TEST REPORT

Reference No.	:	WTF19F11081748W
FCC ID	:	2AVMY-4011765PLT
Applicant	:	KOZY COAT
Address	:	50 N. NORTHWEST HWY UNIT #309 PARK RIDGE, IL 60068
Manufacturer	:	DONGGUAN MAINIKO ELECTRONIC CO.,LTD
Address	:	No.888, DAJIAOLING INDUSTRIL, MEIJING ROAD, DALANG TOWN, DONGGUAN, GUANGDONG, CHINA
Product	:	KOZY COAT REMOTE WIRELESS TRANSMITTER
Model(s)	:	401-1765-PLT
Standards	:	FCC CFR47 Part 15 Subpart C (Section 15.249): 2019
Date of Receipt sample	:	2019-11-25
Date of Test	:	2020-10-09
Date of Issue	:	2020-10-12
Test Result	:	Pass

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Revision History

Test report No.	Date of Issue	Purpose	Comment	Approved
WTF19F11081748W	2020-10-12	Original	-	Valid

3 General Information

3.1 General Description of E.U.T.

Product.....: KOZY COAT REMOTE WIRELESS TRANSMITTER

Model(s) .....: 401-1765-PLT

Model Differences .....: N/A

Rated Voltage .....: Battery CR2032 3V

Power Adapter Model .....: N/A

3.2 Technical Characteristics of EUT

Frequency Range .....: 2402-2480MHz

Quantity of Channels .....: 3

Channel List.....: 2402MHz, 2440MHz, 2480MHz

Max. Field Strength .....: 95.3 dBuV/m (3m)

Data Rate..... /

Modulation .....: GFSK

Antenna Type.....: PCB Antenna

Antenna Gain .....: 0dBi

3.3 Test Standards

The following report is prepared on behalf of the E-blue International Corporation in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107,15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

3.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40 GHz.

3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 21895-1**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration IC number:21895-1, Nov. 14, 2016.

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **FCC – Designation No.: CN5034**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation No. CN5034.

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

3.6 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz

Special Cable List and Details			
Cable Description	Length(m)	Shield/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

4 Equipment Used during Test

4.1 Equipment List

3m Semi-anechoic Chamber for Spurious Emission						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMI TEST RECEIVER	RS	ESR7	101566	2020-01-09	2021-01-08
2	Spectrum Analyzer	Agilent	N9020A	MY48011796	2020-01-09	2021-01-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9162	9162-117	2020-01-09	2021-01-08
4	Coaxial Cable (below 1GHz)	H+S	CBL3-NN-12+3 m	214NN320	2020-01-09	2021-01-08
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	01561	2020-01-09	2021-01-08
6	Broadband Preamplifier (Above 1GHz)	Lunar E M	LNA1G18-40	20160501002	2020-01-09	2021-01-08
7	Coaxial Cable (above 1GHz)	Times-Micorwave	CBL5-NN	-	2020-01-09	2021-01-08
RF Conducted test						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	Spectrum Analyzer	Agilent	N9020A	MY48011796	2020-01-09	2021-01-08
2.	Spectrum Analyzer	R&S	FSP40	100501	2020-01-09	2021-01-08
3.	Vector Signal Generator	Agilent	N5182A	MY50141533	2020-01-09	2021-01-08
4.	Analog Signal Generator	Agilent	N5181A	MY48180720	2020-01-09	2021-01-08
5.	Environmental Chamber	KSON	THS-D4C-100	5244K	2020-01-09	2021-01-08
6.	RF Control Unit	CHANGCHUANG	JS0806-2	-	2020-01-09	2021-01-08

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF Output Power	±0.95dB
Occupied Bandwidth	±1.5%
Conducted Spurious Emission	±2.7dB
Conducted Emission	±2.7dB
Transmitter Spurious Emission	±3.8dB (for 25MHz-1GHz)
	±5.0dB (for 1GHz-18GHz)

5 Test Summary

FCC Rules	Description of Test Items	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	N/A
§15.209(a)(f)	Radiated Spurious Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant

Remark:

Pass Test item meets the requirement

Fail Test item does not meet the requirement

N/A Test case does not apply to the test object

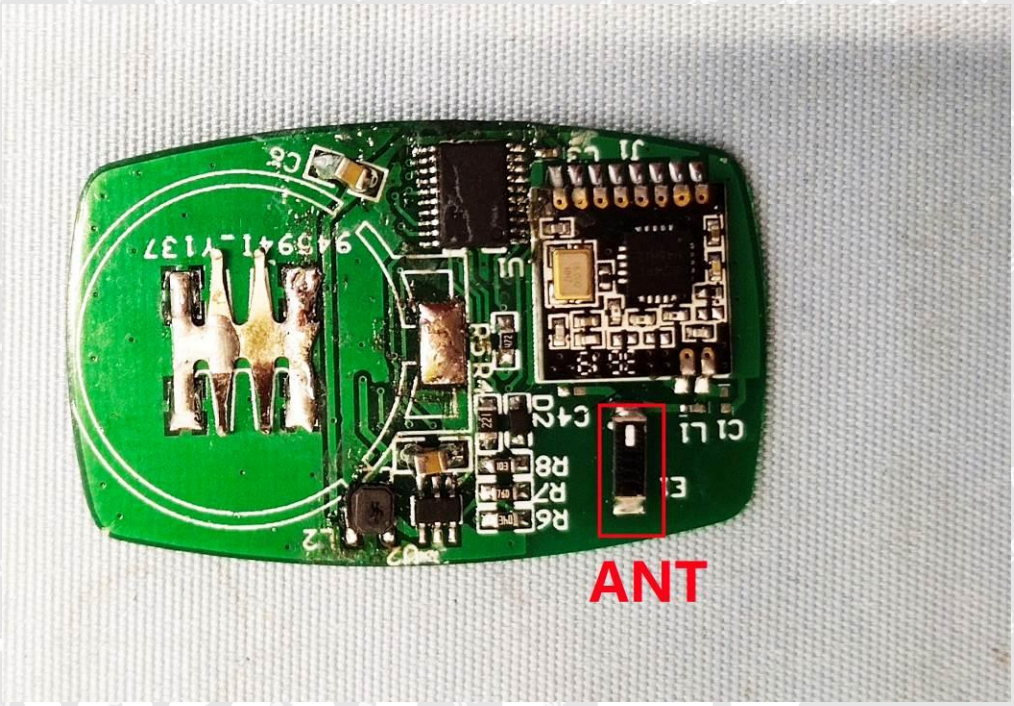
6 Antenna Requirement

6.1 Standard Applicable

According to FCC Part 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

6.2 Test Result

This product has a PCB antenna, fulfill the requirement of this section.



7 Radiation Emission Test

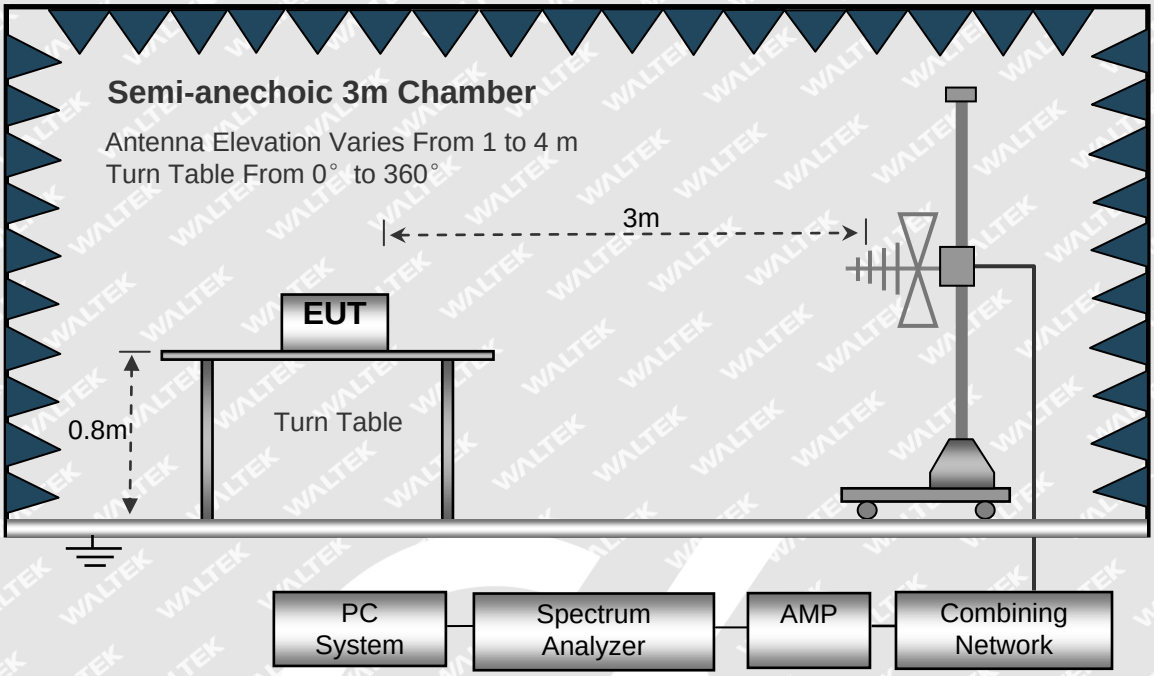
7.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

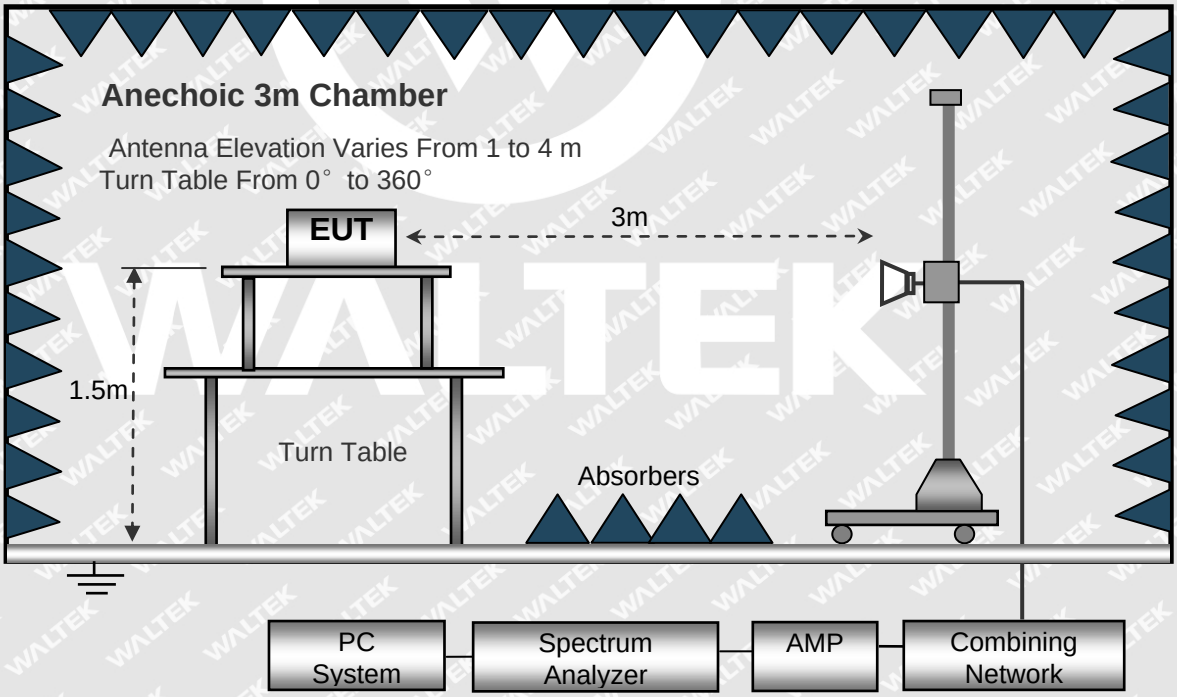
Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	mV/m	dBuV/m
902-928 MHz	50	94	0.5	54
2400-2483.5 MHz	50	94	0.5	54
5725-5875 MHz	50	94	0.5	54
24.0-24.25 GHz	250	108	2.5	68

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1 GHz.



7.2 Spectrum Analyzer Setup

9KHz-30MHz	**30MHz-1GHz**	**Above 1GHz**
RBW=10kHz	RBW=120kHz	RBW=1MHz
VBW=30kHz	VBW=300kHz	VBW=3MHz(Peak), 10MHz(AV)
Sweep time=Auto	Sweep time=Auto	Sweep time=Auto
Trace=Max hold	Trace=Max hold	Trace=Max hold
Detector function=peak	Detector function=peak, QP	Detector function=peak, AV

7.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB V means the emission is 6dB V below the maximum limit. The equation for
margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15C Limit

7.4 Environmental Conditions

Temperature	24℃
Relative Humidity	60%
ATM Pressure	101.2kPa

7.5 Summary of Test Results/Plots

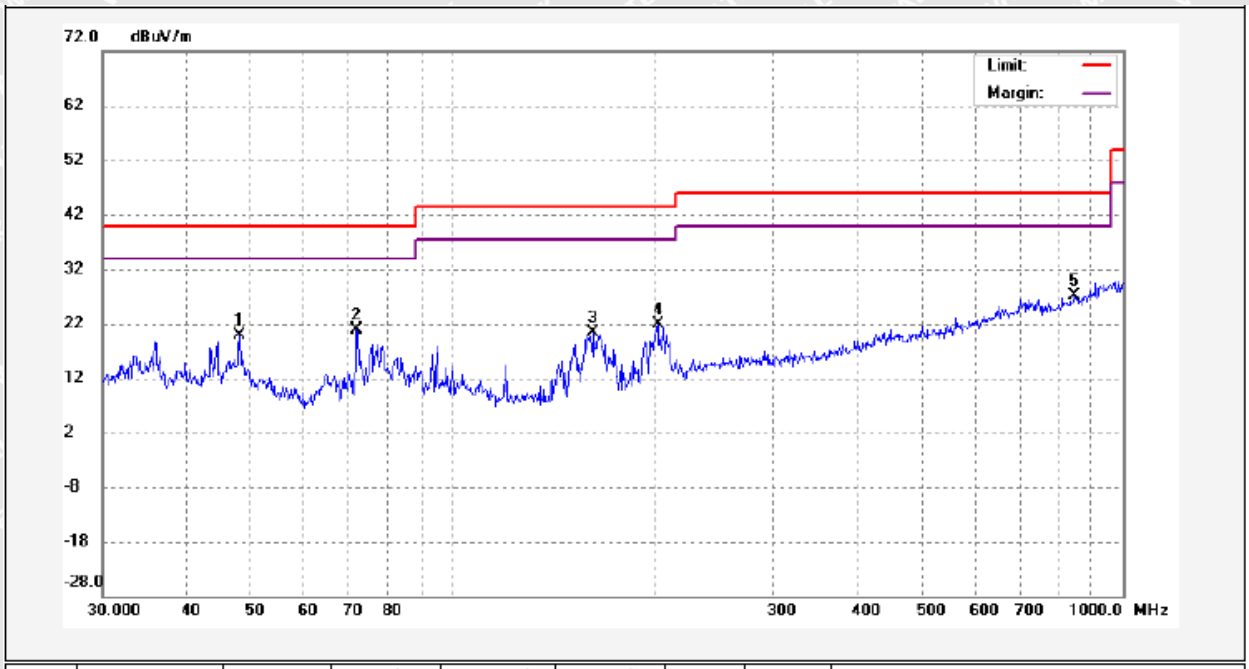
According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

--3.06 dB at **4804MHz** in the **Vertical** polarization, **Low Channel, 9 kHz to 25 GHz, 3Meters**

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

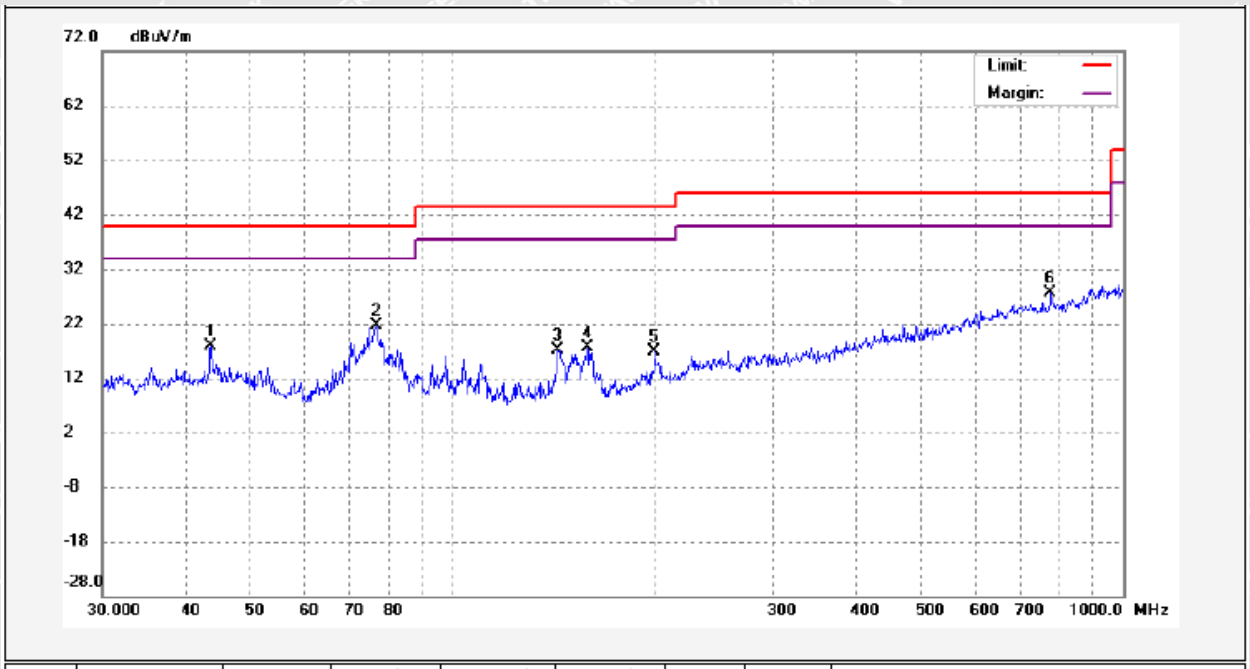
Plot of Radiated Emissions Test Data (30MHz to 1GHz)

Test Channel Transmitting Low Channel(2402MHz) **Test Voltage** DC 3V **Polarization** Vertical



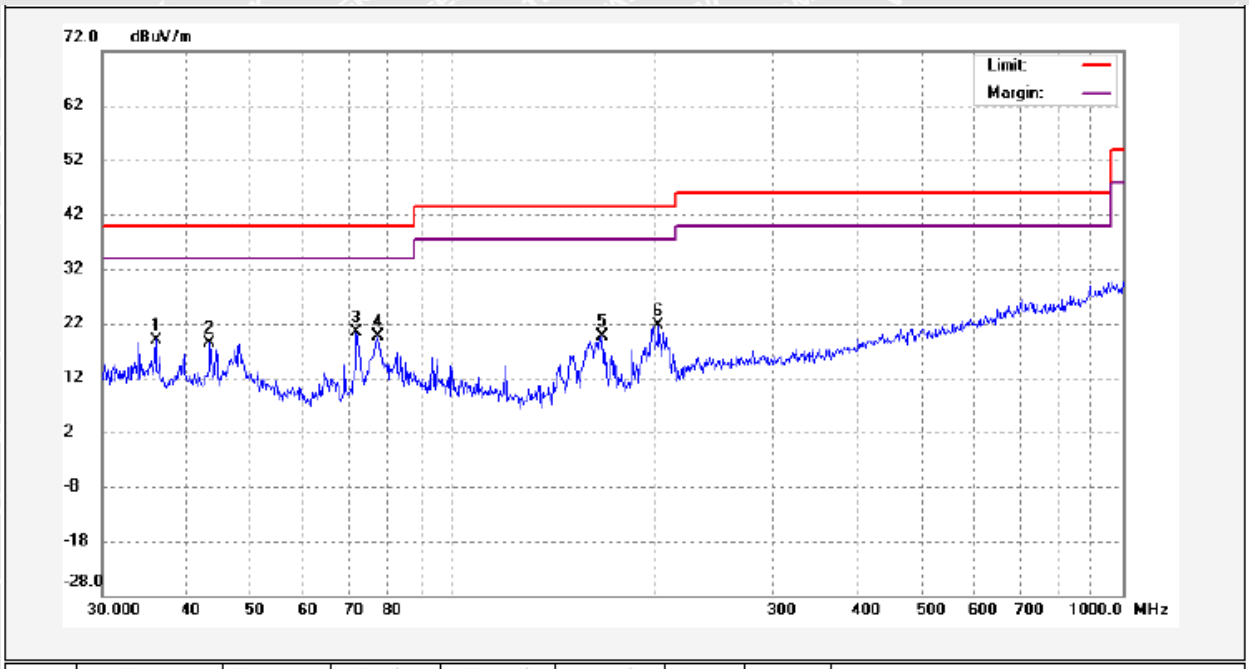
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	47.9940	6.31	13.67	19.98	40.00	-20.02	peak	
2	71.8320	11.44	9.52	20.96	40.00	-19.04	peak	
3	162.0414	9.35	11.10	20.45	43.50	-23.05	peak	
4	202.1005	8.78	13.14	21.92	43.50	-21.58	peak	
5	845.0878	0.68	26.38	27.06	46.00	-18.94	peak	

Test Channel Transmitting Low Channel(2402MHz) **Test Voltage** DC 3V **Polarization** Horizontal



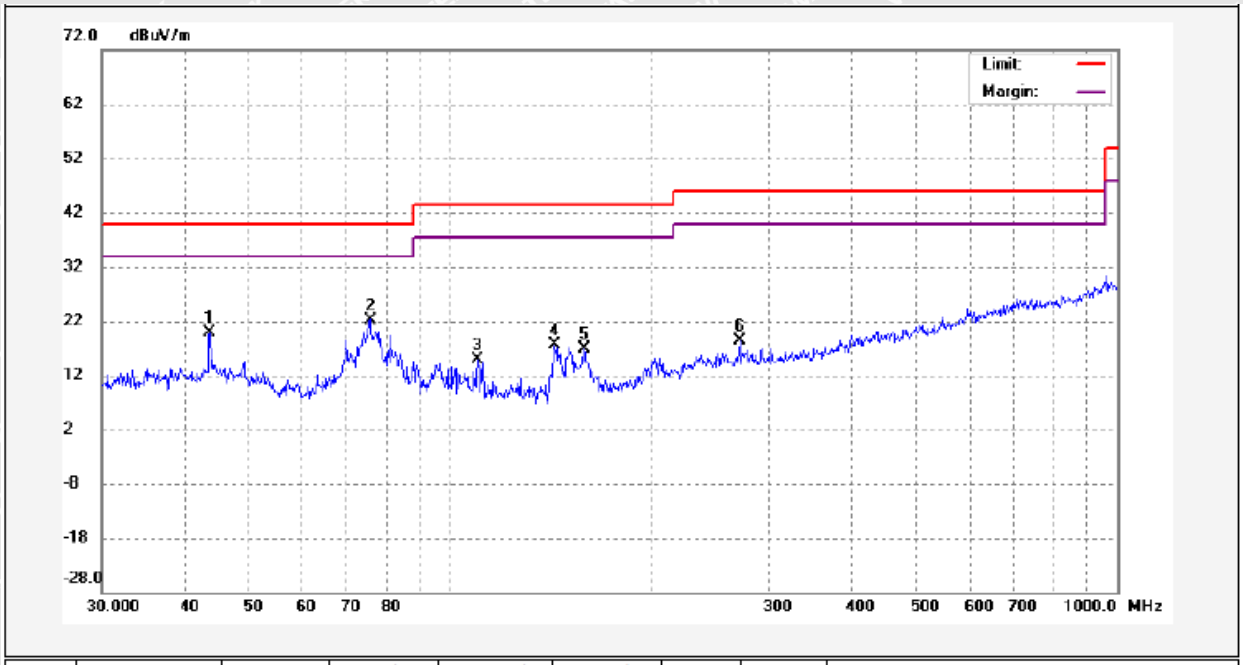
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.5057	2.84	15.16	18.00	40.00	-22.00	peak	
2	76.7808	12.23	9.52	21.75	40.00	-18.25	peak	
3	143.3261	6.99	10.05	17.04	43.50	-26.46	peak	
4	158.6677	6.83	10.72	17.55	43.50	-25.95	peak	
5	199.9856	3.93	12.99	16.92	43.50	-26.58	peak	
6	779.6068	2.07	25.45	27.52	46.00	-18.48	peak	

Test Channel Transmitting Low Channel(2440MHz) **Test Voltage** DC 3V **Polarization** Vertical



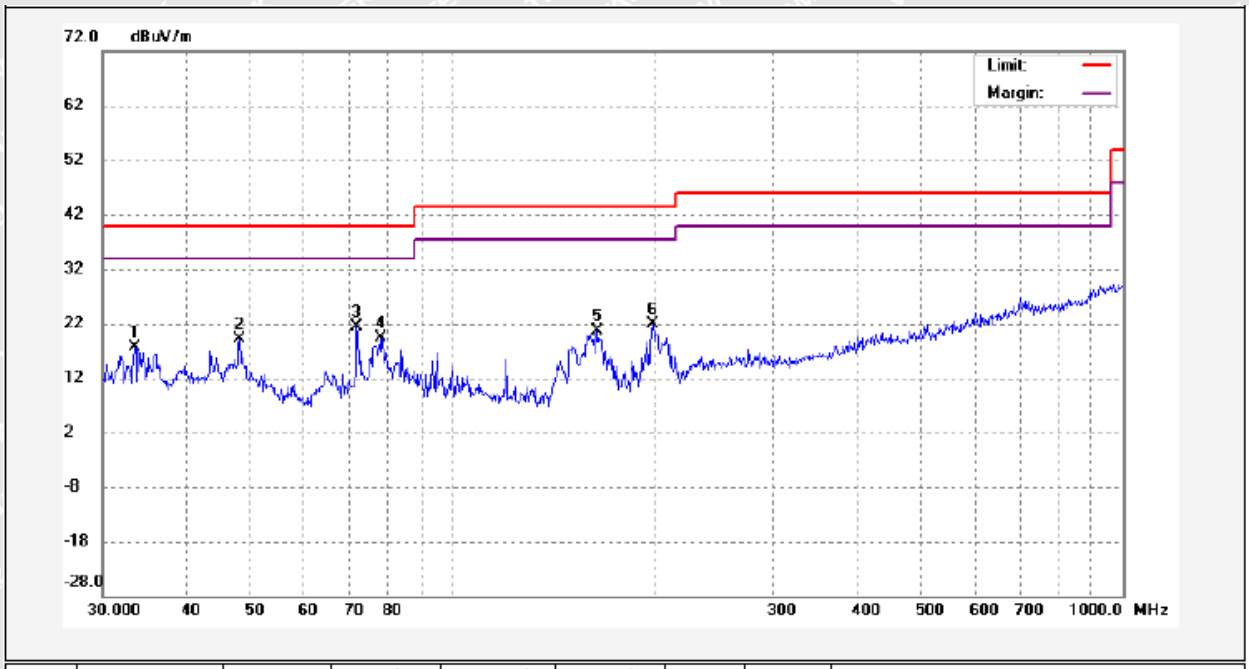
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	36.0007	5.94	13.06	19.00	40.00	-21.00	peak	
2	43.3534	3.80	14.60	18.40	40.00	-21.60	peak	
3	71.8320	10.91	9.52	20.43	40.00	-19.57	peak	
4	77.3212	9.97	9.64	19.61	40.00	-20.39	peak	
5	167.2368	8.21	11.40	19.61	43.50	-23.89	peak	
6	202.8104	8.53	13.16	21.69	43.50	-21.81	peak	

Test Channel Transmitting Low Channel(2440MHz) **Test Voltage** DC 3V **Polarization** Horizontal



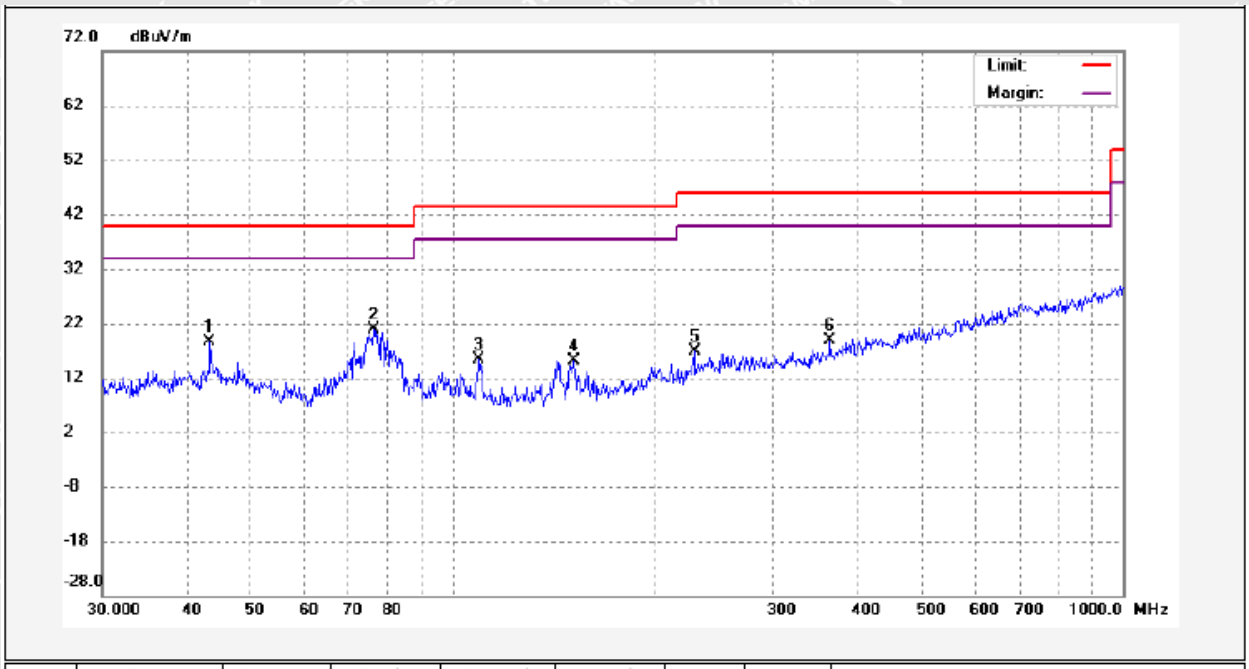
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.5057	4.65	15.16	19.81	40.00	-20.19	peak	
2	75.7114	12.63	9.62	22.25	40.00	-17.75	peak	
3	109.7960	3.51	11.41	14.92	43.50	-28.58	peak	
4	143.3261	7.46	10.05	17.51	43.50	-25.99	peak	
5	158.6677	6.27	10.72	16.99	43.50	-26.51	peak	
6	271.3246	2.91	15.50	18.41	46.00	-27.59	peak	

Test Channel Transmitting Low Channel(2480MHz) **Test Voltage** DC 3V **Polarization** Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.4449	5.19	12.42	17.61	40.00	-22.39	peak	
2	47.9940	5.46	13.67	19.13	40.00	-20.87	peak	
3	71.8320	11.89	9.52	21.41	40.00	-18.59	peak	
4	78.1389	9.70	9.70	19.40	40.00	-20.60	peak	
5	164.3301	9.33	11.26	20.59	43.50	-22.91	peak	
6	198.5880	8.93	13.02	21.95	43.50	-21.55	peak	

Test Channel Transmitting Low Channel(2480MHz) **Test Voltage** DC 3V **Polarization** Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.3534	3.56	15.10	18.66	40.00	-21.34	peak	
2	76.2442	11.25	9.57	20.82	40.00	-19.18	peak	
3	109.4116	3.87	11.44	15.31	43.50	-28.19	peak	
4	151.5972	4.61	10.46	15.07	43.50	-28.43	peak	
5	229.2931	2.03	14.91	16.94	46.00	-29.06	peak	
6	365.5391	1.71	17.18	18.89	46.00	-27.11	peak	

Spurious Emissions Test Data (Above 1GHz)

Frequency (MHz)	Reading (dBμV/m)	Detector	Polar (H/V)	Corrected Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel-2402MHz							
2402	87.62	PK	H	-12.35	75.27	114	-38.73
2402	77.15	AV	H	-12.35	64.80	94	-29.20
4804	61.63	PK	H	-6.71	54.92	74	-19.08
4804	51.01	AV	H	-6.71	44.30	54	-9.70
7206	48.80	PK	H	-1.46	47.34	74	-26.66
7206	35.81	AV	H	-1.46	34.35	54	-19.65
2402	95.31	PK	V	-10.39	84.92	114	-29.08
2402	84.95	AV	V	-10.39	74.56	94	-19.44
4804	65.75	PK	V	-2.96	62.79	74	-11.21
4804	53.90	AV	V	-2.96	50.94	54	-3.06
7206	47.93	PK	V	-1.46	46.47	74	-27.53
7206	38.94	AV	V	-1.46	37.48	54	-16.52
Middle Channel-2440MHz							
2440	86.74	PK	H	-12.27	74.47	114	-39.53
2440	76.31	AV	H	-12.27	64.04	94	-29.96
4880	59.44	PK	H	-6.5	52.94	74	-21.06
4880	48.60	AV	H	-6.5	42.10	54	-11.90
7320	49.32	PK	H	-1.14	48.18	74	-25.82
7320	35.86	AV	H	-1.14	34.72	54	-19.28
2440	95.30	PK	V	-10.21	85.09	114	-28.91
2440	83.16	AV	V	-10.21	72.95	94	-21.05
4880	63.31	PK	V	-2.61	60.70	74	-13.30
4880	52.29	AV	V	-2.61	49.68	54	-4.32
7320	49.13	PK	V	-1.14	47.99	74	-26.01
7320	36.01	AV	V	-1.14	34.87	54	-19.13

Frequency (MHz)	Reading (dBμV/m)	Detector	Polar (H/V)	Corrected Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
High Channel-2480MHz							
2480	85.67	PK	H	-12.19	73.48	114	-40.52
2480	75.28	AV	H	-12.19	63.09	94	-30.91
4960	56.52	PK	H	-6.29	50.23	74	-23.77
4960	45.42	AV	H	-6.29	39.13	54	-14.87
7440	48.14	PK	H	-0.8	47.34	74	-26.66
7440	35.77	AV	H	-0.8	34.97	54	-19.03
2480	91.83	PK	V	-10.03	81.80	114	-32.20
2480	83.26	AV	V	-10.03	73.23	94	-20.77
4960	61.31	PK	V	-2.26	59.05	74	-14.95
4960	50.57	AV	V	-2.26	48.31	54	-5.69
7440	48.73	PK	V	-0.8	47.93	74	-26.07
7440	35.66	AV	V	-0.8	34.86	54	-19.14

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The measurements greater than 20dB below the limit from 9kHz to 30MHz.

8 Out of Band Emissions

8.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

8.2 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

8.3 Environmental Conditions

Temperature	24℃
Relative Humidity	60%
ATM Pressure	101.2kPa

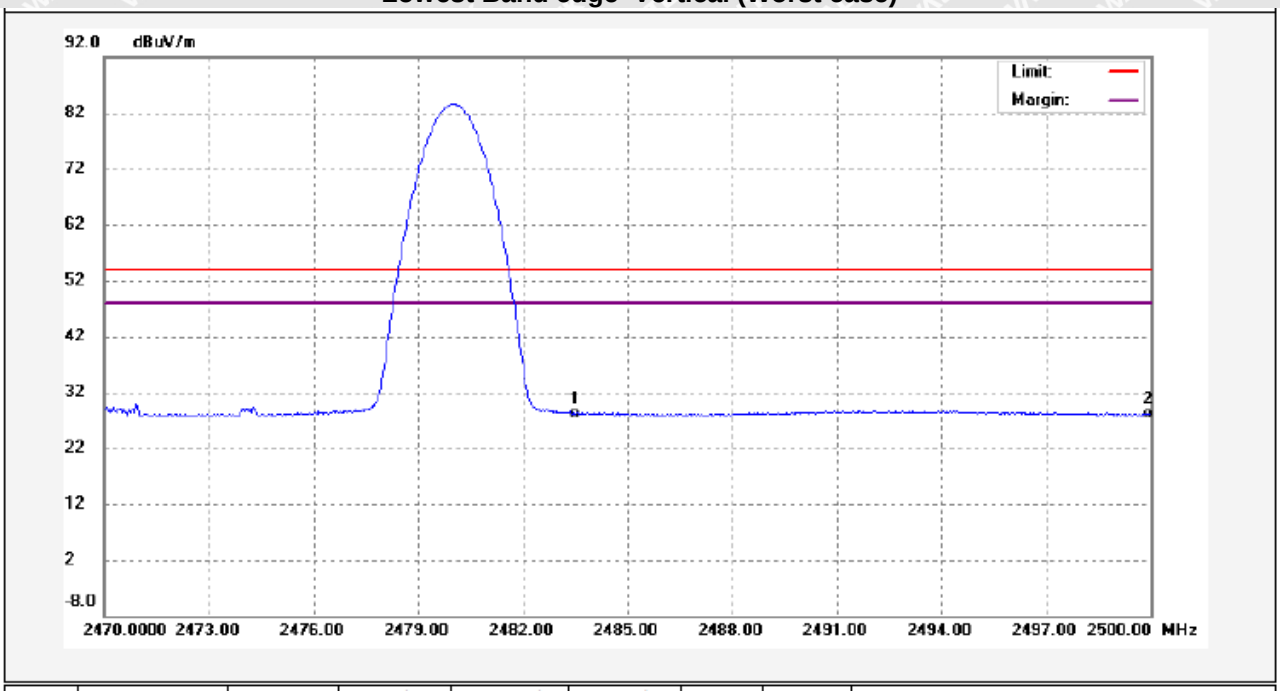
8.4 Summary of Test Results/Plots

Test Mode	Frequency(MHz)	Limit (dBuV / dBc)	Result
Lowest	2310.00	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
Highest	2483.50	<54 dBuV	Pass
	2500.00	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

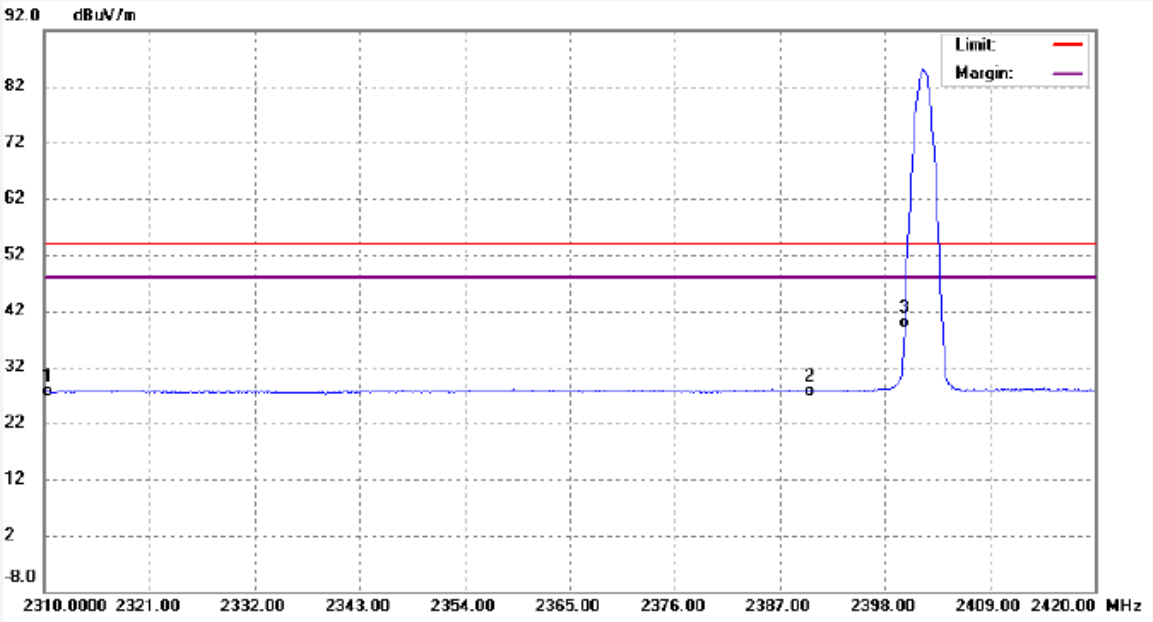
Please refer to the test plots as below.

Lowest Band edge Vertical (Worst case)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2483.500	38.25	-10.02	28.23	54.00	-25.77	AVG	
2	2500.000	37.99	-9.95	28.04	54.00	-25.96	AVG	

Highest Band edge Vertical (Worst case)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2310.000	38.53	-10.78	27.75	54.00	-26.25	AVG	
2	2390.000	38.13	-10.43	27.70	54.00	-26.30	AVG	
3	2400.000	50.17	-10.39	39.78	54.00	-14.22	AVG	

9 Emission Bandwidth

9.1 Standard Applicable

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

9.2 Test Procedure

According to the ANSI 63.10-2013, the emission bandwidth test method as follows.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Set span = 1MHz, centered on a transmitting channel
RBW≥1% 20dB Bandwidth, VBW≥RBW
Sweep = auto
Detector function = peak
Trace = max hold
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

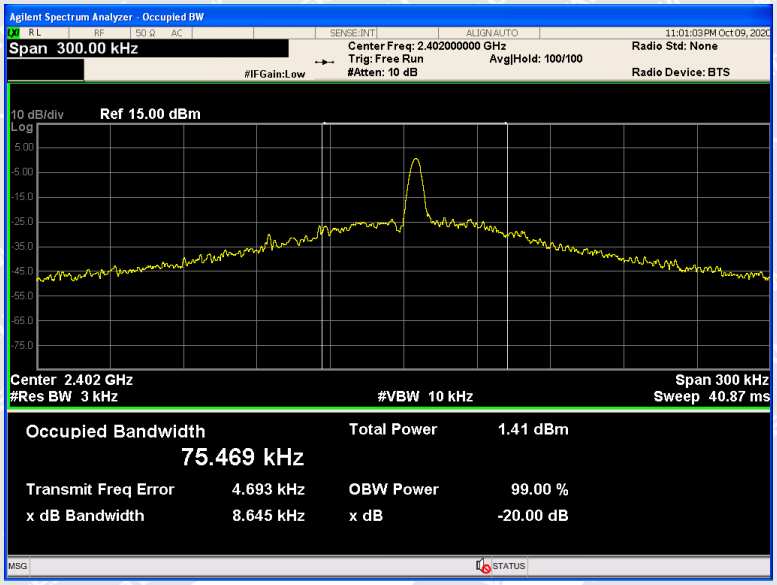
9.3 Environmental Conditions

Temperature	24℃
Relative Humidity	60%
ATM Pressure	101.2kPa

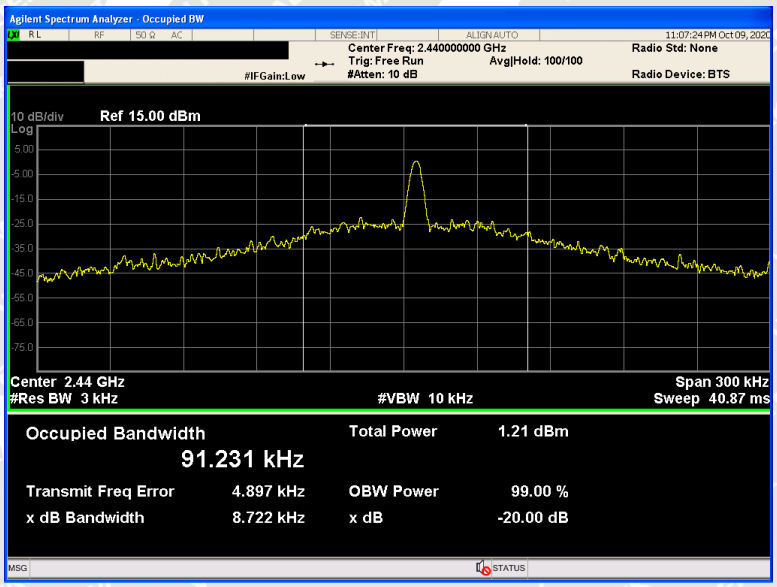
9.4 Summary of Test Results/Plots

Channel	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low channel	2402	8.645	75.469
Middle channel	2440	8.722	91.231
High channel	2480	8.738	75.693

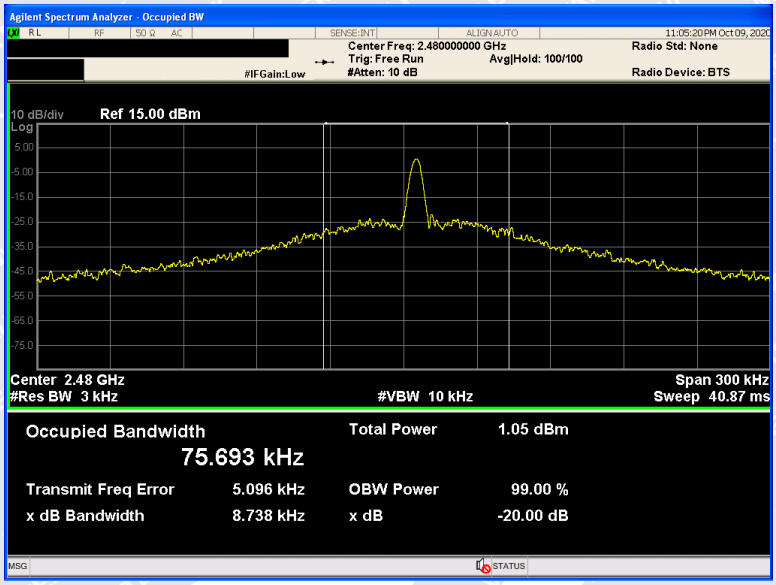
Low channel



Middle channel



High channel

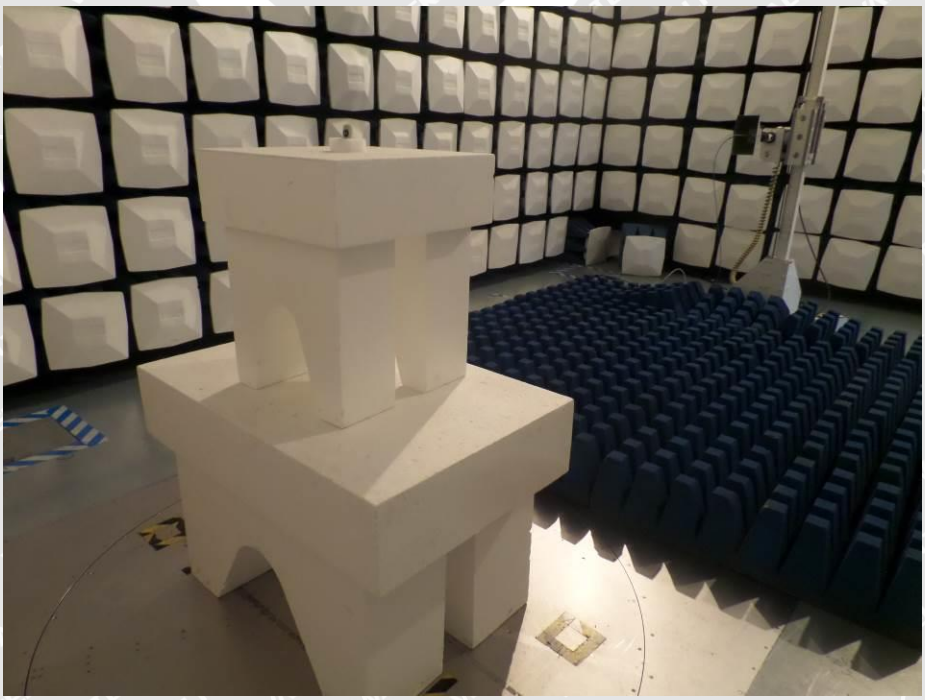


10 Photographs- Test Setup Photos

10.1 Photographs- Radiated Emission Test Setup

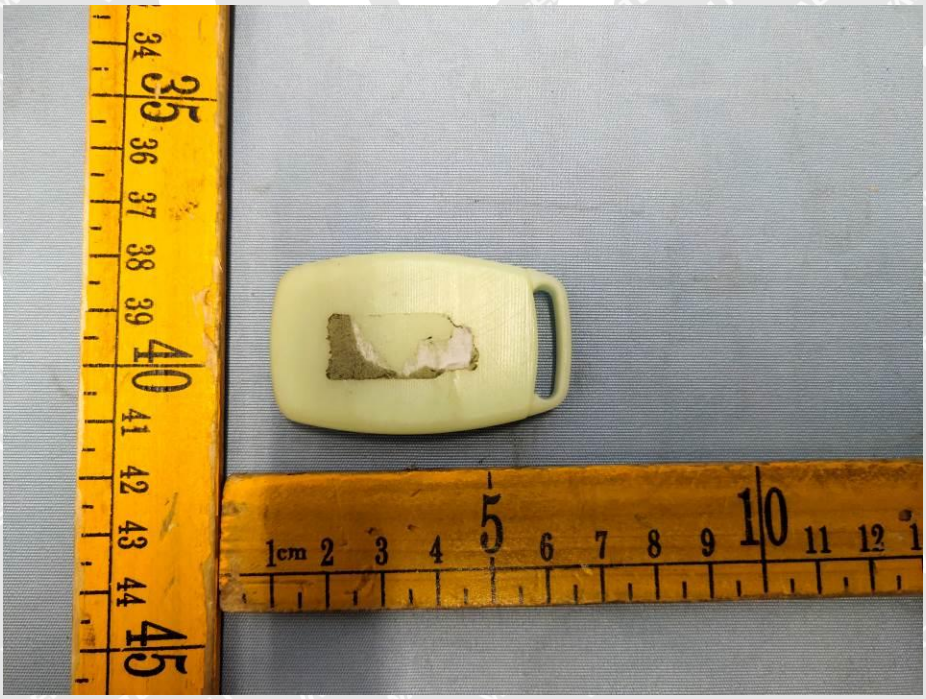
30MHz-1GHz

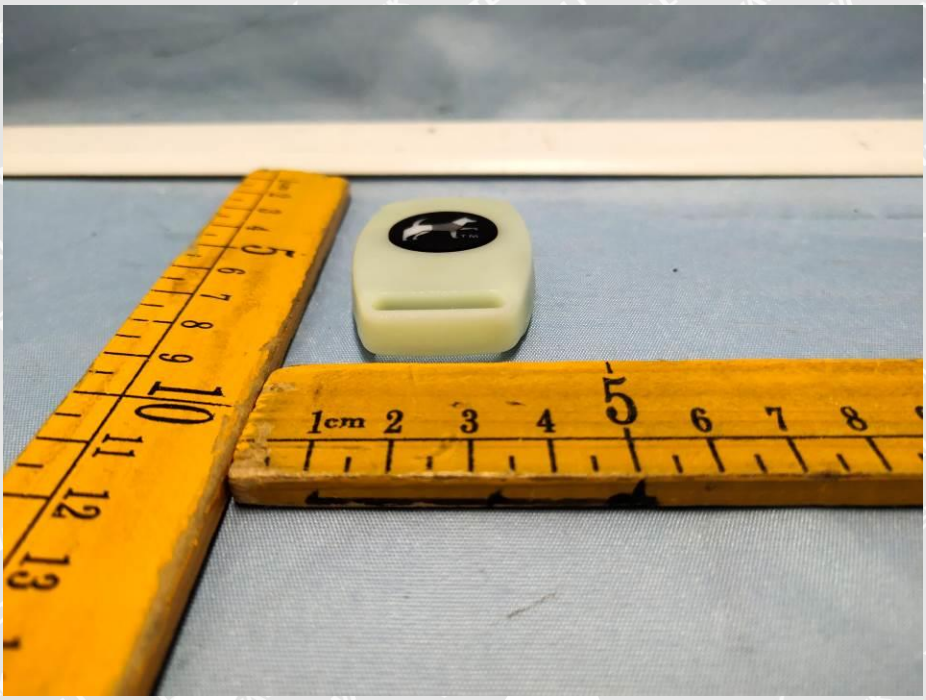
Above 1GHz

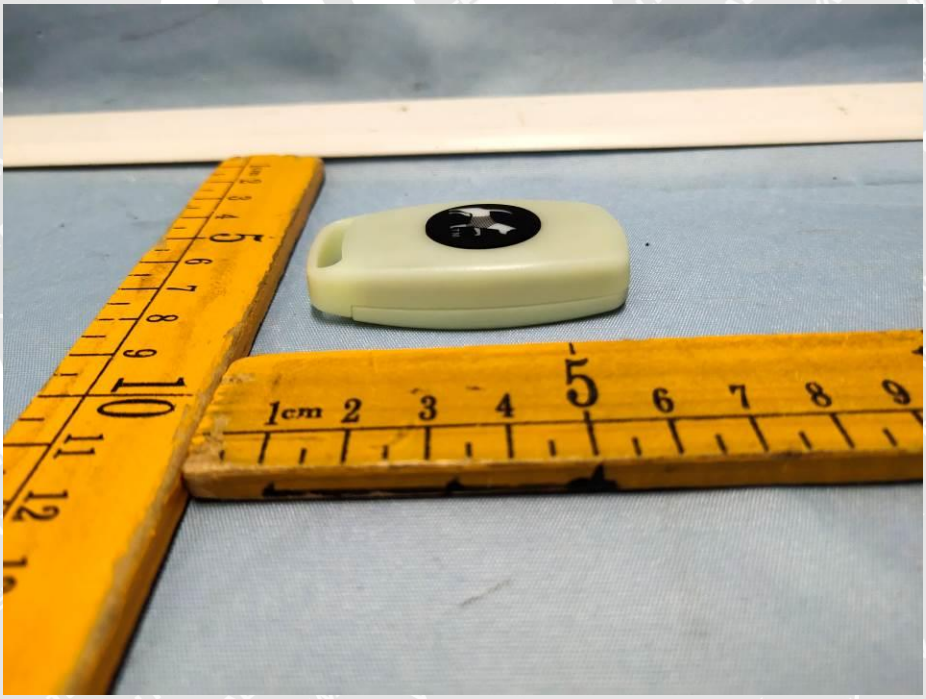


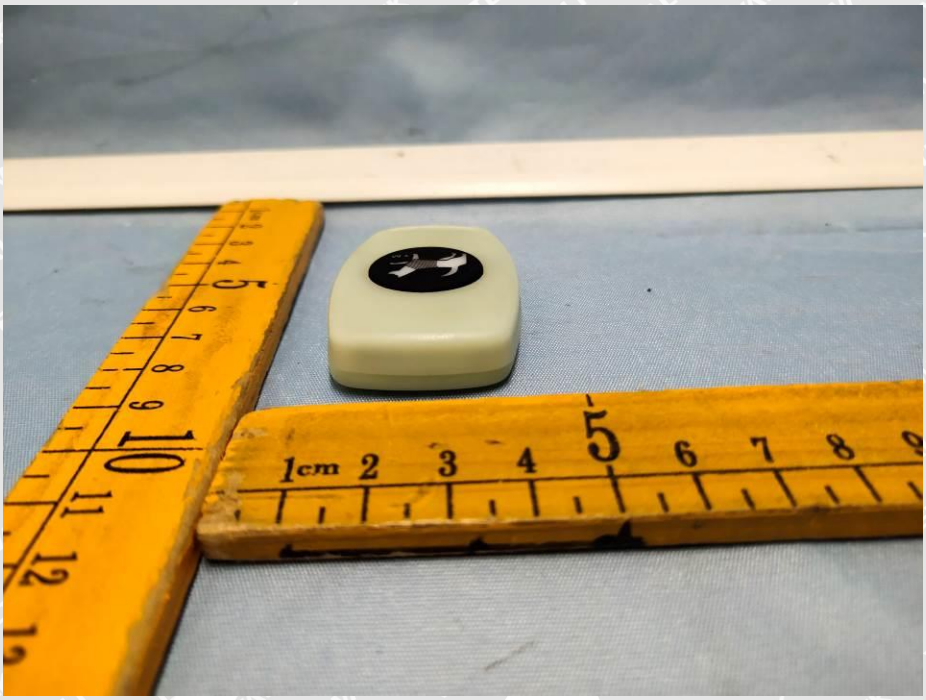
11 Photographs - Constructional Details

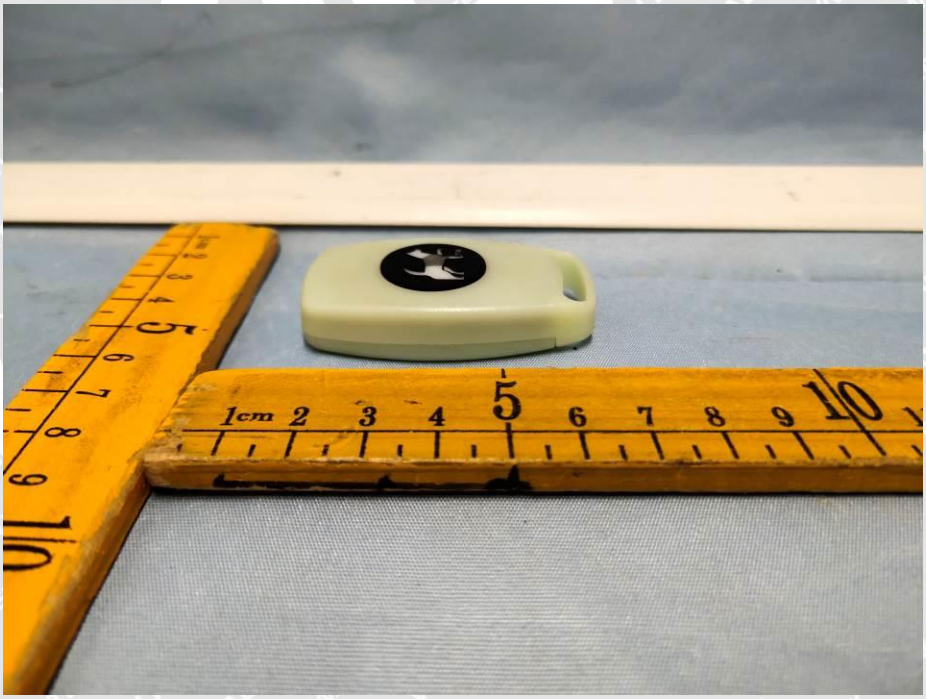
11.1 EUT - External View



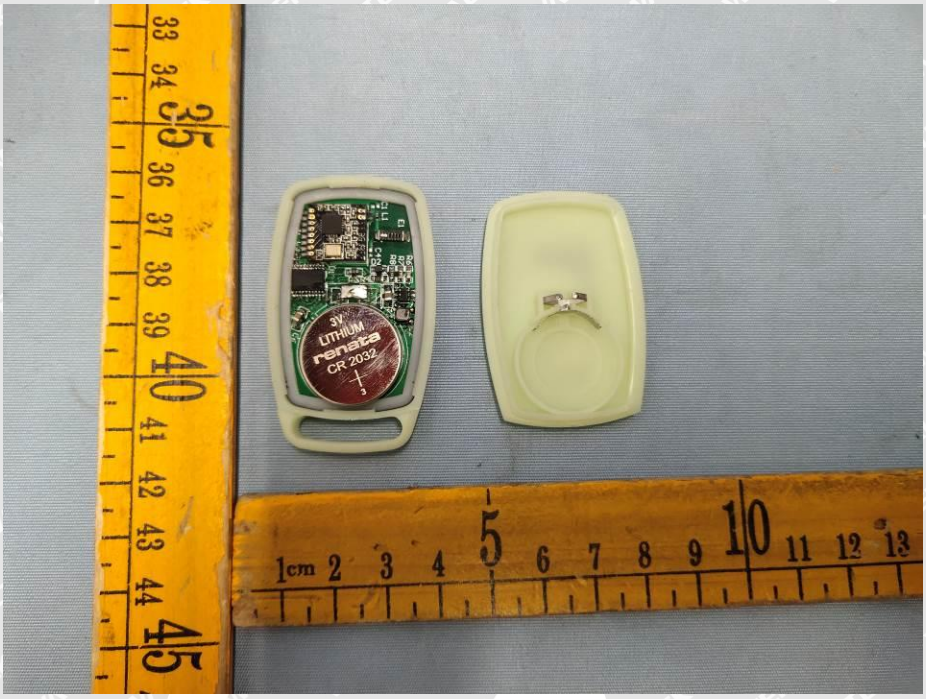

1cm 2 3 4 5 6 7 8
10 11 12 13

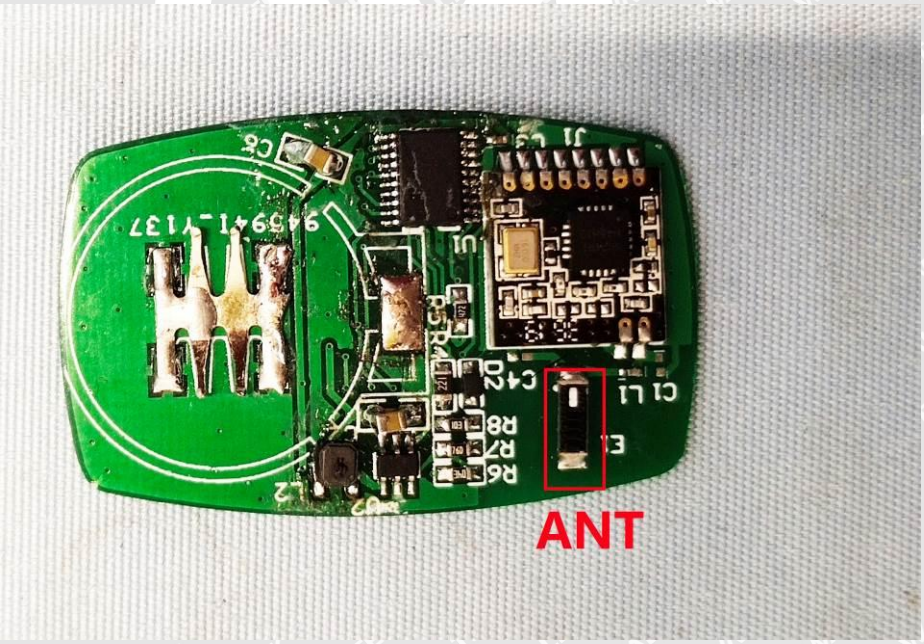

1cm 2 3 4 5 6 7 8 9
10 11 12

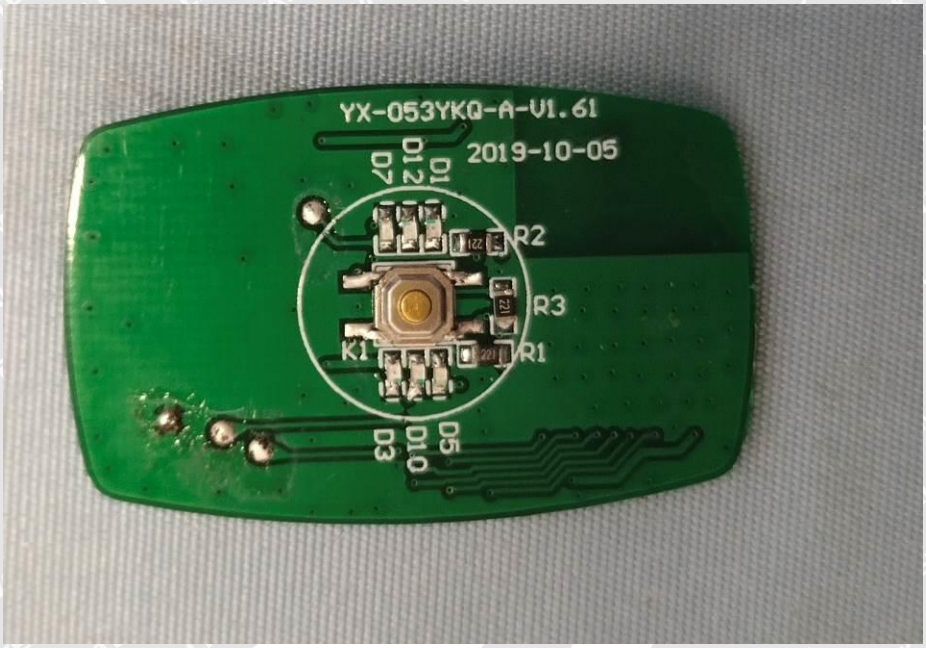

1cm 2 3 4 5 6 7 8

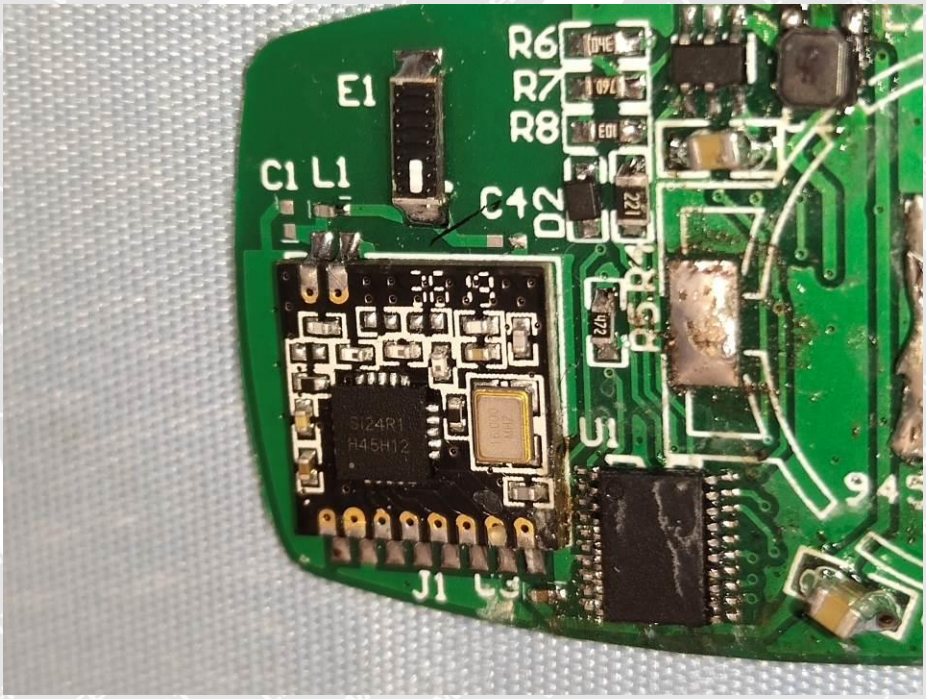

1cm 2 3 4 5 6 7 8 9 10

11.2 EUT- Internal View









======End of Report======