

TEST REPORT

Product Name : Wireless Driveway Alarm
Brand Mark : CHTOOCY
Model No. : CH-205/CH-206
FCC ID : 2AZ6O-CH-205
Report Number : BLA-EMC-202102-A2401
Date of Sample Receipt : 2021/2/7
Date of Test : 2021/2/7 to 2021/6/7
Date of Issue : 2021/6/7
Test Standard : FCC CFR Title 47 Part 15 Subpart C
Section 15.231
Test Result : Pass

Prepared for:

Shenzhen Weiguo Times Technology Co.,Ltd
8th Floor, Block C, Wanguo City, Pingji Avenue, Nanwan Street, Longgang District, Shenzhen

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Building C, No. 107, Shihuan Road, Shiyuan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
TEL: +86-755-23059481

Compiled by:

hason

Review by:

Sweet. Liang

Approved by:

Imen li

Date:

2021/6/7



Report Revise Record

Version No.	Date	Description
00	2021/6/7	Original

BlueAsia

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1 TEST SUMMARY

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.231 (b)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231(c)	Pass
Dwell time	15.231 (a)(2)	Pass
Conducted Emission	15.207	N/A

Remarks:

N/A: The EUT not applicable of the test item.

Pass: The EUT complies with the essential requirements in the standard.

Test according to ANSI C63.4:2014 and ANSI C63.10:2013.

2 GENERAL INFORMATION

Applicant	Shenzhen Weiguo Times Technology Co.,Ltd
Address	8th Floor, Block C, Wanguo City, Pingji Avenue, Nanwan Street, Longgang District, Shenzhen
Manufacturer	Shenzhen Todakj Co., Ltd.
Address	No. 40 Huan Dong Road, Tie Gang Industrial District, Baoan, Shenzhen
Factory	Shenzhen Todakj Co., Ltd.
Address	No. 40 Huan Dong Road, Tie Gang Industrial District, Baoan, Shenzhen

3 GENERAL DESCRIPTION OF E.U.T.

Product Name:	Wireless Driveway Alarm
Model No.:	CH-205/CH-206
Hardware Version	N/A
Software Version	N/A
Operation Frequency:	433.92MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	PCB antenna
Antenna gain:	1dBi(Provided by customer)
Power supply:	DC 3.7V Li-ion

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	22°C	DC3.7V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation.
Remark: Full battery is used during all test except ac conducted emission.	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission	±4.34dB
Radiated Emission	±4.24dB
Radiated Emission	±4.68dB
AC Power Line Conducted Emission	±3.45dB

7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
N/A	N/A	N/A	N/A	N/A

8 LABORATORY LOCATION

All tests were performed at:

BlueAsia of Technical Services(Shenzhen) Co., Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen,
Guangdong Province, China

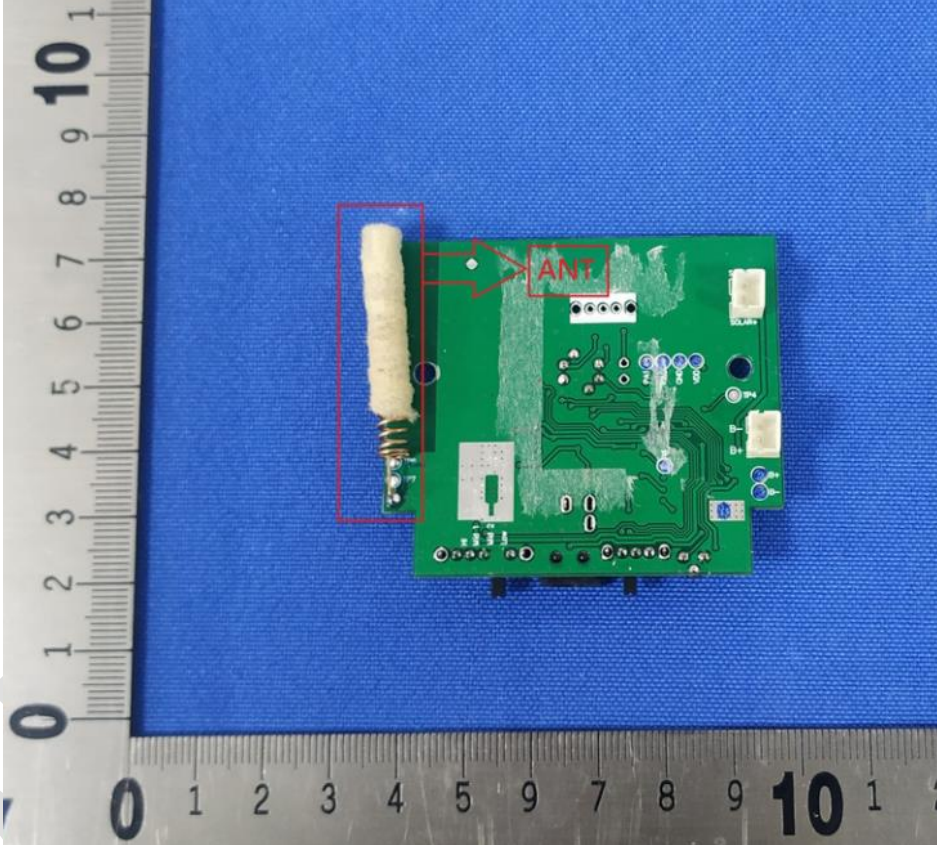
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

No tests were sub-contracted.

9 TEST INSTRUMENTSLIST

Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

10 ANTENNA REQUIREMENT

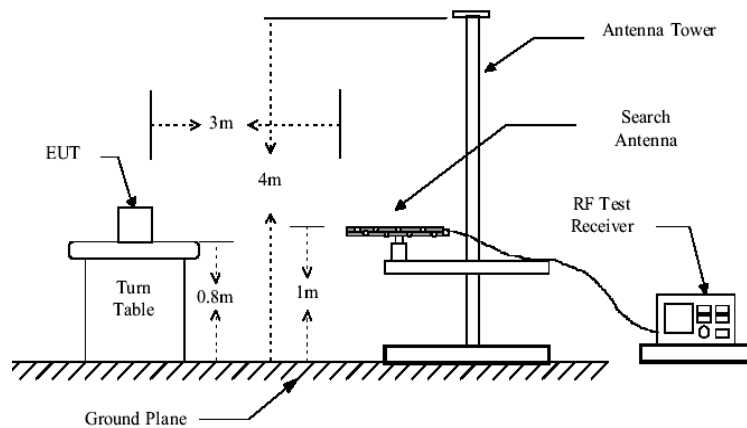
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
The EUT make use of an PCB antenna, The typical gain of the antenna is 0.0dBi.	
	

11 RADIATED EMISSION

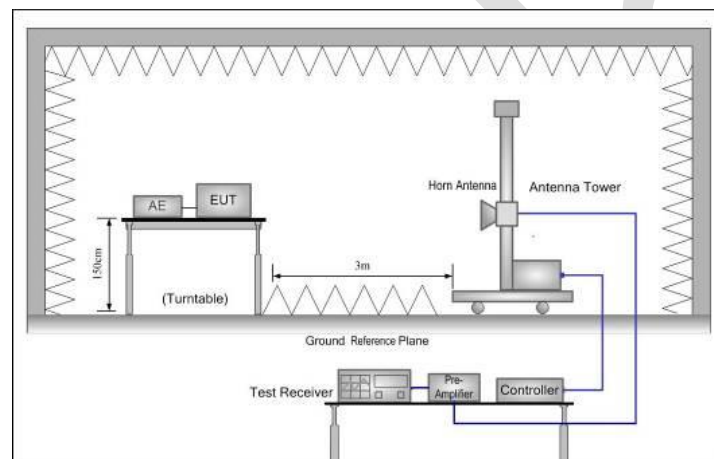
Test Requirement:	FCC Part15 C Section 15.231(b) and 15.209				
Test Method:	ANSI C63.4:2014				
TestFrequencyRange:	30MHz to 5000MHz				
Test site:	Measurement Distance: 3m(Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	433.92 MHz		80.8		Average Value
			100.8		Peak Value
Limit: (Spurious Emissions)	Frequency		Limit (dBuV/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
	Or The maximum permitted unwanted emission level is 20 dB below themaximum permitted fundamental level whichever limit permits higher field strength.				
Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the ground at a 3 meter chamber. 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, whichwas 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 rotatable 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 SpecifiedBandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.				

Test setup:

Below 1GHz



Above 1GHz



Test Instruments:

Refer to section 9 for details

Test mode:

Refer to section 5 for details

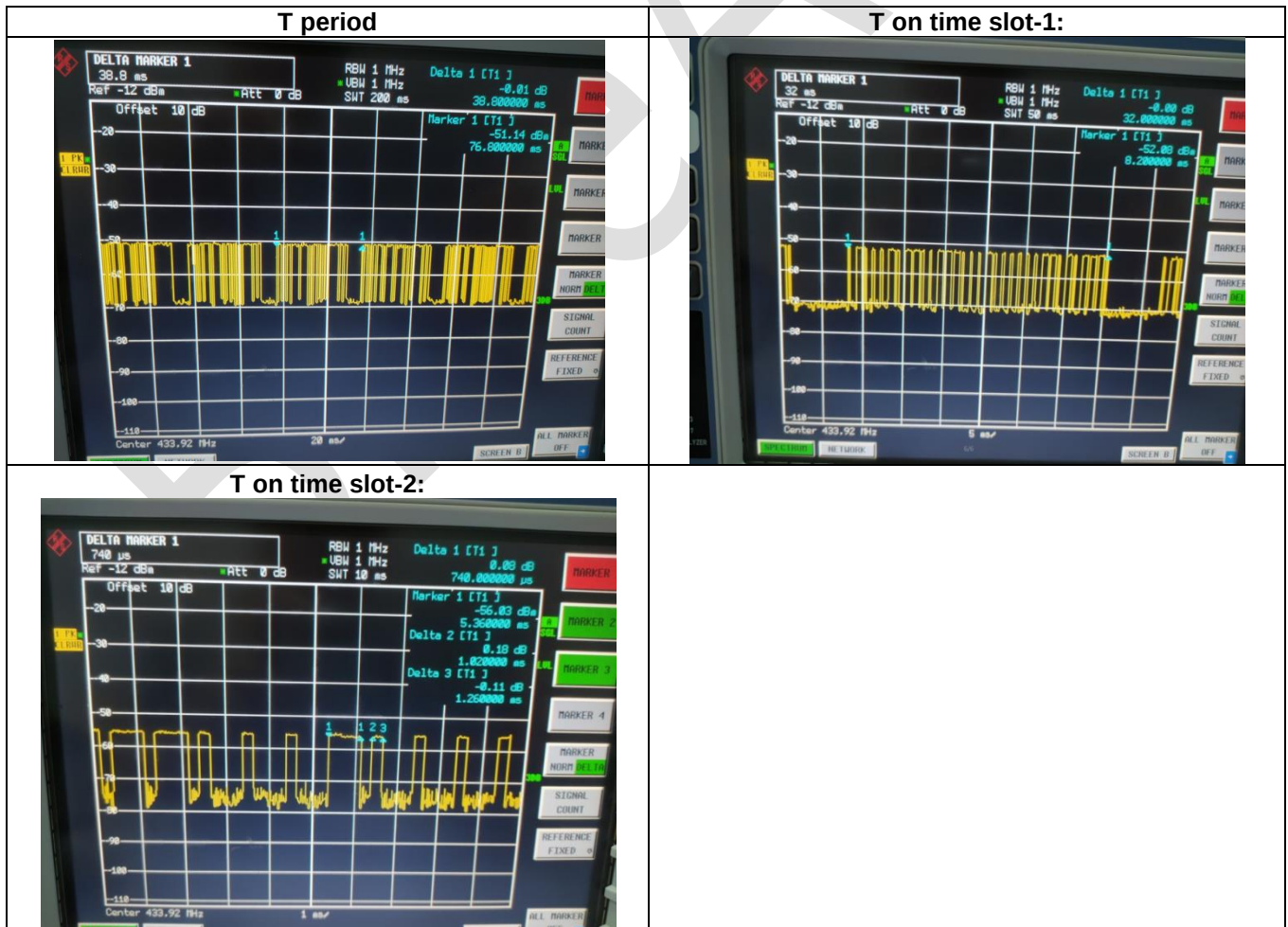
Test results:

Pass

11.1 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL

Peak value						
Frequency (MHz)	Read Level (dBuV)	Correct Facor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	42.07	27.63	69.70	100.80	-31.10	Horizontal
433.92	43.15	27.63	70.78	100.80	-30.02	Vertical
Average value						
Frequency (MHz)	Peak value	Duty cycle factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	69.70	-8.30	61.40	80.80	-19.40	Horizontal
433.92	70.78	-8.30	62.48	80.80	-18.32	Vertical
Calculate Formula:	Average value = Peak value + Duty Cycle Factor					
	Duty cycle factor = 20log(Duty cycle)					
	Duty cycle = on time/ period					
Test data:	T on time = 0.74ms*14+0.24ms*19=14.92(ms)					
	T period = 38.80(ms)					
	Duty cycle = 38.45%					
	Duty cycle factor = 20log(Duty cycle) = -8.30					

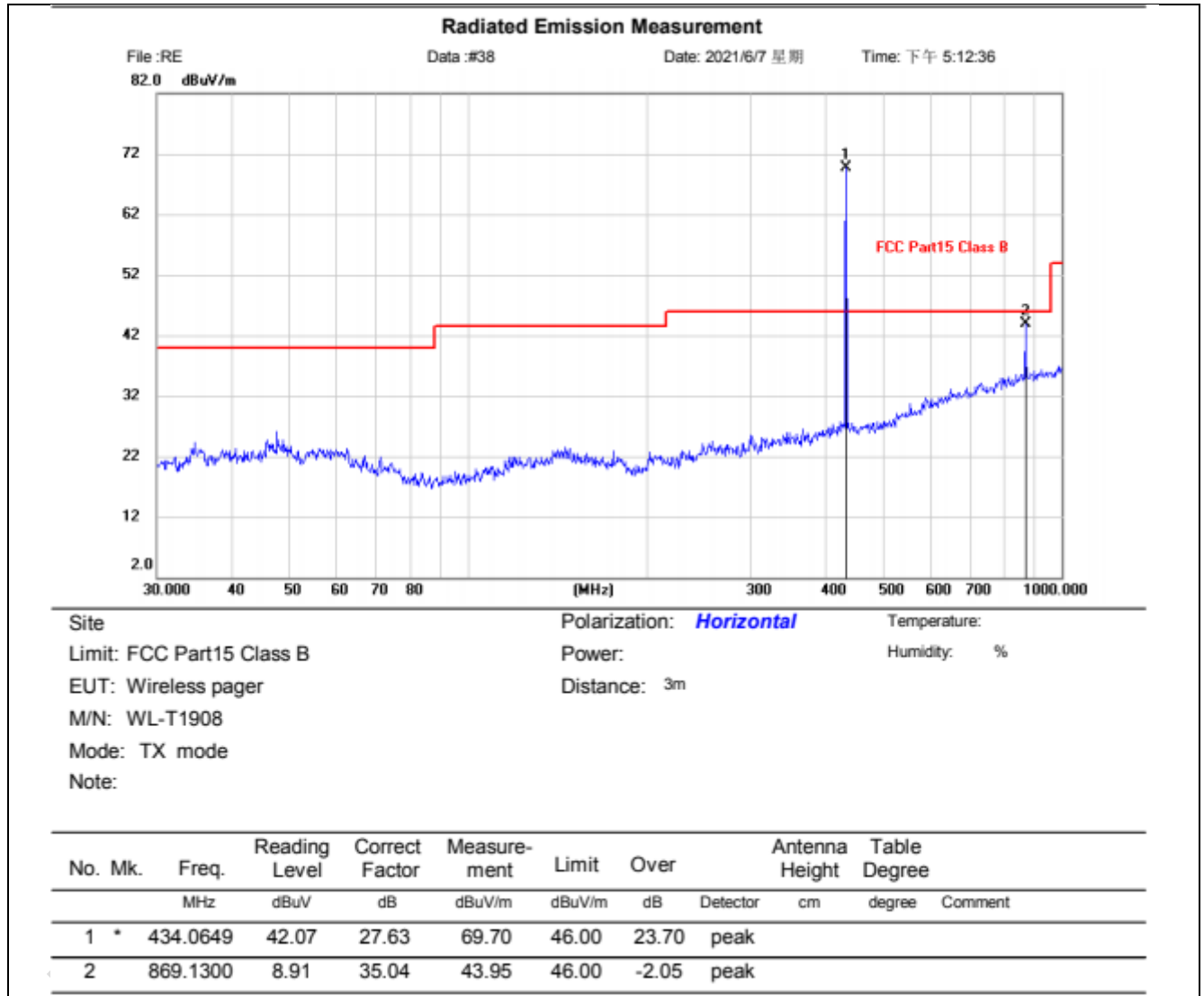
Test data:



11.2 SPURIOUS EMISSIONS

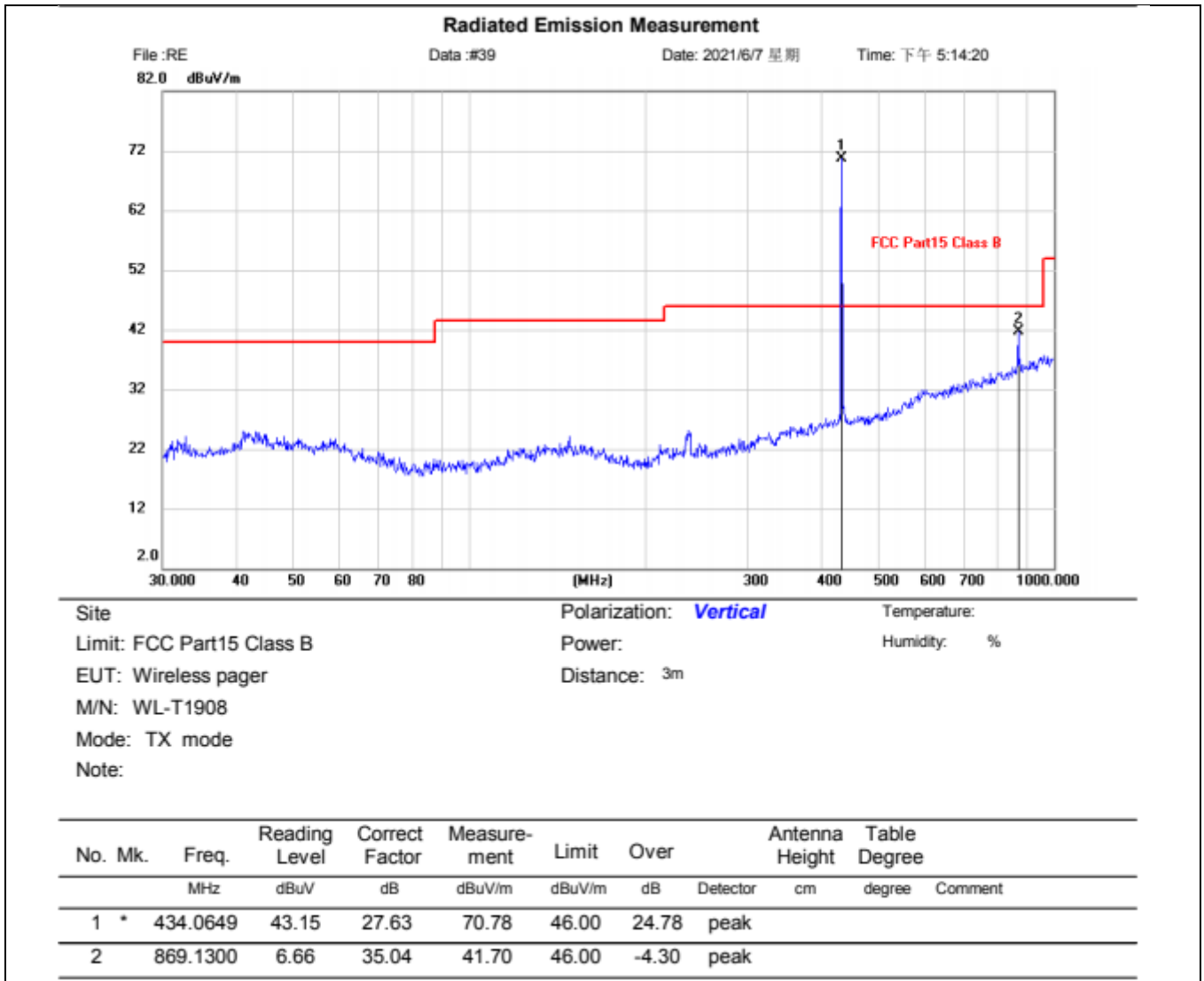
Below 1G

Horizontal



No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	869.1300	43.95	-8.30	35.65	60.8	-25.15	Pass

Vertical



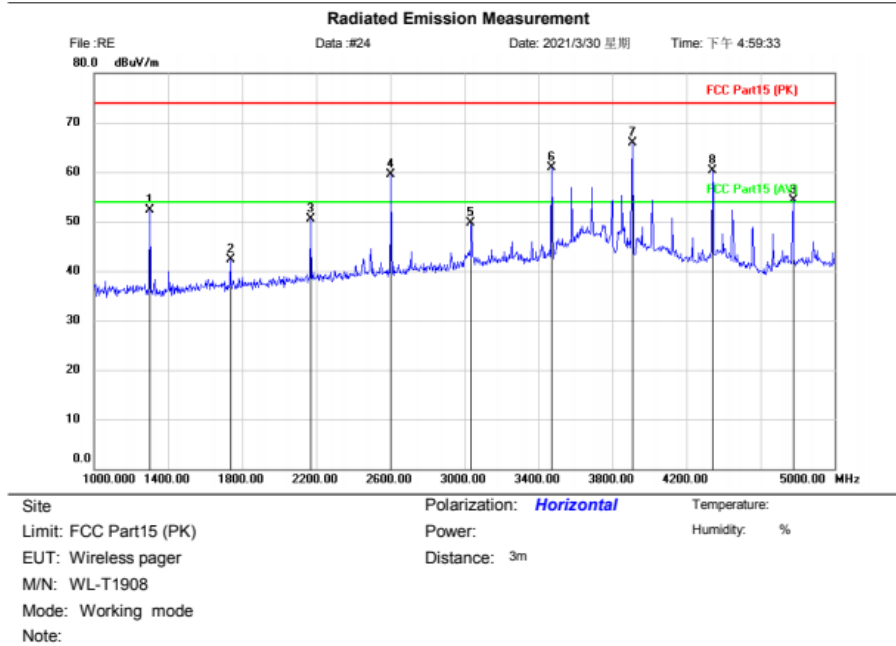
No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	869.1300	41.70	-8.30	33.40	60.8	-27.40	Pass

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. Average value = Peak value + Duty Cycle Factor

Above 1GHz

Horizontal

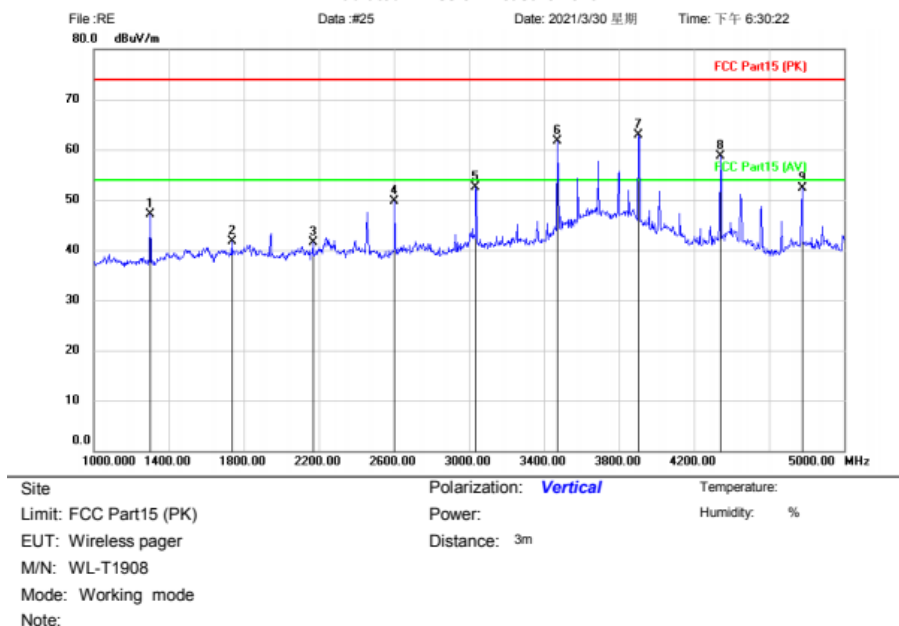


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1300.000	61.14	-8.84	52.30	74.00	-21.70	peak		
2		1736.000	49.54	-7.22	42.32	74.00	-31.68	peak		
3		2168.000	55.72	-5.24	50.48	74.00	-23.52	peak		
4		2604.000	62.63	-3.20	59.43	74.00	-14.57	peak		
5		3036.000	51.17	-1.54	49.63	74.00	-24.37	peak		
6		3472.000	59.75	1.18	60.93	74.00	-13.07	peak		
7	*	3908.000	62.25	3.67	65.92	74.00	-8.08	peak		
8		4340.000	58.69	1.59	60.28	74.00	-13.72	peak		
9		4776.000	53.90	0.34	54.24	74.00	-19.76	peak		

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	2604.000	59.43	-8.30	51.13	60.8	-9.67	Pass
2	3472.000	60.93	-8.30	52.63	60.8	-8.17	Pass
3	3908.000	65.92	-8.30	57.62	60.8	-3.18	Pass
4	4340.000	60.28	-8.30	51.98	60.8	-8.82	Pass
5	4776.000	54.24	-8.30	45.94	60.8	-14.86	Pass

Vertical

Radiated Emission Measurement



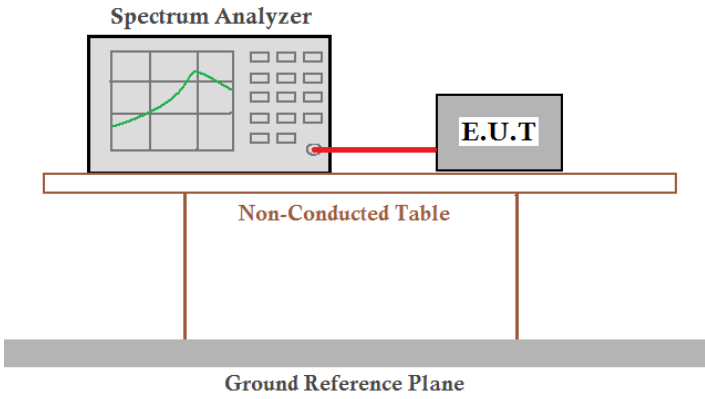
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		1300.000	55.86	-8.84	47.02	74.00	-26.98	peak		
2		1736.000	48.91	-7.22	41.69	74.00	-32.31	peak		
3		2168.000	46.82	-5.25	41.57	74.00	-32.43	peak		
4		2604.000	52.84	-3.20	49.64	74.00	-24.36	peak		
5		3036.000	54.02	-1.54	52.48	74.00	-21.52	peak		
6		3472.000	60.51	1.18	61.69	74.00	-12.31	peak		
7	*	3904.000	59.08	3.73	62.81	74.00	-11.19	peak		
8		4340.000	57.12	1.59	58.71	74.00	-15.29	peak		
9		4776.000	51.89	0.34	52.23	74.00	-21.77	peak		

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	3472.000	61.69	-8.30	53.39	60.8	-7.41	Pass
2	3904.000	62.81	-8.30	54.51	60.8	-6.29	Pass
3	4340.000	58.71	-8.30	50.41	60.8	-10.39	Pass

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. Average value = Peak value + Duty Cycle Factor

12 20DB BANDWIDTH

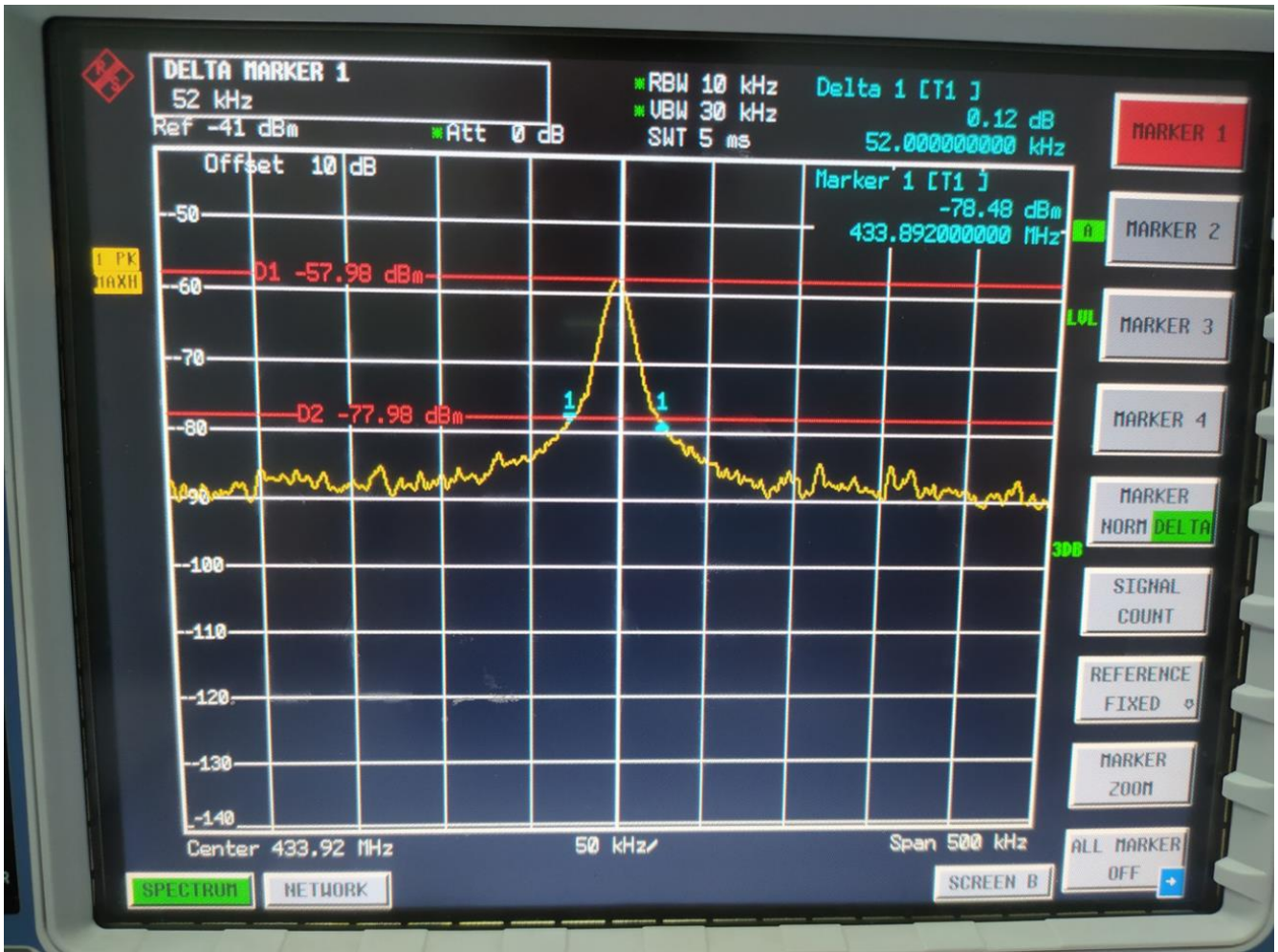
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2014
Receiver setup:	RBW=30kHz, VBW=100kHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 9 for details
Test mode:	Refer to section 5 for details
Test results:	Passed

Measurement Data

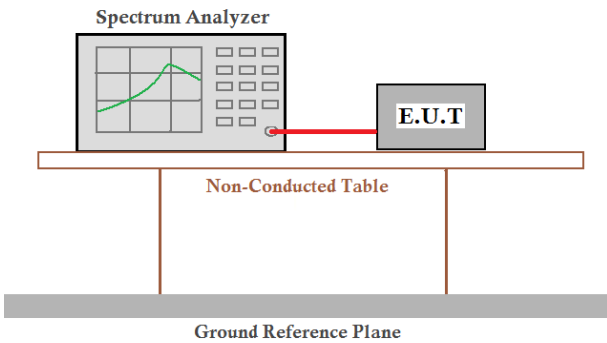
20dB bandwidth (MHz)	Limit (MHz)	Results
0.052	1.0848	Passed

Note: Limit= Fundamental frequency×0.25%=433.92×0.25%=1.0848MHz

Test plot as follows:



13 DURATION TIME

Test Requirement:	FCC Part15 C Section 15.231 (a) (2)
Test Method:	ANSI C63.4:2014
Receiver setup:	RBW=100kHz, VBW=300kHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test mode:	Transmitting mode
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Single scan the transmission, and read the transmission time.
Test setup:	
Test Instruments:	Refer to section 9 for details
Test mode:	Refer to section 5 for details
Test results:	Passed

Measurement Data

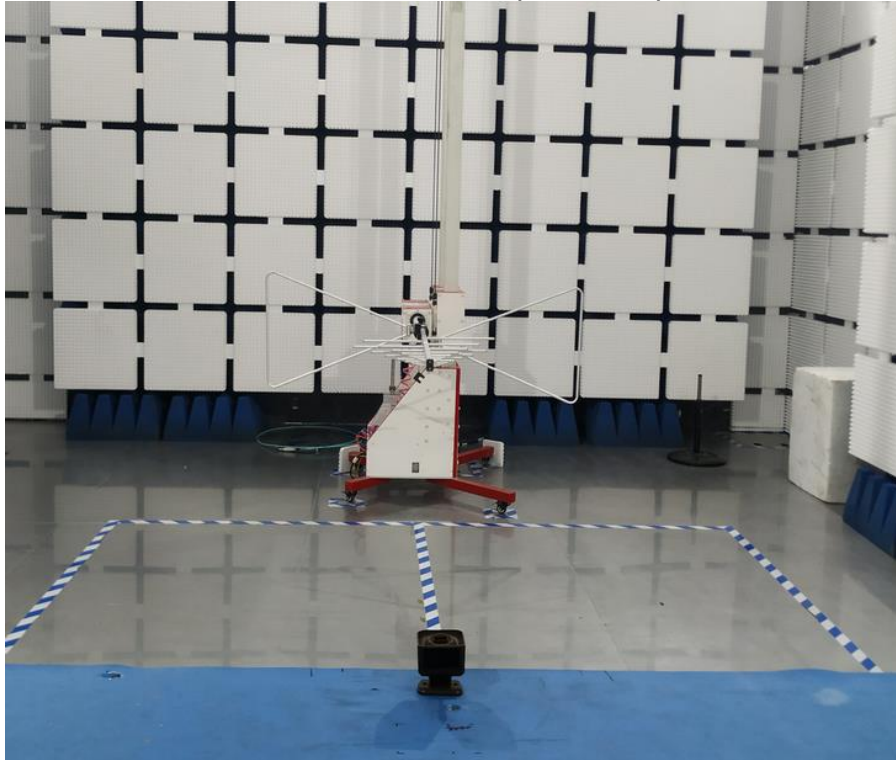
Duration time (second)	Limit (second)	Result
1.02	<5.0	Pass

Test plot as follows:

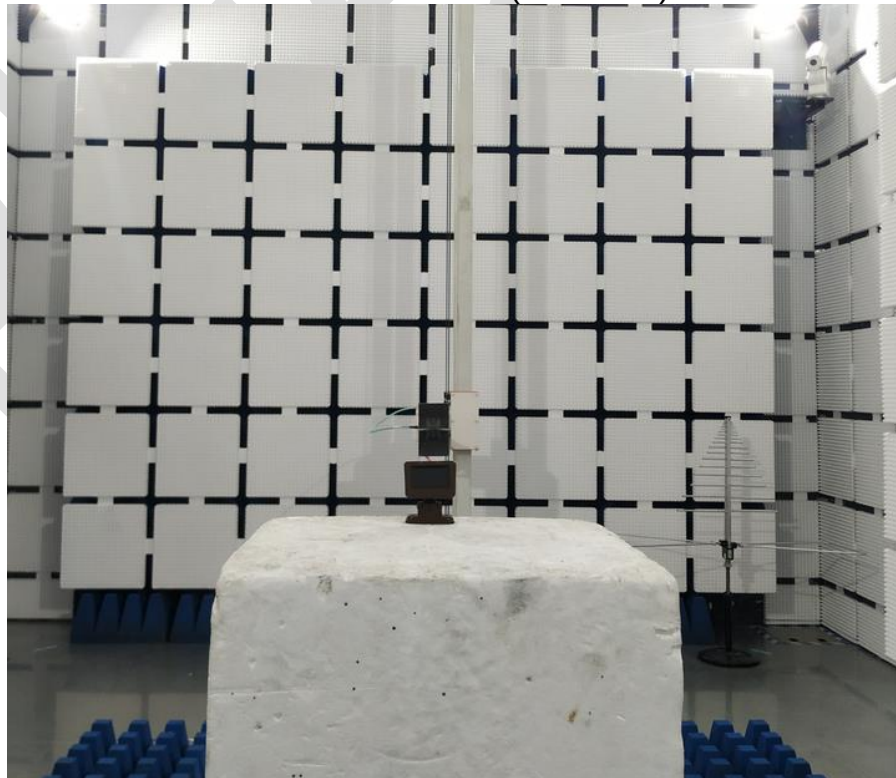


APPENDIX A: PHOTOGRAPHS OF TEST SETUP

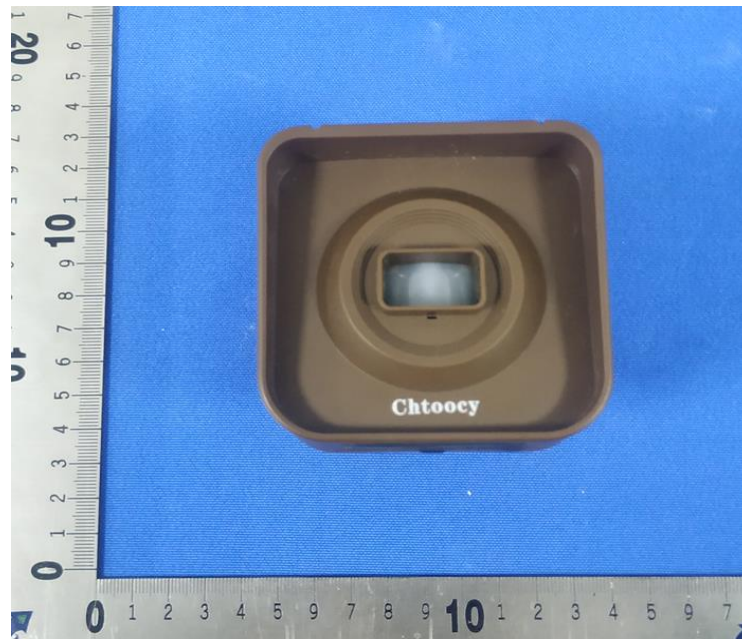
Radiated Emission(below 1G)

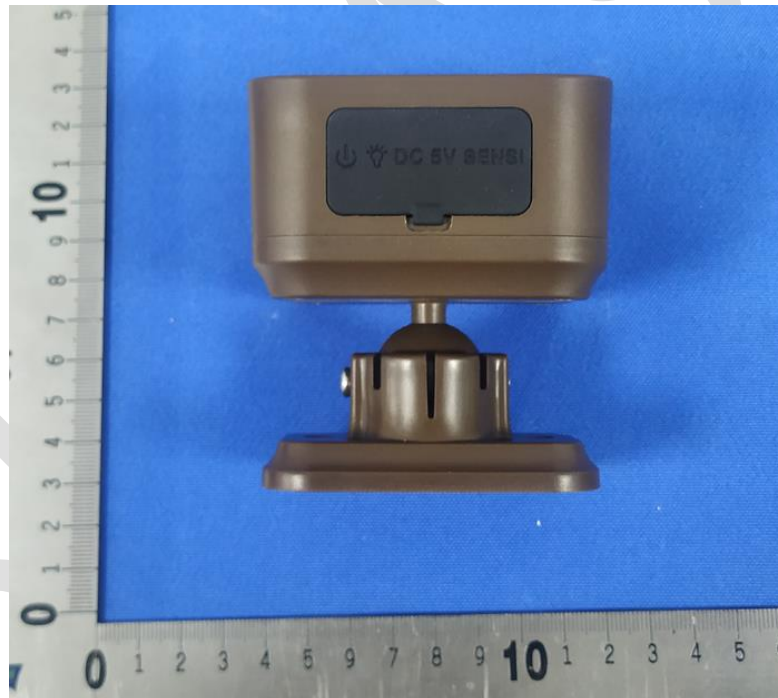
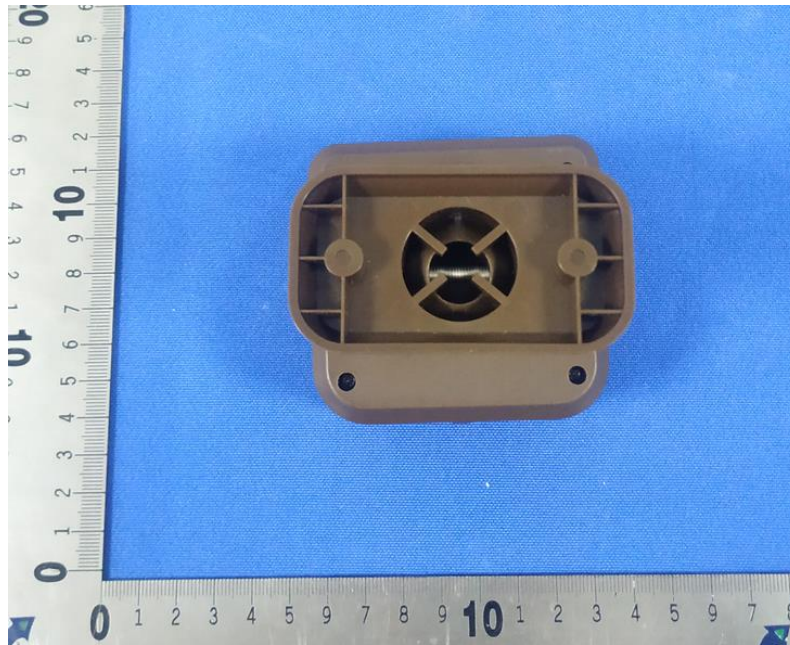


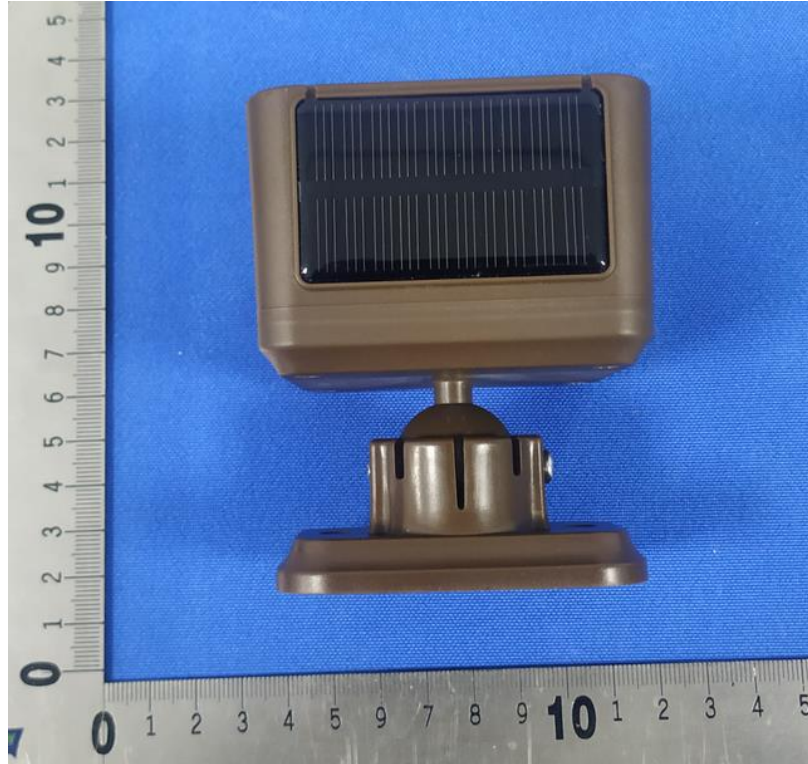
Radiated Emission(above 1G)



APPENDIX B: PHOTOGRAPHS OF EUT

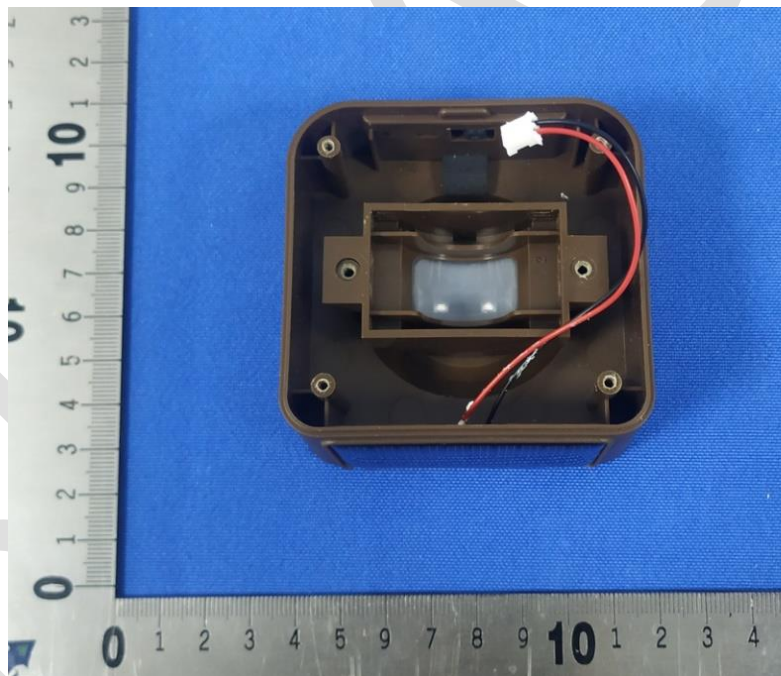
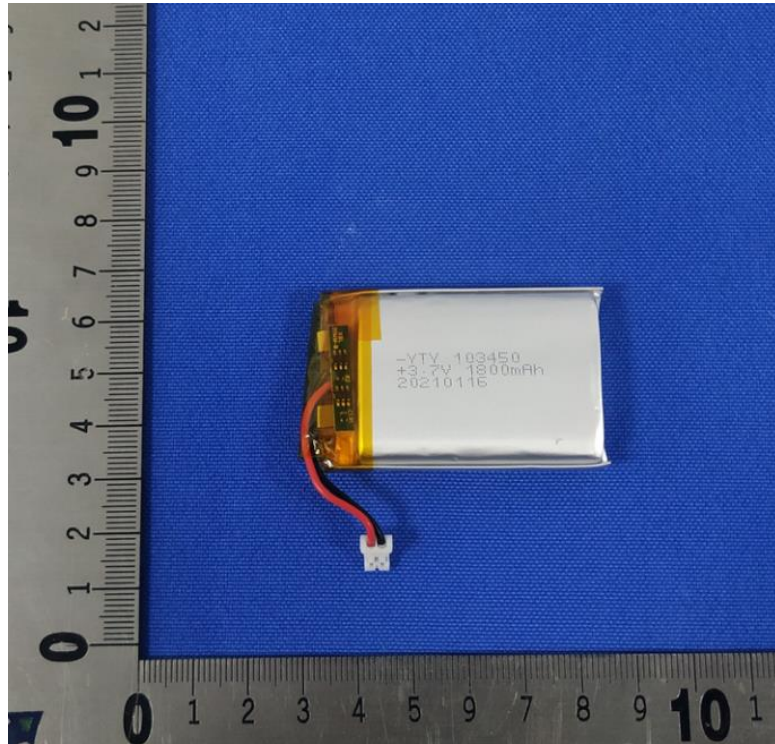


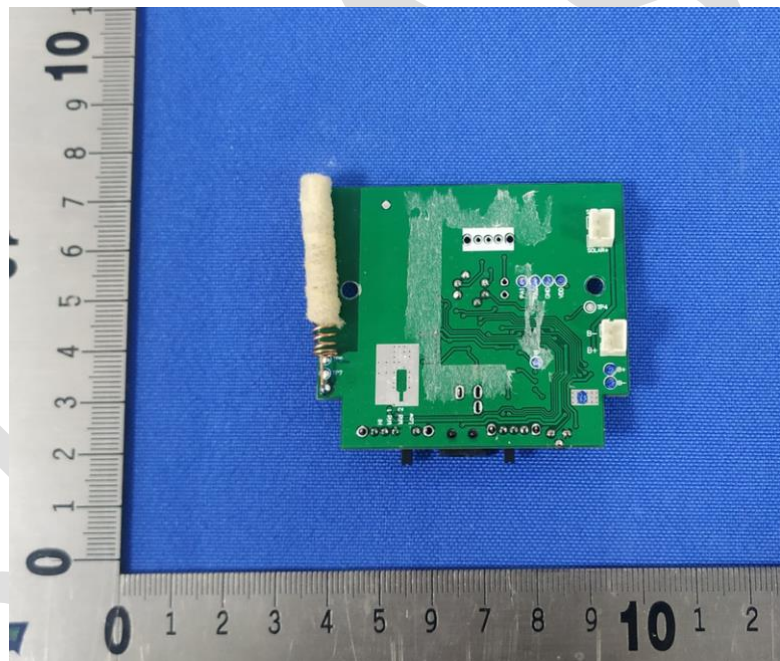
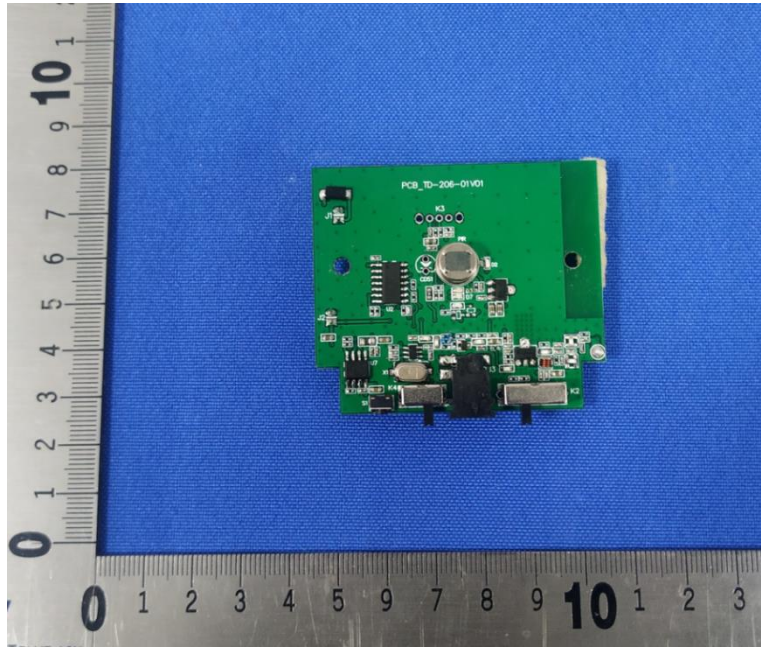












----END OF REPORT----

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