

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standards:** 47 CFR FCC Part 15, Subpart B, Class A  
ANSI C63.4:2014

**Report No.:** FDBEHL-WTW-P20100250

**Test Model:** Balance 380X, Balance 580X

**Series Model:** Peplink Balance 380X, Peplink Balance 580X, BPL-380X,  
BPL-580X, EXM-MINI-15GD, FlexModule Mini 1x 5G  
Module (refer to item 3.1 for more details)

**EUT FCC ID:** U8G-P1X05B

**Received Date:** Nov. 13, 2020

**Test Date:** May 27 ~ May 28, 2021

**Issued Date:** Jun. 28, 2021

**Applicant:** PISMO LABS TECHNOLOGY LIMITED

**Address:** A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road,  
Cheung Sha Wan, Hong Kong

**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., Kwei Shan Dist., Taoyuan City  
33383, TAIWAN

**FCC Registration /** 328930 / TW1050

**Designation Number:**

**Approved by :**



**Date:** Jun. 28, 2021

Carl Chen / Project Engineer

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Prepared by : Vida Chen / Specialist



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### Release Control Record

Issue No.	Description	Date Issued
FDBEHL-WTW-P20100250	Original release.	Jun. 28, 2021

## 1 Certification

- Product:** PEPWAVE / peplink Balance Product
- Brand:** PEPWAVE / peplink
- Test Model:** Balance 380X, Balance 580X
- Series Model:** Peplink Balance 380X, Peplink Balance 580X, BPL-380X, BPL-580X, EXM-MINI-15GD, FlexModule Mini 1x 5G Module (refer to item 3.1 for more details)
- Sample Status:** Identical Prototype
- Applicant:** PISMO LABS TECHNOLOGY LIMITED
- Test Date:** May 27 ~ May 28, 2021
- Standards:** 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

FCC Part 15 Clause	Test Item	Result/Remarks	Verdict
15.107	Conducted Emissions from Power Ports	Minimum passing Class A margin is -8.12 dB at 1.75455 MHz	Pass
15.109	Radiated Emissions up to 1 GHz	Minimum passing Class A margin is -7.51 dB at 1000.00 MHz	Pass
	Radiated Emissions above 1 GHz	Minimum passing Class A margin is -7.84 dB at 1250.05 MHz	Pass

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:

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.14 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.04 dB

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

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 Description of EUT

Product	PEPWAVE / peplink Balance Product
Brand	PEPWAVE / peplink
Module FCC ID	QIPMV31-W
Test Model	Balance 380X, Balance 580X
Series Model	Peplink Balance 380X, Peplink Balance 580X, BPL-380X, BPL-580X, EXM-MINI-15GD, FlexModule Mini 1x 5G Module
Model Difference	Refer to note
Sample Status	Identical Prototype
Operating Software	NA
Power Supply Rating	Refer to note
Accessory Device	Refer to note
Data Cable Supplied	NA

Note:

1. All models are listed as below. Model Balance 380X is the representative for final test.

Model	Difference
Balance 380X	Balance 380X model name
Balance 580X	Balance 580X model name
Peplink Balance 380X	Balance 380X model name for peplink
Peplink Balance 580X	Balance 580X model name for peplink
BPL-380X	Balance 380X product code
BPL-580X	Balance 580X product code
EXM-MINI-15GD	FlexModule Mini 1x 5G Module product code
FlexModule Mini 1x 5G Module	FlexModule Mini 1x 5G Module model name

\*After the pretesting model of Balance 380X and Balance 580X, Balance 380X model is found to be the worst case test modes and therefore had been chosen for final test.

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Power	MEAN WELL	EPS-65-12	I/P: 100-240Vac, 50/60Hz, 1.5A O/P: 12Vdc, 5.42A
Module	CINTERION	MV31-W	-

#### 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 4200MHz provided by PISMO LABS TECHNOLOGY LIMITED, 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 PISMO LABS TECHNOLOGY LIMITED, for detailed feature description, please refer to the manufacturer's specifications or user's manual.

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

The EUT is designed with AC power supply of rating 100-240Vac, 50/60Hz.

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

Mode	Test Condition
1	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM A, 120Vac/60Hz
2	Balance 580X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*5 + USB with Load + Console with cable + SIM B, 120Vac/60Hz
3	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM A, 240Vac/60Hz

For Conducted emission test, the EUT has been pre-tested under following test modes, and test mode 2 was the worst case for final test.

Mode	Test Condition
1	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM A, 120Vac/60Hz
2	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM B, 240Vac/60Hz

Test modes are presented in the report as below.

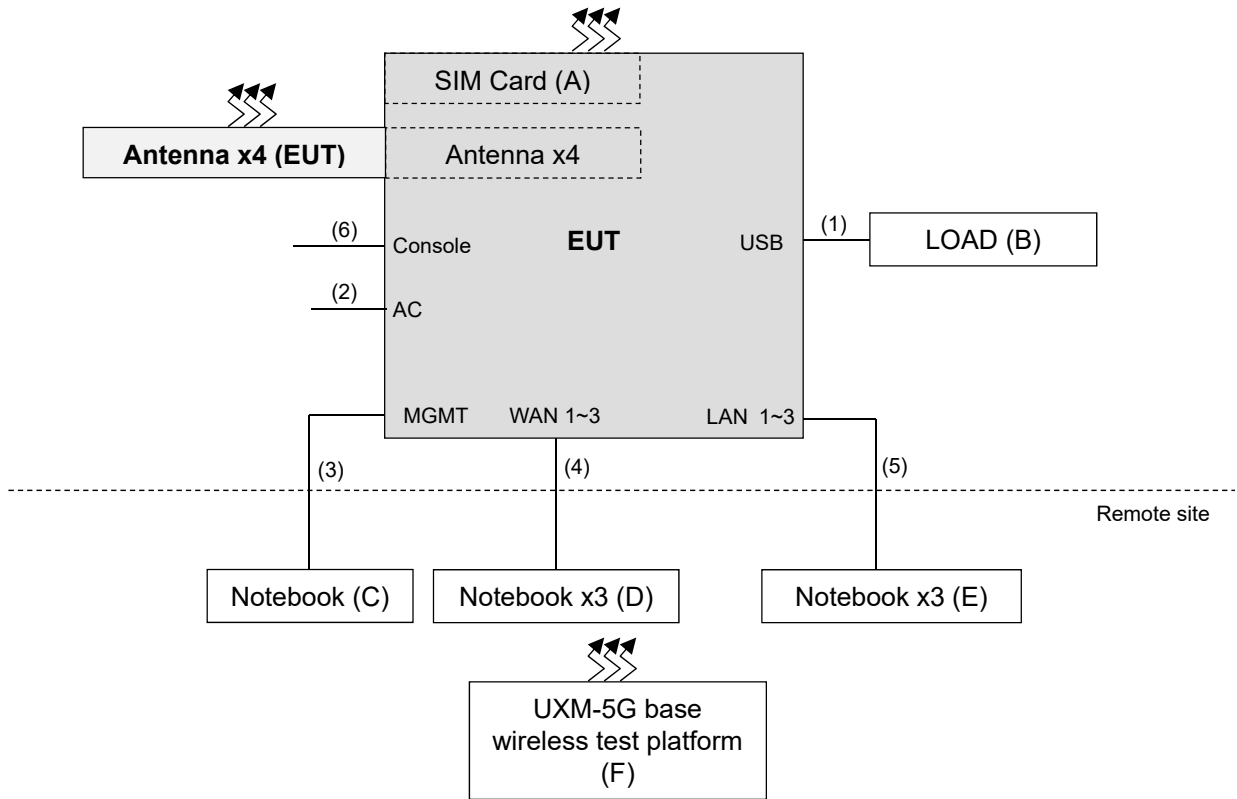
Mode	Test Condition
Conducted emission test	
-	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM B
Radiated emission up to 1GHz test	
-	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM A
Radiated emission above 1GHz test	
-	Balance 380X + MV31-W + 5G band 77 + LTE band 1 + MGMT 1Gbps Ping + LAN 1Gbps Link*3 + WAN 1Gbps Link*3 + USB with Load + Console with cable + SIM A

Note: 5G Band was chosen from the worst case of MV31-W Module Report

### 3.5 Test Program Used and Operation Descriptions

- Placed the EUT on the test table.
- EUT linked with LOAD via micro USB cable.
- Prepared notebooks outside of test area to act as communication partners.
- The communication partners sent data to EUT via LAN by command "PING".
- EUT linked with UXM-5G base wireless test platform through WLAN.

### 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.	SIM card	R&S	N/A	N/A	N/A	--
B.	LOAD	BV-ADT	N/A	N/A	N/A	--
C.	Notebook	lenovo	20AYA00MTW	MP042EKY	FCC DoC Approved	--
D.	Notebook x3	Lenovo	S430	MP-2DBFW	PD92230BNHU	--
		DELL	E6440	FNLNM32	FCC DoC Approved	--
		DELL	E6440	FMLNM32	FCC DoC Approved	--
E.	Notebook x3	DELL	E6230	3PHNSY1	FCC DoC Approved	--
		DELL	E6230	9XV6KX1	FCC DoC Approved	--
		DELL	E5420	FWLXBT1	FCC DoC Approved	--
F.	UXM-5G base wireless test platform	Keysight	E7515E	MY59296049	N/A	--

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items C-F acted as communication partners to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Micro USB cable	1	1.2	Y	0	--
2.	AC power cable	1	1.7	N	0	Provided by client
3.	LAN cable	1	10	N	0	RJ45, Cat5e. Provided by Lab
4.	LAN cable	3	10	N	0	RJ45, Cat5e. Provided by Lab
5.	LAN cable	3	10	N	0	RJ45, Cat5e. Provided by Lab
6.	Console cable	1	0.26	N	0	Provided by client

## 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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The test was performed in HwaYa Shielded Room 2 (Conduction 2).  
2. The VCCI Site Registration No. is C-12047.

### 4.2 Radiated Emissions up to 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ (V)	ESR	101240	Oct. 30, 2020	Oct. 29, 2021
Test Receiver ROHDE & SCHWARZ (H)	ESR	101264	Apr. 09, 2021	Apr. 08, 2022
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-148	Nov. 05, 2020	Nov. 04, 2021
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-156	Nov. 05, 2020	Nov. 04, 2021
Preamplifier Sonoma (V)	310N	352924	Jun. 08, 2020	Jun. 07, 2021
Preamplifier Sonoma (H)	310N	352923	Jun. 08, 2020	Jun. 07, 2021
RF signal cable (with 5dB PAD) Times (V)	LMR-600 (18M) +LMR-400 (7M)	CABLE-CH1 (VER) -01	Sep. 04, 2020	Sep. 03, 2021
RF signal cable (with 5dB PAD) Times (H)	LMR-600 (11.8M) +LMR-400 (7M)	CABLE-CH1 (HOR) -01	Sep. 04, 2020	Sep. 03, 2021
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower (V)	MFA-440	9707	NA	NA
Antenna Tower (H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller (V)	MF7802	074	NA	NA
Controller (H)	MF7802	08093	NA	NA

Note: 1. The test was performed in HwaYa Chamber 1.  
2. The VCCI Site Registration No. is R-11893.

### 4.3 Radiated Emissions above 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	E4446A	MY51100039	Dec. 01, 2020	Nov. 30, 2021
PXA S Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 02, 2020	Jul. 01, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Nov. 04, 2020	Nov. 03, 2021
RF signal cable (with 5dB PAD) Times	LMR-400 (18M)	CABLE-CH2-01	Mar. 22, 2021	Mar. 21, 2022
HORN Antenna (with 4dB PAD) SCHWARZBECK	BBHA 9120 D	9120D-405	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier Agilent (Above 1GHz)	8449B	3008A01961	Sep. 04, 2020	Sep. 03, 2021
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Controller BV ADT	SC100	SC93021702	NA	NA
BandPass Filter (2.4G) MICRO-TRONICS	BRM17690-01	003	Sep. 04, 2020	Sep. 03, 2021
BandPass Filter (5G) MICRO-TRONICS	BRM50716-01	G011	Sep. 04, 2020	Sep. 03, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-1000	170819	Sep. 04, 2020	Sep. 03, 2021
RF Coaxial Cable Rosnol	K1K50-UP0279- K1K50-3000	181129-1	Sep. 04, 2020	Sep. 03, 2021
RF Coaxial Cable JUNFLON+EMC	JUNFLON+EMC104- SM-SM-6000	Cable-CH2- 02(MWX3221308 G003+130710)	Jan. 16, 2021	Jan. 15, 2022
Fix tool for Boresight antenna	BAF-01	2	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
HORN Antenna (with 3dB PAD) SCHWARZBECK	BBHA 9170	148	Nov. 22, 2020	Nov. 21, 2021

Note: 1. The test was performed in HwaYa Chamber 2 (966 Chamber 1).  
2. The VCCI Site Registration No. is G-10018.

## 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
0.5 - 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

Radiated Emissions Limits at 10 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, 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.

### 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 $\mu$ V/m)		
Frequency range	Class A	Class B
Above 1GHz	Avg: 60 Peak: 80	Avg: 54 Peak: 74

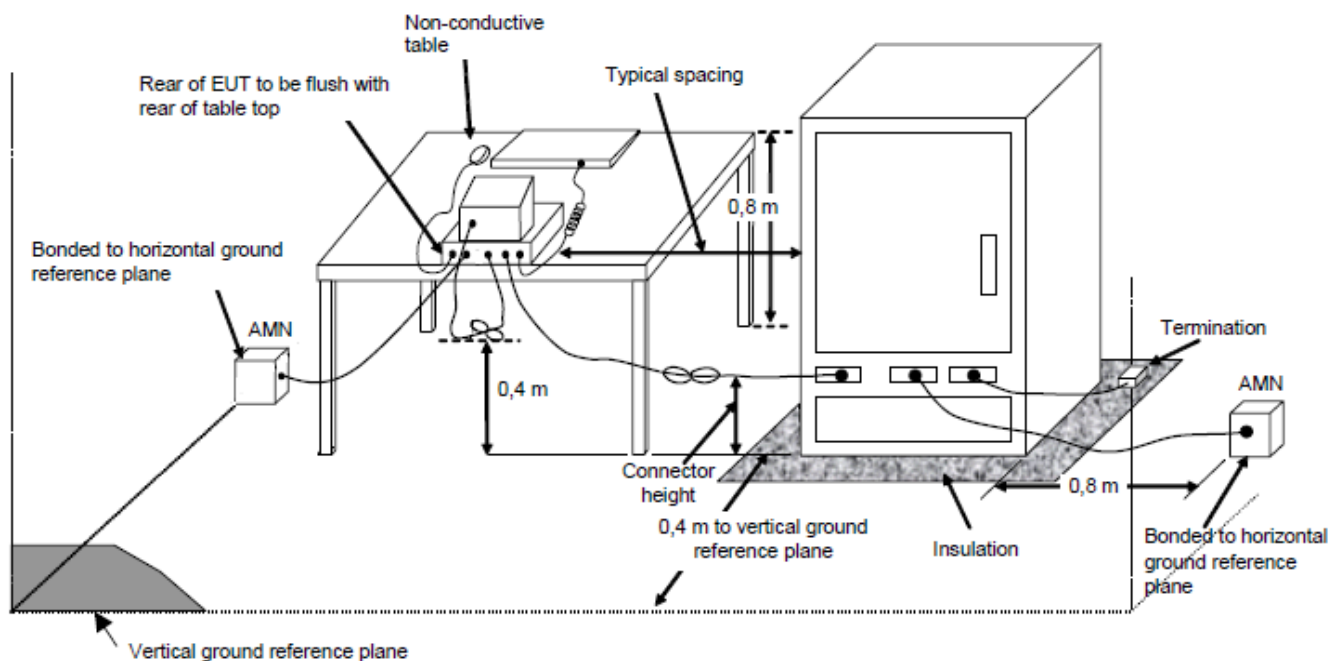
Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far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

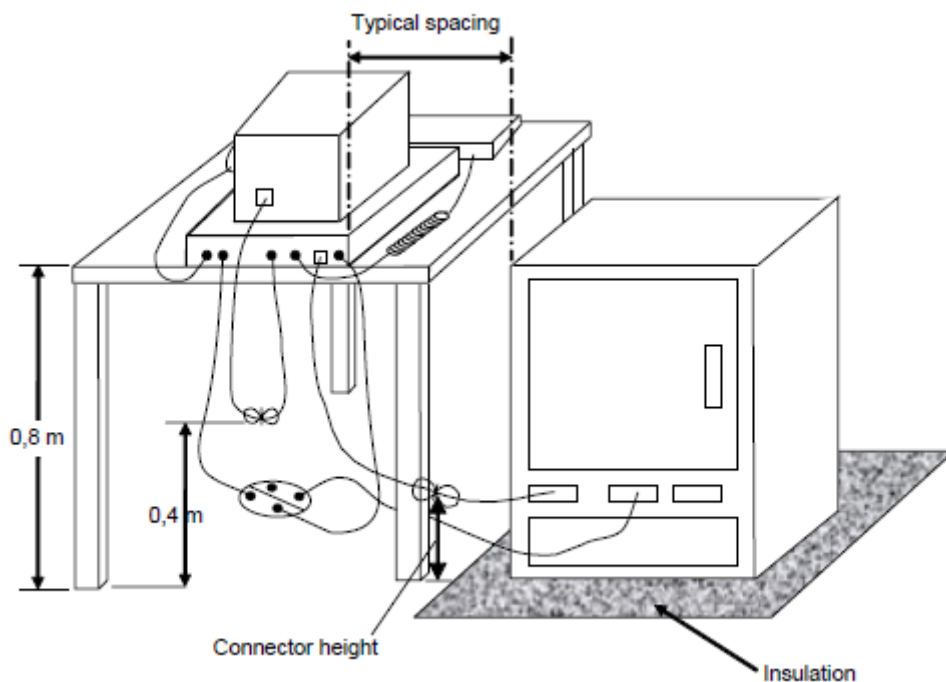


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

## 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 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.

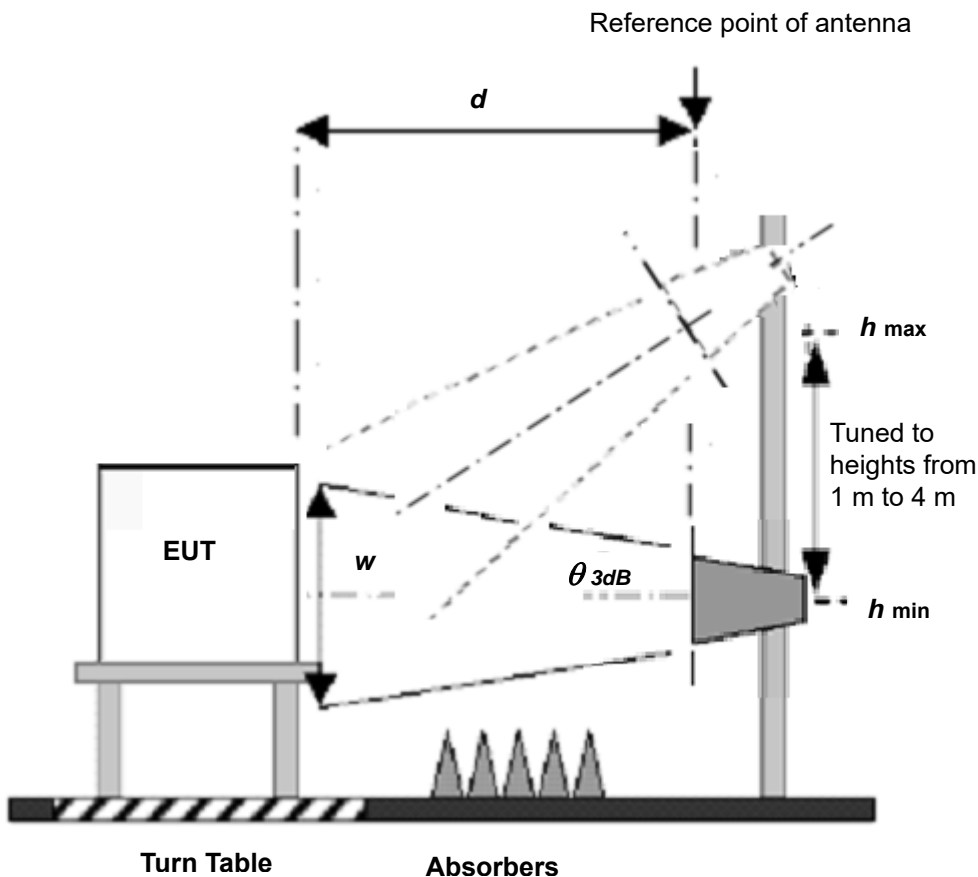


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 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 Emission

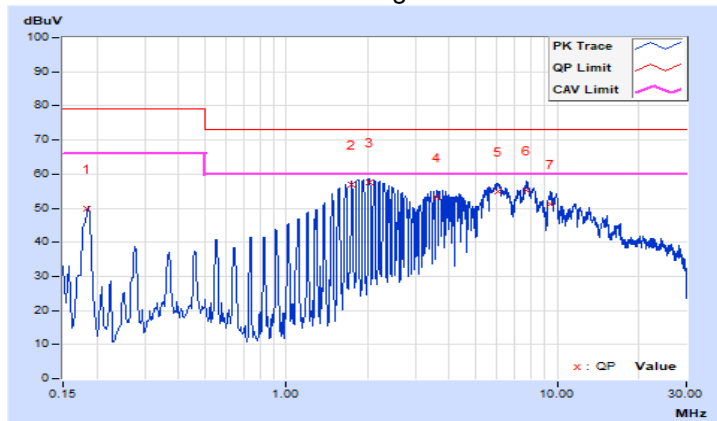
### 7.1 Conducted Emissions from Power Ports

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	Environmental Conditions	28°C, 73%RH
Tested by	Jim Lee	Test Date	2021/5/27

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	0.18419	10.08	39.70	34.81	49.78	44.89	79.00	66.00	-29.22	-21.11
2	1.74255	10.15	46.84	36.66	56.99	46.81	73.00	60.00	-16.01	-13.19
3	2.02407	10.16	47.51	40.08	57.67	50.24	73.00	60.00	-15.33	-9.76
4	3.58689	10.21	42.96	32.28	53.17	42.49	73.00	60.00	-19.83	-17.51
5	6.05801	10.25	44.54	29.94	54.79	40.19	73.00	60.00	-18.21	-19.81
6	7.73931	10.28	44.83	32.37	55.11	42.65	73.00	60.00	-17.89	-17.35
7	9.49490	10.31	40.92	28.46	51.23	38.77	73.00	60.00	-21.77	-21.23

#### 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



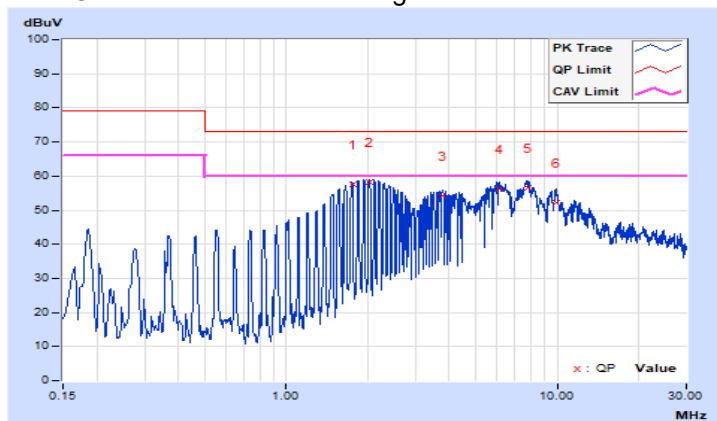


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	Environmental Conditions	28°C, 73%RH
Tested by	Jim Lee	Test Date	2021/5/27

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	1.75455	10.17	47.43	41.71	57.60	51.88	73.00	60.00	-15.40	-8.12
2	2.02898	10.17	47.97	41.01	58.14	51.18	73.00	60.00	-14.86	-8.82
3	3.77693	10.25	43.94	32.95	54.19	43.20	73.00	60.00	-18.81	-16.80
4	6.10493	10.31	46.04	33.88	56.35	44.19	73.00	60.00	-16.65	-15.81
5	7.77841	10.35	46.28	33.73	56.63	44.08	73.00	60.00	-16.37	-15.92
6	9.87808	10.41	41.75	29.33	52.16	39.74	73.00	60.00	-20.84	-20.26

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



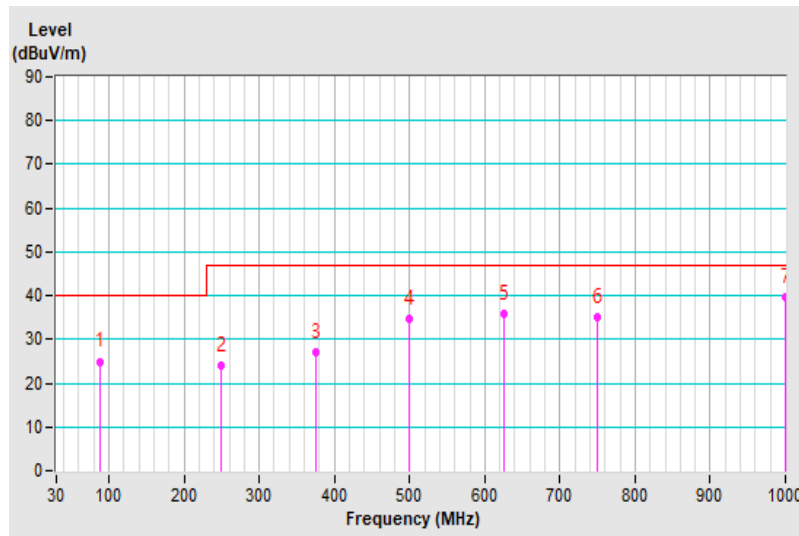
## 7.2 Radiated Emissions up to 1 GHz

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested By	Rolan Zheng	Environmental Conditions	20°C, 64%RH
Test Date	2021/5/27		

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	89.12	24.95 QP	40.00	-15.05	3.50 H	82	43.66	-18.71
2	250.01	23.92 QP	47.00	-23.08	4.00 H	355	38.19	-14.27
3	375.00	27.19 QP	47.00	-19.81	3.00 H	328	37.62	-10.43
4	499.99	34.65 QP	47.00	-12.35	2.50 H	303	42.20	-7.55
5	625.03	35.75 QP	47.00	-11.25	1.50 H	71	40.52	-4.77
6	750.02	34.97 QP	47.00	-12.03	1.00 H	16	37.60	-2.63
7	<b>1000.00</b>	<b>39.49 QP</b>	<b>47.00</b>	<b>-7.51</b>	<b>1.00 H</b>	<b>340</b>	<b>37.42</b>	<b>2.07</b>

Remarks:

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

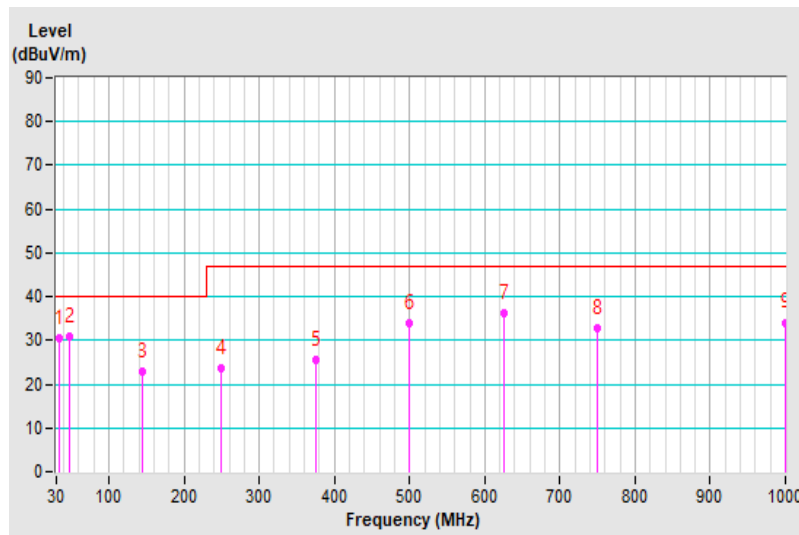


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested By	Rolan Zheng	Environmental Conditions	20°C, 64%RH
Test Date	2021/5/27		

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	34.03	30.33 QP	40.00	-9.67	1.00 V	2	45.22	-14.89
2	48.29	30.84 QP	40.00	-9.16	1.00 V	221	44.42	-13.58
3	145.24	22.81 QP	40.00	-17.19	1.00 V	267	36.22	-13.41
4	250.01	23.63 QP	47.00	-23.37	1.50 V	345	37.68	-14.05
5	375.00	25.51 QP	47.00	-21.49	1.00 V	65	35.34	-9.83
6	499.99	34.02 QP	47.00	-12.98	1.00 V	256	41.07	-7.05
7	625.03	36.04 QP	47.00	-10.96	3.00 V	227	40.35	-4.31
8	750.02	32.82 QP	47.00	-14.18	1.00 V	25	35.21	-2.39
9	1000.00	34.12 QP	47.00	-12.88	4.00 V	150	32.58	1.54

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



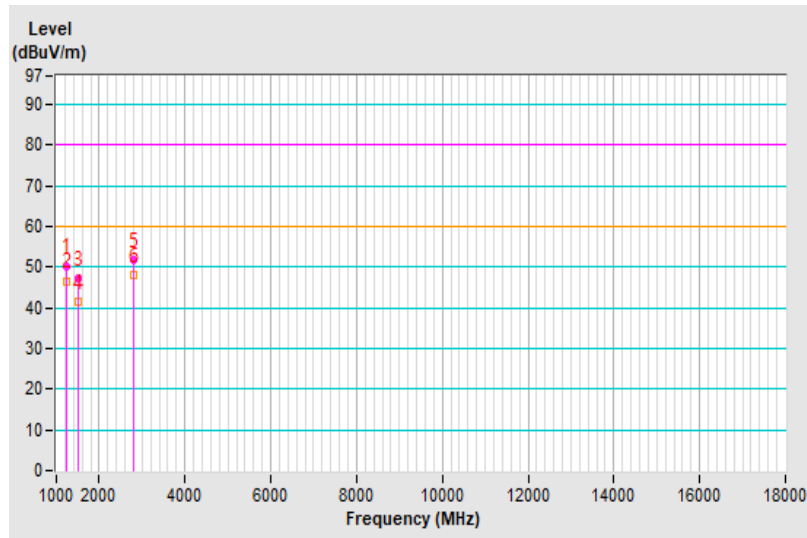
### 7.3 Radiated Emissions above 1 GHz

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Mick Chou	Environmental Conditions	24°C, 70%RH
Test Date	2021/5/27		

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	1250.06	50.30 PK	80.00	-29.70	1.59 H	360	52.80	-2.50
2	1250.06	46.62 AV	60.00	-13.38	1.59 H	360	49.12	-2.50
3	1500.04	47.19 PK	80.00	-32.81	1.39 H	360	49.27	-2.08
4	1500.04	41.34 AV	60.00	-18.66	1.39 H	360	43.42	-2.08
5	2800.02	51.73 PK	80.00	-28.27	1.16 H	345	49.47	2.26
6	2800.02	48.13 AV	60.00	-11.87	1.16 H	345	45.87	2.26

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

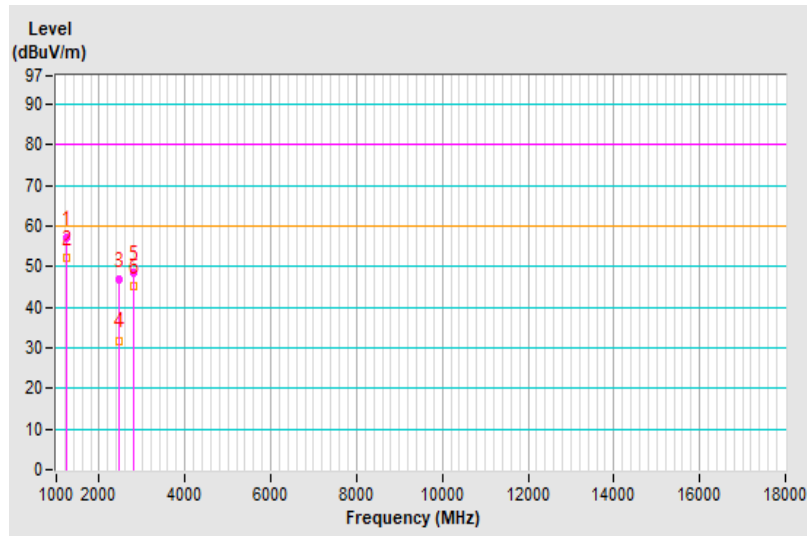


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Mick Chou	Environmental Conditions	24°C, 70%RH
Test Date	2021/5/27		

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	1250.05	56.94 PK	80.00	-23.06	1.37 V	346	59.44	-2.50
<b>2</b>	<b>1250.05</b>	<b>52.16 AV</b>	<b>60.00</b>	<b>-7.84</b>	<b>1.37 V</b>	<b>346</b>	<b>54.66</b>	<b>-2.50</b>
3	2448.38	46.86 PK	80.00	-33.14	1.61 V	147	45.59	1.27
4	2448.38	31.85 AV	60.00	-28.15	1.61 V	147	30.58	1.27
5	2799.99	48.61 PK	80.00	-31.39	1.03 V	0	46.35	2.26
6	2799.99	45.23 AV	60.00	-14.77	1.03 V	0	42.97	2.26

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

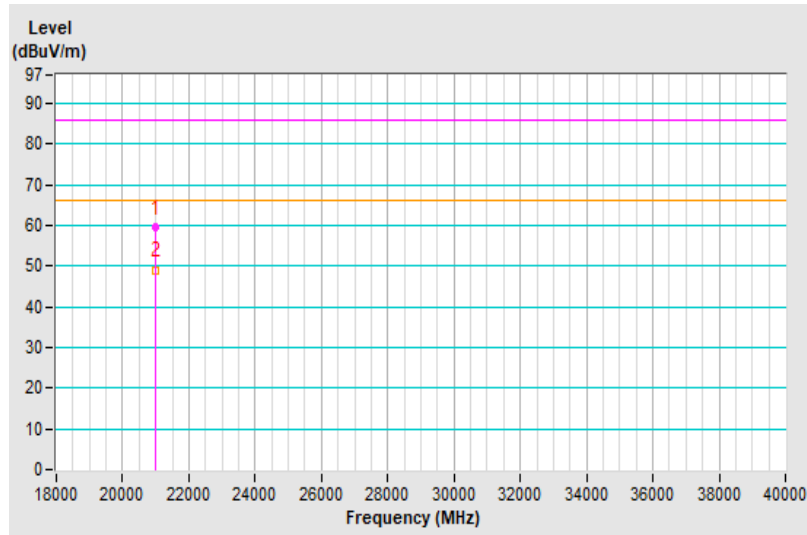


Frequency Range	18GHz ~ 25GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Mick Chou	Environmental Conditions	24°C, 70%RH
Test Date	2021/5/28		

Antenna Polarity & Test Distance : Horizontal at 1.5 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	20994.36	59.56 PK	86.00	-26.44	1.98 H	23	54.86	4.70
2	20994.36	49.11 AV	66.00	-16.89	1.98 H	23	44.41	4.70

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

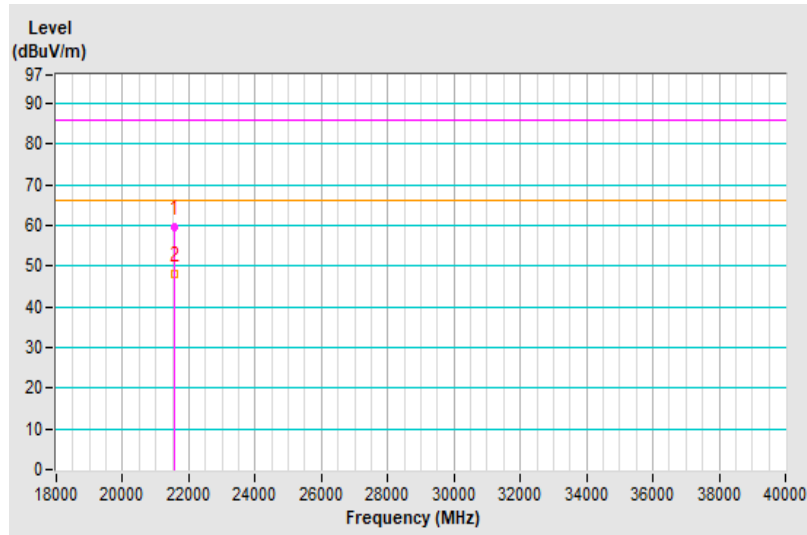


Frequency Range	18GHz ~ 25GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Mick Chou	Environmental Conditions	24°C, 70%RH
Test Date	2021/5/28		

Antenna Polarity & Test Distance : Vertical at 1.5 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	21552.31	59.60 PK	86.00	-26.40	1.14 V	254	54.32	5.28
2	21552.31	48.12 AV	66.00	-17.88	1.14 V	254	42.84	5.28

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

Please refer to the attached file (Test Setup Photo).



## 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 accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Lin Kou EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

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