

TEST REPORT

CERTIFICATE OF CONFORMITY

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

ANSI C63.4-2014

ANSI C63.4a-2017

Report No.: FDCDVB-WTW-P24010023

Product: Notebook

Brand: Getac

Model No.: S510, S510Y(Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_ " or blank for marketing purpose) (refer to item 3.1 for more details)

FCC ID: QYLAX211NG

Received Date: 2024/1/20

Test Date: 2024/1/24 ~ 2024/2/23

Issued Date: 2024/3/21

Applicant: Getac Technology Corporation.

Address: 5F., Building A, No. 209, Sec.1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

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

FCC Registration /

Designation Number: 328930 / TW1050

Approved by: _____

Leo Hsu

Leo Hsu / Project Engineer

Date: _____

2024/3/21

This test report consists of 26 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.

Prepared by : Gina Liu / Specialist



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/>, and is intended 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. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; 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.

Table of Contents

Release Control Record	3
1 Certificate.....	4
2 Summary of Test Results	5
2.1 Measurement Uncertainty	5
2.2 Supplementary Information	5
3 General Information	6
3.1 Description of EUT	6
3.2 Primary Clock Frequencies of Internal Source.....	6
3.3 Features of EUT	6
3.4 Construction of EUT	7
3.5 Operating Modes of EUT and Determination of Worst Case Operating Mode	8
3.6 Test Program Used and Operation Descriptions	9
3.7 Connection Diagram of EUT and Peripheral Devices	9
3.8 Configuration of Peripheral Devices and Cable Connections	10
4 Test Instruments	11
4.1 Conducted Emissions from Power Ports.....	11
4.2 Radiated Emissions up to 1 GHz	12
4.3 Radiated Emissions above 1 GHz.....	13
5 Limits of Test Items.....	14
5.1 Conducted Emissions from Power Ports.....	14
5.2 Radiated Emissions up to 1 GHz	14
5.3 Radiated Emissions above 1 GHz.....	14
6 Test Arrangements.....	15
6.1 Conducted Emissions from Power Ports.....	15
6.2 Radiated Emissions up to 1 GHz	16
6.3 Radiated Emissions above 1 GHz.....	17
7 Test Results of Test Item.....	18
7.1 Conducted Emissions from Power Ports.....	18
7.2 Radiated Emissions up to 1 GHz	20
7.3 Radiated Emissions above 1 GHz.....	22
8 Information of the Testing Laboratories	26



Release Control Record

Issue No.	Description	Date Issued
FDCDVB-WTW-P24010023	Original release.	2024/3/21

1 Certificate

Product: Notebook

Brand: Getac

Test Model: S510, S510Y(Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_ " or blank for marketing purpose) (refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: Getac Technology Corporation.

Test Date: 2024/1/24 ~ 2024/2/23

Standard: 47 CFR FCC Part 15, Subpart B, Class B
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 B margin is -16.13 dB at 13.45000 MHz
FCC Part 15.109	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class B margin is -3.05 dB at 191.86 MHz
FCC Part 15.109	Radiated Emissions above 1 GHz	Pass	Minimum passing Class B margin is -14.98 dB at 19220.32 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	2.88 dB	3.4 dB (U_{CISPR})
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	4.69 dB	6.3 dB (U_{CISPR})
Radiated Emissions above 1 GHz	1 GHz ~ 6 GHz	4.92 dB	5.2 dB (U_{CISPR})
	6 GHz ~ 18 GHz	4.44 dB	5.5 dB (U_{CISPR})
	18 GHz ~ 40 GHz	4.53 dB	-

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	Notebook
Brand	Getac
Test Model	S510, S510Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose)
Model Difference	Refer to Note
Sample Status	Engineering sample
Power Supply Rating	Refer to Note

Note:

1. All models are listed as below.

Brand	Model	Difference
Getac	S510	marketing purpose
	S510Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose)	

2. The EUT uses following accessories.

Battery		
Brand	Model	Specification
Getac	BP3S2P3450P-04	Power Rating : Rating: 10.8Vdc , 6600mAh, 72Wh Typical Capacity: 6900mAh, 75Wh
AC Adapter 1		
Brand	Model	Specification
FSP	FSP065-RBBN3	AC Input : 100-240 Vac ; 50-60 Hz ; 1.5 A DC Output : 19.0Vdc ; 3.42A, 65.0W DC Output Cable : 1.45M / 1core
AC Adapter 2		
Brand	Model	Specification
FSP	FSP090-ABBN3	AC Input : 100-240 Vac ; 50-60 Hz ; 1.2 A DC Output : 19.0Vdc ; 4.74A, 90.0W DC Output Cable : 1.2M / 1 core
Touch Pen		
Brand	Model	
Getac	340GA8900001	

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 6 GHz, provided by Getac Technology Corporation., 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 Getac Technology Corporation., 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 Construction of EUT

Part	Brand	Model	Specification	Configuration		
				SKU A	SKU B	SKU C
CPU	Intel	Alder Lake	i5-125U (Non Vpro)	V		
			i5-135U (Vpro)		V	
			i7-165U (Vpro)			V
DDR	Kingston	---	16GB (8GB+8GB)	V		
		---	32GB (16GB+16GB)		V	
		---	64GB (32GB+32GB)			V
SSD	SSSTC	CL4-8D256	256GB	V		
		CL4-8D512	512GB		V	
		CL4-8D1024	1TB			V
LCD Panel	KD	KD156N20	15.6"	V	V	V
Finger Print	Egistec	908J	---		V	
WLAN Module	Intel	AX211NGW	---	V	V	V
Camera	Chicony	CKFN510	---	V	V	
	Chicony	CKFME66	---			V
Media Bay	Honeywell	N6703	Barcode		V	
	DVD	GUD1N	DVDRW DVICE	V		
	MXM	GTX1650M4D6	Graphic card			V
Option Bay	Getac	---	N/A	V		
	Getac	---	USB+RS232+DP		V	
	Getac	---	2nd LAN+RS232+VGA			V
IC Card	Getac	---	---	V	V	V

3.5 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	SKU A + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + IC Card + LAN 1 1Gbps link + BT link + WLAN 2.4GHz link + Touch pen + DVD play + Adapter 1
2	SKU B + EUT Resolution (1920*1080@60Hz) + Dp with monitor (3840*2160@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + Com Port + IC Card + LAN 1 1Gbps link + BT link + WLAN 5GHz link + Touch pen + Barcode scanner + finger printer + Adapter 1
3	SKU C + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + VGA with monitor (1920*1080@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + Com Port + IC Card + LAN 1 1Gbps link + Lan 2 1Gbps link + BT link + WLAN 6GHz link + Touch pen + Adapter 2
Notes:	
<ol style="list-style-type: none"> 1. There are both AC 120V/60Hz and AC 240V/60Hz to be pre-tested then AC 120V/60Hz has the highest emission value. 2. The worst case is that mode 1 is shown in bold. 	
Mode	Radiated Emissions up to 1 GHz
1	SKU A + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + IC Card + LAN 1 1Gbps link + BT link + WLAN 2.4GHz link + Touch pen + DVD play + Adapter 1
2	SKU B + EUT Resolution (1920*1080@60Hz) + Dp with monitor (3840*2160@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + Com Port + IC Card + LAN 1 1Gbps link + BT link + WLAN 5GHz link + Touch pen + Barcode scanner + finger printer + Adapter 1
3	SKU C + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + VGA with monitor (1920*1080@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + Com Port + IC Card + LAN 1 1Gbps link + Lan 2 1Gbps link + BT link + WLAN 6GHz link + Touch pen + Adapter 2
Notes:	
<ol style="list-style-type: none"> 1. There are both AC 120V/60Hz and AC 240V/60Hz to be pre-tested then AC 120V/60Hz has the highest emission value. 2. The worst case is that mode 1 is shown in bold. 	

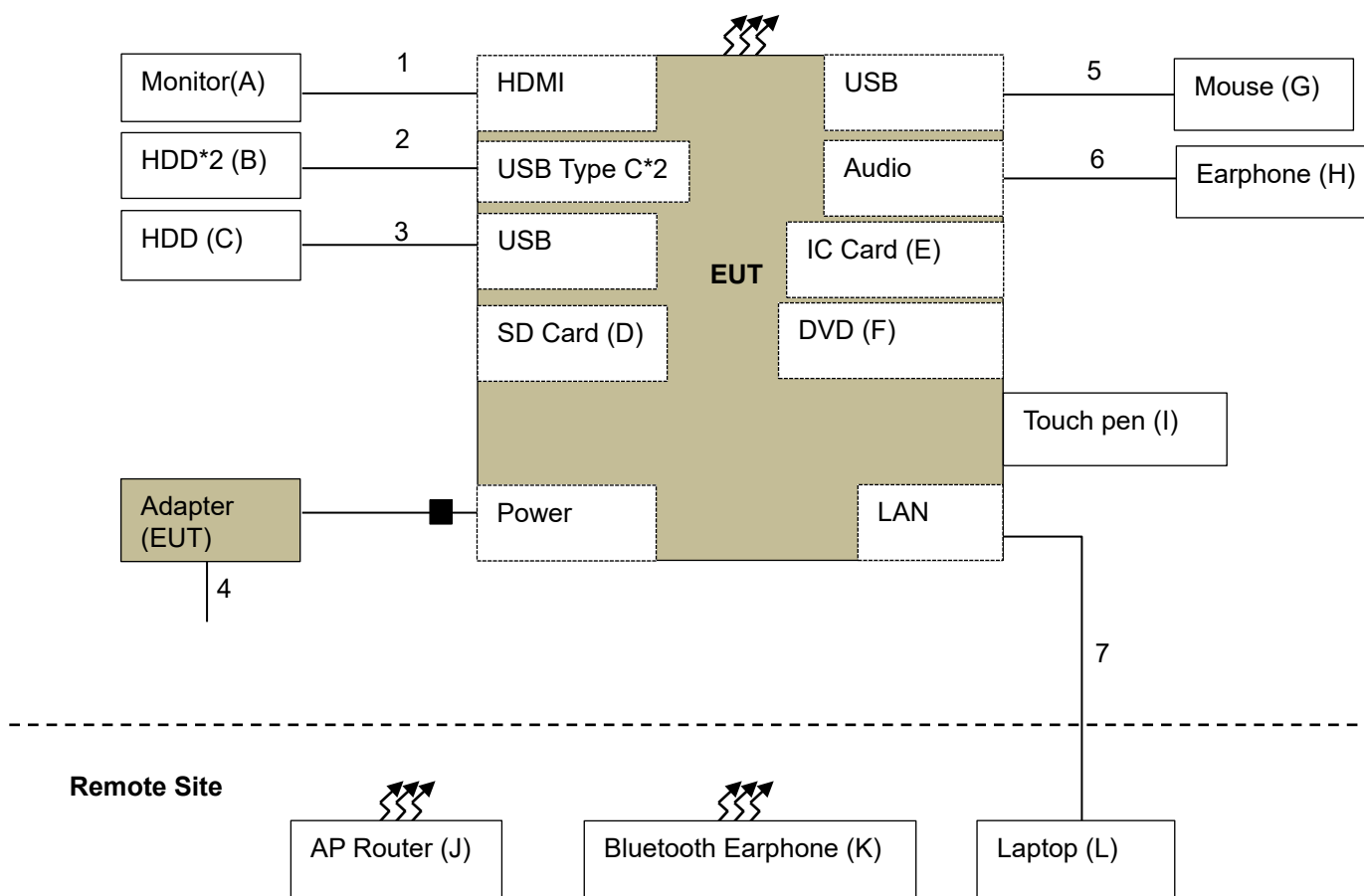
Test modes are presented in the report as below.

Test Condition	
Mode	Conducted Emissions from Power Ports
A	SKU A + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + IC Card + LAN 1 1Gbps link + BT link + WLAN 2.4GHz link + Touch pen + DVD play + Adapter 1
Mode	Radiated Emissions up to 1 GHz
A	SKU A + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + IC Card + LAN 1 1Gbps link + BT link + WLAN 2.4GHz link + Touch pen + DVD play + Adapter 1
Mode	Radiated Emissions above 1 GHz
A	SKU A + EUT Resolution (1920*1080@60Hz) + HDMI with monitor (3840*2160@60Hz) + Camera front + SD Card + Earphone + USB-A with mouse + USB-A with HDD r/w + USB-C with HDD r/w + IC Card + LAN 1 1Gbps link + BT link + WLAN 2.4GHz link + Touch pen + DVD play + Adapter 1

3.6 Test Program Used and Operation Descriptions

- a. The EUT was charged from adapter.
- b. The EUT linked with mouse via USB cable.
- c. The EUT linked with Bluetooth Earphone.
- d. The EUT use BurnIn test program to enable all functions.
- e. The EUT use BurnIn test program to read and wrote data with HDD via USB / USB Type C Cable, and data was read and written with the internal HDD / SD Card.
- f. The EUT enabled Camera Function.
- g. The EUT sent "H" patterns to monitor, and external monitor displayed them via HDMI Cable.
- h. The EUT sent and received messages to remote Laptop via LAN cable.
- i. The EUT communicated data with the AP router which acted as a communication partner.
- j. The EUT executes " Diagnostic_tool " program to read the IC Card.
- k. The EUT read DVD via DVD Player.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Monitor	ASUS	MX27U	H3LMRS034164	N/A	Provided by Lab
B	HDD	Transcend	ESD370C	G88779-0004	N/A	Provided by Lab
	HDD	Transcend	ESD370C	G88779-0016	N/A	Provided by Lab
C	HDD	Transcend	TS1TBJ25M3G	G02688-0209	N/A	Provided by Lab
D	SD Card	SANDISK	8GB	N/A	N/A	Provided by Lab
E	IC Card	N/A	N/A	N/A	N/A	Provided by Lab
F	DVD	N/A	N/A	N/A	N/A	Provided by Lab
G	Mouse	DELL	MS116P	CN-0145WW-PRC00-32R-07TM	N/A	Provided by Lab
H	Earphone	APPLE	MB770FE/B	N/A	N/A	Provided by Lab
I	Touch pen	Getac	340GA8900001	N/A	N/A	Supplied by applicant
J	AP Router	D-LINK	DIR826L	QBQ91C9000007	N/A	Provided by Lab
K	Bluetooth Earphone	ELECOM	LBT-MPHS400	N/A	N/A	Provided by Lab
L	Laptop	DELL	Latitude 5420	C6F33F3	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	HDMI	1	2	Yes	0	HDMI 2.0 (Brand: Amber, Model: HDMI-AA120)
2	USB Type C	2	0.5	Yes	0	Provided by Lab
3	USB	1	0.5	Yes	0	Provided by Lab
4	Power	1	1.73	No	0	Supplied by applicant
5	USB	1	1.8	Yes	0	Provided by Lab
6	Audio	1	1.2	Yes	0	Provided by Lab
7	Cat.5e	1	10	No	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 resistance HUBER+SUHNER	E1-011315	13	2023/11/22	2024/11/21
50 ohm terminal resistance	E1-011279	04	2023/11/22	2024/11/21
	E1-011280	05	2023/11/22	2024/11/21
DC-LISN Schwarzbeck	NNBM 8126G	8126G-069	2023/11/7	2024/11/6
EMI Test Receiver R&S	ESCI	100613	2023/12/4	2024/12/3
Fixed Attenuator Mini-Circuits	HAT-10+	PAD-COND1-01	2024/1/6	2025/1/5
LISN R&S	ENV216	101826	2023/3/23	2024/3/22
	ESH3-Z5	100311	2023/9/6	2024/9/5
RF Coaxial Cable Woken	5D-FB	Cable-cond1-01	2024/1/6	2025/1/5
Software BVADT	BVADT_Cond_ V7.3.7.4	N/A	N/A	N/A
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2023/8/31	2024/8/30

Notes:

1. The test was performed in HY - Conduction 1.
2. The VCCI Site Registration No. is C-12040.
3. Tested Date: 2024/2/23

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 Schwarzbeck	VULB 9168	9168-148	2023/12/14	2024/12/13
		9168-156	2023/12/14	2024/12/13
Controller (H)	MF7802	08093	N/A	N/A
Controller (V)	MF7802	074	N/A	N/A
EMI Test Receiver R&S	ESR7	101240	2023/11/9	2024/11/8
		101264	2023/4/10	2024/4/9
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-CH(H)-01	2023/9/2	2024/9/1
		PAD-CH(V)-01	2023/9/2	2024/9/1
Preamplifier Sonoma	310N	352923	2023/5/7	2024/5/6
		352924	2023/5/7	2024/5/6
RF Coaxial Cable TIMES	LMR-600(11.8M)+LMR-400 (7M)	CABLE-CH1(HOR)-01	2023/9/2	2024/9/1
	LMR-600(18M)+LMR-400 (7M)	CABLE-CH1(VER)-01	2023/9/2	2024/9/1
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Turn Table	DS430	50303	N/A	N/A

Notes:

1. The test was performed in HY - 10M Chamber. The test site validated date: 2023/7/29 (NSA)
2. The VCCI Site Registration No. is R-11893.
3. Tested Date: 2024/1/24

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
Controller BVADT	SC100	SC93021702	N/A	N/A
Fix tool for Boresight antenna tower BV	BAF-01	2	N/A	N/A
Fixed Attenuator Mini-Circuits	BW-K3-2W44+	PAD-CH1-03	2023/9/2	2024/9/1
	BW-N4W5+	PAD-CH2-02	2024/1/6	2025/1/5
Horn Antenna ETS-Lindgren	3117	00034126	2023/10/18	2024/10/17
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-405	2023/11/12	2024/11/11
	BBHA 9170	148	2023/11/12	2024/11/11
		BBHA9170241	2023/10/16	2024/10/15
Notch Filter Micro-Tronics	BRM17690-01	003	2023/9/2	2024/9/1
	BRM50716-01	G011	2023/9/2	2024/9/1
Preamplifier Agilent	8449B	3008A01961	2023/9/2	2024/9/1
Preamplifier EMCI	EMC012645SE	980338	2023/5/7	2024/5/6
	EMC184045B	980175	2023/9/2	2024/9/1
	EMC184045SE	980610	2023/5/7	2024/5/6
PSA Spectrum Analyzer Agilent	E4446A	MY51100039	2023/12/11	2024/12/10
RF Coaxial Cable ATK+EMC	EM104-SMSM- 600&EM104-SMSM-500	Cable-CH2-02	2024/1/6	2025/1/5
RF Coaxial Cable EMCI	EMC102-KM-KM-1000	170820	2024/1/6	2025/1/5
RF Coaxial Cable Rosnol	K1K50-UP0279-K1K50- 3000	181129-2	2024/1/6	2025/1/5
Software BVADT	ADT_Radiated_V8.7.08	N/A	N/A	N/A
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: 2023/12/2 (VSWR)
2. The VCCI Site Registration No. is G-10018.
3. Tested Date: 2024/1/24

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

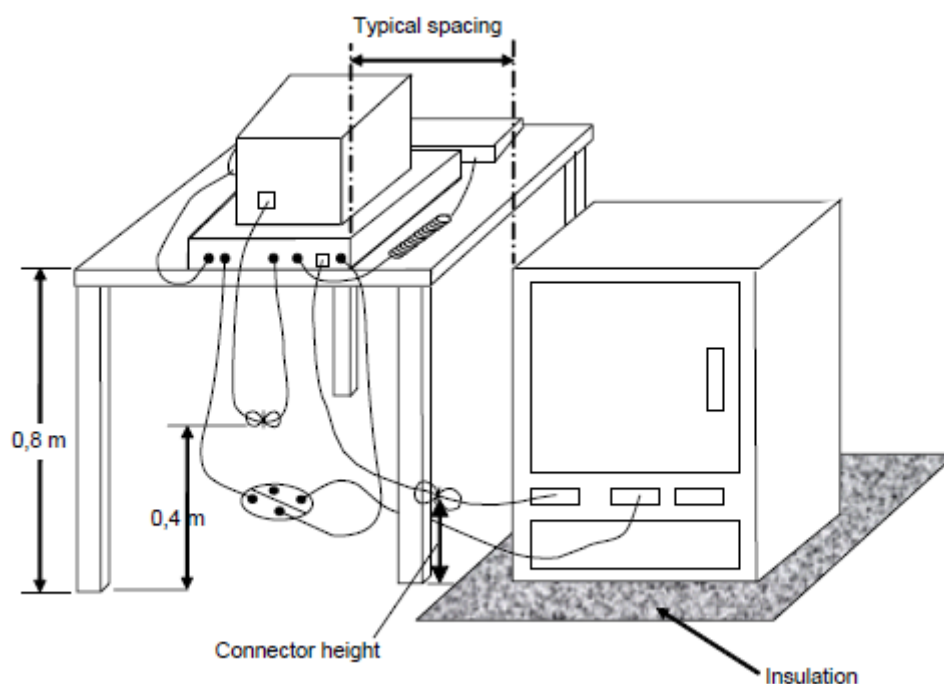
Radiated Emissions Limits at 3 meters (dB μ V/m)		
Frequency range	Class A	Class B
Above 1GHz	Avg: 60 Peak: 80	Avg: 54 Peak: 74

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.

6.2 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.

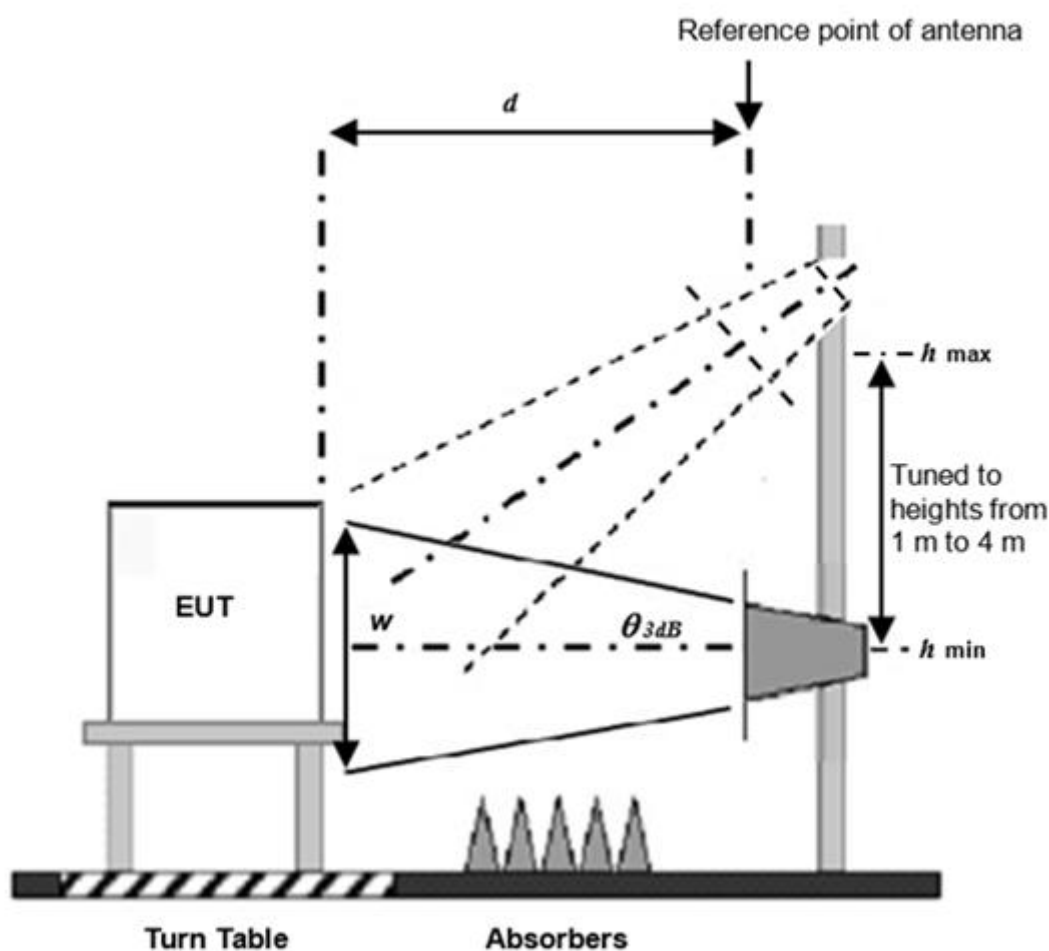


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

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 for 1 GHz to 18 GHz and $d = 1.5$ meters for 18 GHz to 40 GHz 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

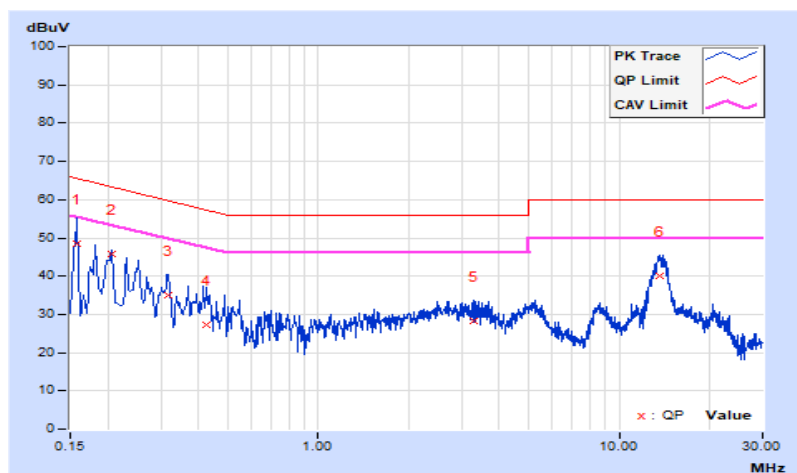
Mode A

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
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	0.15800	9.63	38.69	12.41	48.32	22.04	65.57	55.57	-17.25	-33.53
2	0.20600	9.64	36.17	21.14	45.81	30.78	63.37	53.37	-17.56	-22.59
3	0.31614	9.66	25.38	11.90	35.04	21.56	59.81	49.81	-24.77	-28.25
4	0.42600	9.68	17.45	5.68	27.13	15.36	57.33	47.33	-30.20	-31.97
5	3.29000	9.73	18.63	10.69	28.36	20.42	56.00	46.00	-27.64	-25.58
6	13.71800	9.80	30.42	23.11	40.22	32.91	60.00	50.00	-19.78	-17.09

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

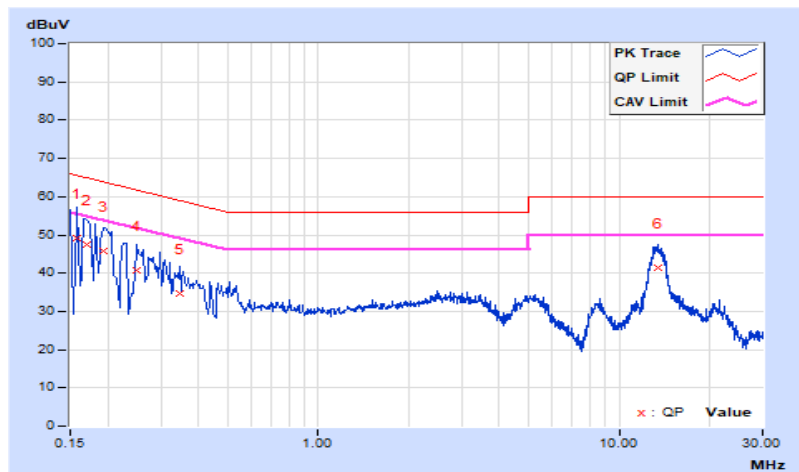


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac , 60 Hz	Environmental Conditions	24°C, 70% RH
Tested by	Fox Chang		

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	0.15800	9.63	39.68	18.48	49.31	28.11	65.57	55.57	-16.26	-27.46
2	0.17000	9.63	37.95	14.46	47.58	24.09	64.96	54.96	-17.38	-30.87
3	0.19400	9.64	36.05	24.07	45.69	33.71	63.86	53.86	-18.17	-20.15
4	0.25000	9.65	31.03	19.95	40.68	29.60	61.76	51.76	-21.08	-22.16
5	0.34577	9.67	24.99	14.64	34.66	24.31	59.06	49.06	-24.40	-24.75
6	13.45000	9.85	31.68	24.02	41.53	33.87	60.00	50.00	-18.47	-16.13

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

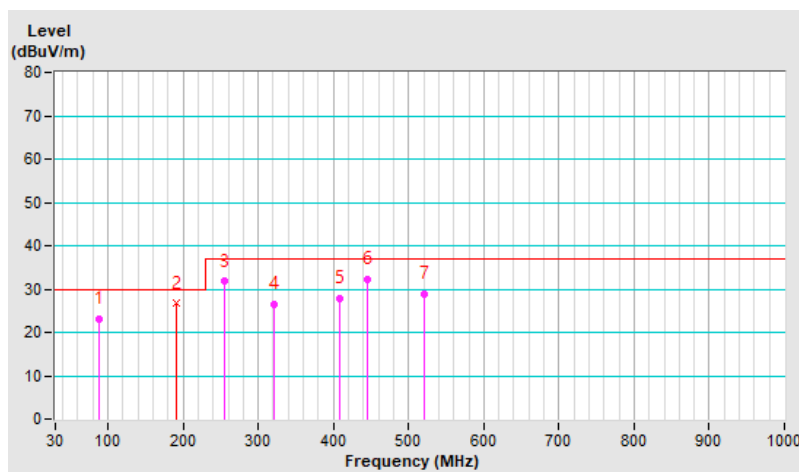
Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	21°C, 66% RH
Tested By	Daniel Lin		

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	88.04	23.13 QP	30.00	-6.87	3.50 H	138	41.66	-18.53
2	190.66	26.62 QP	30.00	-3.38	3.50 H	305	41.90	-15.28
3	255.98	31.71 QP	37.00	-5.29	4.00 H	288	45.86	-14.15
4	321.52	26.45 QP	37.00	-10.55	3.00 H	244	38.24	-11.79
5	407.94	27.72 QP	37.00	-9.28	2.00 H	123	37.35	-9.63
6	445.52	32.29 QP	37.00	-4.71	2.00 H	194	40.69	-8.40
7	520.92	28.80 QP	37.00	-8.20	1.00 H	287	35.88	-7.08

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.

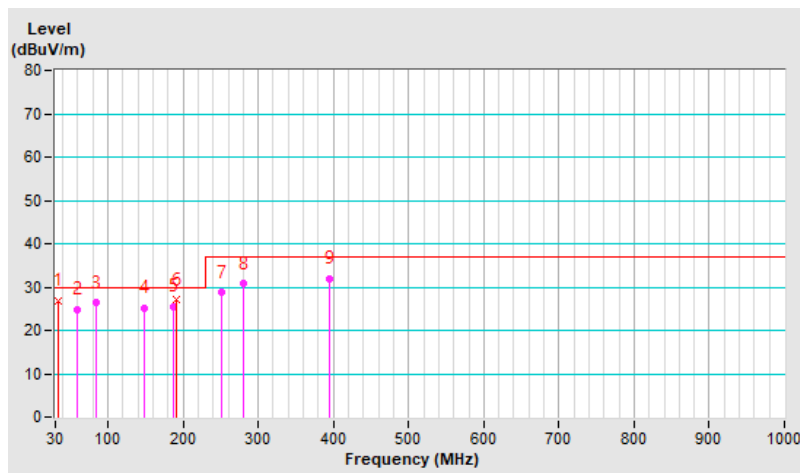


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	21°C, 66% RH
Tested By	Daniel Lin		

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	34.46	26.84 QP	30.00	-3.16	1.00 V	326	41.15	-14.31
2	59.36	24.85 QP	30.00	-5.15	1.00 V	142	38.39	-13.54
3	83.96	26.30 QP	30.00	-3.70	2.00 V	257	44.45	-18.15
4	148.50	25.24 QP	30.00	-4.76	2.00 V	114	38.60	-13.36
5	186.88	25.55 QP	30.00	-4.45	2.50 V	286	41.07	-15.52
6	191.86	26.95 QP	30.00	-3.05	2.50 V	250	42.86	-15.91
7	251.90	28.67 QP	37.00	-8.33	1.50 V	161	42.91	-14.24
8	280.55	30.76 QP	37.00	-6.24	1.50 V	139	43.77	-13.01
9	395.24	31.91 QP	37.00	-5.09	4.00 V	133	41.71	-9.80

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

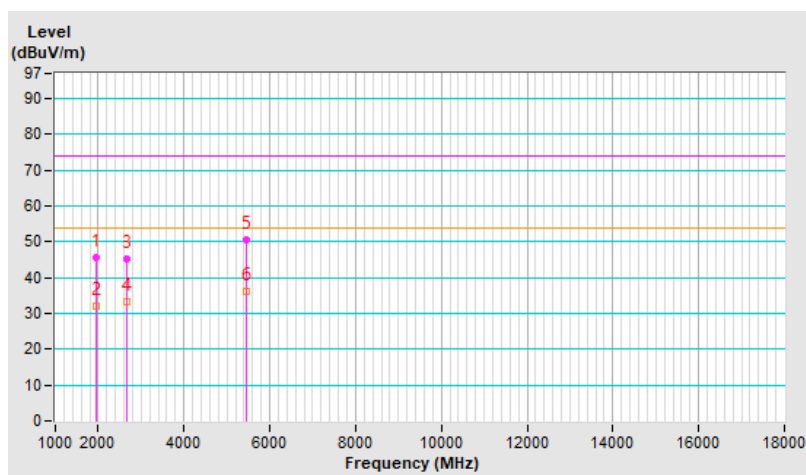
Mode A

Frequency Range	1 GHz ~ 18 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 57% RH
Tested By	Scott Yang		

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	1960.74	45.63 PK	74.00	-28.37	2.50 H	351	44.71	0.92
2	1960.74	32.02 AV	54.00	-21.98	2.50 H	351	31.10	0.92
3	2668.74	45.21 PK	74.00	-28.79	1.00 H	308	43.03	2.18
4	2668.74	33.36 AV	54.00	-20.64	1.00 H	308	31.18	2.18
5	5437.71	50.36 PK	74.00	-23.64	2.50 H	230	41.01	9.35
6	5437.71	36.11 AV	54.00	-17.89	2.50 H	230	26.76	9.35

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.

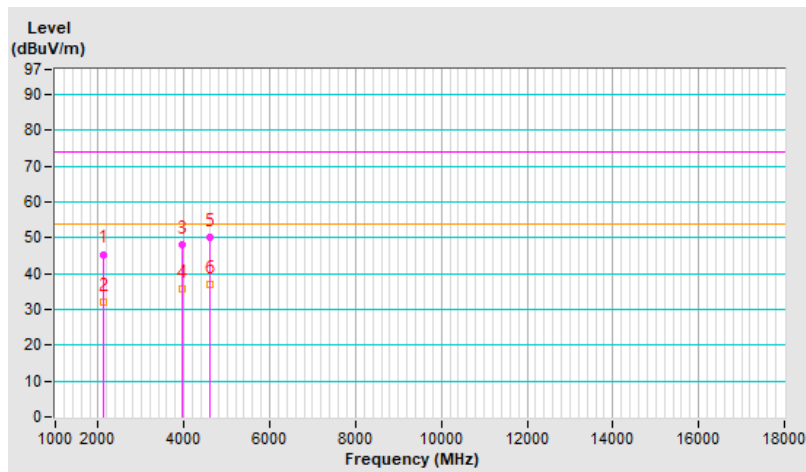


Frequency Range	1 GHz ~ 18 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 57% RH
Tested By	Scott Yang		

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	2118.25	45.36 PK	74.00	-28.64	1.50 V	251	43.10	2.26
2	2118.25	32.15 AV	54.00	-21.85	1.50 V	251	29.89	2.26
3	3974.06	47.89 PK	74.00	-26.11	1.50 V	98	41.75	6.14
4	3974.06	35.71 AV	54.00	-18.29	1.50 V	98	29.57	6.14
5	4590.25	50.02 PK	74.00	-23.98	1.50 V	268	41.16	8.86
6	4590.25	37.06 AV	54.00	-16.94	1.50 V	268	28.20	8.86

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.

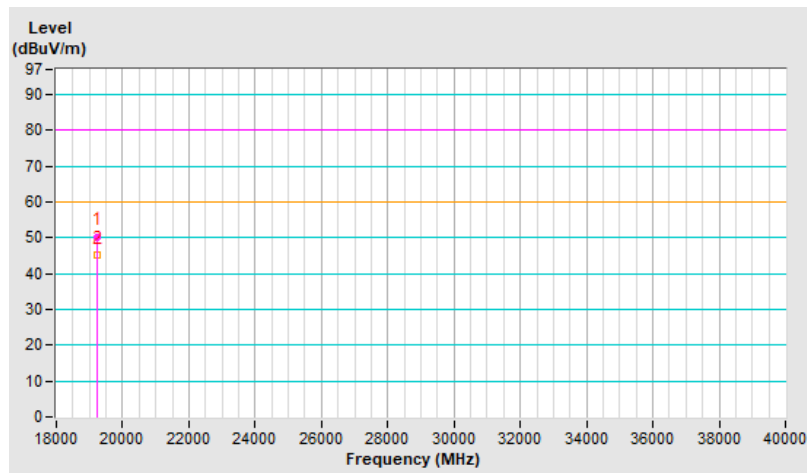


Frequency Range	18 GHz ~ 40 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 57% RH
Tested By	Scott Yang		

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	19220.32	50.32 PK	80.00	-29.68	1.00 H	163	47.16	3.16
2	19220.32	45.02 AV	60.00	-14.98	1.00 H	163	41.86	3.16

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.

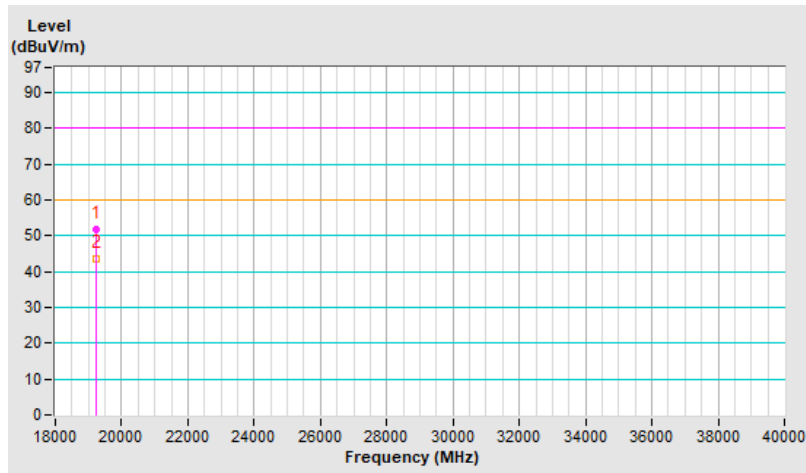


Frequency Range	18 GHz ~ 40 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 57% RH
Tested By	Scott Yang		

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	19219.88	51.63 PK	80.00	-28.37	1.00 V	336	48.47	3.16
2	19219.88	43.68 AV	60.00	-16.32	1.00 V	336	40.52	3.16

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 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.

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@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

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

--- END ---