021/9/7	2022/9/6
	ENV216	100072	2021/6/16	2022/6/15
LISN Schwarzbeck	NNLK 8121	8121-731	2021/4/28	2022/4/27
RF Coaxial Cable WOKEN	5D-FB	Cable-cond1-01	2022/1/15	2023/1/14
Software BVADT	BVADT_Cond_ V7.3.7.4	N/A	N/A	N/A
Test Receiver Rohde&Schwarz	ESCI	100613	2021/12/3	2022/12/2
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2021/8/20	2022/8/19

Notes:

1. The test was performed in HY - Conduction 1.
2. Tested Date: 2022/3/28

## 4.2 Radiated Emissions up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower (H)	MFA-440	970705	N/A	N/A
Antenna Tower (V)	MFA-440	9707	N/A	N/A
Bi_Log Antenna Schwarbeck	VULB9168	9168-148	2021/10/19	2022/10/18
		9168-156	2021/10/19	2022/10/18
Controller (H)	MF7802	08093	N/A	N/A
Controller (V)	MF7802	074	N/A	N/A
Pre_Amplifier Sonoma	310N	352924	2021/6/5	2022/6/4
		352923	2021/6/5	2022/6/4
RF Coaxial Cable TIMES	LMR-600(18M)+LMR-400 (7M)	CABLE-CH1(VER)-01	2021/9/4	2022/9/3
	LMR-600(11.8M)+LMR- 400 (7M)	CABLE-CH1(HOR)-01	2021/9/4	2022/9/3
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Test Receiver ESR7 R&S	ESR	101240	2021/11/3	2022/11/2
		101264	2021/4/9	2022/4/8
Turn Table	DS430	50303	N/A	N/A

### Notes:

1. The test was performed in HY - 10M Chamber. The test site validated date: 2021/8/07 (NSA)
2. Tested Date: 2022/4/1

### 4.3 Radiated Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower BVADT	AT100	AT93021702	N/A	N/A
BandPass Filter MICRO-TRONICS	BRM17690-01	003	2021/9/4	2022/9/3
	BRM50716-01	G011	2021/9/4	2022/9/3
Controller BVADT	SC100	SC93021702	N/A	N/A
Fix tool for Boresight antenna tower BV	BAF-01	2	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-405	2021/11/14	2022/11/13
Pre-Amplifier Agilent	8449B	3008A01961	2021/9/4	2022/9/3
RF Coaxial Cable EMCI	EMC102-KM-KM-1000	170820	2022/1/15	2023/1/14
RF Coaxial Cable Rosnol	K1K50-UP0279-K1K50- 3000	181129-2	2022/1/15	2023/1/14
RF Coaxial Cable ATK+EMC	JUNFLON+EMC104- SM-SM-6000	Cable-CH2- 02(MWX3221308G003+130710)	2022/1/15	2023/1/14
Software BVADT	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer Agilent	E4446A	MY51100039	2021/12/7	2022/12/6
Turn Table BVADT	TT100	TT93021702	N/A	N/A

**Notes:**

1. The test was performed in HY - 966 chamber 1. The test site validated date: 2021/1/9, 2022/1/8 (VSWR)
2. Tested Date: 2022/3/31

## 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 dBμV/m	Class A (10 m) Quasi-peak dBμV/m	Class B (3 m) Quasi-peak dBμV/m	Class B (10 m) Quasi-peak dBμV/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 ( $F_x$ ) (MHz)	Highest measurement frequency ( $F_M$ ) (GHz)
$F_x \leq 108 \text{ MHz}$	1
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5
$F_x > 1 \text{ GHz}$	$5 \times F_x$ 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 (dBμV/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.

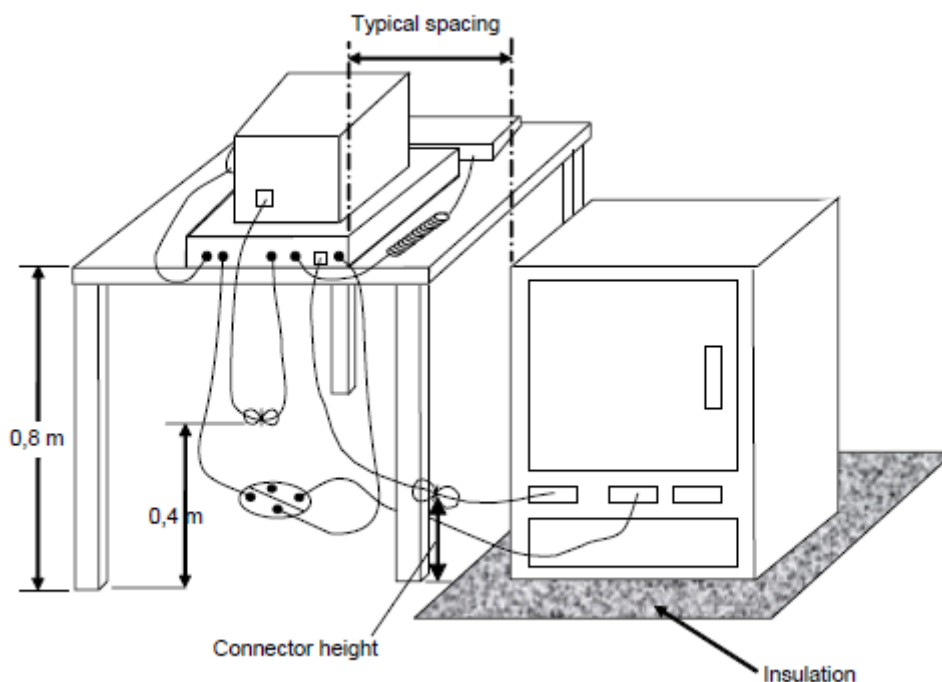
At and above 1 GHz, if the ITE or digital apparatus is an outdoor unit of home satellite receiving systems, it shall comply with the limits in Table A.7 in clause A.2 of CAN/CSA-CISPR 32:17 (in Annex A therein). For these types of ITE or digital apparatus, the highest measurement frequency shall be 18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



## 6.2 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 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.

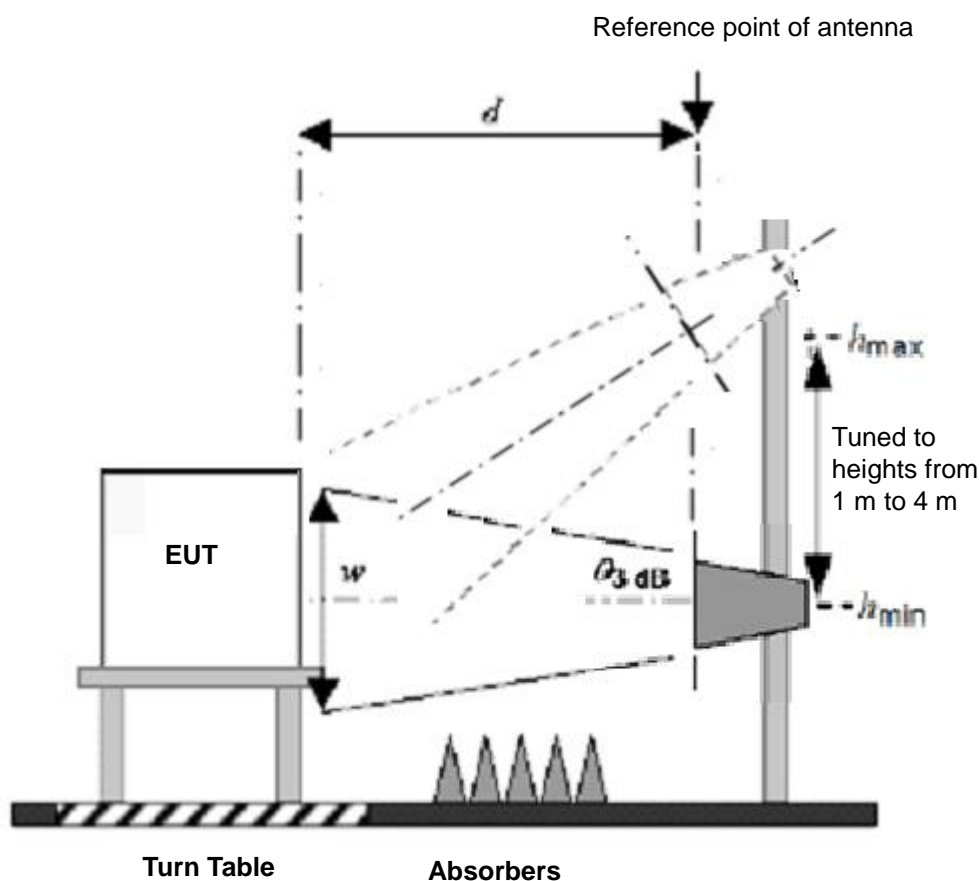


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 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 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

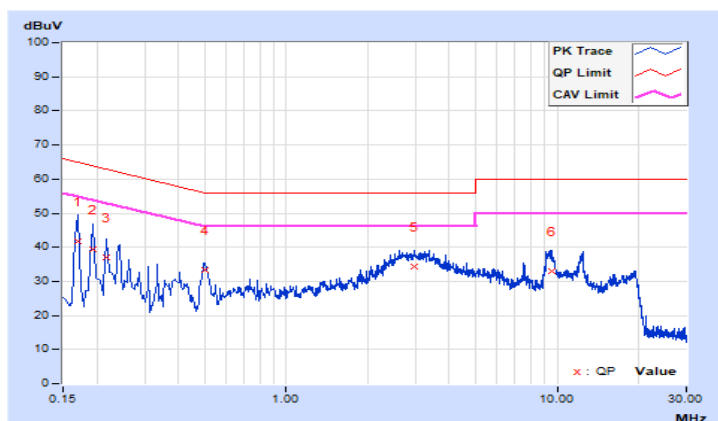
#### Mode A

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	19 °C, 76 % RH
Tested by	Fox Chang		

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	0.17000	9.63	32.17	16.27	41.80	25.90	64.96	54.96	-23.16	-29.06
2	0.19400	9.64	29.81	16.12	39.45	25.76	63.86	53.86	-24.41	-28.10
3	0.21800	9.64	27.26	16.14	36.90	25.78	62.89	52.89	-25.99	-27.11
4	0.50132	9.69	23.50	19.45	33.19	29.14	56.00	46.00	-22.81	-16.86
5	2.98600	9.73	24.48	20.59	34.21	30.32	56.00	46.00	-21.79	-15.68
6	9.56200	9.81	23.34	18.17	33.15	27.98	60.00	50.00	-26.85	-22.02

#### 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

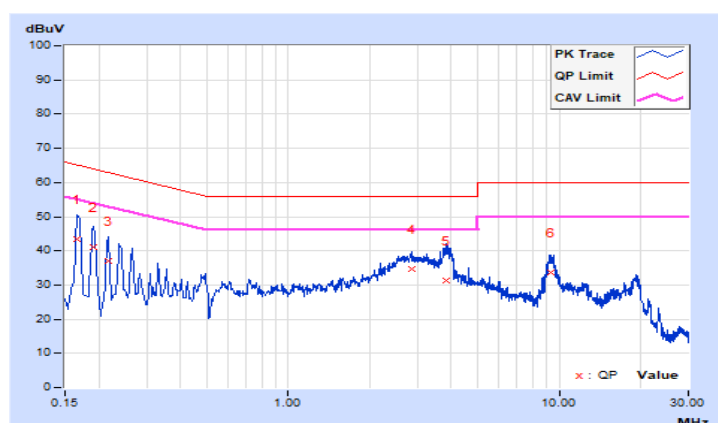


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	19 °C, 76 % RH
Tested by	Fox Chang		

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	0.16600	9.63	33.79	17.20	43.42	26.83	65.16	55.16	-21.74	-28.33
2	0.19000	9.64	31.37	13.86	41.01	23.50	64.04	54.04	-23.03	-30.54
3	0.21800	9.64	27.24	13.31	36.88	22.95	62.89	52.89	-26.01	-29.94
4	2.87400	9.74	24.79	20.80	34.53	30.54	56.00	46.00	-21.47	-15.46
5	3.81400	9.75	21.61	17.07	31.36	26.82	56.00	46.00	-24.64	-19.18
6	9.37800	9.80	23.96	18.52	33.76	28.32	60.00	50.00	-26.24	-21.68

#### 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



## 7.2 Radiated Emissions up to 1 GHz

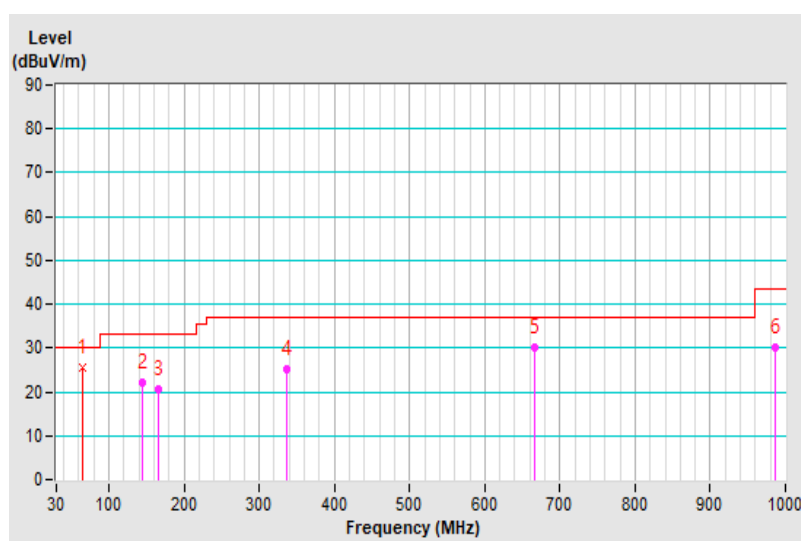
### Mode A

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 72 % RH
Tested By	Kai Chu		

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	64.78	25.37 QP	30.00	-4.63	1.05 H	212	39.50	-14.13
2	143.98	21.98 QP	33.10	-11.12	3.50 H	254	35.39	-13.41
3	166.00	20.56 QP	33.10	-12.54	4.00 H	89	34.12	-13.56
4	336.00	25.18 QP	37.00	-11.82	2.00 H	17	36.58	-11.40
5	666.45	29.99 QP	37.00	-7.01	1.50 H	90	34.56	-4.57
6	985.79	29.99 QP	43.50	-13.51	2.50 H	298	28.38	1.61

#### 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

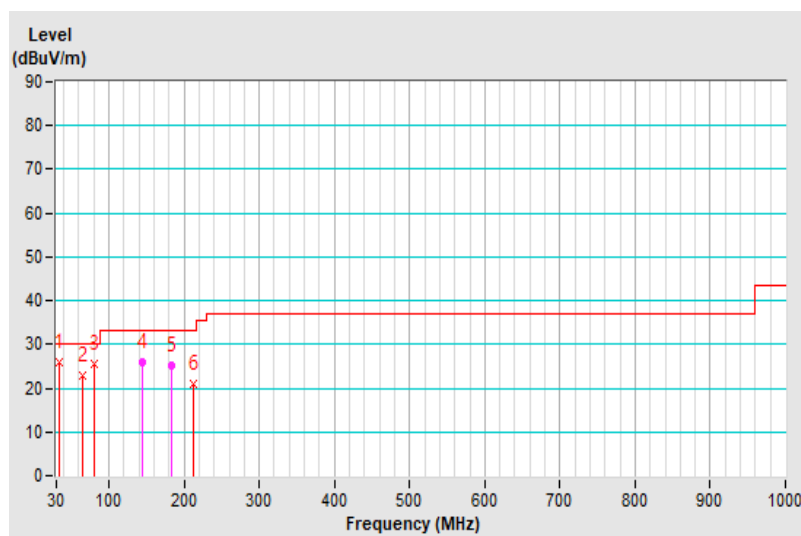


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 72 % RH
Tested By	Kai Chu		

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	33.31	25.94 QP	30.00	-4.06	2.84 V	209	41.01	-15.07
2	65.16	22.93 QP	30.00	-7.07	1.00 V	128	37.50	-14.57
3	79.75	25.62 QP	30.00	-4.38	1.00 V	81	43.39	-17.77
4	143.98	25.90 QP	33.10	-7.20	3.50 V	346	39.27	-13.37
5	184.04	25.29 QP	33.10	-7.81	1.00 V	143	40.24	-14.95
6	212.56	21.04 QP	33.10	-12.06	1.00 V	79	37.01	-15.97

**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

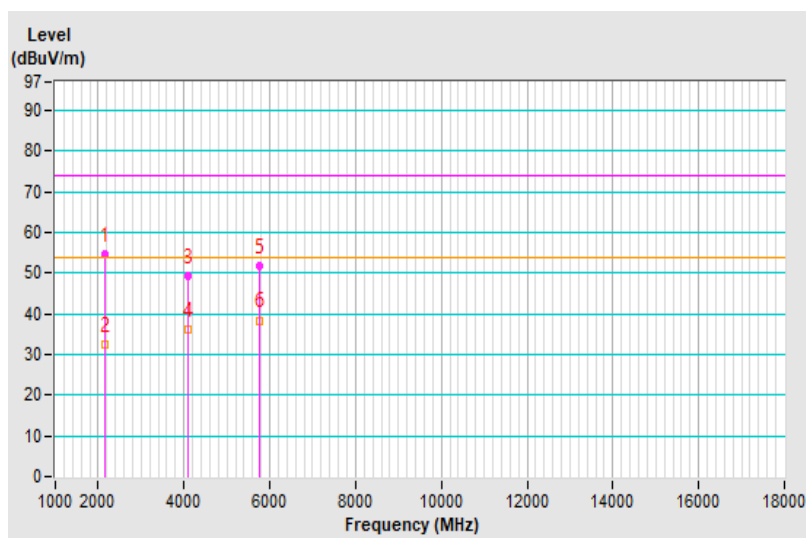
#### Mode A

Frequency Range	1GHz ~ 13GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Kai Chu		

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	2168.21	54.64 PK	74.00	-19.36	1.34 H	294	50.39	4.25
2	2168.21	32.55 AV	54.00	-21.45	1.34 H	294	28.30	4.25
3	4082.04	49.31 PK	74.00	-24.69	1.48 H	255	40.87	8.44
4	4082.04	36.20 AV	54.00	-17.80	1.48 H	255	27.76	8.44
5	5764.74	51.84 PK	74.00	-22.16	1.93 H	231	39.61	12.23
6	5764.74	38.41 AV	54.00	-15.59	1.93 H	231	26.18	12.23

#### 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

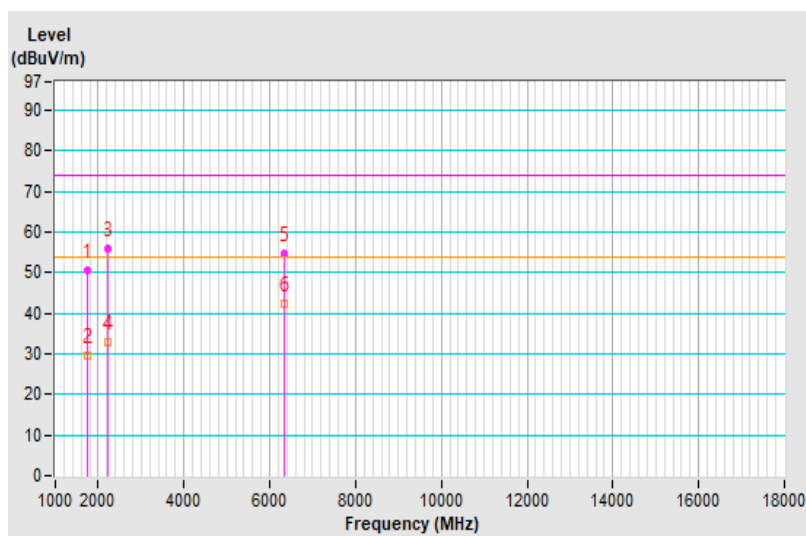


Frequency Range	1GHz ~ 13GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Kai Chu		

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	1747.16	50.65 PK	74.00	-23.35	1.00 V	351	50.90	-0.25
2	1747.16	29.45 AV	54.00	-24.55	1.00 V	351	29.70	-0.25
3	2208.33	55.75 PK	74.00	-18.25	1.43 V	312	51.10	4.65
4	2208.33	33.00 AV	54.00	-21.00	1.43 V	312	28.35	4.65
5	6346.46	54.69 PK	74.00	-19.31	1.40 V	38	38.62	16.07
6	6346.46	42.22 AV	54.00	-11.78	1.40 V	38	26.15	16.07

**Remarks:**

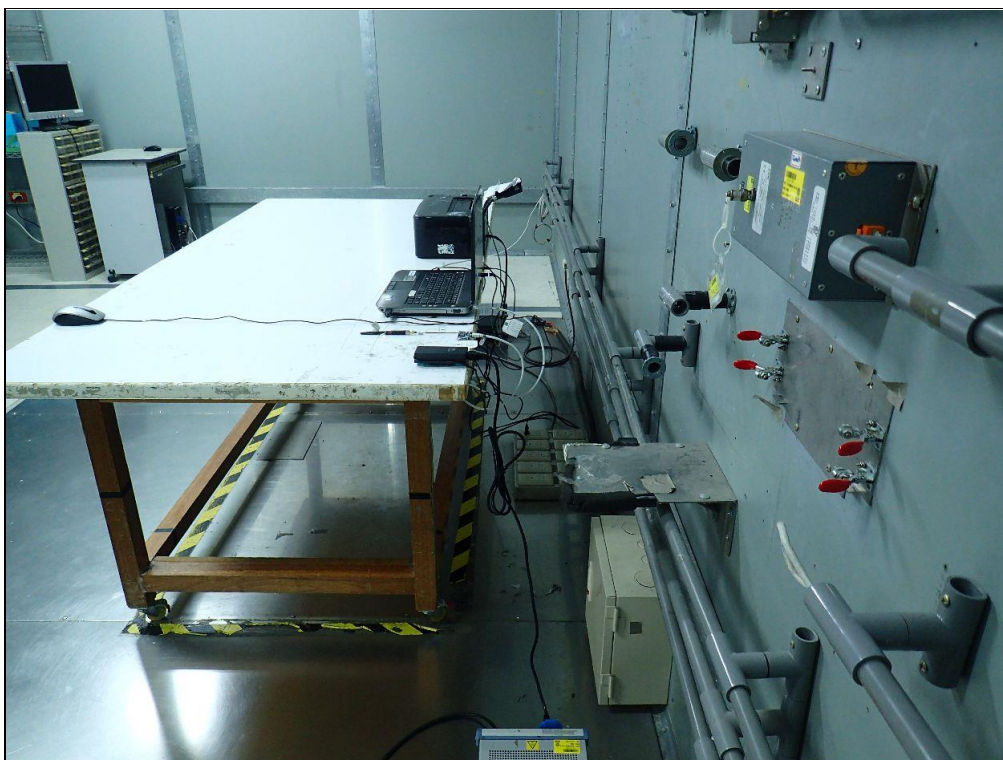
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)  
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



## 8 Pictures of Test Arrangements

### 8.1 Conducted Emissions from Power Ports

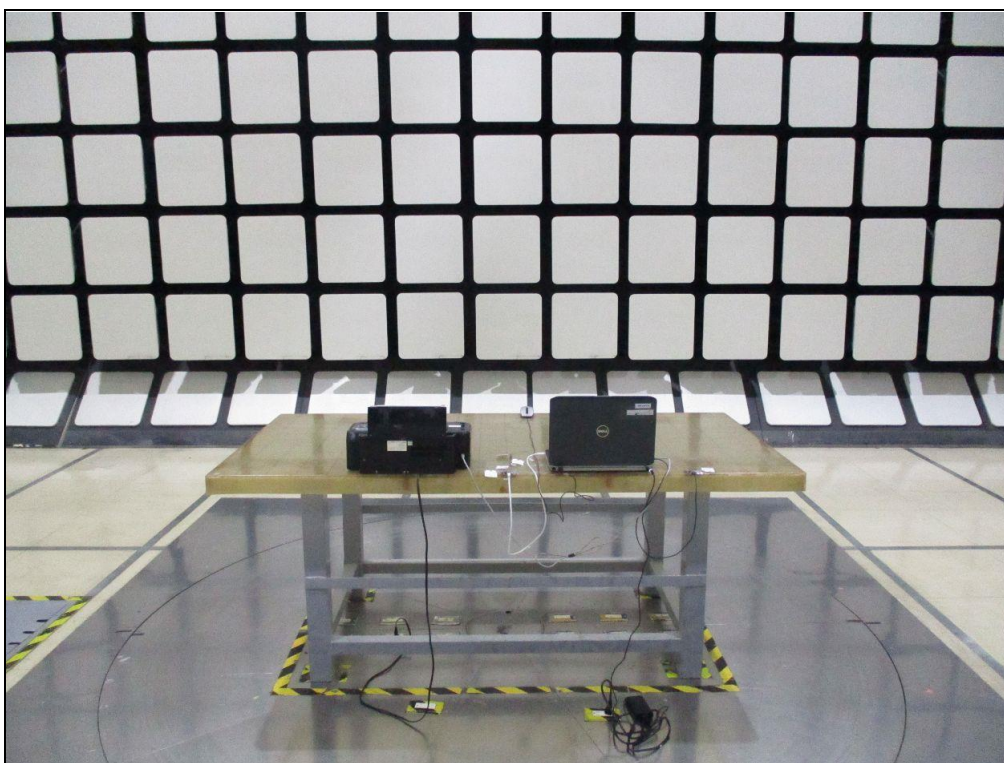
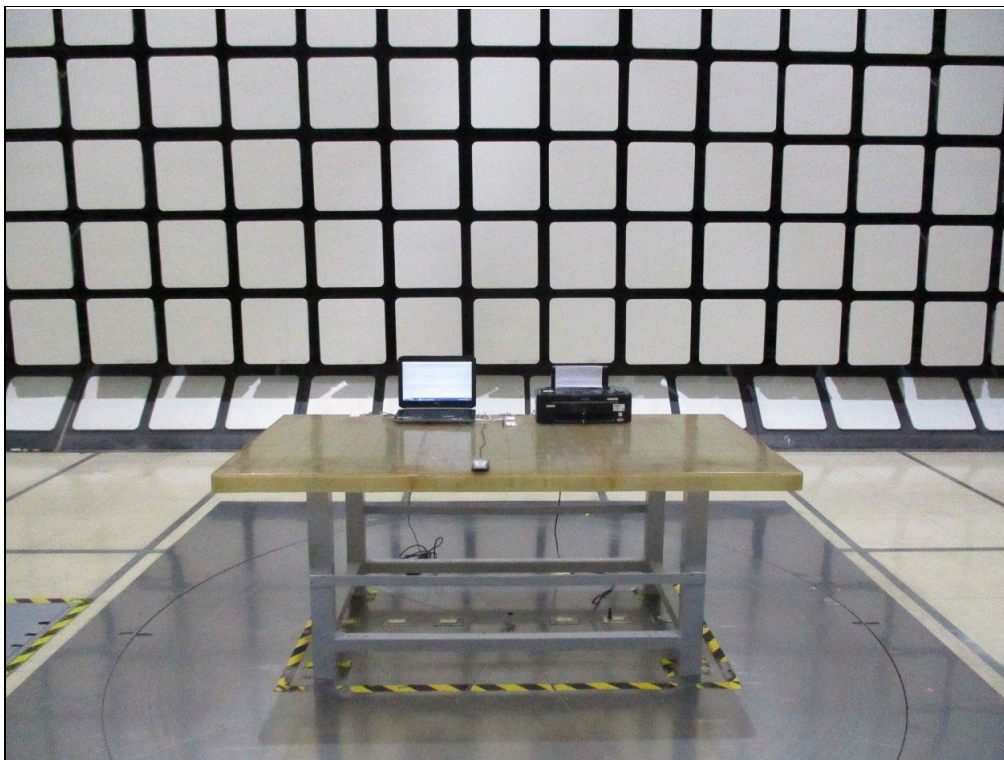
#### Mode A





## 8.2 Radiated Emissions up to 1 GHz

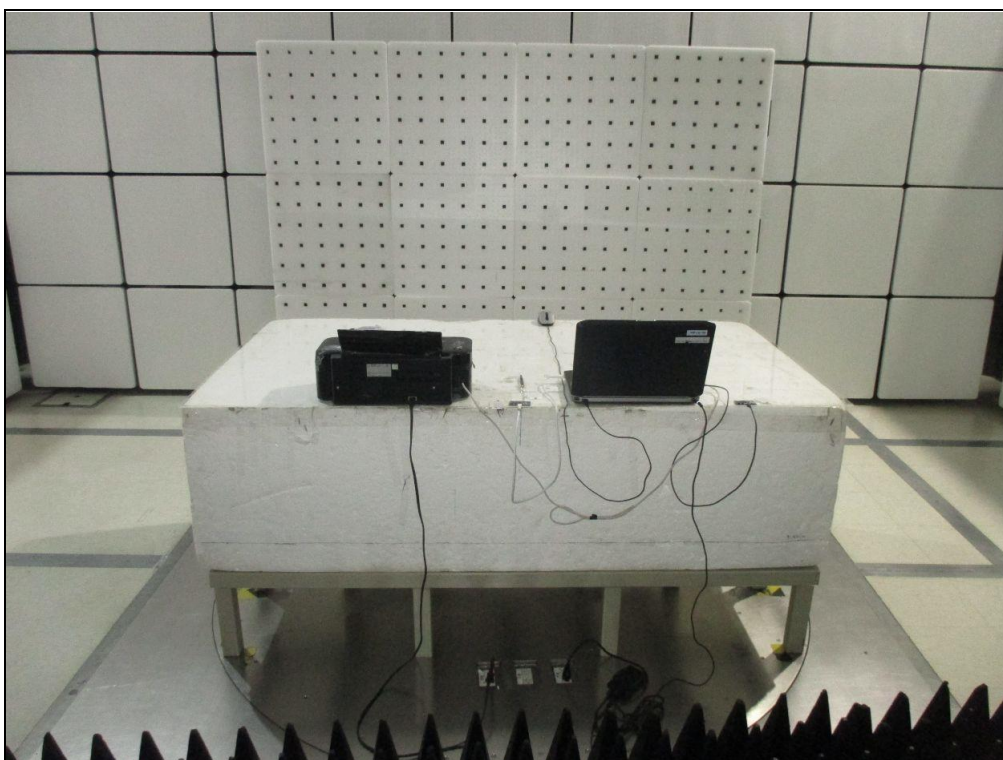
### Mode A





### 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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