

FCC Test Report

Report No.: FCBELJ-WTW-P20090372

FCC ID: H8N-ASK-MAE310

Test Model: ASK-MAE310

Received Date: Sep. 17, 2020

Test Date: Sep. 23 to 25, 2020

Issued Date: Oct. 08, 2020

Applicant: ASKEY COMPUTER CORP.

Address: 10F, No. 119, JIANKANG RD. ZHONGHE DIST., NEW TAIPEI CITY, 235
85, TAIWAN

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

Test Location (1): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan.

FCC Registration / 810758 / TW1085 for Test Location (1)

Designation Number: 960022 / TW1058 for Test Location (2)



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.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 Summary of Test Results.....	5
2.1 Measurement Uncertainty	5
2.2 Modification Record	5
3 General Information	6
3.1 Description of EUT	6
3.2 Features of EUT	6
3.3 Operating Modes of EUT and Determination of Worst Case Operating Mode	7
3.4 Test Program Used and Operation Descriptions.....	8
3.5 Primary Clock Frequencies of Internal Source	8
4 Configuration and Connections with EUT	9
4.1 Connection Diagram of EUT and Peripheral Devices	9
4.2 Configuration of Peripheral Devices and Cable Connections	10
5 Conducted Emissions at Mains Ports	11
5.1 Limits	11
5.2 Test Instruments	11
5.3 Test Arrangement	12
5.4 Supplementary Information	12
5.5 Test Results (Mode 1)	13
5.6 Test Results (Mode 2)	15
6 Radiated Emissions up to 1 GHz	17
6.1 Limits	17
6.2 Test Instruments	18
6.3 Test Arrangement	19
6.4 Supplementary Information	19
6.5 Test Results.....	20
7 Radiated Emissions above 1 GHz.....	22
7.1 Limits	22
7.2 Test Instruments	23
7.3 Test Arrangement	24
7.4 Supplementary Information	24
7.5 Test Results.....	25
8 Pictures of Test Arrangements	27
Appendix – Information of the Testing Laboratories	28

Release Control Record

Issue No.	Description	Date Issued
FCBELJ-WTW-P20090372	Original release.	Oct. 08, 2020

1 Certificate of Conformity

Product: Network Adapter SKU1

Brand: Verizon

Test Model: ASK-MAE310

Sample Status: ENGINEERING SAMPLE

Applicant: ASKEY COMPUTER CORP.

Test Date: Sep. 23 to 25, 2020

Standards: 47 CFR FCC Part 15, Subpart B, Class B
ICES-003:2016 Issue 6, updated Apr. 2019, Class B
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.

Prepared by : Cherry Chuo , **Date:** Oct. 08, 2020
Cherry Chuo / Specialist

Approved by : Ken Lu , **Date:** Oct. 08, 2020
Ken Lu / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart B / ICES-003:2016 Issue 6, updated Apr. 2019, Class B

ANSI C63.4:2014

FCC Clause	ICES-003 Clause	Test Item	Result/Remarks	Verdict
15.107	6.1	AC Power Line Conducted Emissions	Minimum passing Class B margin is -6.16 dB at 0.46641 MHz.	Pass
15.109	6.2.1	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -7.13 dB at 715.84 MHz.	Pass
	6.2.2	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -13.17 dB at 7023.95 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	1.8 dB
Radiated Emissions up to 1GHz	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz~6GHz	5.0 dB
	6GHz~18GHz	4.1 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Description of EUT

Product	Network Adapter SKU1
Brand	Verizon
Test Model	ASK-MAE310
Sample Status	ENGINEERING SAMPLE
Operating Software	NA
Power Supply rating	Refer to Note
Accessory Device	Adapter x1 Wall Mount Screw x1
Data Cable Supplied	Coaxial Cable x1 (Shielded, 1m) Ethernet Cable x1 (Unshielded, 1.5m)

Note:

1. The EUT must be supplied with a power adapter and the following different models could be chosen:

Adapter			
No	Brand	Model No.	Spec.
1	FLYPOWER	PS12T120K1000UD	Input: 100-240Vac, 0.35A, 50/60Hz Output: 12Vdc, 1A DC output cable (Unshielded, 1.5 m)
2	LEI	MU12B1120100-A1	Input: 100-240Vac, 0.5A, 50/60Hz Output: 12Vdc, 1A DC output cable (Unshielded, 1.5 m)

3.2 Features of EUT

The tests reported herein were performed according to the method specified by ASKEY COMPUTER CORP., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

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

For radiated emission test, the EUT has been pre-tested under following test modes, and Mode A was the worst cases for final test.

Mode	Test Condition			
	Radiated emission test			
	Power Supply	Adapter Model	WAN Speed	Arrangement
A	AC120V / 60HZ	PS12T120K1000UD	2500Mbps	Wall Mount
B	AC120V / 60HZ	PS12T120K1000UD	1000Mbps	Wall Mount
C	AC120V / 60HZ	MU12B1120100-A1	2500Mbps	Wall Mount
D	AC120V / 60HZ	PS12T120K1000UD	2500Mbps	Horizontal Placement

NOTE: The test configurations are defined by the applicant requirement.

Test modes are presented in the report as below.

Mode	Test Condition			
	Conducted emission test			
	Power Supply	Adapter Model	WAN Speed	Arrangement
1	AC120V / 60HZ	PS12T120K1000UD	2500Mbps	Wall Mount
2	AC120V / 60HZ	MU12B1120100-A1	2500Mbps	Wall Mount
Mode	Radiated emission test			
	Power Supply	Adapter Model	WAN Speed	Arrangement
	Power Supply	Adapter Model	WAN Speed	Arrangement
1	AC120V / 60HZ	PS12T120K1000UD	2500Mbps	Wall Mount

3.4 Test Program Used and Operation Descriptions

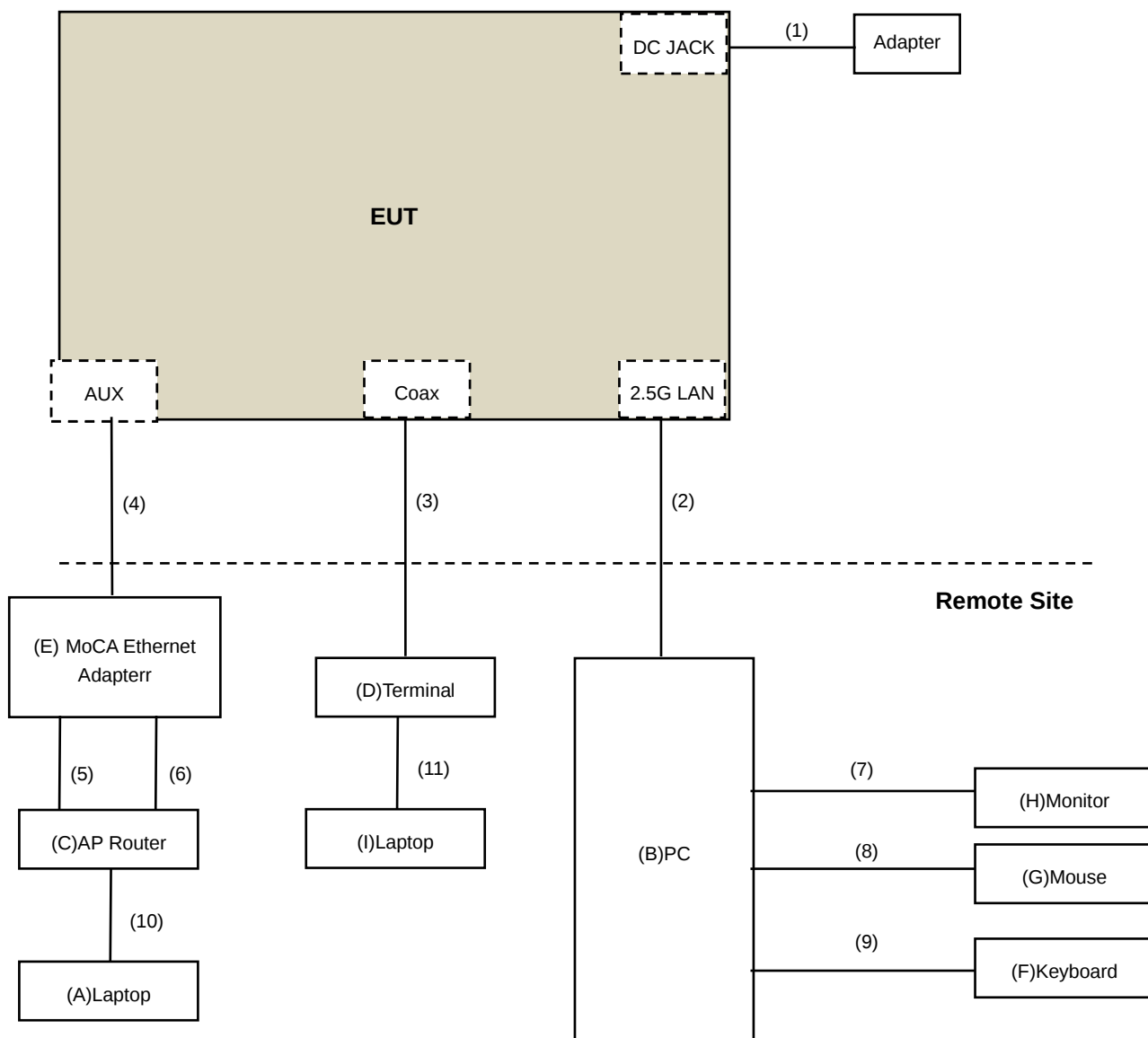
1. Turn on the power of all equipment.
2. Support unit A (Laptop) & Support unit B (PC) runs "Ping.exe" program to communicate with Support unit I (Laptop).

3.5 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 1675 MHz, provided by ASKEY COMPUTER CORP., for detailed internal source, please refer to the manufacturer's specifications.

4 Configuration and Connections with EUT

4.1 Connection Diagram of EUT and Peripheral Devices



4.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	P70F	JJY07L2	FCC DoC	Provided by Lab
B.	PC	Dell	3010	8VN85W1	NA	Provided by Lab
C.	AP Router	NA	NA	NA	NA	Supplied by applicant
D.	Terminal	HUAWEI	SmartAX MA5633	NA	NA	Supplied by applicant
E.	MoCA Ethernet Adapter	Verizon	ASK-MAE310	NA	NA	Supplied by applicant
F.	Keyborad	logitech	YU0036	NA	FCC DoC	Provided by Lab
G.	Mouse	logitech	M-U0026	NA	FCC DoC	Provided by Lab
H.	Monitor	LG	24UD58	24UD58	NA	Provided by Lab
I.	Laptop	ASUS	M5200AE	NA	NA	Supplied by applicant

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Power Cable	1	1.5	No	0	Supplied by applicant
2.	RJ45	1	10	No	0	Provided by Lab
3.	Coaxial	1	10	Yes	0	Provided by Lab
4.	Coaxial	1	10	Yes	0	Provided by Lab
5.	Coaxial	1	3	Yes	0	Provided by Lab
6.	RJ45	1	3	No	0	Provided by Lab
7.	HDMI	1	1.8	No	0	Provided by Lab
8.	USB	1	1.8	No	0	Provided by Lab
9.	USB	1	1.8	No	0	Provided by Lab
10.	RJ45	1	3	No	0	Provided by Lab
11.	RJ45	1	3	No	0	Provided by Lab

5 Conducted Emissions at Mains Ports

5.1 Limits

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 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2020	Apr. 15, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100071	Oct. 30, 2019	Oct. 29, 2020
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 08, 2020	Sep. 07, 2021
RF Cable	5D-FB	COACAB-001	Mar. 13, 2020	Mar. 12, 2021
10 dB PAD EMEC	STI02-2200-10	006	Aug. 28, 2020	Aug. 27, 2021
50 ohms Terminator	N/A	EMC-04	Oct. 29, 2019	Oct. 28, 2020
50 ohms Terminator	N/A	EMC-02	Sep. 16, 2020	Sep. 15, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

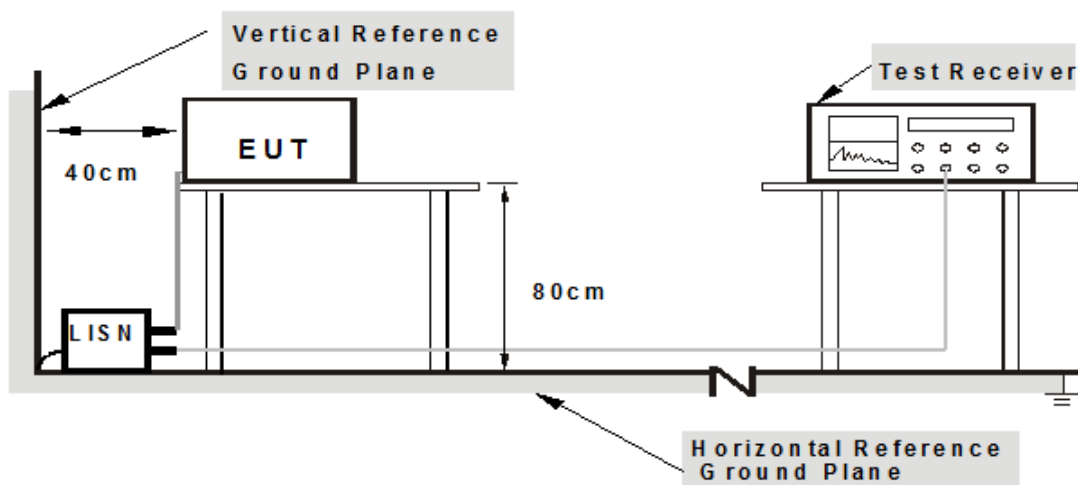
Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conducted Room C
- 3 The VCCI Con C Registration No. is C-13611.
- 4 Tested Date: Sep. 25, 2020

5.3 Test Arrangement

- The EUT was 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 were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of 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.



Note: 1.Support units were connected to second LISN.

5.4 Supplementary Information

There is not any deviation from the test standards for the test method.

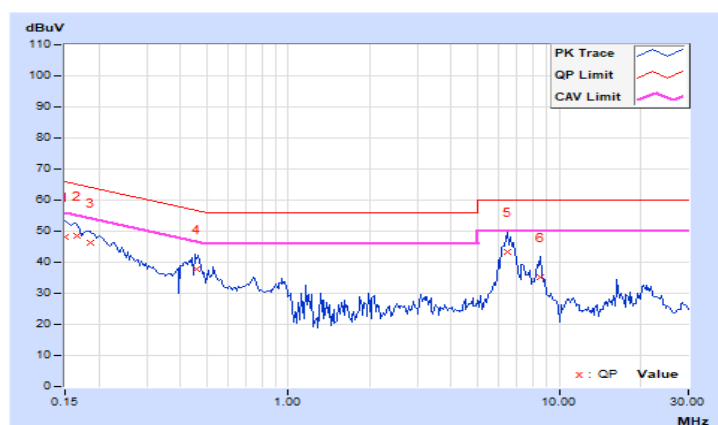
5.5 Test Results (Mode 1)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26°C, 76%RH
Test Mode	Mode 1	Tested by	Eagle Chen

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	0.15034	9.94	38.23	22.03	48.17	31.97	65.98	55.98	-17.81	-24.01
2	0.16562	9.94	38.46	23.08	48.40	33.02	65.18	55.18	-16.78	-22.16
3	0.18516	9.95	36.51	21.52	46.46	31.47	64.25	54.25	-17.79	-22.78
4	0.45853	9.97	27.75	20.75	37.72	30.72	56.72	46.72	-19.00	-16.00
5	6.43750	10.20	33.08	18.74	43.28	28.94	60.00	50.00	-16.72	-21.06
6	8.54297	10.27	24.80	15.44	35.07	25.71	60.00	50.00	-24.93	-24.29

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

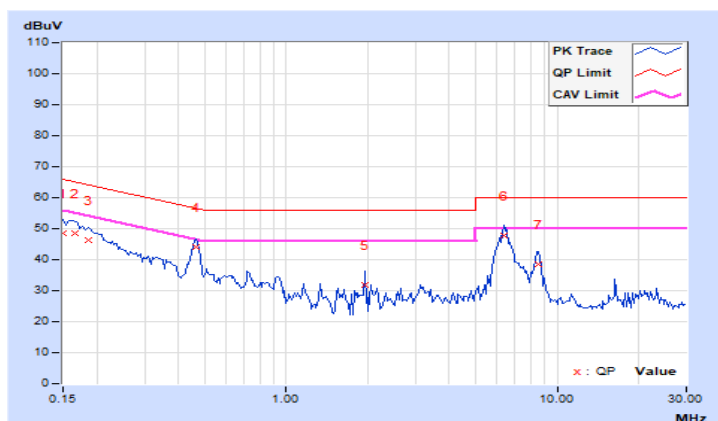


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26°C, 76%RH
Test Mode	Mode 1	Tested by	Eagle Chen

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	0.15022	9.95	38.56	23.55	48.51	33.50	65.99	55.99	-17.48	-22.49
2	0.16562	9.95	38.66	24.96	48.61	34.91	65.18	55.18	-16.57	-20.27
3	0.18516	9.96	36.49	22.53	46.45	32.49	64.25	54.25	-17.80	-21.76
4	0.46641	9.98	34.02	30.44	44.00	40.42	56.58	46.58	-12.58	-6.16
5	1.95313	10.05	21.68	11.92	31.73	21.97	56.00	46.00	-24.27	-24.03
6	6.34766	10.20	37.71	23.26	47.91	33.46	60.00	50.00	-12.09	-16.54
7	8.49609	10.27	28.15	16.91	38.42	27.18	60.00	50.00	-21.58	-22.82

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



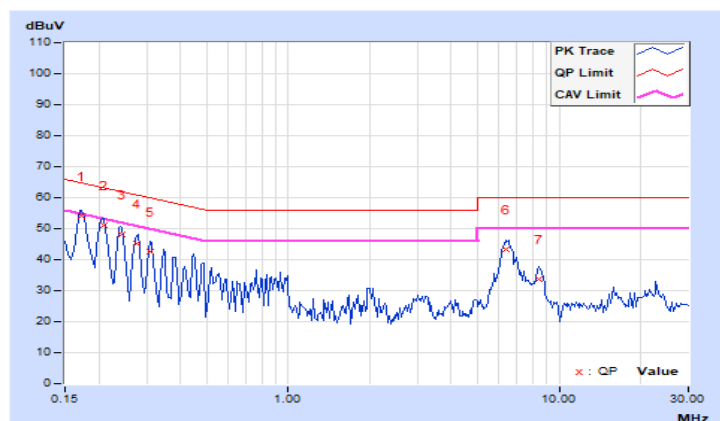
5.6 Test Results (Mode 2)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26°C, 76%RH
Test Mode	Mode 2	Tested by	Eagle Chen

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	0.17316	9.94	44.25	32.32	54.19	42.26	64.81	54.81	-10.62	-12.55
2	0.20859	9.95	41.15	29.22	51.10	39.17	63.26	53.26	-12.16	-14.09
3	0.24159	9.95	38.10	26.43	48.05	36.38	62.04	52.04	-13.99	-15.66
4	0.27591	9.96	35.19	23.53	45.15	33.49	60.94	50.94	-15.79	-17.45
5	0.31016	9.96	32.63	20.95	42.59	30.91	59.97	49.97	-17.38	-19.06
6	6.33984	10.20	33.06	20.33	43.26	30.53	60.00	50.00	-16.74	-19.47
7	8.46484	10.27	23.49	13.94	33.76	24.21	60.00	50.00	-26.24	-25.79

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

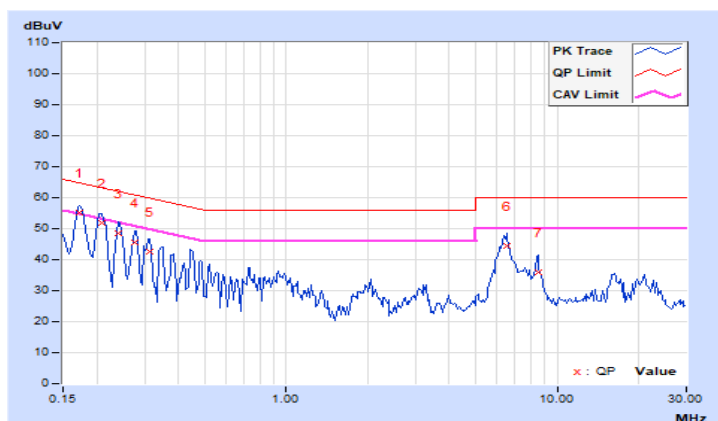


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	26°C, 76%RH
Test Mode	Mode 2	Tested by	Eagle Chen

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	0.17344	9.95	45.15	35.50	55.10	45.45	64.79	54.79	-9.69	-9.34
2	0.20859	9.96	42.02	31.14	51.98	41.10	63.26	53.26	-11.28	-12.16
3	0.23984	9.96	38.45	26.51	48.41	36.47	62.10	52.10	-13.69	-15.63
4	0.27500	9.97	35.76	24.78	45.73	34.75	60.97	50.97	-15.24	-16.22
5	0.31406	9.97	32.75	20.93	42.72	30.90	59.86	49.86	-17.14	-18.96
6	6.54169	10.20	34.12	19.11	44.32	29.31	60.00	50.00	-15.68	-20.69
7	8.48828	10.27	25.78	15.27	36.05	25.54	60.00	50.00	-23.95	-24.46

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



6 Radiated Emissions up to 1 GHz

6.1 Limits

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Showing:

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960				
960-1000	49.5	43.5	47	37

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960				
960-1000	60	54	57.5	47.5

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

6.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 24, 2020	July 23, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-03	Oct. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Nov. 07, 2019	Nov. 06, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-04	Jan. 14, 2020	Jan. 13, 2021
RF Cable	8D-FB	CHFCAB-003-2	Oct. 21, 2019	Oct. 20, 2020
	8D-FB	CHGCAB-001-2	Sep. 26, 2019	Sep. 25, 2020
	RF-141	CHGCAB-004	Sep. 26, 2019	Sep. 25, 2020
Software BVADT	ADT_Radiated _V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

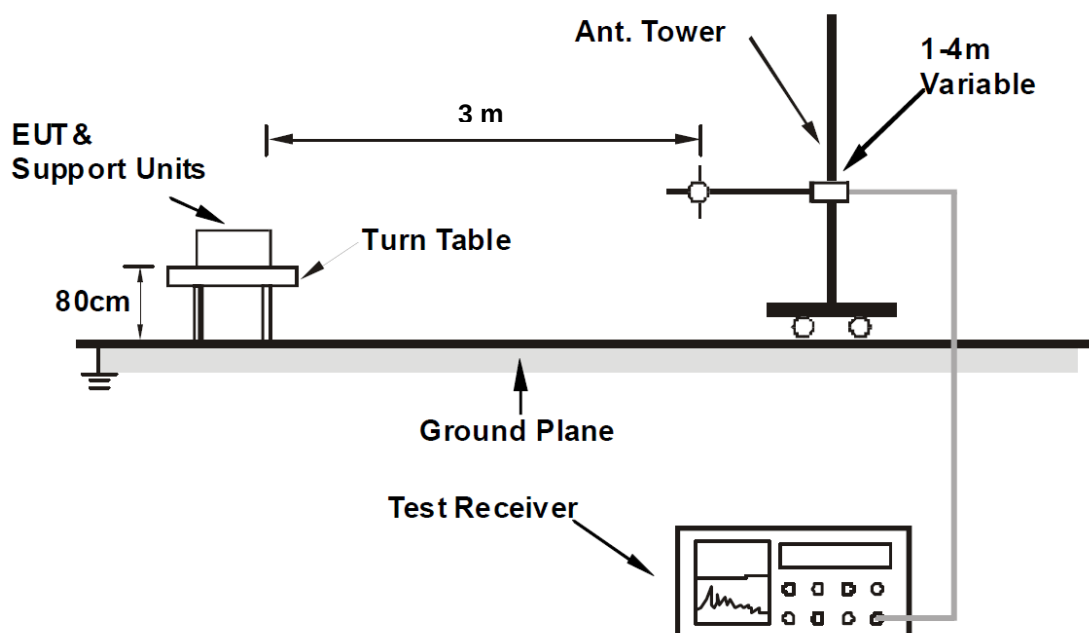
Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber G room
3. The VCCI Site Registration No. is R-20009.
4. Tested Date: Sep. 25, 2020

6.3 Test Arrangement

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 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.

6.4 Supplementary Information

There is not any deviation from the test standards for the test method.

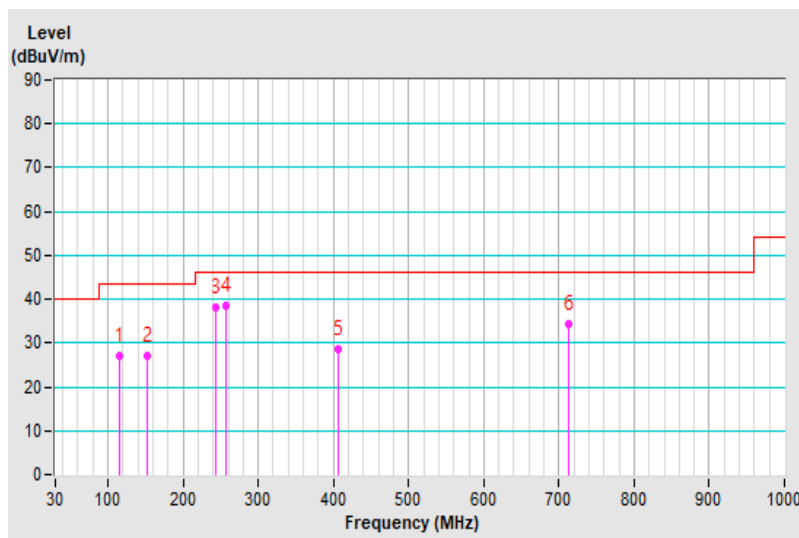
6.5 Test Results

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 67%RH
Test Mode	Mode 1	Tested By	Abner Chang

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	115.09	26.94 QP	43.50	-16.56	2.00 H	220	37.41	-10.47
2	152.07	27.13 QP	43.50	-16.37	4.00 H	201	35.05	-7.92
3	243.01	38.21 QP	46.00	-7.79	2.00 H	16	47.45	-9.24
4	256.54	38.51 QP	46.00	-7.49	4.00 H	142	47.24	-8.73
5	406.26	28.58 QP	46.00	-17.42	3.00 H	294	32.85	-4.27
6	713.56	34.19 QP	46.00	-11.81	3.00 H	119	31.72	2.47

Remarks:

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

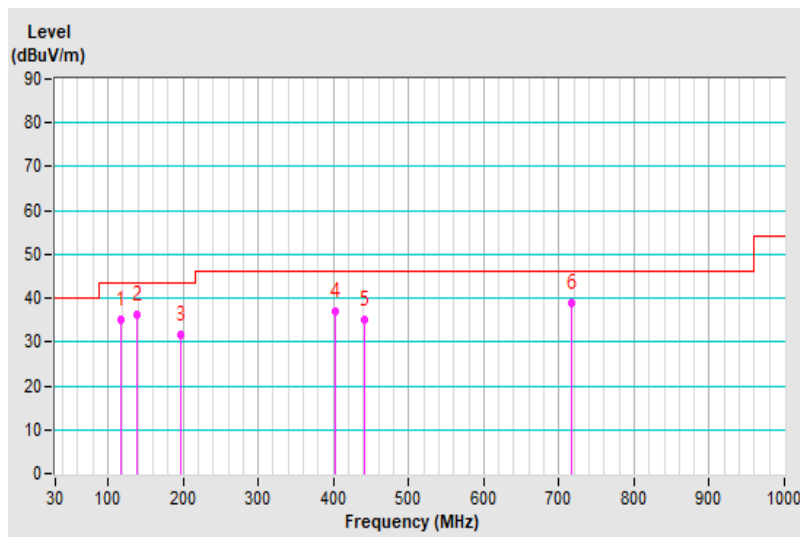


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 67%RH
Test Mode	Mode 1	Tested By	Abner Chang

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	117.64	35.03 QP	43.50	-8.47	1.00 V	217	45.26	-10.23
2	138.93	36.25 QP	43.50	-7.25	1.00 V	250	44.66	-8.41
3	197.40	31.79 QP	43.50	-11.71	1.00 V	21	42.72	-10.93
4	402.29	36.98 QP	46.00	-9.02	1.00 V	26	41.36	-4.38
5	441.98	35.02 QP	46.00	-10.98	1.00 V	328	37.92	-2.90
6	715.84	38.87 QP	46.00	-7.13	3.00 V	0	36.35	2.52

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 Radiated Emissions above 1 GHz

7.1 Limits

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

Radiated Emissions Limits at 3 meters (dB μ V/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 60	Avg: 54	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000	Peak: 80	Peak: 74	Avg: 60 Peak: 80	Avg: 54 Peak: 74

- Notes:
1. The lower limit shall apply at the transition frequencies.
 2. Emission level (dB μ V/m) = 20 log Emission level (uV/m).
 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Frequency Range (For unintentional radiators)

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

7.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 24, 2020	July 23, 2021
Horn Antenna FT-RF	HA-07M18G-NF	0000320091110	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier Agilent	8449B	3008A02578	June 09, 2020	June 08, 2021
RF Cable EMCI	EMC104-SM-SM-2000	181208	Aug. 25, 2020	Aug. 24, 2021
RF Cable EMCI	EMC104-SM-SM-6000	181209	Aug. 25, 2020	Aug. 24, 2021
RF Cable EMCI	EMC104-SM-SM-8500	181211	Aug. 25, 2020	Aug. 24, 2021
Software BVADT	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Fix tool for Boresight antenna tower	BAF-01	5	NA	NA

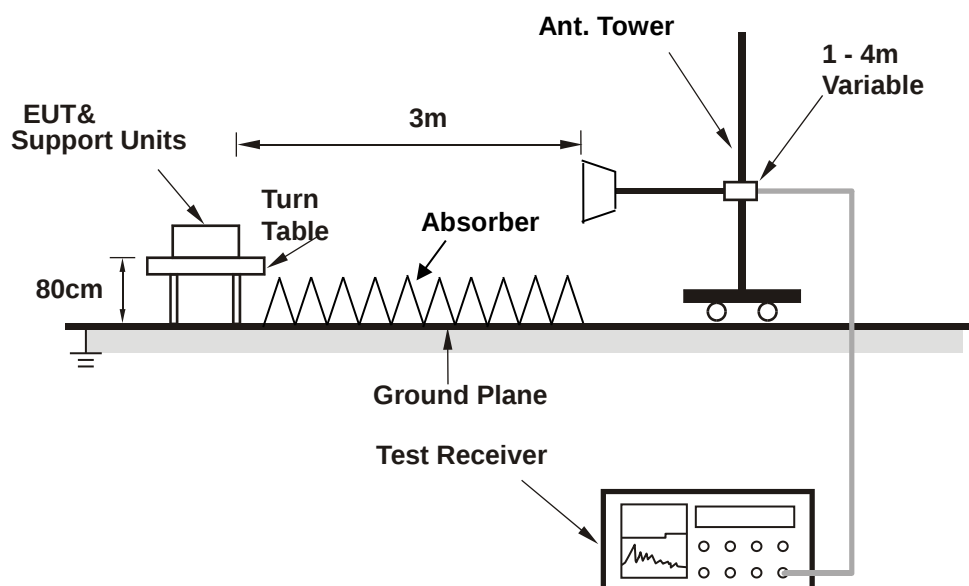
Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber G room
3. Tested Date: Sep. 23, 2020

7.3 Test Arrangement

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 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.



The test arrangement is in accordance with ANSI 63.4:2014. For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.4 Supplementary Information

There is not any deviation from the test standards for the test method.

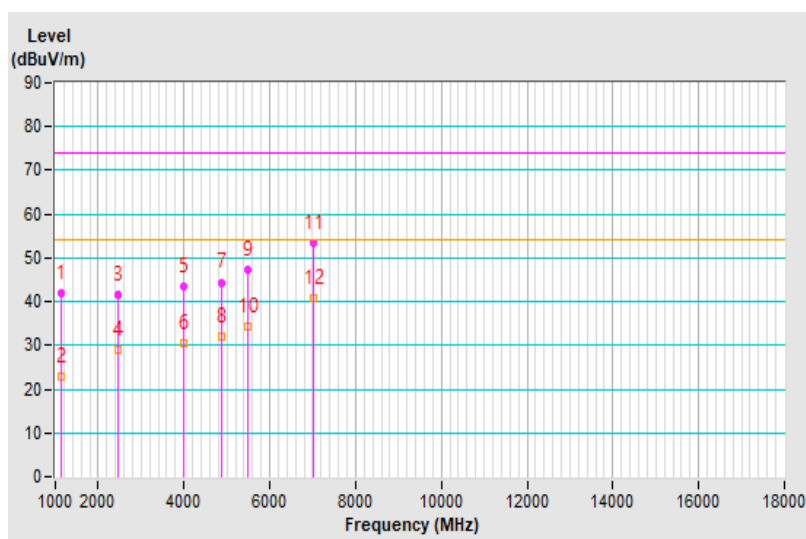
7.5 Test Results

Frequency Range	1GHz ~ 8.375GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 67%RH
Test Mode	Mode 1	Tested By	Abner Chang

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	1130.05	41.85 PK	74.00	-32.15	1.00 H	213	49.22	-7.37
2	1130.05	22.90 AV	54.00	-31.10	1.00 H	228	30.27	-7.37
3	2445.00	41.54 PK	74.00	-32.46	1.00 H	360	41.76	-0.22
4	2445.00	28.91 AV	54.00	-25.09	1.00 H	126	29.13	-0.22
5	4002.20	43.32 PK	74.00	-30.68	2.00 H	125	37.96	5.36
6	4002.20	30.46 AV	54.00	-23.54	2.00 H	265	25.10	5.36
7	4864.10	44.39 PK	74.00	-29.61	1.00 H	241	35.62	8.77
8	4864.10	32.06 AV	54.00	-21.94	1.00 H	308	23.29	8.77
9	5473.55	47.33 PK	74.00	-26.67	1.00 H	269	36.81	10.52
10	5473.55	34.44 AV	54.00	-19.56	1.00 H	121	23.92	10.52
11	7023.95	53.43 PK	74.00	-20.57	1.00 H	182	36.23	17.20
12	7023.95	40.83 AV	54.00	-13.17	1.57 H	4	23.63	17.20

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

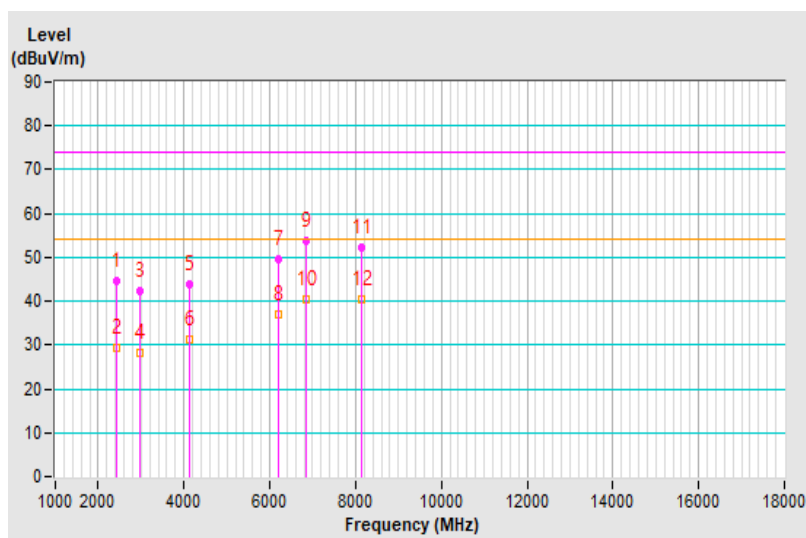


Frequency Range	1GHz ~ 8.375GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 67%RH
Test Mode	Mode 1	Tested By	Abner Chang

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	2442.45	44.55 PK	74.00	-29.45	2.00 V	158	44.78	-0.23
2	2442.45	29.26 AV	54.00	-24.74	2.00 V	360	29.49	-0.23
3	2976.25	42.17 PK	74.00	-31.83	1.00 V	296	41.20	0.97
4	2976.25	28.12 AV	54.00	-25.88	1.00 V	302	27.15	0.97
5	4116.95	43.68 PK	74.00	-30.32	1.00 V	360	37.35	6.33
6	4116.95	31.16 AV	54.00	-22.84	1.00 V	360	24.83	6.33
7	6185.85	49.70 PK	74.00	-24.30	1.00 V	129	36.64	13.06
8	6185.85	36.84 AV	54.00	-17.16	1.00 V	196	23.78	13.06
9	6848.85	53.64 PK	74.00	-20.36	1.00 V	74	36.91	16.73
10	6848.85	40.53 AV	54.00	-13.47	1.34 V	360	23.80	16.73
11	8148.50	52.13 PK	74.00	-21.87	1.00 V	360	35.79	16.34
12	8148.50	40.44 AV	54.00	-13.56	1.00 V	175	24.10	16.34

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).

Appendix – 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@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---