

FCC 47 CFR Part 15 Subpart B

TEST REPORT

For

Doorbell Plug-in Chime

MODEL NUMBER: E98BQ4N, MI-CW074-125W, E98BQXN(X is 0~9)

REPORT NUMBER: E04A24020145F00401

ISSUE DATE: March 16, 2024

FCC ID: Z63-E98BQ4N

Prepared for

SHENZHEN AONI ELECTRONIC CO., LTD
No.5,Bldg.,Honghui Industrial Park,2nd Liuxian Road,Xin'An streets, Bao'an
District,ShenZhen,China

Prepared by

Guangdong Global Testing Technology Co., Ltd.

Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park,
Dongguan city, Guangdong, People's Republic of China, 523808

This report is based on a single evaluation of the submitted sample(s) of the above mentioned Product, it does not imply an assessment of the production of the products.
This report shall not be reproduced, except in full, without the written approval of Guangdong Global Testing Technology Co., Ltd.

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
<u>V0</u>	<u>March 16, 2024</u>	<u>Initial Issue</u>	<u></u>

Summary of Test Results

Emission			
Standard	Test Item	Limit	Result
FCC 47 CFR Part 15 Subpart B	Conducted emissions	FCC Part 15.107	Pass
	Radiated emissions below 1GHz	FCC Part 15.109	Pass
	Radiated emissions above 1GHz	FCC Part 15.109	Pass

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.

*The measurement result for the sample received is <Pass> according to <FCC 47 CFR Part 15 Subpart B> when <Accuracy Method> decision rule is applied.

CONTENTS

1. ATTESTATION OF TEST RESULTS.....	5
2. TEST METHODOLOGY.....	6
3. FACILITIES AND ACCREDITATION.....	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>7</i>
5. EQUIPMENT UNDER TEST	8
5.1. <i>DESCRIPTION OF EUT</i>	<i>8</i>
5.2. <i>TEST MODE.....</i>	<i>8</i>
5.3. <i>SUPPORT UNITS FOR SYSTEM TEST</i>	<i>8</i>
6. MEASURING EQUIPMENT AND SOFTWARE USED.....	9
7. EMISSION TEST	10
7.1. <i>Conducted emissions.....</i>	<i>10</i>
7.2. <i>Radiated emissions below 1GHz</i>	<i>14</i>
7.3. <i>Radiated emissions above 1GHz.....</i>	<i>18</i>
APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION	22
APPENDIX: PHOTOGRAPHS OF THE EUT	24

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: SHENZHEN AONI ELECTRONIC CO., LTD
 Address: No.5,Bldg.,Honghui Industrial Park,2nd Liuxian Road,Xin'An streets, Bao'an District,ShenZhen,China

Manufacturer Information

Company Name: Shenzhen Keyu Power Supply Technology Co.,Ltd.
 Address: 2~3F,No.13, Lane3, Yuquan East Road, the 2nd, Industrial Park, Yulv, Guangming District, 518000 Shenzhen, PEOPLE'S REPUBLIC OF CHINA

EUT Information

Product Description: Doorbell Plug-in Chime
 Model: E98BQ4N, MI-CW074-125W, E98BQXN(X is 0~9)
 Brand: Merkury
 Sample Received Date: March 12, 2024
 Sample Status: Normal
 Sample ID: A24020145 001
 Date of Tested: March 14, 2024 to March 15, 2024

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR Part 15 Subpart B	Pass

Prepared By:




 Jik Wang
 Project Engineer

Approved By:



 Shawn Wen
 Laboratory Manager

Checked By:



 Alan He
 Laboratory Leader

2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC 47 CFR Part 15 Subpart B

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 6947.01) Guangdong Global Testing Technology Co., Ltd. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1343) Guangdong Global Testing Technology Co., Ltd. has been recognized to perform compliance testing on equipment subject to Supplier's Declaration of Conformity (SDoC) and Certification rules</p> <p>ISED (Company No.: 30714) Guangdong Global Testing Technology Co., Ltd. has been registered and fully described in a report filed with ISED. The Company Number is 30714 and the test lab Conformity Assessment Body Identifier (CABID) is CN0148.</p>
---------------------------	--

Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted emissions	0.009 MHz - 30 MHz	2	3.37
Radiated emissions below 1GHz	30 MHz -1 GHz	2	3.79
Radiated emissions above 1GHz	1 GHz - 18 GHz	2	5.62

Note1: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name		Doorbell Plug-in Chime
Model		E98BQ4N
Series Model		MI-CW074-125W, E98BQXN(X is 0~9)
EUT Classification		Class B
Hardware Version		V1.1
Software Version		/
Frequency Band		433.92MHz
Ratings		100-240V~ 50/60Hz 0.2A Max
Power Supply	AC	120V/60Hz
Note: The EUT is only a receiver.		

5.2. TEST MODE

Test Mode	Description
M01	Normal Working: Operate according to the user manual

5.3. SUPPORT UNITS FOR SYSTEM TEST

No.	Equipment	Manufacturer	Model No.	Serial No.
1	Smart Battery Doorbell Camera	SHENZHEN AONI ELECTRONIC CO., LTD	ER02201	/
2	USB-C cable (0.56m)	SHENZHEN AONI ELECTRONIC CO., LTD	/	/
3	phone	Xiaomi	21091116AC	/

6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Conducted emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Shielding Room 1	CHENG YU	8*5*4	N/A	2022/10/29	2025/10/28
LISN	R&S	ENV216	102843	2023/9/18	2024/9/17
EMI Test Receiver	R&S	ESR3	102647	2023/9/18	2024/9/17
LISN	Schwarzbeck	NNLK 8129 RC	5046	2023/9/18	2024/9/17
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	#237	2023/9/18	2024/9/17
CURRENT PROBE	R&S	EZ-17	101602	2023/9/18	2024/9/17
Test Software for CE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Radiated emissions below 1GHz					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Chamber	ETS	9*6*6	Q2146	2022/8/30	2025/8/29
Receiver	R&S	ESCI3	101409	2023/9/18	2024/9/17
Loop Antenna	ETS	6502	243668	2022/3/30	2025/3/30
Pre-Amplifier	HzEMC	HPA-9K0130	HYPA21001	2023/9/18	2024/9/17
Biconilog Antenna	Schwarzbeck	VULB 9168	1315	2022/10/10	2025/10/9
Biconilog Antenna	ETS	3142E	243646	2022/3/23	2025/3/22
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Radiated emissions above 1GHz					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Spectrum Analyzer	R&S	FSV40	101413	2023/9/18	2024/9/17
Pre-Amplifier	HzEMC	HPA-1G1850	HYPA21003	2023/9/18	2024/9/17
Horn antenna	ETS	3117	246069	2022/3/11	2025/3/10
Pre-Amplifier	ETS	HPA-184057	HYPA21004	2023/9/18	2024/9/17
Horn antenna	ETS	3116C	246265	2022/3/29	2025/3/28
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

7. EMISSION TEST

7.1. CONDUCTED EMISSIONS

LIMITS

CFR 47 FCC Part15 Subpart B				
FREQUENCY (MHz)	Class A (dB μ V)		Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46*
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

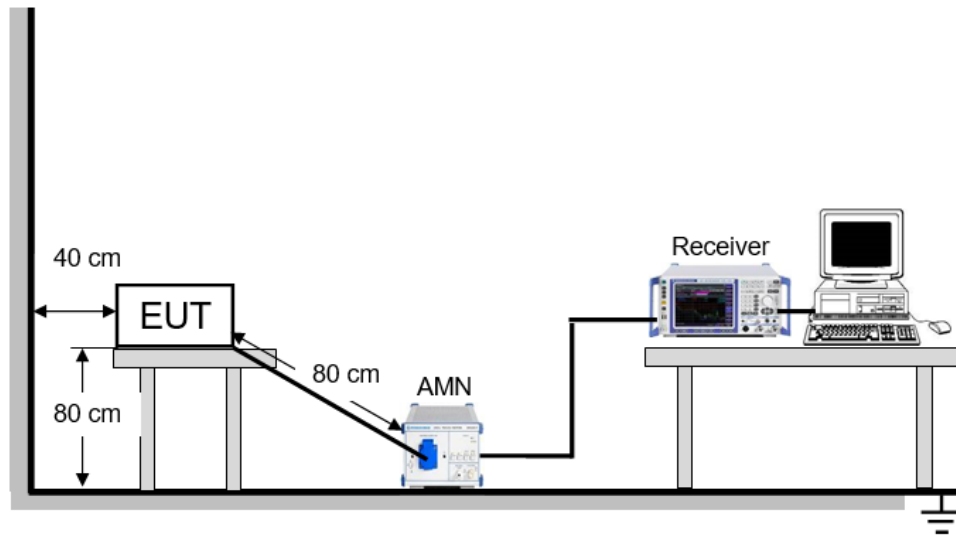
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.4-2014.
2. The EUT was placed on the top of a rotating table 0.8 meters above the horizontal ground plane and being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
3. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
4. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
5. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

TEST SETUP



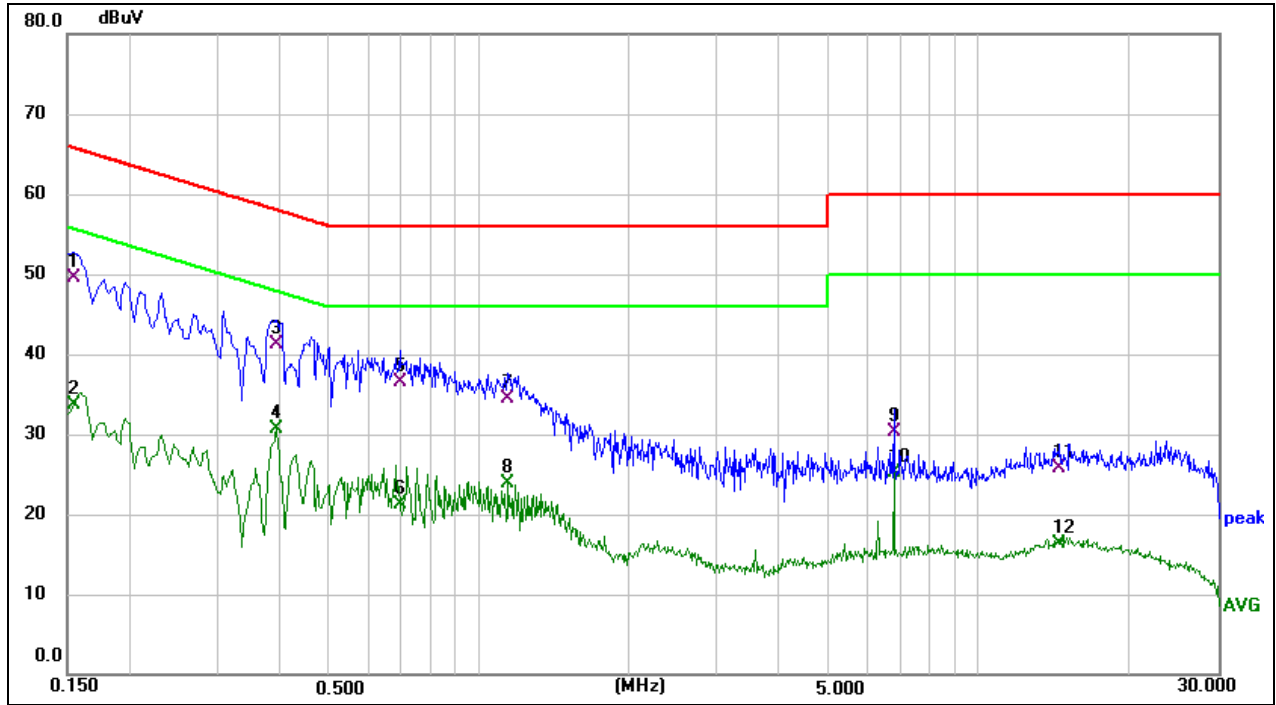
TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	54%
Atmosphere Pressure	101kPa		

TEST MODE

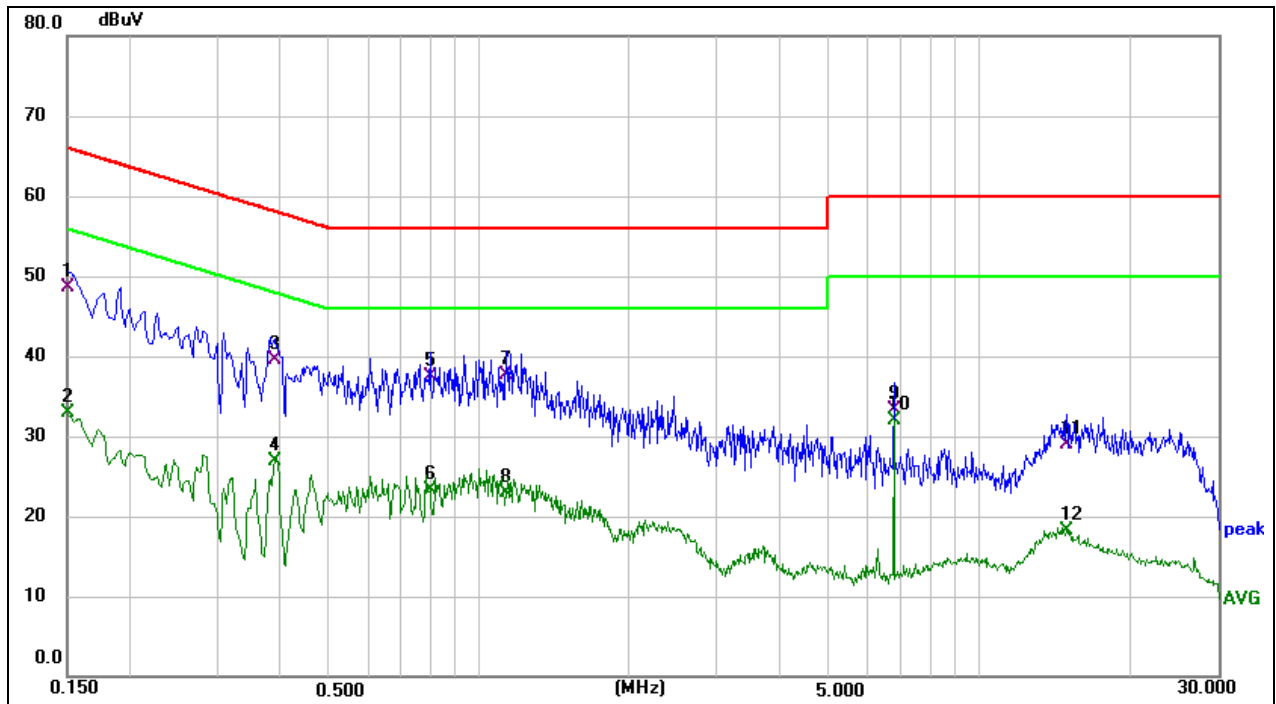
Pre-test Mode:	M01
Final Test Mode:	M01

TEST RESULTS



Phase: L1	Mode: M01
-----------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1 *	0.1544	39.45	10.15	49.60	65.76	-16.16	QP	
2	0.1544	23.53	10.15	33.68	55.76	-22.08	AVG	
3	0.3930	31.41	9.79	41.20	58.00	-16.80	QP	
4	0.3930	20.87	9.79	30.66	48.00	-17.34	AVG	
5	0.6945	26.75	9.85	36.60	56.00	-19.40	QP	
6	0.6945	11.33	9.85	21.18	46.00	-24.82	AVG	
7	1.1445	24.58	9.82	34.40	56.00	-21.60	QP	
8	1.1445	14.08	9.82	23.90	46.00	-22.10	AVG	
9	6.7470	20.43	9.77	30.20	60.00	-29.80	QP	
10	6.7470	15.46	9.77	25.23	50.00	-24.77	AVG	
11	14.4733	15.81	9.99	25.80	60.00	-34.20	QP	
12	14.4733	6.37	9.99	16.36	50.00	-33.64	AVG	



Phase: N	Mode: M01
----------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1 *	0.1500	38.39	10.21	48.60	66.00	-17.40	QP	
2	0.1500	22.74	10.21	32.95	56.00	-23.05	AVG	
3	0.3885	29.80	9.80	39.60	58.10	-18.50	QP	
4	0.3885	17.13	9.80	26.93	48.10	-21.17	AVG	
5	0.7980	27.55	9.95	37.50	56.00	-18.50	QP	
6	0.7980	13.31	9.95	23.26	46.00	-22.74	AVG	
7	1.1310	27.65	9.95	37.60	56.00	-18.40	QP	
8	1.1310	13.00	9.95	22.95	46.00	-23.05	AVG	
9	6.7470	23.16	10.14	33.30	60.00	-26.70	QP	
10	6.7470	21.88	10.14	32.02	50.00	-17.98	AVG	
11	14.9504	17.24	11.66	28.90	60.00	-31.10	QP	
12	14.9504	6.48	11.66	18.14	50.00	-31.86	AVG	

Remark: Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)

Margin = Result - Limit

7.2. RADIATED EMISSIONS BELOW 1GHZ

LIMITS

Below 1 GHz

CFR 47 FCC Part 15 Subpart B		
Frequency (MHz)	Class A	Class B
	Field strength (dBuV/m) (at 3 m)	Field strength (dBuV/m) (at 3 m)
30 - 88	49.5	40
88 - 216	53.9	43.5
216 - 960	56.9	46
Above 960	60	54

Test Frequency Range of Radiated Disturbance Measurement

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

NOTE:

- (1) The limit for radiated test was performed according to FCC Part 15, Subpart B;
- (2) The tighter limit applies at the band edges;
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10 m Emission level + 20log(10 m/3 m);

TEST PROCEDURE

Below 1 GHz and above 30 MHz

The setting of the spectrum analyser

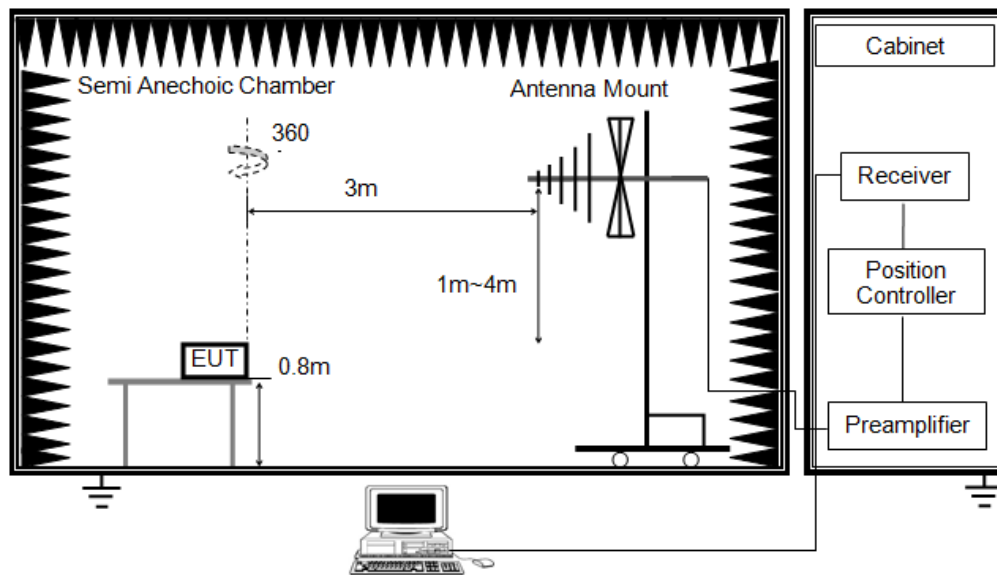
RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak and QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp was used

for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.
7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
8. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

TEST SETUP



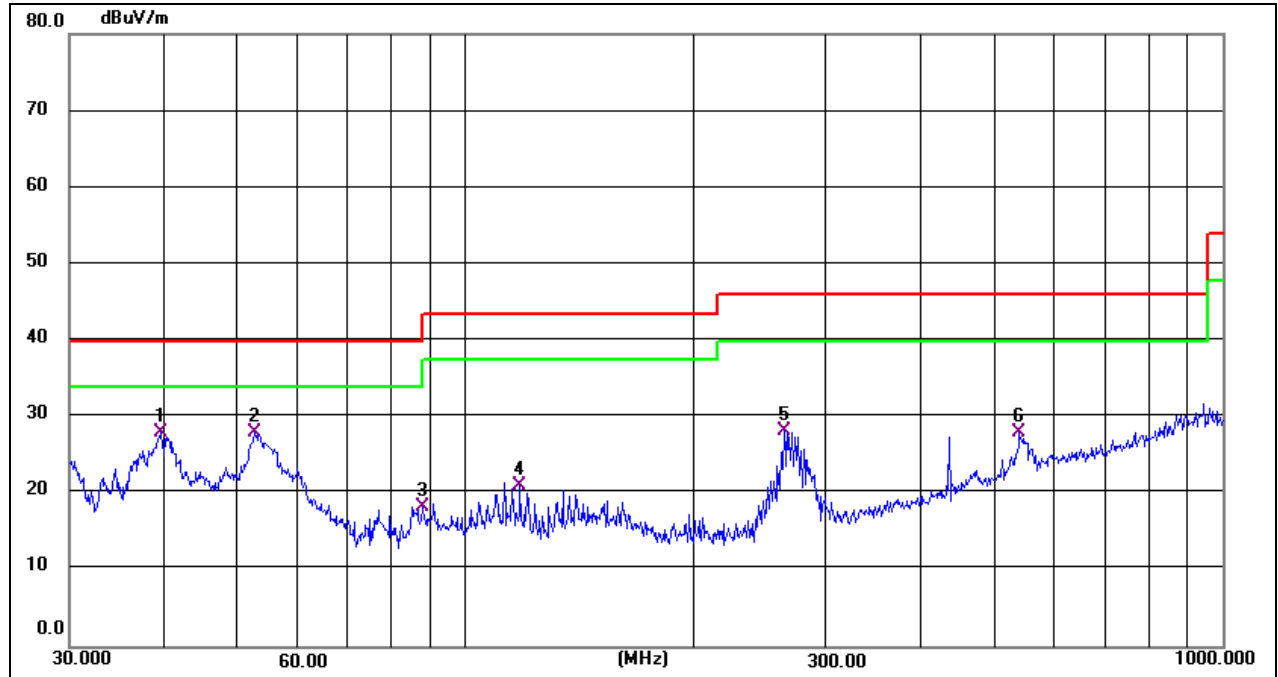
TEST ENVIRONMENT

Temperature	23.3°C	Relative Humidity	53%
Atmosphere Pressure	101kPa		

TEST MODE

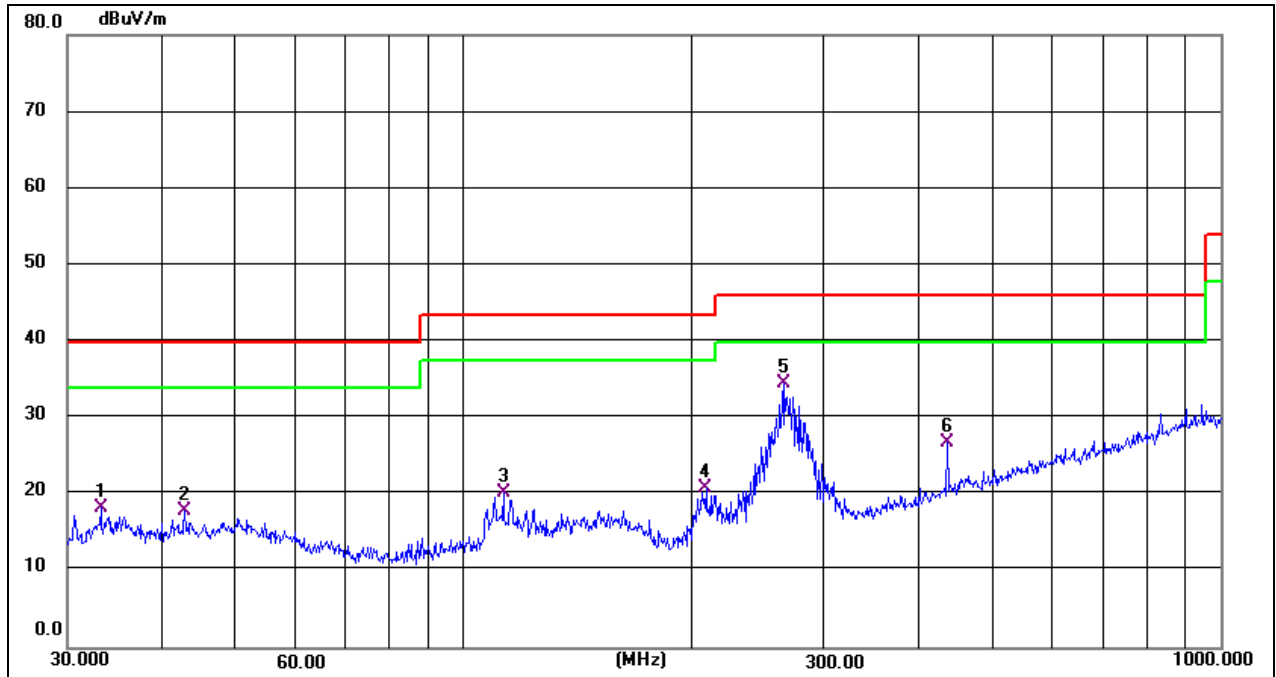
Pre-test Mode:	M01
Final Test Mode:	M01

TEST RESULTS



Antenna: Vertical	Mode: M01
-------------------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measurement(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	39.5757	41.18	-13.11	28.07	40.00	-11.93	QP
2	52.7600	40.60	-12.55	28.05	40.00	-11.95	QP
3	87.7248	34.40	-16.18	18.22	40.00	-21.78	QP
4	118.1862	34.61	-13.52	21.09	43.50	-22.41	QP
5	263.8190	41.93	-13.69	28.24	46.00	-17.76	QP
6	539.4775	34.29	-6.31	27.98	46.00	-18.02	QP



Antenna: Horizontal	Mode: M01
---------------------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measurement(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.2112	32.01	-13.60	18.41	40.00	-21.59	QP
2	42.8998	30.69	-12.78	17.91	40.00	-22.09	QP
3	112.9196	34.32	-14.00	20.32	43.50	-23.18	QP
4	209.3129	36.13	-15.24	20.89	43.50	-22.61	QP
5 *	264.7457	48.29	-13.65	34.64	46.00	-11.36	QP
6	435.5898	35.70	-8.95	26.75	46.00	-19.25	QP

Remark: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
 2. Margin = Result - Limit

7.3. RADIATED EMISSIONS ABOVE 1GHZ

LIMITS

Above 1 GHz

CFR 47 FCC Part 15 Subpart B				
Frequency (MHz)	Class A		Class B	
	(dBuV/m) (at 3 m)		(dBuV/m) (at 3 m)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

Test Frequency Range of Radiated Disturbance Measurement

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

NOTE:

- (1) The limit for radiated test was performed according to FCC Part 15, Subpart B;
- (2) The tighter limit applies at the band edges;
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10 m Emission level + 20log(10 m/3 m);

TEST PROCEDURE

Above 1 GHz

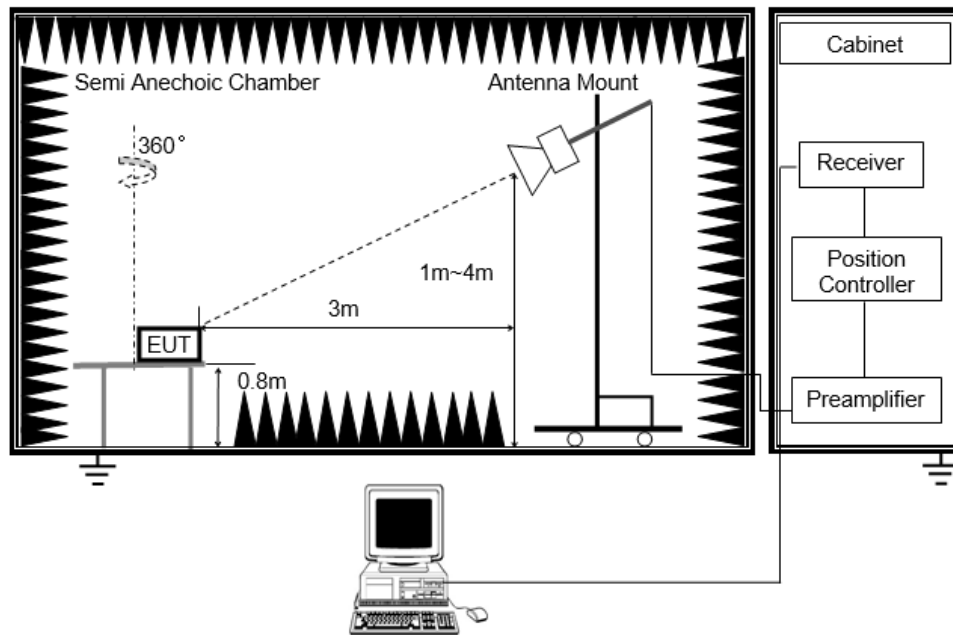
The setting of the spectrum analyser

RBW	1 MHz
VBW	3 MHz
Sweep	Auto
Detector	Peak: Peak AVG: RMS
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.

4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.
7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
8. For measurement above 1 GHz, the peak emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the peak limit specified in Section 15.109. If peak result complies with average limit, average result is deemed to comply with average limit.
9. The average emission measurement will be measured by the RMS detector and must comply with the average limit specified in Section 15.109.

TEST SETUP



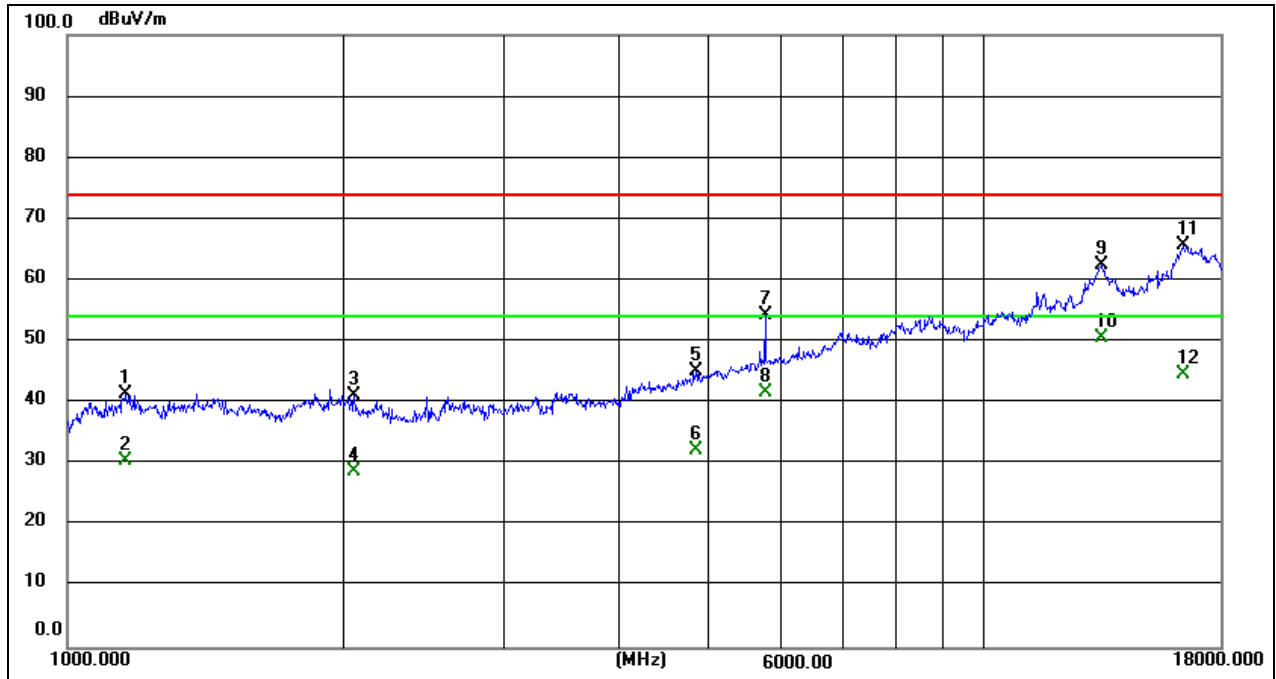
TEST ENVIRONMENT

Temperature	24.3°C	Relative Humidity	53.2%
Atmosphere Pressure	kPa		

TEST MODE

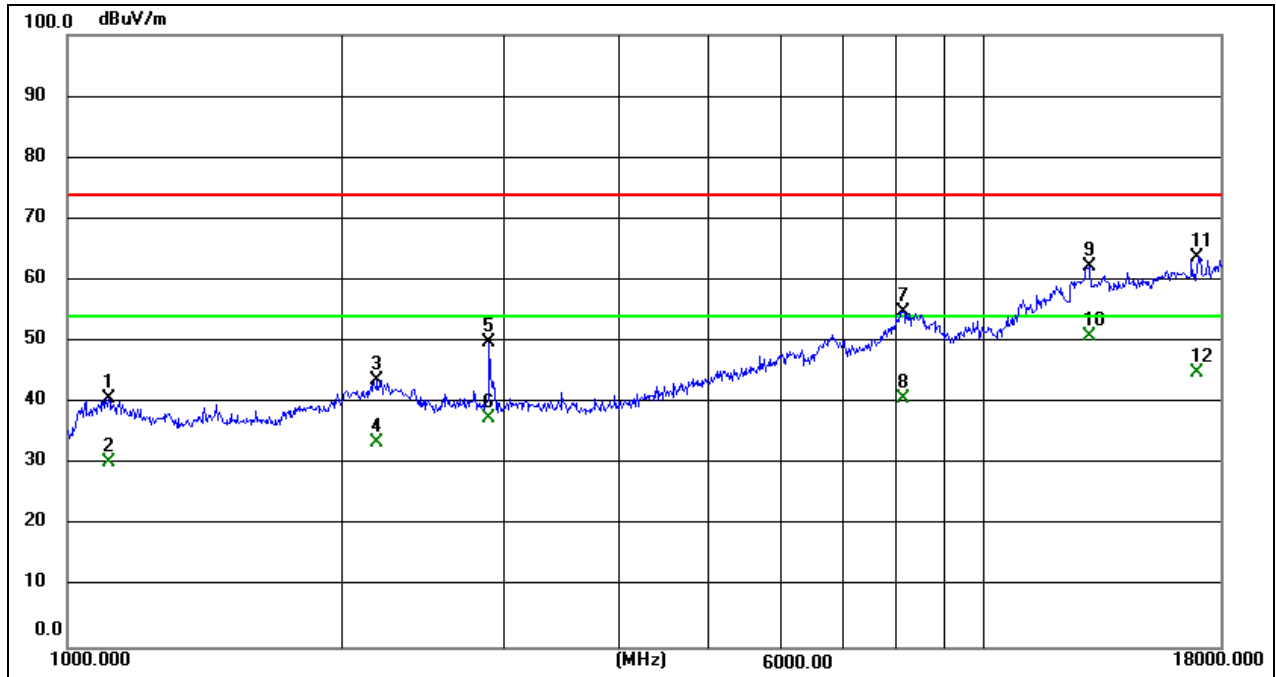
Pre-test Mode:	M01
Final Test Mode:	M01

TEST RESULTS



Antenna: Vertical	Mode: M01
-------------------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measurement(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1160.168	57.11	-15.62	41.49	74.00	-32.51	peak
2	1160.168	46.12	-15.62	30.50	54.00	-23.50	AVG
3	2057.982	52.54	-11.27	41.27	74.00	-32.73	peak
4	2057.982	40.17	-11.27	28.90	54.00	-25.10	AVG
5	4841.748	46.54	-1.43	45.11	74.00	-28.89	peak
6	4841.748	33.83	-1.43	32.40	54.00	-21.60	AVG
7	5748.644	53.03	1.29	54.32	74.00	-19.68	peak
8	5748.644	40.31	1.29	41.60	54.00	-12.40	AVG
9	13388.521	50.22	12.19	62.41	74.00	-11.59	peak
10 *	13388.521	38.51	12.19	50.70	54.00	-3.30	AVG
11	16428.802	50.53	15.17	65.70	74.00	-8.30	peak
12	16428.802	29.53	15.17	44.70	54.00	-9.30	AVG



Antenna: Horizontal	Mode: M01
---------------------	-----------

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measurement(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1111.907	56.50	-15.76	40.74	74.00	-33.26	peak
2	1111.907	45.96	-15.76	30.20	54.00	-23.80	AVG
3	2178.564	54.69	-10.91	43.78	74.00	-30.22	peak
4	2178.564	44.41	-10.91	33.50	54.00	-20.50	AVG
5	2881.912	58.08	-8.26	49.82	74.00	-24.18	peak
6	2881.912	45.86	-8.26	37.60	54.00	-16.40	AVG
7	8136.716	49.71	5.15	54.86	74.00	-19.14	peak
8	8136.716	35.65	5.15	40.80	54.00	-13.20	AVG
9	12958.300	49.95	12.20	62.15	74.00	-11.85	peak
10 *	12958.300	38.60	12.20	50.80	54.00	-3.20	AVG
11	17038.145	46.72	16.97	63.69	74.00	-10.31	peak
12	17038.145	27.93	16.97	44.90	54.00	-9.10	AVG

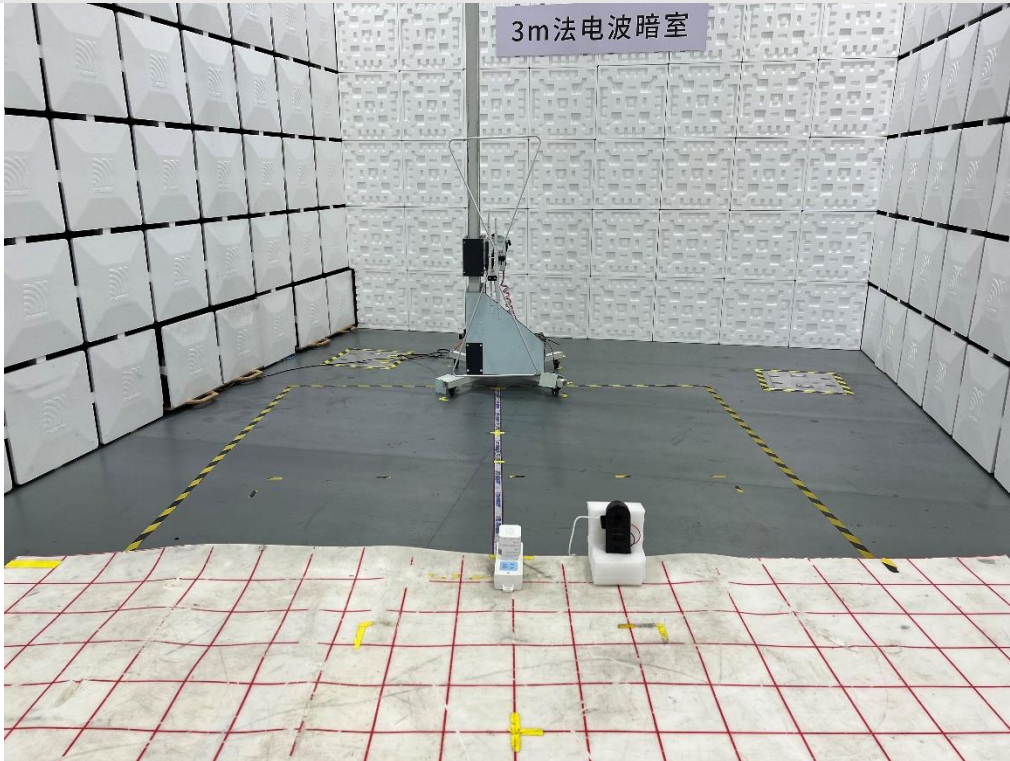
Remark: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
 2. Margin = Result - Limit

APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

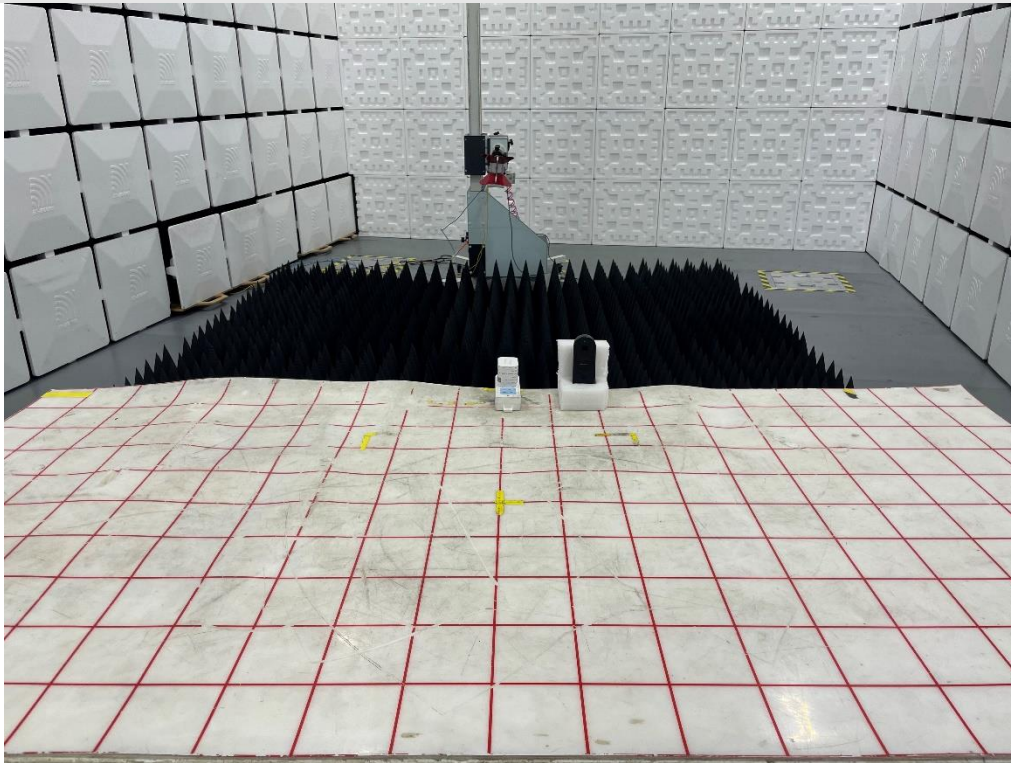
Conducted emissions



Radiated emissions below 1GHz

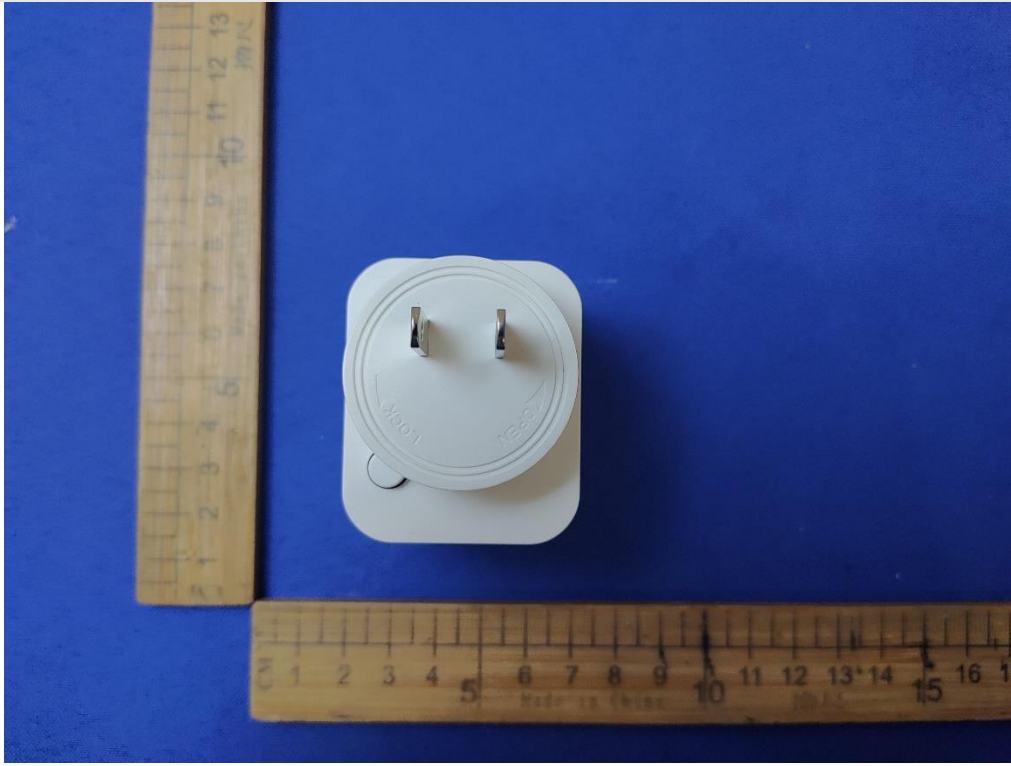


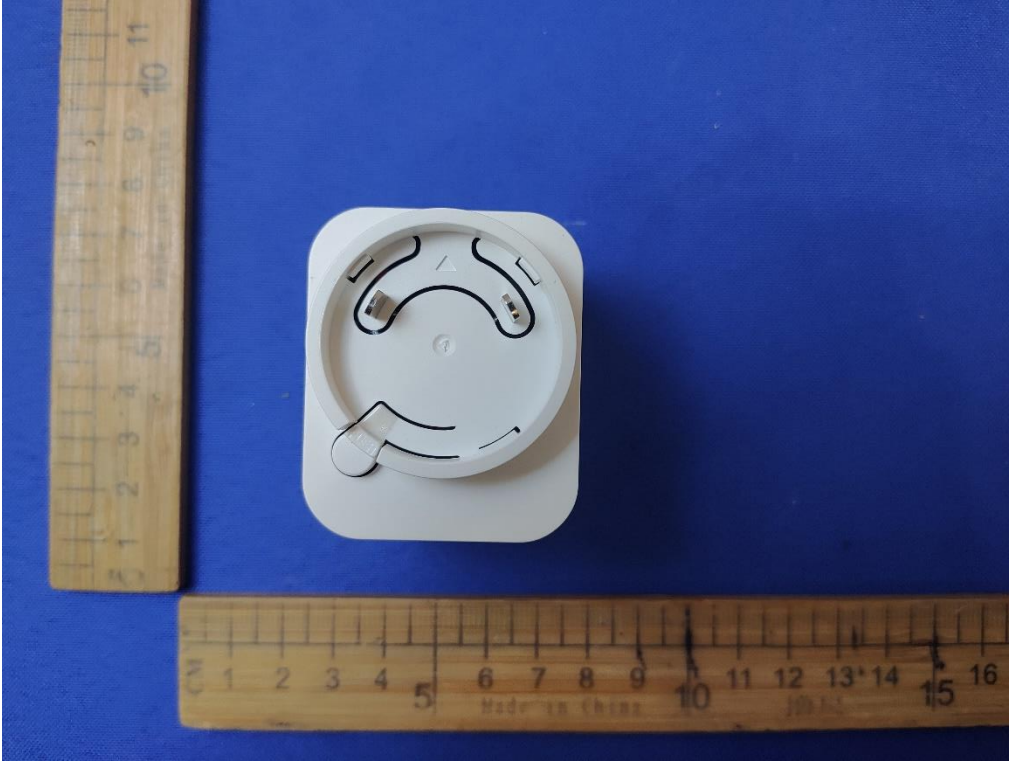
Radiated emissions above 1GHz



APPENDIX: PHOTOGRAPHS OF THE EUT

External

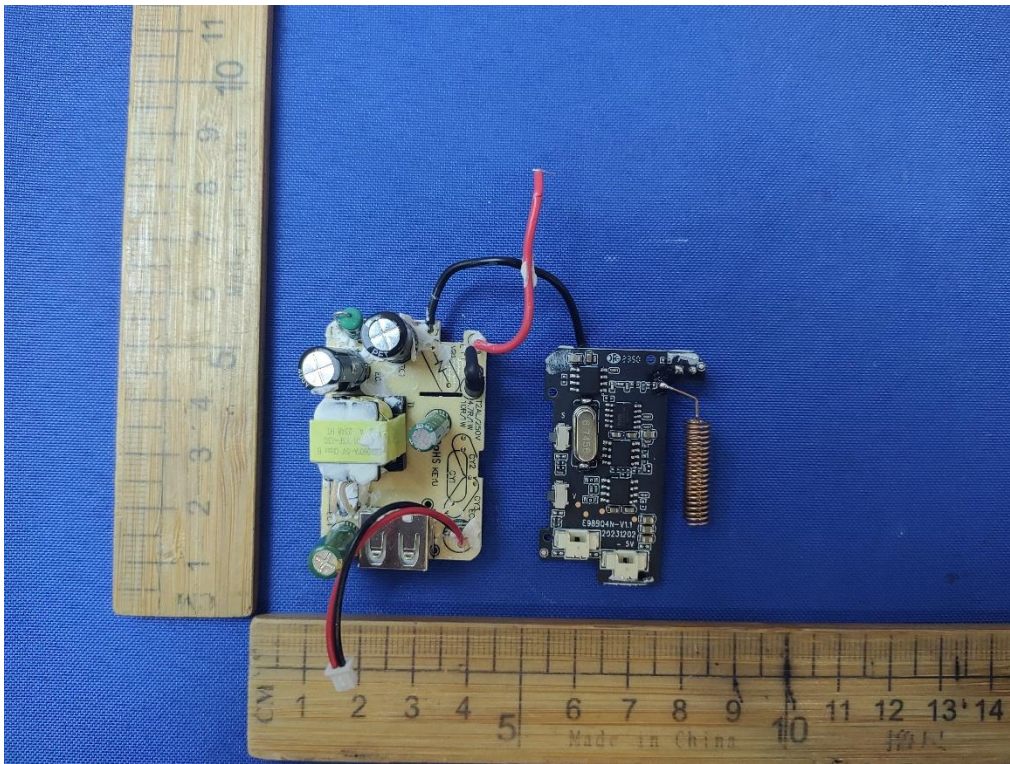


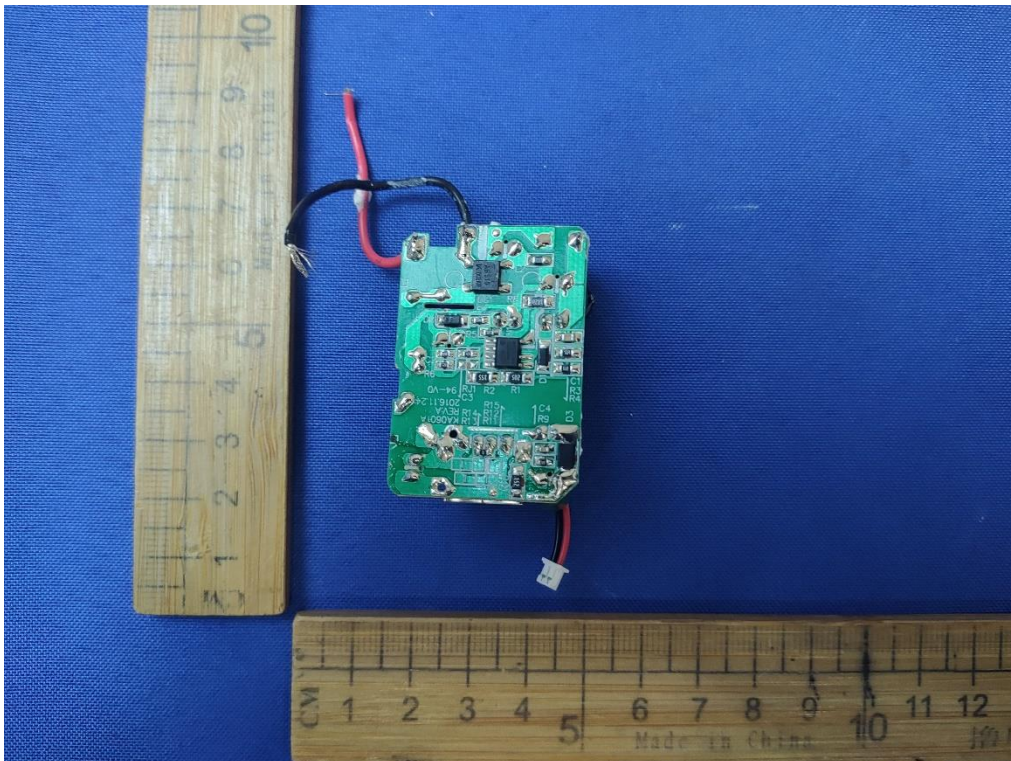
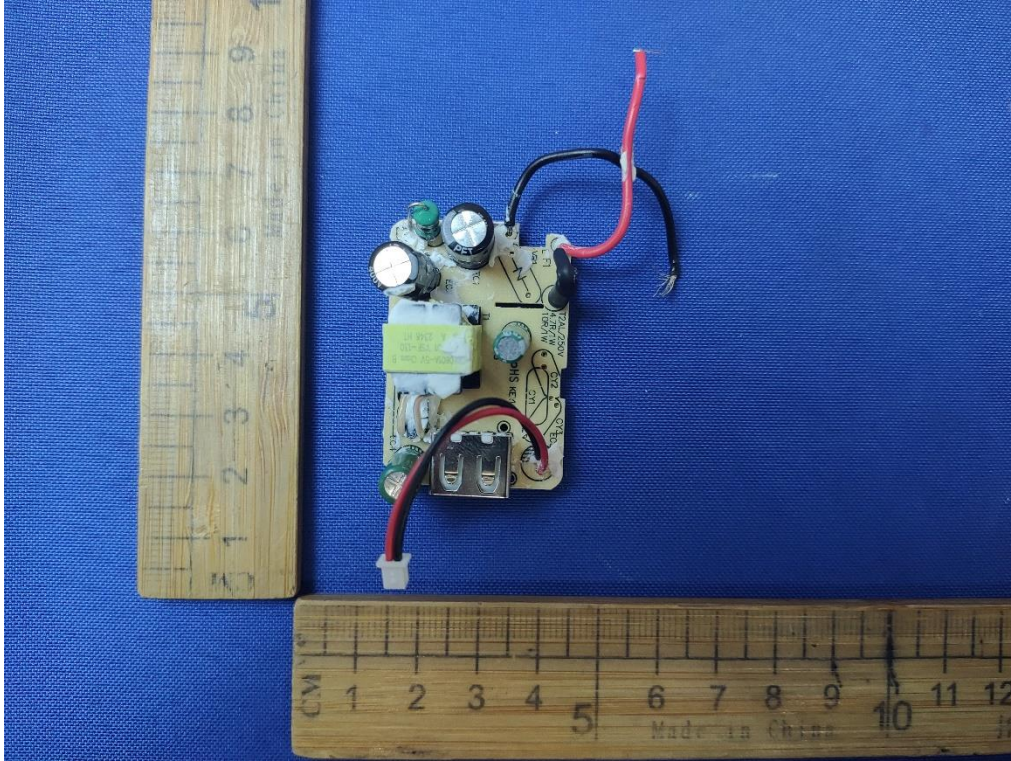


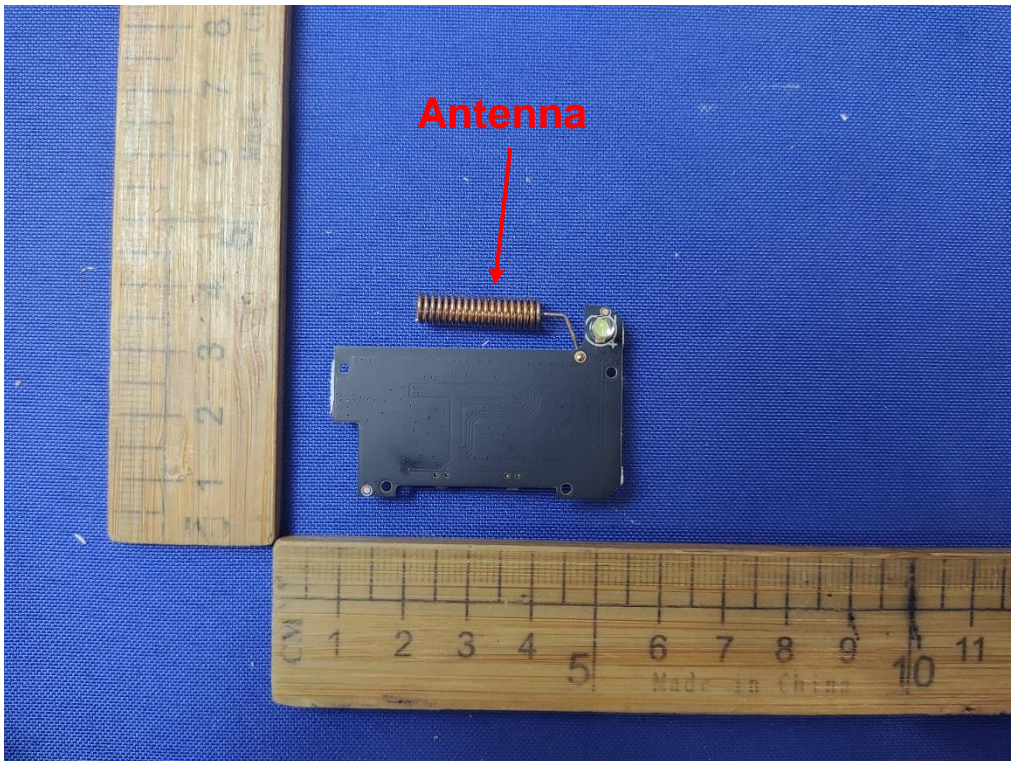
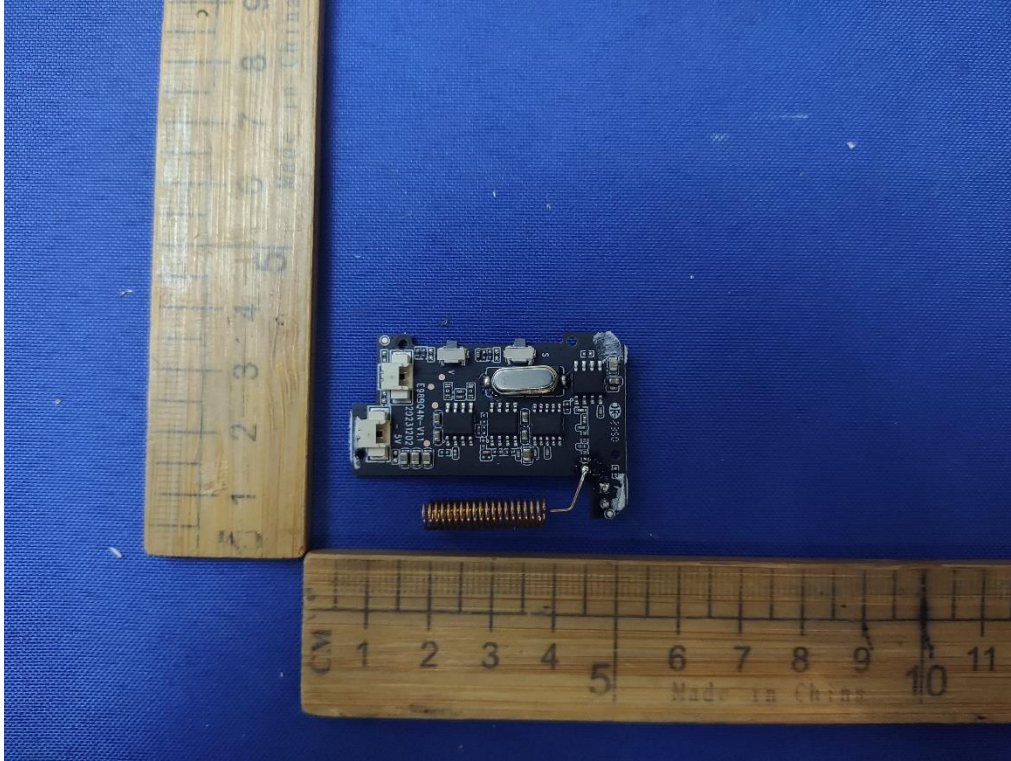


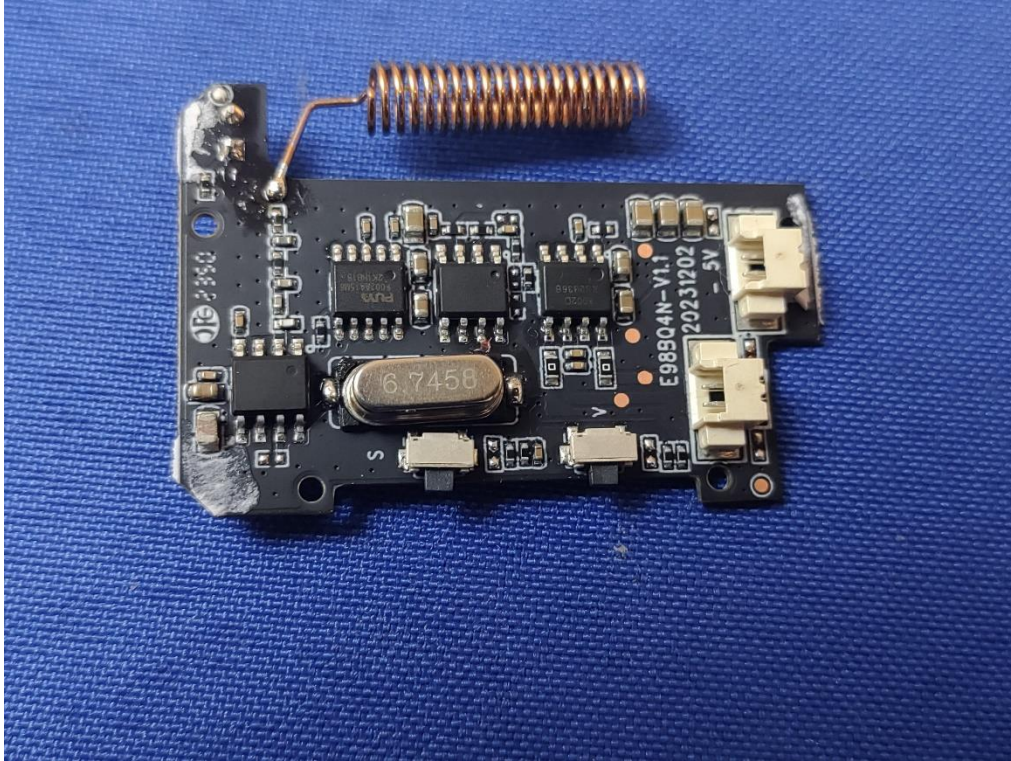


Internal









END OF REPORT