TEST REPORT

Product Name	:	DOORBELL
Brand Mark	:	TeckNet or TECKNET
Model No.	:	TK-WD003
FCC ID	:	2AK8Q-TKWD003
Report Number	:	BLA-EMC-202104-A5201
Date of Sample Receipt	:	2021/4/15
Date of Test	:	2021/4/15 to 2021/4/28
Date of Issue	:	2021/4/28
Test Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.231
Test Result	:	Pass

Prepared for:

Shenzhen Unichain Technology Co., Ltd
201, 2nd Floor, Building C, Shanhai Commercial Plaza, Huangjunshan District, Bantian Street, Longgang District, Shenzhen, China

Prepared by:

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

Compiled by: Sven **Review by:** Sweet. Liang

Approved by: **Date:** 2021/4/28

Report Revise Record

Version No.	Date	Description
00	2021/4/28	Original

TABLE OF CONTENTS

1 TEST SUMMARY 4
2 GENERAL INFORMATION 5
3 GENERAL DESCRIPTION OF E.U.T. 5
4 TEST ENVIRONMENT 6
5 TEST MODE 6
6 MEASUREMENT UNCERTAINTY 6
7 DESCRIPTION OF SUPPORT UNIT 7
8 LABORATORY LOCATION 7
9 TEST INSTRUMENTSLIST 8
10 ANTENNA REQUIREMENT 9
11 RADIATED EMISSION 10
11.1 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL 12
11.2 SPURIOUS EMISSIONS 14
12 20DB BANDWIDTH 18
13 DURATION TIME 20
APPENDIX A: PHOTOGRAPHS OF TEST SETUP 21
APPENDIX B: PHOTOGRAPHS OF EUT 22

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) (1)	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 Unichain Technology Co., Ltd
Address	201, 2nd Floor, Building C, Shanhai Commercial Plaza, Huangjunshan District, Bantian Street, Longgang District, Shenzhen, China
Manufacturer	Shenzhen Unichain Technology Co., Ltd
Address	201, 2nd Floor, Building C, Shanhai Commercial Plaza, Huangjunshan District, Bantian Street, Longgang District, Shenzhen, China
Factory	FOSHAN SHUNDE ADVANTE ELECTRON LTD.
Address	NORTH SECOND XINXI ROAD, LUNJIAO INDUSTRIAL AVENUE, LUNJIAO, SHUNDE, FOSHAN, GUANGDONG, CHINA

3 GENERAL DESCRIPTION OF E.U.T.

Product Name:	DOORBELL
Model No.:	TK-WD003
Hardware Version	N/A
Software Version	N/A
Operation Frequency:	433.92MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	Internal antenna
Antenna gain:	0 dBi
Power supply:	DC 3.0V

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	22°C	DC3.0V

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*	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9KHz~30MHz)	±4.34dB
Radiated Emission(30MHz~1000MHz)	±4.24dB
Radiated Emission(1000MHz~6000MHz)	±4.68dB
AC Power Line Conducted Emission(150KHz~30MHz)	±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

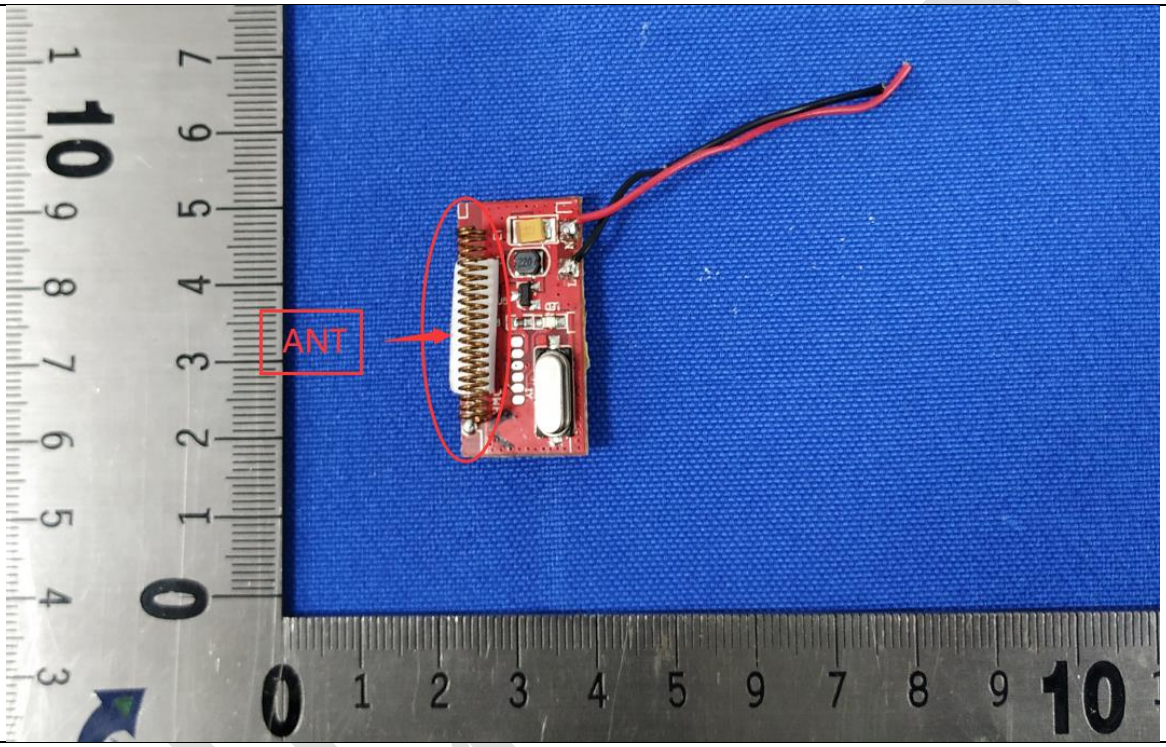
Standard requirement:	FCC Part15 C Section 15.203

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.

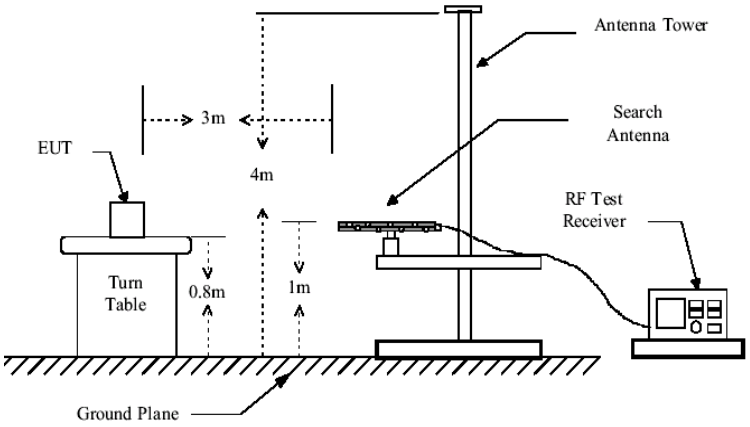
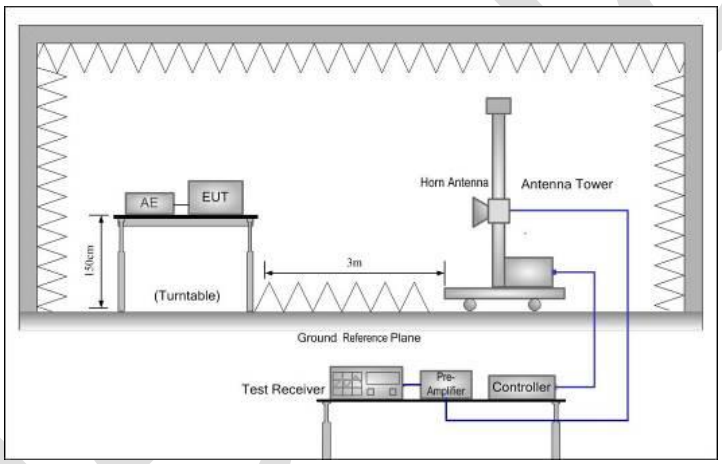
E.U.T Antenna:	

The EUT make use of an Internal antenna, The typical gain of the antenna is 0.0dBi.



11 RADIATED EMISSION

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part15 C Section 15.231 a) 1) and 15.209</td></tr>
<tr><td>Test Method:</td><td colspan="5">ANSI C63.4:2014</td></tr>
<tr><td>TestFrequencyRange:</td><td colspan="5">30MHz to 5000MHz</td></tr>
<tr><td>Test site:</td><td colspan="5">Measurement Distance: 3m(Semi-Anechoic Chamber)</td></tr>
<tr><td rowspan="3">Receiver setup:</td><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td rowspan="3">Limit:
(Field strength of the fundamental signal)</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td colspan="2" rowspan="2">433.92 MHz</td><td colspan="2">80.8</td><td>Average Value</td></tr>
<tr><td colspan="2">100.8</td><td>Peak Value</td></tr>
<tr><td rowspan="8">Limit:
(Spurious Emissions)</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td colspan="2">30MHz-88MHz</td><td colspan="2">40.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">88MHz-216MHz</td><td colspan="2">43.5</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">216MHz-960MHz</td><td colspan="2">46.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2">960MHz-1GHz</td><td colspan="2">54.0</td><td>Quasi-peak Value</td></tr>
<tr><td colspan="2" rowspan="2">Above 1GHz</td><td colspan="2">54.0</td><td>Average Value</td></tr>
<tr><td colspan="2">74.0</td><td>Peak Value</td></tr>
<tr><td colspan="5">Or The maximum permitted unwanted emission level is 20 dB below themaximum permitted fundamental level whichever limit permits higher field strength.</td></tr>
<tr><td>Test Procedure:</td><td colspan="5">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 thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatabletable 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.</td></tr>
</table>

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

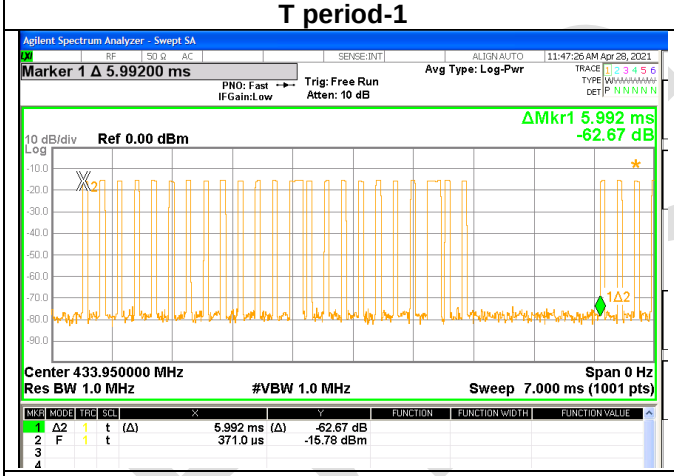
11.1 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL

Peak value						
Frequency (MHz)	Read Level (dBuV)	Correct Facor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	62.99	27.92	90.91	100.80	-9.89	Horizontoal
433.92	48.95	27.92	76.87	100.80	-23.93	Vertical
Average value						
Frequency (MHz)	Peak value	Duty cycle factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	90.91	-12.25	78.66	80.80	-2.14	Vertical
433.92	76.87	-12.25	64.62	80.80	-16.18	Horizontoal

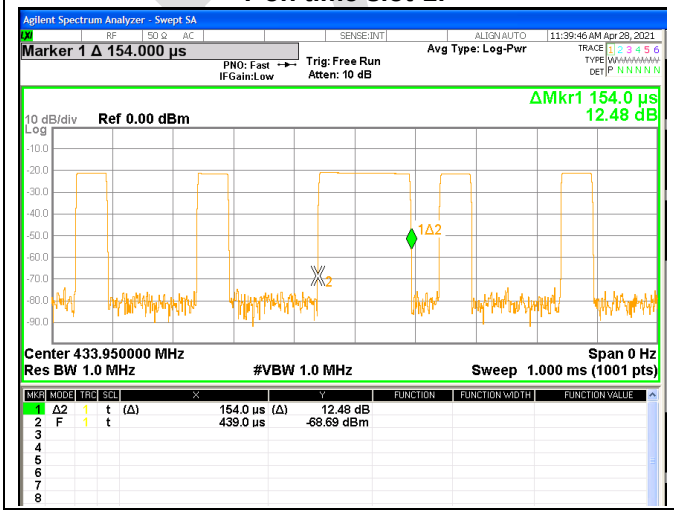
Calculate Formula:	Average value = Peak value + Duty Cycle Factor
	Duty cycle factor = 20log(Duty cycle)
	Duty cycle = on time/ period
Test data:	T on time =0.055ms*21+0.154ms*2=1.463(ms)
	T period =5.992(ms)
	Duty cycle =24.41%
	Duty cycle factor = 20log(Duty cycle) = -12.25

Test data:

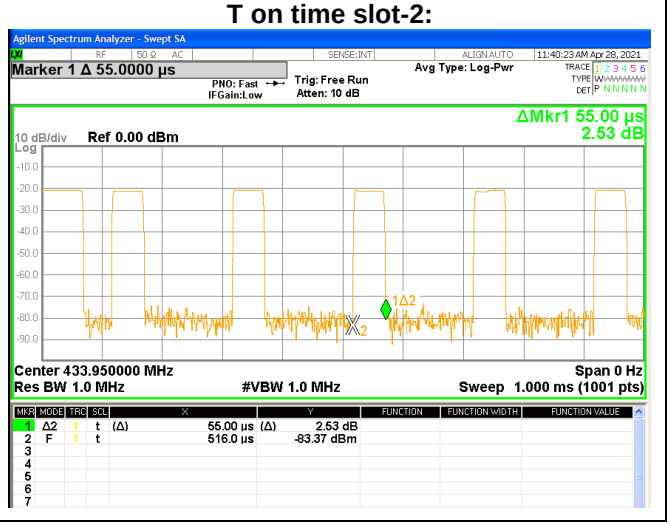
T period-1



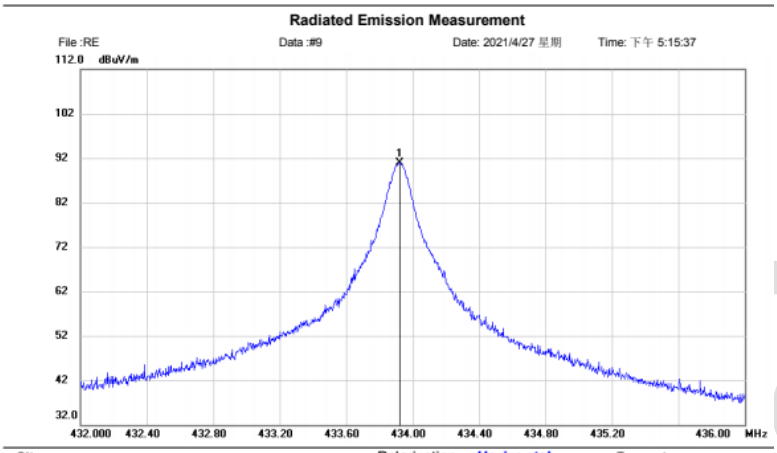
T on time slot-1:



T on time slot-2:



Horizontoal



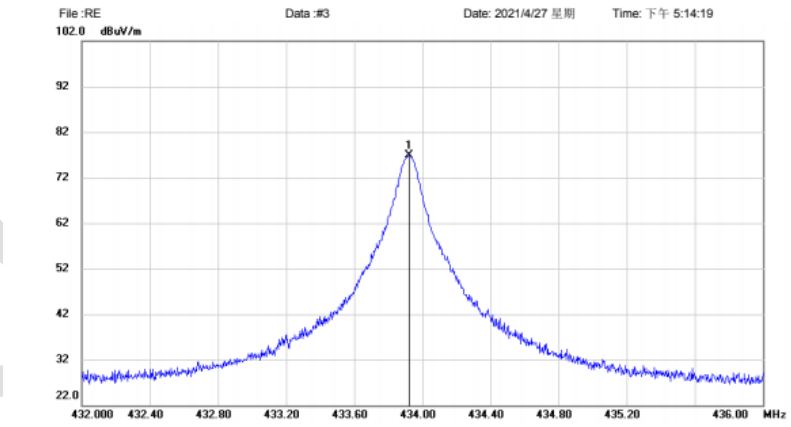
Site
Limit:
EUT: DOORBELL
M/N: TK-WD003
Mode: working mode
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	433.9200	62.99	27.92	90.91			peak			

Vertical



Site
Limit:
EUT: True Wireless Earbuds
M/N: EP-N8
Mode: working mode
Note:

Polarization: *Vertical*
Power:
Distance: 3m

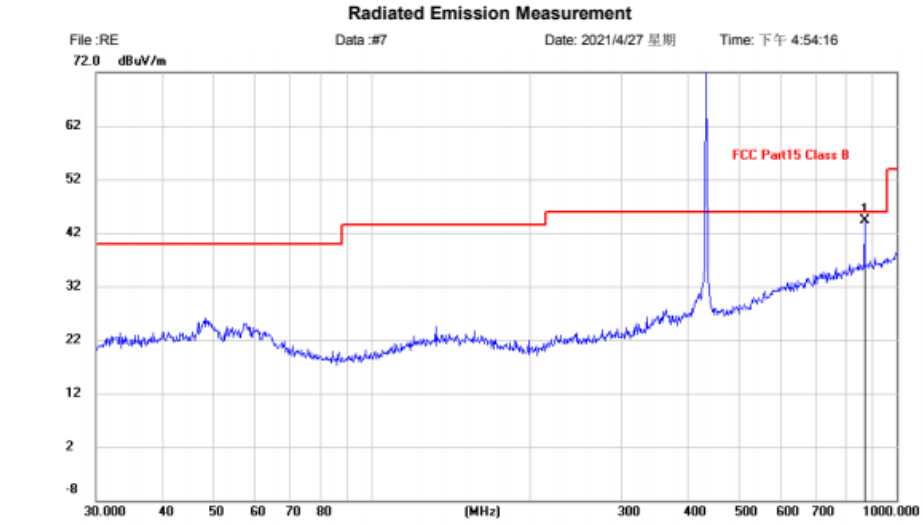
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	433.9239	48.95	27.92	76.87			peak			

11.2 SPURIOUS EMISSIONS

Below 1G

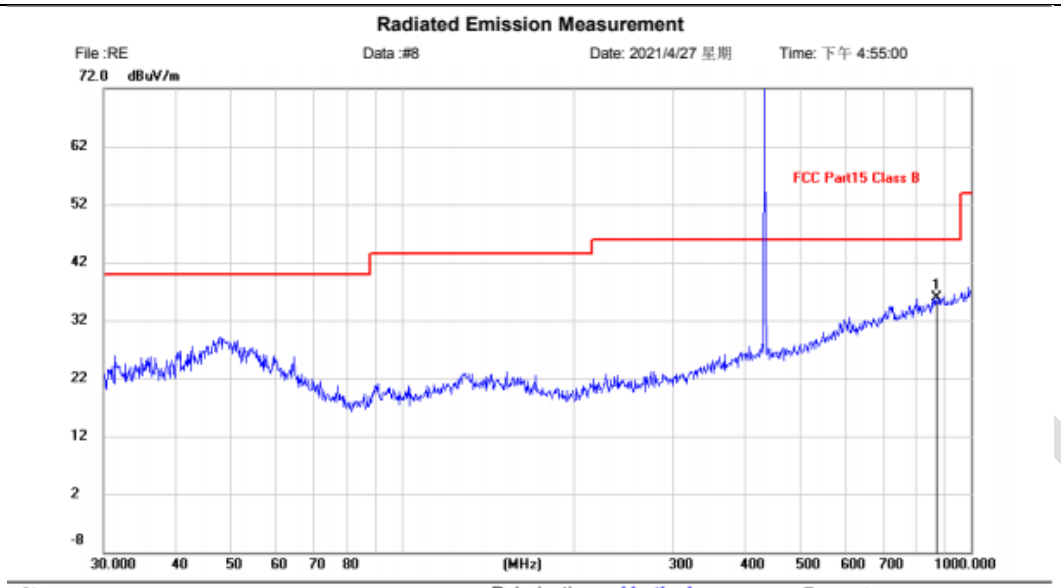
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	869.1302	8.93	35.33	44.26	46.00	-1.74	peak			

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	869.1302	44.26	-12.25	32.01	60.8	-28.79	Pass

Vertical



Site
Limit: FCC Part15 Class B
EUT: DOORBELL
M/N: TK-WD003
Mode: working mode
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature:
Humidity: %

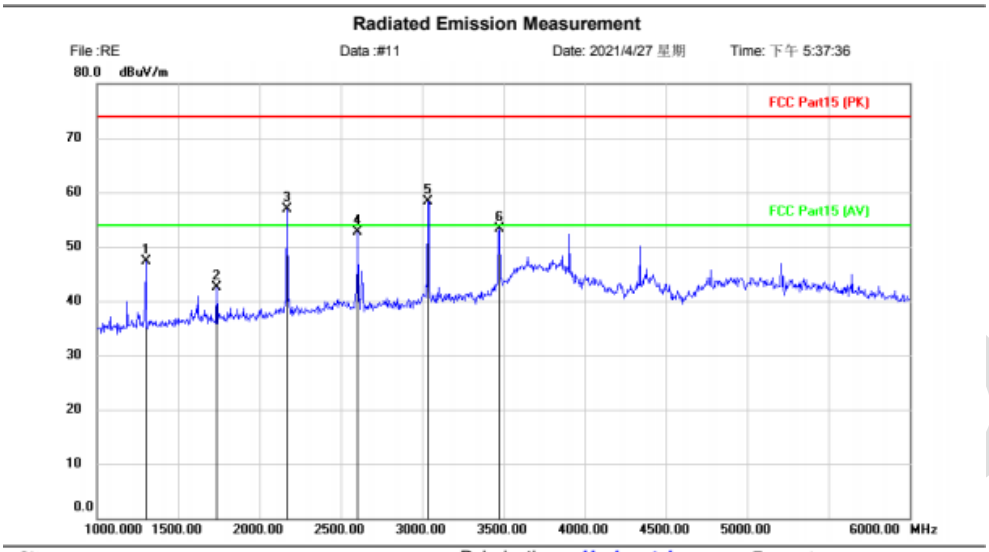
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	868.0000	0.56	35.31	35.87	46.00	-10.13	peak			

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	868.0000	35.87	-12.25	23.62	60.8	-37.18	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



Site
Limit: FCC Part15 (PK)
EUT: DOORBELL
M/N: TK-WD003
Mode: working mode
Note:

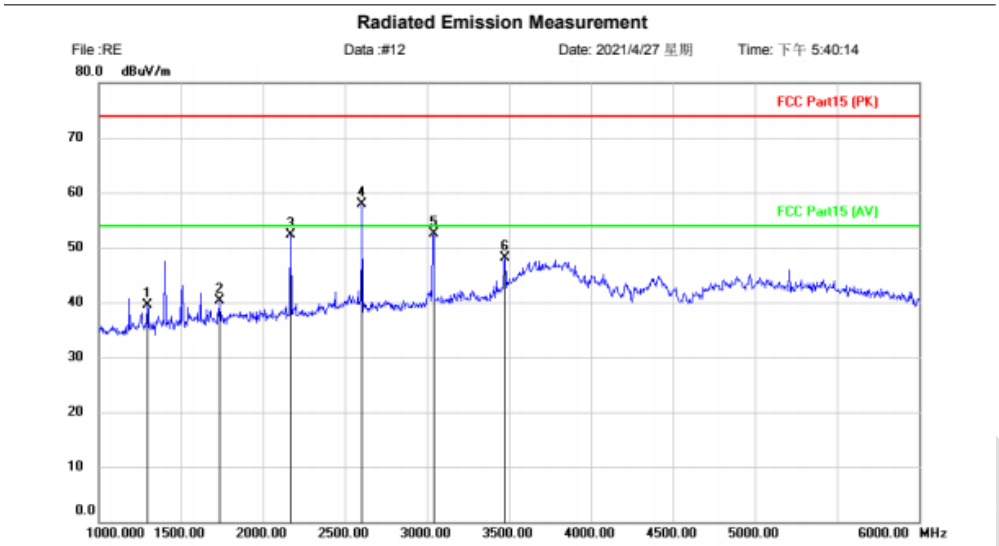
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1300.000	55.94	-8.68	47.26	74.00	-26.74	peak			
2		1735.000	49.04	-6.55	42.49	74.00	-31.51	peak			
3		2170.000	61.25	-4.42	56.83	74.00	-17.17	peak			
4		2605.000	55.66	-2.86	52.80	74.00	-21.20	peak			
5	*	3035.000	59.91	-1.63	58.28	74.00	-15.72	peak			
6		3475.000	52.12	1.21	53.33	74.00	-20.67	peak			

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	1300.000	47.26	-12.25	35.01	60.8	-25.79	Pass
2	1735.000	42.49	-12.25	30.24	60.8	-30.56	Pass
3	2170.000	56.83	-12.25	44.58	60.8	-16.22	Pass
4	2605.000	52.80	-12.25	40.55	60.8	-20.25	Pass
5	3035.000	58.28	-12.25	46.03	60.8	-14.77	Pass
6	3475.000	53.33	-12.25	41.08	60.8	-19.72	Pass

Vertical



Site
Limit: FCC Part15 (PK)
EUT: DOORBELL
M/N: TK-WD003
Mode: working mode
Note:

Polarization: *Vertical*
Power:
Distance: 3m

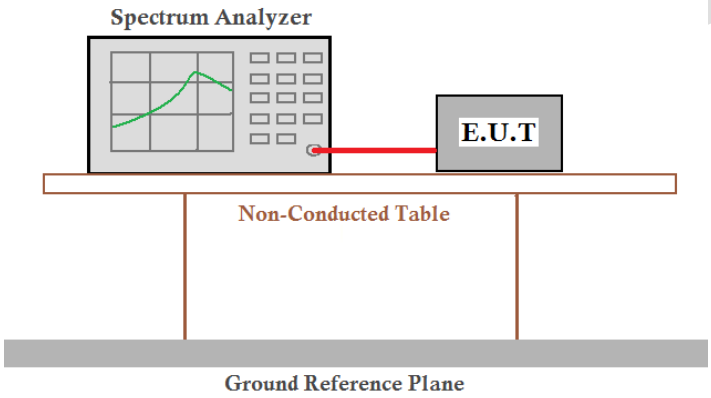
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1295.000	48.20	-8.69	39.51	74.00	-34.49	peak			
2		1735.000	46.94	-6.55	40.39	74.00	-33.61	peak			
3		2170.000	56.70	-4.42	52.28	74.00	-21.72	peak			
4	*	2605.000	60.70	-2.86	57.84	74.00	-16.16	peak			
5		3040.000	54.14	-1.63	52.51	74.00	-21.49	peak			
6		3475.000	46.99	1.21	48.20	74.00	-25.80	peak			

No.	Frequency (MHz)	Peak Result (dBuV/m)	Duty cycle factor	Average Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
1	1295.000	39.51	-12.25	27.26	60.8	-33.54	Pass
2	1735.000	40.39	-12.25	28.14	60.8	-32.66	Pass
3	2170.000	52.28	-12.25	40.03	60.8	-20.77	Pass
4	2605.000	57.84	-12.25	45.59	60.8	-15.21	Pass
5	3040.000	52.51	-12.25	40.26	60.8	-20.54	Pass
6	3475.000	48.20	-12.25	35.95	60.8	-24.85	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

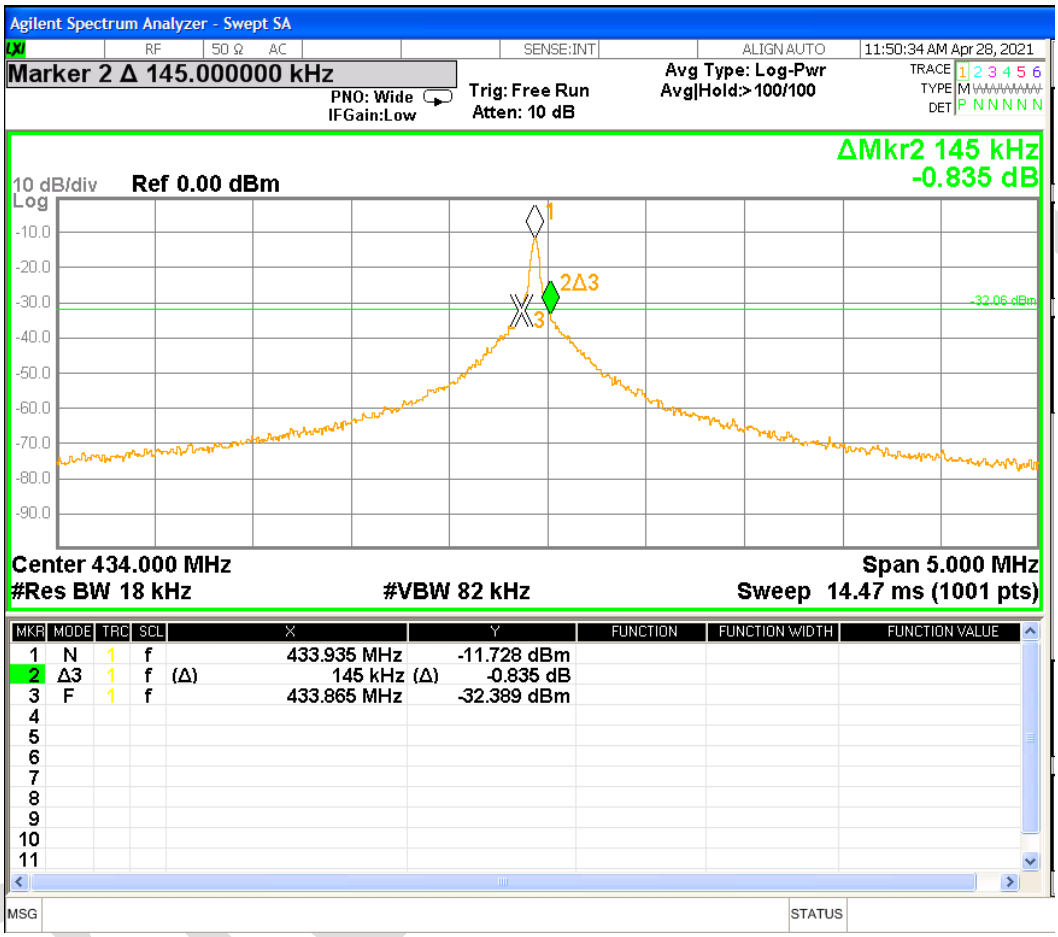
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2014
Receiver setup:	RBW=30kHz, VBW=100kHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 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:	
Test Instruments:	Refer to section 9 for details
Test mode:	Refer to section 5 for details
Test results:	Passed

Measurement Data

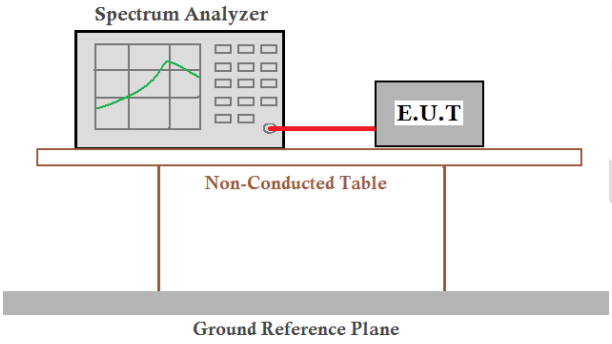
20dB bandwidth (MHz)	Limit (MHz)	Results
0.145	1.0848	Passed

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

Test plot as follows:



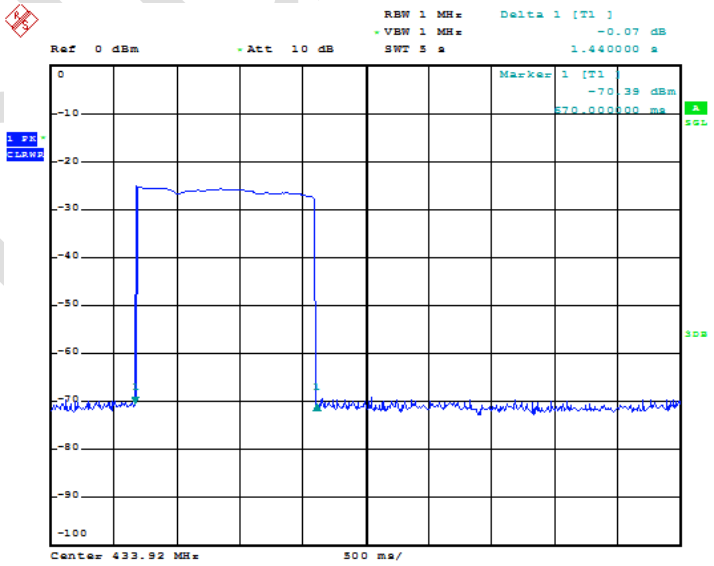
13 DURATION TIME

Test Requirement:	FCC Part15 C Section 15.231 (a) (1)
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

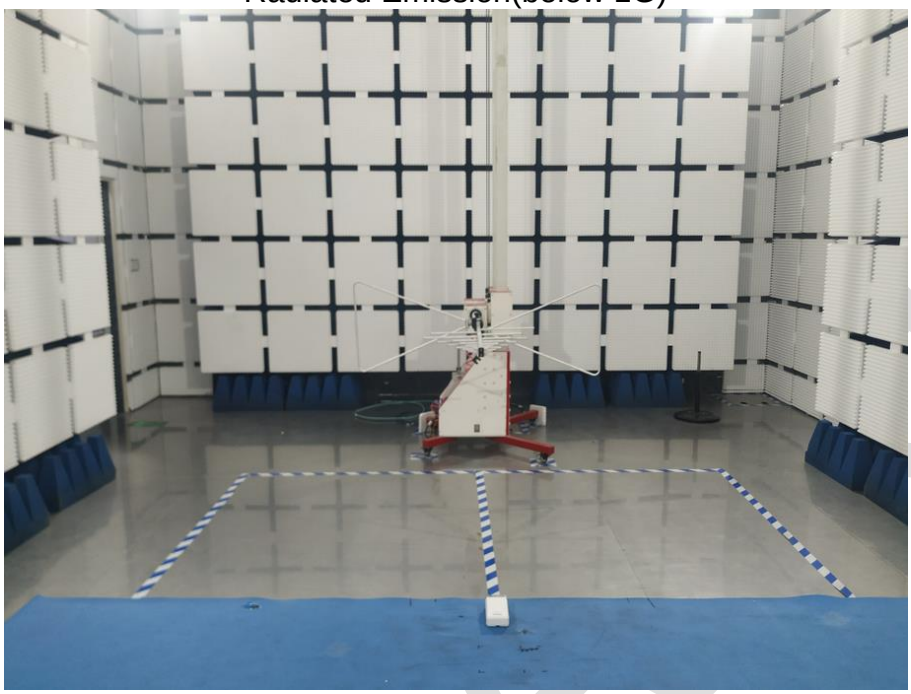
Duration time (second)	Limit (second)	Result
1.44	<5.0	Pass

Test plot as follows:



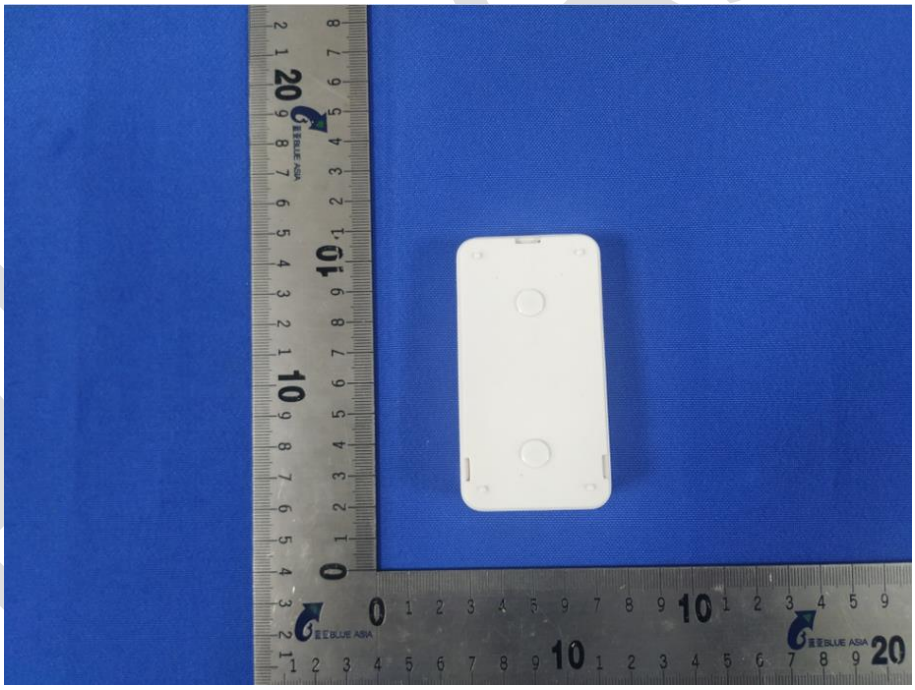
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

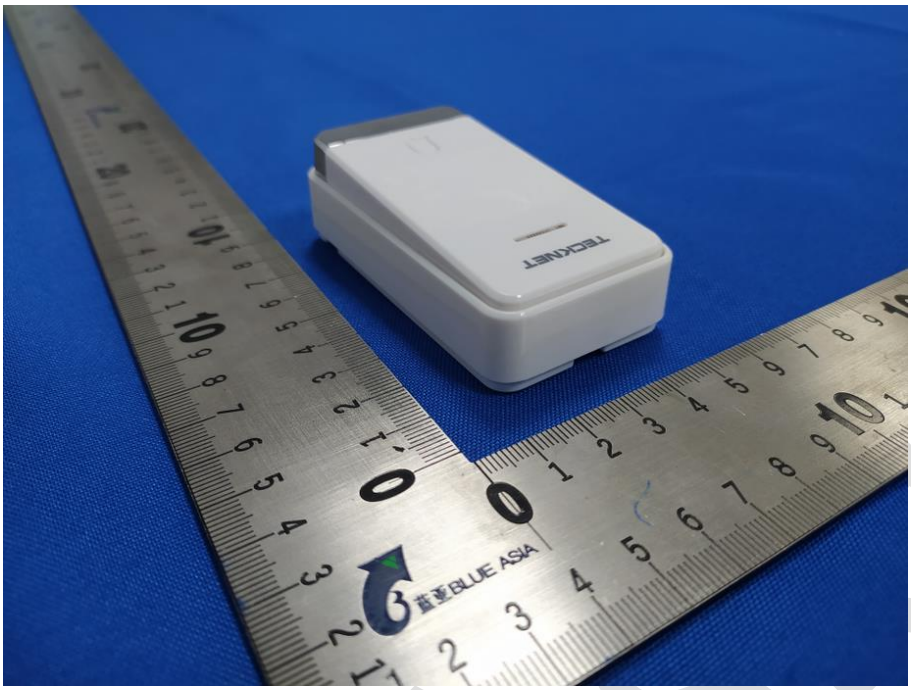
Radiated Emission(below 1G)

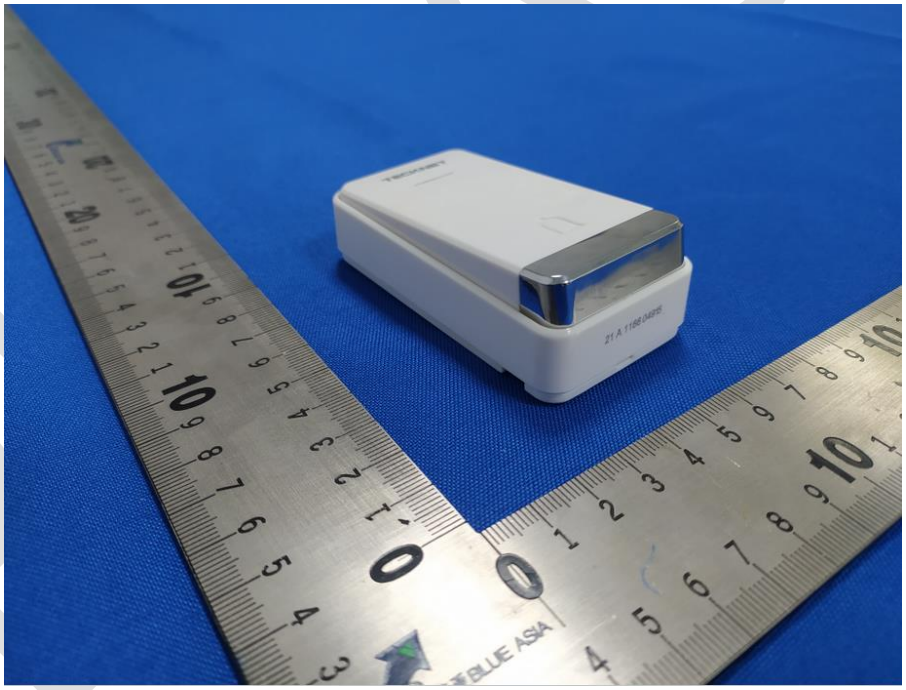


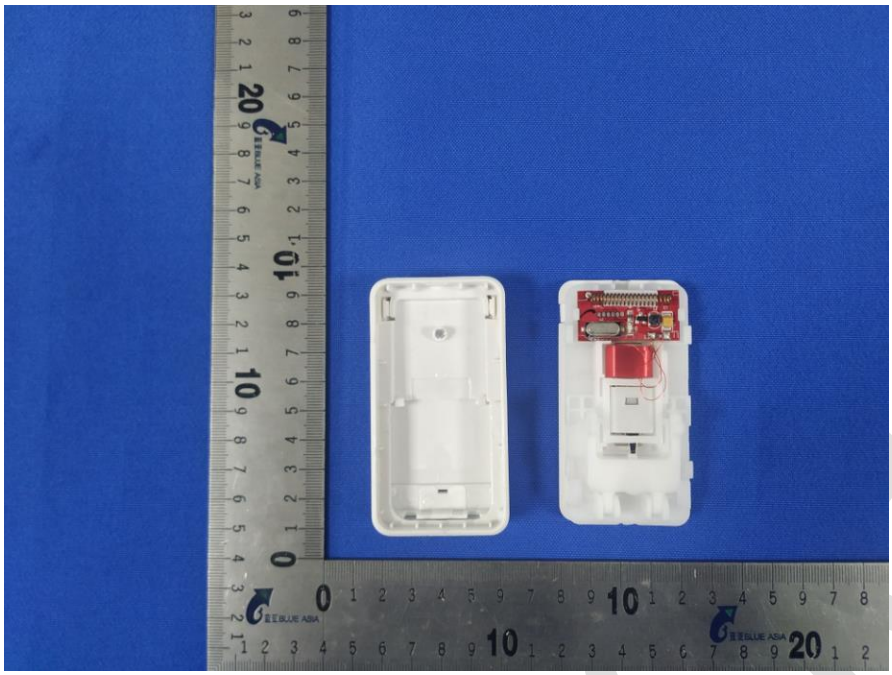
Radiated Emission(above 1G)

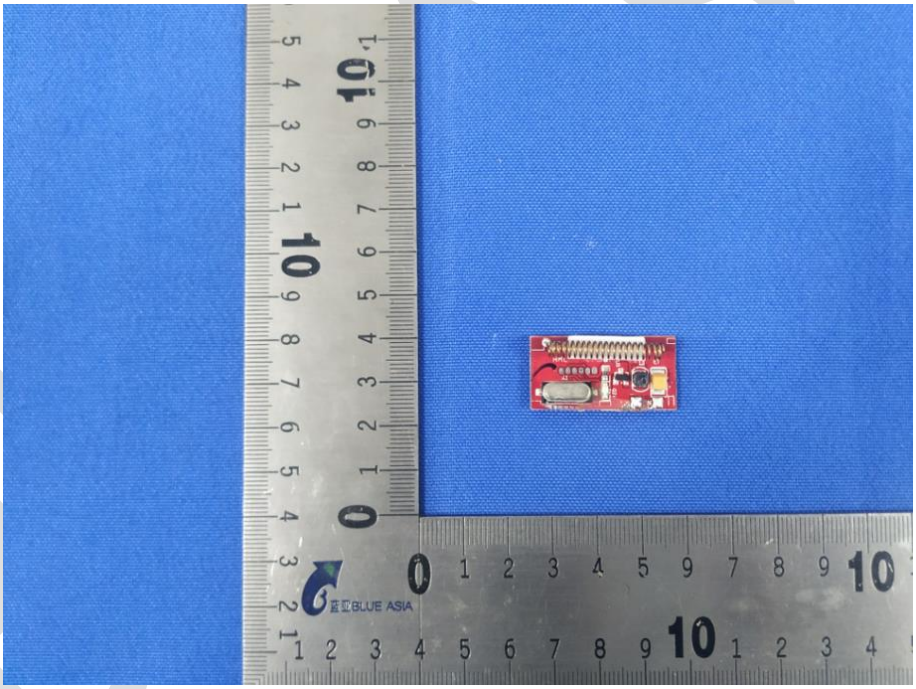
APPENDIX B: PHOTOGRAPHS OF EUT

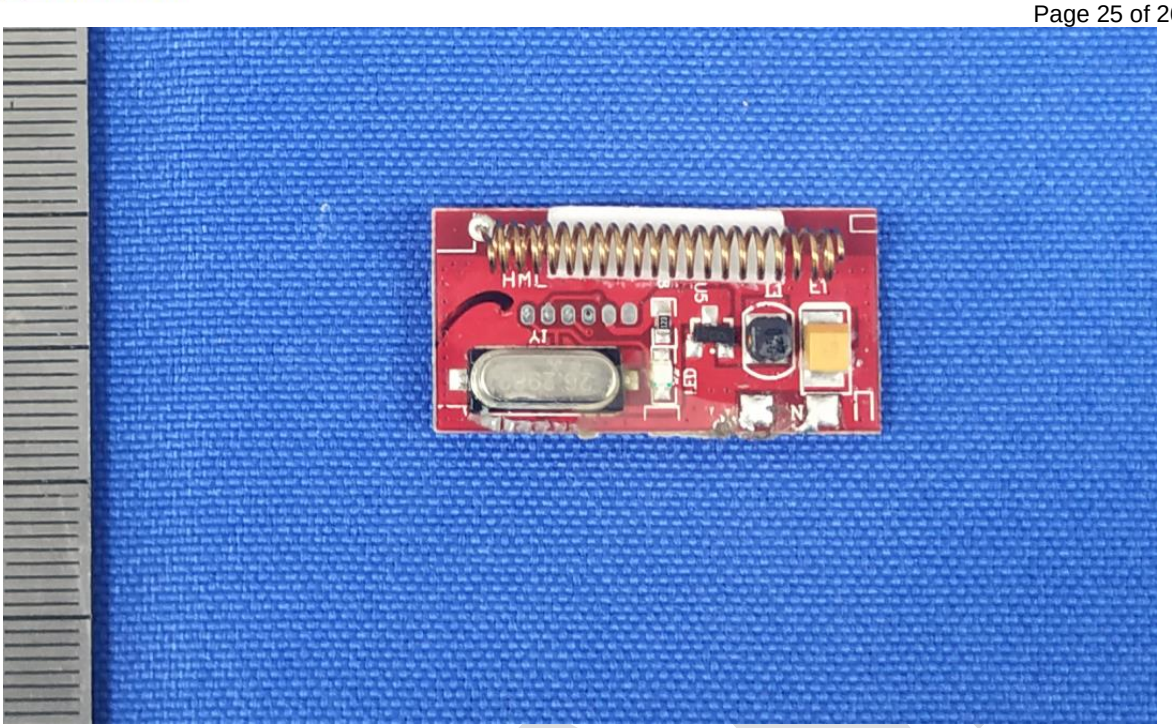


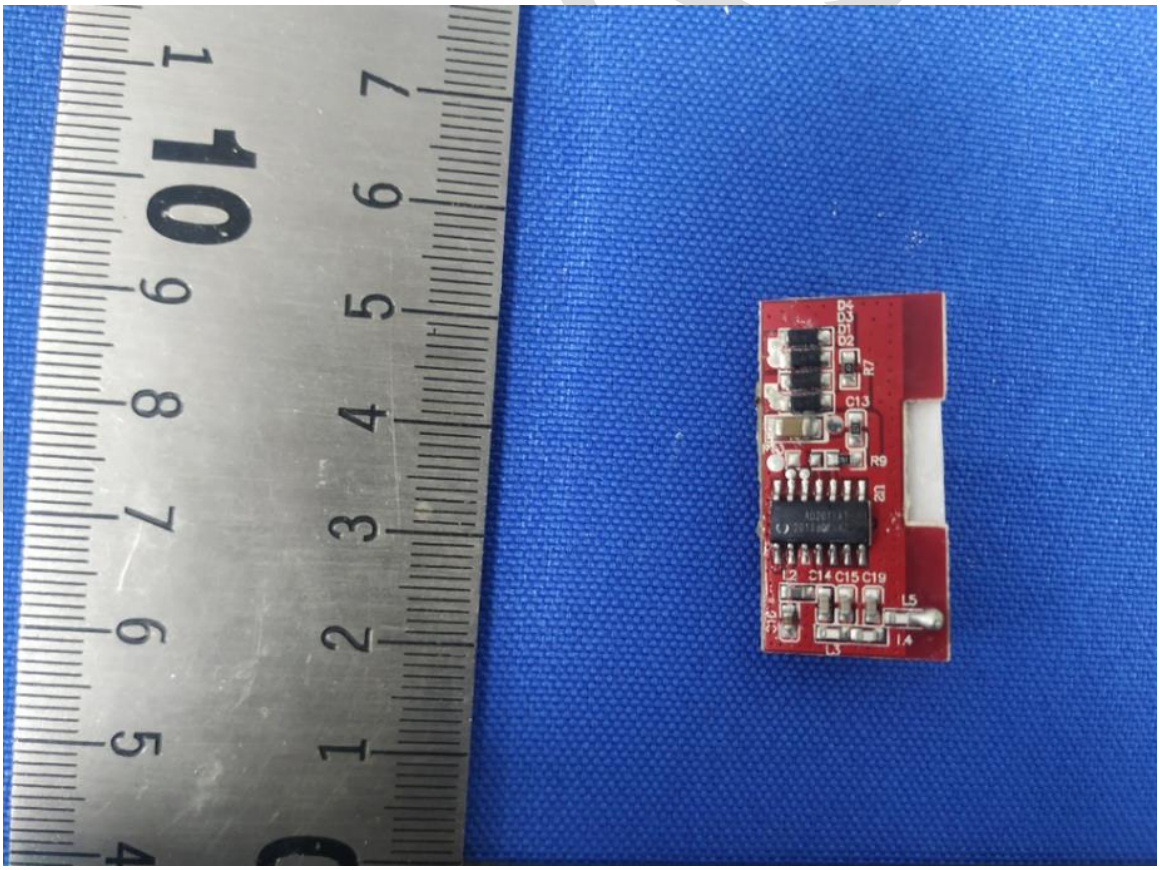

TECKNET
BLUE ASIA


BLUE ASIA






HML


C13
R9
C14 C15 C19
L5

----END OF REPORT----

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 BlueAsia, this report can't be reproduced except in full.