



FCC TEST REPORT

FCC Part 15 B

Report Number..... : ZKT-250116L1492E

Date of Test..... Jan. 13, 2025 to Jan. 20, 2025

Date of issue : Jan. 20, 2025

Total number of pages 16

Test Result : PASS

Testing Laboratory..... : **Shenzhen ZKT Technology Co., Ltd.**

Address : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name : **Changzhou HEMM Electronic Technology Co., Ltd.**

Address : Building 2, No. 3 Longzi Road, Wujin High-Tech Industrial Development Zone, Changzhou, Jiangsu Province, China.

Manufacturer's name : **Changzhou HEMM Electronic Technology Co., Ltd.**

Address : Building 2, No. 3 Longzi Road, Wujin High-Tech Industrial Development Zone, Changzhou, Jiangsu Province, China.

Test specification:

Standard..... : FCC Part 15 B, ANSI C63.4:2014

Test procedure : /

Non-standard test method : N/A

Test Report Form No. : TRF-EL-117_V0

Test Report Form(s) Originator : ZKT Testing

Master TRF : Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Product name..... : **Brushless motor**

Trademark : HEMM

Model/Type reference : HEM-23BR170-A1-01
13BR, 23BR, 32BR

Ratings: 110-120V~ 50/60Hz 1.3A



Testing procedure and testing location:

Testing Laboratory.....: **Shenzhen ZKT Technology Co., Ltd.**

Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community
Industrial Avenue, Fuhai Street, Bao'an District,
Shenzhen, China

Tested by (name + signature): Jim Liu

Reviewer (name + signature).....: Jackson Fang

Approved (name + signature): Lake Xie





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1.VERSION

Report No.	Version	Description	Approved
ZKT-250116L1492E	Rev.01	Initial issue of report	Jan. 20, 2025



2.GENERAL INFORMATION

2.1 Description of Device (EUT)

EUT	Brushless motor
Trademark	HEMM
Model Number	HEM-23BR170-A1-01 13BR, 23BR, 32BR
Model Difference	Only the model name is different.
Power Supply	110-120V~ 50/60Hz 1.3A

2.2 Tested System Details

None.

2.3 Test Facility

Site Description

Name of Firm : Shenzhen ZKT Technology Co., Ltd.

Site Location : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033

2.4 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted Emission (150K-30MHZ)	3.20
Radiated disturbance30MHz-1000MHz	4.80



2.5 Test Instrument Used

Conducted emissions Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Sep. 30, 2024	Sep. 29, 2025
2	LISN	CYBERTEK	EM5040A	E185040014 g	N/A	Sep. 30, 2024	Sep. 29, 2025
3	Test Cable	N/A	C-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
4	Test Cable	N/A	C-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Test Cable	N/A	C-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
6	EMI Test Receiver	R&S	ESC13	101393	4.42 SP3	Sep. 29, 2024	Sep. 28, 2025
7	Triple-Loop Antenna	N/A	RF300	N/A	N/A	Sep. 29, 2024	Sep. 28, 2025
8	Absorbing Clamp	DZ	ZN23201	15034	N/A	Oct. 10, 2024	Oct. 09, 2025
9	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\

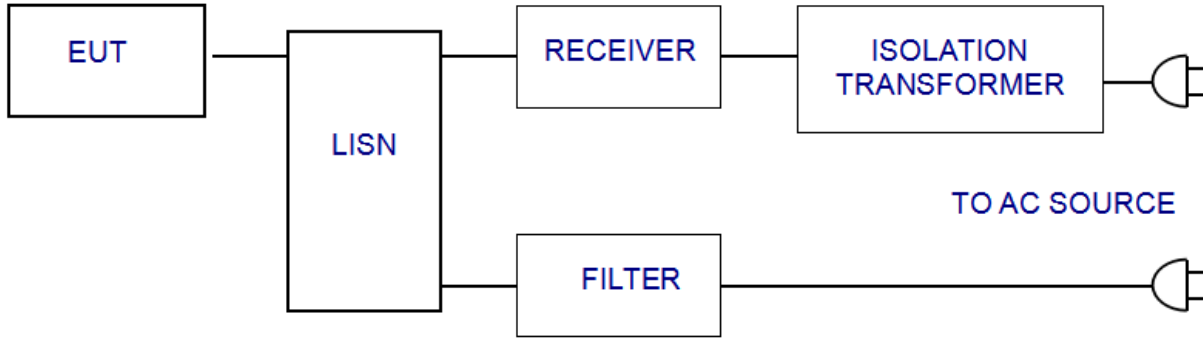
Radiation emissions& Radio Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	A.17.05	Sep. 29, 2024	Sep. 28, 2025
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 30, 2024	Sep. 29, 2025
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESC17	101169	4.32	Sep. 29, 2024	Sep. 28, 2025
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Sep. 30, 2024	Sep. 29, 2025
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Sep. 30, 2024	Sep. 29, 2025
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Oct. 11, 2024	Oct. 10, 2025
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	N/A	Sep. 29, 2024	Sep. 28, 2025
9	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	N/A	Sep. 29, 2024	Sep. 28, 2025
10	Amplifier (500MHz-40GHz)	全聚达	DLE-161	097	N/A	Sep. 30, 2024	Sep. 29, 2025
11	Test Cable	N/A	R-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
12	Test Cable	N/A	R-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
13	Test Cable	N/A	R-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
14	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	\	\
15	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\
16	Turntable	MF	MF-7802BS	N/A	N/A	\	\
17	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\



3.CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

3.1 Block Diagram Of Test Setup



3.2 Test Standard

FCC PART 15 B

3.3 Power Line Conducted Emission Limit

Frequency MHz	Limits dB(μV)	
	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

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

3.4 EUT Configuration on Test

The following equipments are installed on conducted emission test to meet FCC PART 15 B requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and simulators as shown in Section 3.1.
- 3.5.2 Turn on the power of all equipments.
- 3.5.3 Let the EUT work in test modes and test it.

3.6 Test Procedure

The EUT is put on the ground and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **FCC PART 15 B** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCI) is set at 10KHz.

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

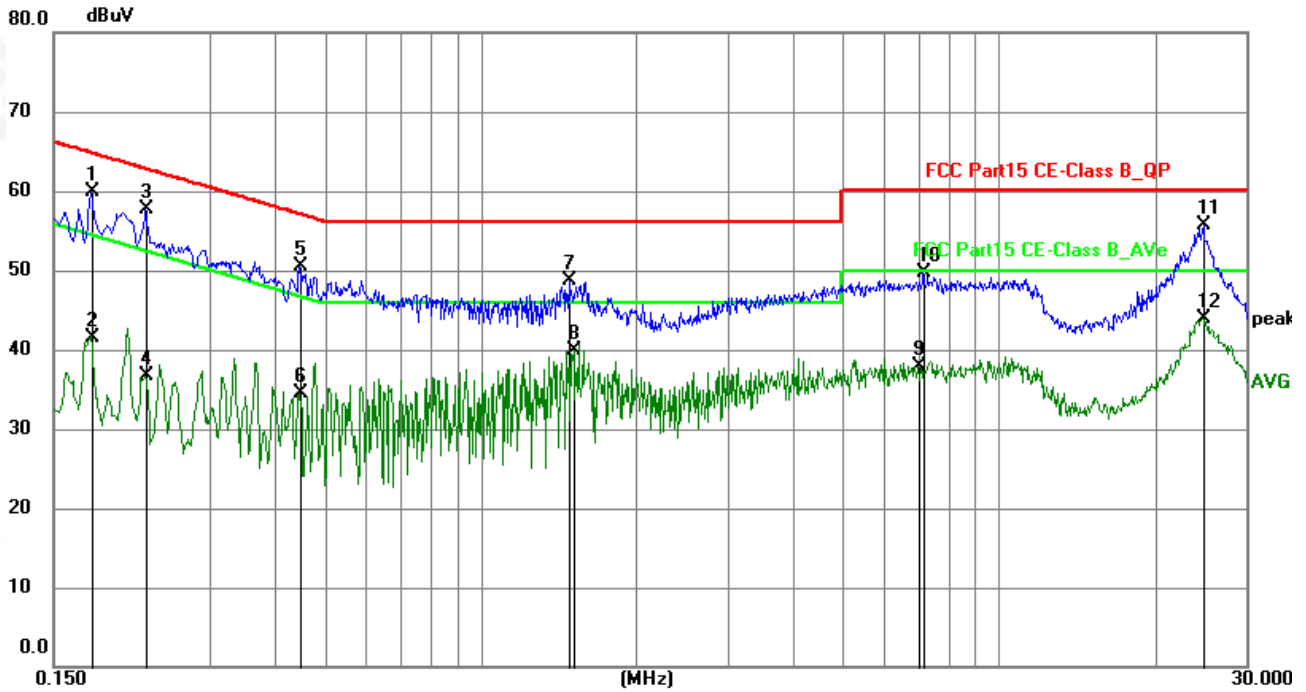
3.7 Test Result

PASS

Please refer to the following page.



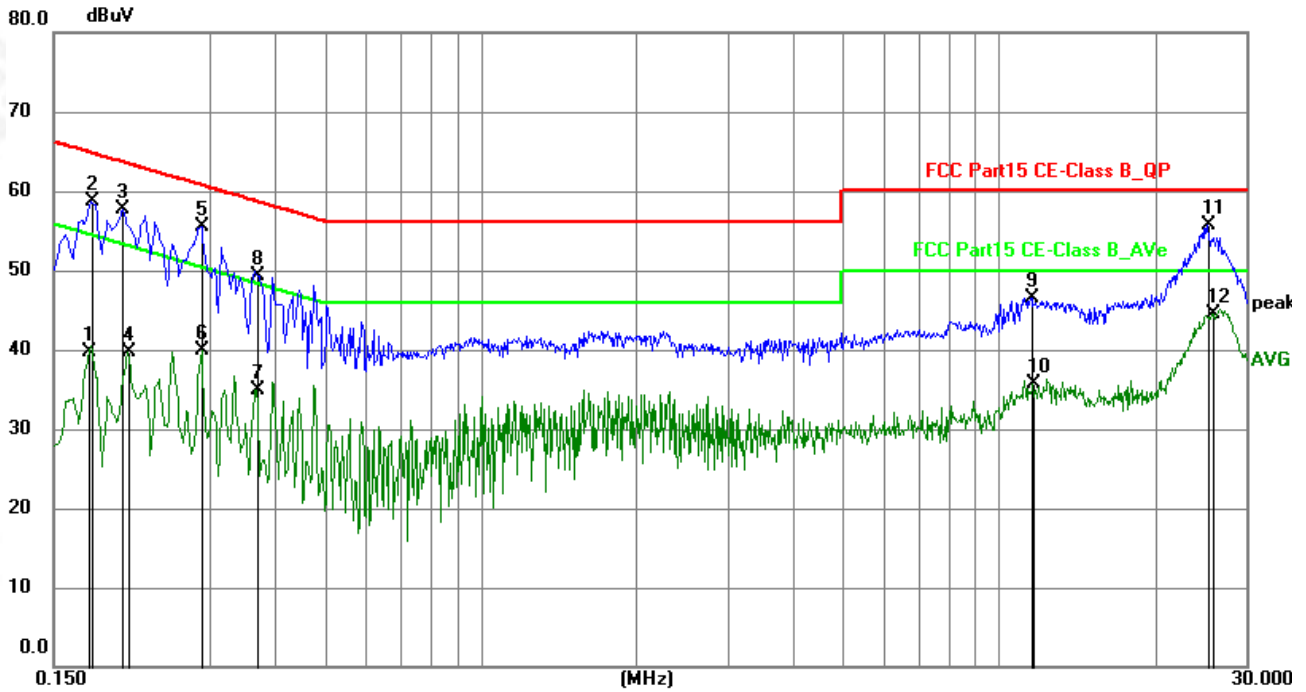
Conducted Emission At The Mains Terminals Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1768	39.03	20.89	59.92	64.63	-4.71	QP	P	
2	0.1768	20.71	20.89	41.60	54.63	-13.03	AVG	P	
3	0.2265	36.68	20.93	57.61	62.58	-4.97	QP	P	
4	0.2265	15.86	20.93	36.79	52.58	-15.79	AVG	P	
5	0.4470	29.63	20.84	50.47	56.93	-6.46	QP	P	
6	0.4470	13.68	20.84	34.52	46.93	-12.41	AVG	P	
7	1.4862	27.87	20.78	48.65	56.00	-7.35	QP	P	
8	1.5179	19.20	20.78	39.98	46.00	-6.02	AVG	P	
9	6.9900	17.09	20.73	37.82	50.00	-12.18	AVG	P	
10	7.1520	28.93	20.73	49.66	60.00	-10.34	QP	P	
11	24.8730	35.00	20.74	55.74	60.00	-4.26	QP	P	
12	24.8730	23.17	20.74	43.91	50.00	-6.09	AVG	P	



Conducted Emission At The Mains Terminals Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



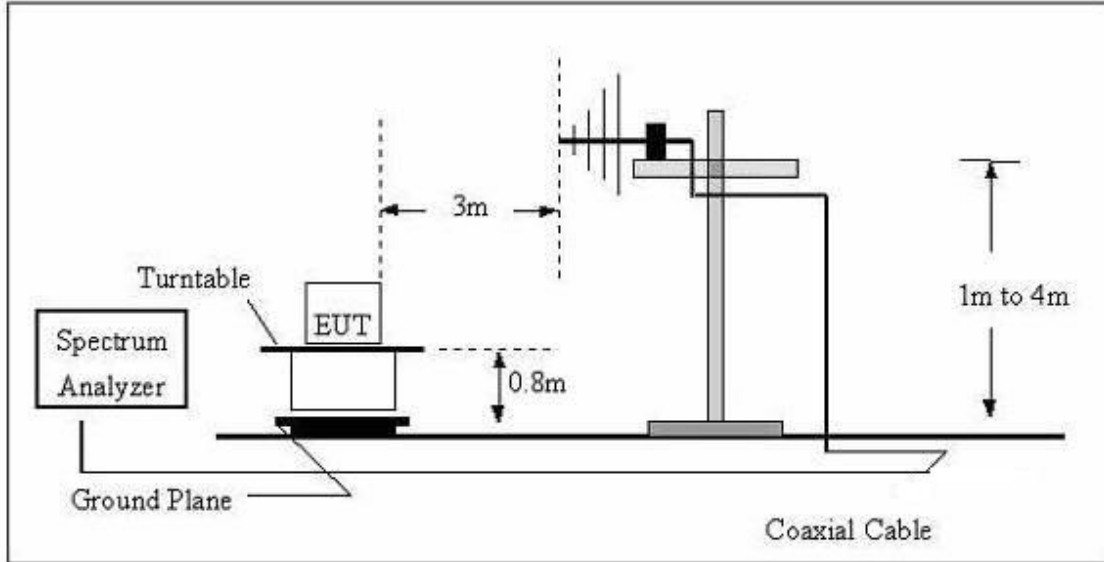
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1758	18.86	20.86	39.72	54.68	-14.96	AVG	P	
2	0.1768	37.77	20.87	58.64	64.63	-5.99	QP	P	
3	0.2039	36.70	20.94	57.64	63.45	-5.81	QP	P	
4	0.2084	18.78	20.93	39.71	53.27	-13.56	AVG	P	
5	0.2894	34.64	20.86	55.50	60.54	-5.04	QP	P	
6	0.2894	19.12	20.86	39.98	50.54	-10.56	AVG	P	
7	0.3704	14.03	20.84	34.87	48.49	-13.62	AVG	P	
8	0.3710	28.52	20.84	49.36	58.48	-9.12	QP	P	
9	11.5259	25.91	20.57	46.48	60.00	-13.52	QP	P	
10	11.6340	15.19	20.56	35.75	50.00	-14.25	AVG	P	
11	25.2013	34.92	20.75	55.67	60.00	-4.33	QP	P	
12	25.8000	23.72	20.79	44.51	50.00	-5.49	AVG	P	



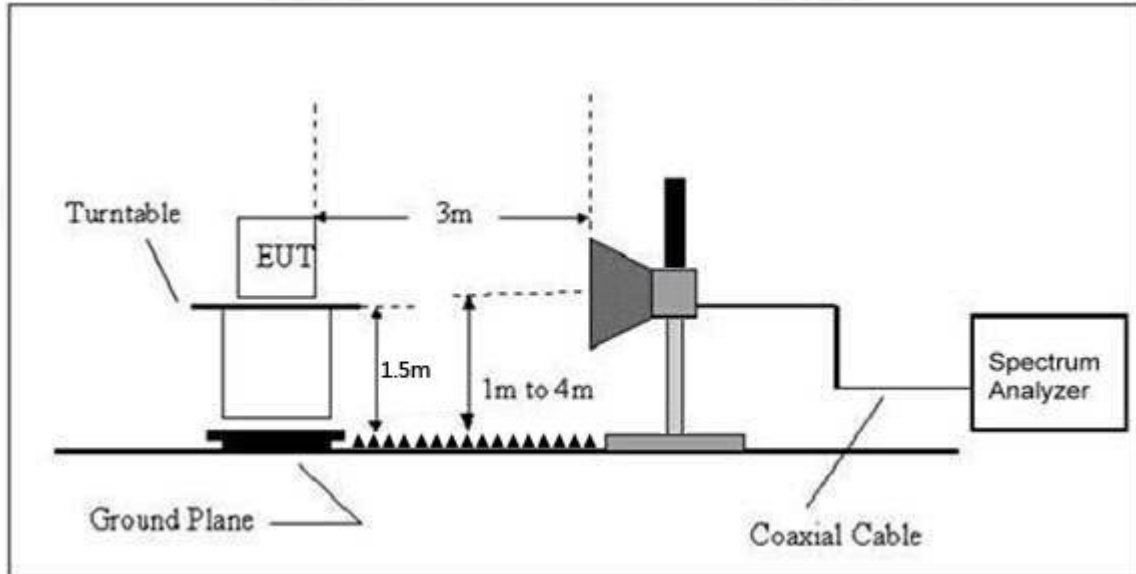
4. RADIATION EMISSION TEST

4.1 Block Diagram of Test Setup

(A) Radiated Emission Test-Up Frequency 30MHz~1GHz



(B) Radiated Emission Test-Up Frequency Above 1GHz



4.2 Test Standard

FCC PART 15 B

4.3 Radiation Limit

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0



4.4 EUT Configuration on Test

The FCC PART 15 B regulations test method must be used to find the maximum emission during radiated emission test. The configuration of EUT is the same as used in conducted emission test. Please refer to Section 2.2.

4.5 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 2.2 except the test set up replaced as Section 4.1.

4.6 Test Procedure

The EUT and its simulators are placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find the maximum emission levels, the interface cable must be manipulated according to FCC PART 15 B on radiated emission test.

The bandwidth setting on the field strength meter (R&S Test Receiver ESCI) is set at 120KHz below 1GHz, set at 1MHz above 1GHz. The frequency range from 30MHz to 1000MHz is checked.

4.7 Test Result

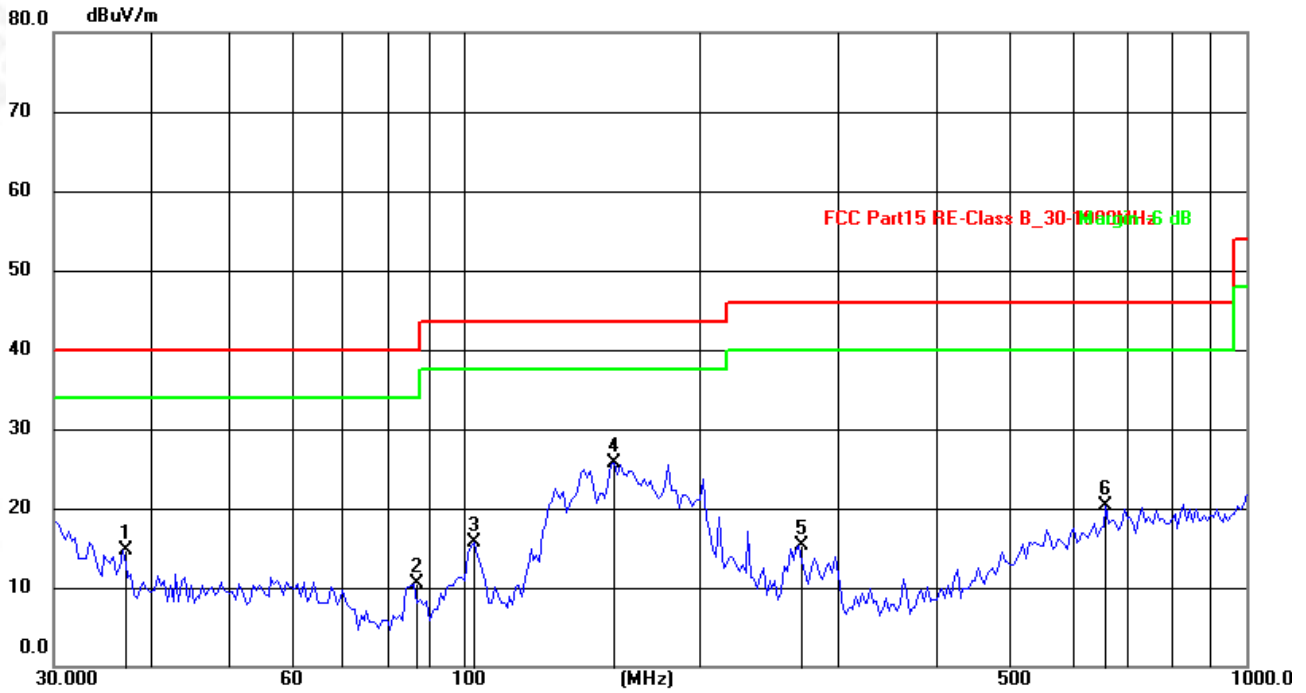
PASS

Please refer to the following page.



30MHz-1GHz

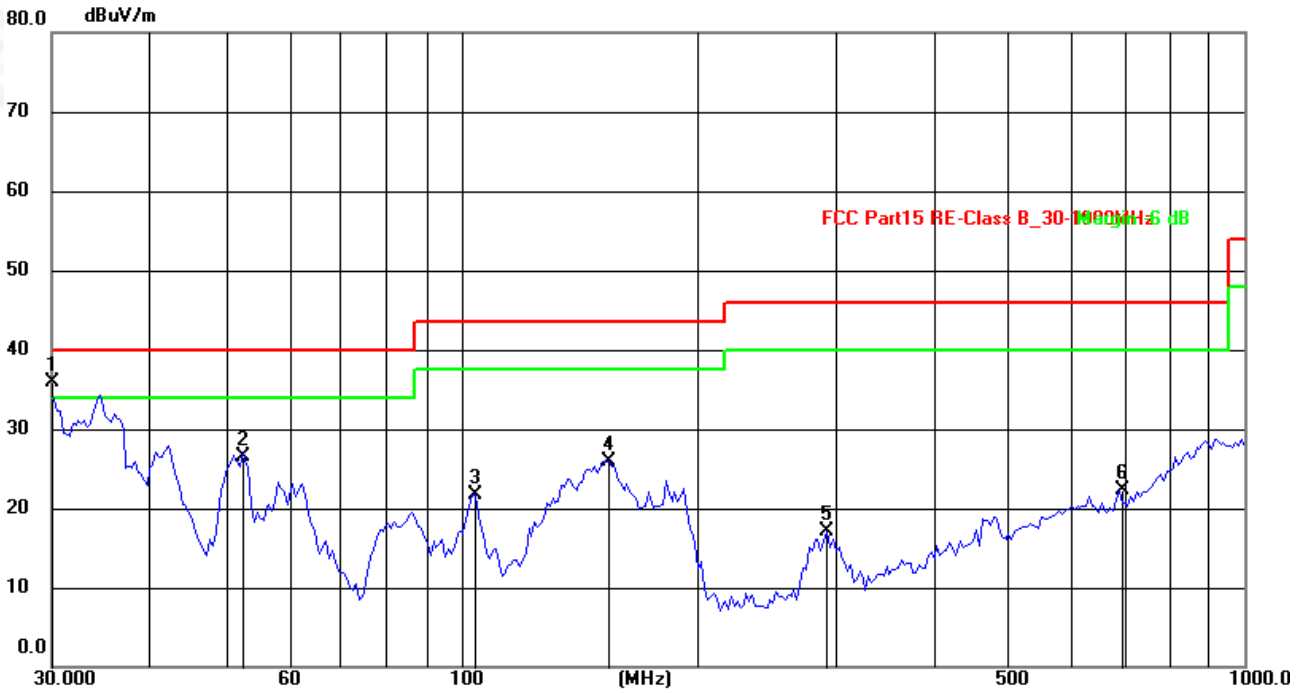
Radiation Emission Test Data			
Temperature:	26°C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.7018	29.52	-14.73	14.79	40.00	-25.21	QP
2	86.6547	30.40	-19.95	10.45	40.00	-29.55	QP
3	103.2609	35.31	-19.62	15.69	43.50	-27.81	QP
4	155.9101	42.13	-16.34	25.79	43.50	-17.71	QP
5	268.4853	30.29	-15.04	15.25	46.00	-30.75	QP
6	662.3106	27.74	-7.50	20.24	46.00	-25.76	QP



Radiation Emission Test Data			
Temperature:	26°C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode:	Working

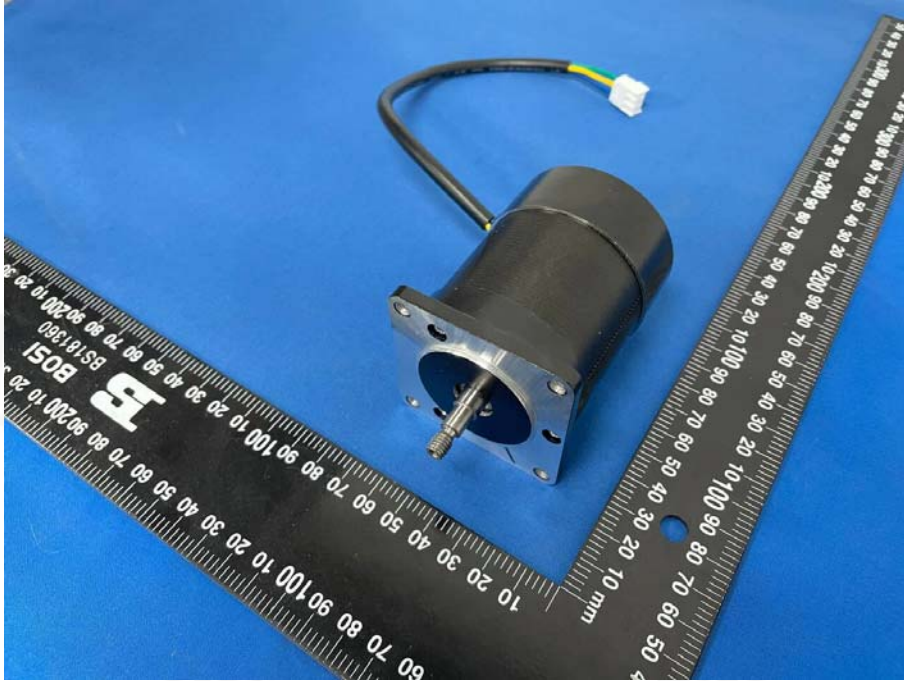


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.0000	54.30	-18.44	35.86	40.00	-4.14	QP
2	52.5753	44.11	-17.55	26.56	40.00	-13.44	QP
3	104.1701	43.01	-21.24	21.77	43.50	-21.73	QP
4	154.5493	46.25	-20.39	25.86	43.50	-17.64	QP
5	293.0842	35.68	-18.54	17.14	46.00	-28.86	QP
6	691.9867	30.05	-7.66	22.39	46.00	-23.61	QP

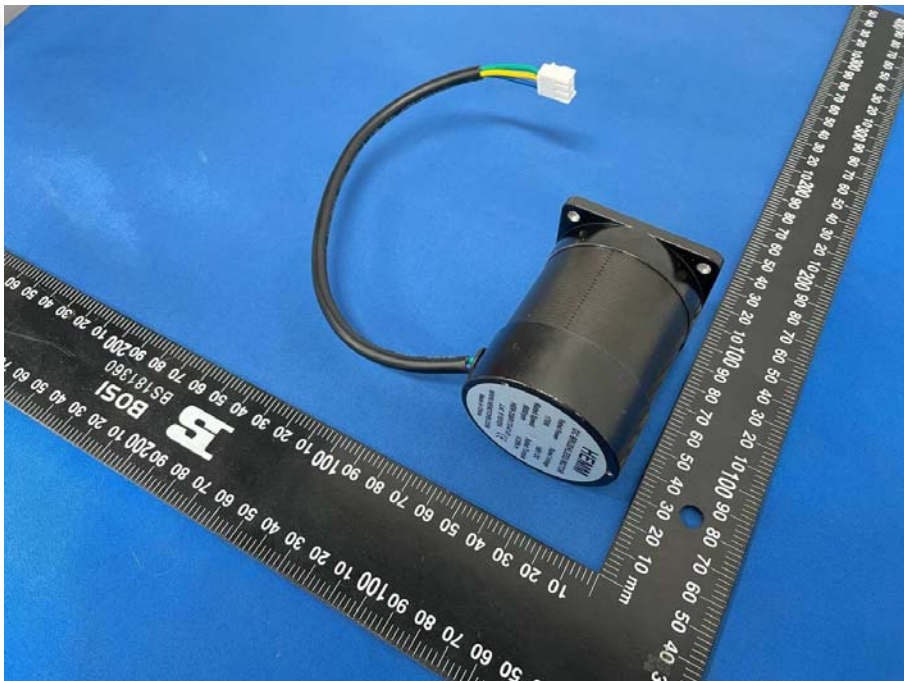


5.EUT PHOTOGRAPHS

EUT Photo 1

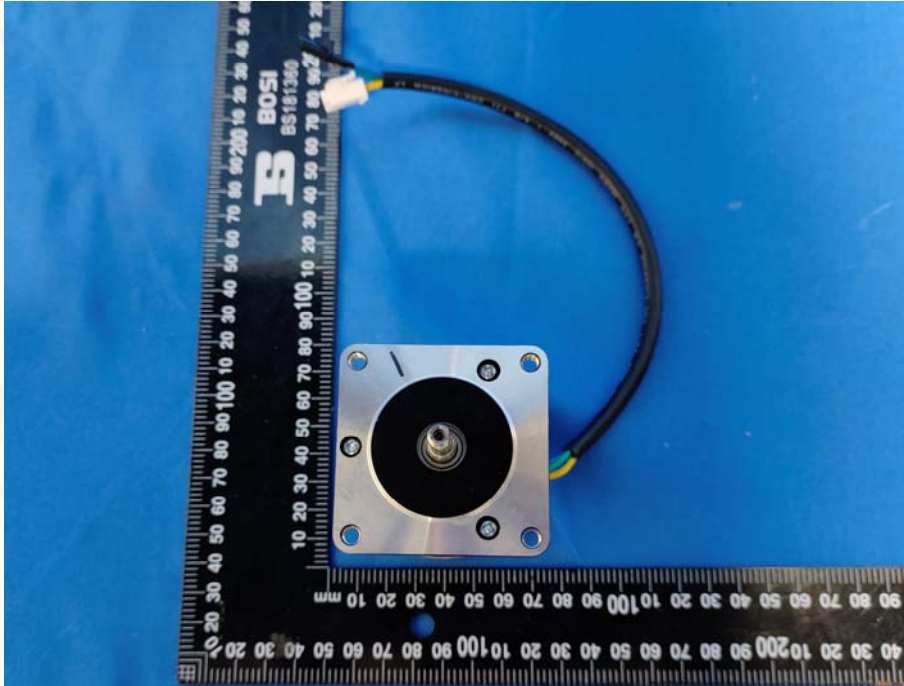


EUT Photo 2

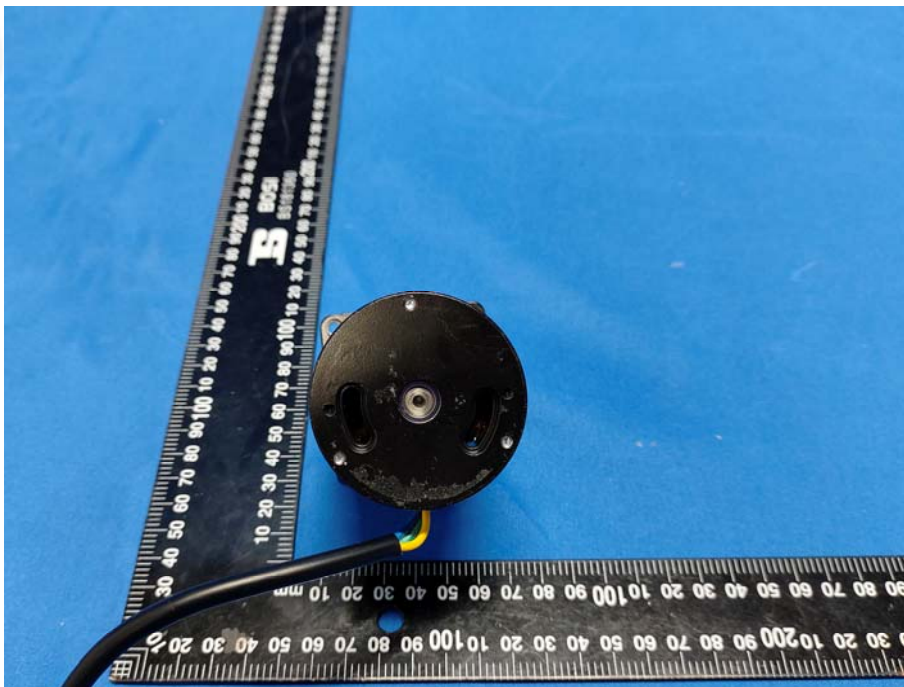




EUT Photo 3



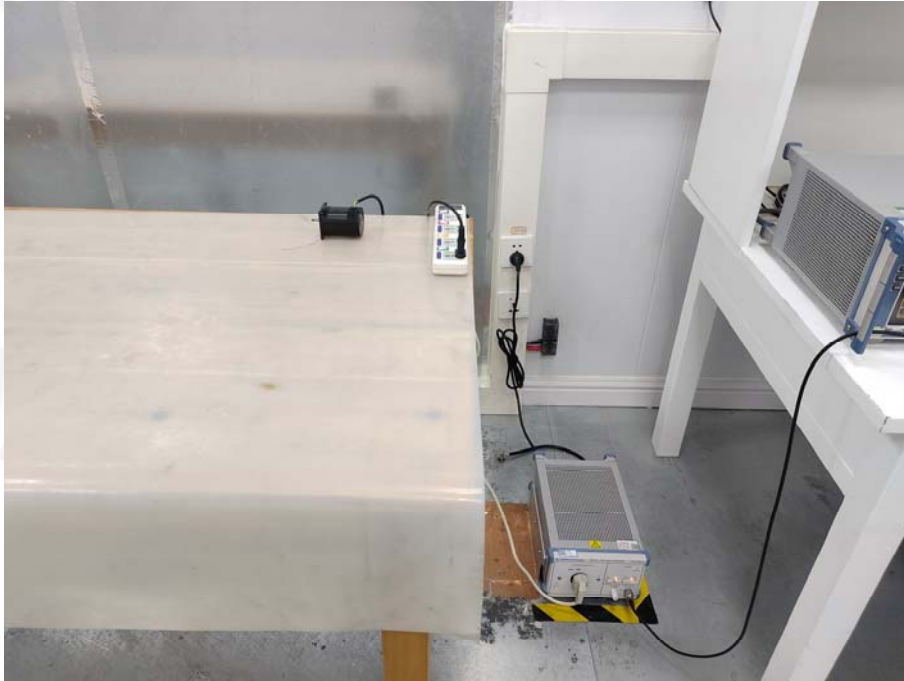
EUT Photo 4





6.EUT TEST PHOTOGRAPHS

RE



CE



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