

TEST REPORT

Reference No...... : WTX23X11243517W001
FCC ID : 2A8YA-NW5000
Applicant : SYSMAX Innovations Co., Ltd.
Address : Unit 6355,5/F,No.1021 Gaopu Road,Tianhe District,Guangzhou,510653,
Guangdong,China
Manufacturer : Sysmax Power Technology.LLC
Address : Room 401, Building 2, No. 2, Huahong East Street, Gaopu Town, Dongguan
City, Guangdong Province
Product Name : Carbon Fiber Magnetic Wireless Power Bank
Model No...... : NW5000
Standards : FCC Part 15.207&15.209
Date of Receipt sample : 2023-11-15
Date of Test..... : 2023-11-15 to 2023-12-14
Date of Issue : 2023-12-14
Test Report Form No. : WTX_Part 15_207_209W
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.

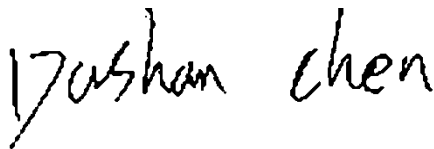
Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

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TABLE OF CONTENTS

1. GENERAL INFORMATION	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
1.2 TEST STANDARDS.....	5
1.3 TEST METHODOLOGY	5
1.4 TEST FACILITY	5
1.5 EUT SETUP AND OPERATION MODE	6
1.6 MEASUREMENT UNCERTAINTY	7
1.7 TEST EQUIPMENT LIST AND DETAILS	8
2. SUMMARY OF TEST RESULTS.....	11
3. ANTENNA REQUIREMENT	12
3.1 STANDARD APPLICABLE	12
3.2 TEST RESULT.....	12
4. CONDUCTED EMISSIONS	13
4.1 TEST PROCEDURE	13
4.2 BASIC TEST SETUP BLOCK DIAGRAM	13
4.3 ENVIRONMENTAL CONDITIONS	13
4.4 SUMMARY OF TEST RESULTS/PLOTS.....	13
5. RADIATED EMISSION.....	16
5.1 STANDARD APPLICABLE	16
5.2 TEST PROCEDURE	16
5.3 TEST RECEIVER SETUP	18
5.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	18
5.5 ENVIRONMENTAL CONDITIONS	18
5.6 SUMMARY OF TEST RESULTS/PLOTS.....	18
6. OCCUPIED BANDWIDTH	25
6.1 STANDARD APPLICABLE	25
6.2 TEST PROCEDURE	25
6.3 ENVIRONMENTAL CONDITIONS	25
6.4 SUMMARY OF TEST RESULTS/PLOTS.....	25
APPENDIX PHOTOGRAPHS.....	27

Report version

Version No.	Date of issue	Description
Rev.00	2023-12-14	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Carbon Fiber Magnetic Wireless Power Bank
Trade Name:	NITECORE
Model No.:	NW5000
Adding Model(s):	/
Rated Voltage:	Battery Capacity: 5000mAh(19.25Wh) Type C Input: 5V, 9V, 12V Type C output: 5V, 9V, 12V Wireless Charger: 5W/7.5W/10W/15W Total Output: 15W Max
Rated Current:	Input : 2.4A/ 2A/1.5A Output : 2.4A/ 2.22A/1.67A
Rated Power:	Wireless Output : 5W, 7.5W, 10W, 15W Total Output: 15W Max
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	110-205KHz
Antenna Type:	Coil Antenna

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.207: Conducted limits.

FCC Rules Part 15.209: Radiated emission limits; general requirements.

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

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, 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 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.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List			
Test Mode	Description	Remark	Power Supply Mode
TM1	Wireless Charging	Output 5W	/
TM2	Wireless Charging	Output 15W	/

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	0.45	Unshielded	Without Ferrite

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Wireless charging tester	YBZ	YBZ wireless charging tester	/
Adapter	Xiaomi	MDY-08-ES	/
Smart phone	Apple	iPhone 12 Pro Max	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Radiated 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 $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	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
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
☒ 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 1003	LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

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

Description of Test	Result
§15.203Antenna Requirement	Compliant
§15.207 (a) Conducted Emission	Compliant
§15.209 Radiated Emission	Compliant

N/A: not applicable.

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 Test Result

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

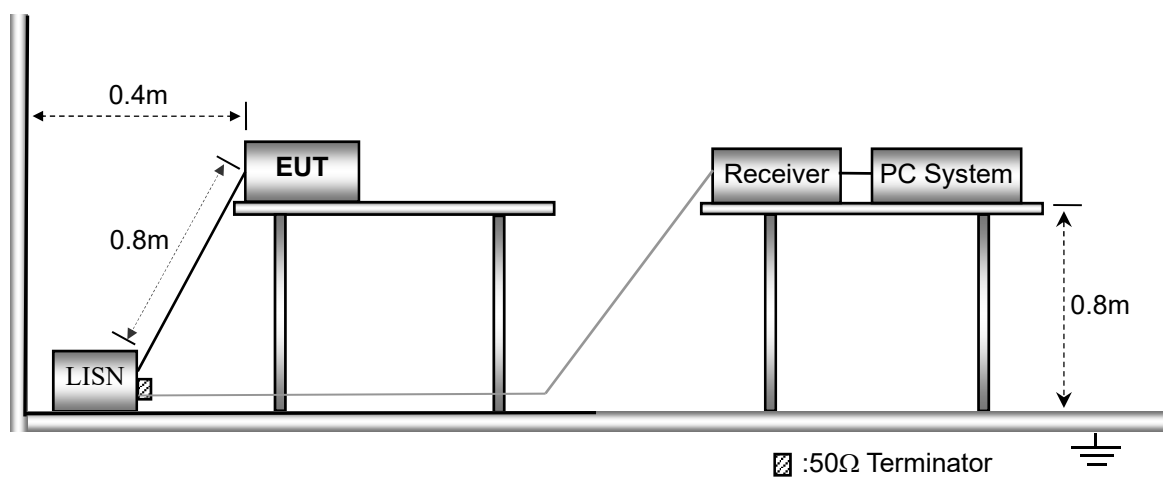
4. Conducted Emissions

4.1 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.

4.2 Basic Test Setup Block Diagram

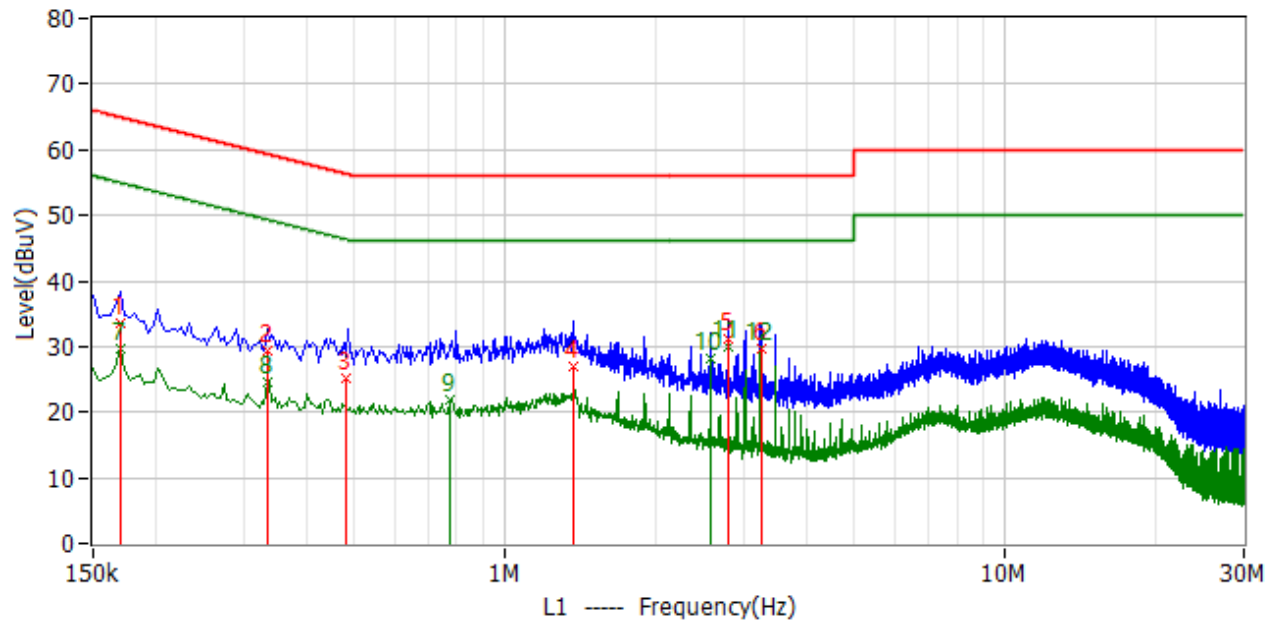


4.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

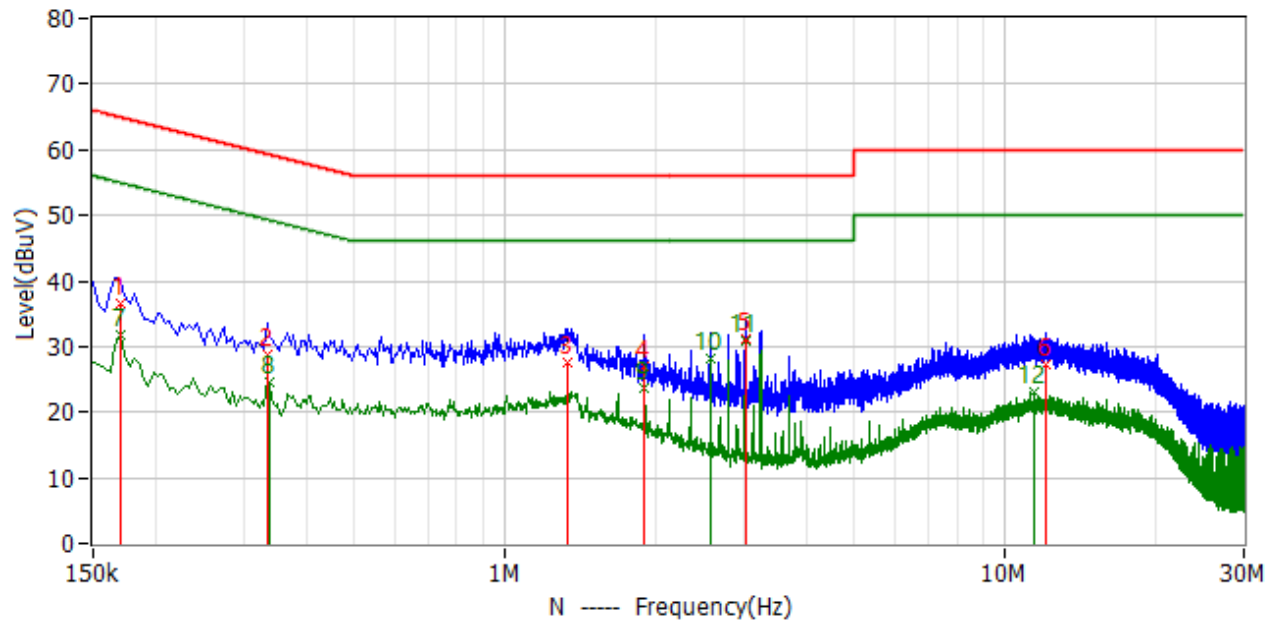
4.4 Summary of Test Results/Plots

Test mode:	TM1	Polarity:	Line
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	170.000kHz	12.8	20.8	33.6	65.0	-31.3	QP
2	334.000kHz	8.9	20.4	29.3	59.4	-30.1	QP
3	482.000kHz	4.5	20.7	25.2	56.3	-31.1	QP
4	1.370MHz	6.2	20.8	27.0	56.0	-29.0	QP
5	2.798MHz	10.3	20.9	31.2	56.0	-24.8	QP
6	3.246MHz	8.9	20.9	29.8	56.0	-26.2	QP
7*	170.000kHz	8.8	20.8	29.6	55.0	-25.4	AV
8*	334.000kHz	4.2	20.4	24.6	49.4	-24.7	AV
9*	778.000kHz	1.2	20.8	22.0	46.0	-24.0	AV
10*	2.574MHz	7.4	20.9	28.3	46.0	-17.7	AV
11*	2.798MHz	9.0	20.9	29.9	46.0	-16.1	AV
12*	3.246MHz	8.9	20.9	29.8	46.0	-16.2	AV

Test mode:	TM1	Polarity:	Neutral
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	170.000kHz	15.8	20.8	36.6	65.0	-28.3	QP
2	334.000kHz	8.5	20.4	28.9	59.4	-30.4	QP
3	1.338MHz	6.8	20.8	27.6	56.0	-28.4	QP
4	1.902MHz	6.3	20.8	27.1	56.0	-28.9	QP
5	3.022MHz	10.2	20.9	31.1	56.0	-24.9	QP
6	12.078MHz	6.5	20.8	27.3	60.0	-32.7	QP
7*	170.000kHz	10.9	20.8	31.7	55.0	-23.2	AV
8*	338.000kHz	4.1	20.4	24.5	49.3	-24.7	AV
9*	1.902MHz	2.9	20.8	23.7	46.0	-22.3	AV
10*	2.574MHz	7.3	20.9	28.2	46.0	-17.8	AV
11*	3.022MHz	9.9	20.9	30.8	46.0	-15.2	AV
12*	11.410MHz	2.2	20.8	23.0	50.0	-27.0	AV

5. RADIATED EMISSION

5.1 Standard Applicable

According to 15.209(a), radiated emission limits; General requirements.

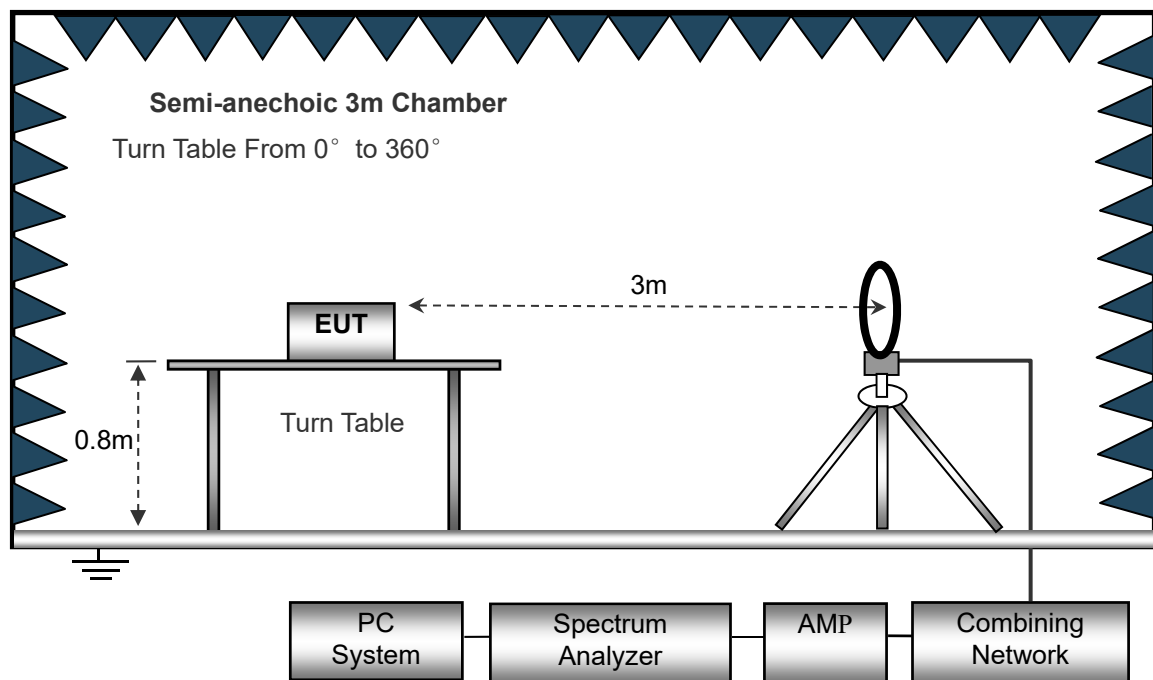
Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

5.2 Test Procedure

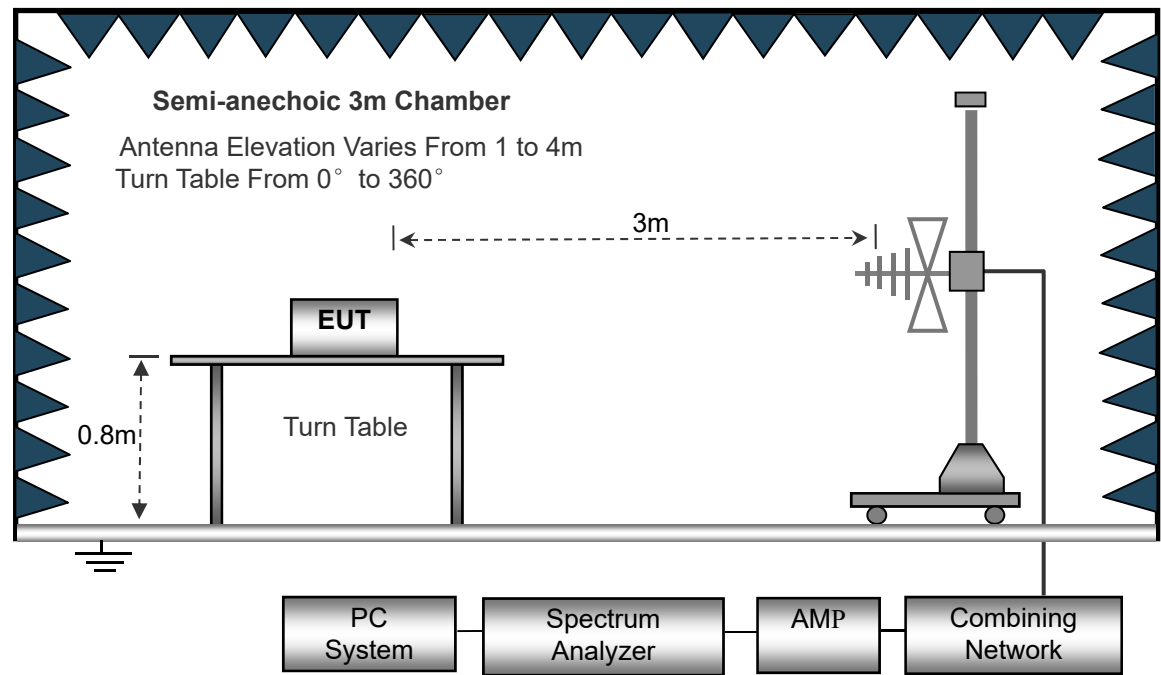
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.

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.

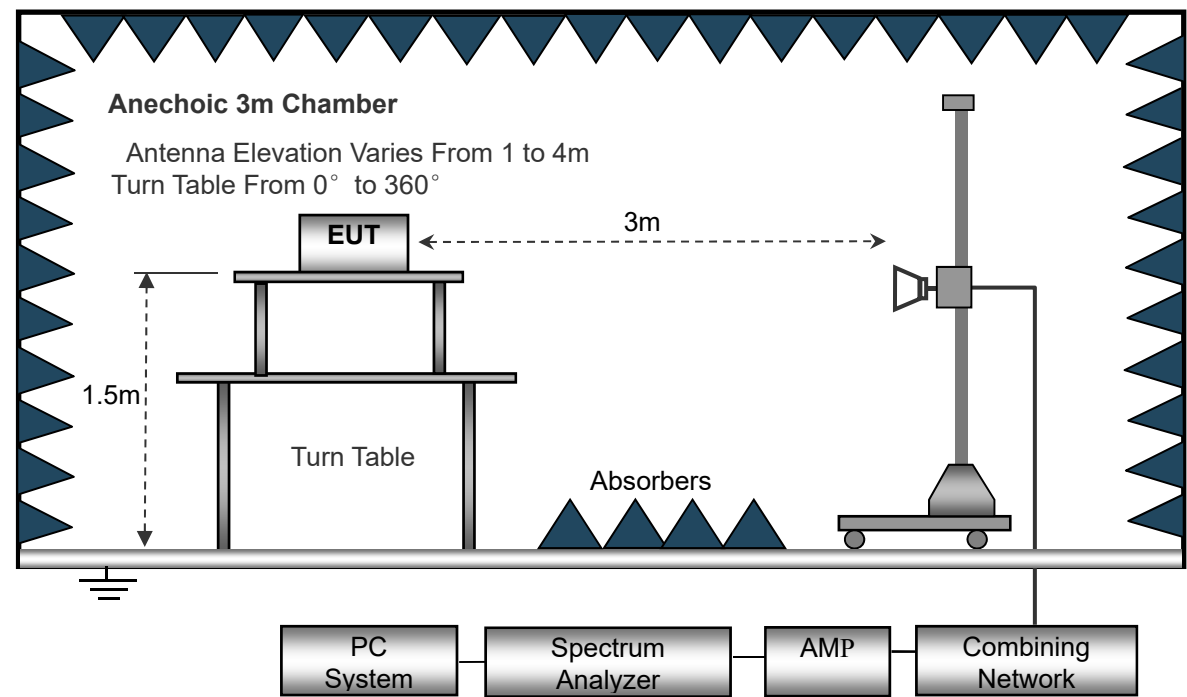
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1GHz.



5.3 Test Receiver Setup

Frequency: 9kHz-30MHz

RBW=10 kHz,

VBW =30 kHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency: 30MHz-1GHz

RBW=120 kHz,

VBW=300 kHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency: Above 1GHz

RBW=1MHz,

VBW=3MHz (Peak), 10Hz (AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

5.4 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

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 a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.209(a) Limit}$$

5.5 Environmental Conditions

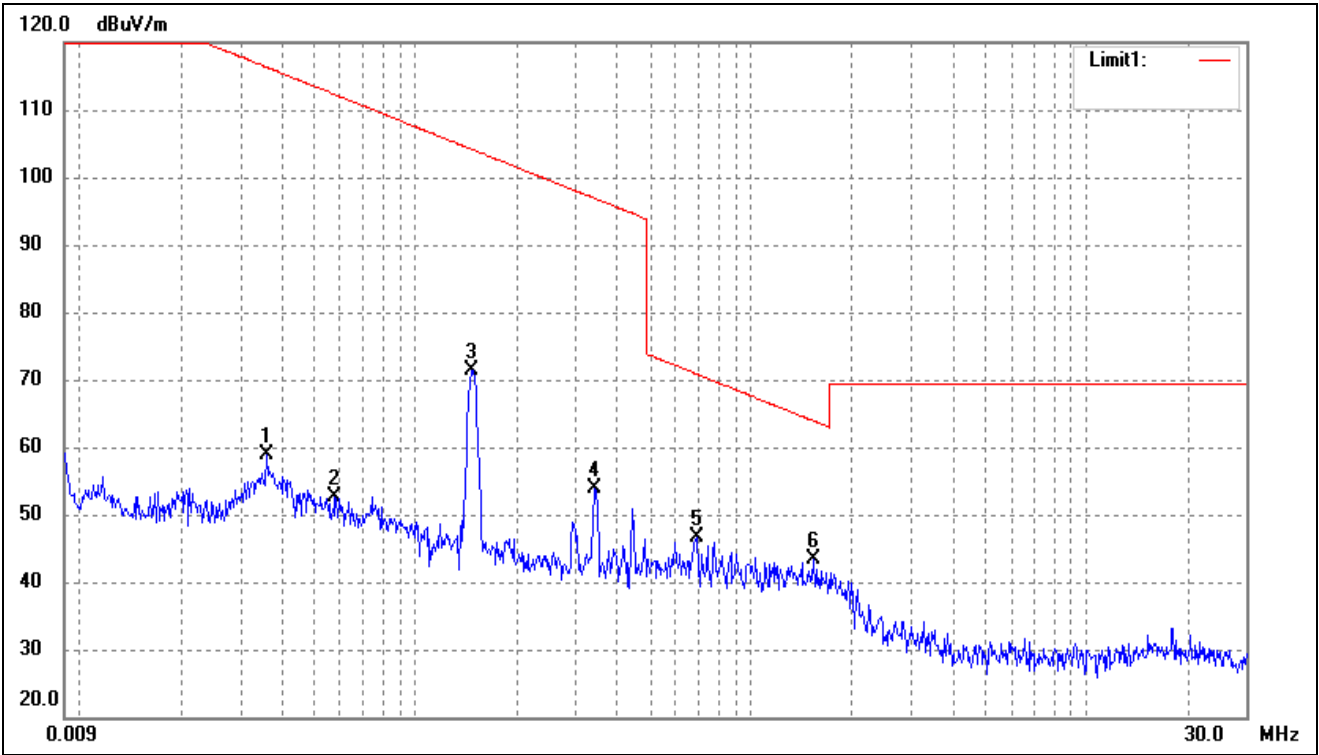
Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

5.6 Summary of Test Results/Plots

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

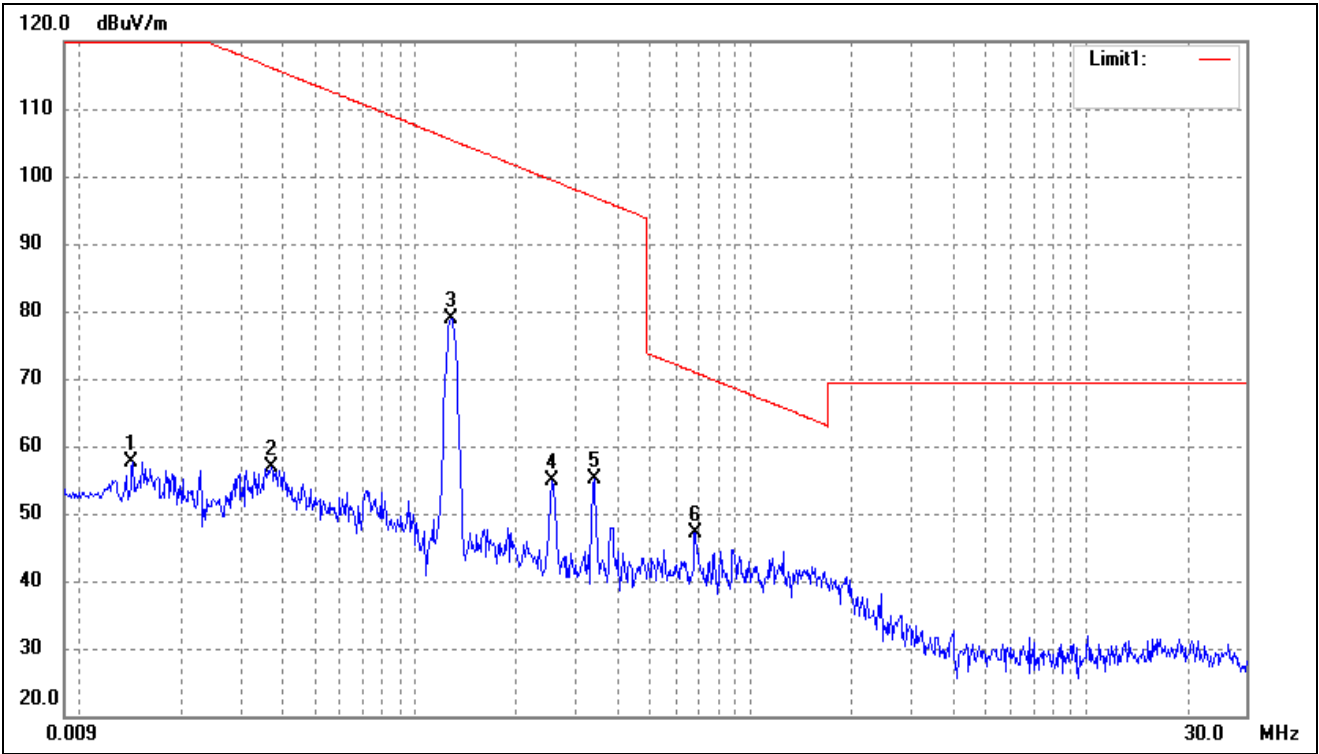
➤ Below 30MHz

Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuA)	Correct dB	Result (dBuA)	Limit (dBuA)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0359	64.95	-6.19	58.76	116.36	-57.60	-	-	peak
2	0.0577	58.28	-5.75	52.53	112.27	-59.74	-	-	peak
3	0.1476	77.79	-6.34	71.45	104.16	-32.71	-	-	peak
4	0.3436	61.77	-7.77	54.00	96.86	-42.86	-	-	peak
5	0.6902	53.32	-6.67	46.65	70.83	-24.18	-	-	peak
6	1.5405	49.52	-6.11	43.41	63.88	-20.47	-	-	peak

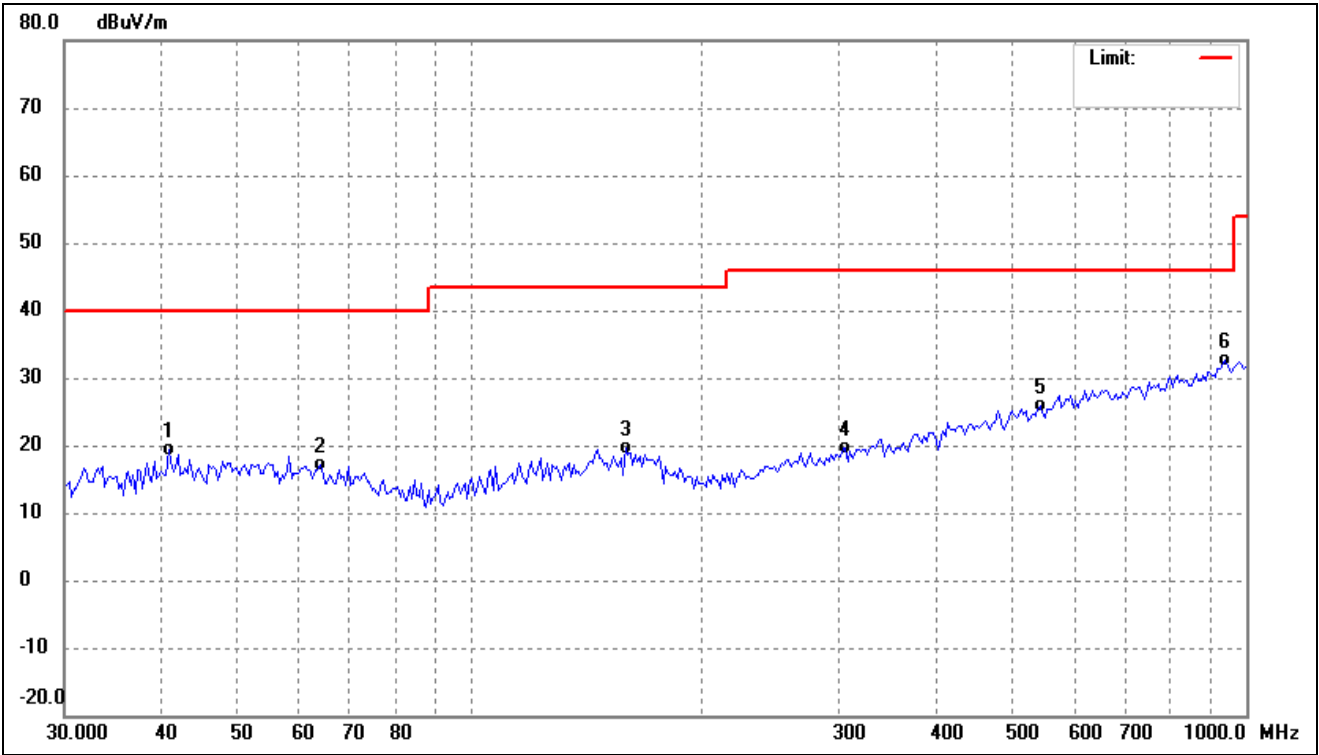
Test mode:	TM2	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuA)	Correct dB	Result (dBuA)	Limit (dBuA)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0143	64.75	-7.01	57.74	124.39	-66.65	-	-	peak
2	0.0371	62.91	-6.13	56.78	116.14	-59.36	-	-	peak
3	0.1277	85.39	-6.45	78.94	105.44	-26.50	-	-	peak
4	0.2565	62.67	-7.69	54.98	99.40	-44.42	-	-	peak
5	0.3407	62.86	-7.77	55.09	96.95	-41.86	-	-	peak
6	0.6844	53.84	-6.70	47.14	70.91	-23.77	-	-	peak

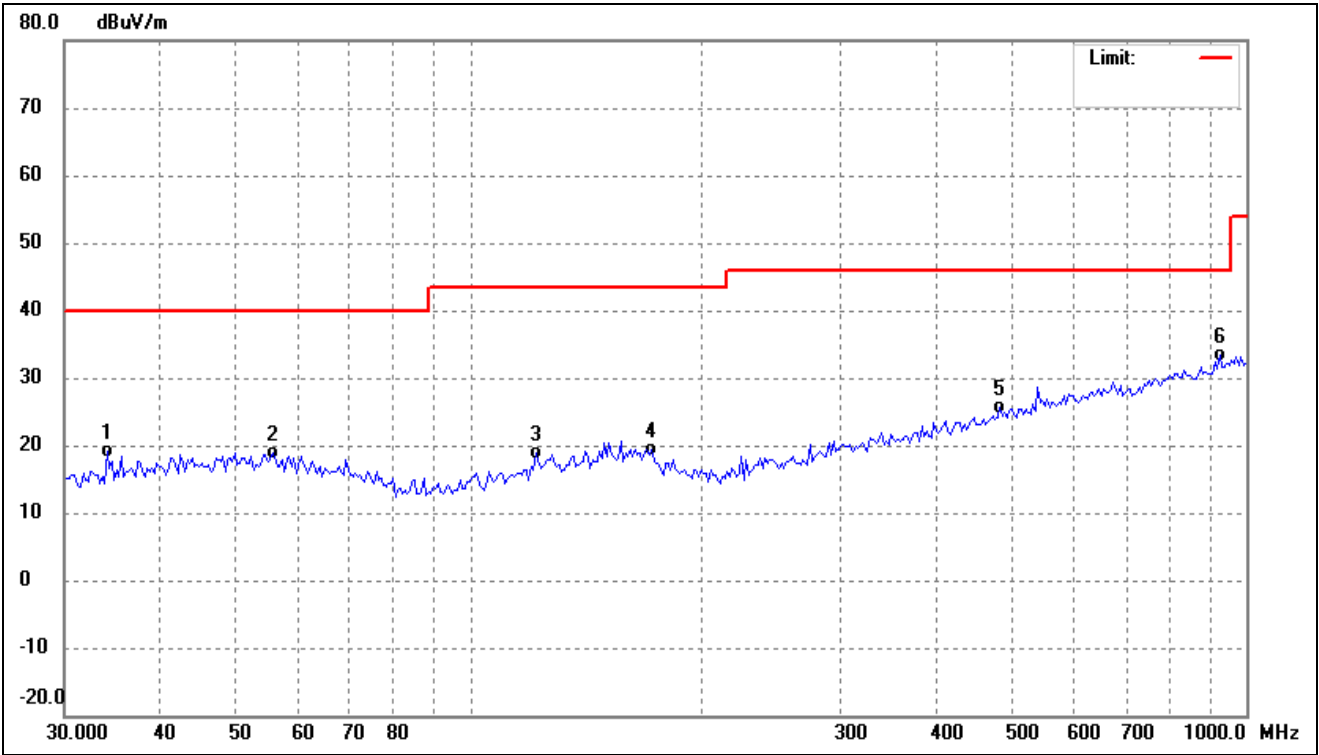
➤ 30MHz-1GHz

Test mode:	TM1	Polarity:	Horizontal
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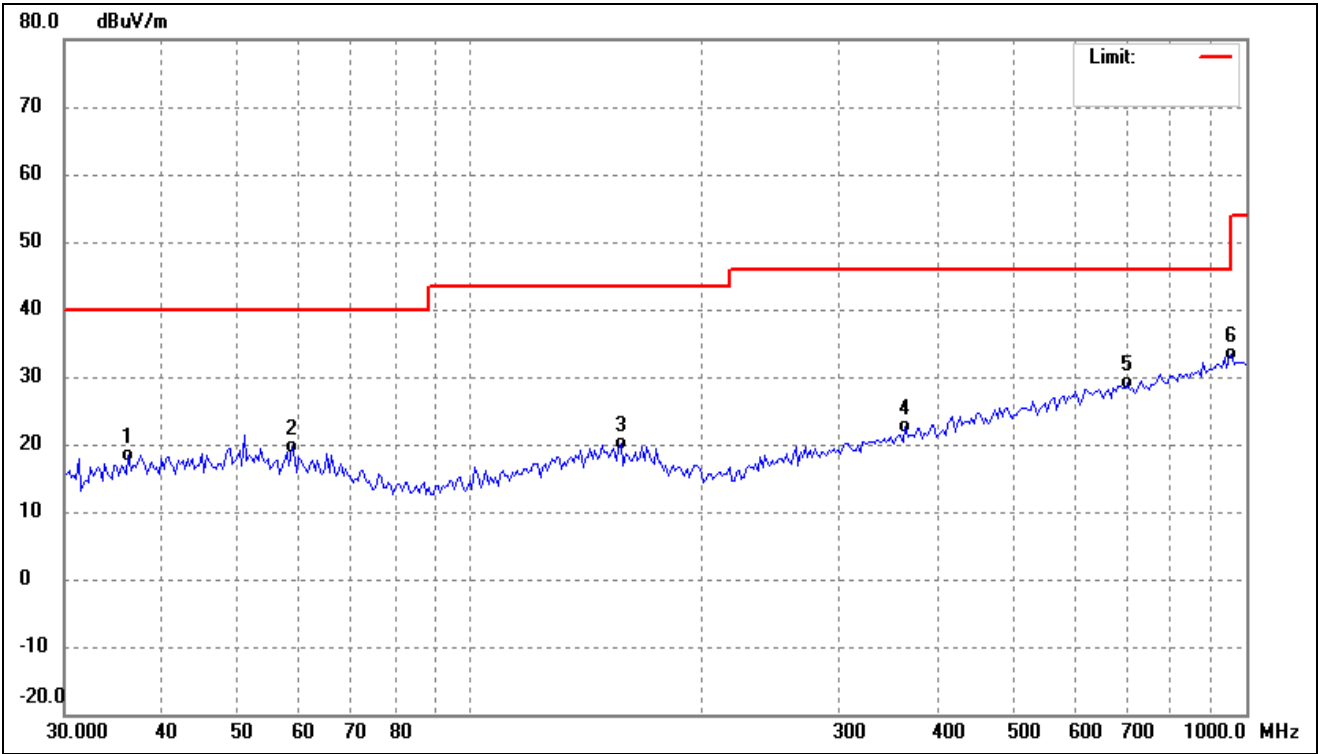
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	40.8698	27.87	-8.47	19.40	40.00	-20.60	-	-	QP
2	64.0799	26.74	-9.68	17.06	40.00	-22.94	-	-	QP
3	158.6397	28.12	-8.61	19.51	43.50	-23.99	-	-	QP
4	304.9547	27.87	-8.12	19.75	46.00	-26.25	-	-	QP
5	542.6103	28.87	-3.05	25.82	46.00	-20.18	-	-	QP
6	938.7139	30.60	2.01	32.61	46.00	-13.39	-	-	QP

Test mode:	TM1	Polarity:	Vertical
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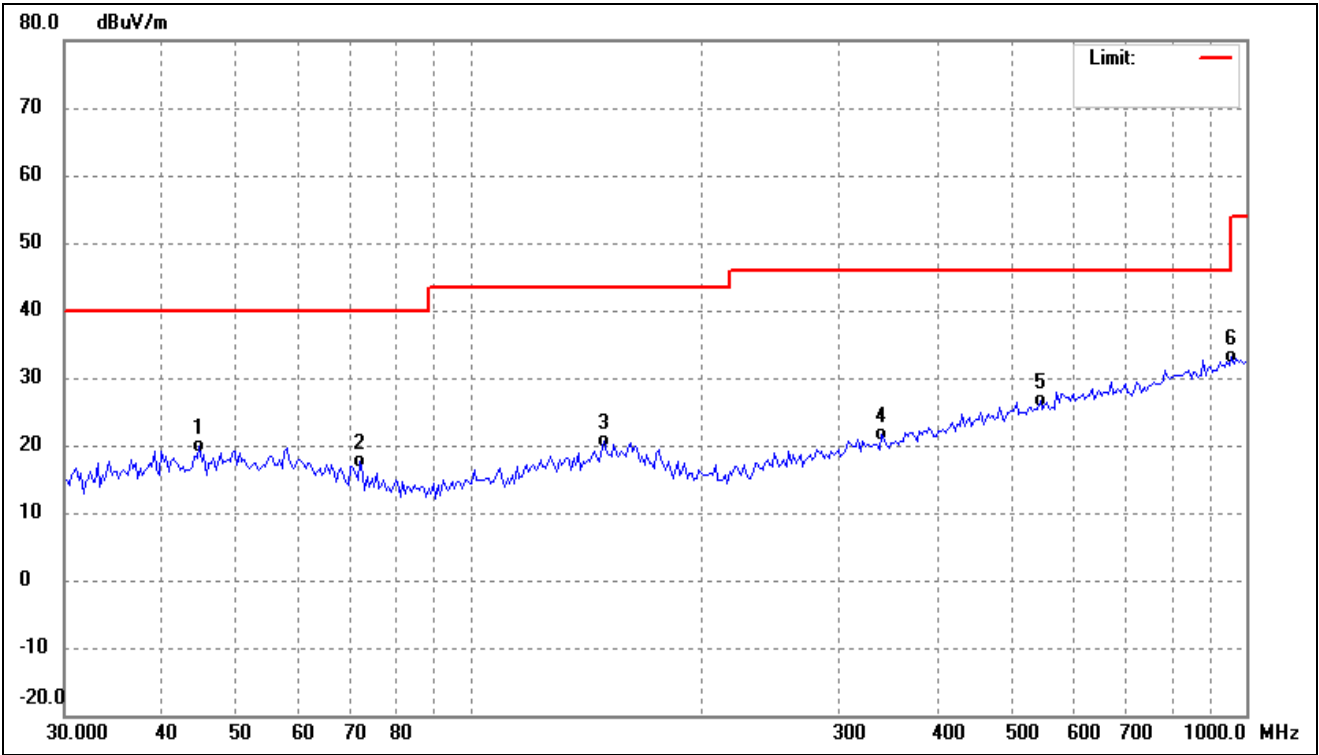
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	34.0451	28.90	-9.67	19.23	40.00	-20.77	-	-	QP
2	55.6781	27.46	-8.67	18.79	40.00	-21.21	-	-	QP
3	121.4623	29.21	-10.43	18.78	43.50	-24.72	-	-	QP
4	171.3889	28.44	-9.08	19.36	43.50	-24.14	-	-	QP
5	481.5112	29.71	-4.15	25.56	46.00	-20.44	-	-	QP
6	925.6131	31.55	1.74	33.29	46.00	-12.71	-	-	QP

Test mode:	TM2	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	36.2678	27.59	-9.28	18.31	40.00	-21.69	-	-	QP
2	58.8979	28.42	-8.87	19.55	40.00	-20.45	-	-	QP
3	156.4258	28.85	-8.60	20.25	43.50	-23.25	-	-	QP
4	363.5230	29.37	-6.76	22.61	46.00	-23.39	-	-	QP
5	703.7314	30.12	-1.02	29.10	46.00	-16.90	-	-	QP
6	958.7134	31.01	2.26	33.27	46.00	-12.73	-	-	QP

Test mode:	TM2	Polarity:	Vertical
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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	44.7793	28.41	-8.47	19.94	40.00	-20.06	-	-	QP
2	72.2110	28.80	-11.26	17.54	40.00	-22.46	-	-	QP
3	148.9173	29.22	-8.68	20.54	43.50	-22.96	-	-	QP
4	338.8545	28.87	-7.31	21.56	46.00	-24.44	-	-	QP
5	542.6103	29.59	-3.05	26.54	46.00	-19.46	-	-	QP
6	958.7134	30.96	2.26	33.22	46.00	-12.78	-	-	QP

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

6. Occupied Bandwidth

6.1 Standard Applicable

According to 15.215,20dB emission bandwidth.

6.2 Test Procedure

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

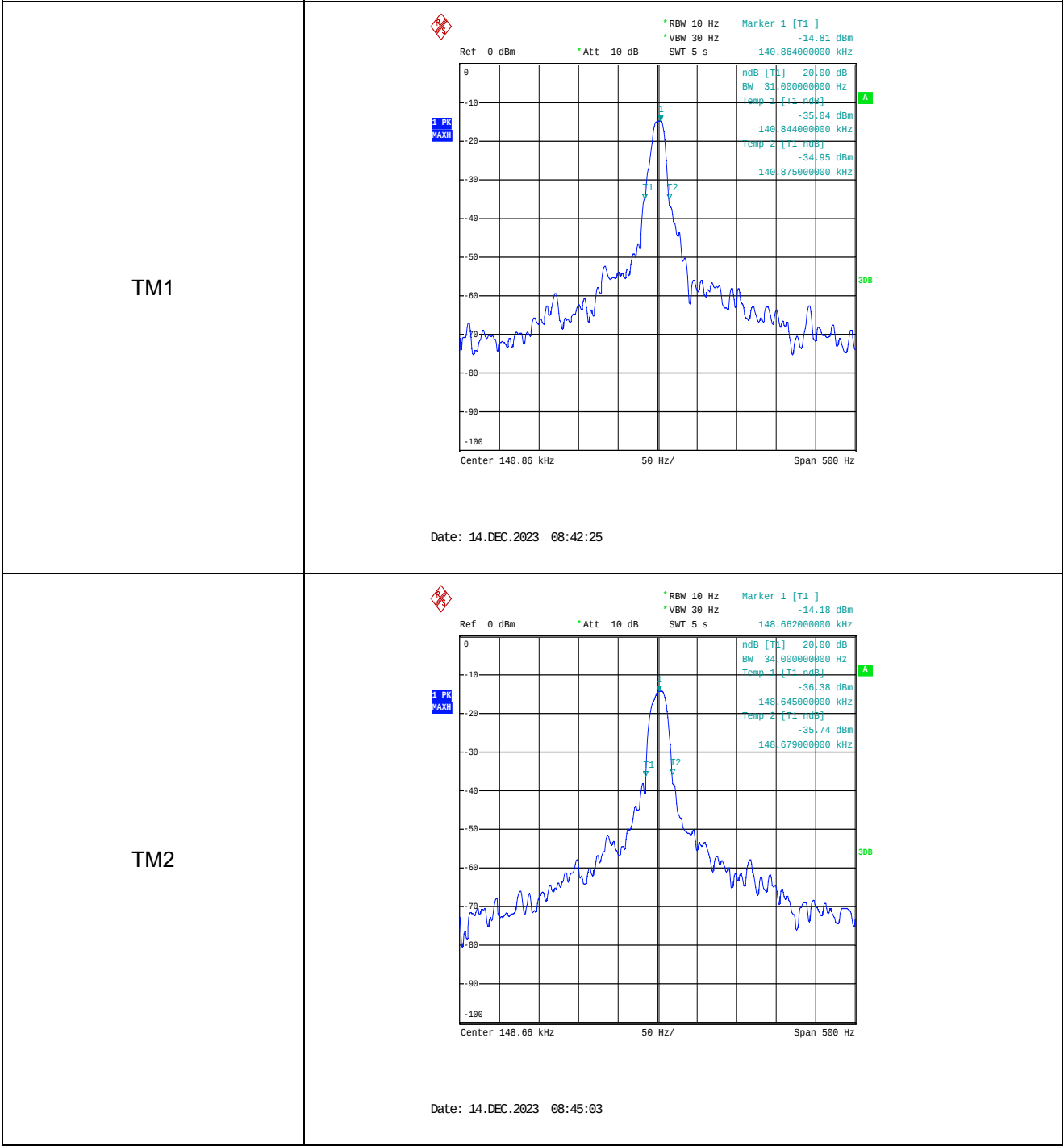
6.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

Test mode	Test Channel(kHz)	20dB Bandwidth(Hz)
TM1	112.0210	26.40
TM2	112.0210	26.40

Please refer to the attached plots.



Note: The RBW of the analyzer measuring Bandwidth cannot be adjusted to 1%-5% OBW, the RBW of the test setting is the closest value.

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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