FCC Test Report

Client Name	:	Guangdong Hongguan Electrical Appliance CO., LTD
Address	:	No. 62, Xinzhou West Street, Lincun Community, TangxiaTown, Dongguan, Guangdong Province, China
Product Name	:	EC Turbo Fan
Date	:	Dec. 08 2022

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Guangdong Hongguan Electrical Appliance CO.,LTD
Manufacturer	:	No. 62, Xinzhou West Street, Lincun Community, TangxiaTown, Dongguan, Guangdong Province, China
Product Name	:	EC Turbo Fan
Model No.	:	HR-100AE
Trade Mark	:	N/A
Rating(s)	:	AC 110~240V/50~60Hz
Test Standard(s)	**:**	**FCC Rules and Regulations Part 15 Subpart B**
Test Method(s)	**:**	**ANSI C63.4-2014**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Receipt	Dec. 08 2022
Date of Test	July. 04~Dec. 08 2022

Prepared By

Ella Liang

(Ella Liang)

Approved & Authorized Signer

Kingkong Jin

(Kingkong Jin)

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1. General Information

1.1. Client Information

Applicant	:	Guangdong Hongguan Electrical Appliance CO.,LTD
Address	:	No. 62, Xinzhou West Street, Lincun Community, TangxiaTown, Dongguan, Guangdong Province, China
Manufacturer	:	Shenzhen Hongguan Mechatronics Co, Ltd. Dongguan Branch
Address	:	No. 62, Xinzhou West Street, Lincun, Tangxia Town, Dongguan, Guangdong Province
Factory	:	Shenzhen Hongguan Mechatronics Co, Ltd. Dongguan Branch
Address	:	No. 62, Xinzhou West Street, Lincun, Tangxia Town, Dongguan, Guangdong Province

1.2. Description of Device (EUT)

Product Name	:	EC Turbo Fan	
Model No.	:	HR-100AE	
Trade Mark	:	N/A	
Test Power Supply	:	AC 110~240V/50~60Hz	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Adapter:	N/A
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

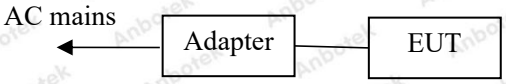
1.3. Auxiliary Equipment Used During Test

N/A		

1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On Mode

For Mode 1 Block Diagram of Test Setup



1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (150KHz To 30MHz)	Mode 1	P
Radiated Emission Test (30MHz To 6000MHz)	Mode 1	P
P) Indicates “PASS”. N) Indicates “Not applicable”.		

1.6. Test Equipment List

Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Latest calibration
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 25, 2021	Oct. 22, 2022
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	July 05, 2021	July 04, 2022
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 25, 2021	Oct. 22, 2022
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 25, 2021	Oct. 22, 2022
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Latest calibration
1.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 25, 2021	Oct. 22, 2022
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	Oct. 22, 2022
3.	Pre-amplifier	SONOMA	310N	186860	Oct. 25, 2021	Oct. 22, 2022
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A
5.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 25, 2021	Oct. 22, 2022
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	Oct. 22, 2022

1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, 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. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

2. Power Line Conducted Emission Test

2.1. Test Standard and Limit

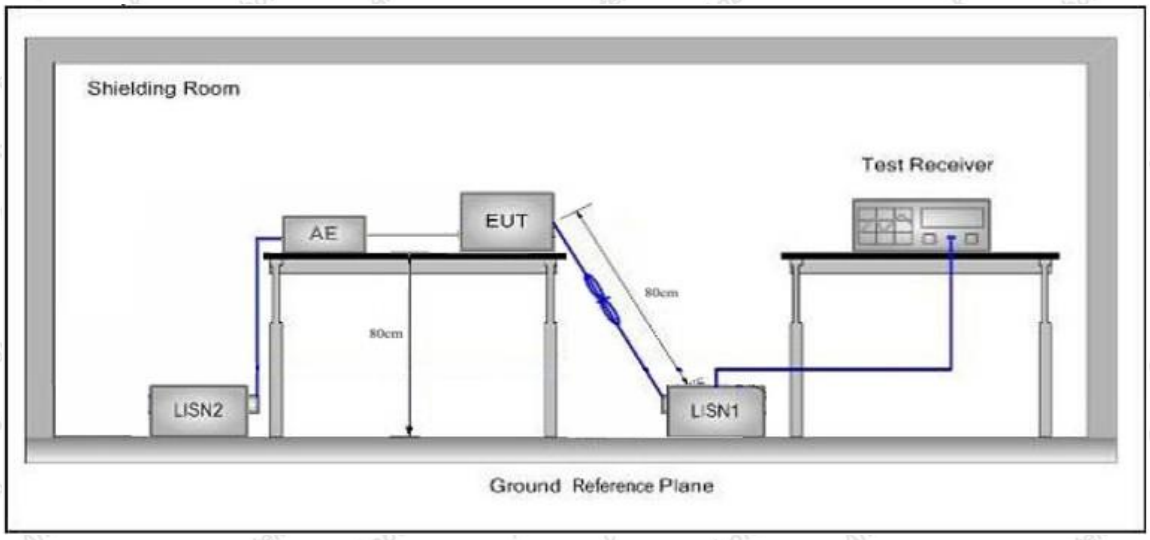
Test Standard	FCC Part 15 Subpart B

Power Line Conducted Emission Measurement Limits (FCC Part 15 Class B)

Test Limit	Frequency (MHz)	At mains terminals (dBμV)	
		Quasi-peak Level	Average Level
	0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
	0.50 ~ 5.00	56	46
	5.00 ~ 30.00	60	50

Remark: (1) The lower limit shall apply at the transition frequencies.
(2) * Decreasing linearly with logarithm of frequency.

2.2. Test Setup



2.3. EUT Configuration on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

2.4.3. Let the EUT work in test mode and measure it.

2.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

All the test results are listed in Section 2.6.

2.6. Test Results

PASS

The frequency range from 150KHz to 30MHz is investigated.

Only the worst case data was showed in the report, please to see the following pages.

Conducted Emission Test Data

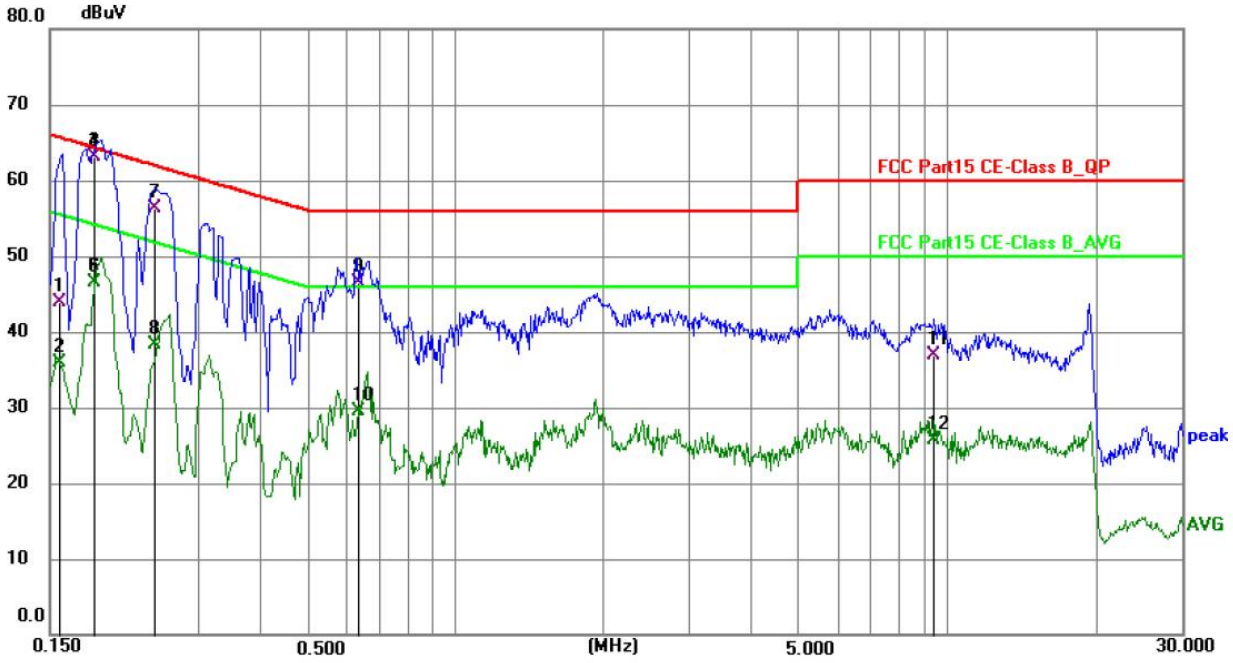
Test Site: 1# Shielded Room

Operating Condition: Mode 1

Test Specification: AC 240V, 50Hz for Power cord

Comment: Live Line

Tem.: 26.4℃ Hum.: 53%



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1570	33.59	10.25	43.84	65.62	-21.78	QP	P
2	0.1570	25.57	10.25	35.82	55.62	-19.80	AVG	P
3	0.1840	52.89	10.22	63.11	64.30	-1.19	QP	P
4 *	0.1840	52.94	10.22	63.16	64.30	-1.14	QP	P
5	0.1840	36.21	10.22	46.43	54.30	-7.87	AVG	P
6	0.1840	36.22	10.22	46.44	54.30	-7.86	AVG	P
7	0.2440	46.01	10.26	56.27	61.96	-5.69	QP	P
8	0.2440	28.10	10.26	38.36	51.96	-13.60	AVG	P
9	0.6350	36.19	10.36	46.55	56.00	-9.45	QP	P
10	0.6350	19.20	10.36	29.56	46.00	-16.44	AVG	P
11	9.4170	26.46	10.53	36.99	60.00	-23.01	QP	P
12	9.4170	15.13	10.53	25.66	50.00	-24.34	AVG	P

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

Conducted Emission Test Data

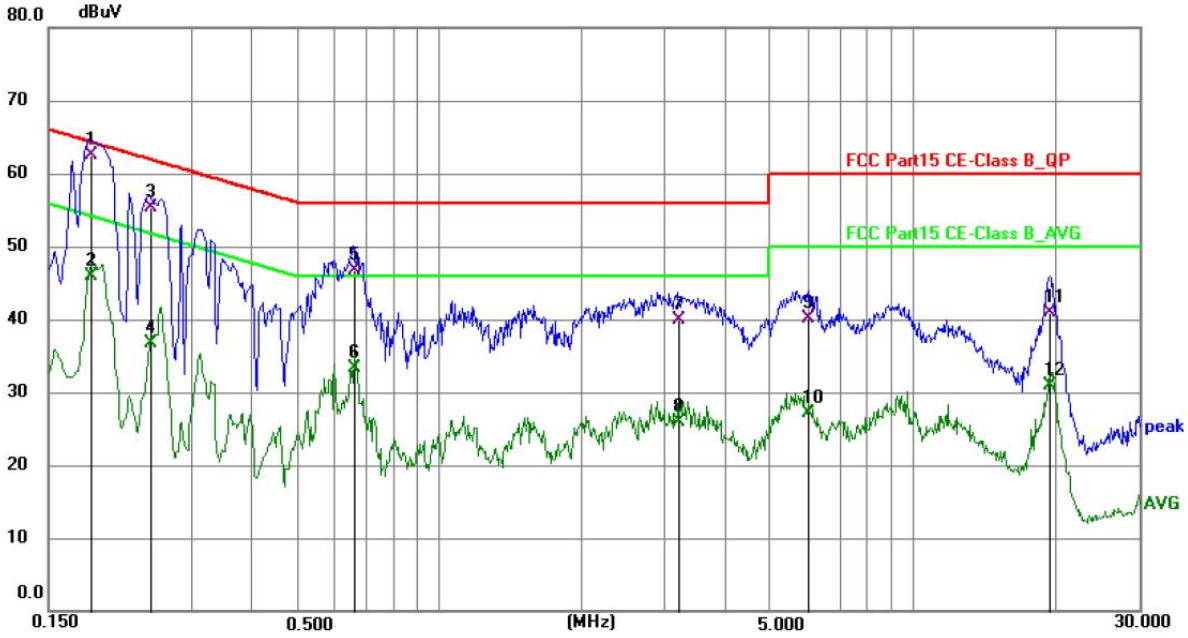
Test Site: 1# Shielded Room

Operating Condition: Mode 1

Test Specification: AC 240V, 50Hz for Power cord

Comment: Neutral Line

Tem.: 26.4℃ Hum.: 53%



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1 *	0.1840	52.30	10.22	62.52	64.30	-1.78	QP	P
2	0.1840	35.70	10.22	45.92	54.30	-8.38	AVG	P
3	0.2450	45.08	10.26	55.34	61.92	-6.58	QP	P
4	0.2450	26.42	10.26	36.68	51.92	-15.24	AVG	P
5	0.6600	36.43	10.35	46.78	56.00	-9.22	QP	P
6	0.6600	22.93	10.35	33.28	46.00	-12.72	AVG	P
7	3.2230	29.48	10.43	39.91	56.00	-16.09	QP	P
8	3.2230	15.50	10.43	25.93	46.00	-20.07	AVG	P
9	5.9960	29.71	10.45	40.16	60.00	-19.84	QP	P
10	5.9960	16.60	10.45	27.05	50.00	-22.95	AVG	P
11	19.4970	29.97	10.89	40.86	60.00	-19.14	QP	P
12	19.4970	20.07	10.89	30.96	50.00	-19.04	AVG	P

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

3. Radiated Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part 15 Subpart B

Radiated Emission Test Limit (Subpart B Class B)

	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

3.2. Test Setup

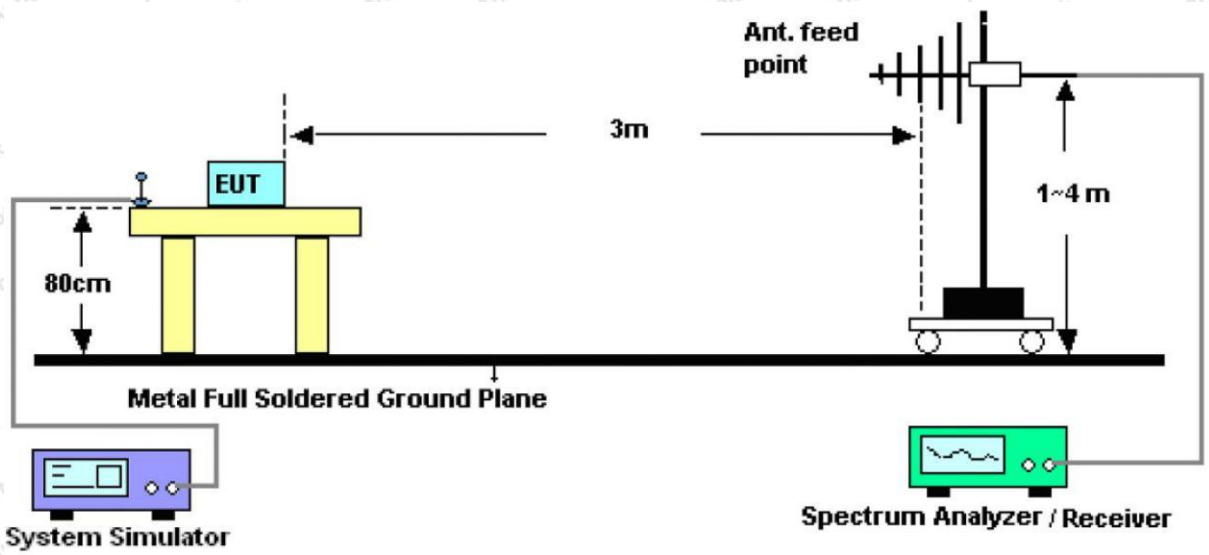


Figure 1. 30MHz to 1GHz

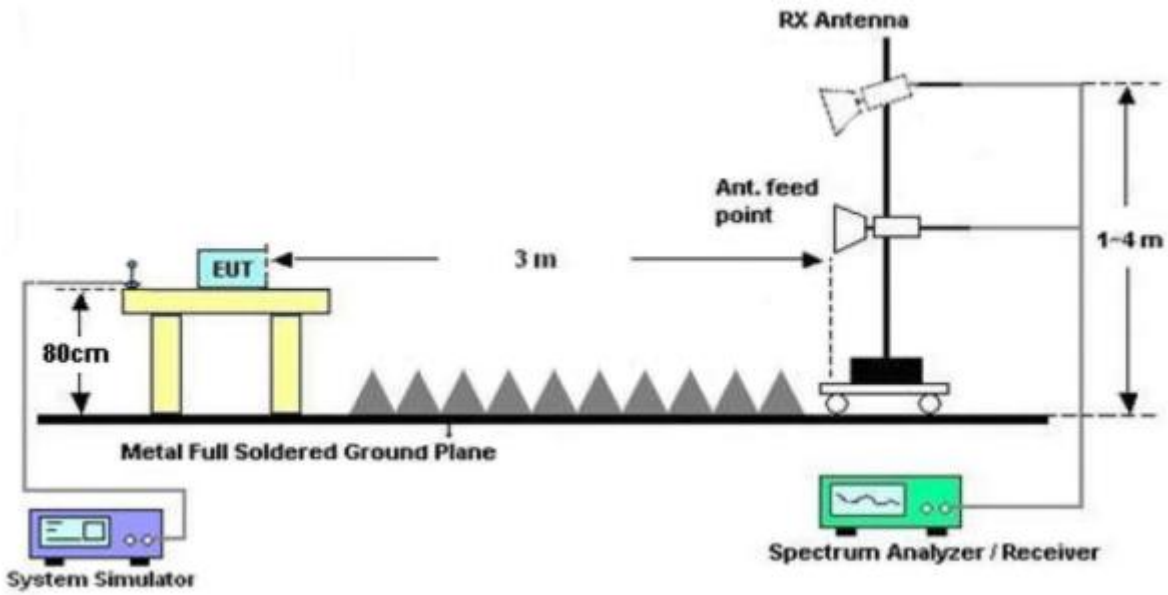


Figure 2. Above 1 GHz

3.3. EUT Configuration on Measurement

The following equipments are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT as shown in Section 3.2.

3.4.2. Turn on the power of all equipments.

3.4.3. Let the EUT work in test mode and measure it.

3.5. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Bilog antenna & Double Ridged Horn Antenna is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver (ESR26) is set at 120kHz.
The frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the EMI test receiver (ESR26) is set at 1MHz.
The frequency range from 1000MHz to 6000MHz is checked.

The test results are listed in Section 3.6.

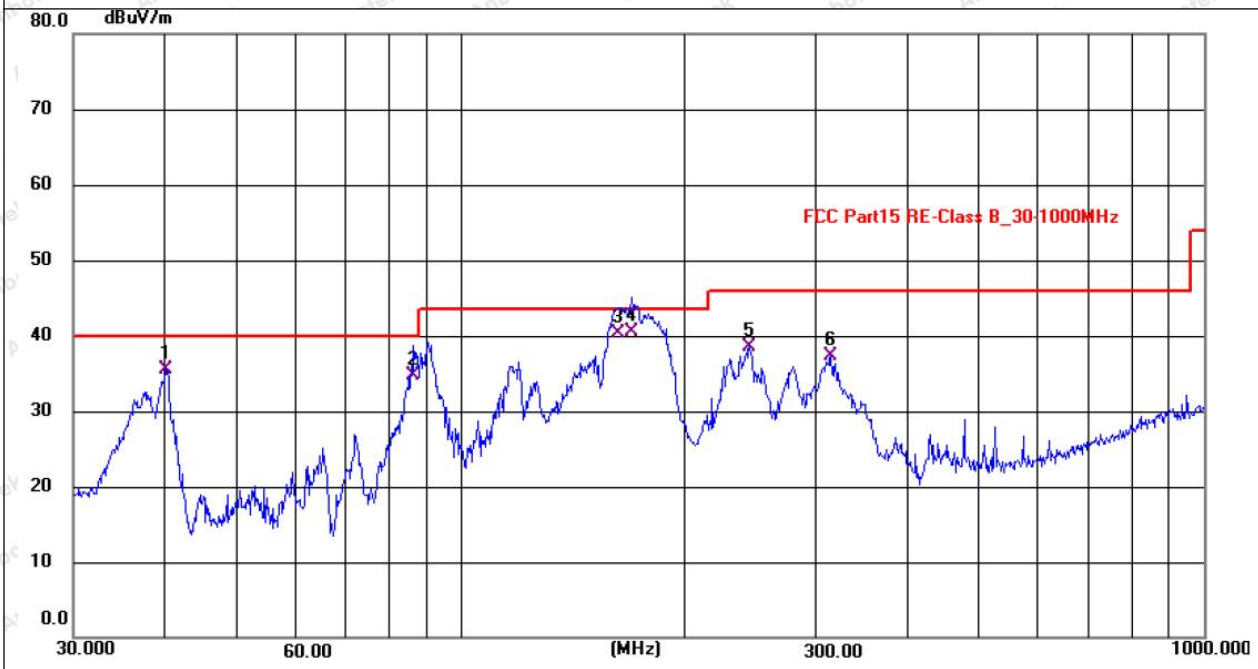
3.6. Test Results

PASS

Only the worst case data was showed in the report, please to see the following pages.

Test Results (30~1000MHz)

Test item:	Radiation Test	Polarization:	Horizontal
Standard:	(RE)FCC Part 15 Subpart B	Power Source:	AC 120V, 60Hz for Power cord
Test Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	24℃/60%RH



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	40.0644	50.03	-14.58	35.45	40.00	-4.55	QP
2	86.2001	54.18	-19.49	34.69	40.00	-5.31	QP
3	162.8959	56.10	-15.78	40.32	43.50	-3.18	QP
4 *	169.5990	57.01	-16.51	40.50	43.50	-3.00	QP
5	244.2321	54.65	-16.20	38.45	46.00	-7.55	QP
6	314.9281	51.97	-14.68	37.29	46.00	-8.71	QP

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

Test Results (30~1000MHz)

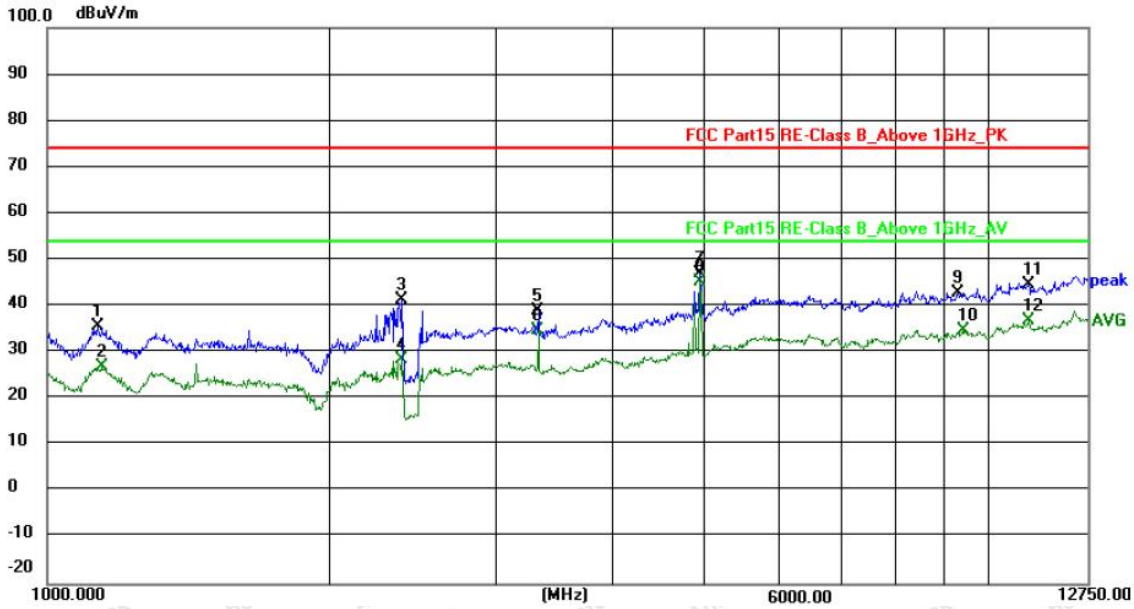
Test item:	Radiation Test	Polarization:	Vertical
Standard:	(RE)FCC Part 15 Subpart B	Power Source:	AC 120V, 60Hz for Power cord
Test Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	24℃/60%RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	45.9357	50.48	-14.98	35.50	40.00	-4.50	QP
2	54.7387	48.59	-15.69	32.90	40.00	-7.10	QP
3	94.7600	60.89	-19.44	41.45	43.50	-2.05	QP
4	119.8556	57.26	-17.06	40.20	43.50	-3.30	QP
5 *	177.8206	58.52	-17.02	41.50	43.50	-2.00	QP
6	245.5201	54.25	-16.32	37.93	46.00	-8.07	QP

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

Test Results (1GHz-12.75GHz)

Test item:	Radiation Test	Polarization:	Horizontal
Standard:	(RE)FCC Part 15 Subpart B	Power Source:	AC 120V, 60Hz for Power cord
Test Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	24℃/60%RH

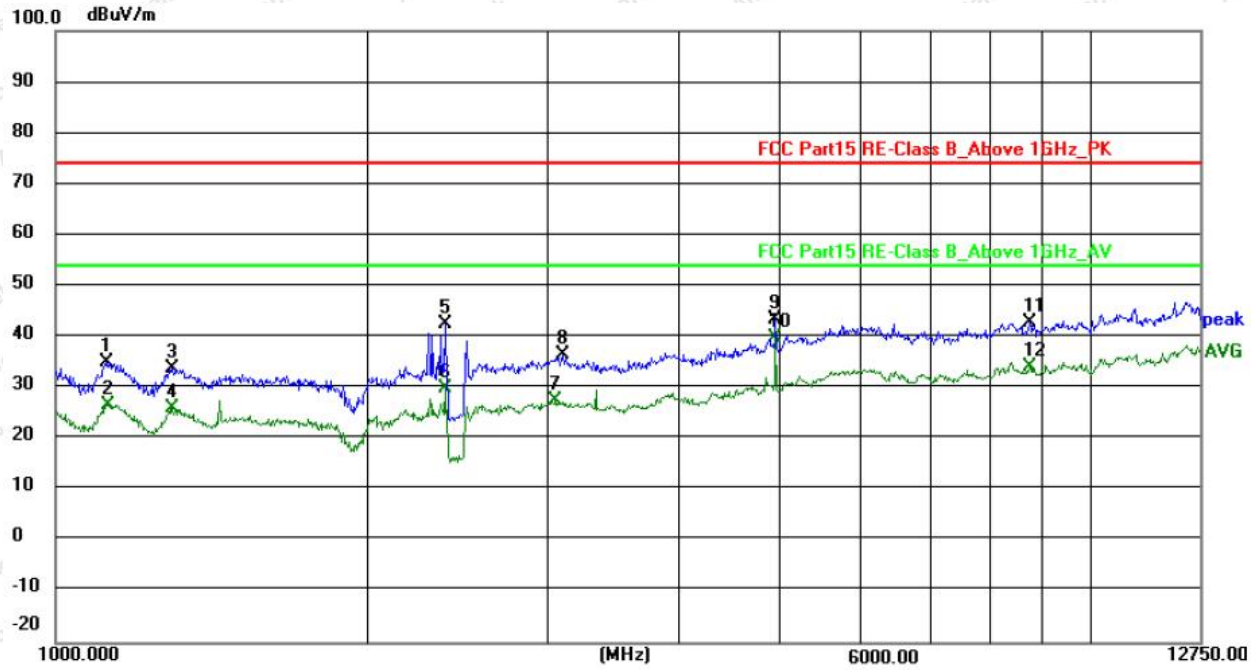


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1132.775	43.78	-7.99	35.79	74.00	-38.21	peak
2	1143.350	34.78	-7.95	26.83	54.00	-27.17	AVG
3	2385.912	43.96	-2.68	41.28	74.00	-32.72	peak
4	2385.912	31.12	-2.68	28.44	54.00	-25.56	AVG
5	3328.262	38.63	0.28	38.91	74.00	-35.09	peak
6	3328.262	34.45	0.28	34.73	54.00	-19.27	AVG
7	4940.363	41.21	5.90	47.11	74.00	-26.89	peak
8 *	4940.363	39.40	5.90	45.30	54.00	-8.70	AVG
9	9292.563	31.01	11.93	42.94	74.00	-31.06	peak
10	9417.700	22.52	12.11	34.63	54.00	-19.37	AVG
11	11046.250	29.86	14.76	44.62	74.00	-29.38	peak
12	11046.250	22.10	14.76	36.86	54.00	-17.14	AVG

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

Test Results (1GHz-12.75GHz)

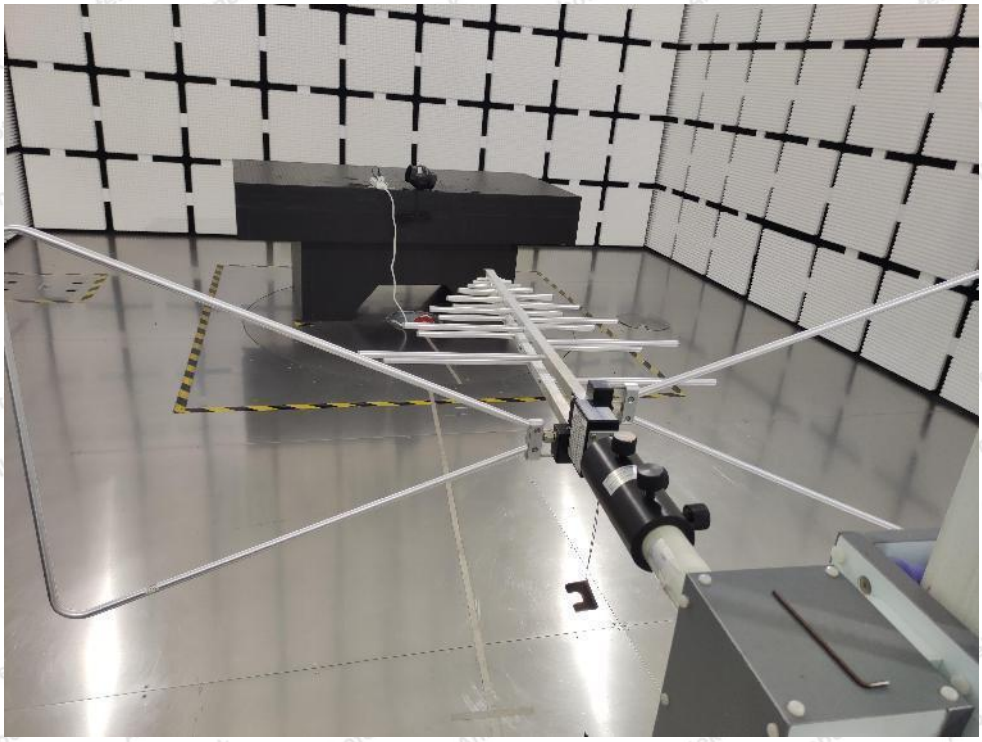
Test item:	Radiation Test	Polarization:	Vertical
Standard:	(RE)FCC Part 15 Subpart B	Power Source:	AC 120V, 60Hz for Power cord
Test Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	24℃/60%RH



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1118.675	43.11	-8.03	35.08	74.00	-38.92	peak
2	1125.138	34.76	-8.01	26.75	54.00	-27.25	AVG
3	1297.275	41.30	-7.41	33.89	74.00	-40.11	peak
4	1297.275	33.58	-7.41	26.17	54.00	-27.83	AVG
5	2378.863	45.35	-2.70	42.65	74.00	-31.35	peak
6	2378.863	32.52	-2.70	29.82	54.00	-24.18	AVG
7	3046.850	27.65	-0.12	27.53	54.00	-26.47	AVG
8	3089.150	36.67	-0.06	36.61	74.00	-37.39	peak
9	4960.925	37.52	5.99	43.51	74.00	-30.49	peak
10 *	4960.925	33.81	5.99	39.80	54.00	-14.20	AVG
11	8728.563	31.46	11.25	42.71	74.00	-31.29	peak
12	8728.563	22.83	11.25	34.08	54.00	-19.92	AVG

PPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Radiation Emission Test



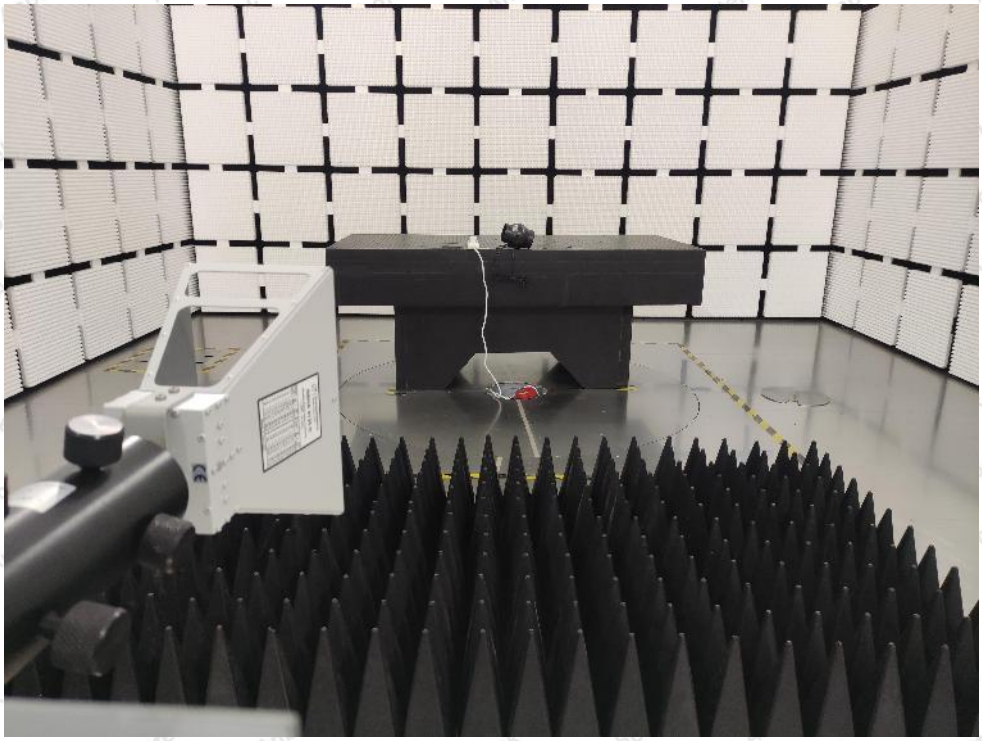
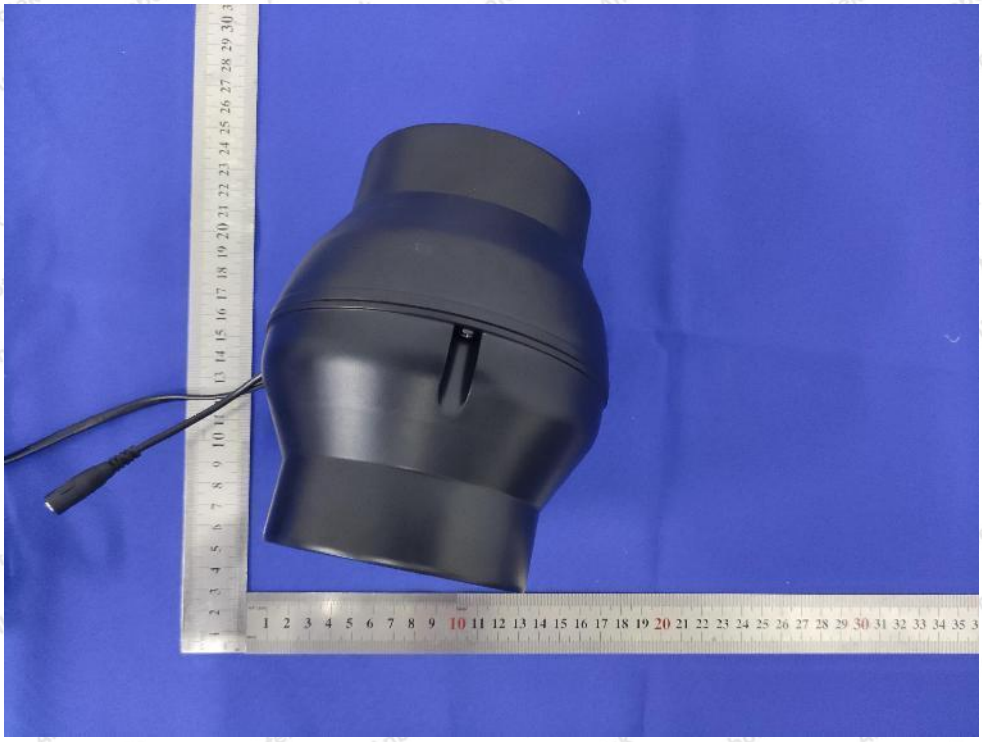
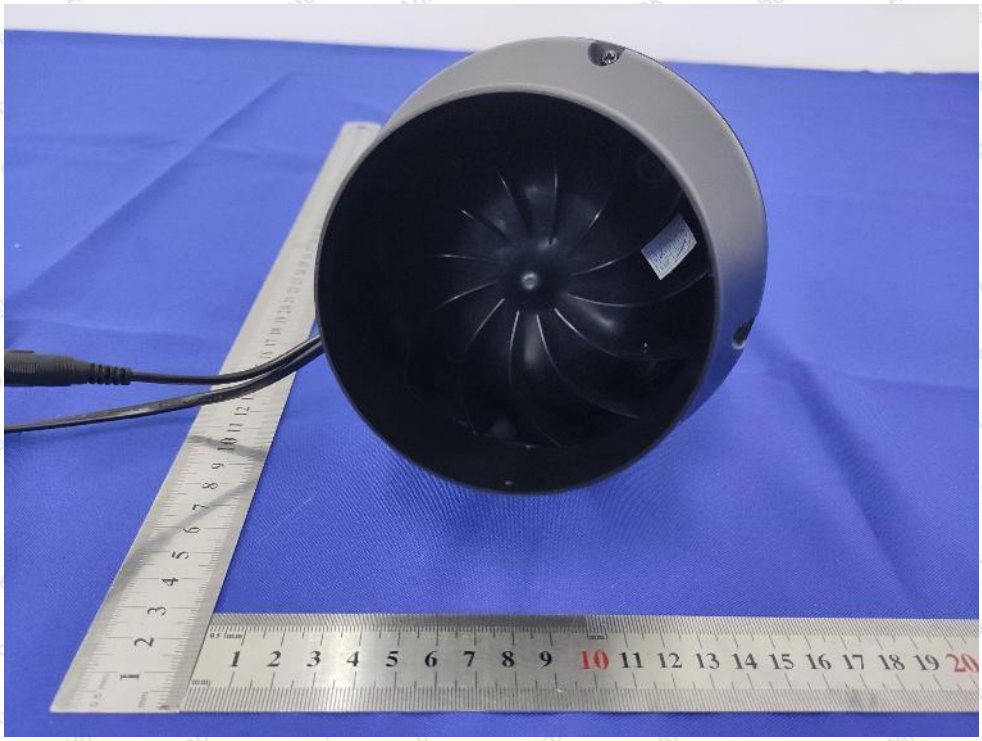
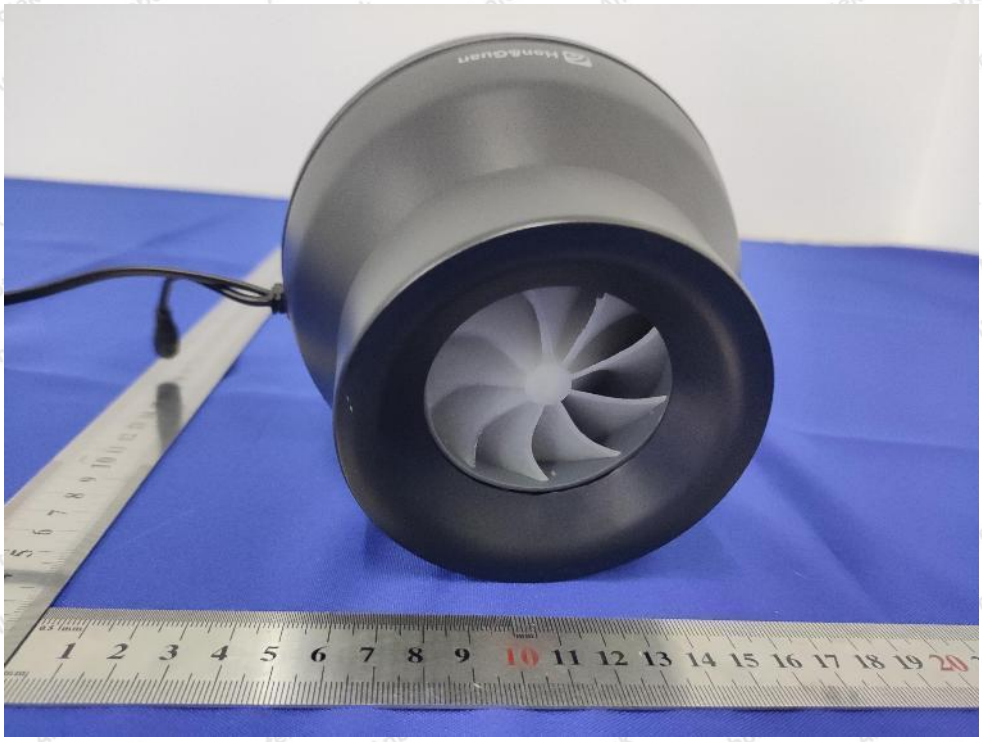


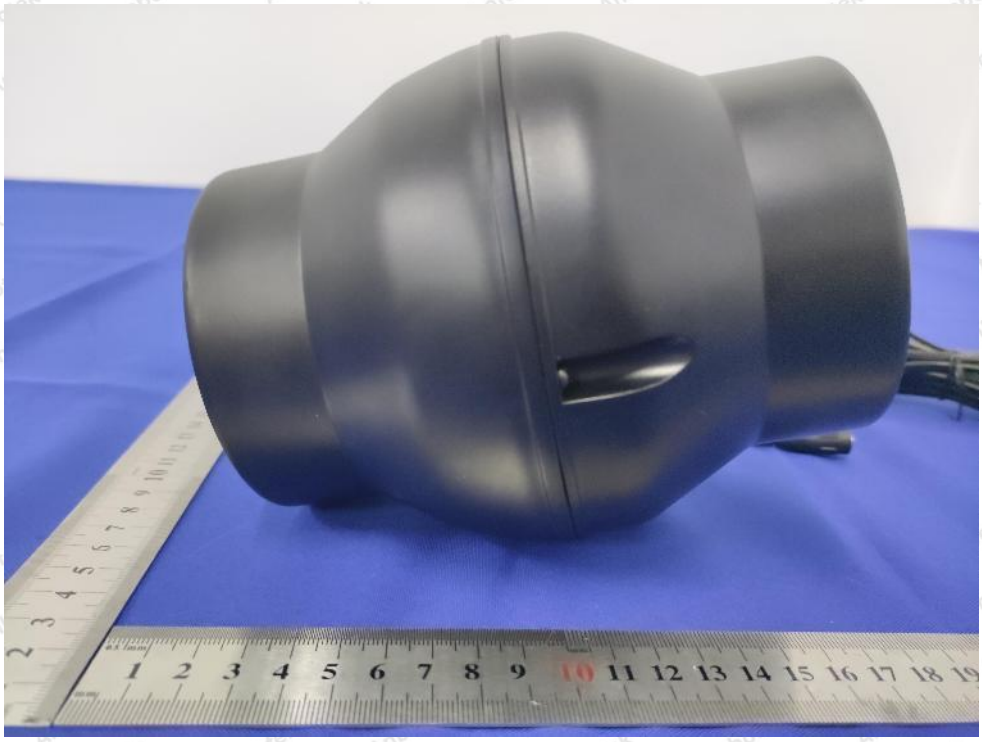
Photo of Conducted Emission Test

APPENDIX II -- EXTERNAL PHOTOGRAPH

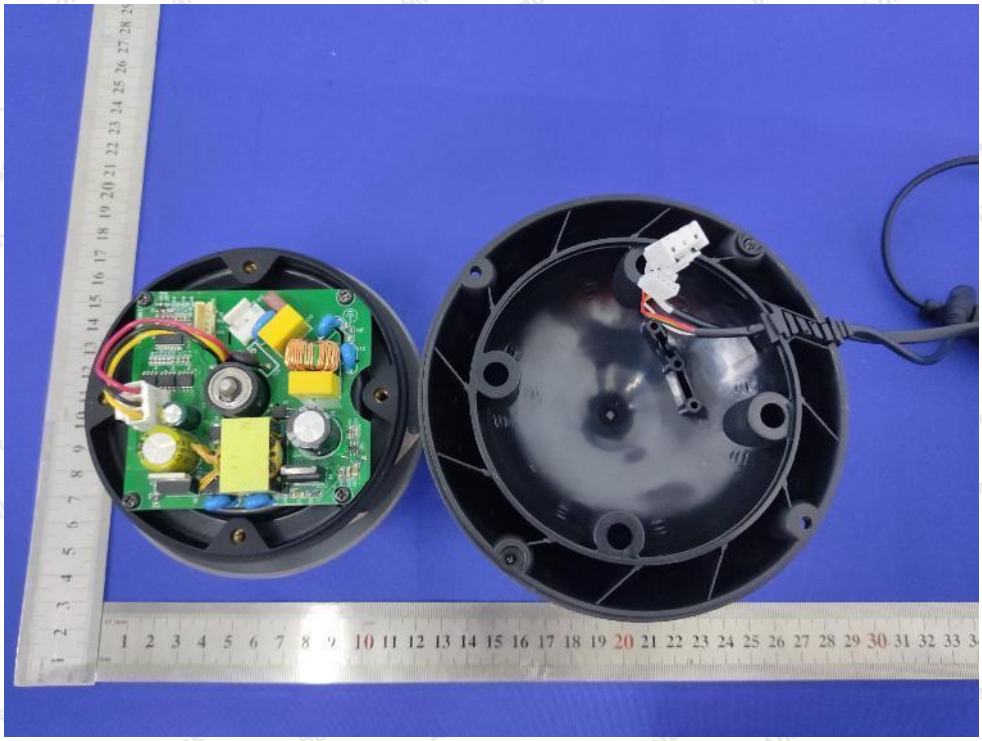


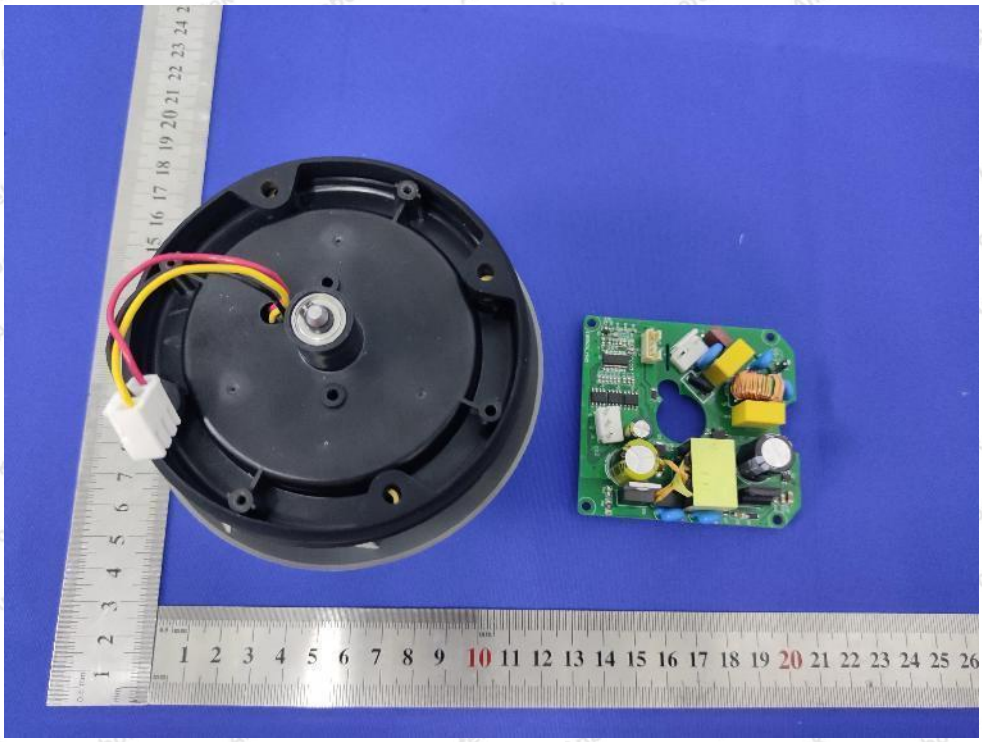


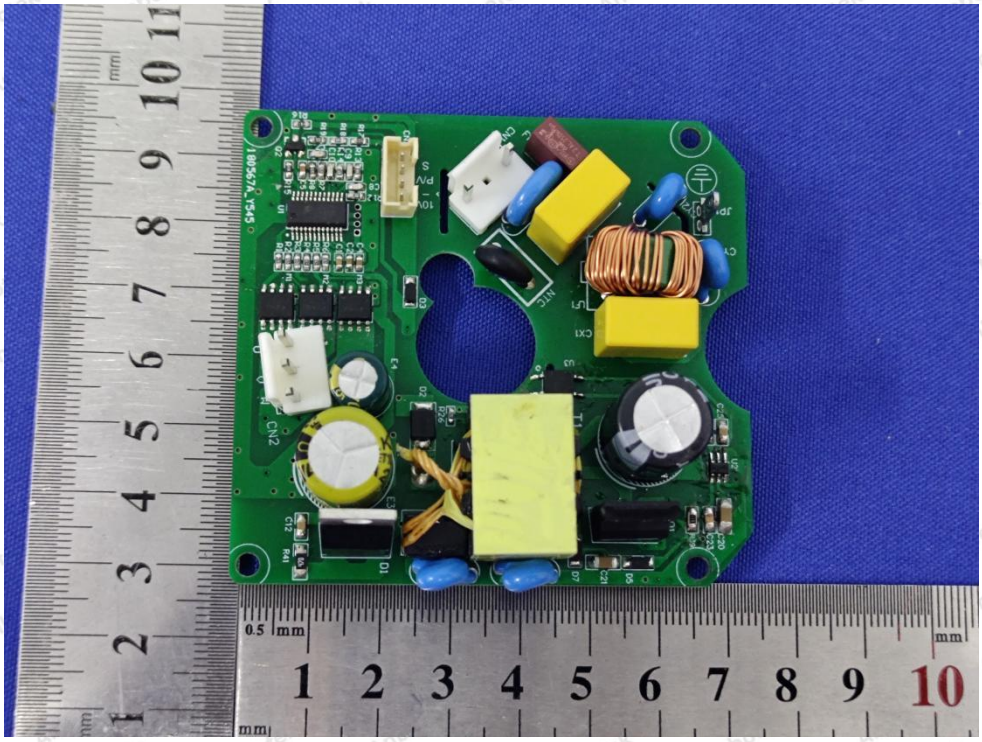


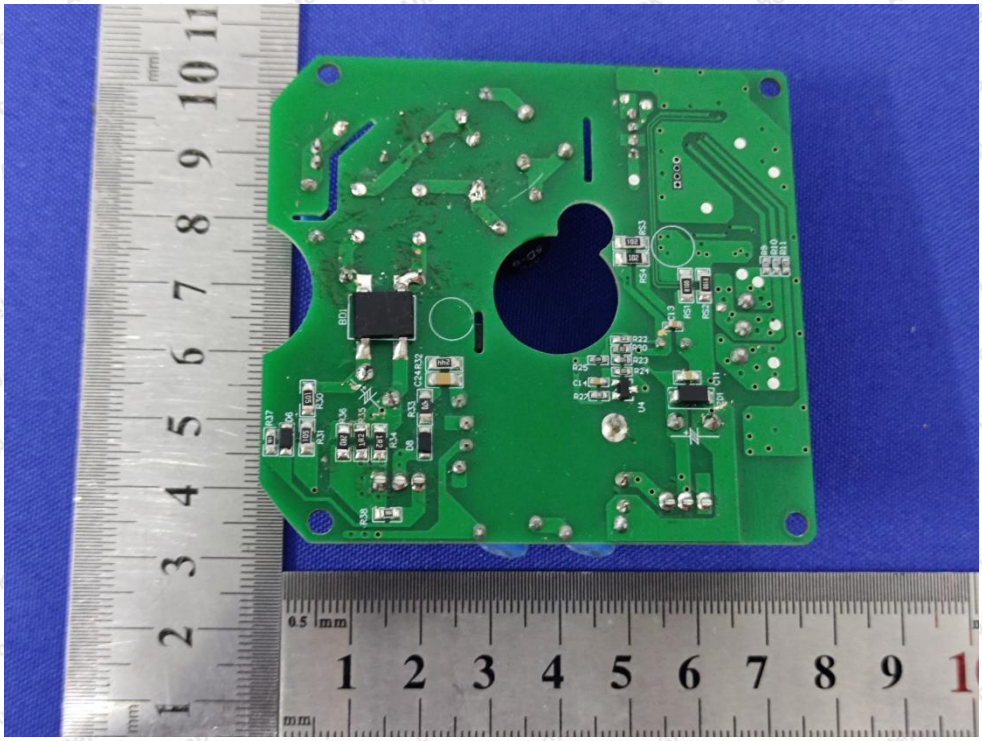


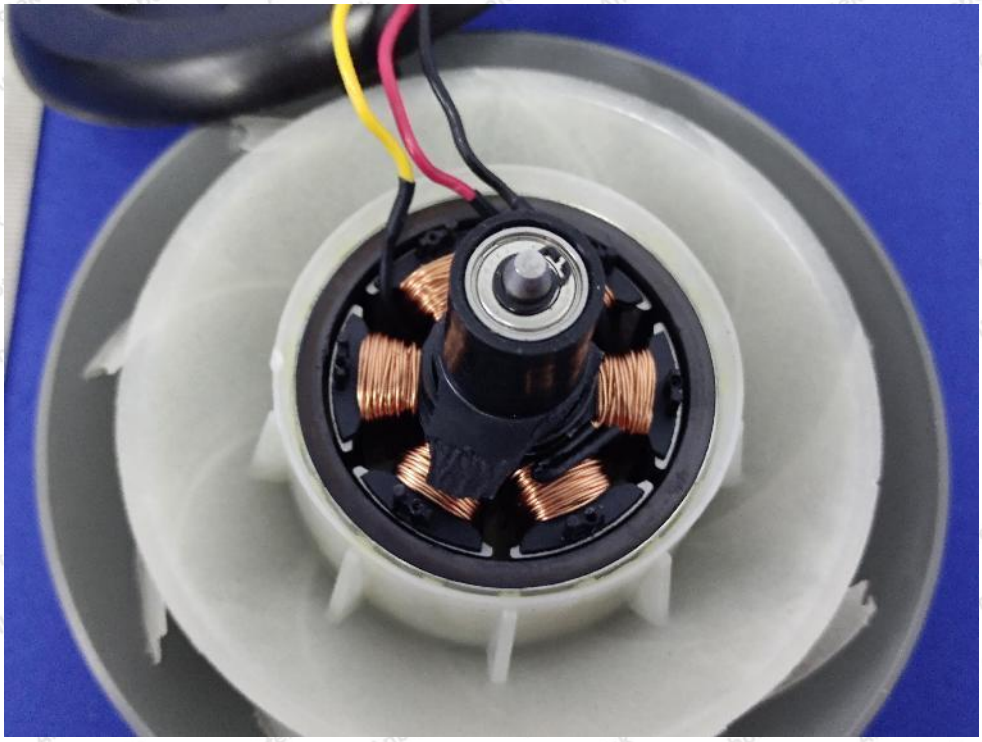
APPENDIX III -- INTERNAL PHOTOGRAPH











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