FCC 47 CFR Part 15 Subpart B

TEST REPORT

For

Interactive Whiteboard

MODEL NUMBER: RICOH Interactive Whiteboard A7510

REPORT NUMBER: 4791337879-EMC-1

FCC ID: BBP-OTY3251

ISSUE DATE: June 4, 2024

Prepared for

RICOH COMPANY, LTD.
2-7-1 Izumi Ebina Kanagawa, 243-0460 Japan

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	June 4, 2024	Initial Issue	

Summary of Test Results

Emission			
Standard	**Test Item**	**Limit**	**Result**
FCC 47 CFR Part 15 Subpart B	Conducted emissions	FCC Part 15.107, ICES-003 Issue 7 Section 3.2.1	Pass
	Radiated emissions below 1GHz	FCC Part 15.109, ICES-003 Issue 7 Section 3.2.2	Pass
	Radiated emissions above 1GHz	FCC Part 15.109, ICES-003 Issue 7 Section 3.2.2	Pass (NOTE 1,2)

Note:
1. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.
(2) The frequency which started from 18 GHz to 40 GHz was pre-scanned and the result which was 20 dB lower than the limit line was not reported.

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
*The measurement result for the sample received is <Pass> according to <FCC 47 CFR Part 15 Subpart B> when <Simple Acceptance> decision rule is applied.

CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	RICOH COMPANY, LTD.
Address:	2-7-1 Izumi Ebina Kanagawa, 243-0460 Japan

Manufacturer Information

Company Name:	SHENZHEN Hitevision Technology Co., Ltd.
Address:	Honghe Mansion No. 1 Building A, 1 Danzi North Road, Shatian, Kengzi Street, Pingshan District, Shenzhen, Guangdong 518122 China

EUT Information

EUT Name:	Interactive Whiteboard
Model:	RICOH Interactive Whiteboard A7510
Brand:	RICOH
Sample Received Date:	May 27, 2024
Sample ID:	7282355
Date of Tested:	May 30, 2024 to June 3, 2024

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC 47 CFR Part 15 Subpart B	**Pass**

Prepared By:

Andy Xiong

Engineer Project Associate

Checked By:

Denny Huang

Senior Project Engineer

Approved By:

Stephen Guo

Operations Manager

2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC 47 CFR Part 15 Subpart B. KDB 414788 D01 Radiated Test Site v01r01

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **ISED (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. **VCCI (Registration No.: G-20192, C-20153, T-20155 and R-20202)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20192 and R-20202 Shielding Room B, the VCCI registration No. is C-20153 and T-20155

Note:
All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted emissions	0.009 MHz - 0.15 MHz	2	4
	0.15MHz - 30MHz	2	3.63
Radiated emissions below 1GHz	9kHz - 30MHz	2	2.2
	30MHz -1GHz	2	4.13
Radiated emissions above 1GHz	1GHz - 18GHz	2	5.64
Note1: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.			

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name		Interactive Whiteboard
Model		RICOH Interactive Whiteboard A7510
EUT Classification		Class A
Highest Internal Frequency		5825MHz
Power Supply	AC	Input: AC 100-240V 50/60Hz, 4.2A

5.2. TEST MODE

Test Mode	Description
M01	Front HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 2.4GHz WiFi On+ BT On
M02	Rear HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 2.4GHz WiFi On+ BT On
M03	Front Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 2.4GHz WiFi On+ BT On
M04	Rear Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 2.4GHz WiFi On+ BT On
M05	DP port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 2.4GHz WiFi On+ BT On
M06	Front HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 5GHz WiFi On+ BT On
M07	Rear HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 5GHz WiFi On+ BT On
M08	Front Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 5GHz WiFi On+ BT On
M09	Rear Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 5GHz WiFi On+ BT On
M10	DP port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + earphone + 5GHz WiFi On+ BT On
M11	Front HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 2.4GHz WiFi On+ BT On
M12	Rear HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 2.4GHz WiFi On+ BT On
M13	Front Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 2.4GHz WiFi On+ BT On
M14	Rear Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 2.4GHz WiFi On+ BT On
M15	DP port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 2.4GHz WiFi On+ BT On
M16	Front HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 5GHz WiFi On+ BT On
M17	Rear HDMI port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 5GHz

	WiFi On+ BT On
M18	Front Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 5GHz WiFi On+ BT On
M19	Rear Type-C port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 5GHz WiFi On+ BT On
M20	DP port 4k Input + HDMI arc output +HDMI video output + Ethernet port data transfer + USB disk data transfer + audio output via internal speaker + 5GHz WiFi On+ BT On

Note: Other terminals have connected to equipment load.

5.3. EUT ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	HDMI Cable	N/A	N/A	N/A
2	Type-C Cable	N/A	N/A	N/A
3	USB Cable	N/A	N/A	N/A
4	Stylus pen	N/A	N/A	N/A
5	Remote	N/A	N/A	N/A

5.4. SUPPORT UNITS FOR SYSTEM TEST

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
E-1	PC	LENOVO	ThinkCentre E73	N/A	PC0K90L4
E-2	Monitor	DELL	U2720Q	27 inch	CN-09MRJJ-WSL00-1BQ-C65L-A11
E-3	speaker	Behringer	Ms20	N/A	S1600511274
E-4	Mouse	Lenovo	MO28UOB	USB port	8SSM50G4 5918FCCC1545
E-5	Keyboard	Lenovo	LXH-JME2209U	USB port	60804634
E-6	USB Disk	SanDisk	N/A	USB 3.0	N/A
E-7	USB Disk	SanDisk	N/A	USB 3.0	N/A
E-8	USB Disk	SanDisk	N/A	USB 3.0	N/A
E-9	USB Disk	SanDisk	N/A	USB 3.0	N/A
E-10	USB Disk	SanDisk	N/A	USB 3.0	N/A
E-11	Laptop	ThinkPad	ThinkPad T14 Gen 1	N/A	PF-39TCFN
E-12	Earphone	N/A	N/A	N/A	N/A
E-13	Earphone	N/A	N/A	N/A	N/A
E-14	HDMI ARC audio extractor adapter	N/A	N/A	N/A	N/A

The following cables were used to form a representative test configuration during the tests.

Item	Type of cable	Shielded Type	Ferrite Core	Length
C-1	HDMI Cable	Shielded	NO	1.5 m
C-2	HDMI Cable	Shielded	NO	1.5 m
C-3	HDMI Cable	Shielded	NO	2.0 m
C-4	HDMI Cable	Shielded	NO	2.0 m
C-5	USB-A Cable	Shielded	YES	1.5 m
C-6	USB-A Cable	Shielded	YES	1.5 m
C-7	USB-A Cable	Shielded	NO	1.8 m
C-8	USB-A Cable	Shielded	NO	3.0 m
C-9	Optical Cable	Unshielded	NO	1.5 m
C-10	Audio Cable	Unshielded	NO	1.0 m
C-11	RJ 45 Cable	Unshielded	NO	3.0 m
C-12	RJ 45 Cable	Unshielded	NO	3.0 m
C-13	Type-C Cable	Shielded	NO	1.0 m
C-14	DP Cable	Shielded	NO	1.0 m

6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Conducted emissions					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EMI Test Receiver	ROHDE & SCHWARZ	ESR3	101961	Oct. 13, 2023	Oct. 12, 2024
Two-Line V-Network	ROHDE & SCHWARZ	ENV216	101983	Oct. 13, 2023	Oct. 12, 2024
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Oct. 12, 2023	Oct. 11, 2024
Test Software for Conducted Emission	Farad	EZ-EMC	Ver.UL-3A1	N/A	N/A

Test Equipment of Radiated emissions below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Aug. 2, 2021	Aug. 1, 2024
MXE EMI Receiver	KEYSIGHT	N9038A	MY56400036	Oct. 12, 2023	Oct. 11, 2024
Amplifier	HP	8447F	2944A03683	Oct. 12, 2023	Oct. 11, 2024
Test Software for Radiated Emission	Farad	EZ-EMC	Ver.UL-3A1	N/A	N/A

Test Equipment of Radiated emissions above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EMI Measurement Receiver	ROHDE & SCHWARZ	ESR26	101377	Oct. 12, 2023	Oct. 11, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct. 12, 2023	Oct. 11, 2024
Highpass Filter	Wainwright	WHKX10-2700-3000-18000-40SS	23	/	/
Horn Antenna	TDK	HRN-0118	130940	Jul. 20, 2021	Jul. 19, 2024
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct. 12, 2023	Oct. 11, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct. 12, 2023	Oct. 11, 2024
High Gain Horn Antenna	Schwarzbeck	BBHA-9170	697	Jul. 20, 2021	Jul. 19, 2024
Test Software for Radiated Emission	Farad	EZ-EMC	Ver.UL-3A1	N/A	N/A

Other Instrument					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date

Temperature humidity probe	OMEGA	ITHX-SD-5	18470007	Oct.21, 2023	Oct.20, 2024
Barometer	Yiyi	Baro	N/A	Oct.19, 2023	Oct.18, 2024

7. EMISSION TEST

7.1. CONDUCTED EMISSIONS

LIMITS

CFR 47 FCC Part15 Subpart B /ICES-003 Issue 7				
FREQUENCY (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46*
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.4-2014.

2. The EUT was placed on the top of a rotating table 0.8 meters above the horizontal ground plane and being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

3. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

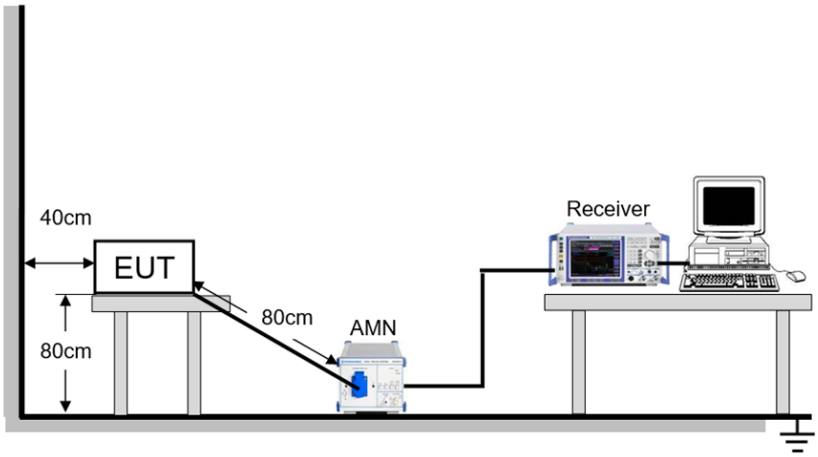
4. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

5. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

6. LISN at least 80 cm from nearest part of EUT chassis.

7. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

TEST SETUP



TEST ENVIRONMENT

Temperature	21.3℃	Relative Humidity	54.4%
Atmosphere Pressure	101kPa		

TEST DATE / ENGINEER

Test Date	May 30, 2024	Test By	Andy Xiong

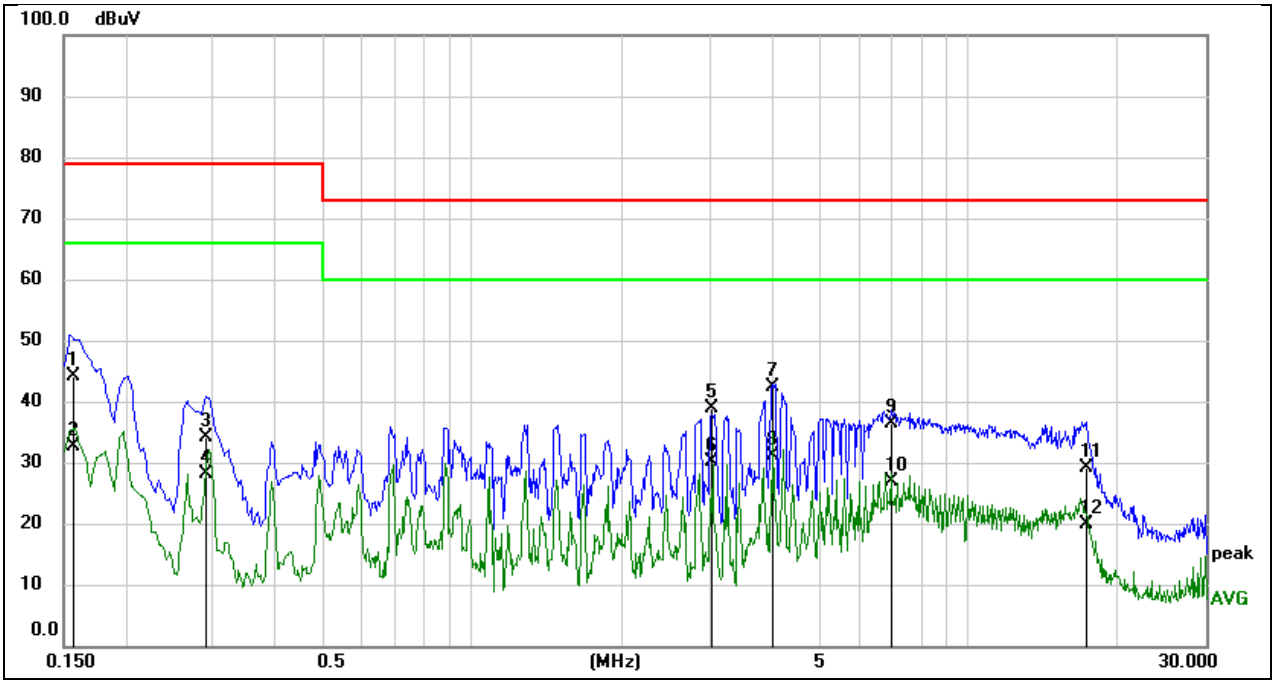
TEST MODE

Pre-test Mode:	M01 ~ M20
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

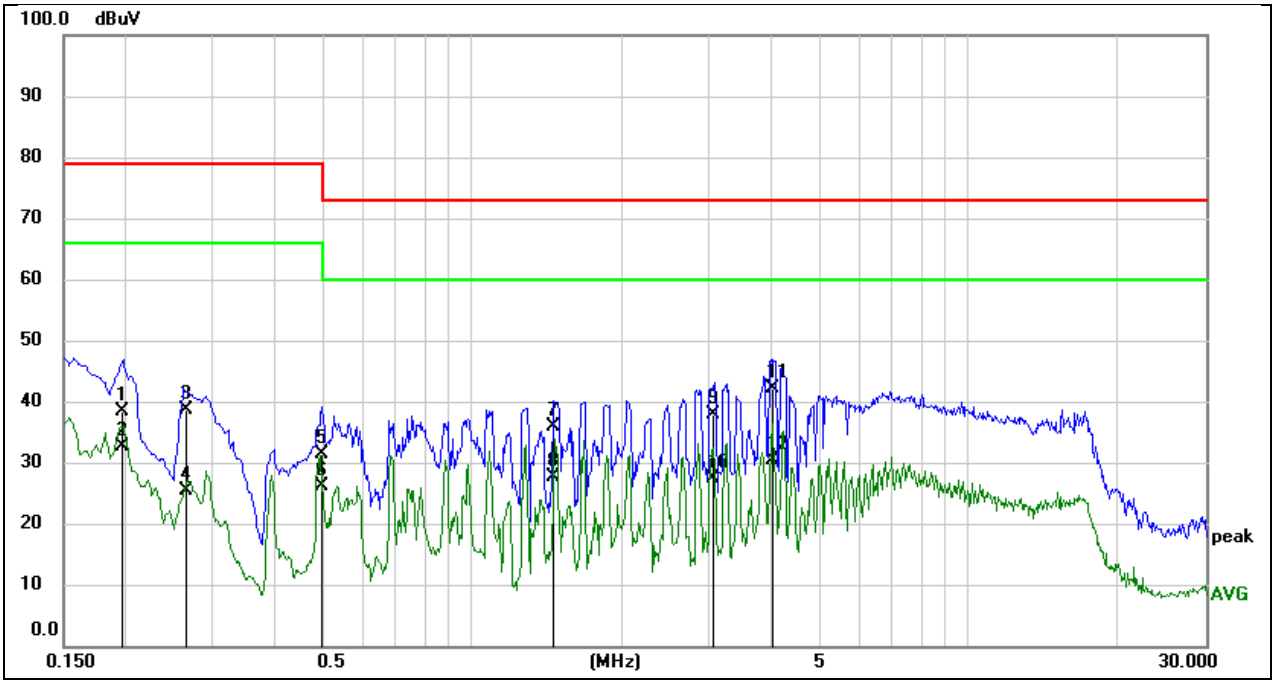
Test Mode:	M01	Line:	Line
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1572	33.77	10.33	44.10	79.00	-34.90	QP
2	0.1572	22.23	10.33	32.56	66.00	-33.44	AVG
3	0.2918	23.99	10.24	34.23	79.00	-44.77	QP
4	0.2918	17.96	10.24	28.20	66.00	-37.80	AVG
5	3.0529	28.91	10.09	39.00	73.00	-34.00	QP
6	3.0529	20.13	10.09	30.22	60.00	-29.78	AVG
7	4.0502	32.14	10.23	42.37	73.00	-30.63	QP
8	4.0502	20.83	10.23	31.06	60.00	-28.94	AVG
9	6.9987	26.06	10.33	36.39	73.00	-36.61	QP
10	6.9987	16.60	10.33	26.93	60.00	-33.07	AVG
11	17.2569	18.49	10.68	29.17	73.00	-43.83	QP
12	17.2569	9.22	10.68	19.90	60.00	-40.10	AVG

Remark: Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
Margin = Result - Limit

Test Mode:	M01	Line:	Neutral
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1958	28.27	10.15	38.42	79.00	-40.58	QP
2	0.1958	22.42	10.15	32.57	66.00	-33.43	AVG
3	0.2644	28.60	10.12	38.72	79.00	-40.28	QP
4	0.2644	15.30	10.12	25.42	66.00	-40.58	AVG
5	0.4954	21.38	10.04	31.42	79.00	-47.58	QP
6	0.4954	16.03	10.04	26.07	66.00	-39.93	AVG
7	1.4693	25.87	9.93	35.80	73.00	-37.20	QP
8	1.4693	17.64	9.93	27.57	60.00	-32.43	AVG
9	3.0362	27.67	10.19	37.86	73.00	-35.14	QP
10	3.0362	17.23	10.19	27.42	60.00	-32.58	AVG
11	4.0195	31.80	10.33	42.13	73.00	-30.87	QP
12	4.0195	20.08	10.33	30.41	60.00	-29.59	AVG

Remark: Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
Margin = Result - Limit

7.2. RADIATED EMISSIONS BELOW 1GHZ

LIMITS

Below 1 GHz

CFR 47 FCC Part 15 Subpart B		
Frequency (MHz)	Class A	Class B
	Field strength (dBuV/m) (at 3 m)	Field strength (dBuV/m) (at 3 m)
30 - 88	49.54	40.00
88 - 216	53.98	43.52
216 - 960	56.90	46.02
Above 960	60.00	53.98

ICES-003 Issue 7		
Frequency (MHz)	Class A	Class B
	Field strength (dBuV/m) (at 3 m)	Field strength (dBuV/m) (at 3 m)
30 - 88	50.0	40.0
88 - 216	54.0	43.5
216 - 230	56.9	46.0
230 - 960	57.0	47.0
Above 960	60.0	54.0

Note: The different between FCC Part 15 Subpart B limit and ICES-003 Issue 7 limit is only in frequency band 230 MHz to 960 MHz, the limit of FCC Part 15 Subpart B is 1 dB smaller than the limit of ICES-003 Issue 7, if the test result complies with FCC Part 15 Subpart B limit, it deemed to comply with ICES-003 Issue 7 limit.

Test Frequency Range of Radiated Disturbance Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	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 40 GHz, whichever is lower

NOTE:

(1) The limit for radiated test was performed according to CFR 47 FCC Part15 Subpart B /ICES-003 Issue 7;
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10 m Emission level + 20log(10 m/3 m);

TEST PROCEDURE

Below 1 GHz and above 30 MHz

The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak and QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp was used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

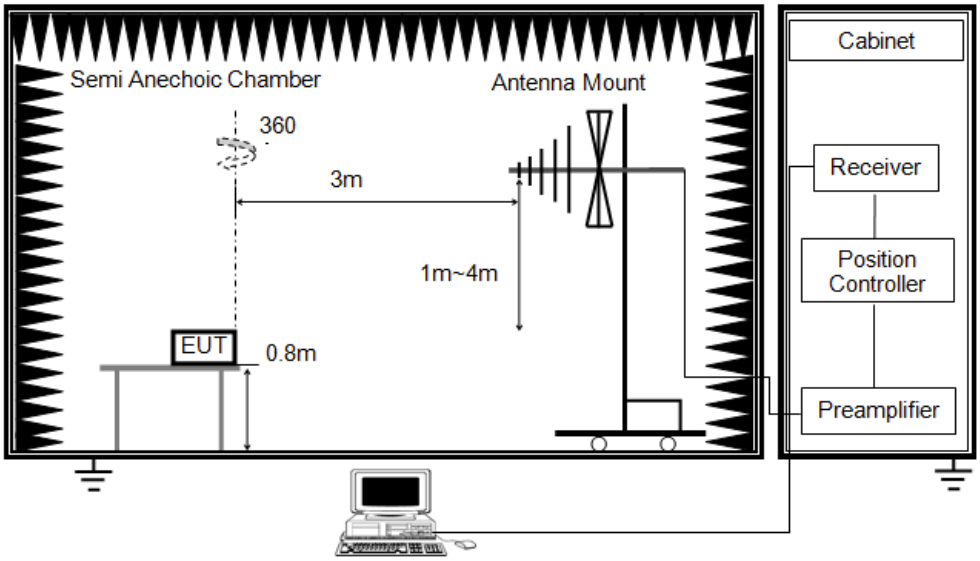
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

8. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

TEST SETUP



Below 1 GHz and above 30 MHz

TEST ENVIRONMENT

Temperature	22.4℃	Relative Humidity	59%
Atmosphere Pressure	101kPa		

TEST DATE / ENGINEER

Test Date	May 30, 2024	Test By	Deacon Tan

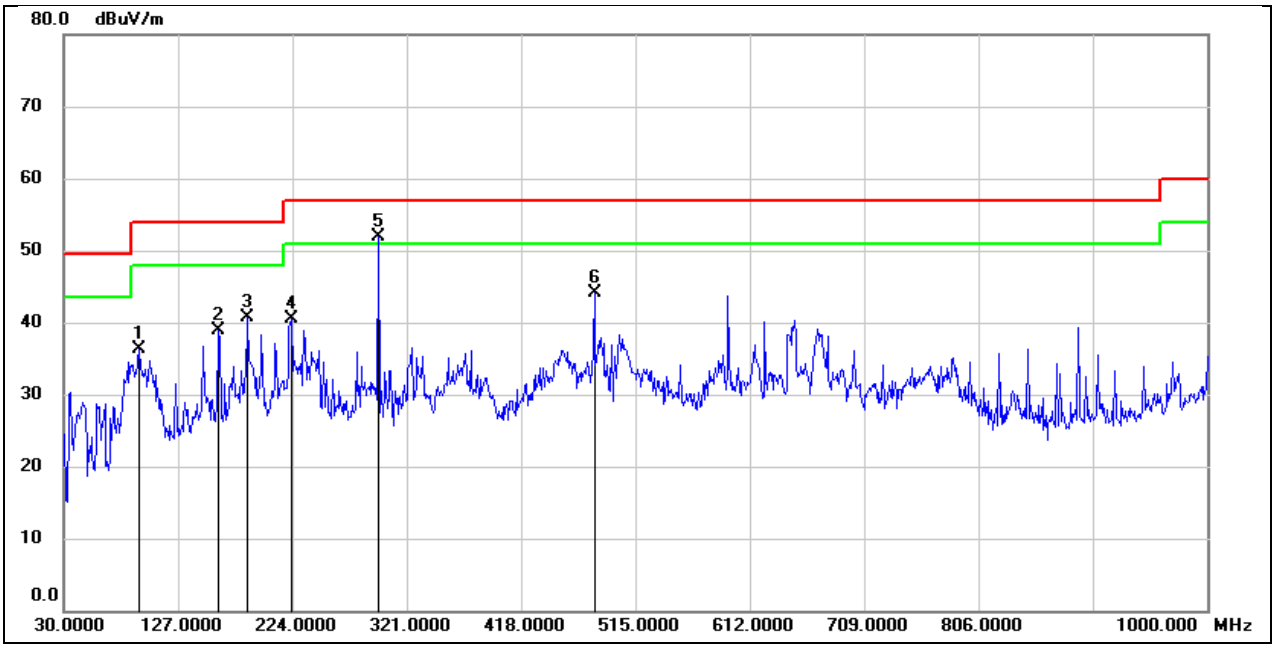
TEST MODE

Pre-test Mode:	M01 ~ M20
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

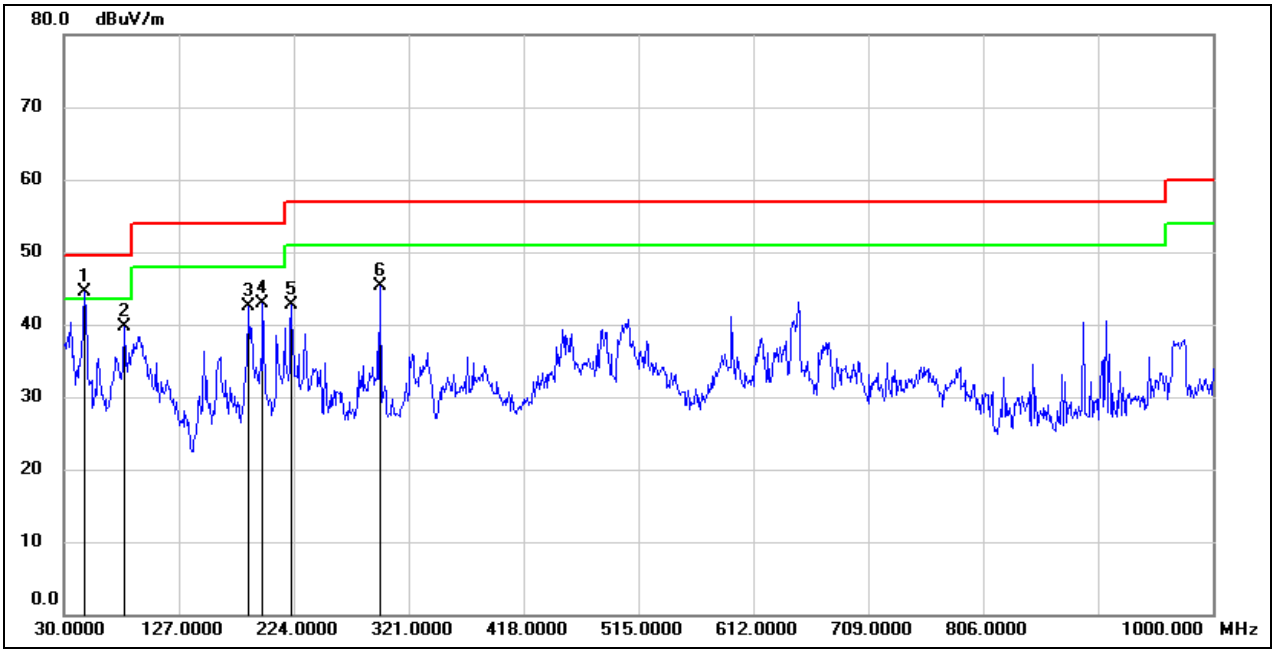
Test Mode:	M01	Polarity:	Horizontal
Test Voltage:	AC120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	94.0199	53.26	-16.95	36.31	53.90	-17.59	QP
2	160.9500	51.56	-12.73	38.83	53.90	-15.07	QP
3	186.1700	52.91	-12.12	40.79	53.90	-13.11	QP
4	223.0300	53.76	-13.23	40.53	56.90	-16.37	QP
5	296.7500	63.80	-11.90	51.90	56.90	-5.00	QP
6	480.0800	52.16	-8.04	44.12	56.90	-12.78	QP

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

Test Mode:	M01	Polarity:	Vertical
Test Voltage:	AC120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	47.4600	59.85	-15.38	44.47	49.50	-5.03	QP
2	80.4400	56.13	-16.35	39.78	49.50	-9.72	QP
3	185.2000	54.52	-12.08	42.44	53.90	-11.46	QP
4	197.8100	54.95	-12.11	42.84	53.90	-11.06	QP
5	222.0600	55.79	-13.18	42.61	56.90	-14.29	QP
6	296.7500	57.17	-11.90	45.27	56.90	-11.63	QP

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

7.3. RADIATED EMISSIONS ABOVE 1GHZ

LIMITS

Above 1 GHz

CFR 47 FCC Part15 Subpart B /ICES-003 Issue 7				
Frequency (MHz)	Class A (dBuV/m) (at 3 m)		Class B (dBuV/m) (at 3 m)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

Test Frequency Range of Radiated Disturbance Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	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 40 GHz, whichever is lower

NOTE:

(1) The limit for radiated test was performed according to CFR 47 FCC Part15 Subpart B /ICES-003 Issue 7;
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10 m Emission level + 20log(10 m/3 m);

TEST PROCEDURE

Above 1 GHz

The setting of the spectrum analyser

RBW	1 MHz
VBW	3 MHz
Sweep	Auto
Detector	Peak: Peak AVG: RMS
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

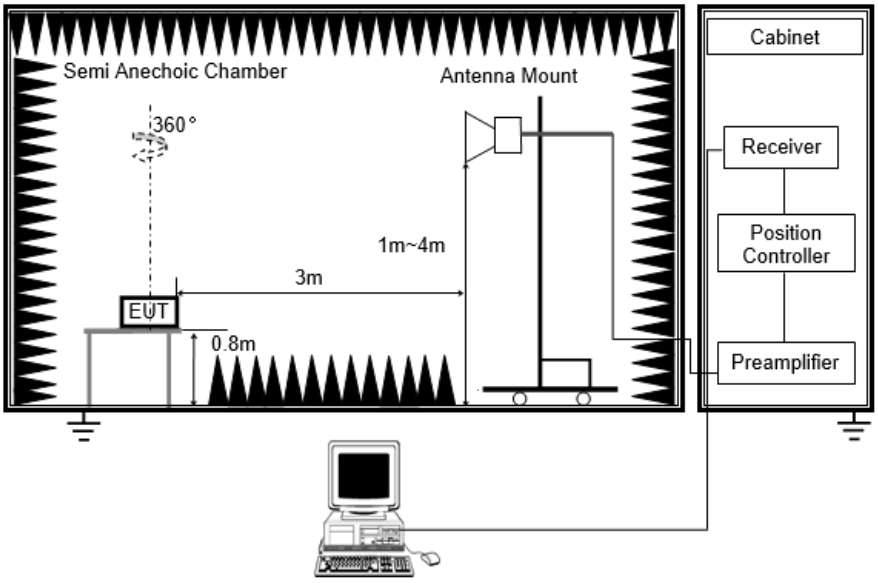
6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

8. For measurement above 1 GHz, the peak emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the peak limit specified in Section 15.109. If peak result complies with average limit, average result is deemed to comply with average limit.

9. The average emission measurement will be measured by the RMS detector and must comply with the average limit specified in Section 15.109.

TEST SETUP



Above 1GHz

TEST ENVIRONMENT

Temperature	21.9℃	Relative Humidity	63.1%
Atmosphere Pressure	101kPa		

TEST DATE / ENGINEER

Test Date	June 3, 2024	Test By	Mason Wang

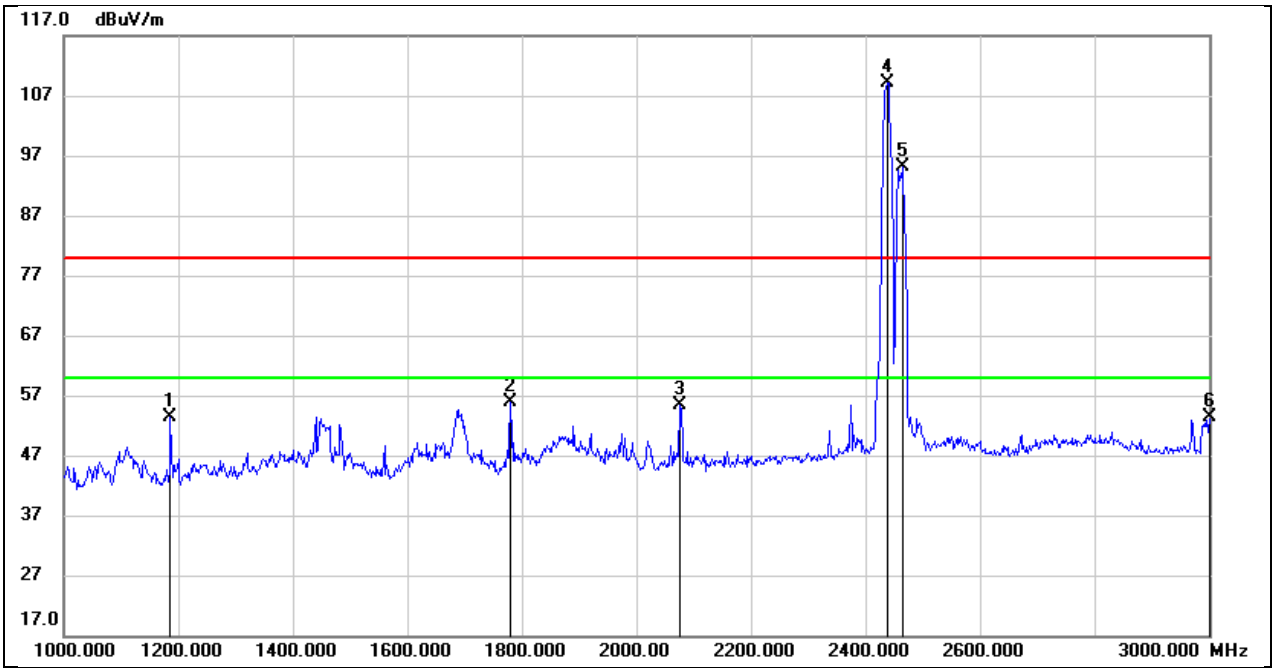
TEST MODE

Pre-test Mode:	M01 ~ M20
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

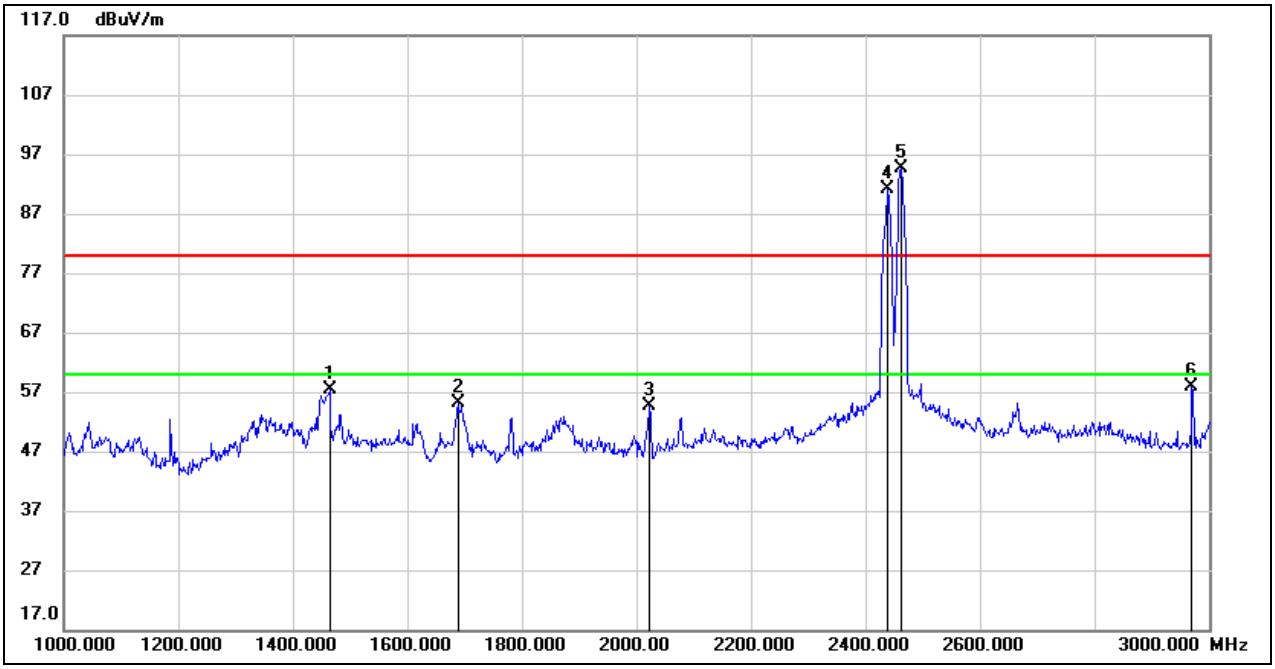
Test Mode:	M01	Polarity:	Horizontal
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	25.03	28.36	53.39	80.00	-26.61	peak
2	1780.000	25.03	30.76	55.79	80.00	-24.21	peak
3	2076.000	24.11	31.19	55.30	80.00	-24.70	peak
4	2438.000	76.10	32.96	109.06	/	/	Note 5
5	2464.000	62.13	32.95	95.08	/	/	Note 5
6	3000.000	19.69	33.78	53.47	80.00	-26.53	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit
3. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
4. Peak: Peak detector.
5. All the frequencies between mark 4 and mark 5 are the fundamental frequency which were transmitted by wireless module from EUT.

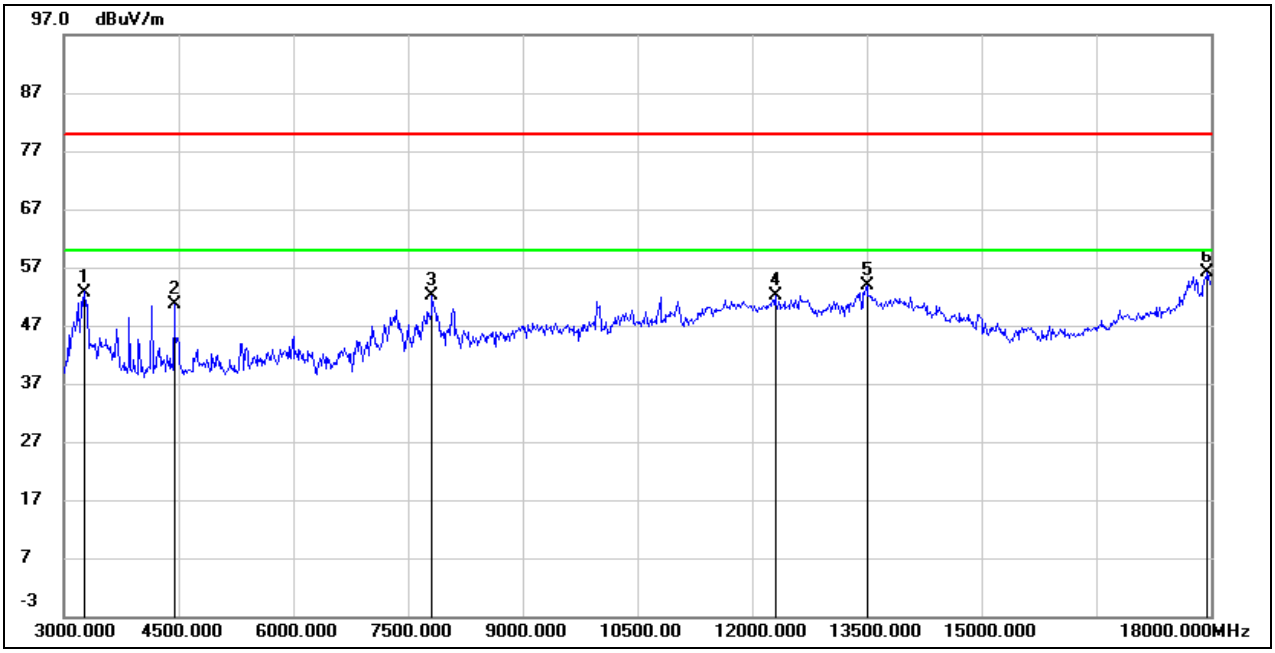
Test Mode:	M01	Polarity:	Vertical
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1464.000	28.35	29.03	57.38	80.00	-22.62	peak
2	1688.000	25.00	30.24	55.24	80.00	-24.76	peak
3	2022.000	23.70	30.89	54.59	80.00	-25.41	peak
4	2438.000	58.05	32.96	91.01	/	/	Note 5
5	2462.000	61.56	32.95	94.51	/	/	Note 5
6	2970.000	24.19	33.74	57.93	80.00	-22.07	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit
3. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
4. Peak: Peak detector.
5. All the frequencies between mark 4 and mark 5 are the fundamental frequency which were transmitted by wireless module from EUT.

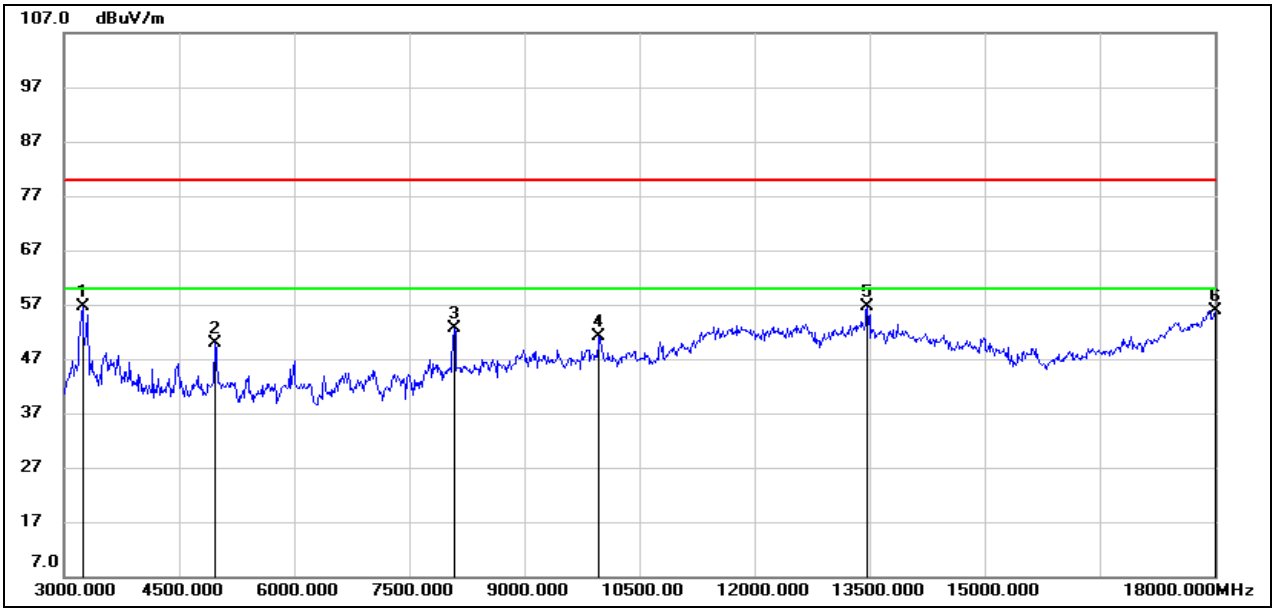
Test Mode:	M01	Polarity:	Horizontal
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (Db/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (Db)	Remark
1	3270.000	57.29	-4.54	52.75	80.00	-27.25	peak
2	4440.000	51.43	-0.89	50.54	80.00	-29.46	peak
3	7815.000	44.70	7.50	52.20	80.00	-27.80	peak
4	12300.000	33.44	18.65	52.09	80.00	-27.91	peak
5	13500.000	32.07	21.69	53.76	80.00	-26.24	peak
6	17955.000	29.43	26.66	56.09	80.00	-23.91	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result – Limit

Test Mode:	M01	Polarity:	Vertical
Test Voltage:	AC 120V_60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Correct (Db/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (Db)	Remark
1	3240.000	61.19	-4.52	56.67	80.00	-23.33	peak
2	4965.000	49.02	0.78	49.80	80.00	-30.20	peak
3	8085.000	44.77	7.80	52.57	80.00	-27.43	peak
4	9975.000	38.83	12.37	51.20	80.00	-28.80	peak
5	13470.000	34.91	21.62	56.53	80.00	-23.47	peak
6	18000.000	29.02	26.83	55.85	80.00	-24.15	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result – Limit

END OF REPORT