



RF TEST REPORT

Applicant Ningbo Seago Electric Co.,Ltd
FCC ID 2BC87-BD0060EBCOE
Product glister Multi-action Power Toothbrush
Model BD0060EBC0E
Report No. R2401A0067-R1V3
Issue Date August 20, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2023)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	June 3, 2024
Rev.1	Updated information and data.	July 25, 2024
Rev.2	Updated data.	July 26, 2024
Rev.3	Updated data.	August 20, 2024

Note: This revised report (Report No.: R2401A0067-R1V3) supersedes and replaces the previously issued report (Report No.: R2401A0067-R1V2). Please discard or destroy the previously issued report and dispose of it accordingly.

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	Occupied Bandwidth	§2.1049 §15.215	PASS
2	Radiated Emissions Measurement	§15.201(a), §15.205(a), §15.209(a), §15.215(a)	PASS
3	AC Conducted Emissions	§15.207(a)	PASS

Date of Testing: January 24, 2024 ~ January 25, 2024 and August 16, 2024

Date of Sample Received: January 22, 2024

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.

Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China

City: Shanghai

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E-mail: Jack.Fan@cpt.eurofinscn.com

2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

Applicant	Ningbo Seago Electric Co.,Ltd
Applicant address	No.239 Jianghu Road, Jiangbei District, Ningbo, China
Manufacturer	Ningbo Seago Electric Co.,Ltd
Manufacturer address	No.239 Jianghu Road, Jiangbei District, Ningbo, China

2.2. General Information

EUT Description	
Model	BD0060EBCOE
Lab internal SN	R2401A0067/S01
HW Version	/
SW Version	/
Power Supply	AC adapter
Test Mode	Wireless charge
Operating Frequency Range(s)	50 kHz ~ 90 kHz
State DC voltage	5 VDC
EUT Accessory	
Cable	Manufacturer: / Model: / 100cm Cable, Shielded
Auxiliary Test Equipment	
Adapter	Manufacturer: HUAWEI Model: HW-050450C00
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.	

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15C (2023) Radio Frequency Devices

ANSI C63.10-2013

4. Test Configuration

Test Mode

Test Mode for Reverse Charging	
Mode 1:	base station in stand-by, idle mode
Mode 2:	Communication before charging, adjustment charging mode / position
Mode 3:	Communication
Mode 4:	energy transmission
During the test, the preliminary test was performed in all modes, mode 4 is selected as the worst condition. The test data of the worst-case condition was recorded in this report.	

5. Test Case Results

5.1. Occupied Bandwidth

Ambient Condition

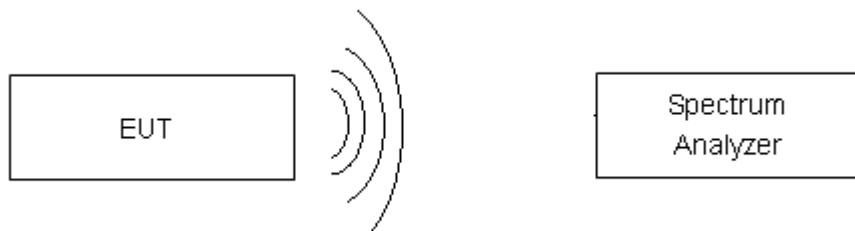
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through space. RBW is set to 1 kHz; VBW is set to 3 kHz on spectrum analyzer.

Detector=Peak, Trace mode=max hold.

Test Setup

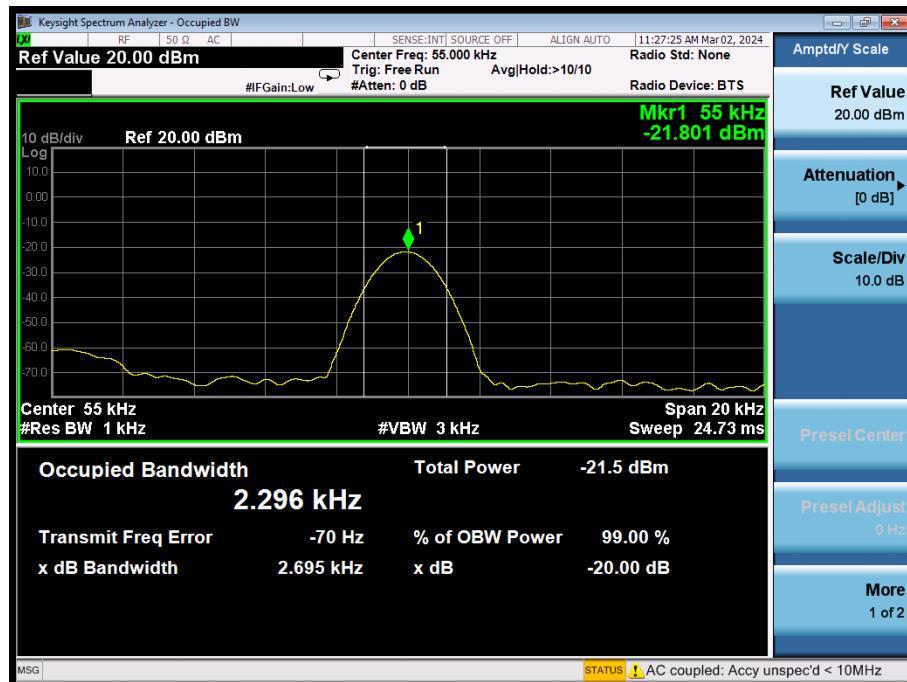


Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:

Test Method	Modulation	Operating Frequency(kHz)			OBW (kHz)	Results
		F _L	F _H	F _C		
Radiated	on	53.852	--	55.00	2.296	Pass
Radiated	on	--	91.333	89.89	2.885	Pass



5.2. Radiates Emission

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m or 10 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

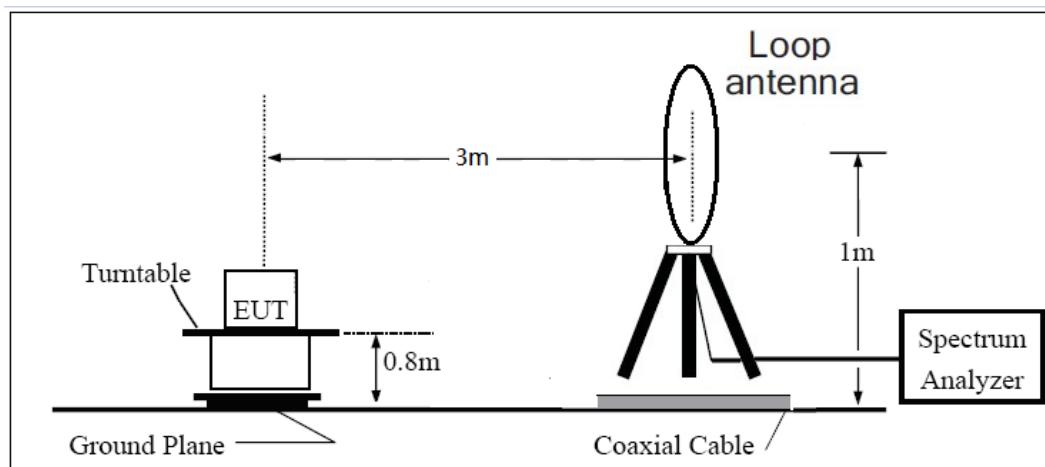
Below 30MHz

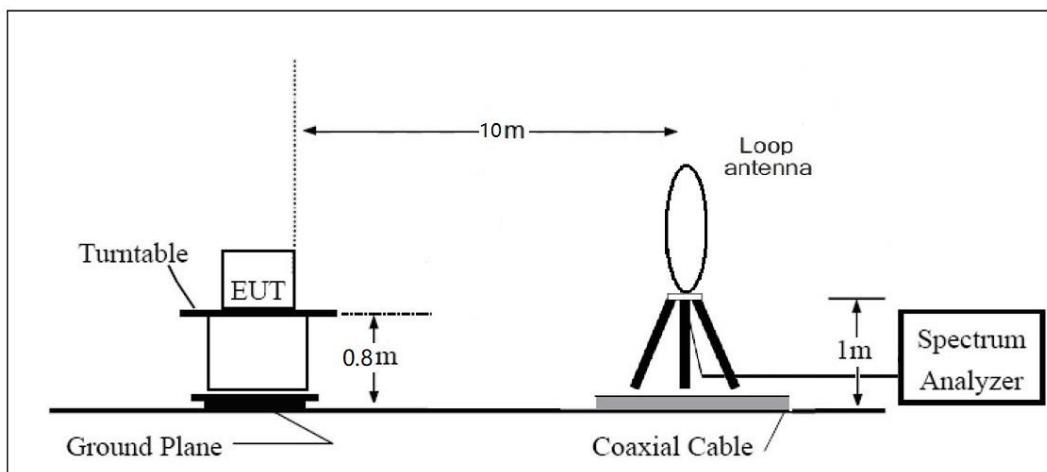
RBW=9 KHz, VBW=30 KHz,

detector; The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test setup

9kHz ~ 30MHz





Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(μ V/m)	Field strength(dB μ V/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dB μ V/m

Average Limit=54 dB μ V/m

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

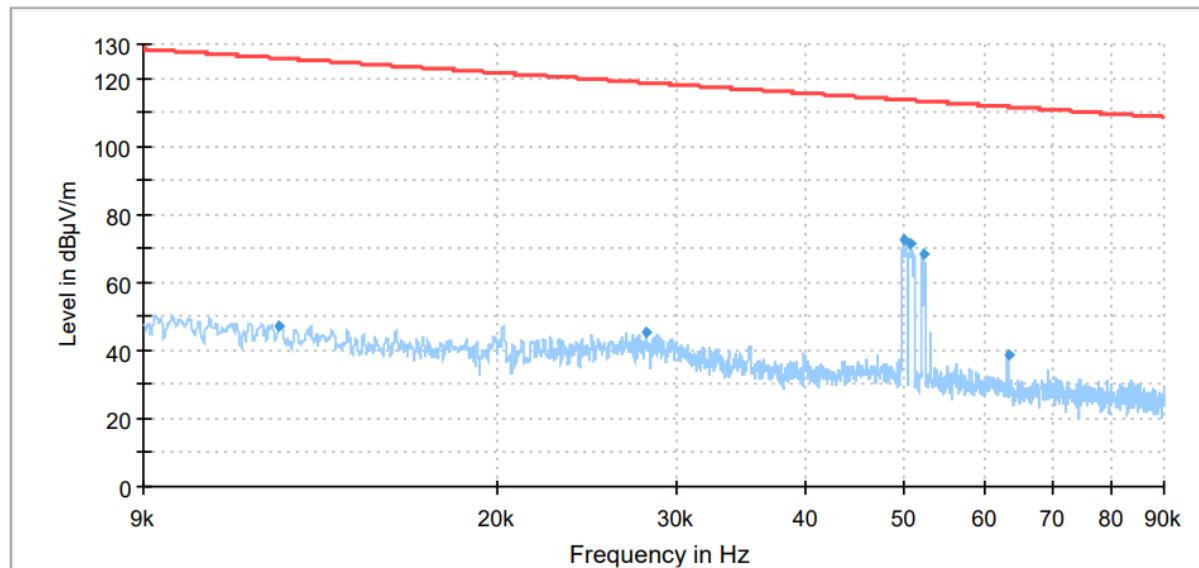
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

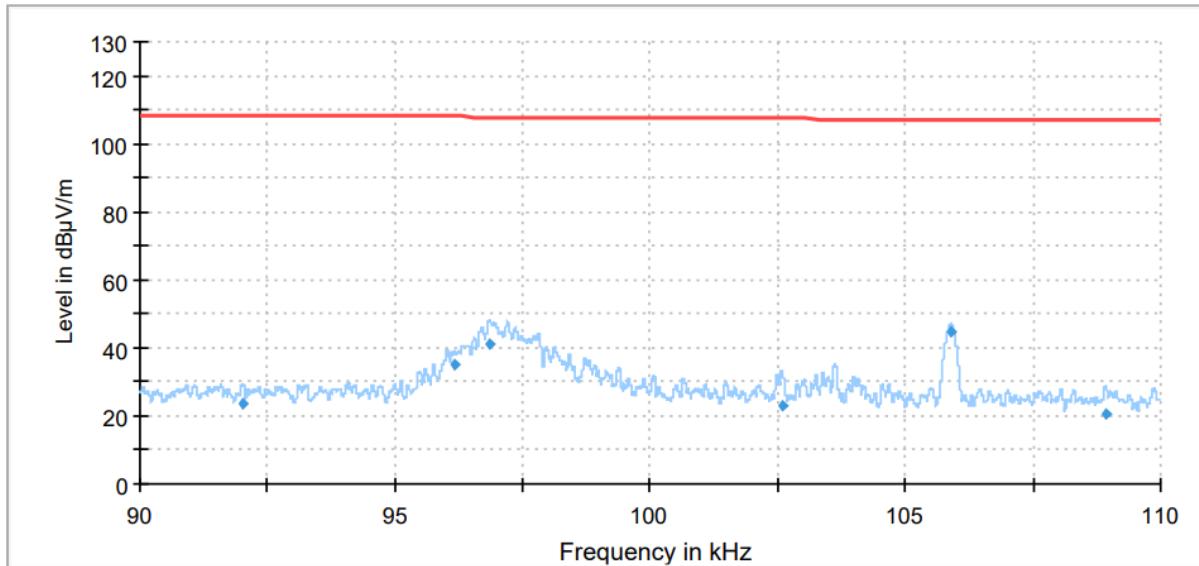
Frequency	Uncertainty
9KHz-30MHz	3.55 dB

Test Results:

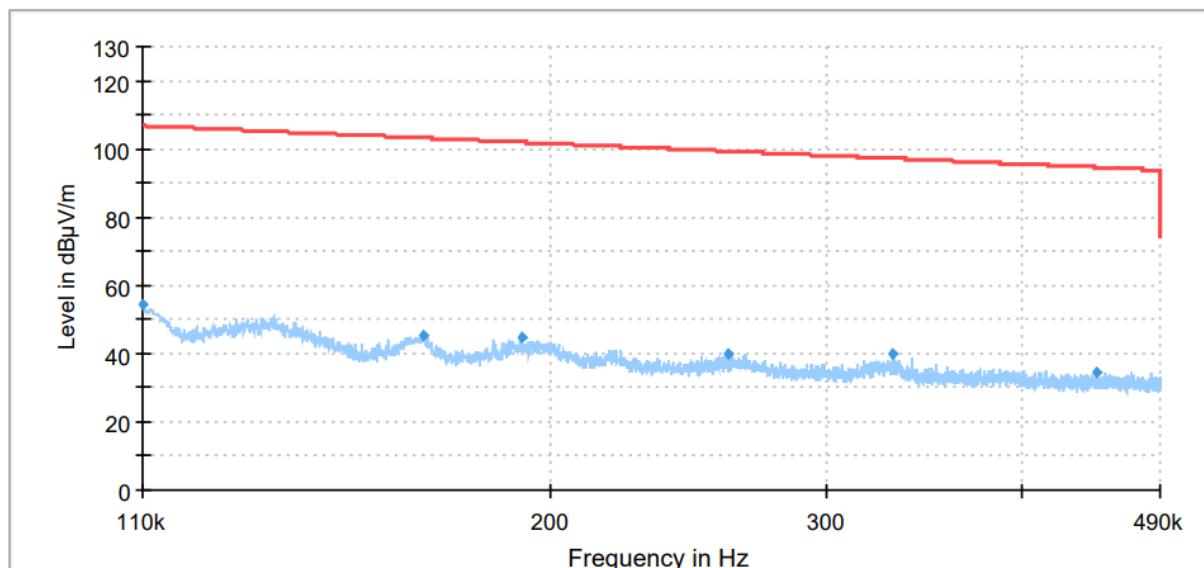
The following graphs display the maximum values of horizontal and vertical by software.



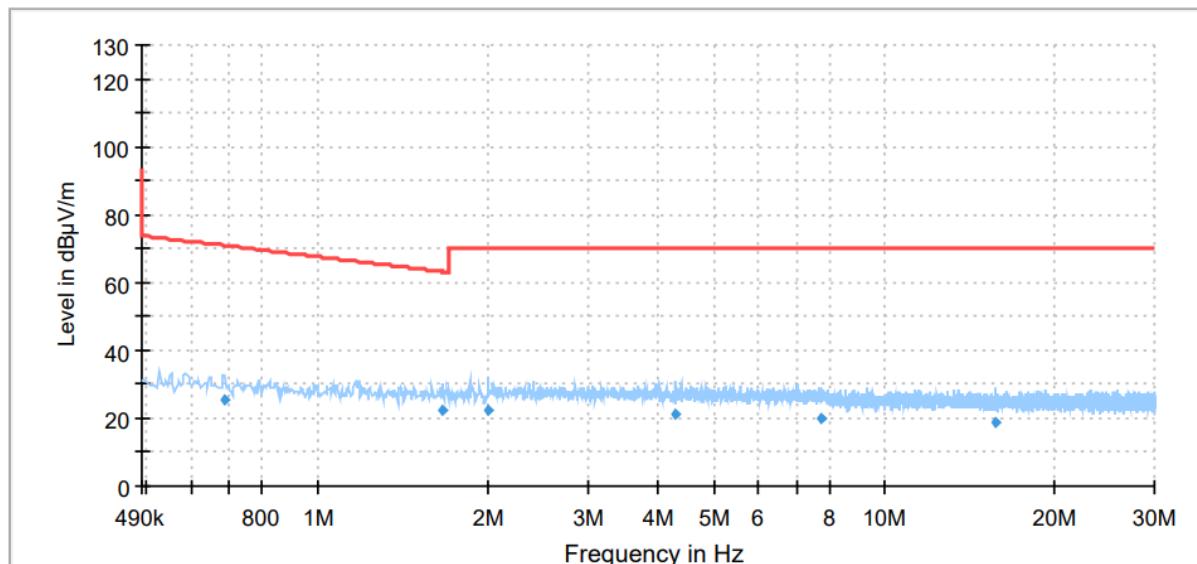
Radiates Emission from 9kHz to 90kHz



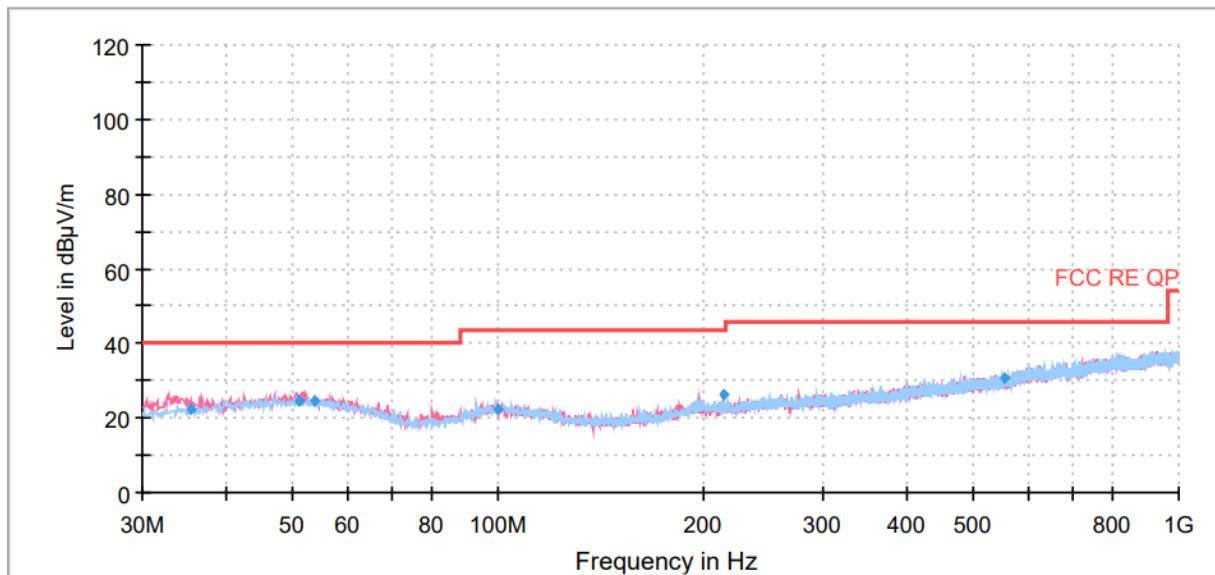
Radiates Emission from 90kHz to 110kHz



Radiates Emission from 110kHz to 490kHz



Radiates Emission from 490kHz to 30MHz

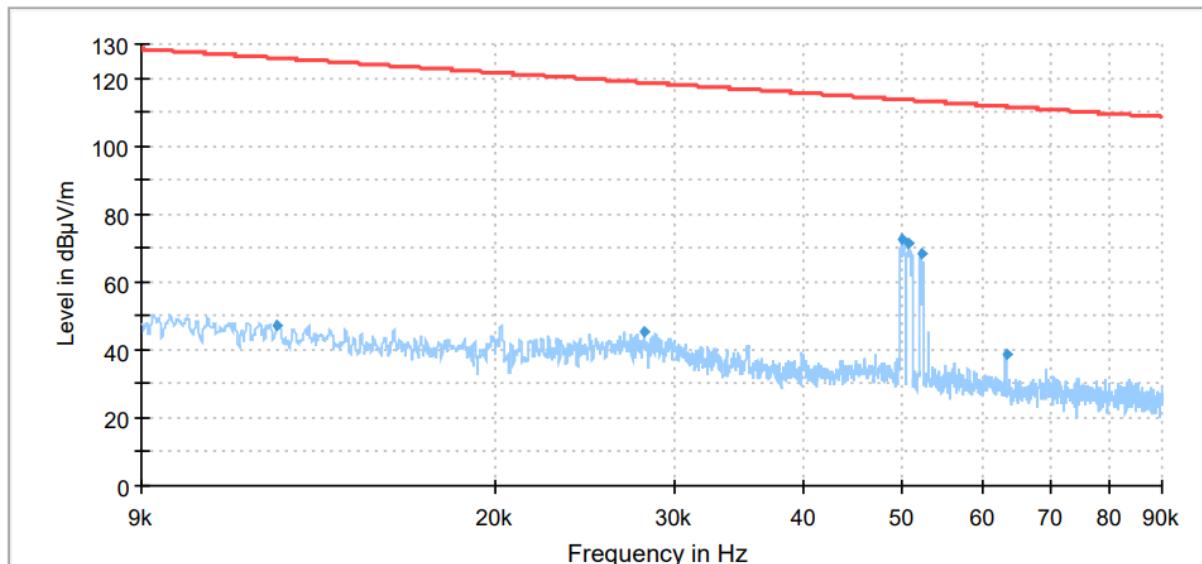
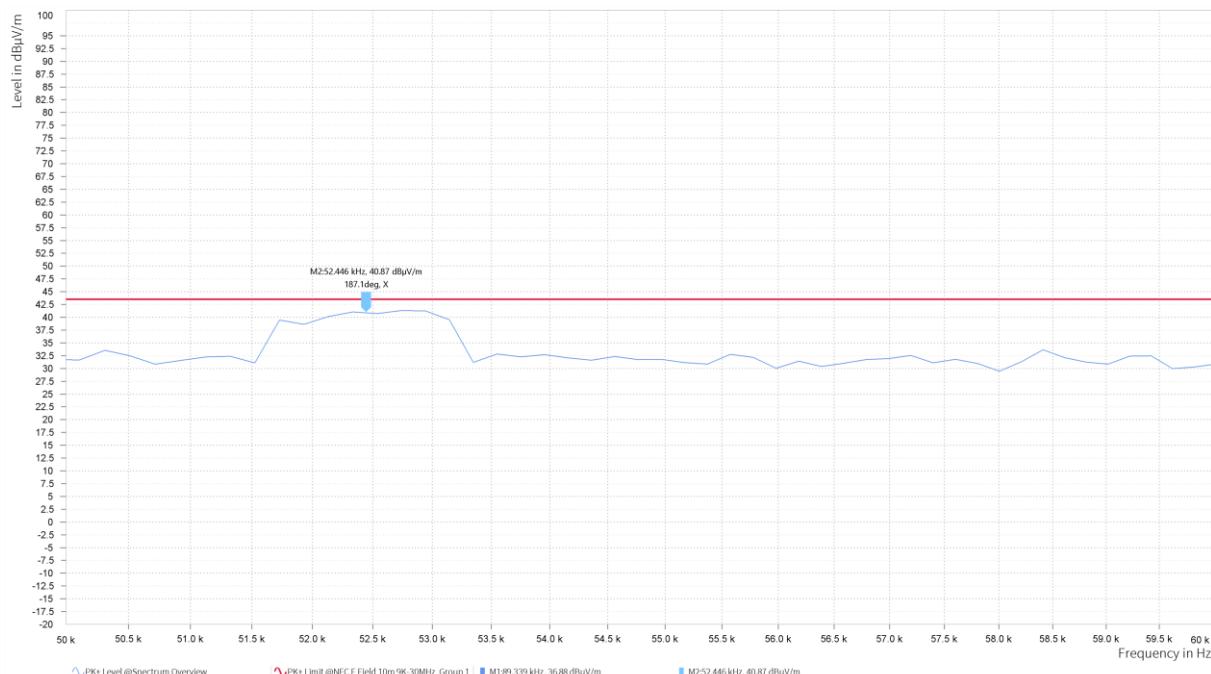


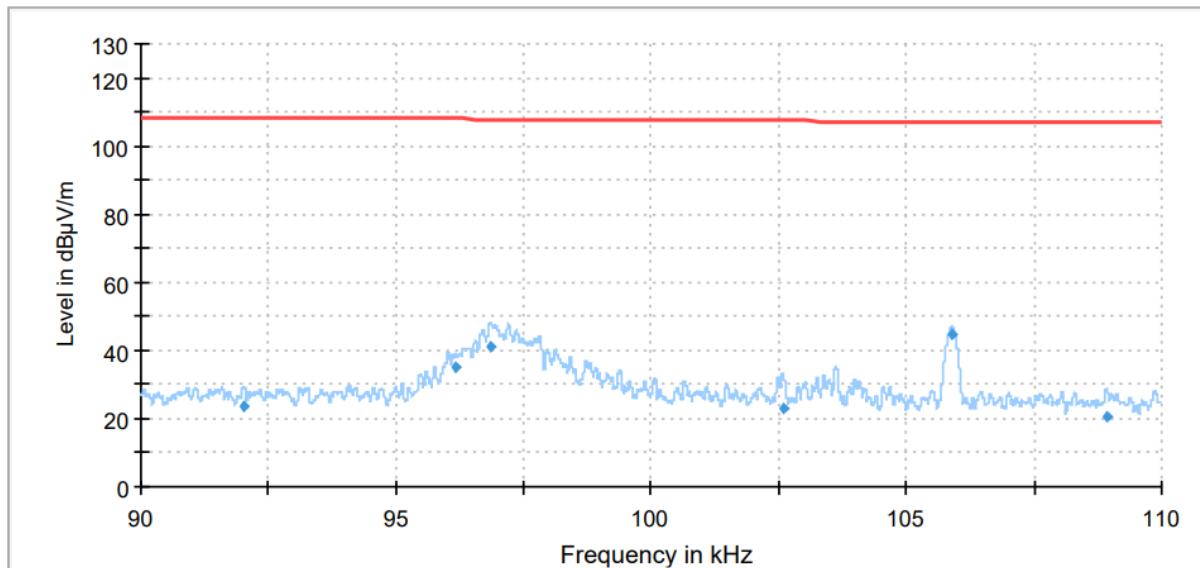
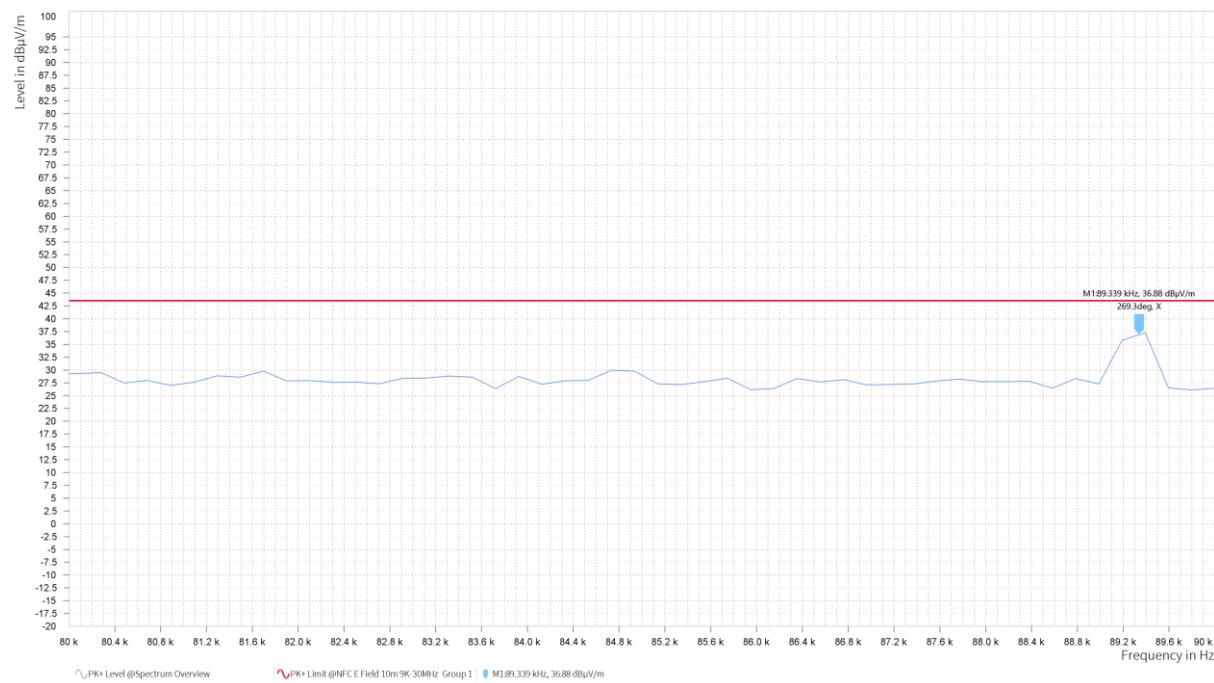
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
35.37	22.29	40.00	17.71	119.0	V	0.00	18
50.94	24.57	40.00	15.43	118.0	V	86.00	20
53.57	24.30	40.00	15.70	100.0	V	22.00	20
99.76	22.35	43.50	21.15	207.0	H	298.00	19
214.50	26.27	43.50	17.23	218.0	V	348.00	18
554.01	30.54	46.00	15.46	213.0	H	24.00	26

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)

2. Margin = Limit -Average

Band Edge

9kHz - 90kHz

50 kHz – 60 kHz


90kHz - 110kHz

80 kHz – 90 kHz

5.3. Conducted Emission

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

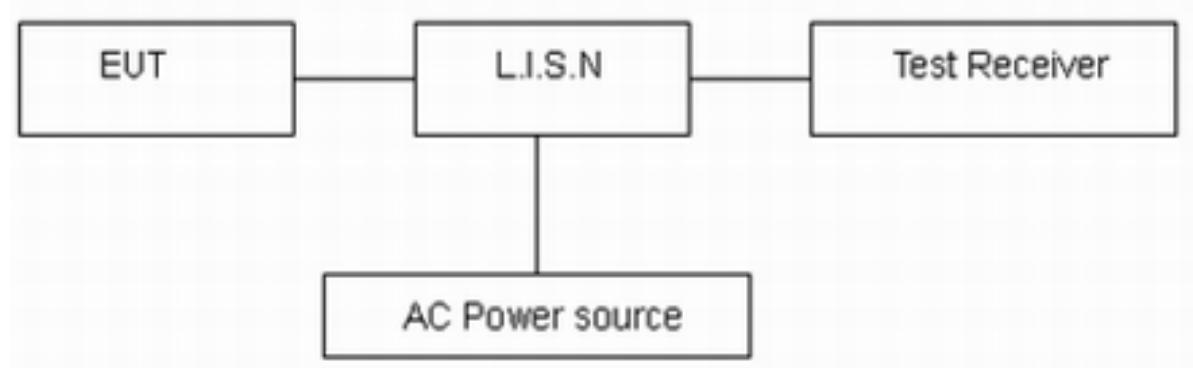
Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz.

The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

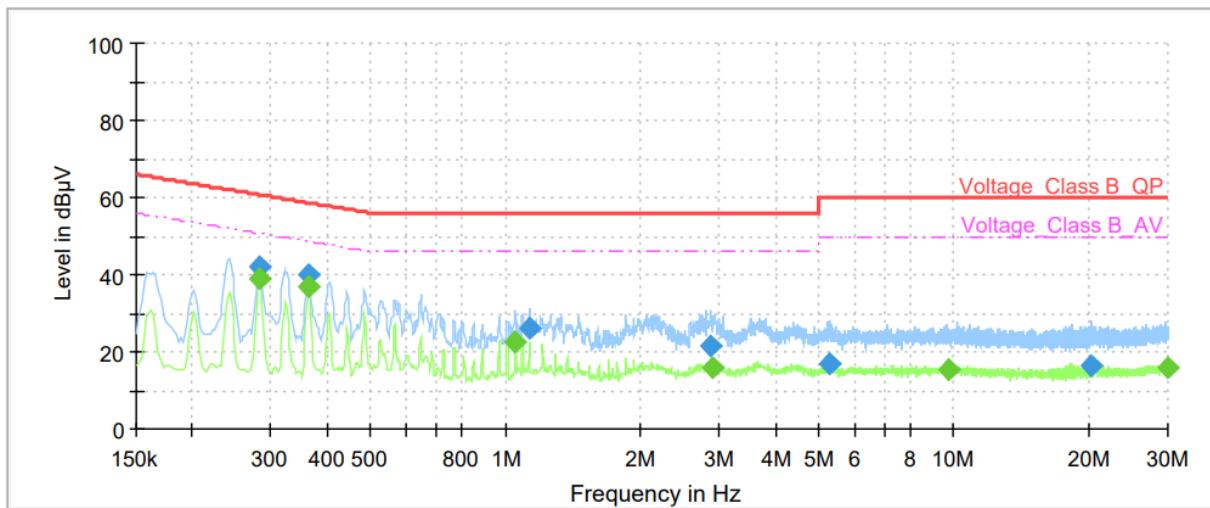
*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 2.69$ dB.

Test Results:

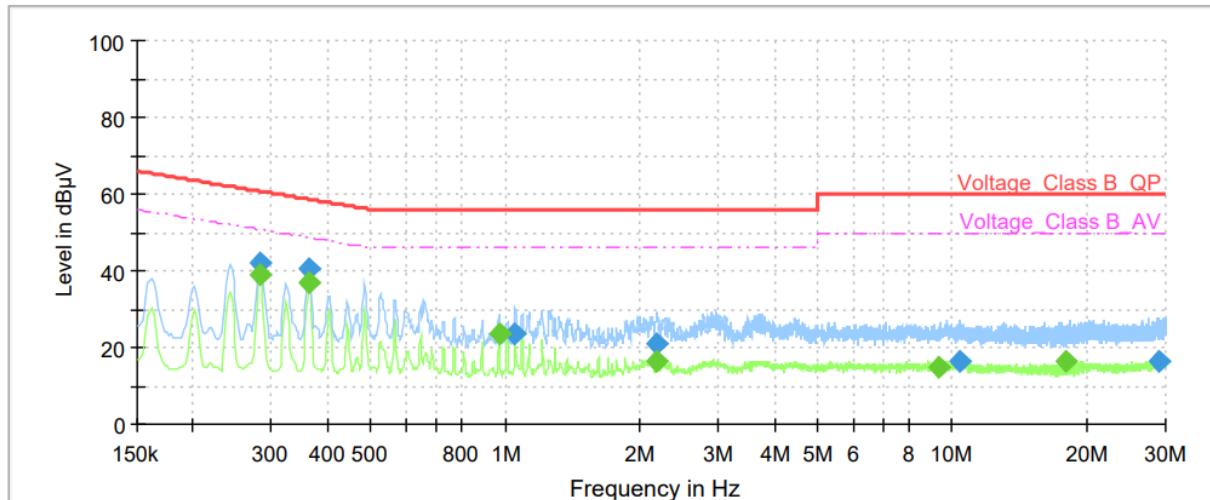
Following plots, Blue trace uses the peak detection and Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.28	42.10	---	60.74	18.64	1000.0	9.000	L	ON	21.0
0.28	---	39.00	50.74	11.74	1000.0	9.000	L	ON	21.0
0.36	40.12	---	58.64	18.52	1000.0	9.000	L	ON	21.0
0.36	---	36.79	48.64	11.85	1000.0	9.000	L	ON	21.0
1.05	---	22.71	46.00	23.29	1000.0	9.000	L	ON	20.2
1.13	25.90	---	56.00	30.10	1000.0	9.000	L	ON	20.1
2.87	21.42	---	56.00	34.58	1000.0	9.000	L	ON	19.6
2.89	---	16.07	46.00	29.93	1000.0	9.000	L	ON	19.6
5.28	16.70	---	60.00	43.30	1000.0	9.000	L	ON	19.5
9.70	---	15.48	50.00	34.52	1000.0	9.000	L	ON	19.6
20.35	16.60	---	60.00	43.40	1000.0	9.000	L	ON	19.8
29.86	---	15.97	50.00	34.03	1000.0	9.000	L	ON	19.7

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.28	---	38.86	50.74	11.88	1000.0	9.000	N	ON	21.0
0.28	42.04	---	60.74	18.70	1000.0	9.000	N	ON	21.0
0.36	---	36.78	48.64	11.87	1000.0	9.000	N	ON	21.0
0.36	40.40	---	58.64	18.24	1000.0	9.000	N	ON	21.0
0.97	---	23.45	46.00	22.55	1000.0	9.000	N	ON	20.3
1.05	23.37	---	56.00	32.63	1000.0	9.000	N	ON	20.2
2.18	21.26	---	56.00	34.74	1000.0	9.000	N	ON	19.7
2.18	---	16.27	46.00	29.73	1000.0	9.000	N	ON	19.7
9.30	---	15.04	50.00	34.96	1000.0	9.000	N	ON	19.6
10.42	16.22	---	60.00	43.78	1000.0	9.000	N	ON	19.6
18.01	---	16.65	50.00	33.35	1000.0	9.000	N	ON	19.7
29.12	16.54	---	60.00	43.46	1000.0	9.000	N	ON	19.7

Remark: Correct factor=cable loss + LISN factor

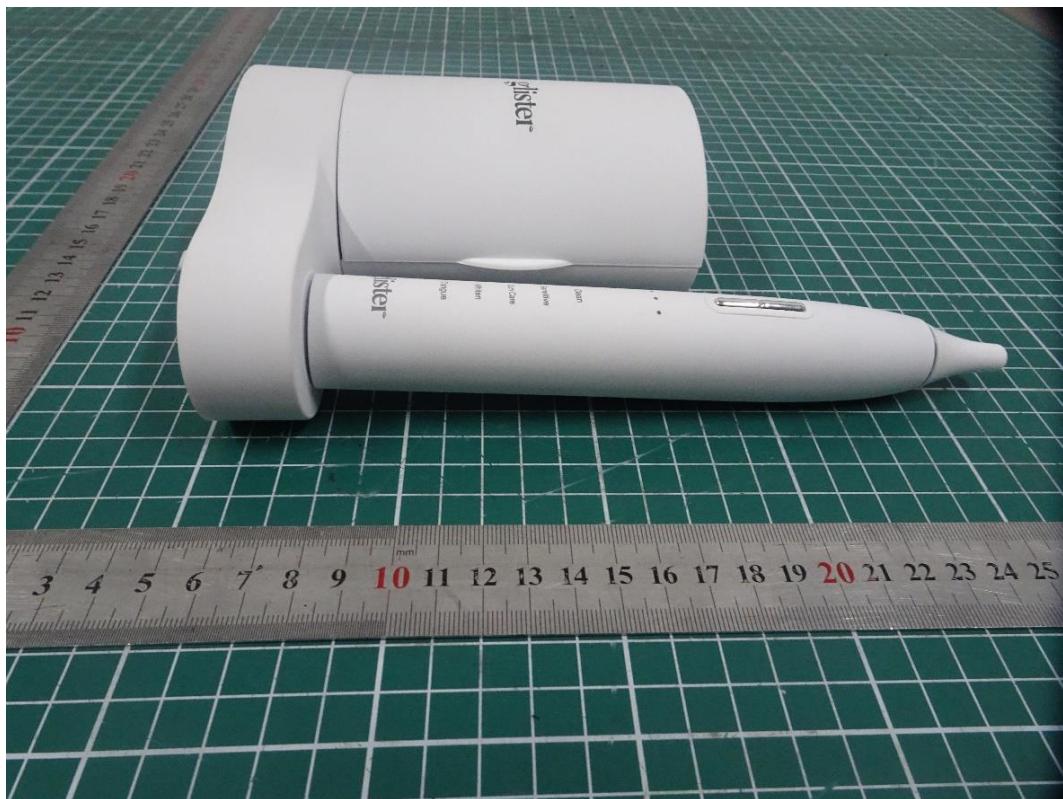
N line Conducted Emission from 150 KHz to 30 MHz

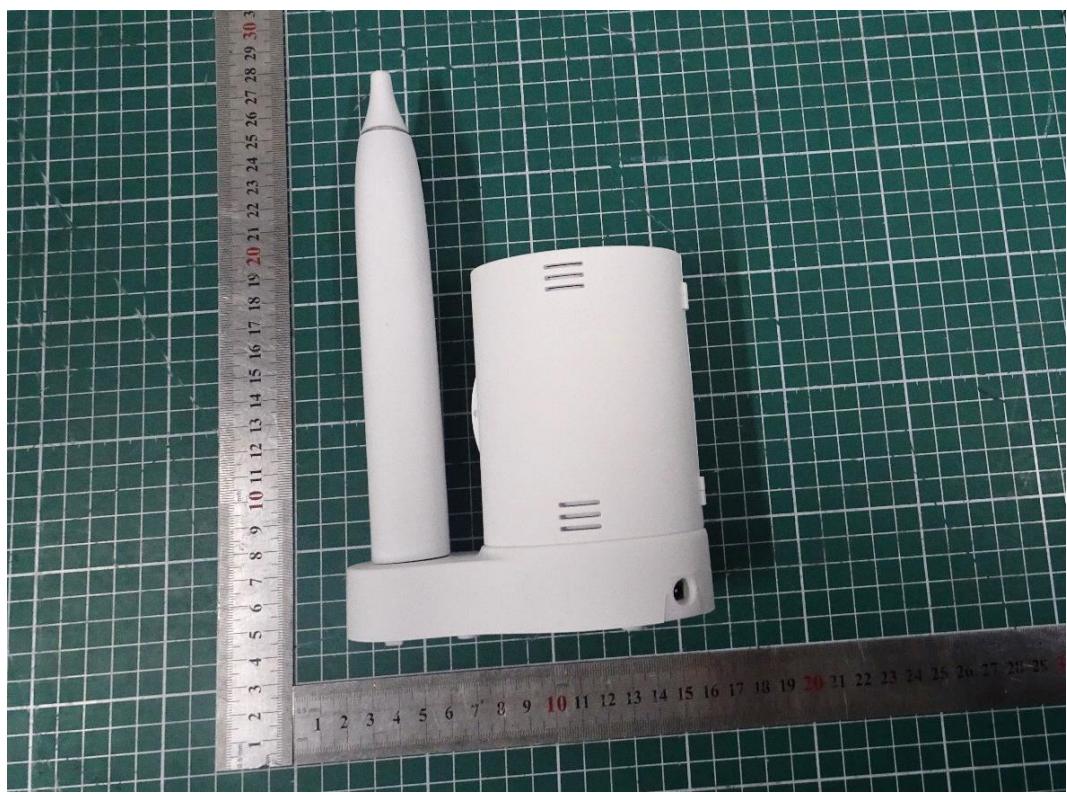
6. Main Test Instruments

Name of Equipment	Manufacturer	Type/Model	Serial Number	Calibration Date	Expiration Time
Radiated Emission					
EMI Test Receiver	R&S	ESCI3	100948	2023-05-12	2024-05-11
EMI Test Receiver	R&S	ESR	102720	2023-09-19	2024-09-18
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2023-04-16	2026-04-15
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	01111	2022-10-25	2025-10-24
Software	R&S	EMC32	9.26.01	/	/
Software	R&S	ELEKTRA	5.00.2	/	/
Conducted Emission					
Artificial main network	R&S	ENV216	102191	2022-12-10	2024-12-09
EMI Test Receiver	R&S	ESR	101667	2023-05-12	2024-05-11
Software	R&S	EMC32	10.35.10	/	/

ANNEX A: The EUT Appearance











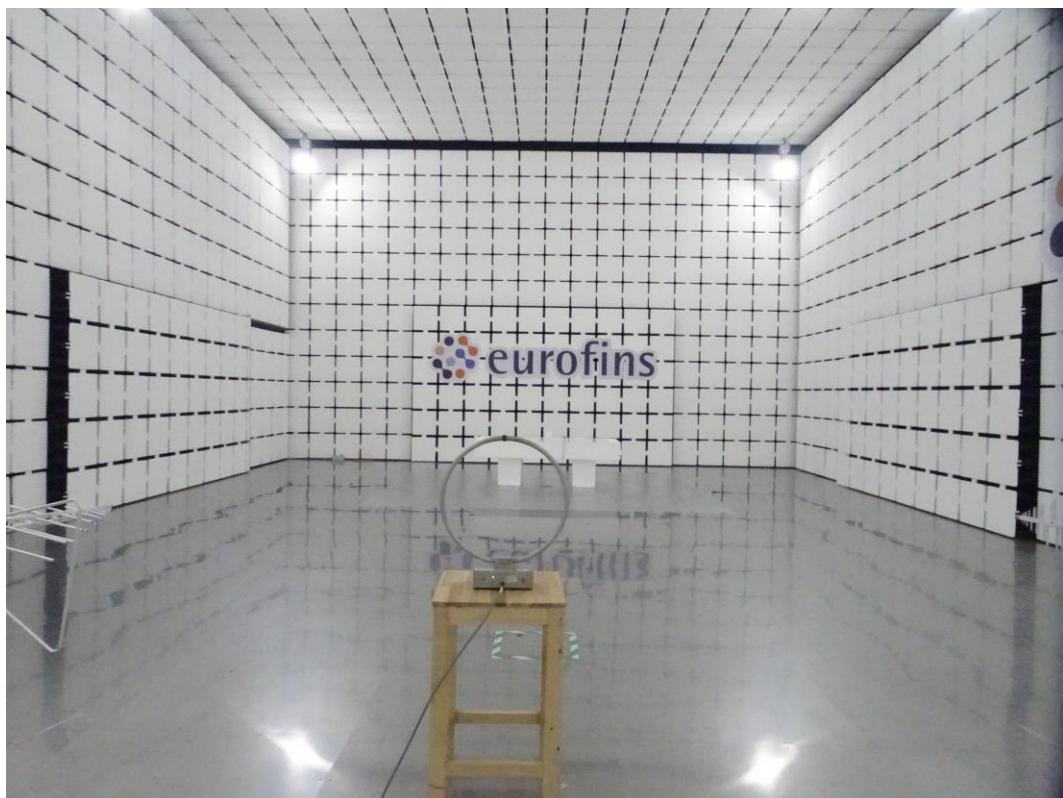
a: EUT



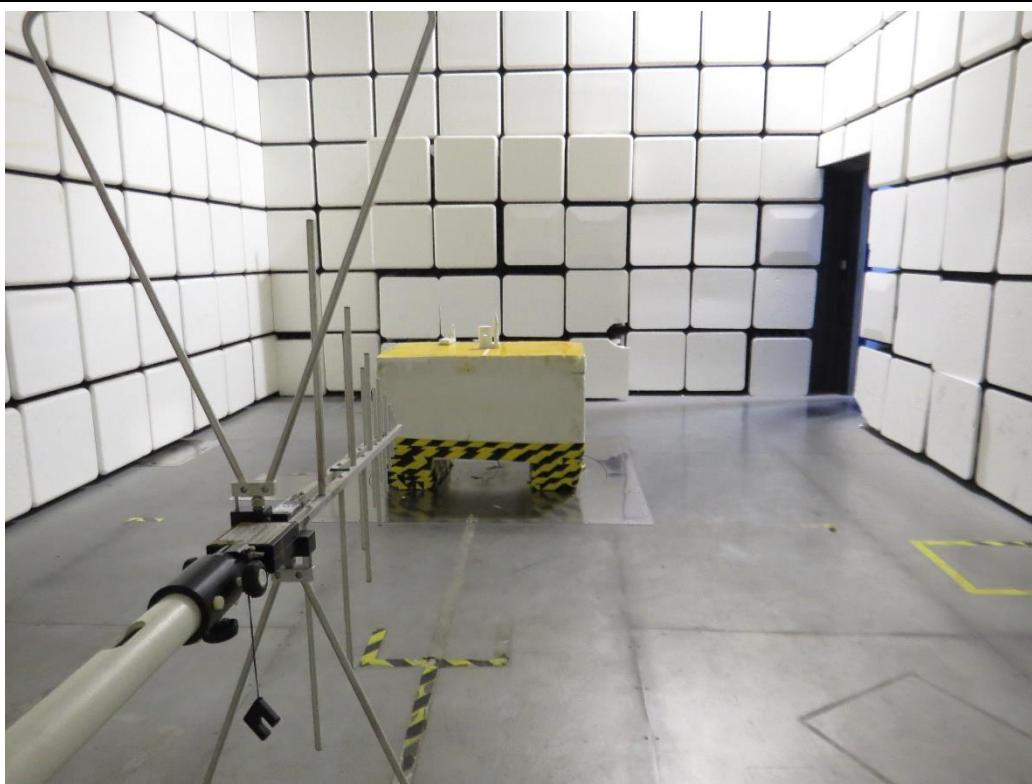
b: USB Cable

Picture 1: Constituents of EUT

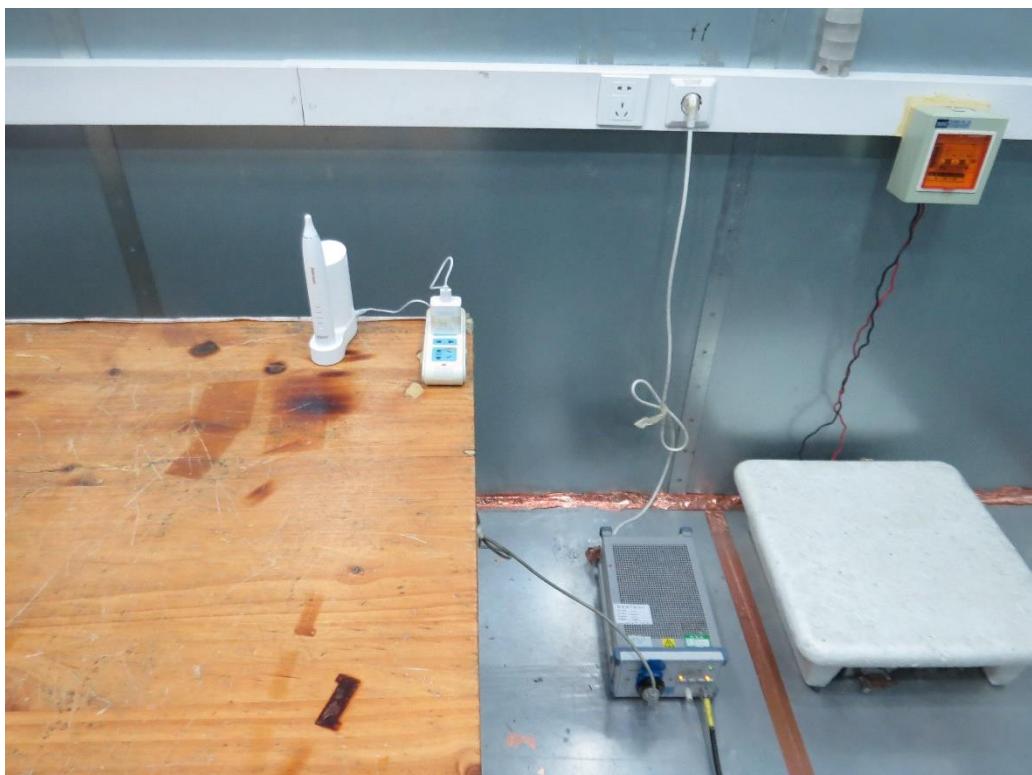
ANNEX B: Test Setup Photos



9kHz-30MHz



30MHz-1GHz

Picture 2 Radiated Emission Test Setup**Picture 3 Conducted Emission Test Setup********* END OF REPORT *******