



BUREAU
VERITAS

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: FC201006E04

FCC ID: NOIKBN604

Model No: N604

Received Date: Oct. 06, 2020

Test Date: Nov. 20, 2020 to Feb. 04, 2021

Issued Date: Jan. 20, 2021

Applicant: NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsin-Chu, 302, Taiwan, R.O.C.

Manufacturer: NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsin-Chu, Taiwan, 30265, R.O.C

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 / Designation Number: 810758 / TW1085 for Test Location (1)
960022 / TW1058 for Test Location (2)

Approved by :

Date: Jan. 20, 2021

Ken Lu / Manager

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Prepared by : Joyce Kuo / Specialist

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Release Control Record

Issue No.	Description	Date Issued
FC201006E04	Original release.	Jan. 20, 2021

1 Certification

Product: Electronic Display Device

Brand: Rakuten kobo

Test Model: N604

Sample Status: ENGINEERING SAMPLE

Applicant: NETRONIX, INC.

Test Date: Nov. 20, 2020 to Feb. 04, 2021

Standards: 47 CFR FCC Part 15, Subpart B, 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.



2 Summary of Test Results

FCC Part 15 Clause	Test Item	Result/Remarks	Verdict
15.107	Conducted Emissions from input power ports	Minimum passing Class B margin is -10.00 dB at 0.42344 MHz	Pass
15.109	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -2.20 dB at 179.16 MHz	Pass
	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -7.32 dB at 14637.77 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) (±)
Conducted Emissions from input power ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.0 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.5 dB
	6GHz ~ 18GHz	4.1 dB
	18GHz ~ 40GHz	4.7 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	Electronic Display Device
Brand	Rakuten kobo
Test Model	N604
Sample Status	Engineering sample
Operating Software	NA
Power Supply Rating	3.7 Vdc from battery or 5 Vdc from USB interface
Accessory Device	NA
Data Cable Supplied	USB Cable x1 (Shielded, 1m)

Note:

1. Two eMMC provided to the EUT, please refer to the following table:

No.	Model	Remark
1	EMMC32G-TA28	^{1st} source eMMC
2	KLMBG2JETD-B041	^{2nd} source eMMC

3.2 Primary Clock Frequencies of Internal Source

The EUT is provided by NETRONIX, INC., 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 NETRONIX, INC., 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

There are both standby mode and normal mode to be pre-tested then normal mode has the highest emission value for radiated emission test.

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

Mode	Test Condition			
	Radiated emission test			
	Input	Type	Emmc	Arrangement
A	DC 5V With Host	USB	Kingston	Horizontal Placement
B	DC 5V With AC to DC Adapter	WiFi 2.4G	Kingston	Horizontal Placement
C	Battery	WiFi 2.4G	Kingston	Horizontal Placement
D	Battery	WiFi 2.4G	Kingston	Vertical Placement
E	Battery	WiFi 2.4G	Kingston	Side Placement
F	Battery	BT	Kingston	Horizontal Placement
G	Battery	WiFi 5G	Kingston	Horizontal Placement

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

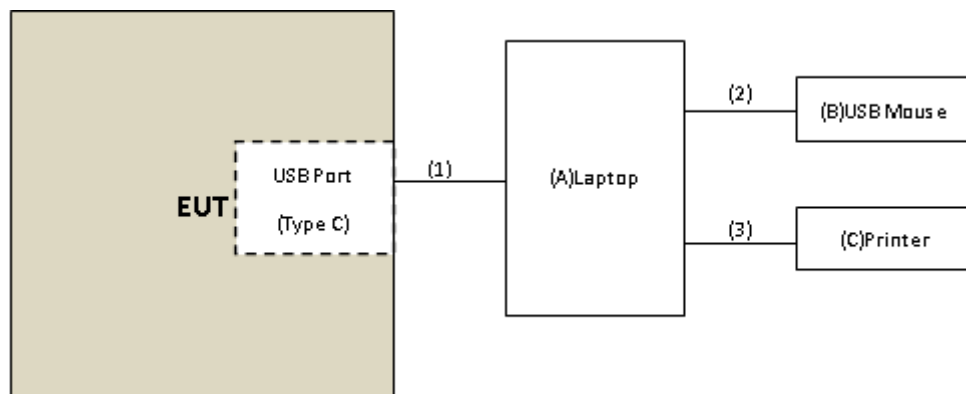
Test mode is presented in the report as below.

Mode	Test Condition			
	Conducted emission / Radiated emission test			
	Input	Type	Emmc	Arrangement
1	DC 5V from Host	USB	Kingston	Horizontal Placement
2	DC 5V from Host	USB	Samsung	Horizontal Placement

3.5 Test Program Used and Operation Descriptions

1. Turn on the power of all equipment.
2. Support unit A (Laptop) runs a test program "EMC.bat" to enable EUT under "R/W mode" continually via one USB cable.
3. Support unit A (Laptop) runs "EMC test.exe" then sends "H" messages to itself.

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	Laptop	Dell	Latitude 5511	NA	DOC	Provided by Lab
B	USB Mouse	DELL	MOC5UO	I1401MMP	FCC DOC	Provided by Lab
C	Printer	EPSON	LQ-300+II	G88Y074085	FCC DOC	Provided by Lab

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	USB to Type C Cable	1	1	Yes	0	Supplied by client
2	USB Cable	1	1.8	Yes	0	Provided by Lab
3	USB Cable	1	1.8	Yes	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 input power ports

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	ENV 216	100072	June 13, 2020	June 12, 2021
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-02	Sep. 16, 2020	Sep. 15, 2021
50 ohms Terminator	N/A	EMC-03	Sep. 30, 2020	Sep. 29, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The test was performed in Conducted Room C
2. The VCCI Con C Registration No. is C-13611.
3. Tested Date: Nov. 20, 2020



4.2 Radiated Emissions up to 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010125	Apr. 08, 2020	Apr. 07, 2021
Test Receiver Agilent	N9038A	MY50010132	June 30, 2020	June 29, 2021
Pre-Amplifier Sonoma	310N	352925	Aug. 25, 2020	Aug. 24, 2021
	310N	352926	Aug. 25, 2020	Aug. 24, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-359	Nov. 05, 2020	Nov. 04, 2021
	VULB 9168	9168-358	Nov. 04, 2020	Nov. 03, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	CHF-001	Sep. 02, 2020	Sep. 01, 2021
	UNAT-5+	CHF-002	Sep. 02, 2020	Sep. 01, 2021
RF Cable	8D-FB	CHFCAB-001-1 CHFCAB-001-3 CHFCAB-001-4	Sep. 14, 2020	Sep. 13, 2021
		CHFCAB-002-1 CHFCAB-002-3 CHFCAB-002-4	Sep. 14, 2020	Sep. 13, 2021
Software BVADT	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The test was performed in Chamber F room
2. The VCCI Site Registration No. is R-13252.
3. Tested Date: Nov. 24 to 30, 2020



4.3 Radiated Emissions above 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010125	Apr. 08, 2020	Apr. 07, 2021
Pre-Amplifier Agilent	8449B	3008A01975	Feb. 20, 2020	Feb. 19, 2021
Horn Antenna SCHWARZBECK	BBHA 9120D	D123	Nov. 22, 2020	Nov. 21, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-11000	170209	Mar. 04, 2020	Mar. 03, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	170207	Mar. 04, 2020	Mar. 03, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-2500	170206	Mar. 04, 2020	Mar. 03, 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:

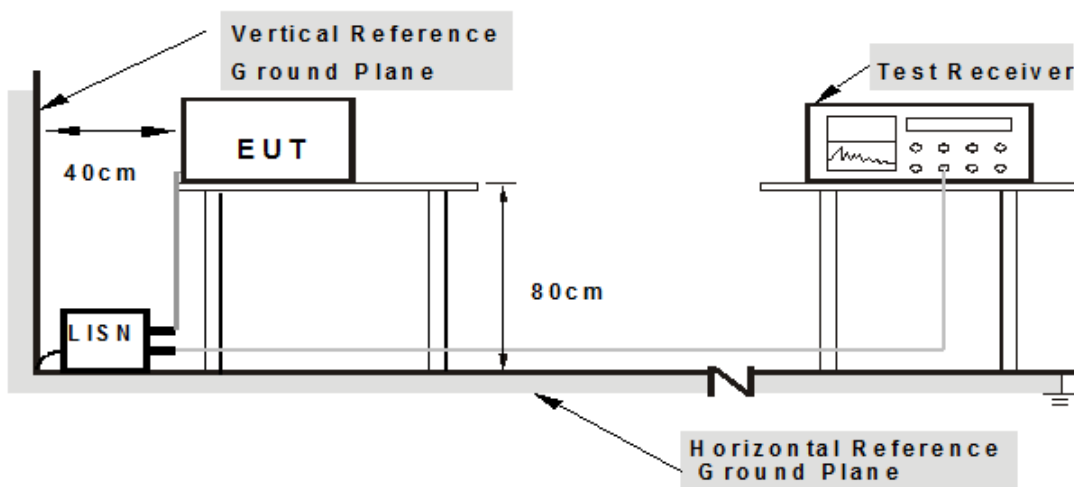
1. The test was performed in Chamber F room
2. Tested Date: Feb. 04, 2021

5 Test Arrangement

5.1 Conducted Emissions from input power ports

- 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.

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

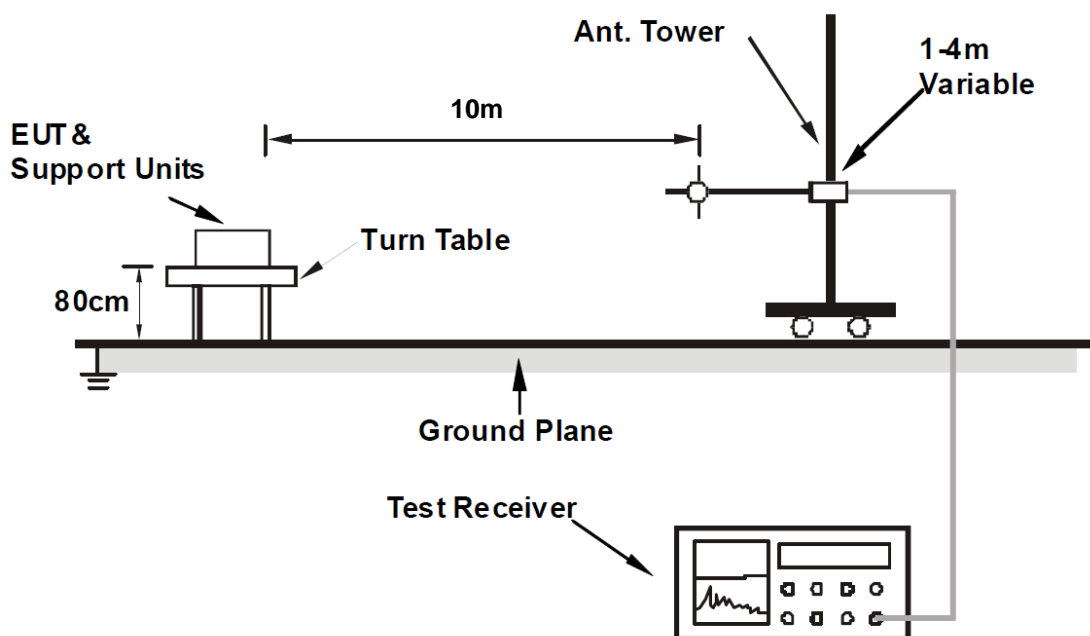
5.2 Supplementary Information

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

5.3 Radiated Emissions up to 1 GHz

- 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 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.

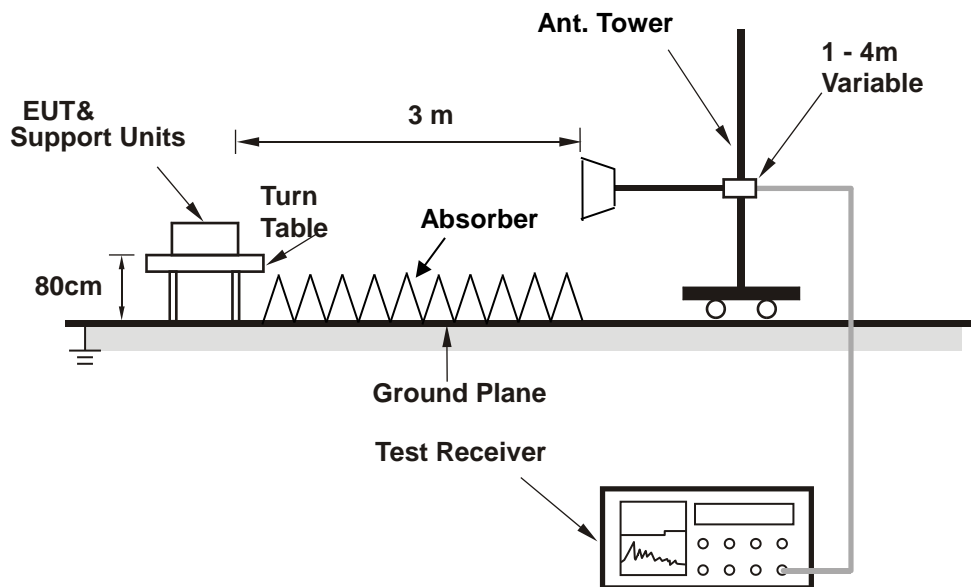
5.4 Supplementary Information

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

5.5 Radiated Emissions above 1 GHz

- 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.

5.6 Supplementary Information

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

6 Limits of Emission

6.1 Conducted Emissions from input 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.

6.2 Radiated Emissions up to 1 GHz

Radiated Emissions Limits at 10 meters (dBuV/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 (dBuV/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.

6.3 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 (dBuV/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.

7 Test Results of Emission

7.1 Conducted Emissions from input power ports

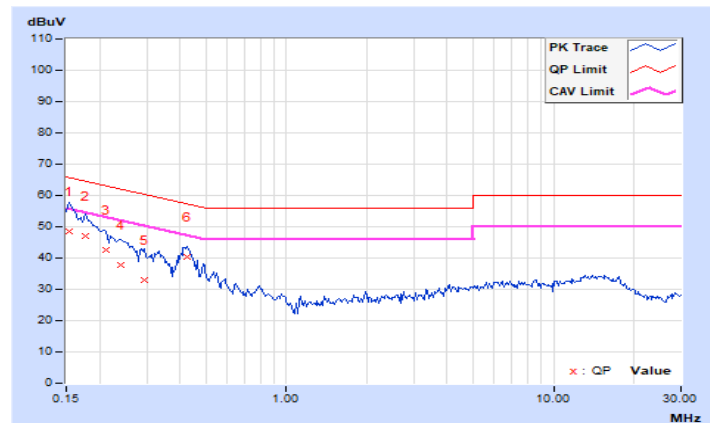
7.1.1 Test Mode 1

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25°C, 63%RH
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	0.15391	9.94	38.64	23.77	48.58	33.71	65.79	55.79	-17.21	-22.08
2	0.17734	9.95	37.26	29.71	47.21	39.66	64.61	54.61	-17.40	-14.95
3	0.21250	9.95	32.62	23.41	42.57	33.36	63.11	53.11	-20.54	-19.75
4	0.23984	9.95	27.67	14.97	37.62	24.92	62.10	52.10	-24.48	-27.18
5	0.29453	9.96	23.18	11.76	33.14	21.72	60.40	50.40	-27.26	-28.68
6	0.42344	9.97	30.51	27.41	40.48	37.38	57.38	47.38	-16.90	-10.00

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

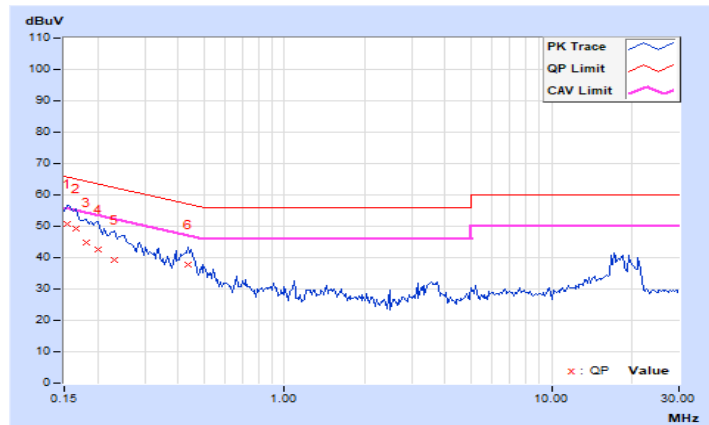


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25°C, 63%RH
Tested by	Eagle Chen		

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	0.15391	9.95	40.66	29.30	50.61	39.25	65.79	55.79	-15.18	-16.54
2	0.16562	9.95	39.38	27.66	49.33	37.61	65.18	55.18	-15.85	-17.57
3	0.18125	9.96	34.86	17.41	44.82	27.37	64.43	54.43	-19.61	-27.06
4	0.20078	9.96	32.77	18.53	42.73	28.49	63.58	53.58	-20.85	-25.09
5	0.23203	9.96	29.32	22.13	39.28	32.09	62.38	52.38	-23.10	-20.29
6	0.43516	9.98	27.84	17.92	37.82	27.90	57.15	47.15	-19.33	-19.25

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





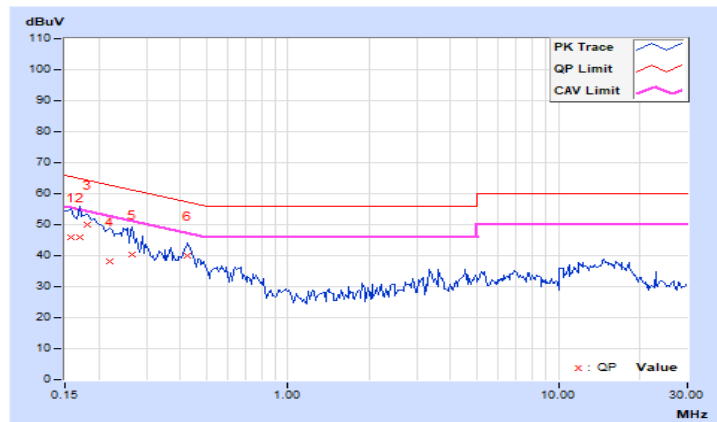
7.1.2 Test Mode 2

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25°C, 63%RH
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	0.15781	9.94	35.98	23.26	45.92	33.20	65.58	55.58	-19.66	-22.38
2	0.16953	9.94	36.04	27.44	45.98	37.38	64.98	54.98	-19.00	-17.60
3	0.18125	9.95	40.13	20.26	50.08	30.21	64.43	54.43	-14.35	-24.22
4	0.22031	9.95	28.22	13.31	38.17	23.26	62.81	52.81	-24.64	-29.55
5	0.26719	9.96	30.51	12.22	40.47	22.18	61.20	51.20	-20.73	-29.02
6	0.42734	9.97	29.90	26.96	39.87	36.93	57.30	47.30	-17.43	-10.37

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



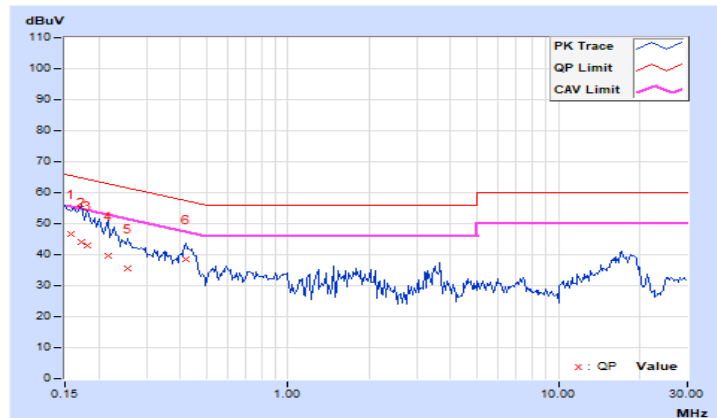


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25°C, 63%RH
Tested by	Eagle Chen		

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	0.15781	9.95	36.67	25.61	46.62	35.56	65.58	55.58	-18.96	-20.02
2	0.17344	9.95	34.15	24.88	44.10	34.83	64.79	54.79	-20.69	-19.96
3	0.18125	9.96	32.96	17.37	42.92	27.33	64.43	54.43	-21.51	-27.10
4	0.21641	9.96	29.53	12.39	39.49	22.35	62.96	52.96	-23.47	-30.61
5	0.25547	9.97	25.74	15.85	35.71	25.82	61.58	51.58	-25.87	-25.76
6	0.41953	9.98	28.69	22.29	38.67	32.27	57.46	47.46	-18.79	-15.19

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

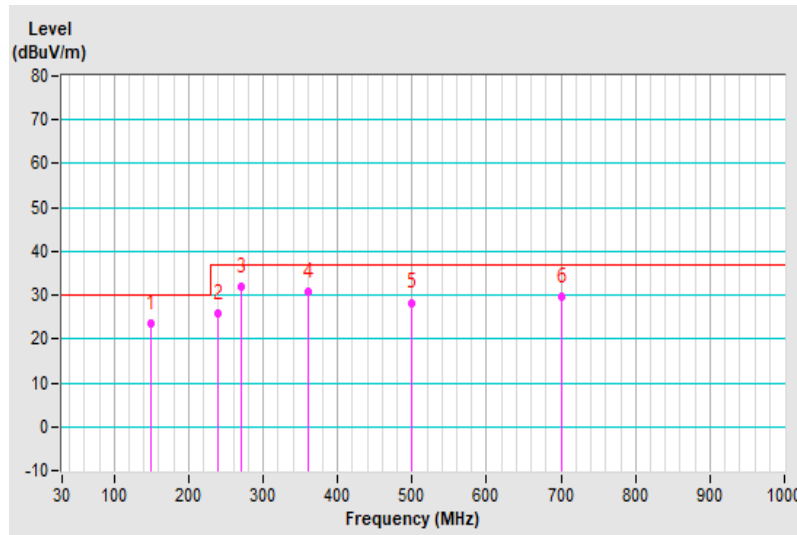
7.2.1 Test Mode 1

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 59.0%RH
Tested By	Nick Lo		

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	149.21	23.69 QP	30.00	-6.31	4.00 H	344	35.66	-11.97
2	239.98	25.87 QP	37.00	-11.13	3.00 H	34	38.96	-13.09
3	269.88	31.91 QP	37.00	-5.09	3.25 H	2	43.67	-11.76
4	360.79	30.77 QP	37.00	-6.23	2.00 H	161	39.85	-9.08
5	500.01	28.29 QP	37.00	-8.71	2.00 H	116	33.70	-5.41
6	700.00	29.61 QP	37.00	-7.39	4.00 H	214	31.13	-1.52

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



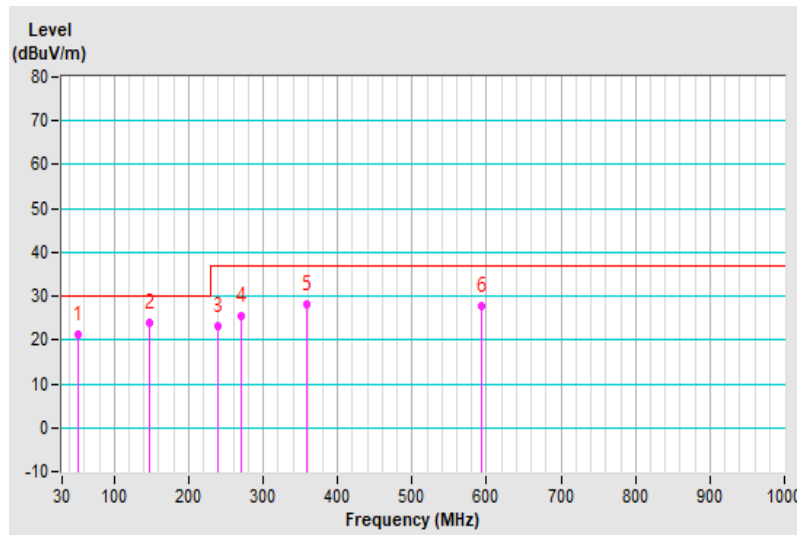


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 59.0%RH
Tested By	Nick Lo		

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	52.29	21.41 QP	30.00	-8.59	2.00 V	233	34.13	-12.72
2	147.42	23.98 QP	30.00	-6.02	1.11 V	229	36.08	-12.10
3	240.00	23.15 QP	37.00	-13.85	3.00 V	348	36.32	-13.17
4	269.88	25.46 QP	37.00	-11.54	2.00 V	212	37.26	-11.80
5	359.19	28.15 QP	37.00	-8.85	1.00 V	317	37.22	-9.07
6	594.01	27.70 QP	37.00	-9.30	4.00 V	232	30.73	-3.03

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





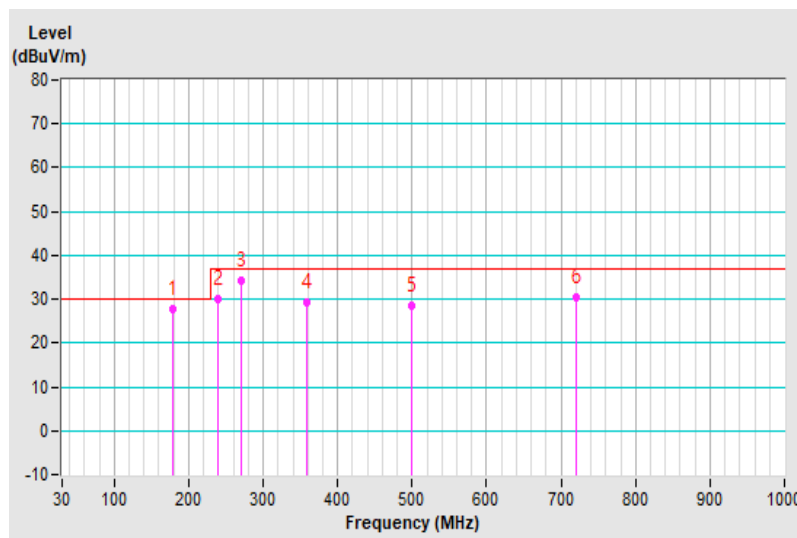
7.2.2 Test Mode 2

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 5V from Host	Environmental Conditions	24.0°C, 65.0%RH
Tested By	Nick Lo		

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	179.16	27.80 QP	30.00	-2.20	3.15 H	48	41.06	-13.26
2	240.08	29.94 QP	37.00	-7.06	4.00 H	57	43.03	-13.09
3	269.91	34.15 QP	37.00	-2.85	3.00 H	350	45.91	-11.76
4	359.19	29.14 QP	37.00	-7.86	2.00 H	332	38.28	-9.14
5	499.99	28.58 QP	37.00	-8.42	2.00 H	136	33.99	-5.41
6	720.06	30.42 QP	37.00	-6.58	2.00 H	34	31.51	-1.09

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



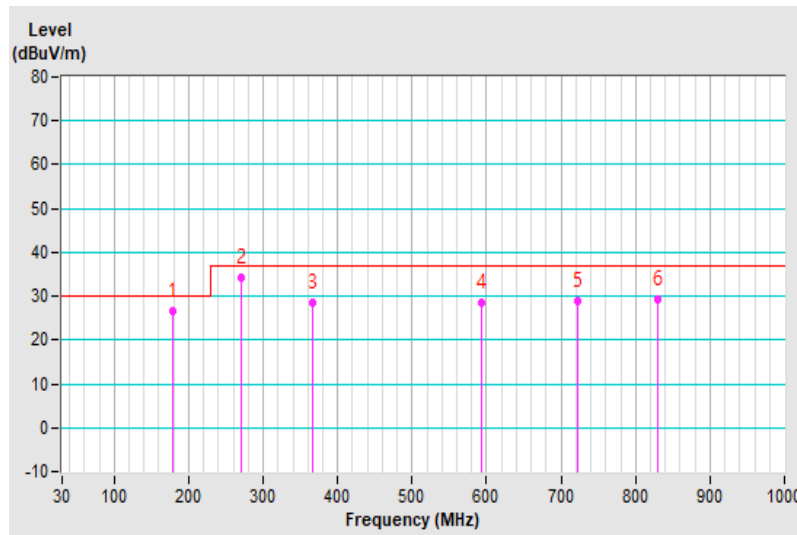


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	DC 5V from Host	Environmental Conditions	24.0°C, 65.0%RH
Tested By	Nick Lo		

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	179.14	26.60 QP	30.00	-3.40	3.00 V	70	40.12	-13.52
2	269.88	34.33 QP	37.00	-2.67	1.11 V	105	46.13	-11.80
3	365.40	28.37 QP	37.00	-8.63	1.00 V	346	37.20	-8.83
4	593.98	28.61 QP	37.00	-8.39	4.00 V	104	31.64	-3.03
5	722.34	28.97 QP	37.00	-8.03	4.00 V	3	29.83	-0.86
6	830.69	29.28 QP	37.00	-7.72	2.00 V	46	27.62	1.66

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 Emissionse above 1 GHz

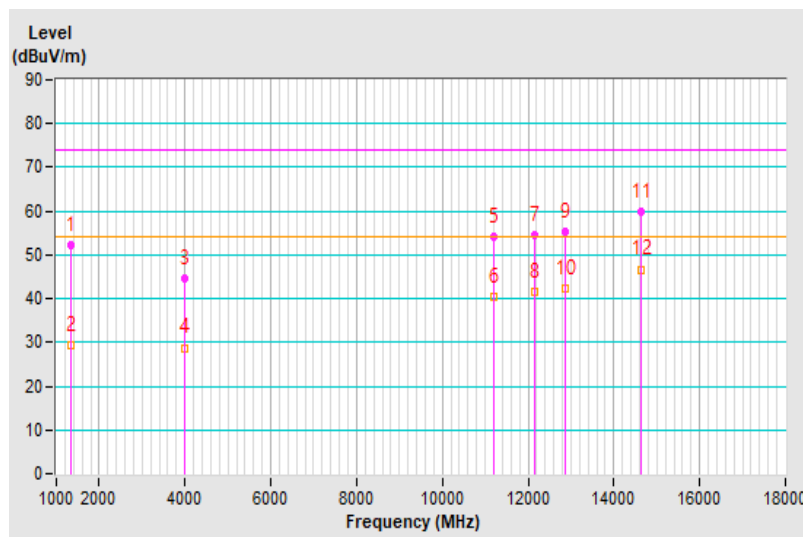
7.3.1 Test Mode 1

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 61.0%RH
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	1330.00	52.31 PK	74.00	-21.69	1.50 H	329	59.13	-6.82
2	1330.00	29.24 AV	54.00	-24.76	1.58 H	0	36.06	-6.82
3	3996.95	44.75 PK	74.00	-29.25	2.00 H	176	46.30	-1.55
4	3996.95	28.78 AV	54.00	-25.22	2.21 H	171	30.33	-1.55
5	11200.83	54.00 PK	74.00	-20.00	1.00 H	17	42.66	11.34
6	11200.83	40.26 AV	54.00	-13.74	1.39 H	231	28.92	11.34
7	12143.08	54.48 PK	74.00	-19.52	1.00 H	9	43.39	11.09
8	12143.08	41.41 AV	54.00	-12.59	1.21 H	239	30.32	11.09
9	12879.87	55.31 PK	74.00	-18.69	2.00 H	12	43.26	12.05
10	12879.87	42.45 AV	54.00	-11.55	2.97 H	355	30.40	12.05
11	14637.77	59.85 PK	74.00	-14.15	2.00 H	360	43.42	16.43
12	14637.77	46.68 AV	54.00	-7.32	2.53 H	142	30.25	16.43

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



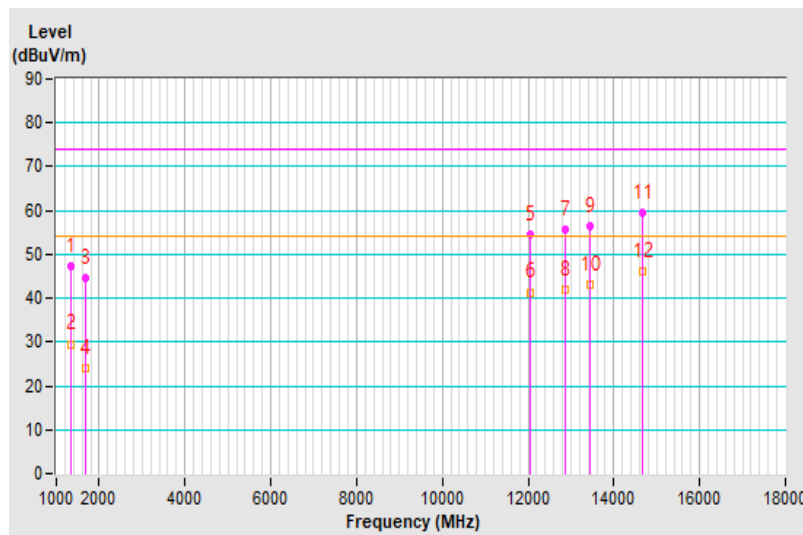


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 61.0%RH
Tested By	Abner Chang		

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	1330.00	47.17 PK	74.00	-26.83	2.00 V	69	53.99	-6.82
2	1330.00	29.55 AV	54.00	-24.45	2.10 V	320	36.37	-6.82
3	1672.45	44.72 PK	74.00	-29.28	1.00 V	342	51.74	-7.02
4	1672.45	23.99 AV	54.00	-30.01	1.19 V	49	31.01	-7.02
5	12053.84	54.51 PK	74.00	-19.49	1.00 V	359	43.43	11.08
6	12053.84	41.34 AV	54.00	-12.66	1.06 V	172	30.26	11.08
7	12852.89	55.71 PK	74.00	-18.29	2.00 V	266	43.77	11.94
8	12852.89	42.00 AV	54.00	-12.00	2.93 V	198	30.06	11.94
9	13438.16	56.37 PK	74.00	-17.63	2.00 V	158	42.71	13.66
10	13438.16	42.94 AV	54.00	-11.06	3.08 V	190	29.28	13.66
11	14673.06	59.49 PK	74.00	-14.51	2.00 V	51	42.94	16.55
12	14673.06	46.28 AV	54.00	-7.72	1.88 V	89	29.73	16.55

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



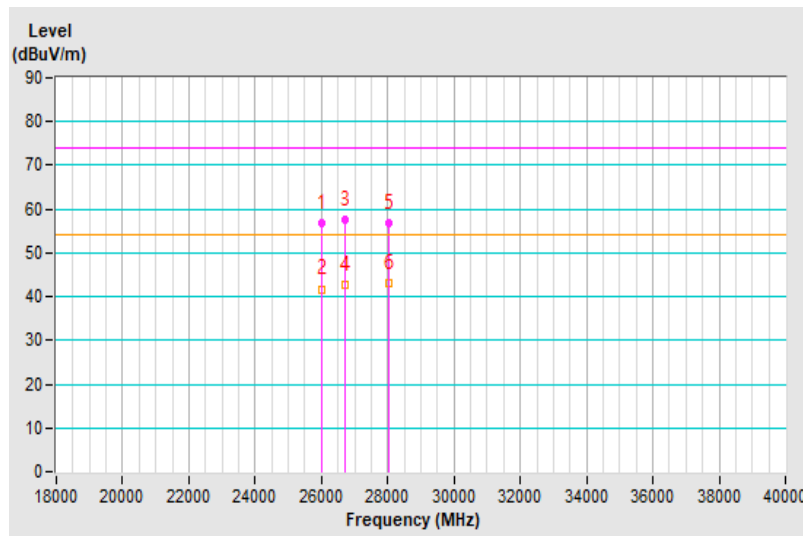


Frequency Range	18GHz ~ 29.5GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	20.0°C, 61.0%RH
Tested By	Abner Chang		

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	26003.91	56.70 PK	74.00	-17.30	1.00 H	300	59.66	-2.96
2	26003.91	41.73 AV	54.00	-12.27	1.42 H	149	44.69	-2.96
3	26723.72	57.55 PK	74.00	-16.45	2.00 H	360	59.62	-2.07
4	26723.72	42.86 AV	54.00	-11.14	2.88 H	0	44.93	-2.07
5	28045.17	56.82 PK	74.00	-17.18	1.00 H	320	59.04	-2.22
6	28045.17	43.18 AV	54.00	-10.82	1.03 H	0	45.40	-2.22

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



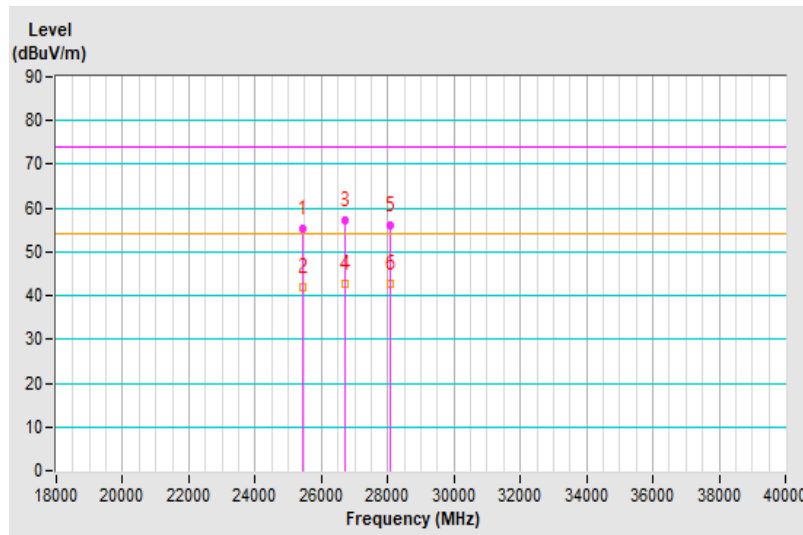


Frequency Range	18GHz ~ 29.5GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	20.0°C, 61.0%RH
Tested By	Abner Chang		

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	25442.56	55.20 PK	74.00	-18.80	1.00 V	360	57.99	-2.79
2	25442.56	41.99 AV	54.00	-12.01	1.55 V	38	44.78	-2.79
3	26726.41	57.14 PK	74.00	-16.86	2.00 V	314	59.20	-2.06
4	26726.41	42.69 AV	54.00	-11.31	2.97 V	283	44.75	-2.06
5	28082.77	56.12 PK	74.00	-17.88	2.00 V	360	58.33	-2.21
6	28082.77	42.70 AV	54.00	-11.30	2.23 V	307	44.91	-2.21

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





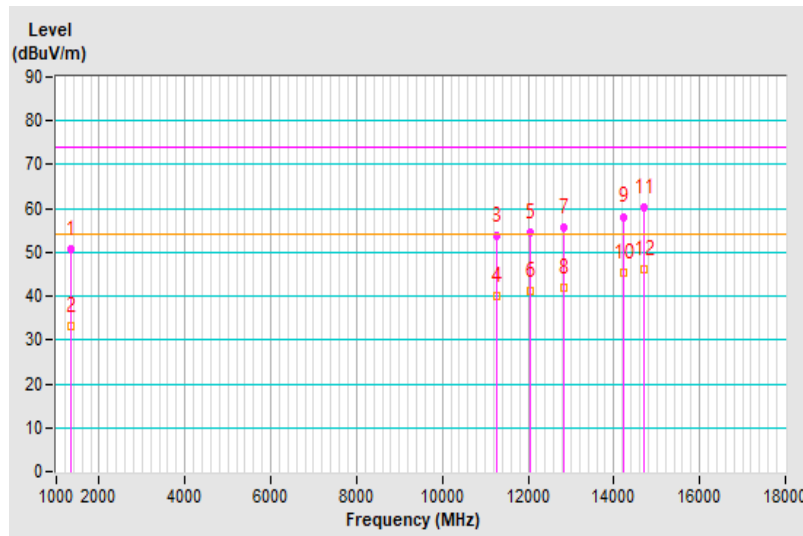
7.3.2 Test Mode 2

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 61.0%RH
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	1332.07	50.66 PK	74.00	-23.34	2.00 H	228	57.47	-6.81
2	1332.07	33.20 AV	54.00	-20.80	2.49 H	120	40.01	-6.81
3	11271.40	53.86 PK	74.00	-20.14	1.00 H	360	42.42	11.44
4	11271.40	40.13 AV	54.00	-13.87	1.65 H	360	28.69	11.44
5	12051.76	54.51 PK	74.00	-19.49	1.50 H	121	43.43	11.08
6	12051.76	41.14 AV	54.00	-12.86	1.52 H	98	30.06	11.08
7	12836.28	55.75 PK	74.00	-18.25	1.50 H	195	43.86	11.89
8	12836.28	41.87 AV	54.00	-12.13	1.96 H	152	29.98	11.89
9	14241.36	58.13 PK	74.00	-15.87	1.50 H	75	42.73	15.40
10	14241.36	45.23 AV	54.00	-8.77	1.71 H	207	29.83	15.40
11	14706.26	60.17 PK	74.00	-13.83	1.50 H	329	43.53	16.64
12	14706.26	46.07 AV	54.00	-7.93	2.02 H	98	29.43	16.64

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



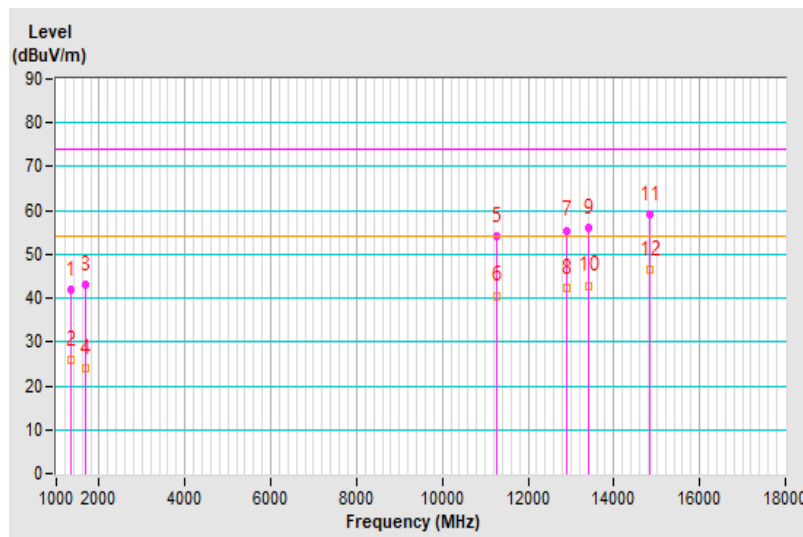


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	19.0°C, 61.0%RH
Tested By	Abner Chang		

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	1332.07	41.98 PK	74.00	-32.02	1.50 V	360	48.79	-6.81
2	1332.07	25.88 AV	54.00	-28.12	1.62 V	309	32.69	-6.81
3	1689.05	42.91 PK	74.00	-31.09	1.50 V	360	49.96	-7.05
4	1689.05	24.13 AV	54.00	-29.87	1.75 V	74	31.18	-7.05
5	11283.85	54.26 PK	74.00	-19.74	1.00 V	183	42.80	11.46
6	11283.85	40.61 AV	54.00	-13.39	1.10 V	295	29.15	11.46
7	12900.62	55.49 PK	74.00	-18.51	1.00 V	2	43.38	12.11
8	12900.62	42.28 AV	54.00	-11.72	1.32 V	116	30.17	12.11
9	13407.03	55.94 PK	74.00	-18.06	1.50 V	277	42.34	13.60
10	13407.03	42.90 AV	54.00	-11.10	1.84 V	278	29.30	13.60
11	14830.79	59.05 PK	74.00	-14.95	1.00 V	36	42.38	16.67
12	14830.79	46.59 AV	54.00	-7.41	1.63 V	137	29.92	16.67

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

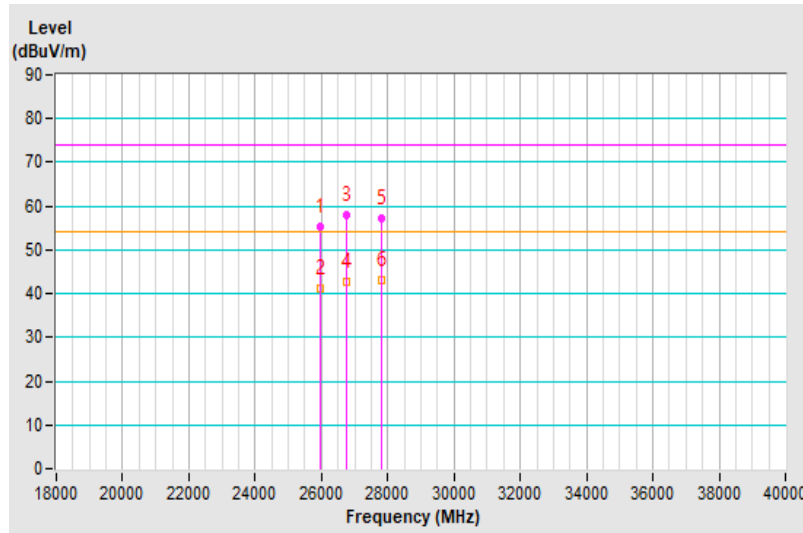


Frequency Range	18GHz ~ 29.5GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	20.0°C, 61.0%RH
Tested By	Abner Chang		

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	25977.05	55.28 PK	74.00	-18.72	1.50 H	56	58.21	-2.93
2	25977.05	41.04 AV	54.00	-12.96	1.46 H	303	43.97	-2.93
3	26742.52	57.92 PK	74.00	-16.08	2.00 H	0	59.97	-2.05
4	26742.52	42.84 AV	54.00	-11.16	2.99 H	219	44.89	-2.05
5	27803.44	57.16 PK	74.00	-16.84	2.00 H	86	59.52	-2.36
6	27803.44	43.07 AV	54.00	-10.93	1.85 H	213	45.43	-2.36

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



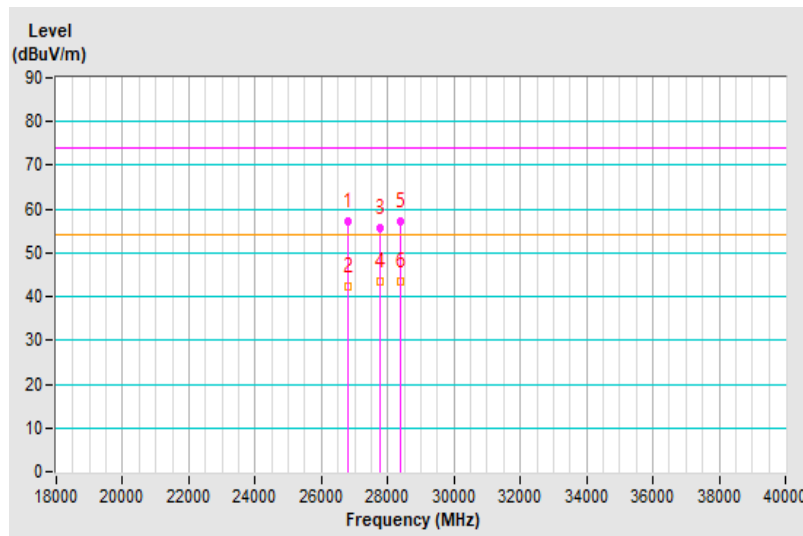


Frequency Range	18GHz ~ 29.5GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	DC 5V from Host	Environmental Conditions	20.0°C, 61.0%RH
Tested By	Abner Chang		

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	26785.50	57.16 PK	74.00	-16.84	1.00 V	7	59.16	-2.00
2	26785.50	42.38 AV	54.00	-11.62	1.13 V	0	44.38	-2.00
3	27776.58	55.82 PK	74.00	-18.18	1.50 V	175	58.28	-2.46
4	27776.58	43.35 AV	54.00	-10.65	1.97 V	206	45.81	-2.46
5	28399.71	57.16 PK	74.00	-16.84	2.00 V	71	59.54	-2.38
6	28399.71	43.51 AV	54.00	-10.49	2.01 V	199	45.89	-2.38

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.

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

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