

EMC TEST REPORT

Product Name: Foot Massager

Trade mark: N/A

Model No.: TD001F-10, TD001F, TD001F-A TD001F-B TD001F-1,TD001F-1A
TD001F-1B,TD001F-2, TD001F-3, TD001F-4, TD001F-5, TD001F-6,
TD001F-7, TD001F-8, TD001F-9,TD001F-10, TD001F-11, TD001F-12,
TD001F-13, TD001F-14 ,TD001F-15

FCC ID: 2A5GJ-TD001F-10

Report No.: CTB2200509020RFX

Prepared For: Zhejiang Todo Hardware Manufacture Co.,Ltd

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Manufacturer: Zhejiang Todo Hardware Manufacture Co.,Ltd

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Date of Receipt: Apr. 24, 2022

Date of Test(s): Apr. 24, 2022 to May. 11, 2022

Date of Issue: May. 11, 2022

Test Standard(s): CFR47, FCC Part 15 Subpart B, ANSI C63.4: 2014

Test Result: Pass

In the configuration tested, the EUT complied with the standards specified above.

Compiled by:



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Reviewed by:



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Approved by:



Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of CTB. This document may be altered or revised by CTB, personnel only, and shall be noted in the revision of the document.

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1. Description of version

Report No.	Issue Date	Description	Approved
CTB2200509020RFX	May. 11, 2022	Original	Valid

2. Test summary

Test procedures according to the technical standards:

Standard	Test Item	Test Result
§15.107	Conducted Emission	PASS
§15.109	Radiated Emission	PASS

3. Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard

Test Item	Frequency	Expanded Uncertainty (U_{Lab})
Conducted Emission	150 kHz to 30 MHz	± 3.2 dB
Radiated Emission	30 MHz to 1000 MHz	± 4.8 dB

uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

4. General information

4.1. Description of EUT

Product name	Wireless remote control switch
Trade mark	N/A
Model No.	TD001F-10, TD001F, TD001F-A TD001F-B TD001F-1,TD001F-1A TD001F-1B,TD001F-2, TD001F-3, TD001F-4, TD001F-5, TD001F-6, TD001F-7, TD001F-8, TD001F-9,TD001F-10, TD001F-11, TD001F-12, TD001F-13, TD001F-14 ,TD001F-15
Serial No.	All the model are the same circuit and RF module, only for model name. Test sample model: TD001F-10
Model Difference	N/A
max Operating frequency	8MHz
Normal Testing Voltage	AC120V/60Hz
Configuration	☒ Table-top ☐ Floor-standing
Adapter Information:	/

Note: The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4.2. Description of accessory device

No.	Device Type	Brand	Model	Specification	Note
/	/	/	/	/	/

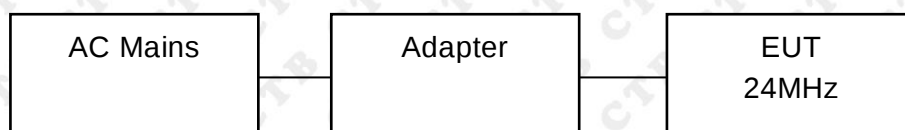
4.3. Test conditions

Temperature: 15-25°C

Relative Humidity: 30-60 %

Atmospheric pressure: 800hPa-1060hPa

4.4. Block diagram of EUT configuration



Operating condition of EUT

Operating condition	Mode 1	Working	Test Voltage	AC 120V/60Hz*
Note: This test covers all possible operating modes of the device, only the worst data are list in report. The worst data are shows (*) is the nearest standard limit which were recorded in this report.				

5. List of Test and Measurement Instruments

Radiated Emission Measurement						
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated date	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	1911	2021.09.27	2022.08.07
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	869	2021.09.27	2022.08.07
3	Amplifier	Agilent	8449B	3008A01838	2021.09.27	2022.08.05
4	Amplifier	HP	8447E	2945A02747	2021.09.27	2022.08.05
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI7	100362	2021.09.27	2022.08.05
6	Coaxial cable	ETS	RFC-SNS-100 -NMS-80 NI	/	2021.09.27	2022.08.05
7	Coaxial cable	ETS	RFC-SNS-100 -NMS-20 NI	/	2021.09.27	2022.08.05
8	Coaxial cable	ETS	RFC-SNS-100 -SMS-20 NI	/	2021.09.27	2022.08.05
9	Coaxial cable	ETS	RFC-NNS-100 -NMS-300 NI	/	2021.09.27	2022.08.05
10	EZ-EMC	Frad	EMC-con3A1. 1	/	/	/

6. Conducted Emission

6.1. Limit

☒ Except for Class A devices:

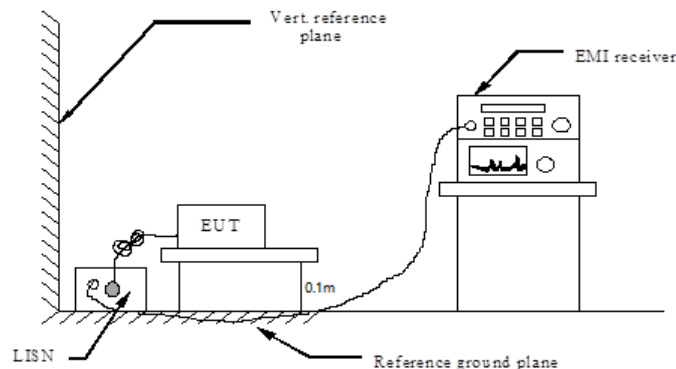
Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

☐ For Class A devices:

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

6.2. Test setup



The setup of EUT is according with ANSI C63.4 measurement procedure. Specification used with FCC Part 15 limits.

6.3. EMI test receiver setup

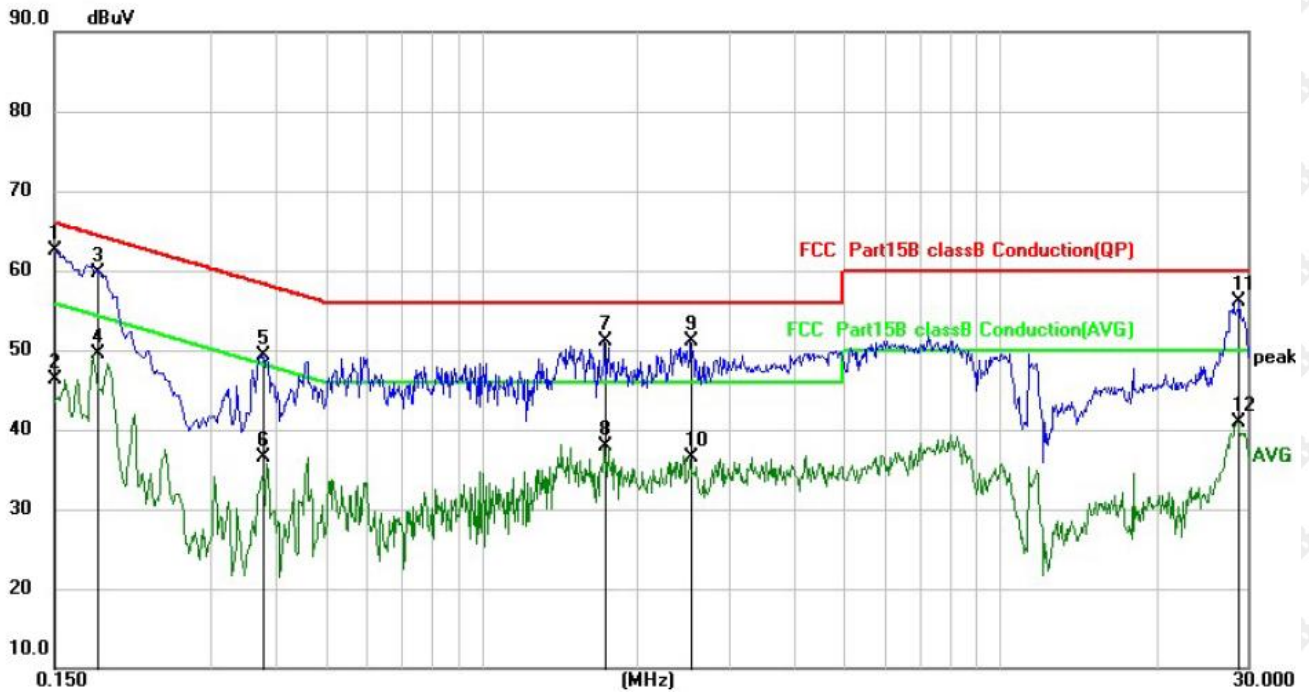
Frequency Range	9kHz-30MHz
Resolution Bandwidth	200Hz (9kHz-150kHz) 9kHz (150kHz-30MHz)

6.4. Test procedure

1. Measurement was performed in shielded room, and instruments used were followed clause 4 of ANSI C63.4.
2. Detailed test procedure was following clause 7 of ANSI C63.4.
3. Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

6.5. Test results

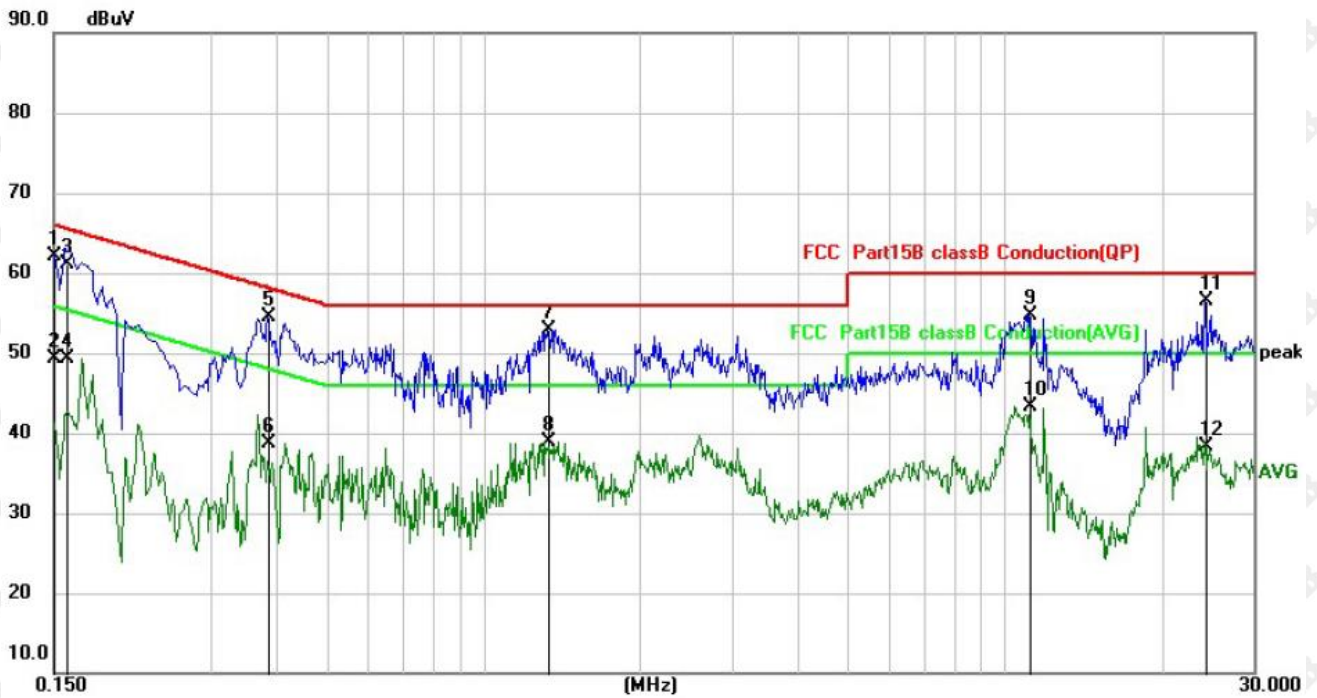
Temperature:	25.6℃	Relative Humidity:	57.8%
Pressure:	101.6kPa	Phase :	L
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1	*	0.1500	51.74	10.72	62.46	66.00	-3.54	QP
2		0.1500	35.61	10.72	46.33	56.00	-9.67	AVG
3		0.1824	49.09	10.70	59.79	64.38	-4.59	QP
4		0.1824	38.80	10.70	49.50	54.38	-4.88	AVG
5		0.3780	38.79	10.59	49.38	58.32	-8.94	QP
6		0.3780	25.87	10.59	36.46	48.32	-11.86	AVG
7		1.7259	40.50	10.63	51.13	56.00	-4.87	QP
8		1.7259	27.36	10.63	37.99	46.00	-8.01	AVG
9		2.5300	40.38	10.63	51.01	56.00	-4.99	QP
10		2.5300	25.96	10.63	36.59	46.00	-9.41	AVG
11		28.8859	44.98	11.03	56.01	60.00	-3.99	QP
12		28.8859	29.87	11.03	40.90	50.00	-9.10	AVG

Remark: Result=Reading +Factor
Over Limit=Result –Limit

Temperature:	25.6 °C	Relative Humidity:	57.8%
Pressure:	101.6kPa	Phase :	N
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.1500	51.41	10.72	62.13	66.00	-3.87	QP
2		0.1500	38.57	10.72	49.29	56.00	-6.71	AVG
3		0.1582	50.44	10.72	61.16	65.56	-4.40	QP
4		0.1582	38.57	10.72	49.29	55.56	-6.27	AVG
5		0.3860	43.90	10.58	54.48	58.15	-3.67	QP
6		0.3860	28.14	10.58	38.72	48.15	-9.43	AVG
7	*	1.3260	42.25	10.62	52.87	56.00	-3.13	QP
8		1.3260	28.21	10.62	38.83	46.00	-7.17	AVG
9		11.1936	43.85	10.84	54.69	60.00	-5.31	QP
10		11.1936	32.42	10.84	43.26	50.00	-6.74	AVG
11		24.2340	45.41	11.01	56.42	60.00	-3.58	QP
12		24.2340	27.22	11.01	38.23	50.00	-11.77	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

7. Radiated emissions

7.1. Limit

☒ Except for Class A devices (at 3m):

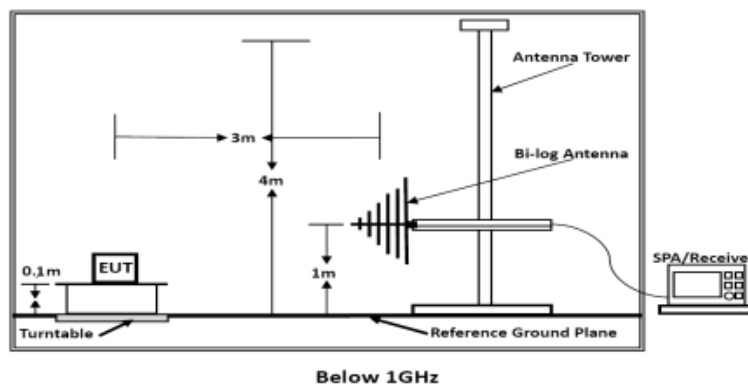
Frequency of emission (MHz)	Field strength (microvolts/meter)	
	(microvolts/meter)	(dB μ V/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

☐ For Class A devices (at 10m):

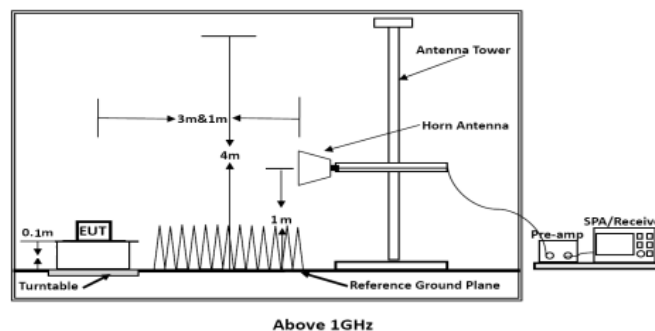
Frequency of emission (MHz)	Field strength (microvolts/meter)	
	(microvolts/meter)	(dB μ V/m)
30-88	90	39
88-216	150	43.5
216-960	210	46.4
Above 960	300	49.5

7.2. Test setup

Radiated Emission Test Set-Up Frequency Below 1 GHz



Radiated Emission Test Set-Up Frequency Above 1GHz



The radiated tests were performed in 3 meter Chamber test site, using the setup accordance with the ANSI C63.4:2014.

7.3. EMI test receiver setup and spectrum analyzer setup

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz-1000MHz	100kHz	300kHz	120kHz	QP
Above 1GHz	1MHz	3MHz	/	PK
	1MHz	10Hz	/	AVG

7.4. Test procedure

1. The measurement was performed in a semi-anechoic chamber, and instruments used were followed clause 4 of ANSI C63.4
2. Detailed test procedure was following clause 8 of ANSI C63.4.

7.5. Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

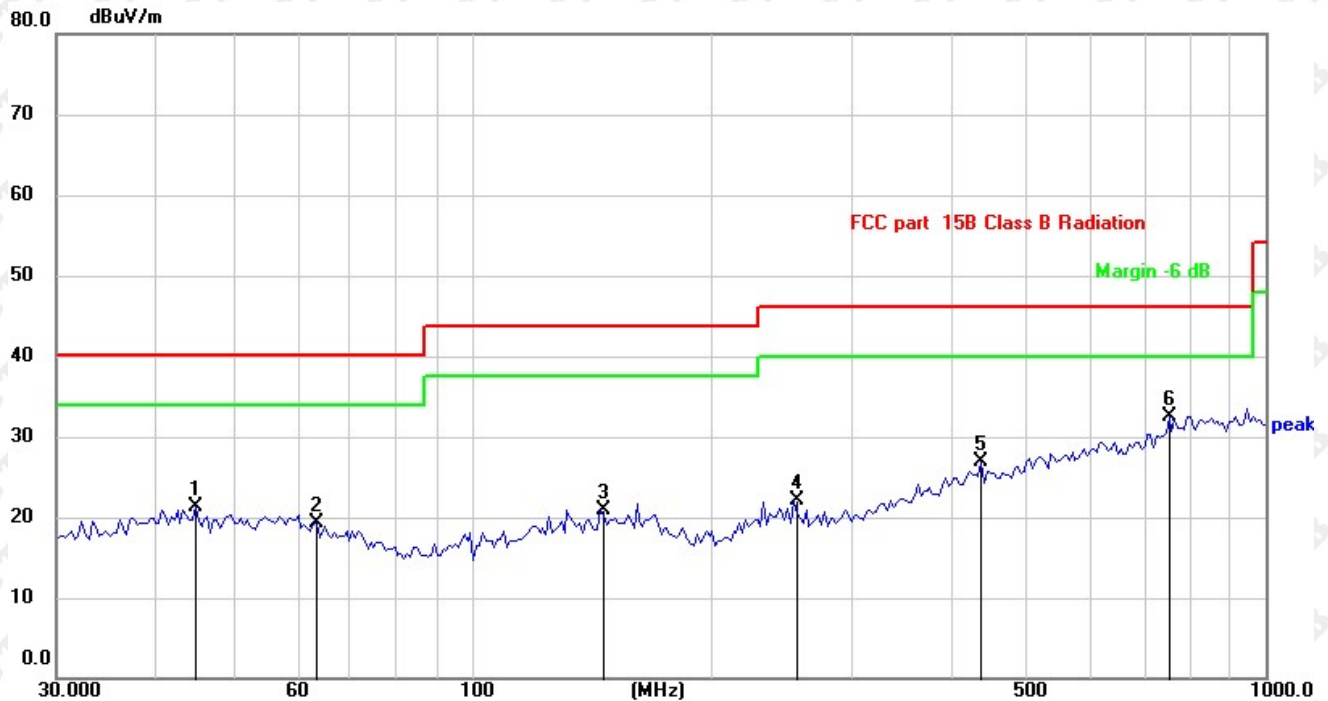
2. The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

7.6. Test results

Up to 1GHz:

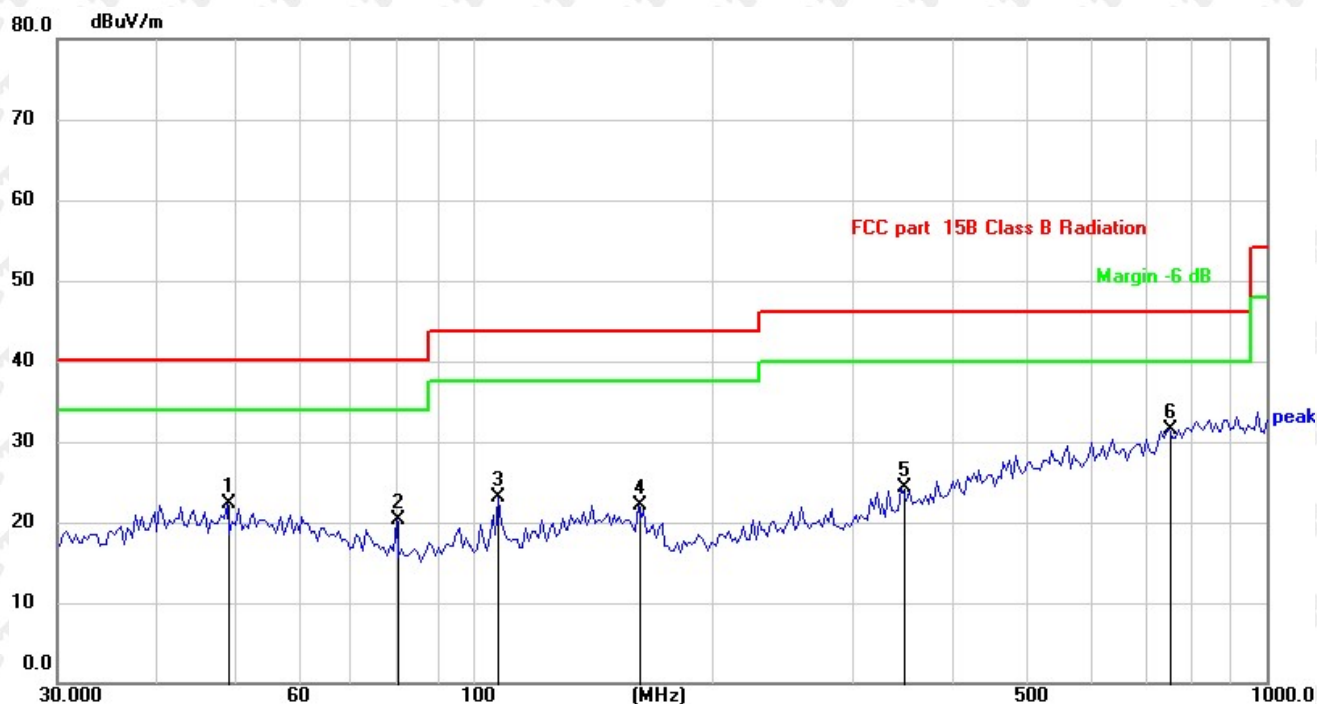
Temperature:	24°C	Relative Humidity:	54 %
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		44.9006	26.67	-5.45	21.22	40.00	-18.78	QP
2		63.7588	26.22	-6.83	19.39	40.00	-20.61	QP
3		145.3506	26.32	-5.47	20.85	43.50	-22.65	QP
4		254.7284	27.68	-5.65	22.03	46.00	-23.97	QP
5		438.6554	27.57	-0.76	26.81	46.00	-19.19	QP
6	*	755.3873	27.48	5.11	32.59	46.00	-13.41	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

Temperature:	24°C	Relative Humidity:	54 %
Pressure:	101kPa	Polarization :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 1

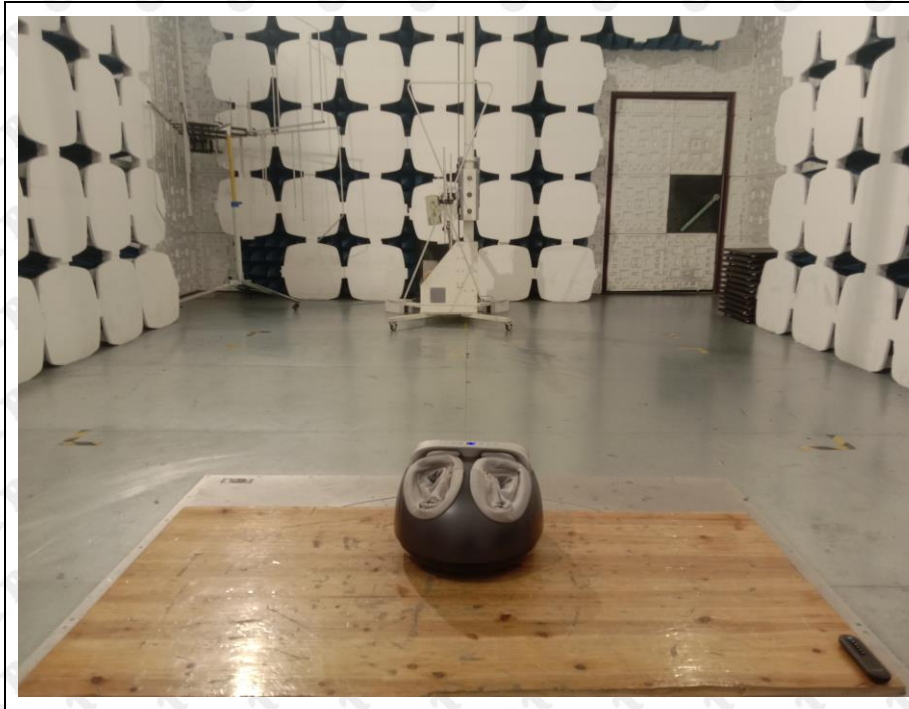


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1		49.0145	27.98	-5.60	22.38	40.00	-17.62	QP
2		80.0806	29.98	-9.76	20.22	40.00	-19.78	QP
3		107.8877	31.27	-8.13	23.14	43.50	-20.36	QP
4		161.4742	27.73	-5.66	22.07	43.50	-21.43	QP
5		346.2017	27.82	-3.58	24.24	46.00	-21.76	QP
6	*	748.7943	26.46	4.98	31.44	46.00	-14.56	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

8. Photographs of test setup

Radiated Emission



Conducted Emission



9. Photographs of EUT

EUT photo 1



EUT photo 2



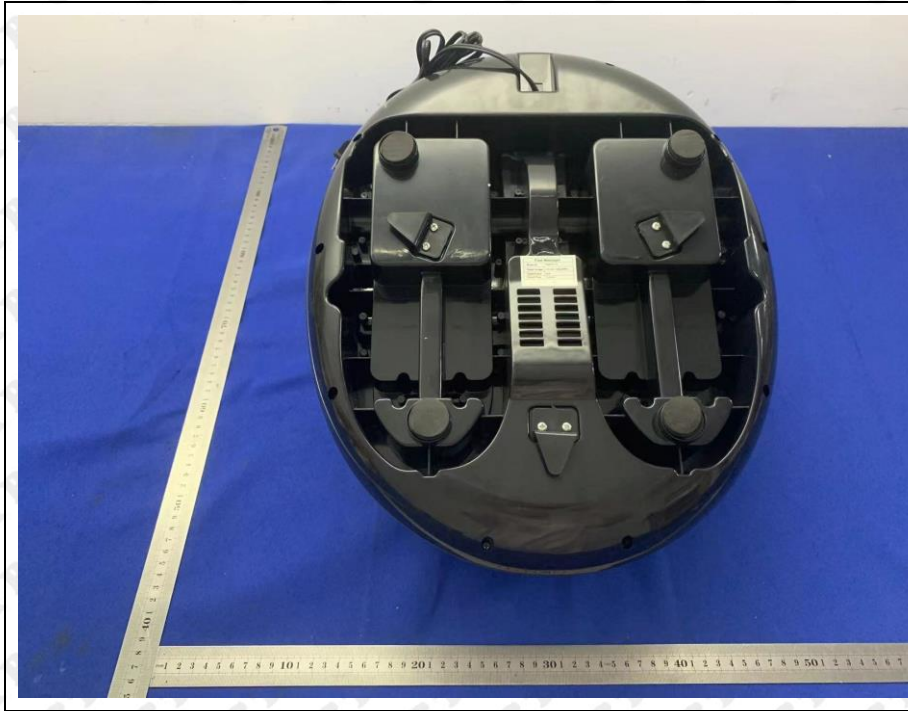
EUT photo 3



EUT photo 4



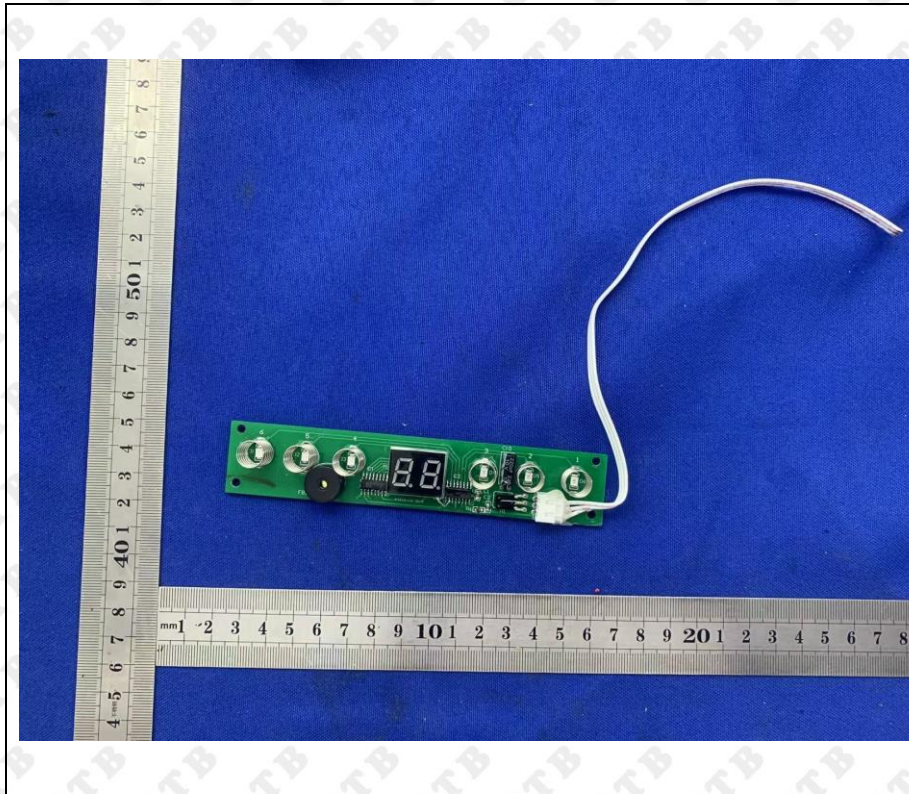
EUT photo 5



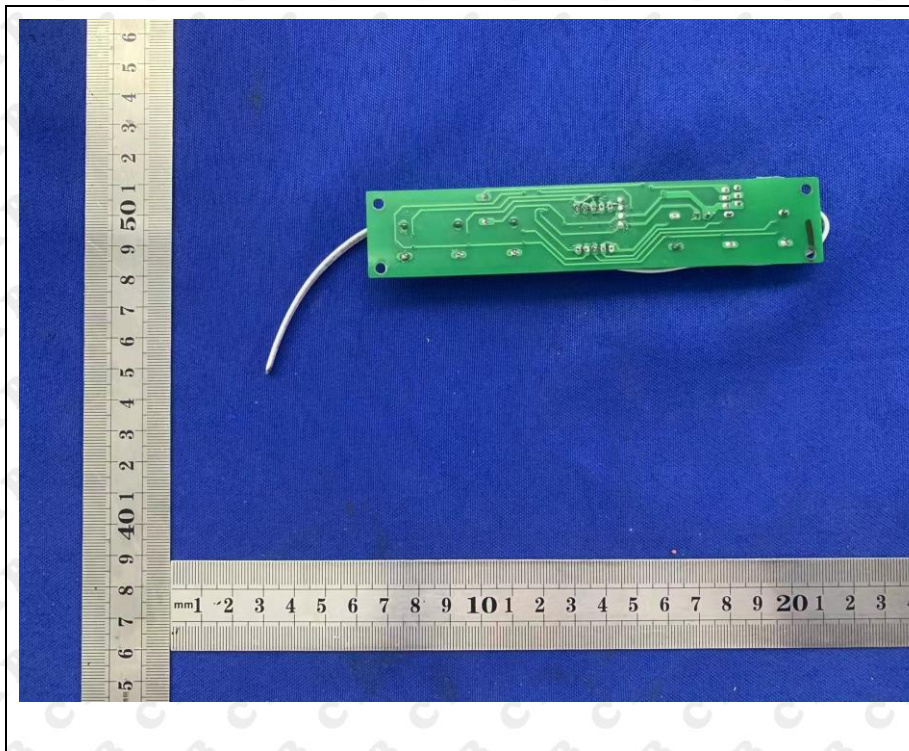
EUT photo 6



EUT photo 7



EUT photo 8



End of report