Shenzhen Huaxia Testing Technology Co., Ltd.

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Report Template Version: V05
Report Template Revision Date: 2021-11-03

TEST REPORT

xcReport No.:	CQASZ20220200277E
Applicant:	Shenzhen Inkbird Technology Co., Ltd.
Address of Applicant:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	Intelligent temperature and humidity controller
Model No.:	ITC-608T, ITC608T, itc-608t, itc608t
Test Model No.:	ITC-608T
Brand Name:	INKBIRD
FCC ID	2AYZDITC-608T
Standards:	47 CFR Part 15, Subpart B, Class B
Date of Receipt:	2022-2-28
Date of Test:	2022-2-28 to 2022-3-3
Date of Issue:	2022-3-11
Test Result:	**PASS***

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

Tested By: Timo Lei

(Timo Lei)

Reviewed By: Rock Huang

(Rock Huang)

Approved By: Jack Ai

(Jack Ai)

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History of Report

Report No.	Version	Description	Issue Date
CQASZ20220200277E	Rev.01	Initial report	2022-3-11

2 Test Summary

Test Item	Test Requirement	Test method	Result
Radiated Emission	47 CFR Part 15B	ANSI C63.4-2014	PASS
Conducted Emission (150kHz to 30MHz)	47 CFR Part 15B	ANSI C63.4-2014	PASS

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	**Upper frequency of measurement Range (MHz)**
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

3 Contents

Page

4 General Information

4.1 Client Information

Applicant:	Shenzhen Inkbird Technology Co., Ltd.
Address of Applicant:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China
Manufacturer:	Shenzhen Inkbird Technology Co., Ltd.
Address of Manufacturer:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China
Factory:	Shenzhen Inkbird Technology Co., Ltd.
Address of Factory:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China

4.2 General Description of EUT

Product Name:	Intelligent temperature and humidity controller
Model No.:	ITC-608T, ITC608T, itc-608t, itc608t
Test Model No.:	ITC-608T
Trade Mark:	INKBIRD
EUT Power Supply:	AC 110V
Test Mode:	
Normal working	Keep the EUT in Normal working

Note:

Model No.: ITC-608T, ITC608T, itc-608t, itc608t.

Only the model ITC-608T was tested, their electrical circuit design, layout, components used and internal wiring are identical, only the sales customers, sales region, product color is different.

4.3 Test Environment and Mode

Operating Environment:	
Radiated Emission	
Temperature:	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar
Conducted Emission	
Temperature:	25.5 °C
Humidity:	55% RH
Atmospheric Pressure:	1009 mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1）support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	CQA

2) cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

4.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Conduction emission	3.74dB (9kHz to 150kHz)
		3.34dB (150kHz to 30MHz)
2	Radiated emission	5.12dB (Below 1GHz)
		4.60dB (Above 1GHz)
3	Temperature	0.8°C
4	Humidity	2.0%

5 Equipment List

Conducted Emissions (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI Test Receiver	R&S	ESPI3	CQA-013	2021/9/10	2022/9/9
LISN	R&S	ENV216	CQA-003	2021/9/10	2022/9/9
Coaxial cable (9kHz~300MHz)	CQA	N/A	C021	2021/9/10	2022/9/9

Radiated Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Loop antenna	SCHWARZBECK	FMZB 1516	CQA-060	2021/9/16	2024/9/15
Horn Antenna	R&S	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
EMI Test Receiver	R&S	ESR7	CQA-005	2021/9/10	2022/9/9
Spectrum analyzer	R&S	FSU26	CQA-038	2021/9/10	2022/9/9
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2021/9/10	2022/9/9
Coaxial cable (1GHz~40GHz)	CQA	N/A	C007	2021/9/10	2022/9/9
Coaxial cable (9kHz~1GHz)	CQA	N/A	C013	2021/9/10	2022/9/9

6 Test results and Measurement Data

6.1 Conducted Emissions

Test Requirement: 47 CFR Part 15B

Test Method: ANSI C63.4

Test frequency range: 150kHz to 30MHz

Limit:

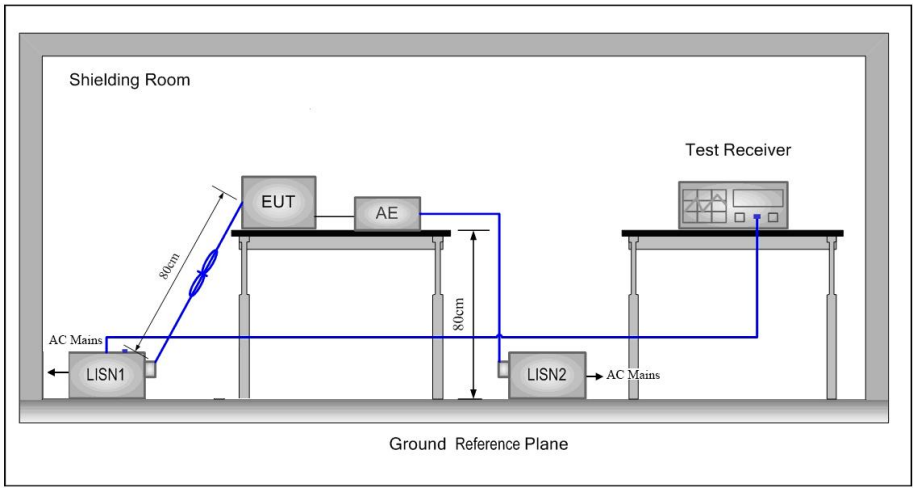
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Procedure:

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.

Test Setup:



Instruments Used: Refer to section 5 for details

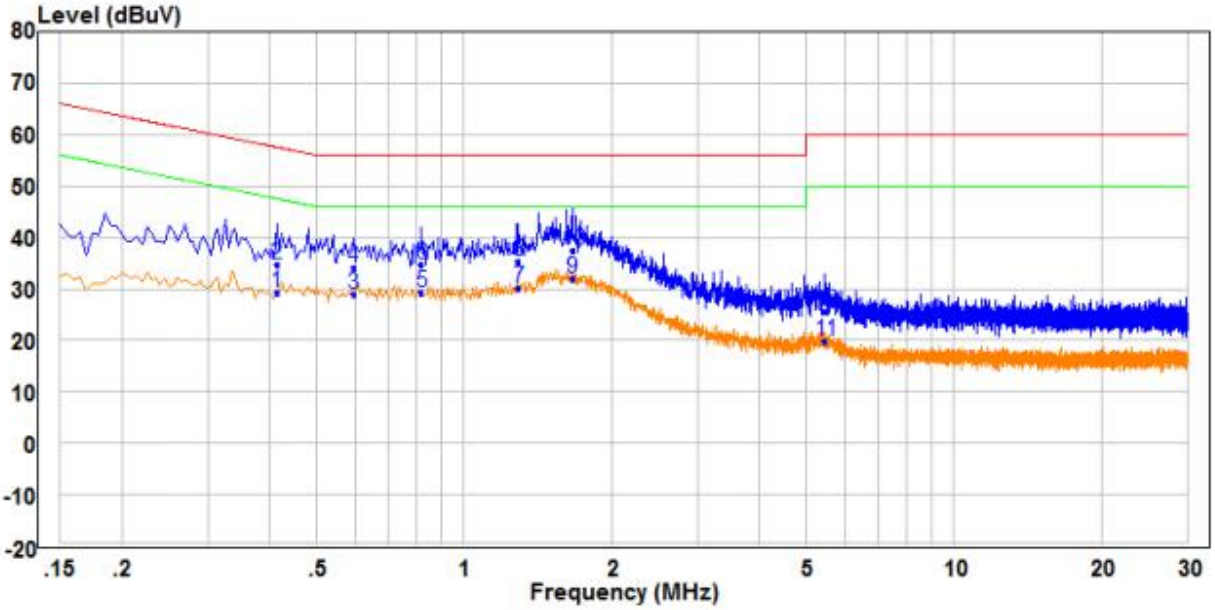
Test Mode: Normal working

Test Results: Pass

Measurement Data

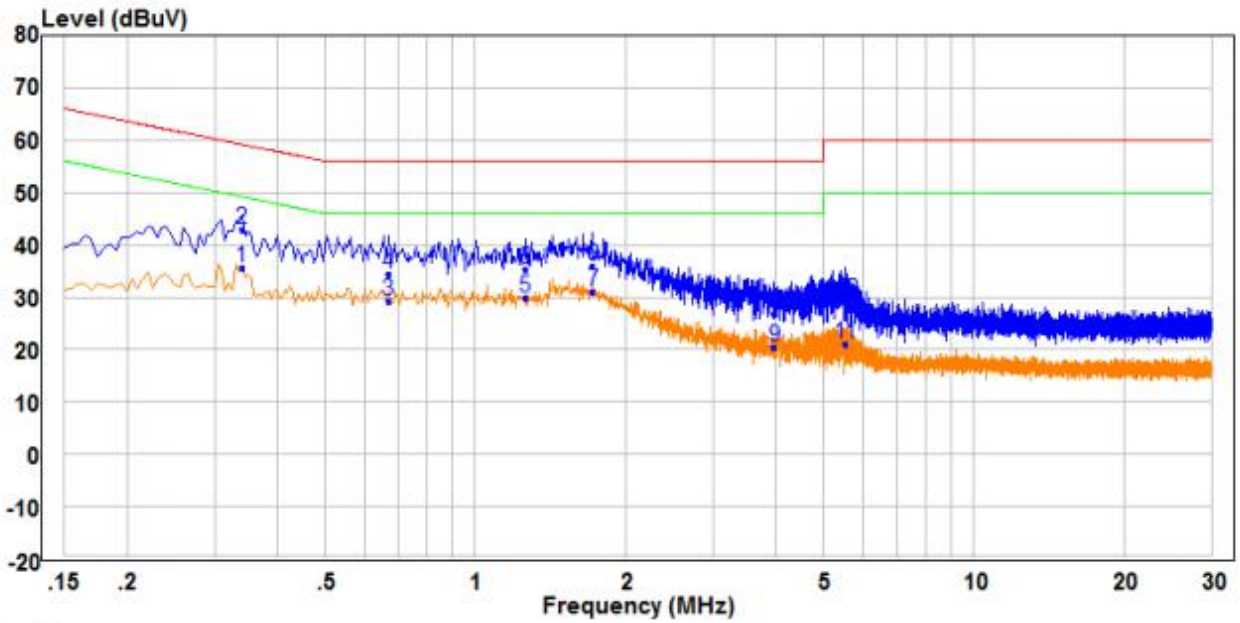
An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.415	19.53	9.62	29.15	47.55	-18.40	Average	Line
2	0.415	25.06	9.62	34.68	57.55	-22.87	QP	Line
3	0.595	19.05	9.80	28.85	46.00	-17.15	Average	Line
4	0.595	24.40	9.80	34.20	56.00	-21.80	QP	Line
5	0.820	19.32	9.82	29.14	46.00	-16.86	Average	Line
6	0.820	24.75	9.82	34.57	56.00	-21.43	QP	Line
7	1.295	19.85	10.42	30.27	46.00	-15.73	Average	Line
8	1.295	24.98	10.42	35.40	56.00	-20.60	QP	Line
9 PP	1.665	20.75	11.13	31.88	46.00	-14.12	Average	Line
10 QP	1.665	26.42	11.13	37.55	56.00	-18.45	QP	Line
11	5.465	9.96	9.76	19.72	50.00	-30.28	Average	Line
12	5.465	15.90	9.76	25.66	60.00	-34.34	QP	Line

Neutral Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1 PP	0.340	26.09	9.53	35.62	49.20	-13.58	Average	Neutral
2 QP	0.340	33.49	9.53	43.02	59.20	-16.18	QP	Neutral
3	0.670	19.51	9.87	29.38	46.00	-16.62	Average	Neutral
4	0.670	24.55	9.87	34.42	56.00	-21.58	QP	Neutral
5	1.260	20.07	9.71	29.78	46.00	-16.22	Average	Neutral
6	1.260	25.48	9.71	35.19	56.00	-20.81	QP	Neutral
7	1.720	21.19	9.74	30.93	46.00	-15.07	Average	Neutral
8	1.720	26.09	9.74	35.83	56.00	-20.17	QP	Neutral
9	3.985	10.58	9.79	20.37	46.00	-25.63	Average	Neutral
10	3.985	17.14	9.79	26.93	56.00	-29.07	QP	Neutral
11	5.535	11.28	9.82	21.10	50.00	-28.90	Average	Neutral
12	5.535	19.40	9.82	29.22	60.00	-30.78	QP	Neutral

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

6.2 Radiated Emission

Test Requirement: 47 CFR Part 15B

Test Method: ANSI C63.4

Test site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver setup:

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value

Limit:

Frequency	Limit (dBμV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber (Above 18GHz the distance is 1 meter).
h. Repeat above procedures until all frequencies measured was complete.

Test Setup:

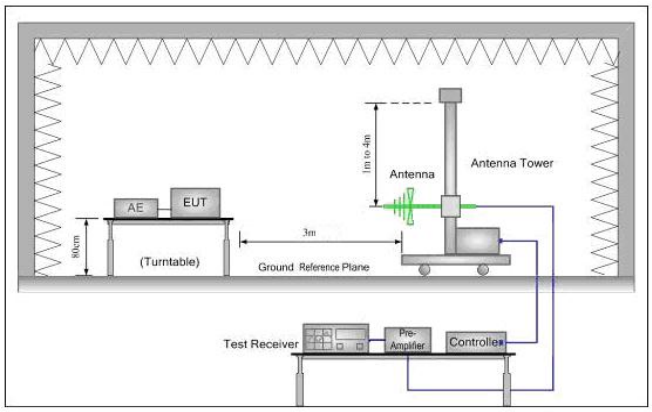


Figure 1. 30MHz to 1GHz

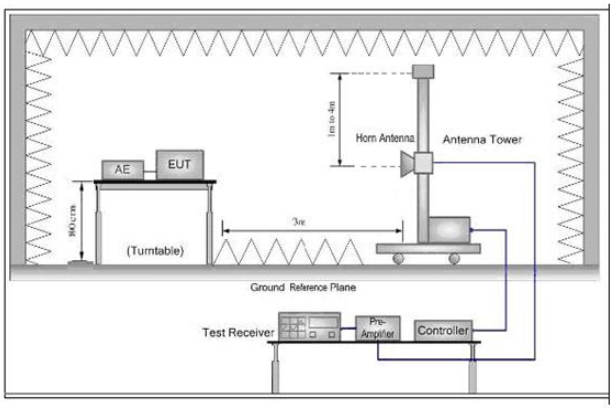


Figure 2. Above 1 GHz

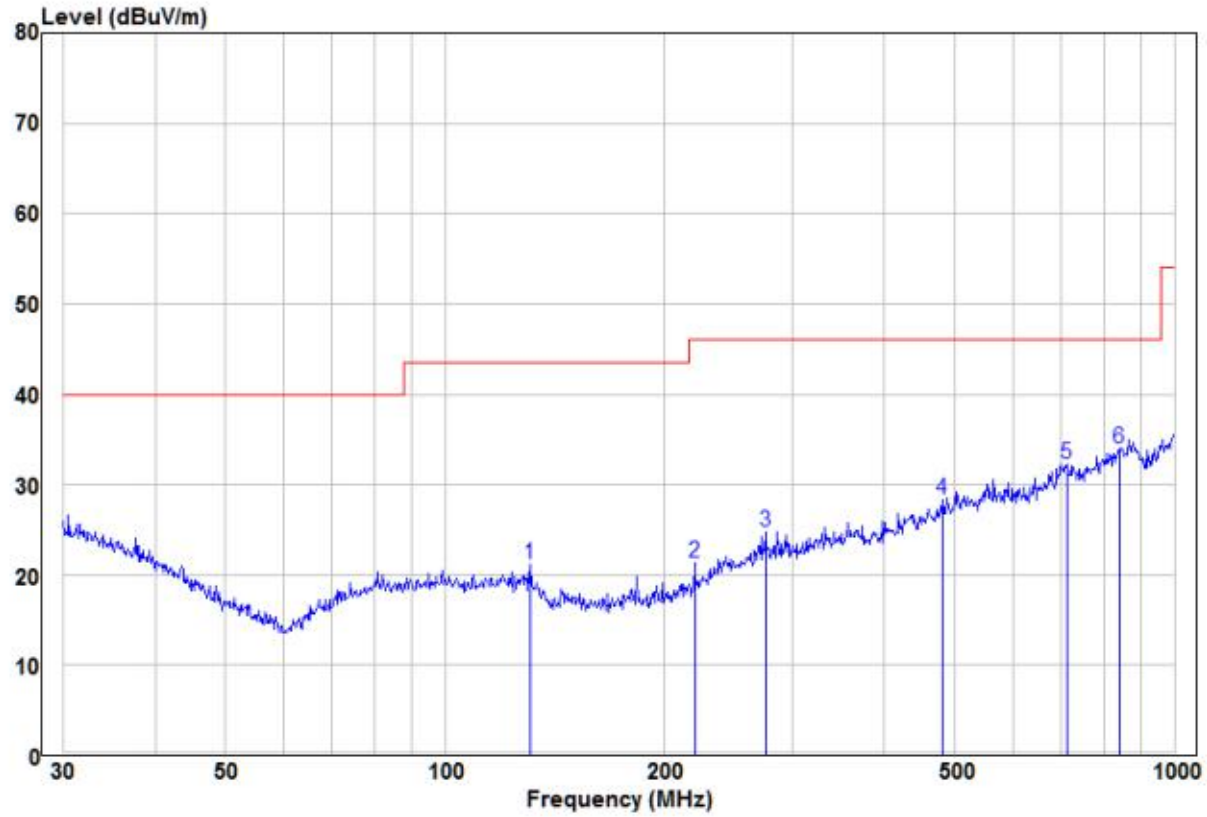
Instruments Used: Refer to section 5 for details

Test Mode: Normal working

Test Results: Pass

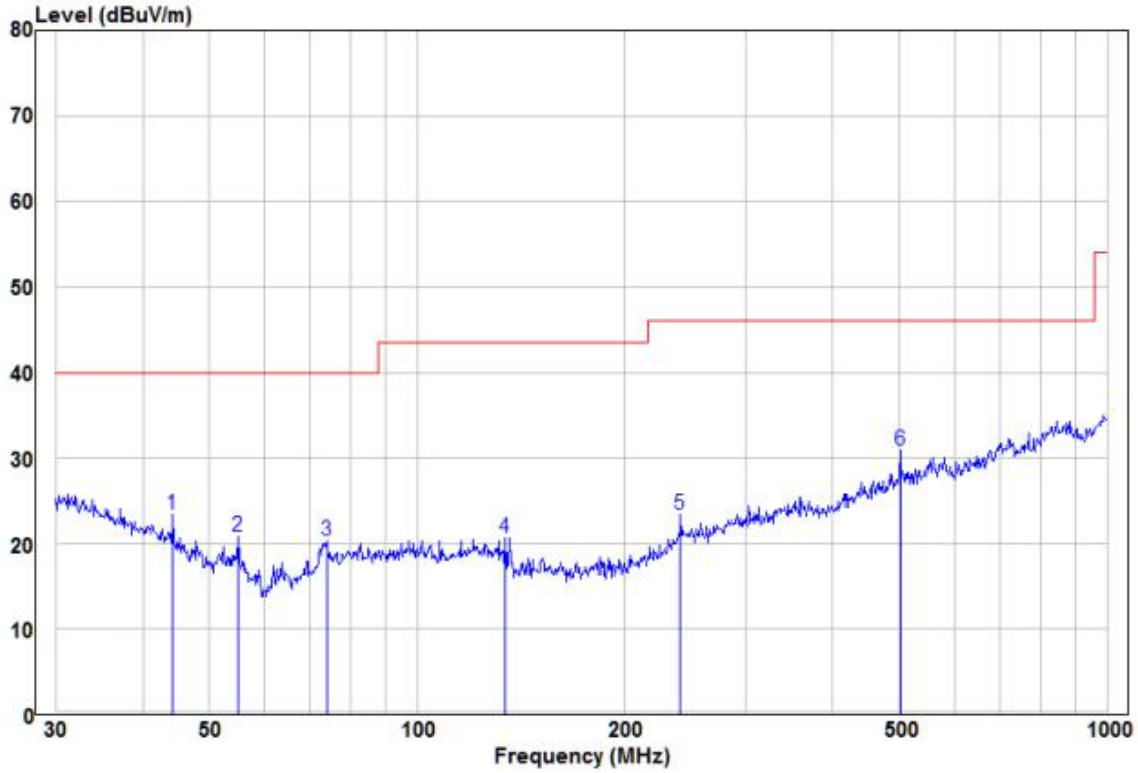
Below 1GHz

Horizontal



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	130.84	11.00	10.13	21.13	43.50	-22.37	Peak	HORIZONTAL
2	219.84	12.22	9.13	21.35	46.00	-24.65	Peak	HORIZONTAL
3	275.16	11.81	12.91	24.72	46.00	-21.28	Peak	HORIZONTAL
4	480.53	10.65	17.68	28.33	46.00	-17.67	Peak	HORIZONTAL
5	711.67	11.05	21.17	32.22	46.00	-13.78	Peak	HORIZONTAL
6 pp	839.18	9.80	24.10	33.90	46.00	-12.10	Peak	HORIZONTAL

Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	44.28	12.58	10.79	23.37	40.00	-16.63	Peak	VERTICAL
2	55.03	13.80	7.05	20.85	40.00	-19.15	Peak	VERTICAL
3	73.88	11.56	8.79	20.35	40.00	-19.65	Peak	VERTICAL
4	134.09	11.29	9.39	20.68	43.50	-22.82	Peak	VERTICAL
5	240.83	11.67	11.62	23.29	46.00	-22.71	Peak	VERTICAL
6 pp	501.18	12.56	18.29	30.85	46.00	-15.15	Peak	VERTICAL

Above 1GHz

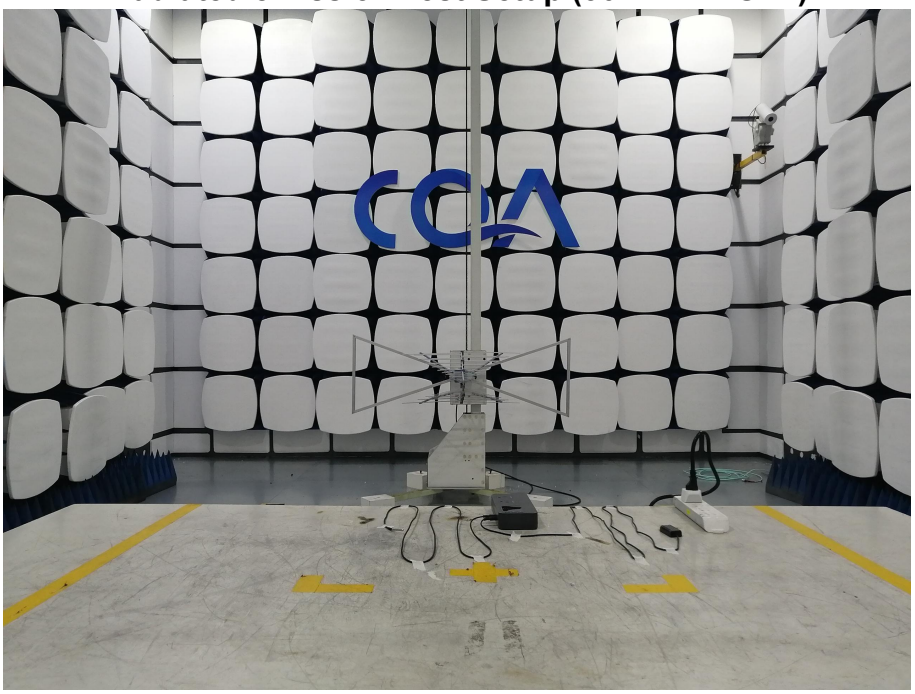
Class B: **Above 1GHz: at 3M**							
Ant.Pol.	Frequency	Measurement (dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
	MHz	PK	AV	PK	AV	PK	AV
Horizontal	1372.40	51.54	35.01	74.00	54.00	-22.46	-18.99
	2172.56	51.13	36.81	74.00	54.00	-22.87	-17.19
	4011.75	59.89	38.63	74.00	54.00	-14.11	-15.37
Vertical	1608.68	50.47	36.34	74.00	54.00	-23.53	-17.66
	2368.49	53.90	35.33	74.00	54.00	-20.10	-18.67
	4603.64	59.90	39.97	74.00	54.00	-14.10	-14.03

Remark:

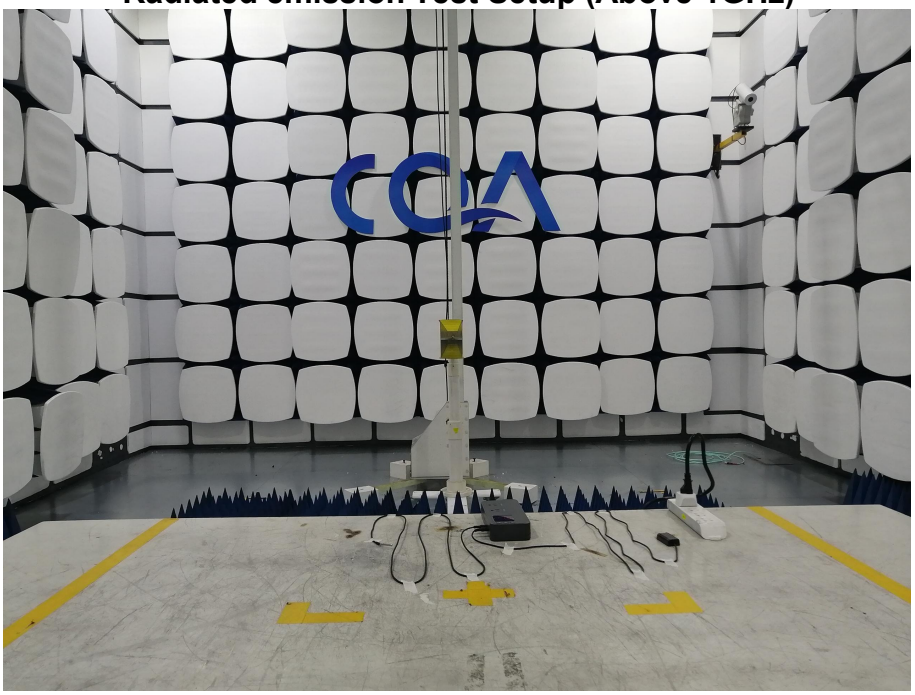
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading - Correct Factor
   Correct Factor = *Preamplifier Factor– Antenna Factor–Cable Factor* .

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Radiated emission Test Setup (30MHz～1GHz)

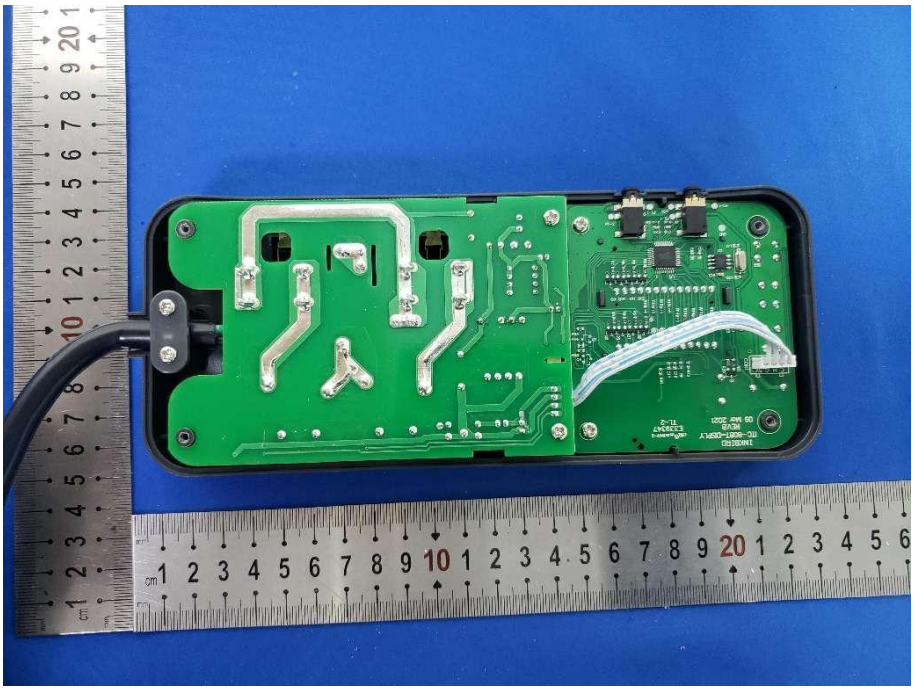


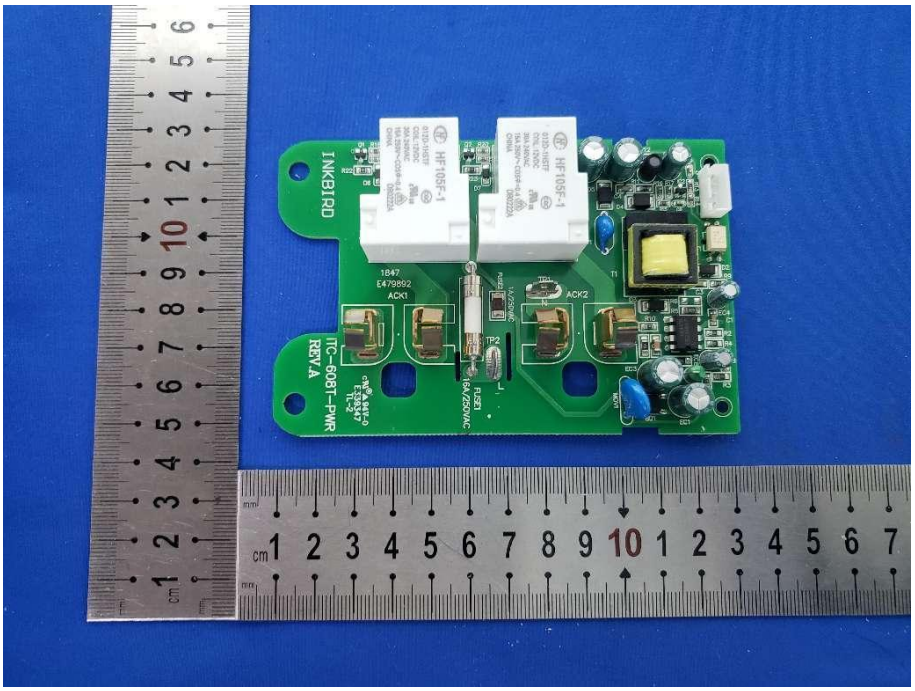
Radiated emission Test Setup (Above 1GHz)

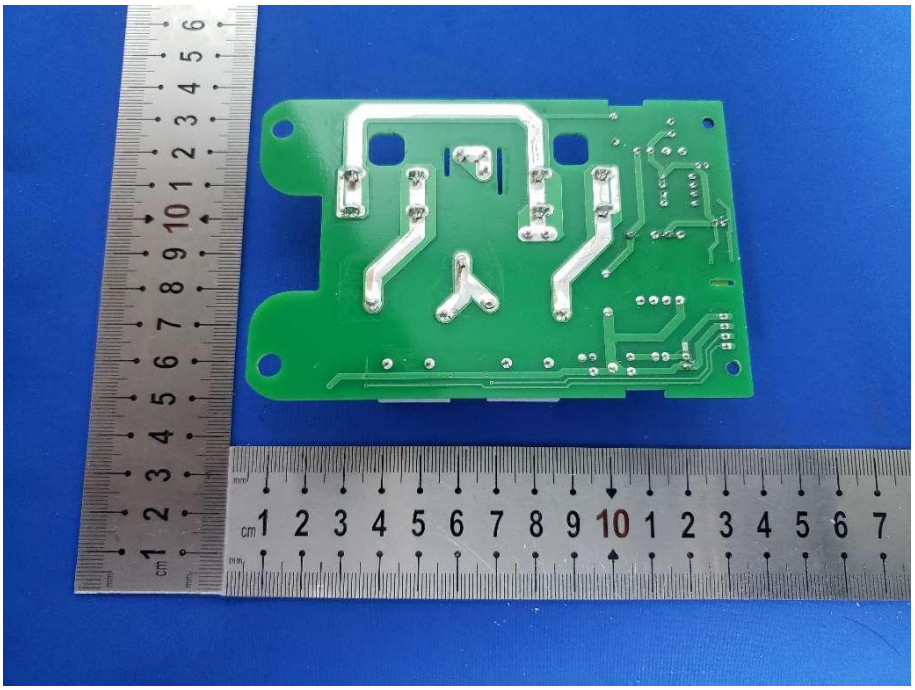


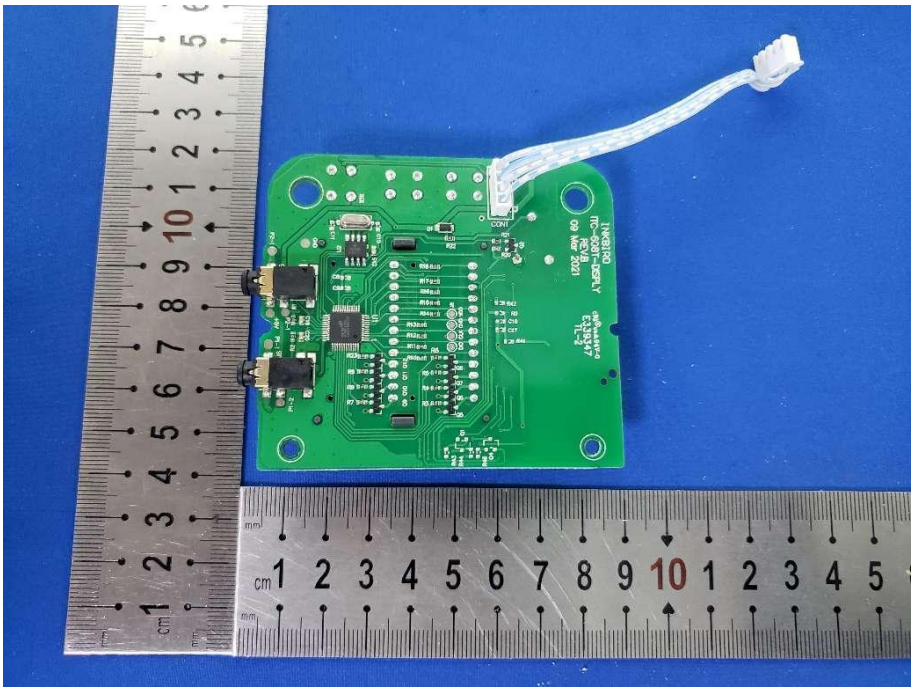
Conducted Emissions Test Setup

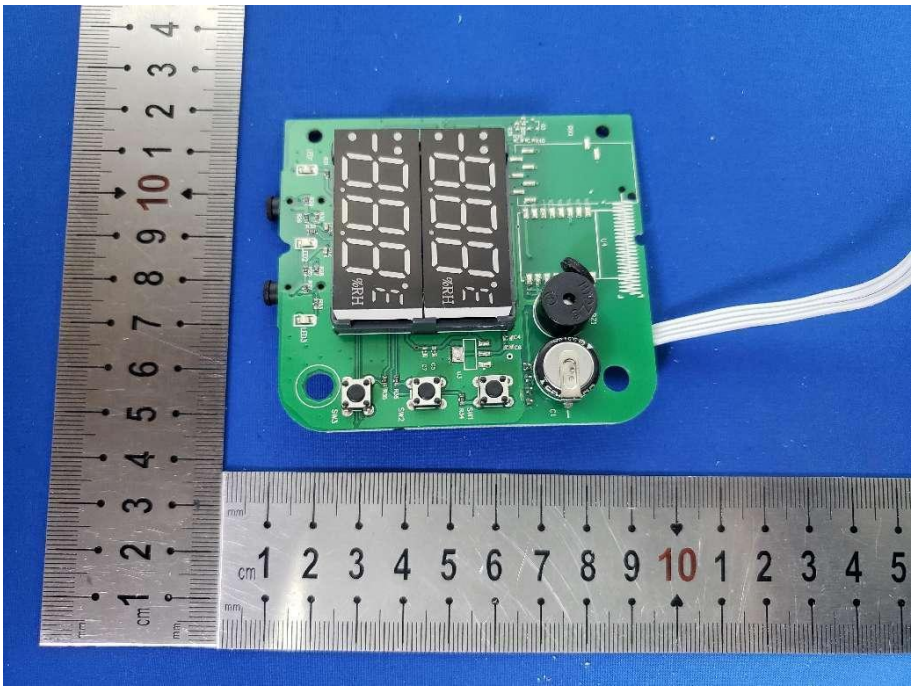
APPENDIX 2 PHOTOGRAPHS OF EUT




INKBIRD
ITC-608T-PWR
REV.A
HF105F-1
HF105F-1
ACK1
ACK2
TP2







*** END OF REPORT ***