

TEST REPORT

Reference No...... : WTX23X10215706W001
FCC ID : 2AIDW-ZZ-H-1-002
Applicant : Shenzhen Zero Zero Infinity Technology Co., Ltd
Address : 4F Qianhai Yidu Tower Building, Shenzhen
Manufacturer : The same as Applicant
Address : The same as Applicant
Product Name : HOVERAir X1
Model No...... : ZZ-H-1-001
Standards : FCC Part 15.407
Date of Receipt sample : 2023-10-09
Date of Test..... : 2023-10-09 to 2023-10-31
Date of Issue : 2023-10-31
Test Report Form No. : WTX_Part 15_407W
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Report version

Version No.	Date of issue	Description
Rev.00	2023-10-31	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	HOVERAir X1
Trade Name:	/
Model No.:	ZZ-H-1-001
Adding Model(s):	/
Rated Voltage:	DC 5V Battery DC 7.7V
Battery Capacity:	1050mAh
Power Adapter:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n-HT20, 802.11n-HT40, 802.11ac-VHT20, 802.11ac-VHT40, 802.11ac-VHT80
Frequency Range:	5150-5250MHz, 5725-5850MHz
RF Output Power:	19.38dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM, 256QAM
Type of Antenna:	FPC Antenna
Antenna Gain:	2.77dBi
<i>Note: The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

KDB789033 D02 v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Use “QRCT” and follow the instructions given by the manufacturer, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825
802.11a 6Mbps	20	20	20	/	/	/	/	/	/	/	20	20	20
802.11n-HT20 MCS0	20	20	20	/	/	/	/	/	/	/	20	20	20
802.11ac-VHT20 MCS0	20	20	20	/	/	/	/	/	/	/	20	20	20
Mode	NCB: 40MHz												
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795			
802.11n-HT40 MCS0	20	20	/	/	/	/	/	/	/	20	20		
802.11ac-VHT40 MCS0	20	20	/	/	/	/	/	/	/	20	20		
Mode	NCB: 80MHz												
	5210		5290		5530		5610		5690		5775		
802.11ac-VHT80 MCS0/Nss2	20		/		/		/		/		20		

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM3	802.11ac-VHT20	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM4	802.11n-HT40	5190MHz,5230MHz, 5755MHz,5795MHz
TM5	802.11ac-VHT40	5190MHz,5230MHz, 5755MHz,5795MHz
TM6	802.11ac-VHT80	5210MHz, 5775 MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.20	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E445	EB12648265
Mobile phone	HUAWEI	VOG-AL00	/
Adapter	FUSHIGANG	AS1201A-0502000USU	/

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022A 1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2023-02-25	2024-02-24
WTXE1044A 1001	Signal Generator	Agilent	83752A	3610A014 53	2023-02-25	2024-02-24
WTXE1045A 1001	Vector Signal Generator	Agilent	N5182A	MY470702 02	2023-02-25	2024-02-24
WTXE1018A 1001	Power Divider	Weinschel	1506A	PM204	2023-02-25	2024-02-24
WTXE1045A 1001	Power Divider	RF-Lambda	RFLT4W5M18G	14110400 027	2023-02-25	2024-02-24
☐ Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007A 1001	Amplifier	HP	8447F	2805A034 75	2023-02-25	2024-02-24
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐ Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1065A 1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18

WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐ Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A104 57	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☒ Conducted Room 1#						
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
☐ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003A	LISN	Rohde &	ENV 216	100097	2023-02-25	2024-02-24

1003		Schwarz				
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Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	N/A
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	N/A
§15.407(a)(1),(2)	Maximum Conducted Output Power	N/A
§15.407(b)(1),(2),(3),(4)	Undesirable emission	N/A
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	N/A
§15.407(h)	Dynamic Frequency Selection (DFS)	N/A

Class II Permissive Change: Change the lens and sensor to improve the image quality; Add VBATT soft start circuit; Add VBAT soft start circuit, cancel battery balance circuit.

Note: Report is for Class II Permissive Change only. Updated test data include Antenna Requirement, Conducted Emission and Radiated Emission. Other test data refer to the original report WTX22X10216896R1W001, The original FCC ID issue date: 07/22/2023.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

This product has a FPC Antenna, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

4.2 Summary of Test Results

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5. Radiated Spurious Emissions

5.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85GHz band:
 - (i) All emissions shall be limited to a level of -27dBm/MHz at 75MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

$$\text{EIRP} = ((E \cdot d)^2) / 30$$

where:

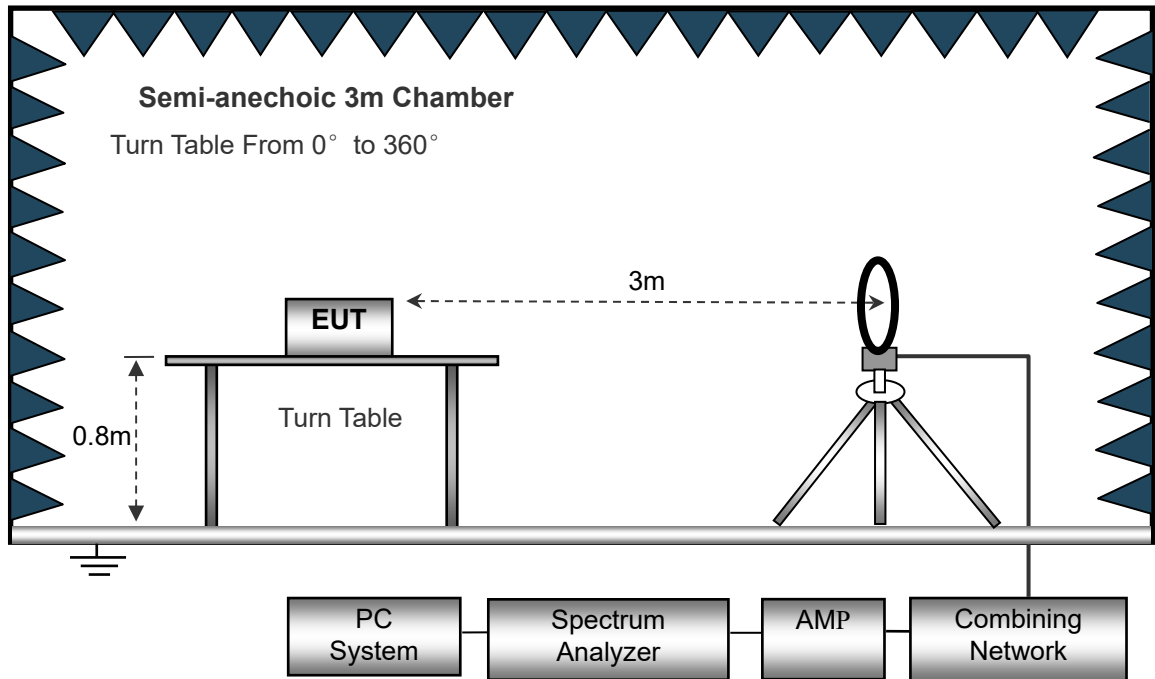
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

5.2 Test Procedure

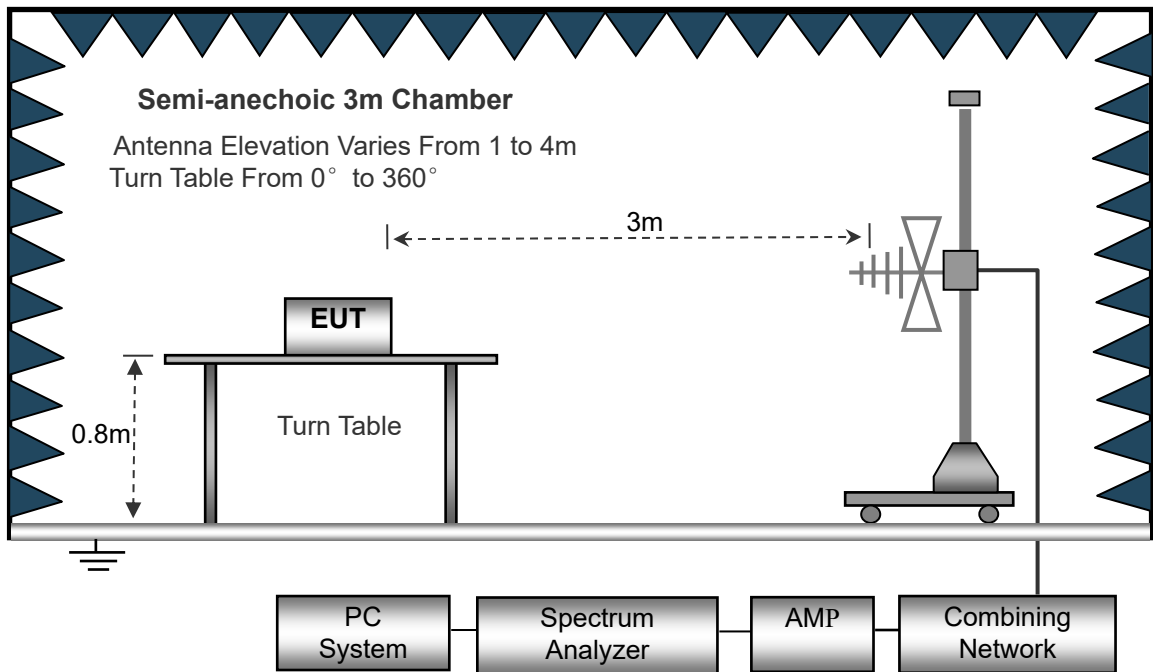
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

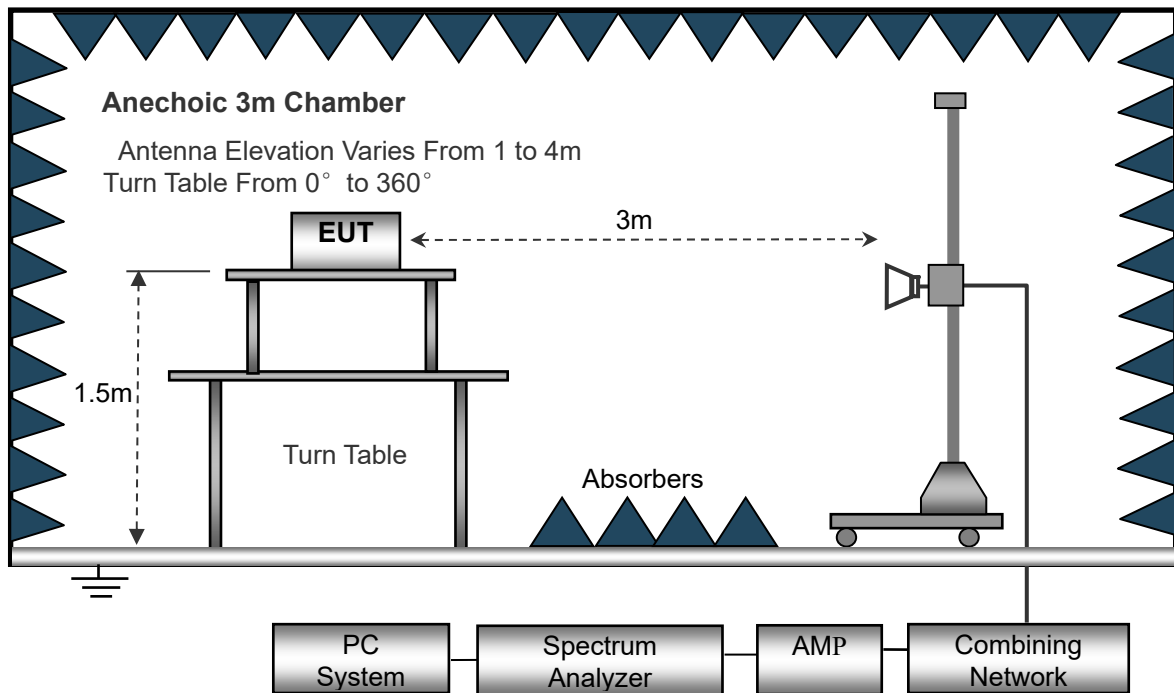
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



5.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

5.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

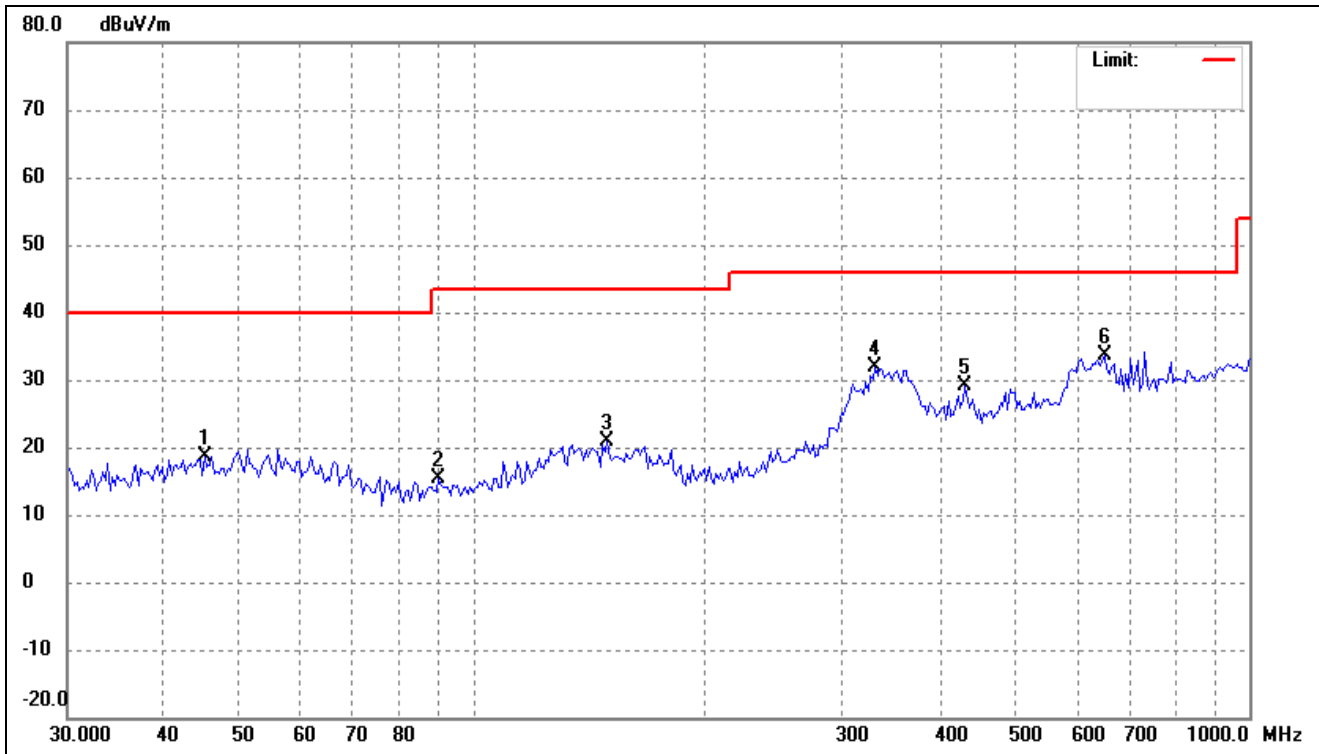
5.5 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- Spurious Emission From 30MHz to 1GHz
- 5150-5250MHz

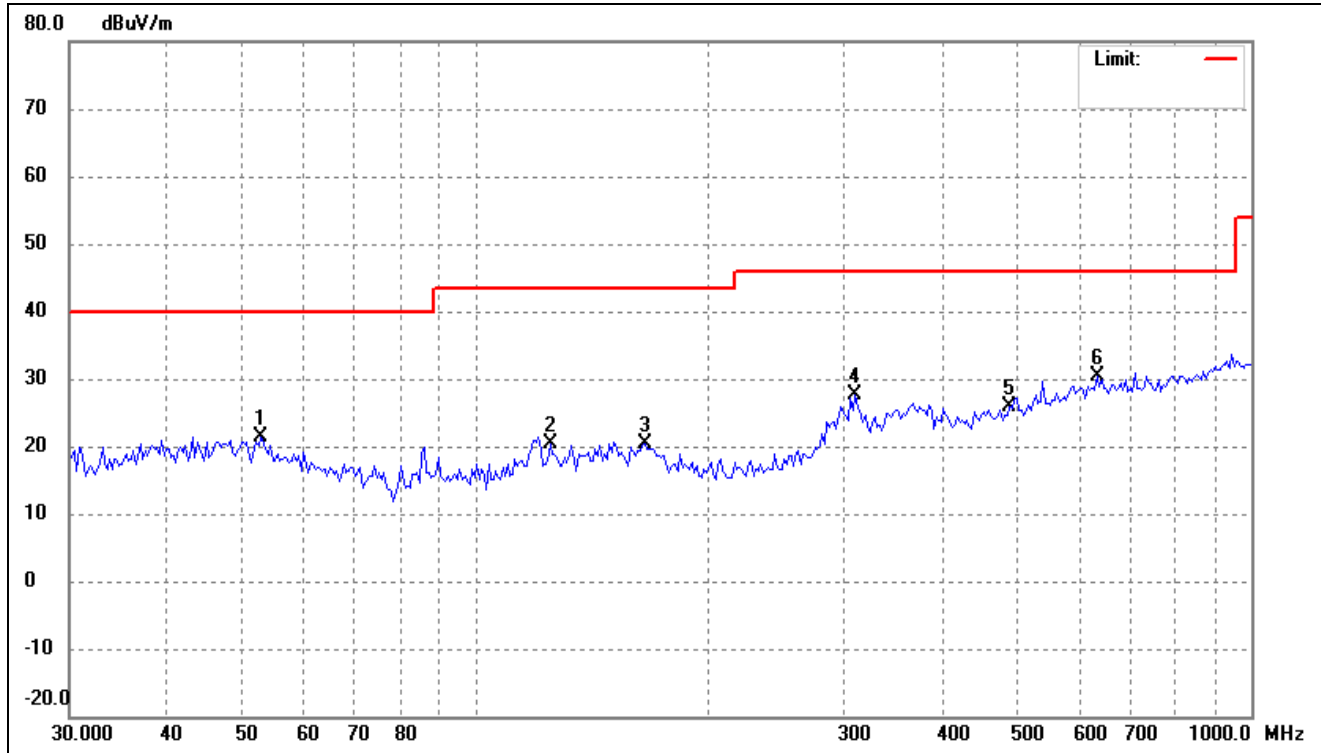
802.11a(Worst case)

Test Channel	5180MHz	Polarity:	Horizontal
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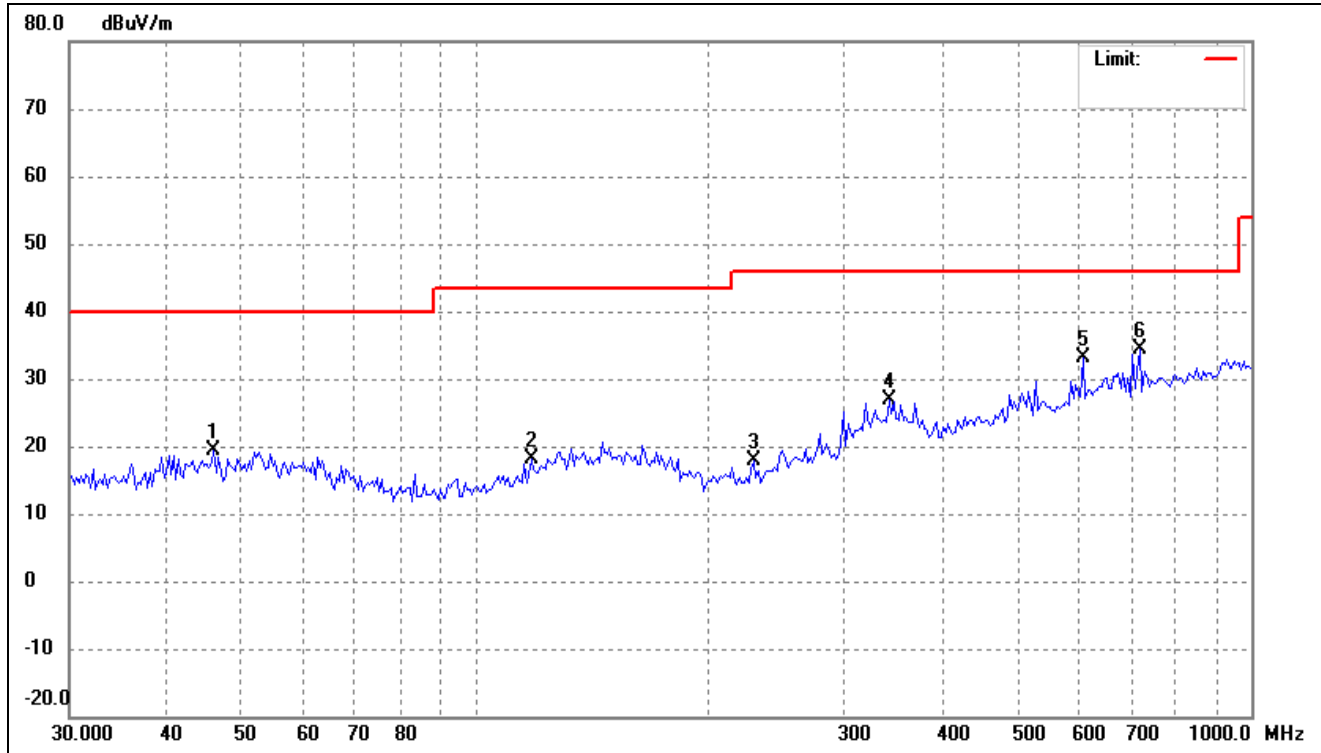
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.0951	27.03	-8.46	18.57	40.00	-21.43	-	-	peak
2	90.4198	28.41	-13.08	15.33	43.50	-28.17	-	-	peak
3	148.9175	29.52	-8.68	20.84	43.50	-22.66	-	-	peak
4	329.4625	39.41	-7.47	31.94	46.00	-14.06	-	-	peak
5	430.3053	34.32	-5.14	29.18	46.00	-16.82	-	-	peak
6	651.3831	34.88	-1.30	33.58	46.00	-12.42	-	-	peak

802.11a(Worst case)			
Test Channel	5180MHz	Polarity:	Vertical



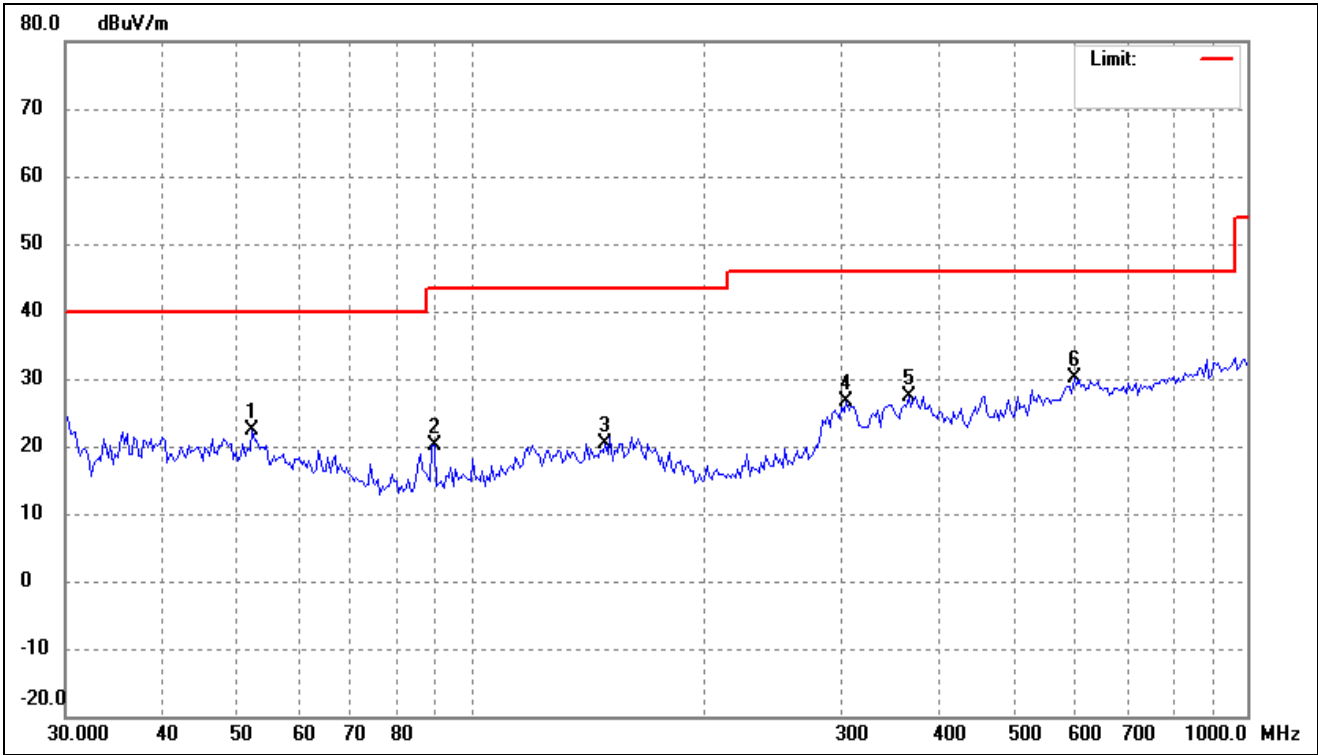
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	53.0056	29.72	-8.41	21.31	40.00	-18.69	-	-	peak
2	124.9249	30.50	-10.19	20.31	43.50	-23.19	-	-	peak
3	165.4716	29.23	-8.76	20.47	43.50	-23.03	-	-	peak
4	309.2710	35.57	-8.00	27.57	46.00	-18.43	-	-	peak
5	488.3263	30.02	-4.06	25.96	46.00	-20.04	-	-	peak
6	633.3285	31.78	-1.37	30.41	46.00	-15.59	-	-	peak

802.11a(Worst case)			
Test Channel	5200MHz	Polarity:	Horizontal



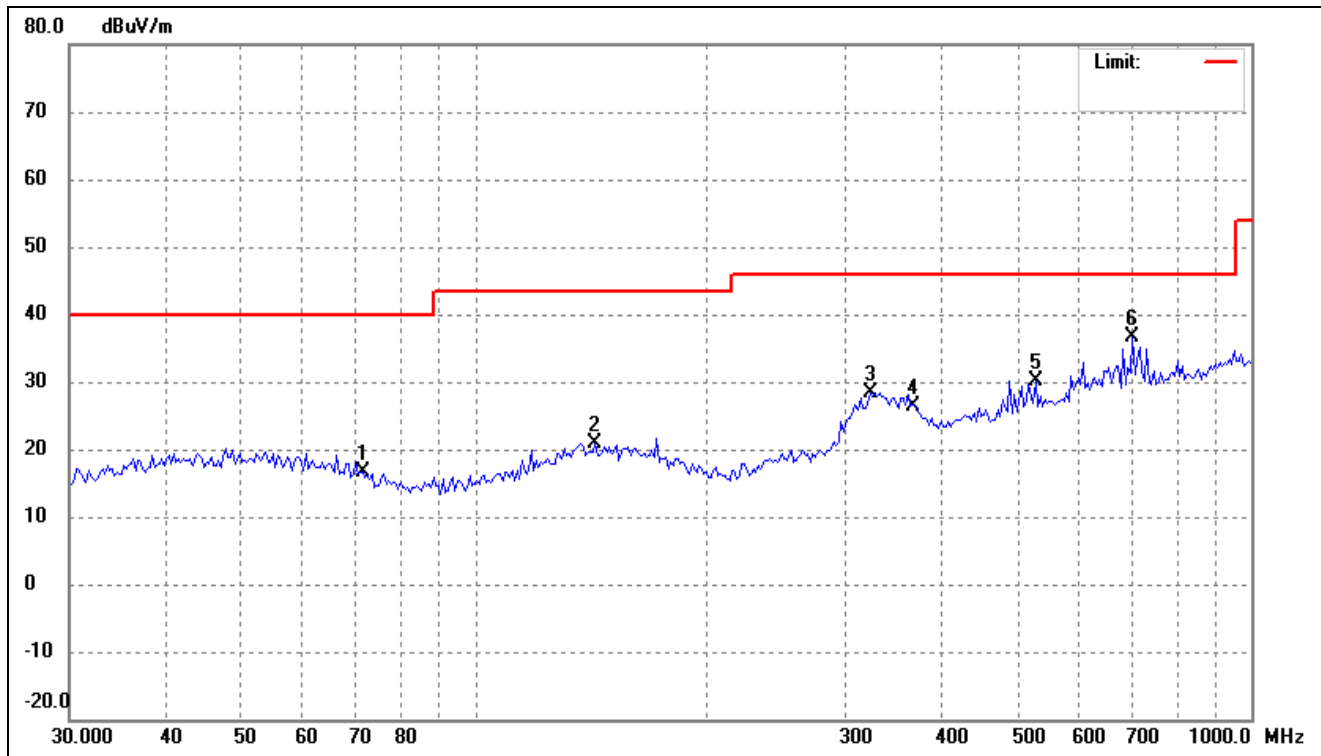
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.0558	27.64	-8.38	19.26	40.00	-20.74	-	-	peak
2	118.0957	28.81	-10.73	18.08	43.50	-25.42	-	-	peak
3	228.6173	29.64	-11.70	17.94	46.00	-28.06	-	-	peak
4	341.2442	34.23	-7.26	26.97	46.00	-19.03	-	-	peak
5	607.1806	34.88	-1.64	33.24	46.00	-12.76	-	-	peak
6	718.7246	35.07	-0.75	34.32	46.00	-11.68	-	-	peak

802.11a(Worst case)			
Test Channel	5200MHz	Polarity:	Vertical



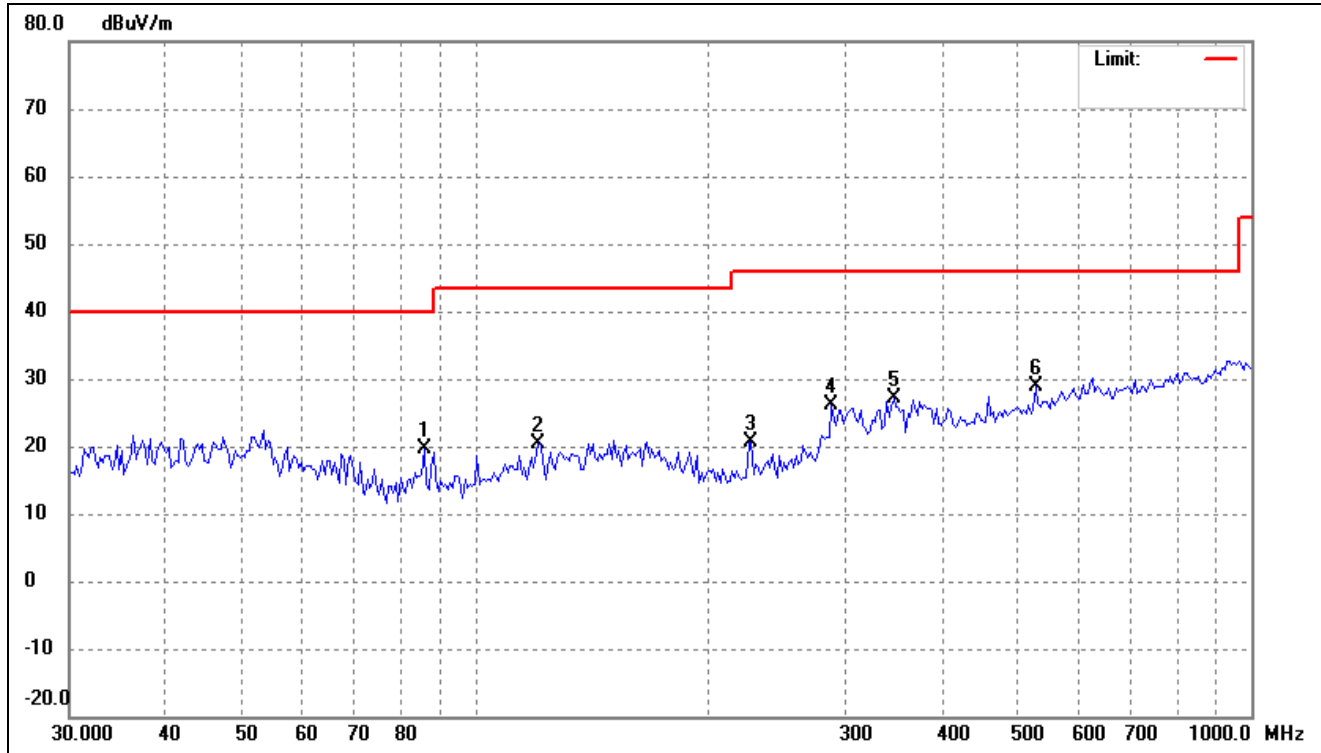
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.2659	30.63	-8.33	22.30	40.00	-17.70	-	-	peak
2	89.7866	33.31	-13.10	20.21	43.50	-23.29	-	-	peak
3	148.9175	29.10	-8.68	20.42	43.50	-23.08	-	-	peak
4	304.9548	34.65	-8.12	26.53	46.00	-19.47	-	-	peak
5	366.0866	34.15	-6.70	27.45	46.00	-18.55	-	-	peak
6	598.7067	31.78	-1.77	30.01	46.00	-15.99	-	-	peak

802.11a(Worst case)			
Test Channel	5240MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	71.7054	27.67	-11.14	16.53	40.00	-23.47	-	-	peak
2	142.7692	30.18	-9.20	20.98	43.50	-22.52	-	-	peak
3	322.5896	36.10	-7.62	28.48	46.00	-17.52	-	-	peak
4	368.6682	32.96	-6.63	26.33	46.00	-19.67	-	-	peak
5	527.5707	33.57	-3.45	30.12	46.00	-15.88	-	-	peak
6	703.7314	37.62	-1.02	36.60	46.00	-9.40	-	-	peak

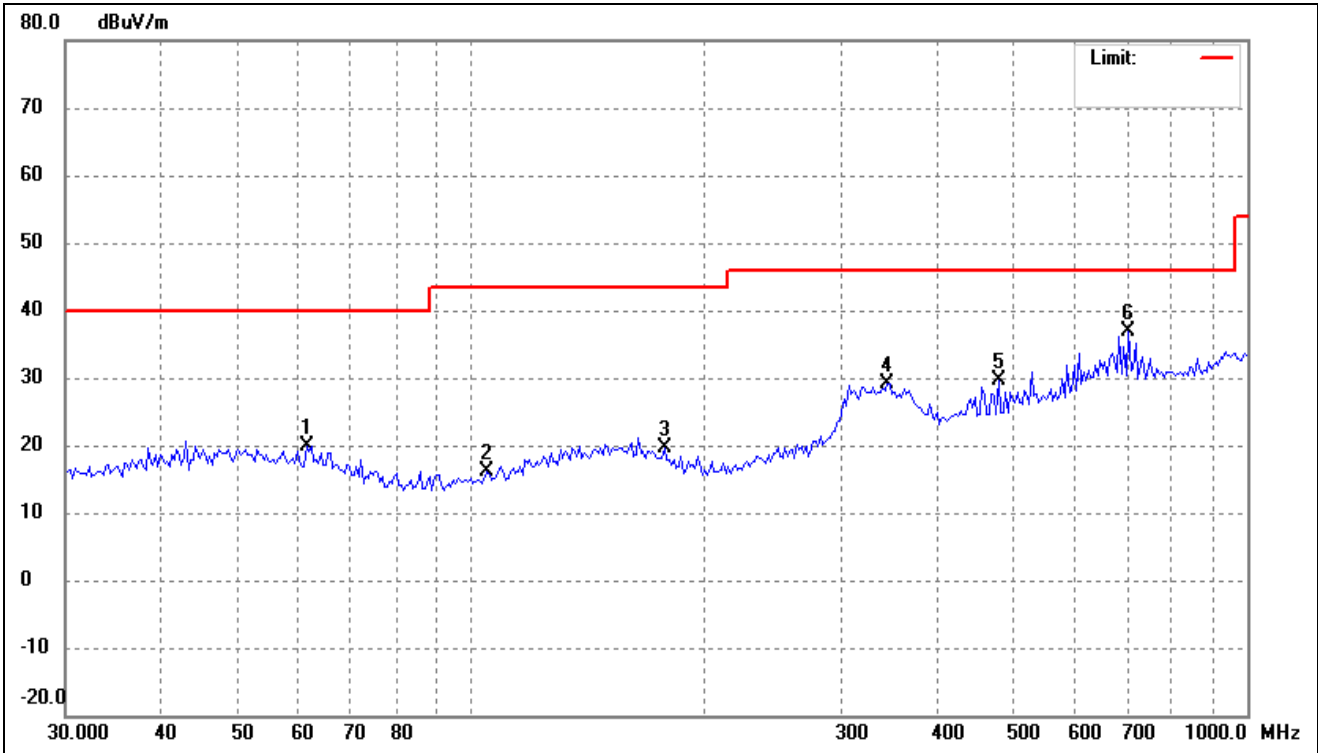
802.11a(Worst case)			
Test Channel	5240MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	86.0796	32.57	-13.04	19.53	40.00	-20.47	-	-	peak
2	120.6118	30.92	-10.49	20.43	43.50	-23.07	-	-	peak
3	227.0164	32.35	-11.76	20.59	46.00	-25.41	-	-	peak
4	288.2840	34.70	-8.66	26.04	46.00	-19.96	-	-	peak
5	346.0740	34.29	-7.18	27.11	46.00	-18.89	-	-	peak
6	527.5707	32.37	-3.45	28.92	46.00	-17.08	-	-	peak

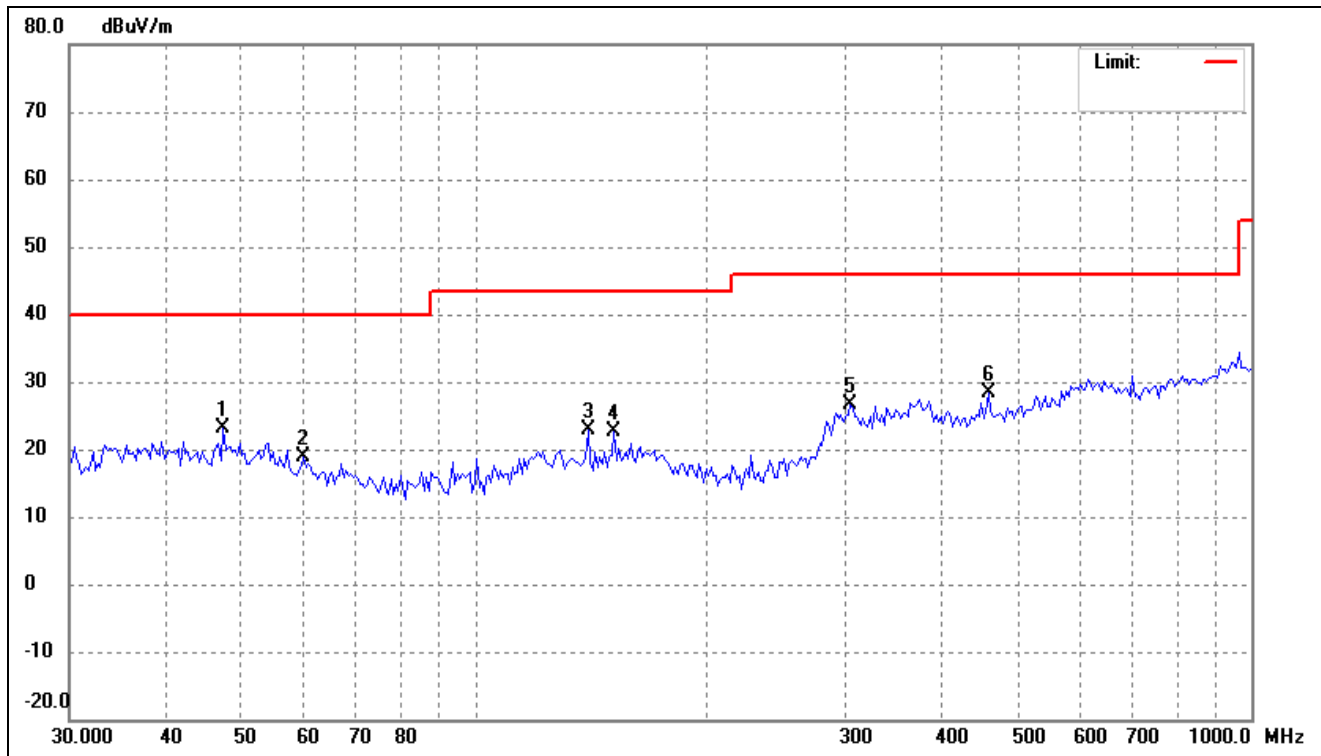
➤ 5725-5850MHz

802.11a(Worst case)			
Test Channel	5745MHz	Polarity:	Horizontal



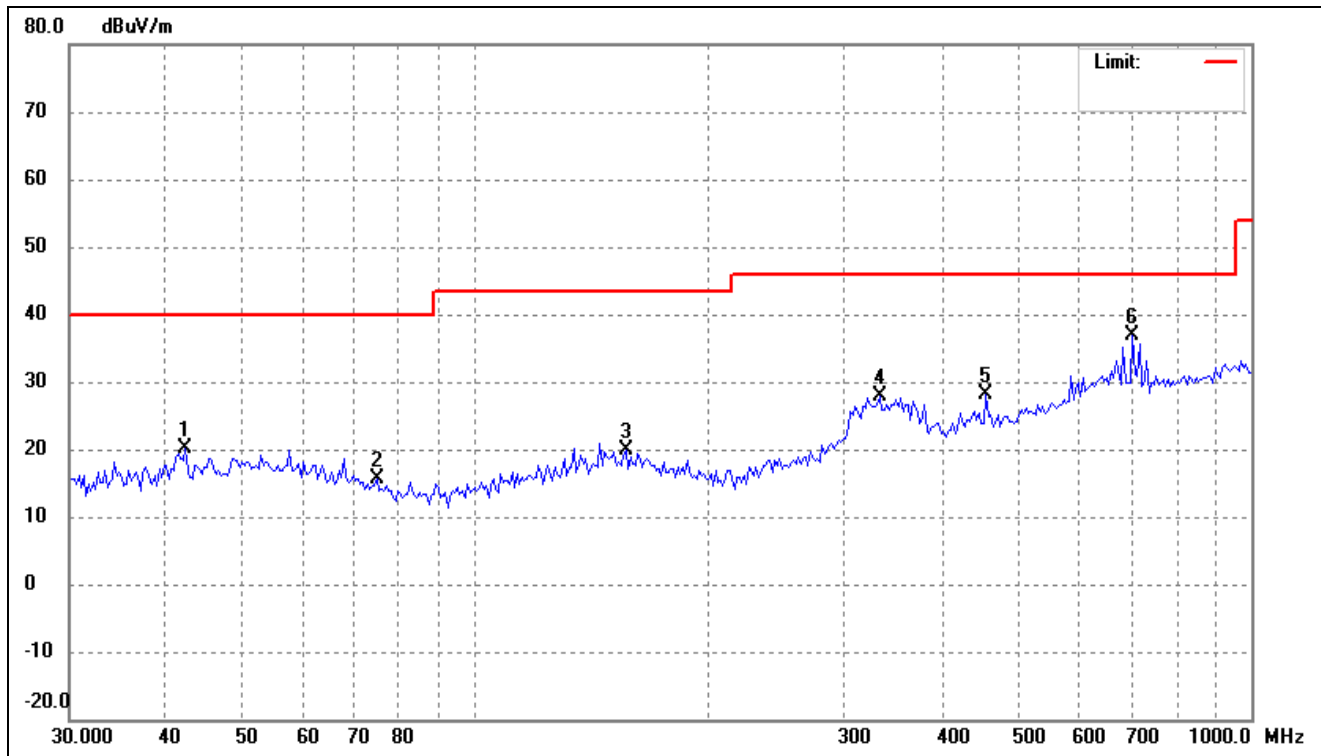
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	61.4343	29.16	-9.20	19.96	40.00	-20.04	-	-	peak
2	104.7979	28.12	-12.05	16.07	43.50	-27.43	-	-	peak
3	177.5179	29.49	-9.96	19.53	43.50	-23.97	-	-	peak
4	343.6506	36.44	-7.22	29.22	46.00	-16.78	-	-	peak
5	478.1394	33.90	-4.20	29.70	46.00	-16.30	-	-	peak
6	703.7314	37.95	-1.02	36.93	46.00	-9.07	-	-	peak

802.11a(Worst case)			
Test Channel	5745MHz	Polarity:	Vertical



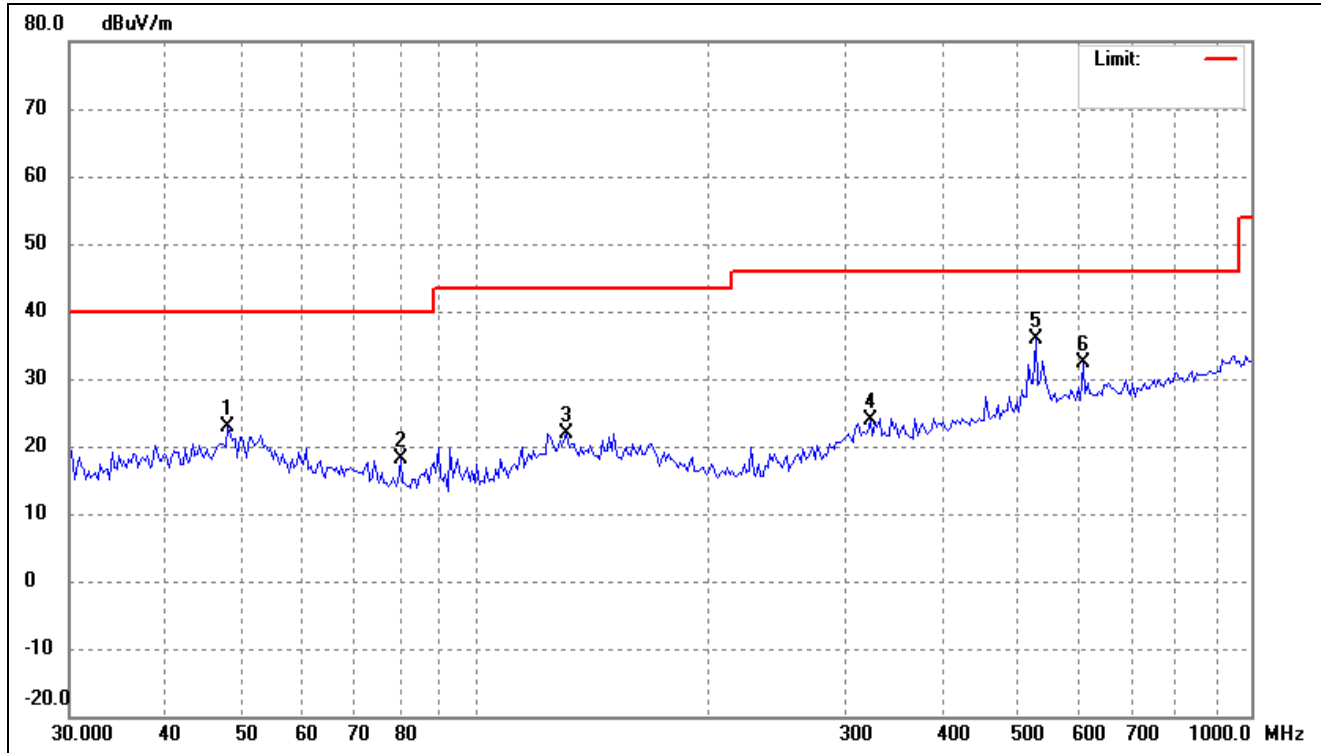
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.3688	31.44	-8.29	23.15	40.00	-16.85	-	-	peak
2	60.1528	27.95	-8.97	18.98	40.00	-21.02	-	-	peak
3	139.7909	32.30	-9.44	22.86	43.50	-20.64	-	-	peak
4	151.0252	31.34	-8.61	22.73	43.50	-20.77	-	-	peak
5	304.9548	34.63	-8.12	26.51	46.00	-19.49	-	-	peak
6	458.3987	32.92	-4.47	28.45	46.00	-17.55	-	-	peak

802.11a(Worst case)			
Test Channel	5785MHz	Polarity:	Horizontal



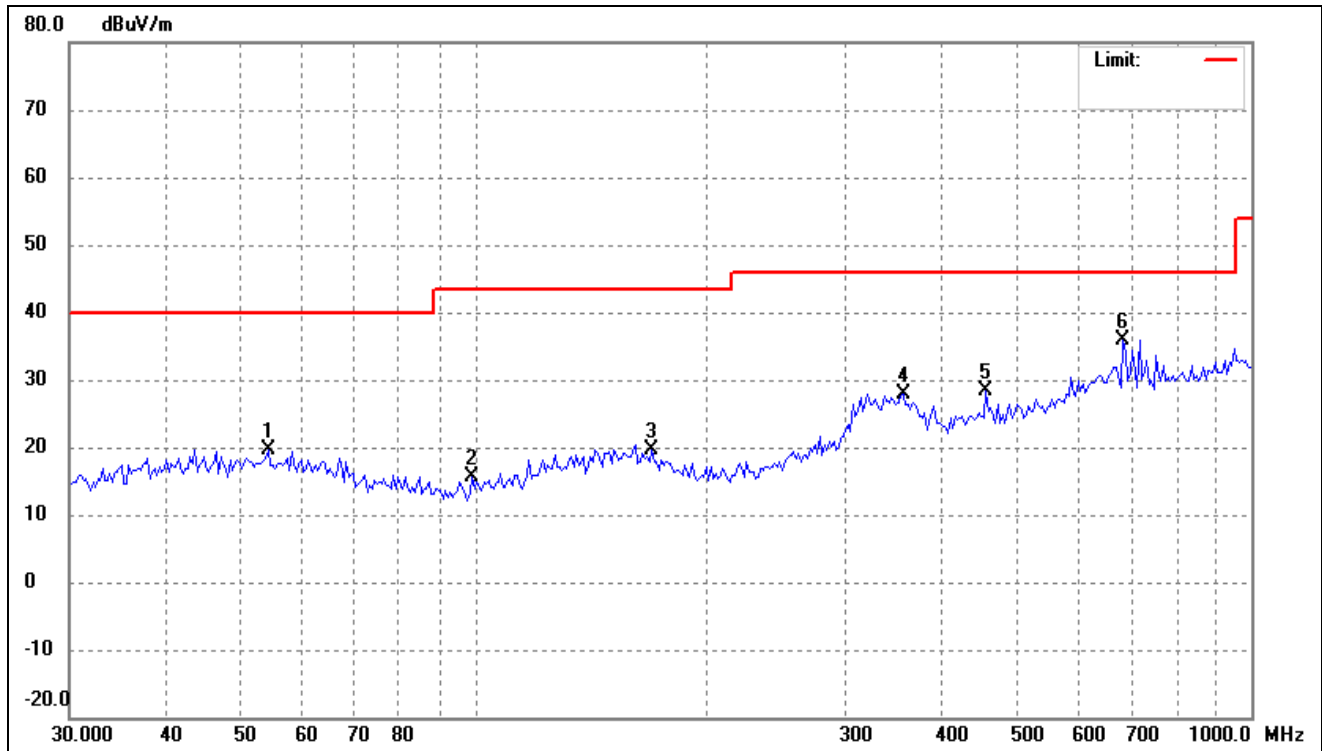
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.3314	28.59	-8.48	20.11	40.00	-19.89	-	-	peak
2	74.7934	27.48	-11.82	15.66	40.00	-24.34	-	-	peak
3	156.4259	28.48	-8.60	19.88	43.50	-23.62	-	-	peak
4	331.7858	35.30	-7.43	27.87	46.00	-18.13	-	-	peak
5	455.1888	32.60	-4.52	28.08	46.00	-17.92	-	-	peak
6	703.7314	37.81	-1.02	36.79	46.00	-9.21	-	-	peak

802.11a(Worst case)			
Test Channel	5785MHz	Polarity:	Vertical



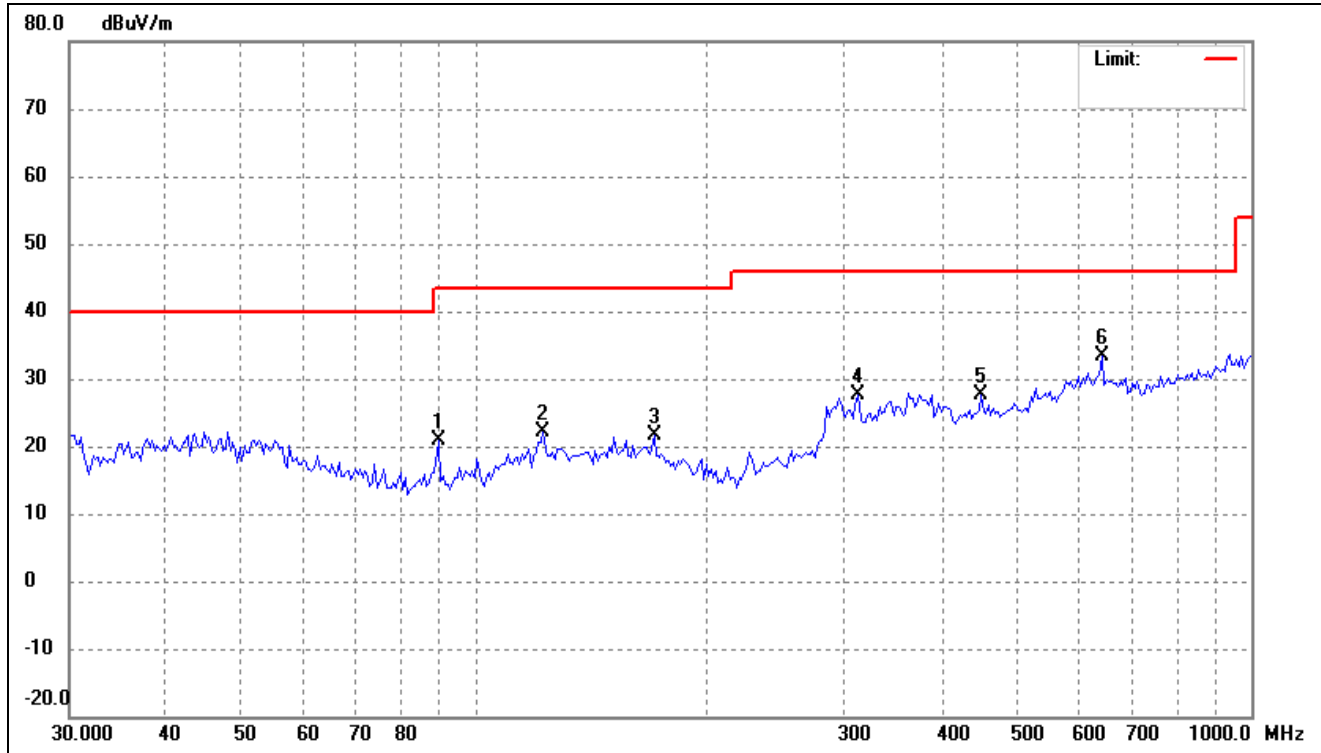
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.0392	31.09	-8.23	22.86	40.00	-17.14	-	-	peak
2	80.2383	31.01	-12.96	18.05	40.00	-21.95	-	-	peak
3	131.2236	31.75	-9.80	21.95	43.50	-21.55	-	-	peak
4	322.5896	31.62	-7.62	24.00	46.00	-22.00	-	-	peak
5	527.5707	39.39	-3.45	35.94	46.00	-10.06	-	-	peak
6	607.1806	34.12	-1.64	32.48	46.00	-13.52	-	-	peak

802.11a(Worst case)			
Test Channel	5825MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	54.1349	28.16	-8.54	19.62	40.00	-20.38	-	-	peak
2	99.0690	28.19	-12.54	15.65	43.50	-27.85	-	-	peak
3	168.9970	28.49	-8.85	19.64	43.50	-23.86	-	-	peak
4	355.9397	34.94	-6.96	27.98	46.00	-18.02	-	-	peak
5	455.1888	32.96	-4.52	28.44	46.00	-17.56	-	-	peak
6	684.2259	37.10	-1.20	35.90	46.00	-10.10	-	-	peak

802.11a(Worst case)			
Test Channel	5825MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	89.7866	34.10	-13.10	21.00	43.50	-22.50	-	-	peak
2	122.3189	32.59	-10.37	22.22	43.50	-21.28	-	-	peak
3	170.1888	30.45	-8.91	21.54	43.50	-21.96	-	-	peak
4	311.4519	35.63	-7.93	27.70	46.00	-18.30	-	-	peak
5	448.8361	32.36	-4.61	27.75	46.00	-18.25	-	-	peak
6	642.2923	34.63	-1.33	33.30	46.00	-12.70	-	-	peak

Remark: '-' Means the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5180MHz)							
10360	58.54	7.11	65.65	74	-8.35	H	PK
15540	41.55	8.22	49.77	54	-4.23	H	AV
10360	58.50	7.11	65.61	74	-8.39	V	PK
15540	38.02	8.22	46.24	54	-7.76	V	AV
Middle Channel (5200MHz)							
10400	58.24	7.22	65.46	74	-8.54	H	PK
15600	40.01	8.67	48.68	54	-5.32	H	AV
10400	57.52	7.22	64.74	74	-9.26	V	PK
15600	40.54	8.67	49.21	54	-4.79	V	AV
High Channel (5240MHz)							
10480	57.45	7.69	65.14	74	-8.86	H	PK
15720	40.20	8.93	49.13	54	-4.87	H	AV
10480	55.40	7.69	63.09	74	-10.91	V	PK
15720	40.90	8.93	49.83	54	-4.17	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	58.59	9.45	68.04	74	-5.96	H	PK
17235	39.35	10.36	49.71	54	-4.29	H	AV
11490	58.29	9.45	67.74	74	-6.26	V	PK
17235	38.85	10.36	49.21	54	-4.79	V	AV
Middle Channel (5785MHz)							
11570	58.91	9.62	68.53	74	-5.47	H	PK
17355	39.38	10.67	50.05	54	-3.95	H	AV
11570	57.81	9.62	67.43	74	-6.57	V	PK
17355	38.34	10.67	49.01	54	-4.99	V	AV
High Channel (5825MHz)							
11650	57.92	9.84	67.76	74	-6.24	H	PK
17475	38.23	10.95	49.18	54	-4.82	H	AV
11650	58.46	9.84	68.30	74	-5.70	V	PK
17475	38.08	10.95	49.03	54	-4.97	V	AV

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5180MHz)							
10360	58.11	7.11	65.22	74	-8.78	H	PK
15540	38.56	8.22	46.78	54	-7.22	H	AV
10360	58.67	7.11	65.78	74	-8.22	V	PK
15540	38.82	8.22	47.04	54	-6.96	V	AV
Middle Channel (5200MHz)							
10400	55.73	7.22	62.95	74	-11.05	H	PK
15600	39.05	8.67	47.72	54	-6.28	H	AV
10400	57.34	7.22	64.56	74	-9.44	V	PK
15600	39.73	8.67	48.40	54	-5.60	V	AV
High Channel (5240MHz)							
10480	55.20	7.69	62.89	74	-11.11	H	PK
15720	39.74	8.93	48.67	54	-5.33	H	AV
10480	58.67	7.69	66.36	74	-7.64	V	PK
15720	38.40	8.93	47.33	54	-6.67	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5745MHz)							
11490	55.56	9.45	65.01	74	-8.99	H	PK
17235	38.44	10.36	48.80	54	-5.20	H	AV
11490	57.13	9.45	66.58	74	-7.42	V	PK
17235	39.91	10.36	50.27	54	-3.73	V	AV
Middle Channel (5785MHz)							
11570	58.05	9.62	67.67	74	-6.33	H	PK
17355	38.48	10.67	49.15	54	-4.85	H	AV
11570	58.43	9.62	68.05	74	-5.95	V	PK
17355	38.66	10.67	49.33	54	-4.67	V	AV
High Channel (5825MHz)							
11650	58.36	9.84	68.20	74	-5.80	H	PK
17475	38.92	10.95	49.87	54	-4.13	H	AV
11650	56.31	9.84	66.15	74	-7.85	V	PK
17475	38.66	10.95	49.61	54	-4.39	V	AV

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5190MHz)							
10380	57.00	7.25	64.25	74	-9.75	H	PK
15570	41.49	8.33	49.82	54	-4.18	H	AV
10380	56.82	7.25	64.07	74	-9.93	V	PK
15570	40.57	8.33	48.90	54	-5.10	V	AV
High Channel (5230MHz)							
10460	57.28	7.54	64.82	74	-9.18	H	PK
15690	40.74	8.86	49.60	54	-4.40	H	AV
10460	56.95	7.54	64.49	74	-9.51	V	PK
15690	41.53	8.86	50.39	54	-3.61	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	56.93	9.65	66.58	74	-7.42	H	PK
17265	38.93	10.87	49.80	54	-4.20	H	AV
11510	58.16	9.65	67.81	74	-6.19	V	PK
17265	39.72	10.87	50.59	54	-3.41	V	AV
High Channel (5795MHz)							
11590	57.94	9.81	67.75	74	-6.25	H	PK
17385	39.99	10.89	50.88	54	-3.12	H	AV
11590	58.06	9.81	67.87	74	-6.13	V	PK
17385	39.44	10.89	50.33	54	-3.67	V	AV

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11ac VHT80)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5210MHz							
10420	57.72	7.33	65.05	74	-8.95	H	PK
15630	40.31	8.75	49.06	54	-4.94	H	AV
10420	55.67	7.33	63.00	74	-11.00	V	PK
15630	40.93	8.75	49.68	54	-4.32	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5775MHz							
11550	55.11	9.54	64.65	74	-9.35	H	PK
17325	39.79	10.59	50.38	54	-3.62	H	AV
11550	58.63	9.54	68.17	74	-5.83	V	PK
17325	39.56	10.59	50.15	54	-3.85	V	AV

Note: Testing is carried out with frequency rang 9kHz to 40Ghz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

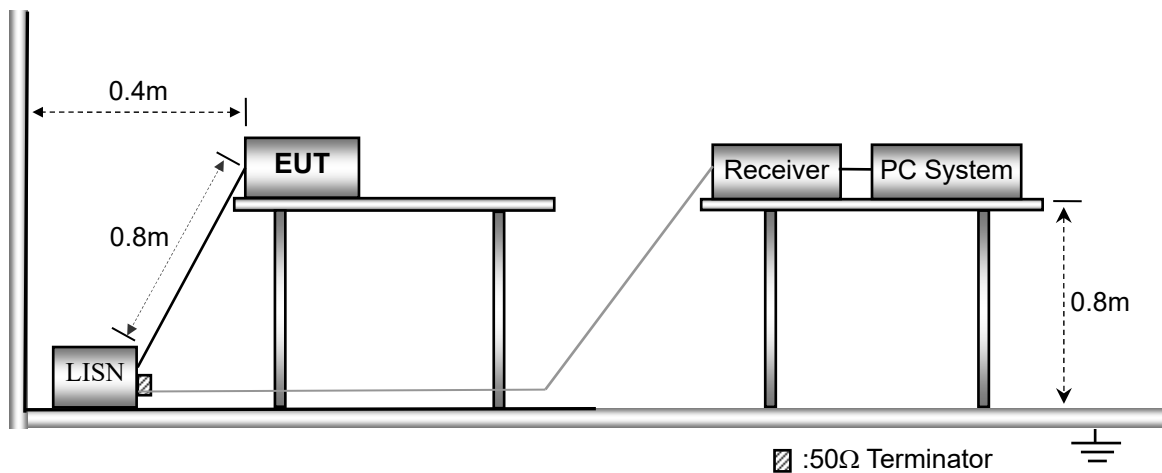
6. Conducted Emissions

6.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

6.2 Basic Test Setup Block Diagram



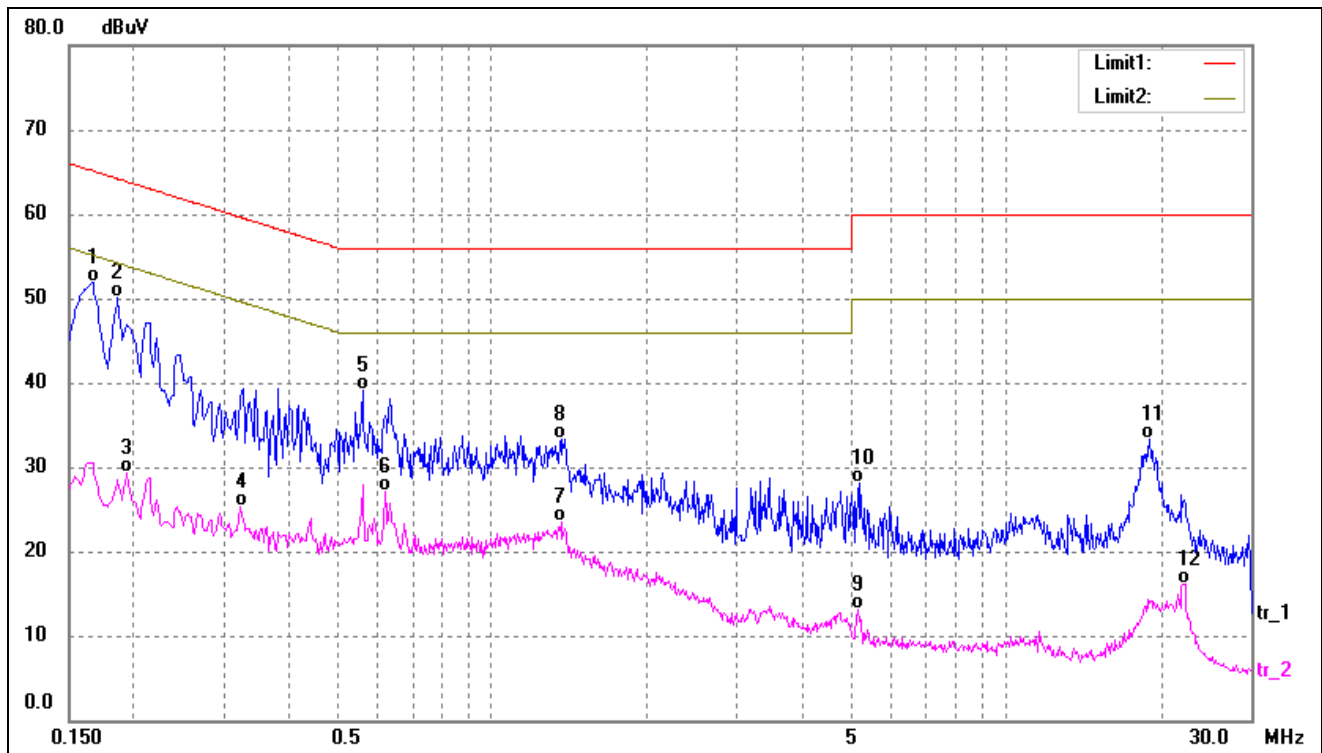
6.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	150kHz
Stop Frequency	30MHz
Sweep Speed	Auto
IF Bandwidth	10kHz
Quasi-Peak Adapter Bandwidth	9kHz
Quasi-Peak Adapter Mode	Normal

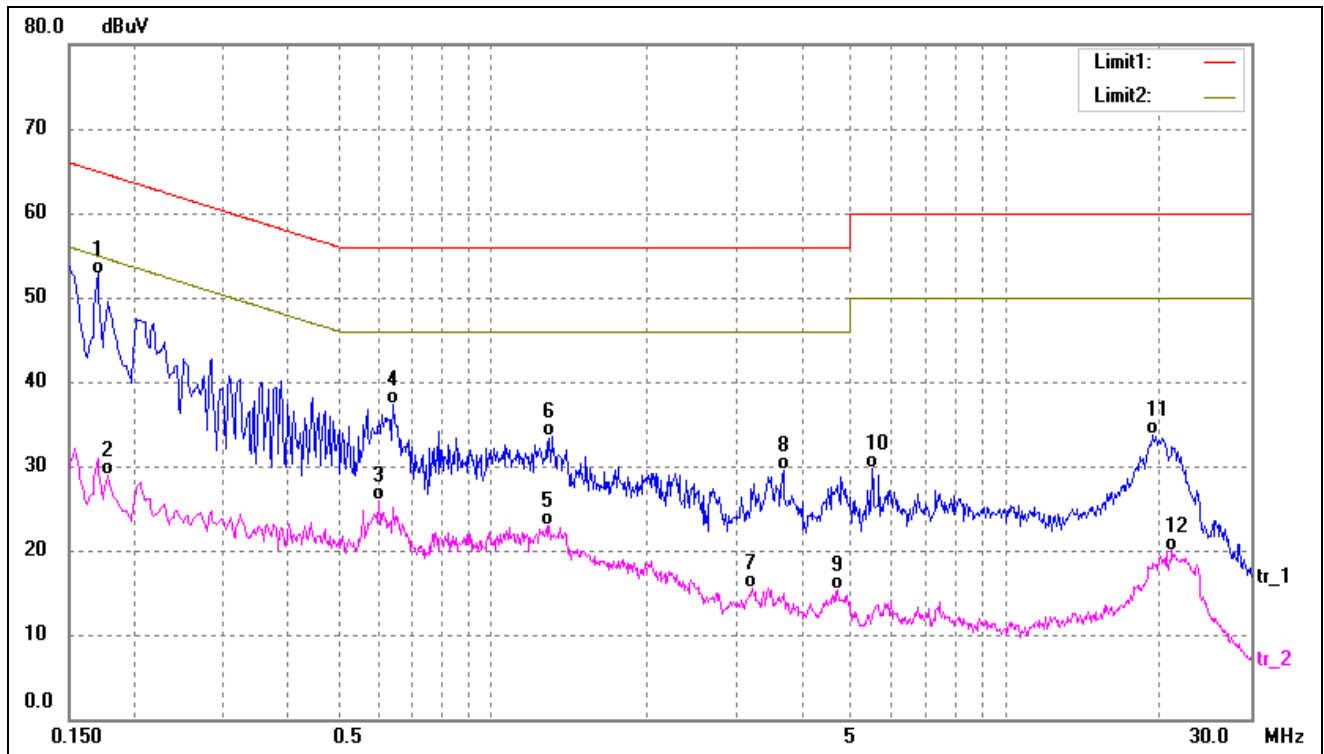
6.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1660	41.44	10.40	51.84	65.15	-13.31	QP
2	0.1859	39.61	10.40	50.01	64.21	-14.20	QP
3	0.1940	18.91	10.39	29.30	53.86	-24.56	AVG
4	0.3220	15.09	10.30	25.39	49.65	-24.26	AVG
5	0.5580	28.89	10.22	39.11	56.00	-16.89	QP
6	0.6179	16.89	10.21	27.10	46.00	-18.90	AVG
7	1.3620	13.47	10.08	23.55	46.00	-22.45	AVG
8	1.3700	23.22	10.07	33.29	56.00	-22.71	QP
9	5.1459	2.66	10.38	13.04	50.00	-36.96	AVG
10	5.1939	17.75	10.38	28.13	60.00	-31.87	QP
11	19.0500	22.93	10.35	33.28	60.00	-26.72	QP
12	22.3260	5.83	10.34	16.17	50.00	-33.83	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1700	42.40	10.40	52.80	64.96	-12.16	QP
2	0.1780	18.42	10.39	28.81	54.58	-25.77	AVG
3	0.6020	15.59	10.22	25.81	46.00	-20.19	AVG
4	0.6420	27.06	10.20	37.26	56.00	-18.74	QP
5	1.2780	12.85	10.10	22.95	46.00	-23.05	AVG
6	1.3060	23.42	10.09	33.51	56.00	-22.49	QP
7	3.2220	5.35	10.14	15.49	46.00	-30.51	AVG
8	3.6900	19.30	10.20	29.50	56.00	-26.50	QP
9	4.7020	4.95	10.34	15.29	46.00	-30.71	AVG
10	5.4980	19.26	10.38	29.64	60.00	-30.36	QP
11	19.4100	23.43	10.36	33.79	60.00	-26.21	QP
12	21.0540	9.64	10.36	20.00	50.00	-30.00	AVG

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

***** END OF REPORT *****