TEST REPORT

Report No. .....:	**HST201704-3046-FCC**
Sample Description….:	**Wireless Microphone**
Model……:	**C-503**
Assessment Category..:	**Entrusted**
Applicant……:	**Joseph Industrial Equipment Co.,Ltd**

Guangdong Huesent Testing & Inspection Technology Co., Ltd.

TEST REPORT

Sample Description	Wireless Microphone	Trademark	JOSEPH
Model	C-503	Specification	DC3V
Assessment Category	Entrusted	Sample Quantity	3
Applicant:	Joseph Industrial Equipment Co.,Ltd	Sample Status	Normal
Sample Received Date	Jun. 15, 2017	Test Date	Jun. 15 to Jun. 30, 2017
Issue Date	Jun. 30, 2017		
Manufacturer	Joseph Industrial Equipment Co.,Ltd		
Address	East Industrial Zone, Enping Guangdong, China.		
Factory	Joseph Industrial Equipment Co.,Ltd		
Address	East Industrial Zone, Enping Guangdong, China.		
Test address	No.91, Dongguanzhuang Road, Tianhe District, Guangzhou, Guangdong, China		
Test Items	Listed on page 4		
Test standard	FCC Part 15.249: 2016		
Test Conclusion	The results conform to the requirements of standards with respect to the test items.		
Remarks	FCC ID:2ANQTC-503		
Tested by ： Lemon Fu	Sign： Lemon Fu		
Reviewed by：Sandy Yu	Sign： Sandy Yu		
Approved by：Robin Peng	Sign：		

TABLE OF CONTENT

1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (9kHz to 25GHz)	FCC PART 15.249	ANSI C63.10:2013	In FCC PART 15.249	PASS
Occupied Bandwidth	FCC PART 15.215	ANSI C63.10:2013	In FCC PART 15.215	PASS
Conducted Emissions at Mains Terminals	FCC PART 15.207	ANSI C63.10: 2013: Clause 6.2	In FCC PART 15.207	PASS
Frequency Stability	FCC Part 15.249b)	FCC CFR 47 Part 2.1055	±0.001% for "fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject"	N/A

Remark:

♣ The 3 channels were chosen to be tested.

Channel	Frequency/ MHz
Lowest	902.2
Middle	914.5
Highest	927.8

2 General Information

2.1 **Details of E.U.T.**

Power Supply: DC3V by 2 AA batteries

Main Function: Wireless transmitter system with an associated receiver for transmitting voice.

Oscillating Frequency: Y2: 24 MHz

Port: /

Cable: /

Frequency Range: 902.2 MHz to 927.8 MHz

Modulation: FM

Antenna Number & Type: One & PCB antenna; ANT Gain : 0 dBi

Product SW version: C-503-MS

Product HW version: JP26D-9TX

Radio SW/HW version: N/A

Test SW Version: N/A

2.2 **Description of Support Units**

/

2.3 **Standards Applicable for Testing**

The standard used was 47 CFR Part 15.249: 2016

The EUT belongs to low power communication device transmitter, and it's an unlicensed low power auxiliary device.

2.4 Test Location

I-Test Laboratory

Address: 1-2 floor, South Block, Building A2 No3 Keyan Lu, Science City, Guangzhou, Guangdong, China

Accredited by CNAS, Accredited Number: L4957

FCC- Registration No: 935596 Renewal on April. 19, 2012

2.5 Deviation from Standards

None.

2.6 Abnormalities from Standard Conditions

None.

3 Test Results

3.1 **Radiation Interference**

Test Requirement:	FCC Part15.249, a) & FCC Part15.209
Test Method:	ANSI C63.10:2013
Detector:	Peak for pre-scan (The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz up to 1.0GHz and 1.0 MHz with a video BW of 3.0 MHz above 1.0GHz.) Average detector if maximised peak within 6dB of limit

3.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25°C Humidity:55% RH Atmospheric Pressure: 103 kPa

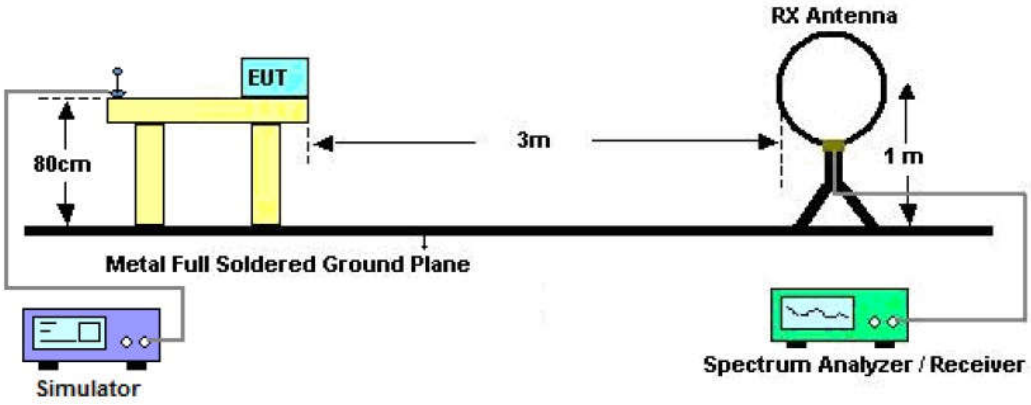
EUT Operation:

In the fundamental test, connecting the EUT to peripheral devices.

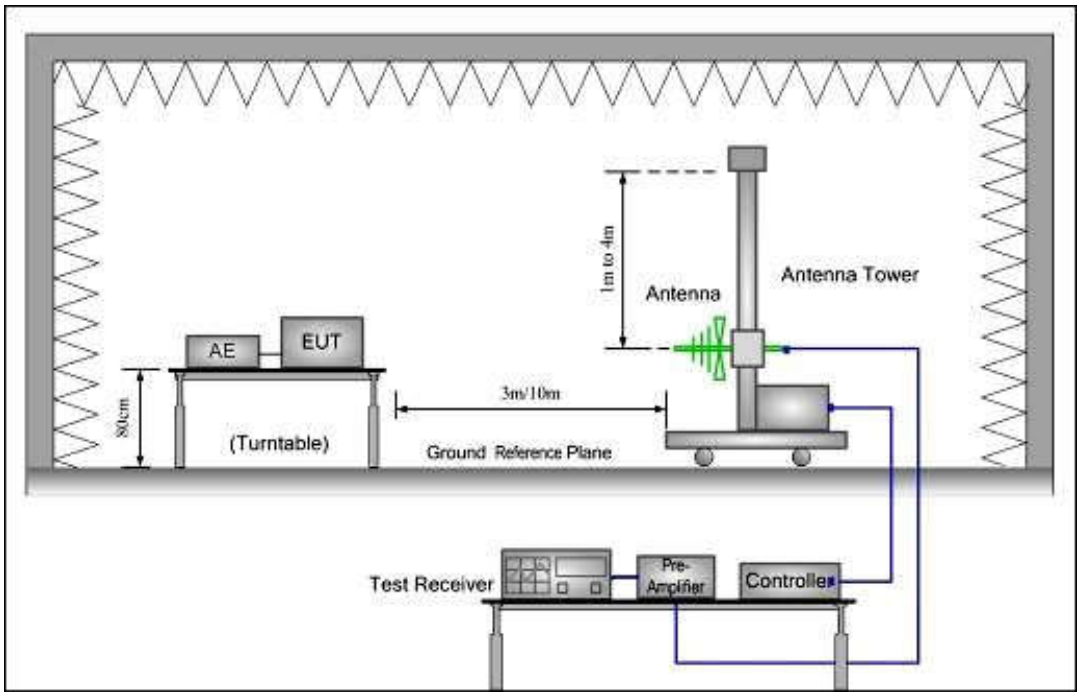
Test the EUT work normally in on mode during the whole test.

3.1.2 Test Setup

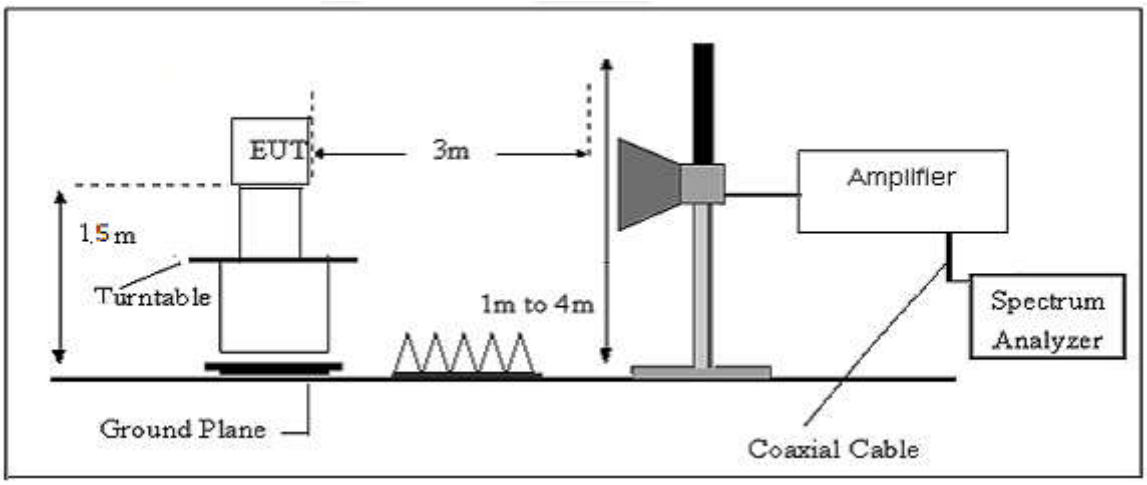
1) 9kHz to 30MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



3.1.3 Test Procedure

ANSI STANDARD C63.10-2013 6.5 Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities. The EUT was measured for both

the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes and choose the worst case of X/ Y/ Z orthogonal planes for the final measurement.

3.1.4 Measurement Data

Copy from FCC Part 15.249.a)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental	Field Strength	
Frequency	Fundamental	Harmonics
MHz	millivolts/meter(mV/m)	microvolts/meter(uV/m)
902 - 928	50	500
2400 - 2483.5	50	500
5725 - 5875	50	500
24000 - 24250	250	2500

(d) 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 Section 15.209, whichever is the lesser attenuation.

Limits for the frequency bands of 902 M - 928 MHz

Frequency	FCC Part 15.209 Radiated limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	40	/
88 - 216	43.5	/
216 - 960	46	/
960 - 1000	54	/
Above 1000	74(PK)	54

Frequency	15.249.d) limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	44	/
88 - 216	44	/
216 - 902	46	/
928-960	46	/
960 - 1000	54	/
1000-9280	74(PK)	54

Remark:

1. RF line voltage (dBuV)= 20 log RF line voltage (uV)
2. In the above table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

QP measurement

902.2 MHz, Horizontal							
Spurious Emission Frequency (MHz)	Read value (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	1-18GHz Pre-amplifier (dB)	Ture value (dBuV/m)	Limit/ (dBuV/m)	Margin(dB)
Fundamental: 902.2	44	23.7	3.8	0	71.5	94	-22.5
band-edge: 902.0	1.8	23.7	3.8	0	29.3	46	-16.7
Other: 269.6	7.3	12.7	2.0	0	22.0	46	-24.0
Other: 662.4	10.3	20.7	3.2	0	34.2	46	-11.8
902.2 MHz, Vertical							
Fundamental: 902.2	56.1	23.7	3.8	0	83.6	94	-10.4
band-edge: 902.0	1.7	23.7	3.8	0	29.2	46	-16.8
Other: 269.6	7.4	12.7	2.0	0	22.1	46	-23.9
Other: 662.4	7.4	20.7	3.2	0	31.3	46	-14.7

914.5 MHz, Horizontal							
Spurious Emission Frequency (MHz)	Read value (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	1-18GHz Pre-amplifier (dB)	Ture value (dBuV/m)	Limit/ (dBuV/m)	Margin(dB)
Fundamental: 914.5	43.3	23.7	3.8	0	70.8	94	-23.2
Other: 490.8	1.1	18.1	2.8	0	22.0	46	-24.0
914.5 MHz, Vertical							
Fundamental: 914.5	56.3	23.7	3.8	0	83.8	94	-10.2
Other: 490.8	2.3	18.1	2.8	0	23.2	46	-22.8

927.8 MHz, Horizontal							
Spurious Emission Frequency (MHz)	Read value (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	1-18GHz Pre-amplifier (dB)	Ture value (dBuV/m)	Limit/ (dBuV/m)	Margin(dB)
Fundamental: 927.8	43.9	23.7	3.8	0	71.4	94	-22.6
band-edge: 928.0	4.0	23.7	3.8	0	31.5	46	-14.5
Other: 564.5	2.8	19.4	3.0	0	25.2	46	-20.8
927.8 MHz, Vertical							
Fundamental: 927.8	57.8	23.8	3.9	0	85.5	94	-8.5
band-edge: 928.0	4.3	23.7	3.8	0	31.8	46	-14.2
Other: 463.6	2.3	17.3	2.7	0	22.3	46	-23.7

Peak measurement

927.8 MHz, Horizontal							
Spurious Emission Frequency (MHz)	Read value (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	1-18GHz Pre-amplifier (dB)	Ture value (dBuV/m)	Limit/ (dBuV/m)	Margin(dB)
Harmonic : 1855.6	53.6	26.7	5.5	30	55.8	74	-18.2
Harmonic : 2783.4	44.5	28.7	6.9	30	50.1	74	-23.9
Harmonic : 3711.2	39.9	31.0	8.1	30	49.0	74	-25.0
927.8 MHz, Vertical							
Harmonic : 1855.6	59.0	26.7	5.5	30	61.2	74	-12.8
Harmonic : 2783.4	50.6	28.7	6.9	30	56.2	74	-17.8
Harmonic : 3711.2	45.1	31.0	8.1	30	54.2	74	-19.8

Average measurement

927.8 MHz, Horizontal							
Spurious Emission Frequency (MHz)	Read value (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	1-18GHz Pre-amplifier (dB)	Ture value (dBuV/m)	Limit/ (dBuV/m)	Margin(dB)
Harmonic : 1855.6	46.7	26.7	5.5	30	48.9	54	-5.1
Harmonic : 2783.4	38.9	28.7	7.0	30	44.6	54	-9.4
Harmonic : 3711.2	34.1	31.1	8.2	30	43.4	54	-10.6
927.8 MHz, Vertical							
Harmonic : 1855.6	49.1	26.7	5.5	30	51.3	54	-2.7
Harmonic : 2783.4	45.3	28.7	7.0	30	51.0	54	-3.0
Harmonic : 3711.2	39.0	31.1	8.2	30	48.3	54	-5.7

Note:

Fundamental in band (902MHz to 928MHz): 50mV/m (94dBuV/m) for QP limit.

Harmonics in band (902MHz to 928MHz): 500μV/m (54dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

9kHz~30MHz test result: The low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per FCC part 15.31(o) was not report.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes and choose the worst case of X orthogonal plane for the final measurement.

* means the max Quasi peak value for band-edge measurements (frequency range of 800 MHz to 902 MHz & 928 MHz to 1000 MHz).

Note:

The EUTs' transmitting frequency range is 902.2-927.8MHz, and it is complied with the requirements of FCC PART 15.249 a)&d).

The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes and choose the worst case of X orthogonal plane for the final measurement.

For above 1GHz , low , mid , high channel all have been tested , only worse case high channel is reported.

3.2 Occupied Bandwidth

Test Requirement:	FCC Part15.215
Test Method:	ANSI C63.10: 2013
Detector:	Peak for scan (The resolution bandwidth was 30kHz and the video bandwidth was 10kHz, span was 2MHz) maximised peak hold

3.2.1 E.U.T. Operation

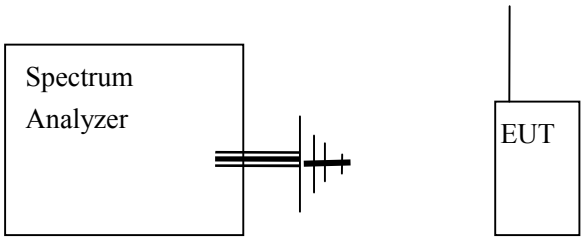
Operating Environment:

Temperature: 25°C Humidity:55% RH Atmospheric Pressure: 103.0 kPa

EUT Operation:

Pre-test the EUT with 1k to 20kHz sine wave signal input(level: 0.3 Vp-p). And the max 99%BW was measured as the EUT with 20 kHz sine wave signal input.

3.2.2 Test Setup



3.2.3 Test Procedure

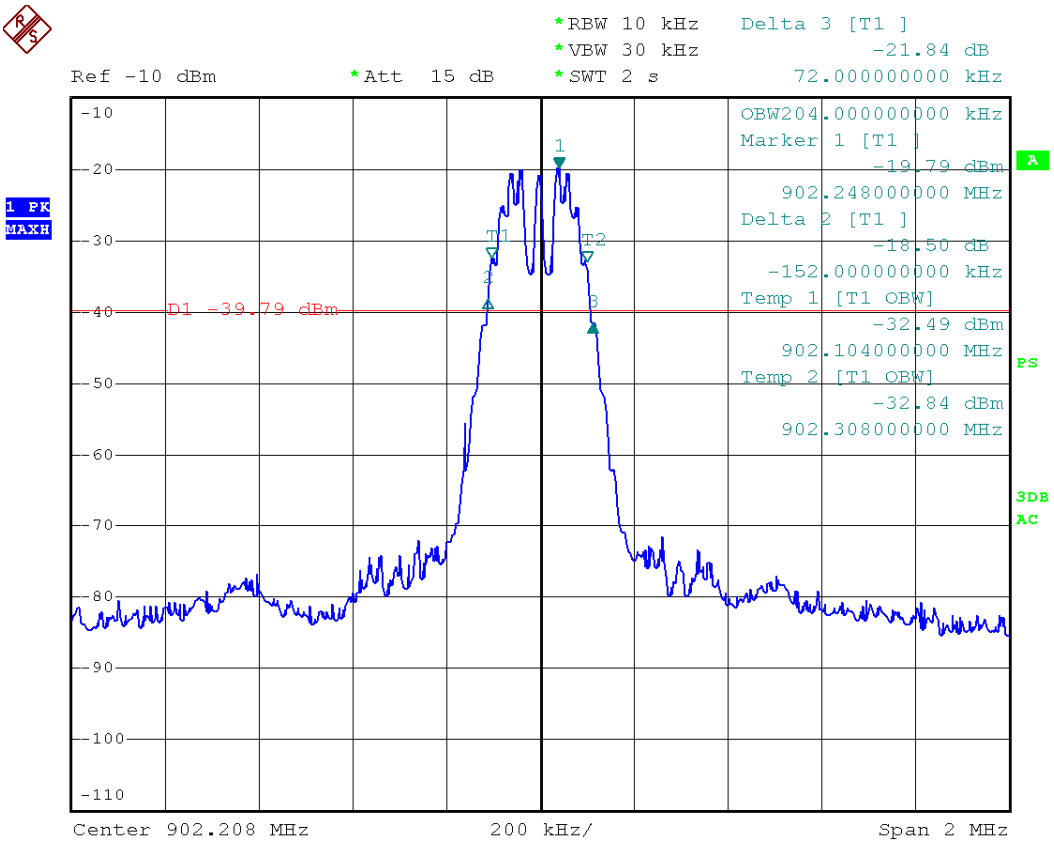
ANSI STANDARD C63.10-2013 6.9 Occupied bandwidth tests:

An initial pre-scan was performed in the 3m chamber using the spectrum analyzer in peak detection mode. Average measurements were conducted based on the peak sweep graph. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical polarities.

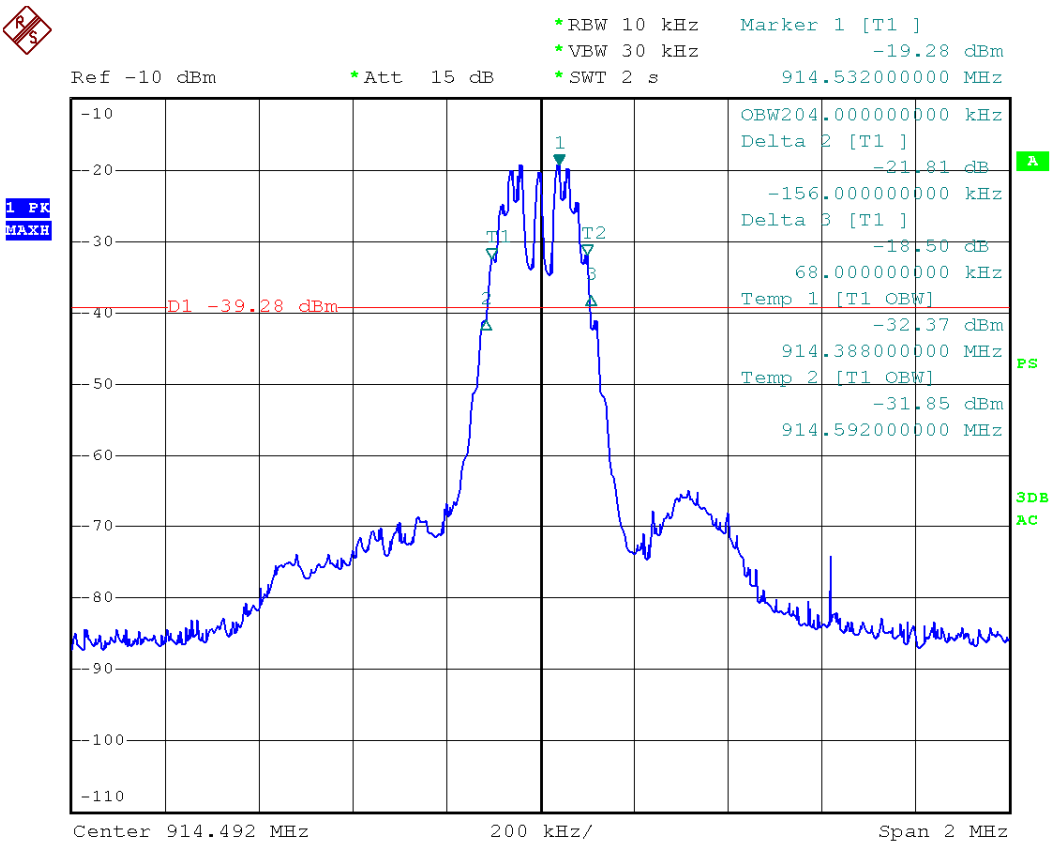
3.2.4 Measurement Data

Test for the EUT with switch ON. Input with 20 kHz AF, 50% modulation + 16dB.

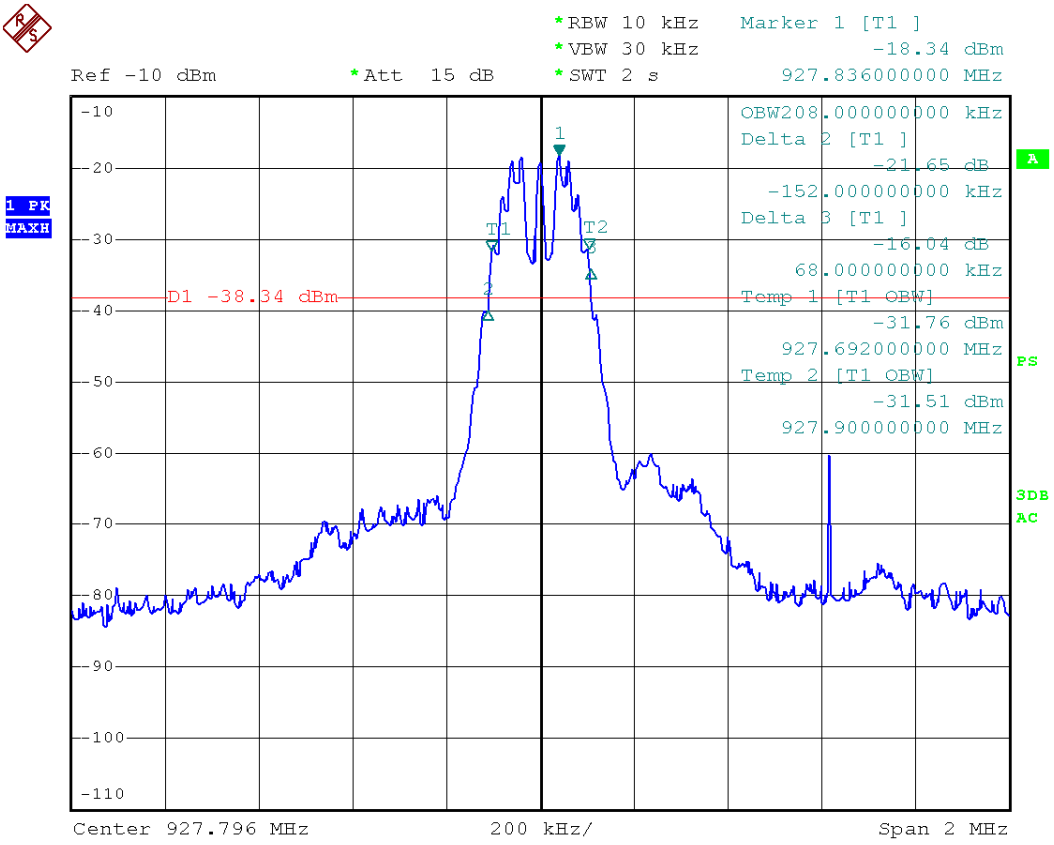
Maximum Peak hold measurement for 902.2 MHz (lowest channel)



Maximum Peak hold measurement for 914.5 MHz (middle channel)



Maximum Peak hold measurement for 927.8 MHz (highest channel)

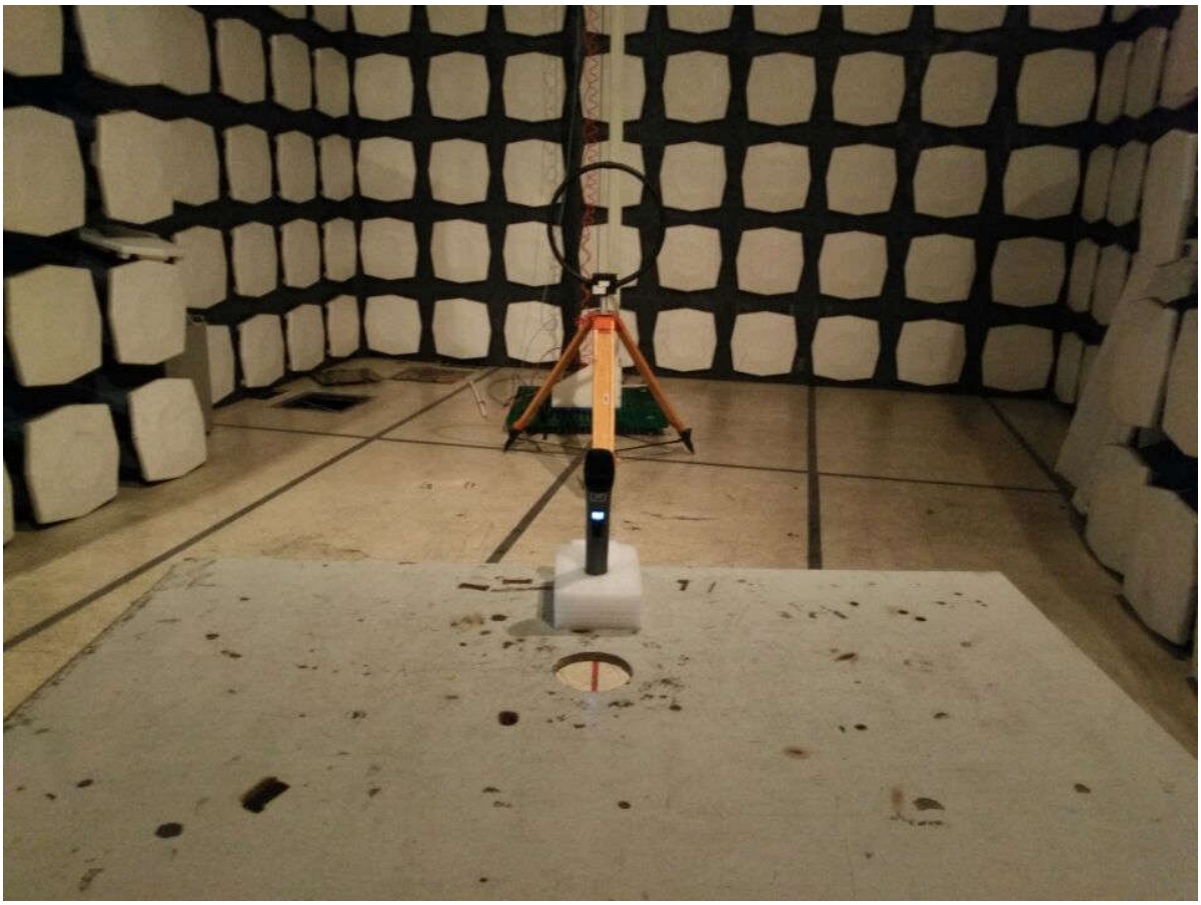


Frequency/ MHz	ΔFL- / kHz	ΔFL+ / kHz	-20dB Bandwidth/ kHz	Occupied Bandwidth (99% of total power)/ kHz
902.2 (lowest)	-152	72	224	204
914.5 (middle)	-156	68	224	204
927.8 (highest)	-152	68	220	208

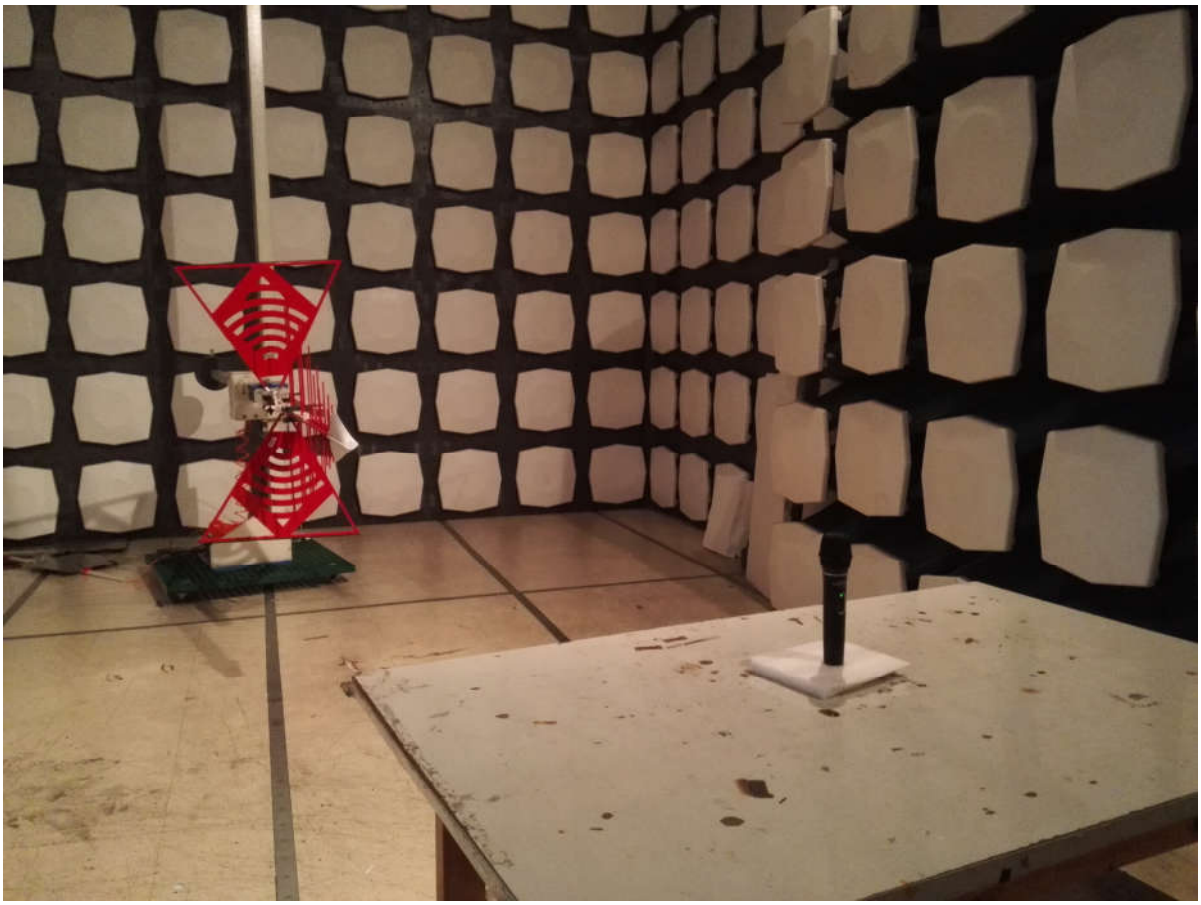
4 Photographs

4.1 **Radiated Emission Test Setup**

9kHz - 30MHz



30MHz – 1GHz



1GHz – 9.3GHz

4.2 **EUT Constructional Details**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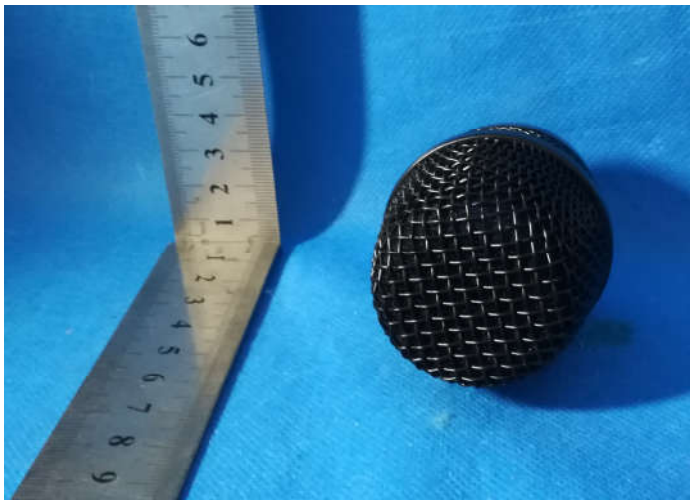

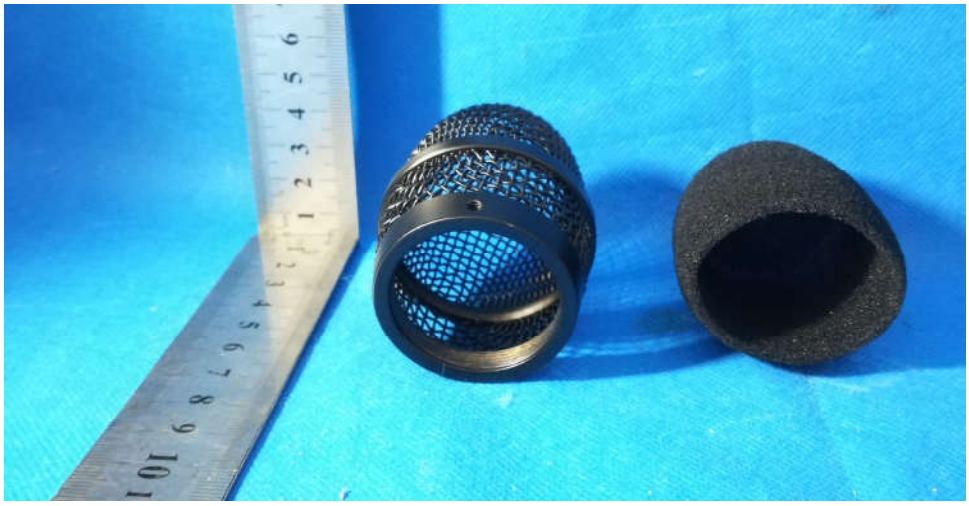

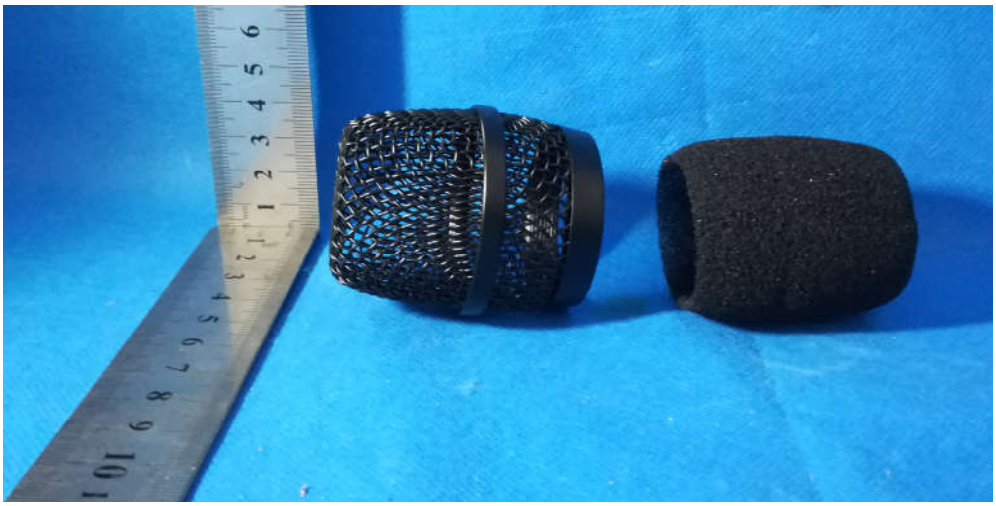


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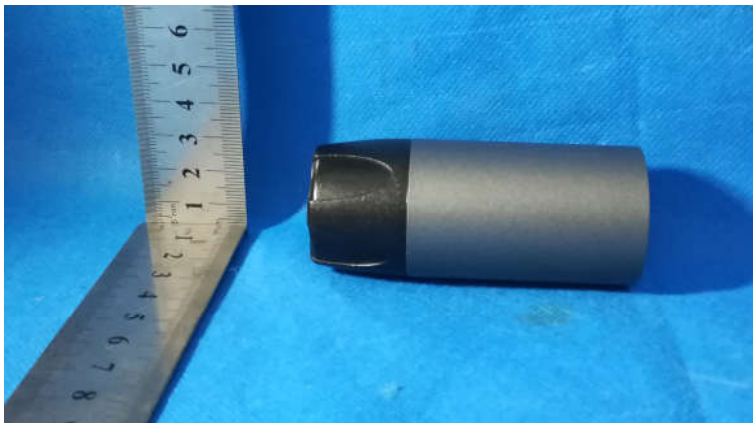
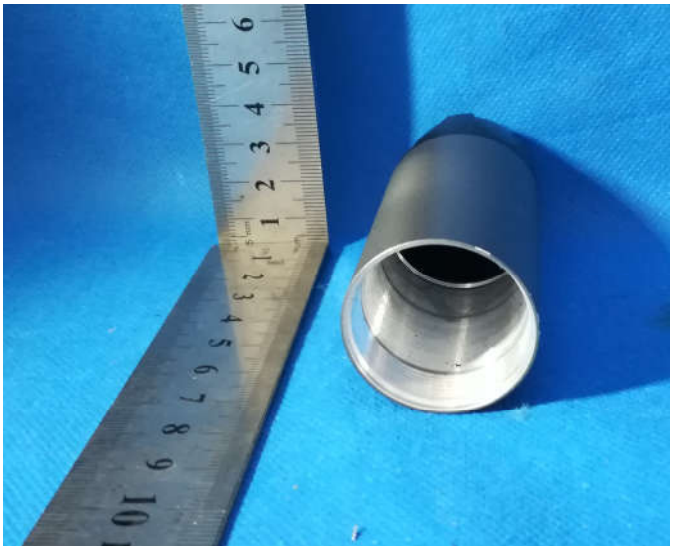
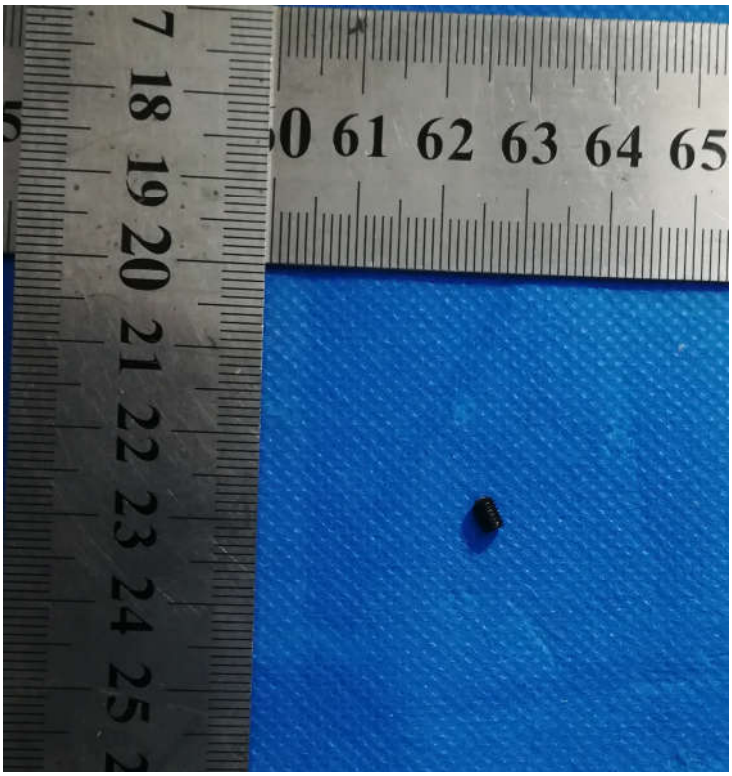
UHF



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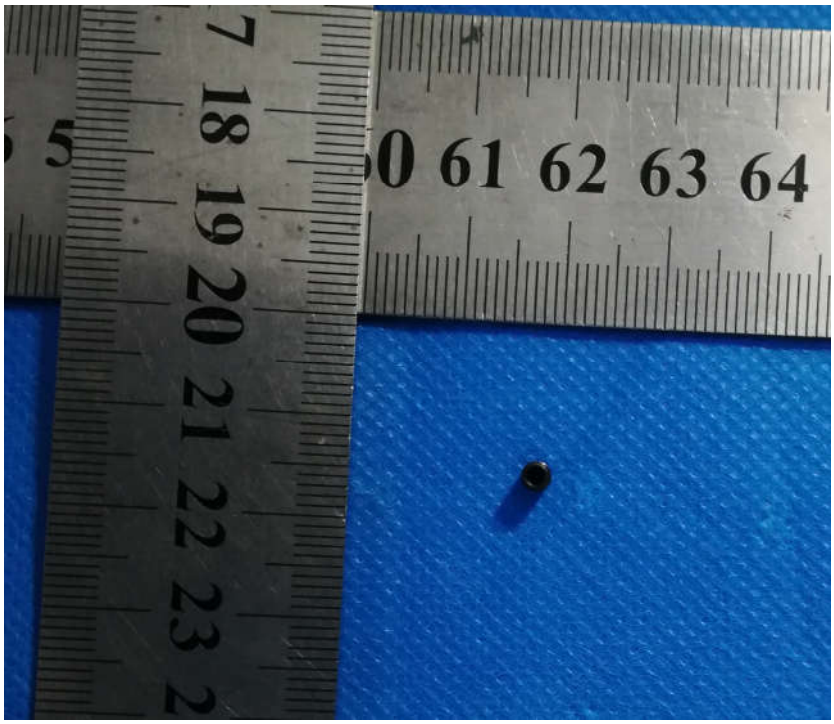
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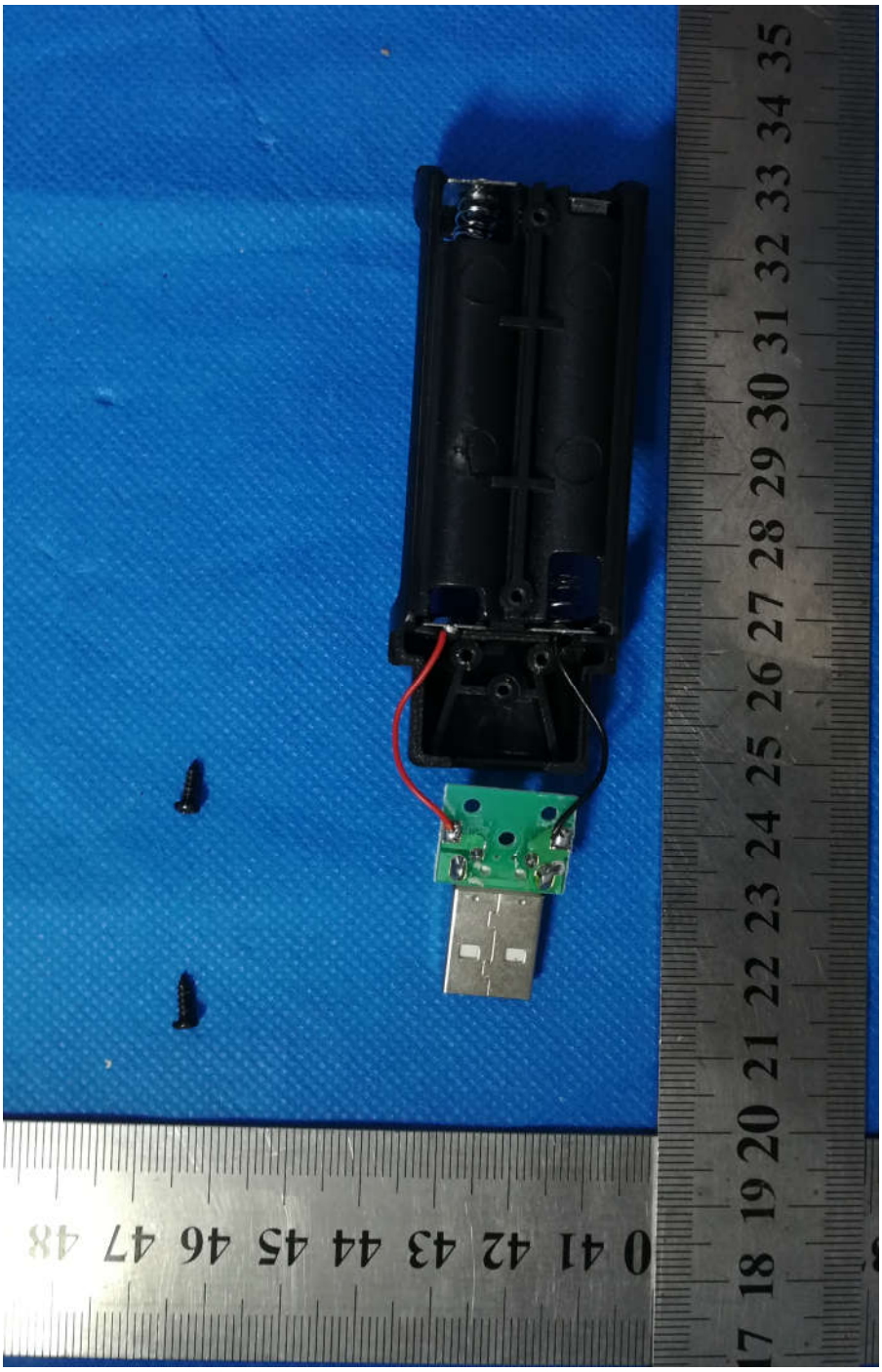

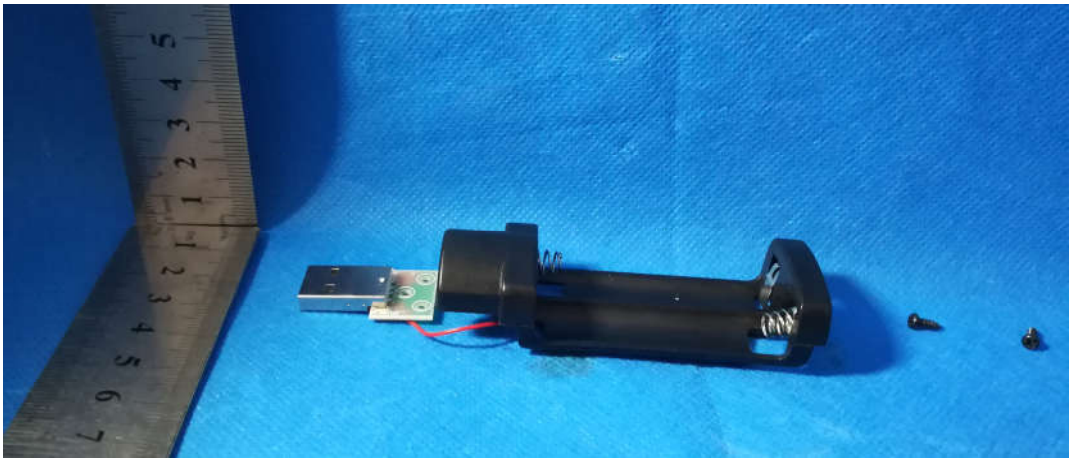

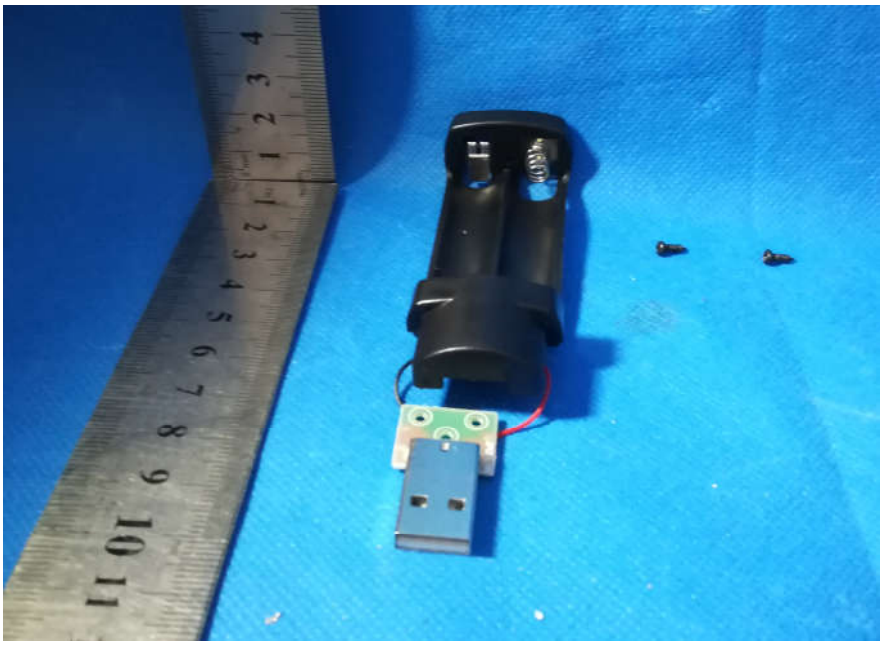


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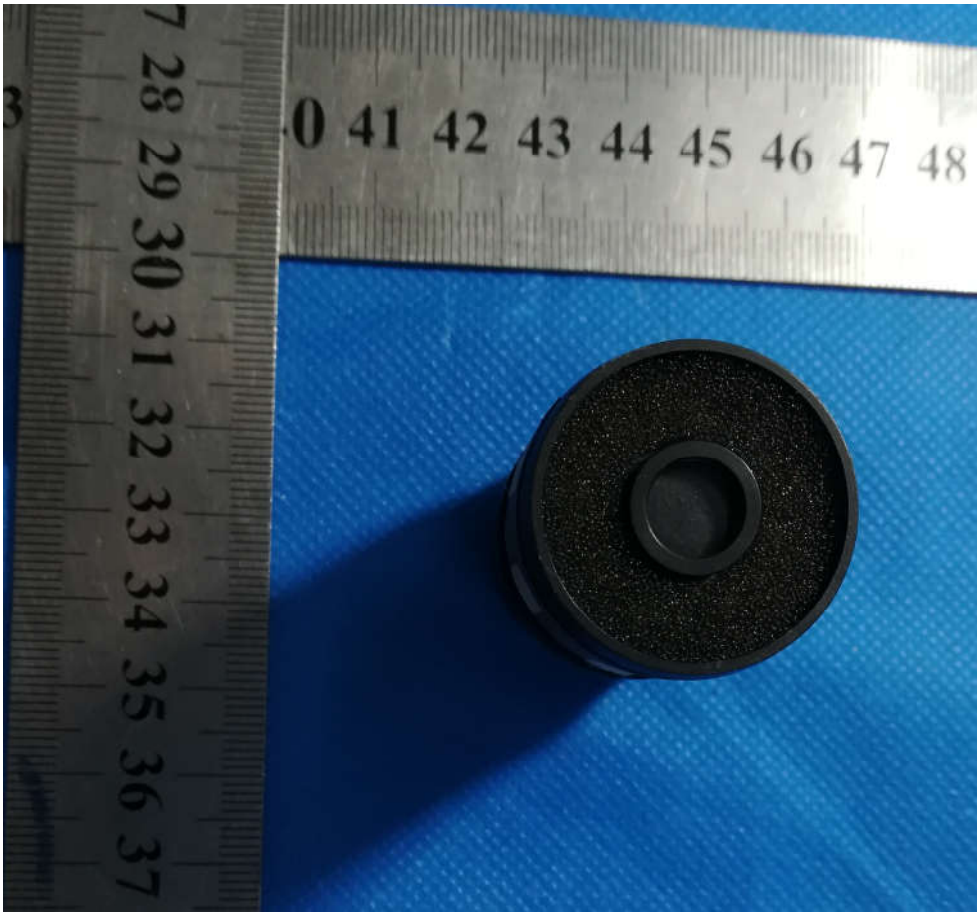
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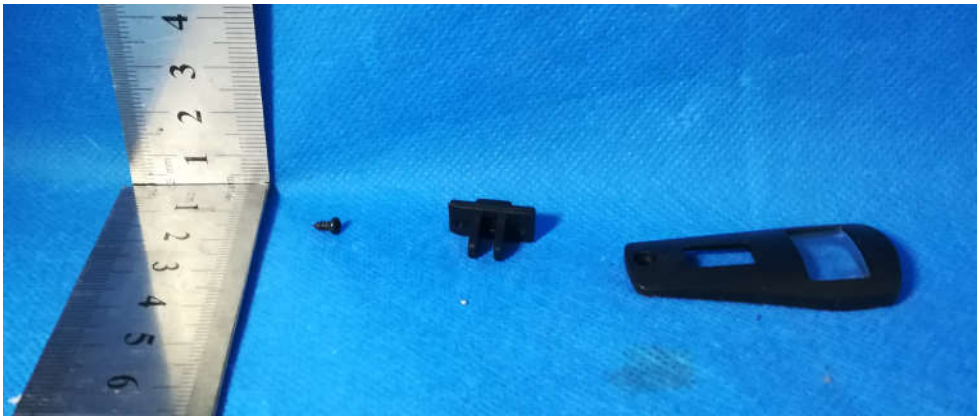

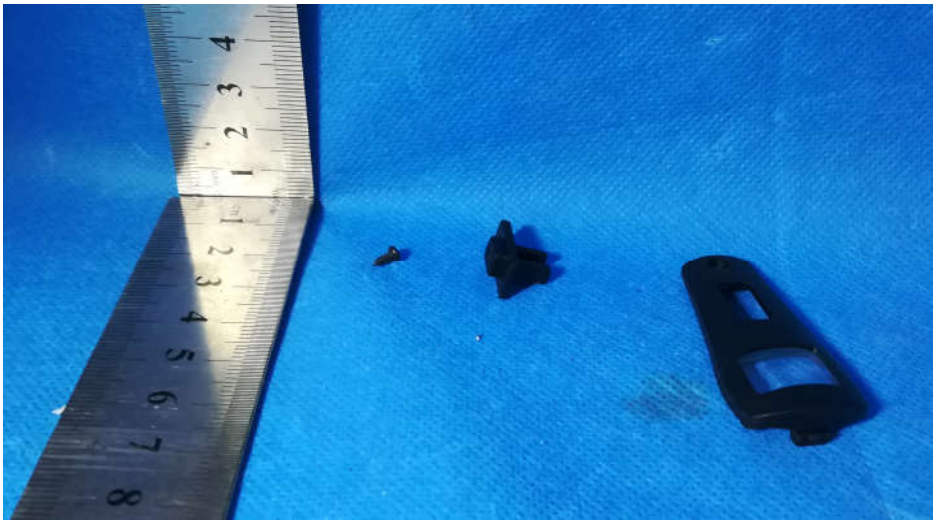

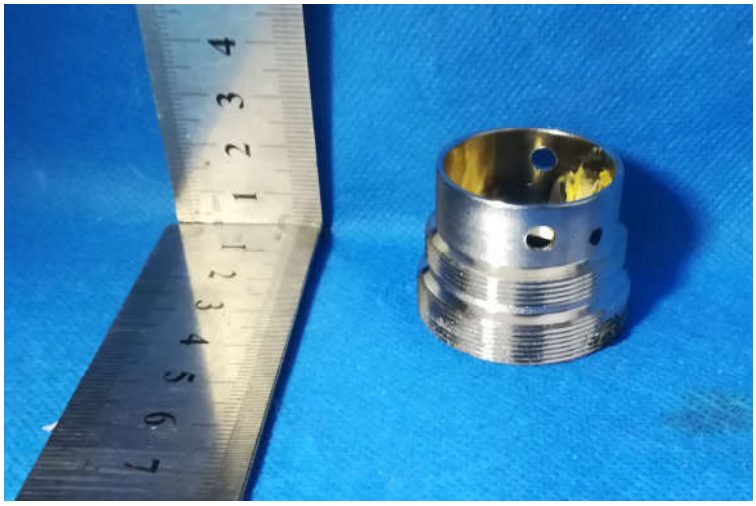

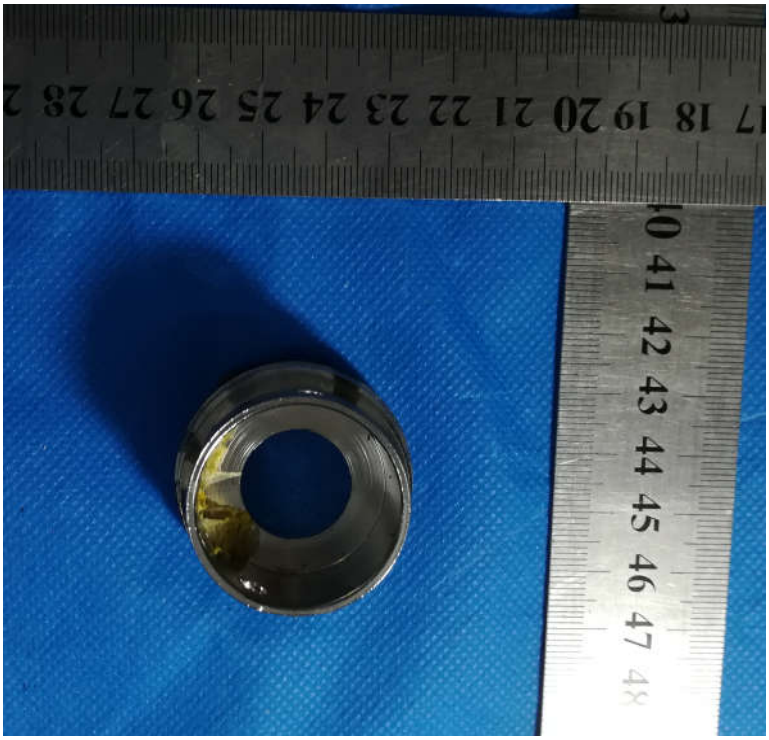

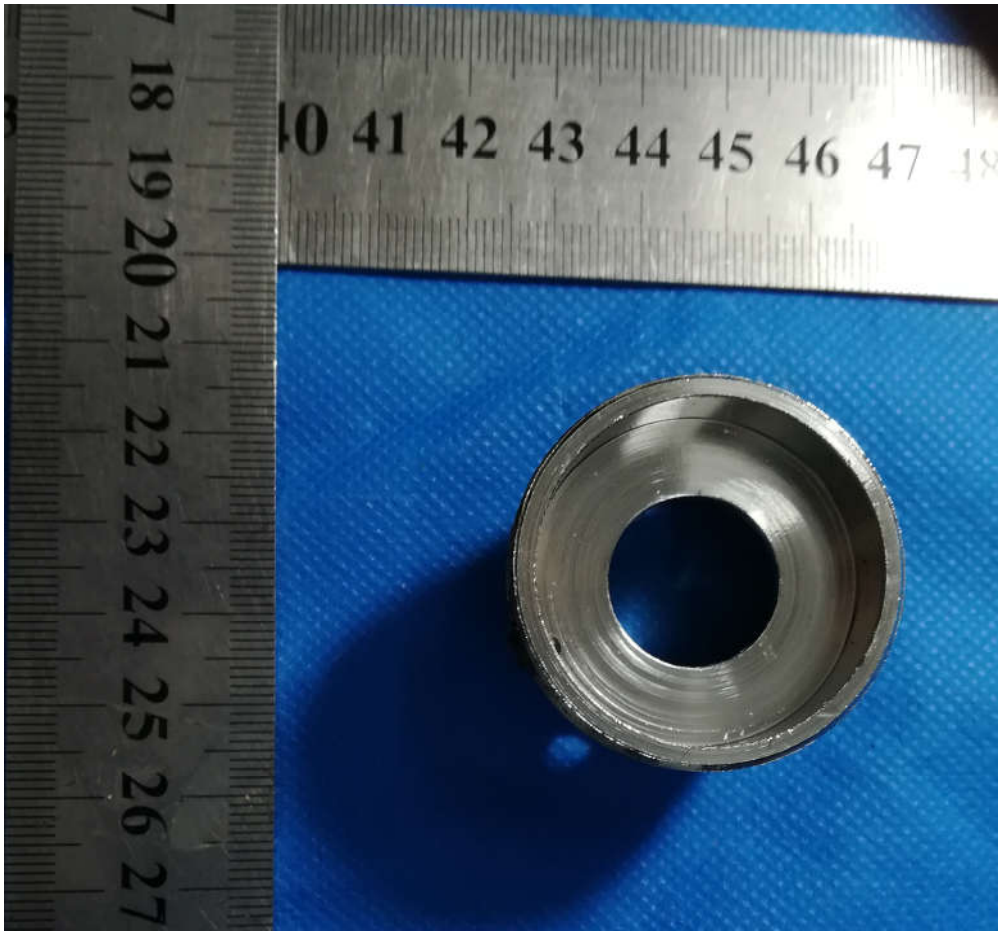

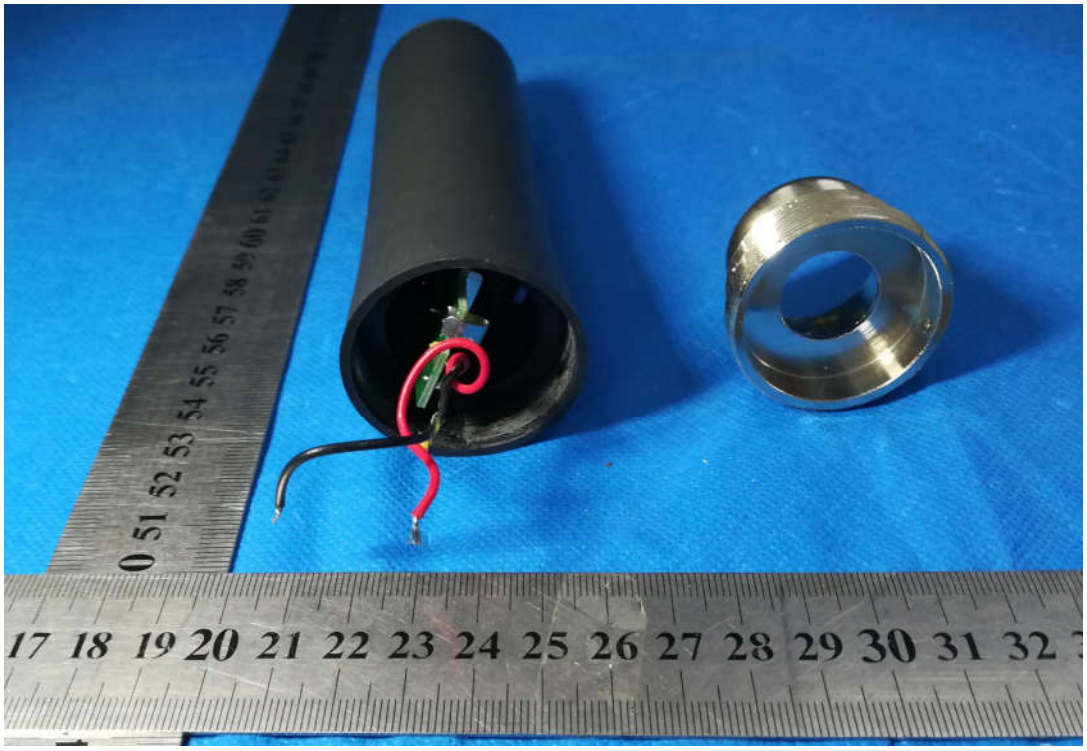


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WIRELESS


50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
6 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38
UHF
PROFESSIONAL WIRELESS


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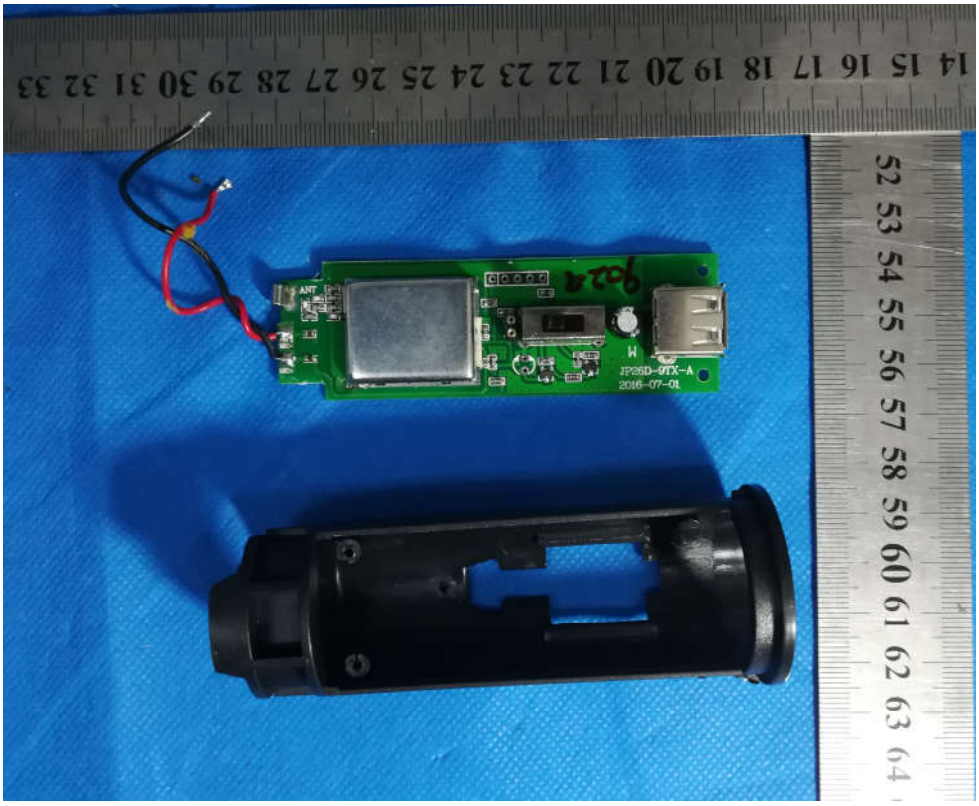
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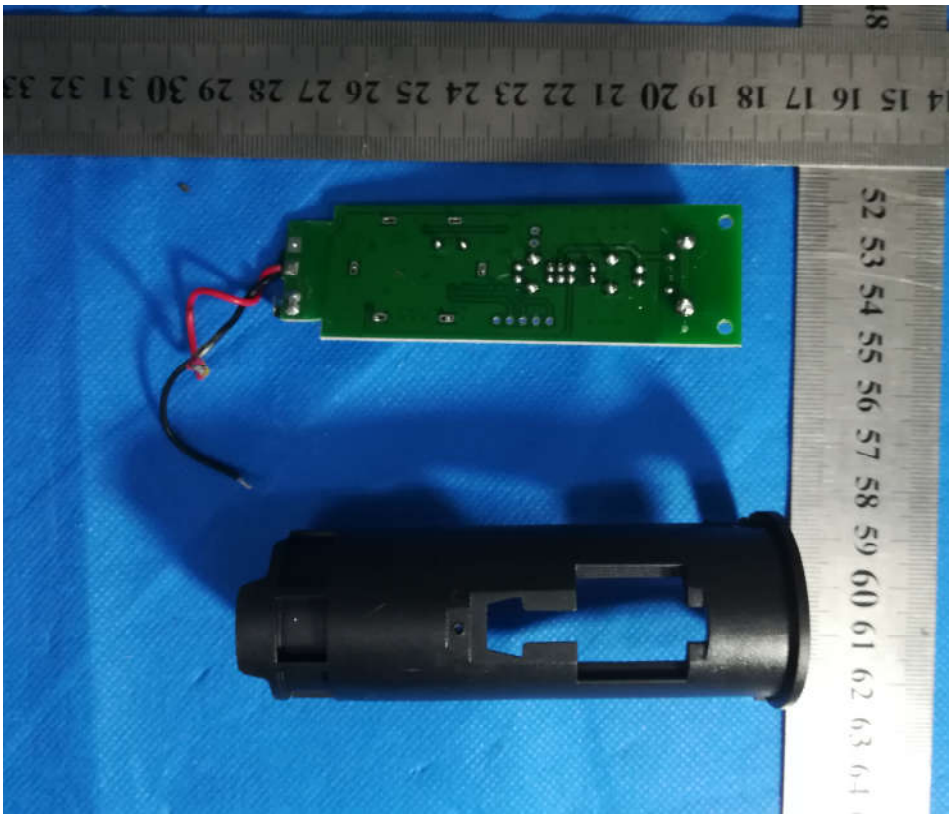
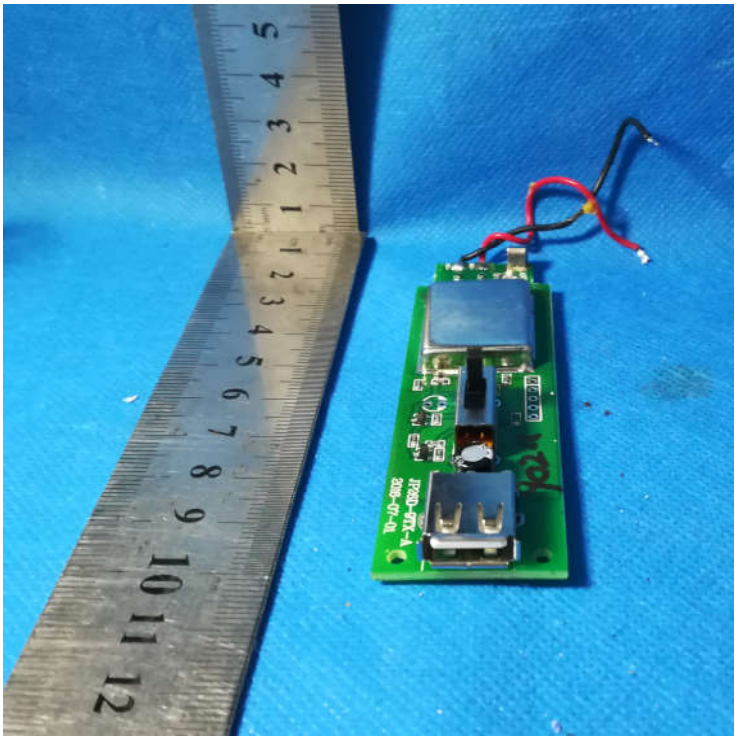
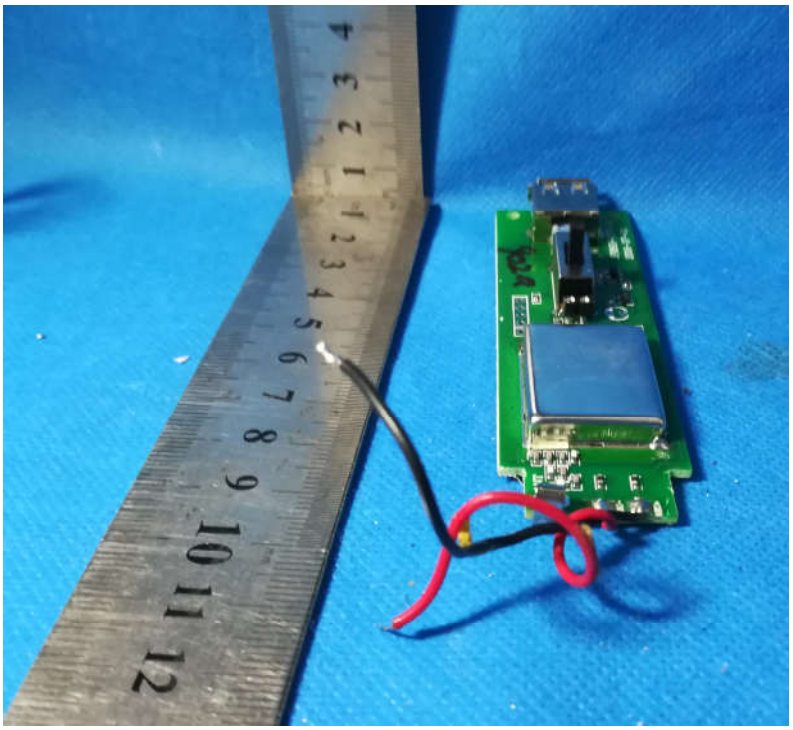
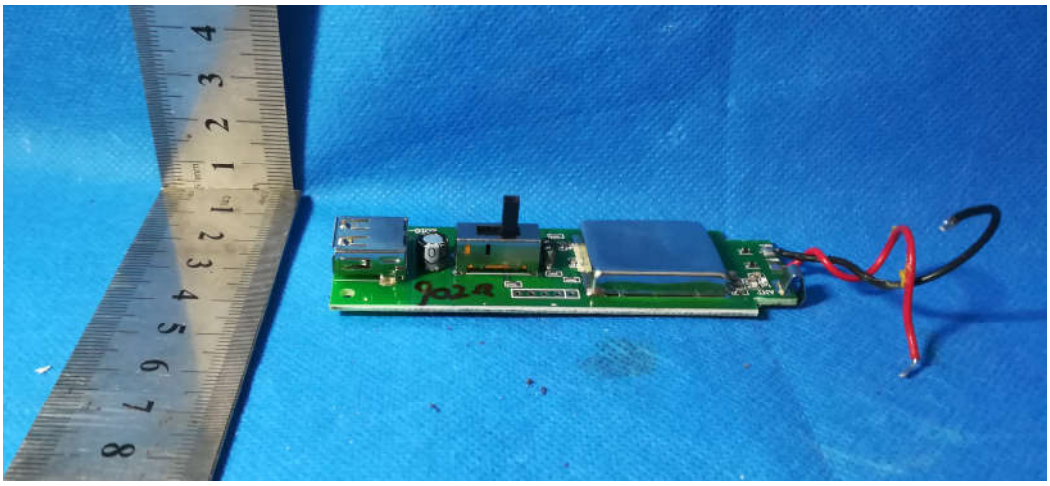
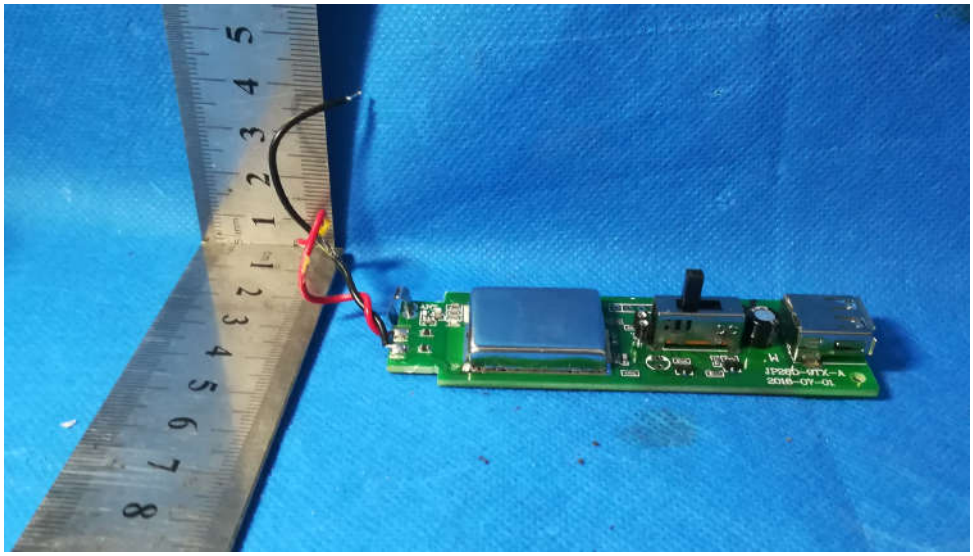
2016-07-01









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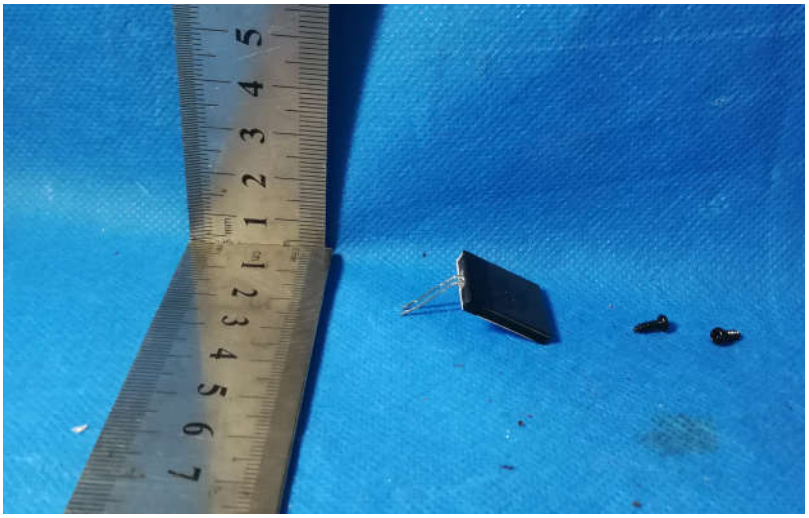

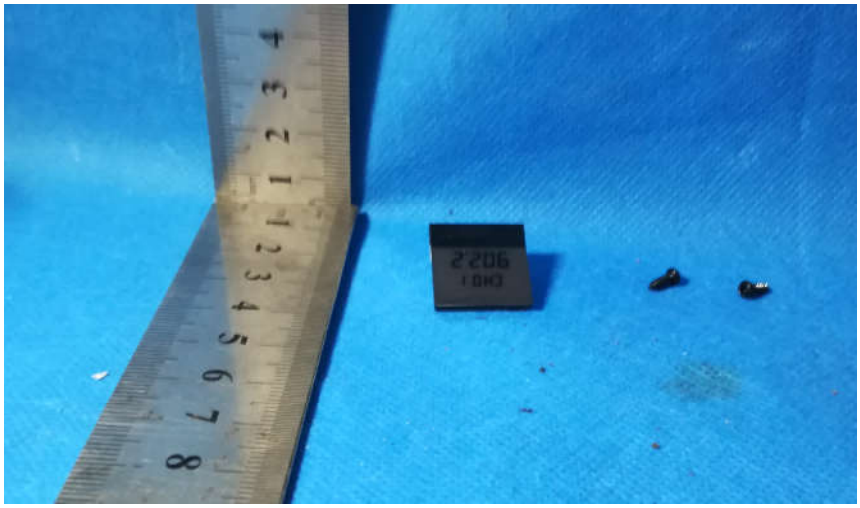
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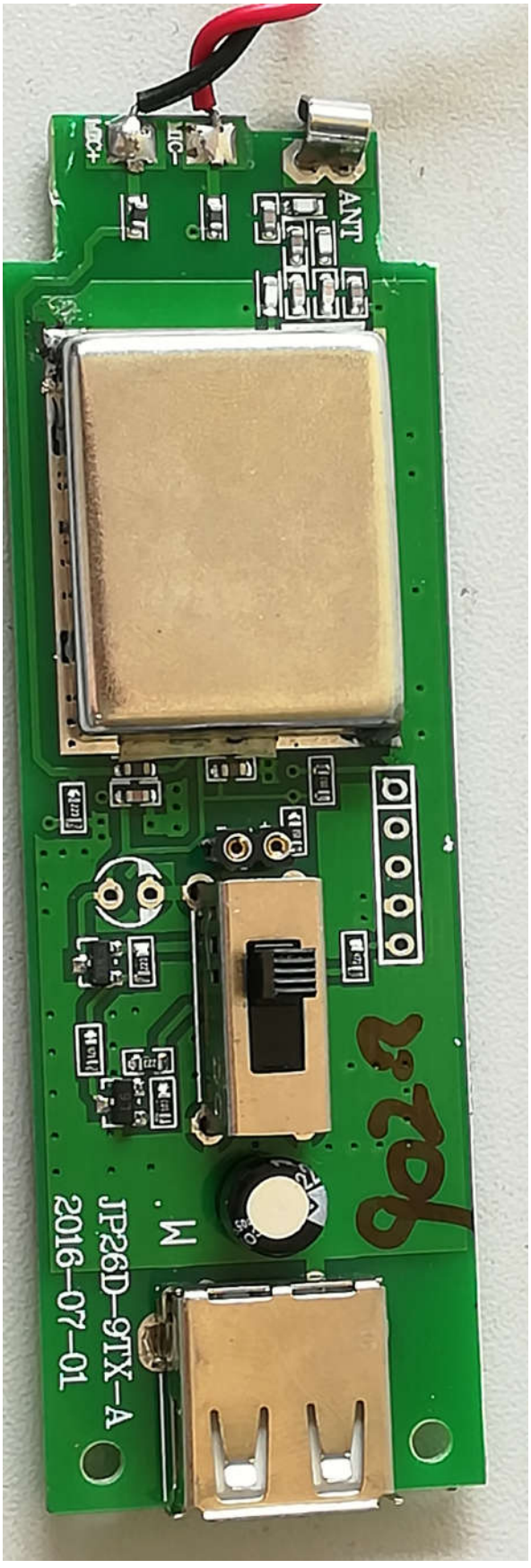
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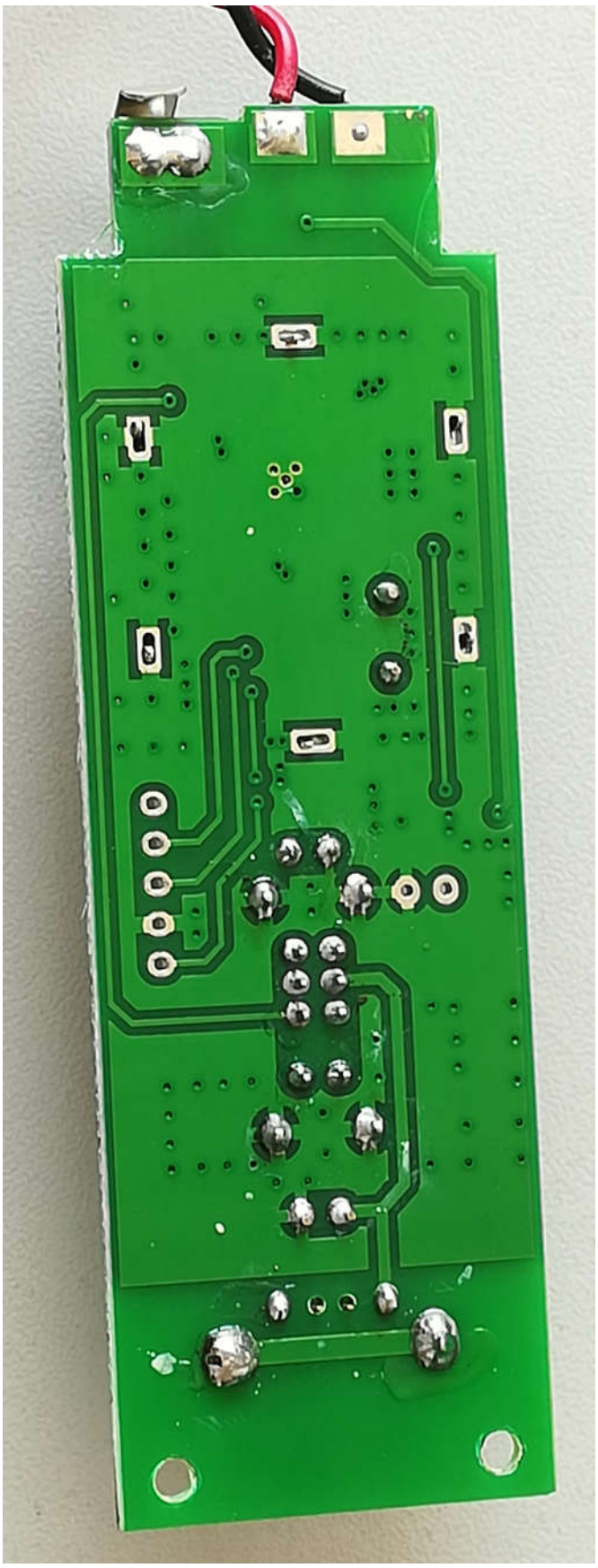
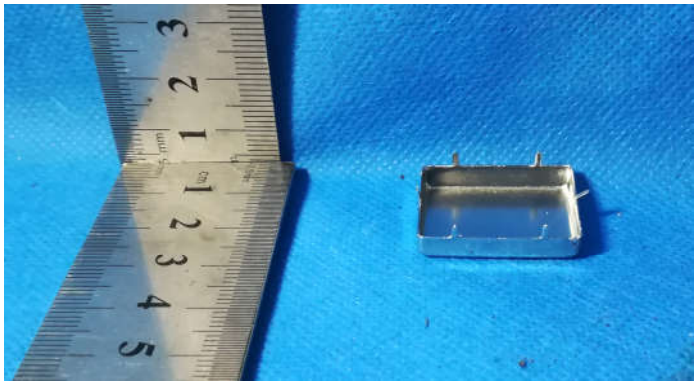
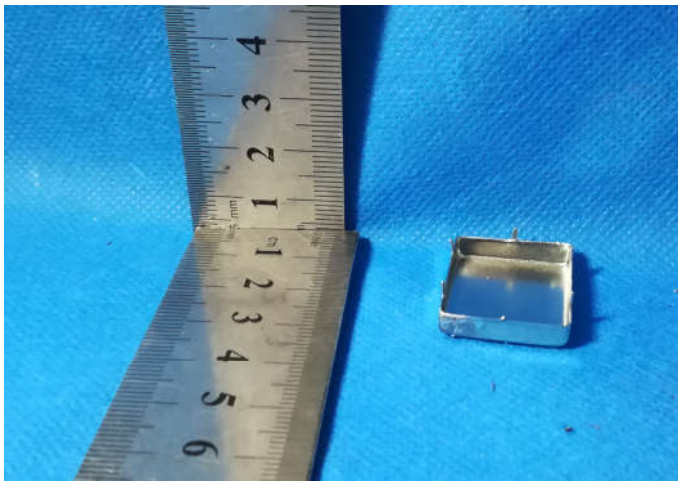
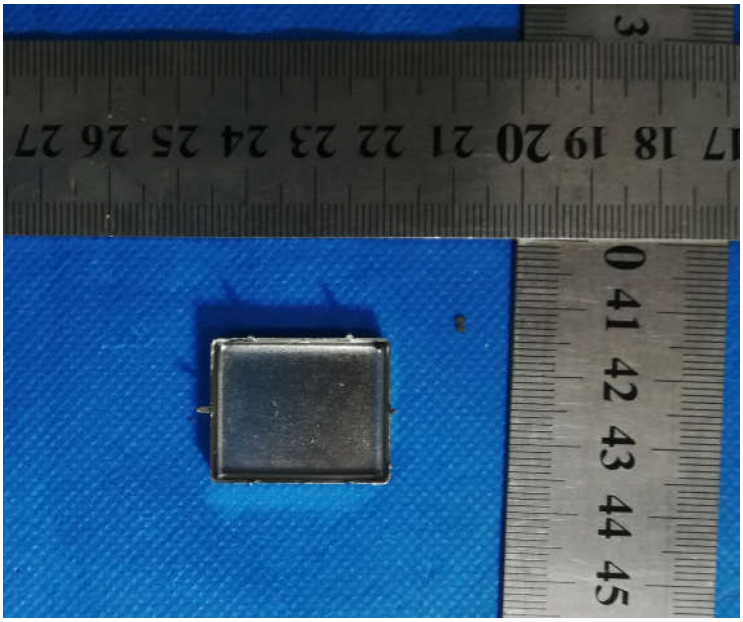
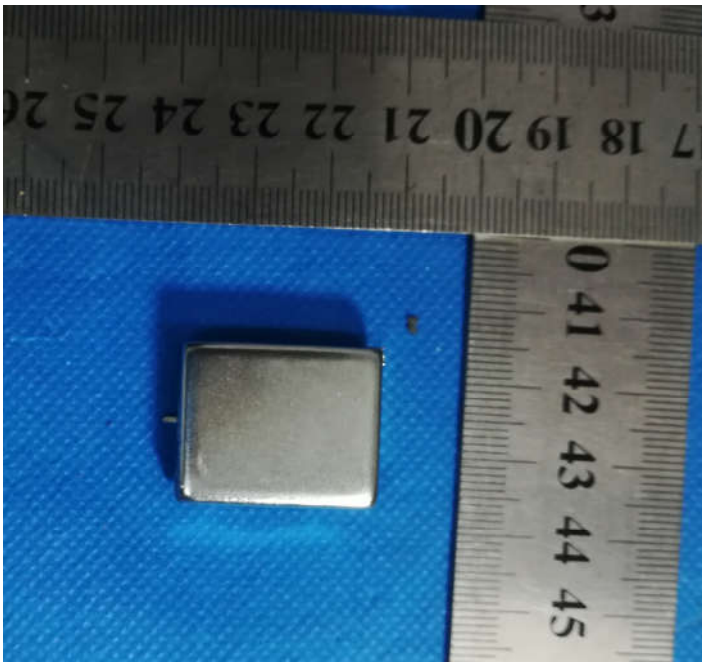
2016-07-01







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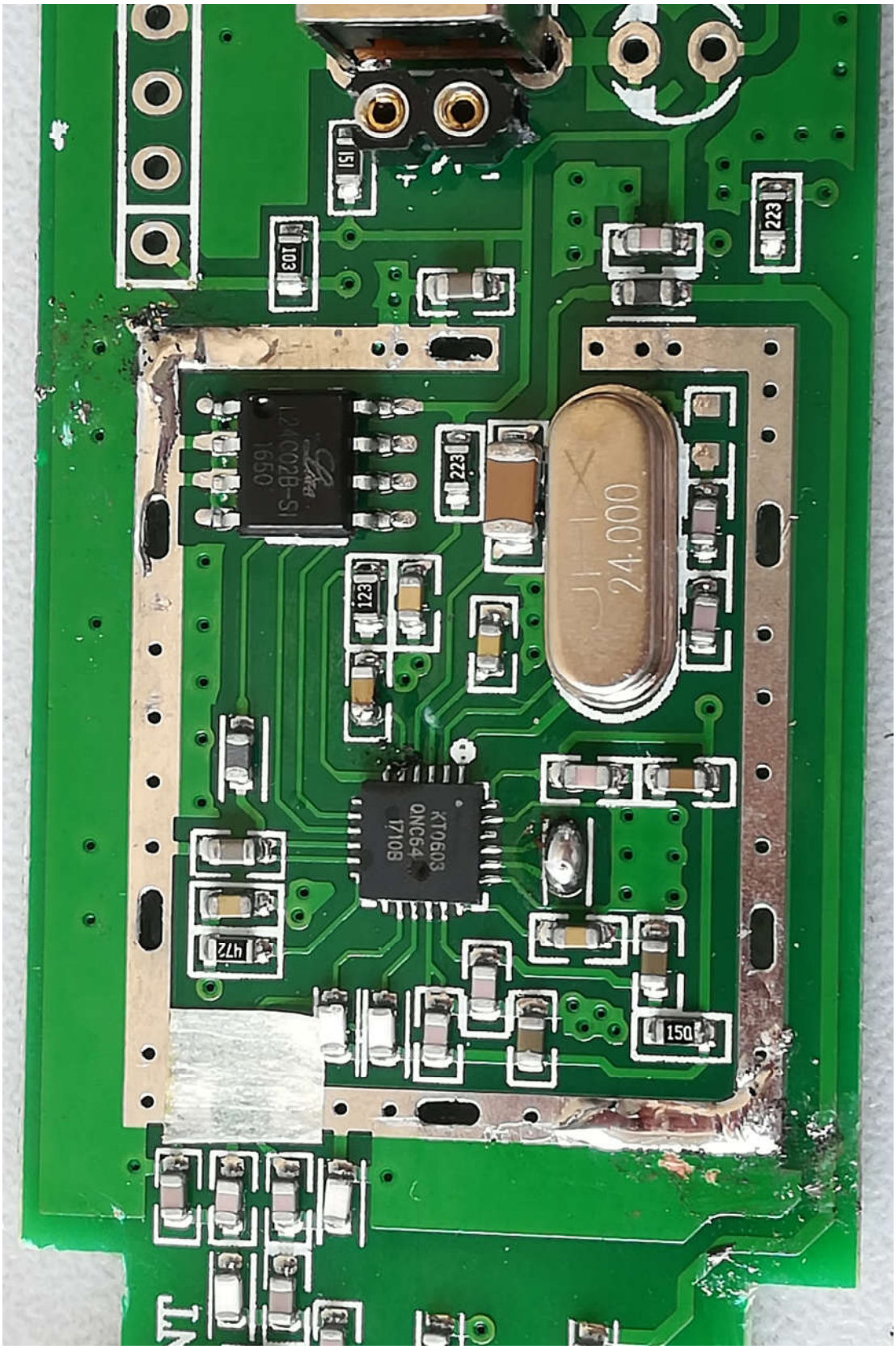
41 42 43 44 45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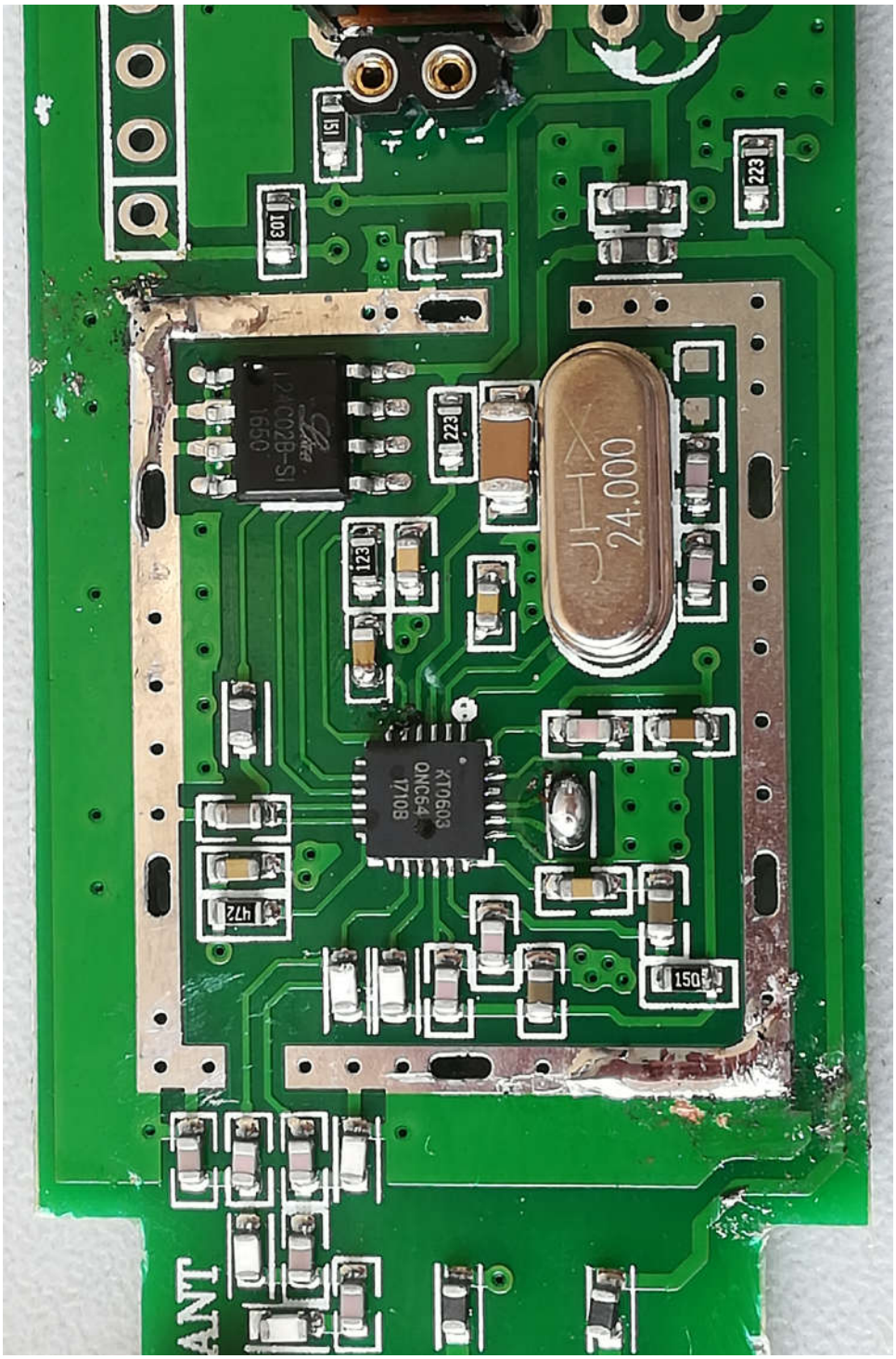
KT0603
QNC64
1710B
150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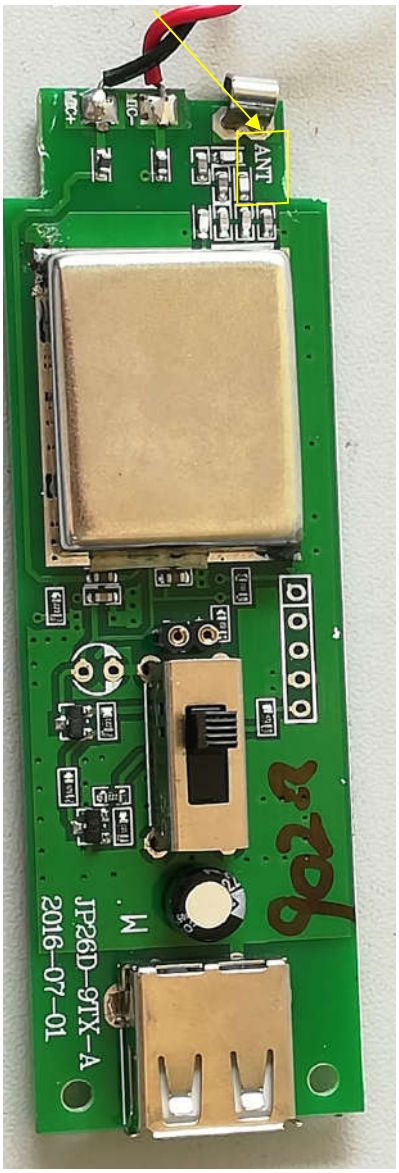
4.3 **Antenna Photo**

Antenna, total length: 55 mm



Note:

The transmitter was used a unique coupling with the antenna, and it's complied with the requirements of section 15.203: antenna requirement.

5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
1	RF Generator	Rohde & Schwarz	SMB100A-B106	1.031	2017-5-10	2018-5-10
2	Spectrum Analyzer	Rohde & Schwarz	FSP30	EMC0001	2017-3-24	2018-3-24
3	EMI Test Receiver	Rohde & Schwarz	ESCI	EMC1002	2017-3-24	2018-3-24
4	2-Channel Power Meter	Rohde & Schwarz	NRP2	1.033	2017-5-10	2018-5-10
5	Audio Analyzer	Hewlett Packard	8903B	EMC0011	2016-11-5	2017-11-5
6	Power Sensor	Rohde & Schwarz	NRP-Z91	1.034	2017-5-10	2018-5-10
7	Power Sensor	Rohde & Schwarz	NRP-Z91	1.035	2017-5-10	2018-5-10
8	Temperature Chamber	Gongwen	GDS-250	SFT0009	2016-11-5	2017-11-5
9	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2016-11-5	2017-11-5
10	Temperature Chamber	Gongwen	GDS-250	SFT0009	2016-11-5	2017-11-5
11	D.C. Power Supply	KIKUSUI	PAN35-10A	SFT0319	2016-11-5	2017-11-5
12	Humidity/ Temperature Meter	Anymetre	TH101B	SFT0063	2016-11-5	2017-11-5
13	Barometer	ChangChun	DYM3	SEL0088	2017-6-8	2018-6-8
14	Multimeter	UNI-T	UT70A	EMC0017	2016-11-5	2017-11-5
15	Monopole Antenna	HST	N/A	EMC0089	2016-11-5	2017-11-5
16	Low loss coaxial cable	HST	2 m	EMC1008	2016-11-5	2017-11-5
17	Monopole Antenna	HST	N/A	N/A	2016-11-5	2017-11-5
18	Noise Generaror	Ningbo Zhongce	DF1681	EMC0009	2016-11-5	2017-11-5
19	Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	ITL-100	2016-6-17	2017-6-17
					2017-6-17	2018-6-17
20	EMI Test receiver	R&S	ESVS10	ITL-111	2017-1-19	2018-1-19
21	EXA Spectrum Analyzer	Agilent Technologies	N9010A	ITL-114	2017-1-19	2018-1-19
22	Biconilog	ETS•Lindgren	3142D	ITL-105	2015-1-24	2018-1-24

	Antenna					
23	Pre Amplifier	HP	8447F	ITL-116	2017-1-19	2018-1-19
24	Wideband Amplifier Super Ultra	Mini-circuits	ZVA-183-S+	ITL-117	2017-1-19	2018-1-19
25	Horn Antenna	A-INFOMW	JXTXLB-10180-N	ITL-110	2015-1-24	2018-1-24
26	Software	Audix	E3	ITL-109	/	/
27	Loop Antenna	BJ 2nd Factory	ZN30900A	EMC6001	2016-7-29	2019-7-29

6

End of report

Report Statement

1.This test report is invalid if altered, additions and deletions.

2.This test report is responsible for tested samples only .

3.Objections to the test report must be submitted to Guangdong Huesent Testing & Inspection Technology Co., Ltd. within 15 days.

4.The test report is invalid without the signatures of tester, reviewer ,approver ,and official stamp of test unit.

5.Without permission of Guangdong Huesent Testing & Inspection Technology Co., Ltd., This report is not permitted to be duplicated in extracts.

6.P"= Pass=Test item conform to the requirement

"F"= Fail=Test item not conform to the requirement

"N"= Not Applicable =Test item Not Applicable to the test object