FCC Test Report

Report No.: AGC08073191101FE06

FCC ID	:	2ATZS-FMT
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Car FM Transmitter
BRAND NAME	:	N/A
MODEL NAME	:	BC49BQ, BC49AQ, BC49CQ, BC49DQ, BC52T, BC51T, BC55A, BC40Q, BC36AQ, TB27
CLIENT	:	SHEN ZHEN LEADINWAY TECHNOLOGY CO.,LTD
DATE OF ISSUE	:	Jan. 16, 2020
STANDARD(S)	:	FCC Part 15.239
REPORT VERSION	:	V1.0

Attestation of Global Compliance(Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 16, 2020	Valid	Original Report

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY 4

2. GENERAL INFORMATION 5

2.1. PRODUCT DESCRIPTION 5

3. MEASUREMENT UNCERTAINTY 5

4. DESCRIPTION OF TEST MODES 5

5. SYSTEM TEST CONFIGURATION 6

5.1. EQUIPMENT USED IN EUT SYSTEM 6

5.2. SUMMARY OF TEST RESULTS 6

6. TEST FACILITY 7

7. RADIATED EMISSION 8

7.1. MEASUREMENT PROCEDURE 8

7.2. TEST SETUP 9

7.3. TEST RESULT FOR FIELD STRENGTH OF FUNDAMENTAL 10

8.4. TEST RESULT FOR FIELD STRENGTH OF BAND EDGE EMISSION 10

7.5. TEST RESULT FOR SPURIOUS EMISSION 11

8. BANDWIDTH 13

8.1. MEASUREMENT PROCEDURE 13

8.2. TEST SETUP 13

8.3. TEST RESULT 14

APPENDIX A: PHOTOGRAPHS OF TEST SETUP 16

APPENDIX B: PHOTOGRAPHS OF EUT 17

1. VERIFICATION OF CONFORMITY

Applicant	SHEN ZHEN LEADINWAY TECHNOLOGY CO.,LTD
Address	BLOCK 29, BAOTIAN INDUSTRIAL ZONE, XIXIANG TOWN, BAO'AN DISTRICT, SHEN ZHEN CITY, GUANGDONG PROVINCE, CHINA
Manufacturer	SHEN ZHEN LEADINWAY TECHNOLOGY CO.,LTD
Address	BLOCK 29, BAOTIAN INDUSTRIAL ZONE, XIXIANG TOWN, BAO'AN DISTRICT, SHEN ZHEN CITY, GUANGDONG PROVINCE, CHINA
Factory	SHEN ZHEN SAILING ELECTRONIC CO.,LTD
Address	BLOCK 29, BAOTIAN INDUSTRIAL ZONE, XIXIANG TOWN, BAO'AN DISTRICT, SHEN ZHEN CITY, GUANGDONG PROVINCE, CHINA
Product Designation	Car FM Transmitter
Brand Name	N/A
Test Model	BC49BQ
Series Model	BC49AQ, BC49CQ, BC49DQ, BC52T, BC51T, BC55A, BC40Q, BC36AQ, TB27
Difference Description	All the same except for the model name
Date of test	Nov. 18, 2019 to Jan. 16, 2020
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd.The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC part 15.239.

Prepared By	Sky Dong (Project Engineer)	Jan. 16, 2020
Reviewed By	Max Zhang (Reviewer)	Jan. 16, 2020
Approved By	Forrest Lei (Authorized Officer)	Jan. 16, 2020

2. GENERAL INFORMATION

2.1.PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	88.1MHz-107.9MHz
Field Strength(3m)	33.66dBuV/m(PK)@3m
Modulation	FM
Number of channels	199(Channel spacing 100kHz)
Hardware Version	YHW-BC49(2819)-V2-20191108
Software Version	CGBT1558_[BC49]_[LX-EN]_SDK-ACT201_20191023_v1.5
Antenna Designation	Integral Antenna (Met 15.203 Antenna requirement)
Power Supply	DC 12/24V by car battery

NOTE: About the EUT, please refer to User's Manual.

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB

Radiated measurement: +/- 3.91dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode(Low channel)
2	Transmitting mode(Middle channel)
3	Transmitting mode(High channel)

Note: 1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

2. All the requirements have beentested by modulating the transmitter with a 2.5 kHz tone at a fixed level which set to the manufacturer's maximum rated input to the modulator.

3. Only the result of the worst case was recorded in the report, if no other cases.

5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Car FM Transmitter	BC49BQ	2ATZS-FMT	EUT
2	Smart phone	V8	N/A	AE
3	Load 1	RX24-50W	50Ω	AE
4	Load 2	RX12-50W	50Ω	AE
5	AUX line	2265	1m	AE
6	Battery	N300	N/A	AE

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.239	Field Strength of Fundamental and Spurious Emission	Compliant
15.215	Bandwidth	Compliant
15.209	Line Conducted Emission	N/A

Note: N/A means it’s not applicable to this item.

6. TEST FACILITY

TestSite	Attestation of Global Compliance(Shenzhen) Co., Ltd
Location	1-2/F,Building19,JunfengIndustrialPark,ChongqingRoad,HepingCommunity,Fuhai Street,Bao'anDistrict,Shenzhen,Guangdong,China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2019	Jun. 26, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec. 11, 2020
Attenuator	ZHINAN	E-002	N/A	Aug. 26, 2019	Aug. 25, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Test software	FARA	EZ-EMC (Ver RA-03A)	N/A	N/A	N/A

7. RADIATED EMISSION

7.1. MEASUREMENT PROCEDURE

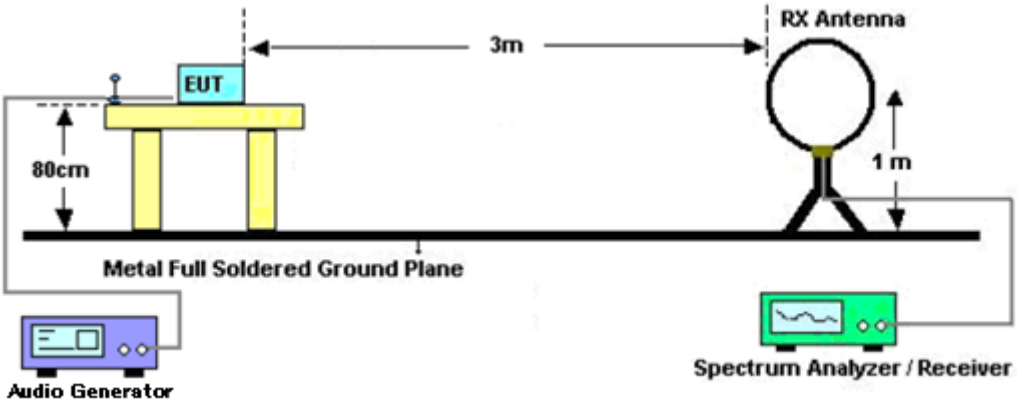
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground and opposite the horn antenna. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions below 1GHz, use 120KHz RBW and VBW>=3RBW for QP reading.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
8. Only the worst case is reported.

The following table is the setting of spectrum analyzer and receiver.

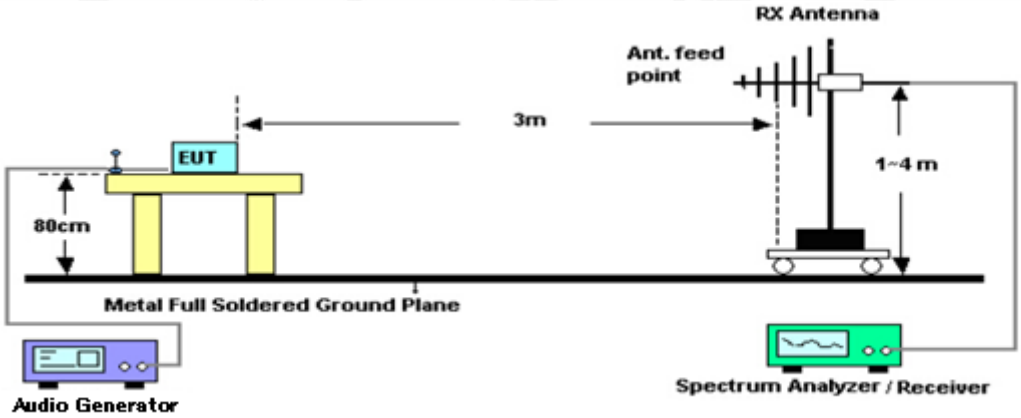
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

7.2.TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.3. TEST RESULTFOR FIELD STRENGTH OF FUNDAMENTAL

Frequency MHz	Polarization	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Detector
88.100	H	33.47	67.96	34.49	Pass	PK
88.100	V	32.12	67.96	35.84	Pass	PK
98.000	H	33.66	67.96	34.30	Pass	PK
98.000	V	32.25	67.96	35.71	Pass	PK
107.900	H	32.41	67.96	35.55	Pass	PK
107.900	V	30.95	67.96	37.01	Pass	PK
Frequency MHz	Polarization	Level dB(uV/m) AV	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Detector
88.100	H	33.21	47.96	14.75	Pass	AV
88.100	V	31.36	47.96	16.60	Pass	AV
98.000	H	32.59	47.96	15.37	Pass	AV
98.000	V	31.48	47.96	16.48	Pass	AV
107.900	H	32.45	47.96	15.51	Pass	AV
107.900	V	30.24	47.96	17.72	Pass	AV

8.4. TEST RESULT FOR FIELD STRENGTH OF BAND EDGE EMISSION

Frequency MHz	Polarization	Level dB(uV/m) QP	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Detector
88.000	H	30.26	40	9.74	Pass	QP
88.000	V	31.17	40	8.83	Pass	QP
108.000	H	31.55	43.5	11.95	Pass	QP
108.000	V	32.59	43.5	10.91	Pass	QP

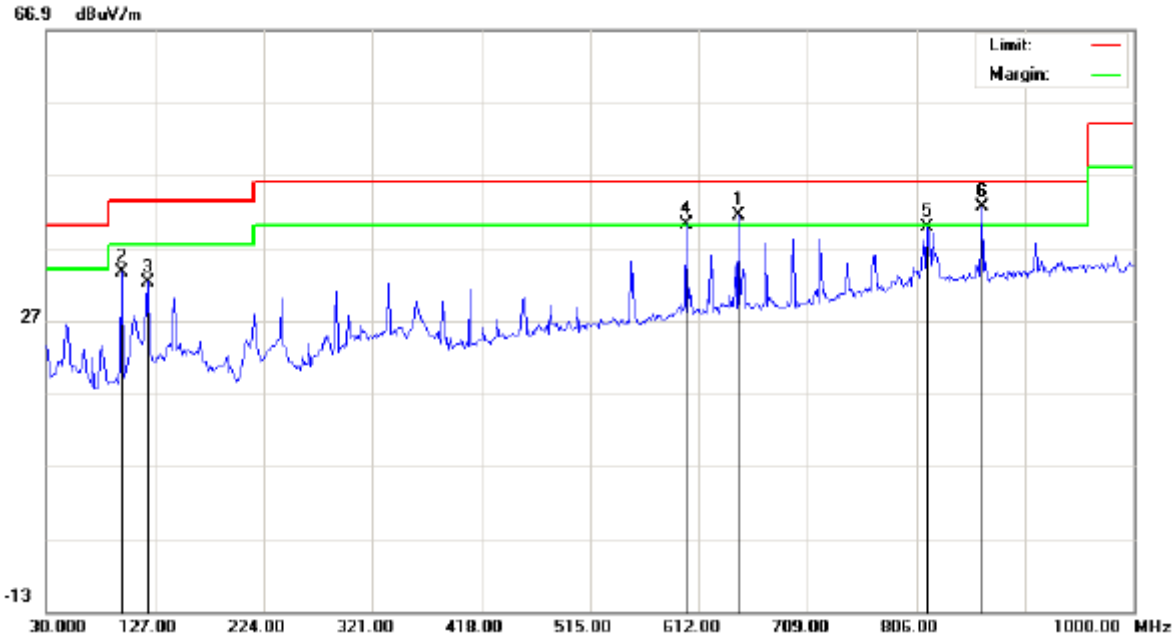
Note: The above two frequencies are the worst case for the band edge emission test.

7.5. TEST RESULT FOR SPURIOUS EMISSION

RADIATED EMISSION BR/EDR OW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

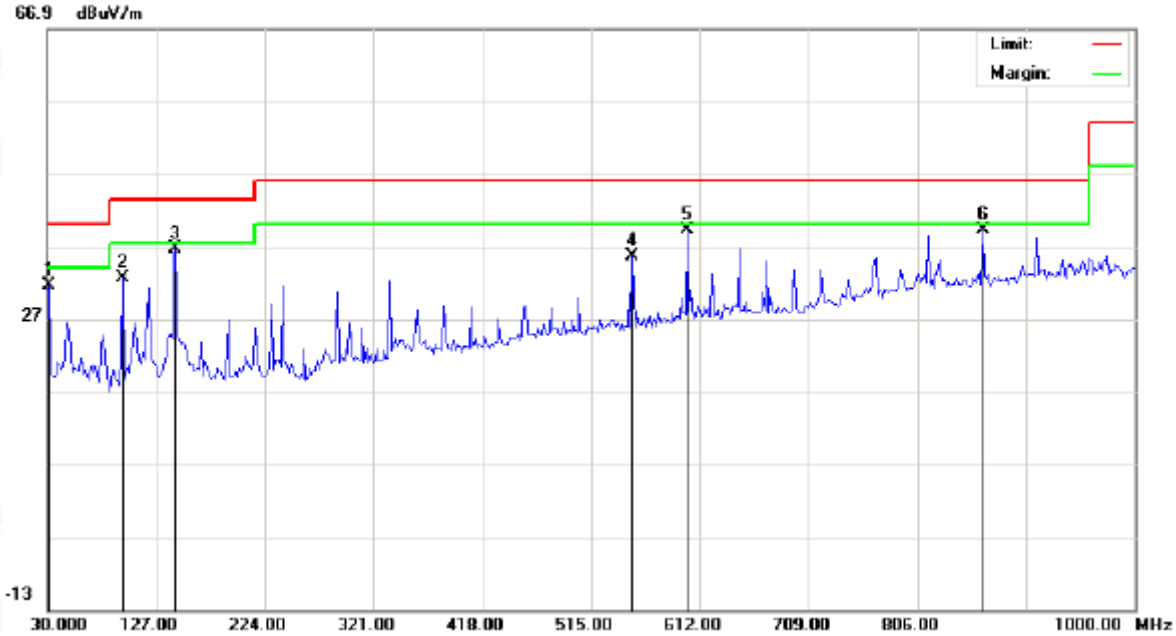
RADIATED EMISSION BR/EDR OW 1GHZ-Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	647.5667	13.87	27.52	41.39	46.00	-4.61	peak			
2		98.0000	17.87	15.79	33.66	43.50	-9.84	peak			
3		120.5333	14.30	18.00	32.30	43.50	-11.20	peak			
4	!	600.6833	13.32	26.96	40.28	46.00	-5.72	peak			
5		815.7000	9.10	30.61	39.71	46.00	-6.29	peak			
6	*	864.2000	11.43	31.24	42.67	46.00	-3.33	peak			

RESULT: PASS

RADIATED EMISSION BELOW 1GHZ-Vertical



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		31.6167	13.39	18.22	31.61	40.00	-8.39	peak			
2		98.0000	16.77	15.79	32.56	43.50	-10.94	peak			
3		144.7833	17.31	19.22	36.53	43.50	-6.97	peak			
4		552.1833	9.66	26.01	35.67	46.00	-10.33	peak			
5		600.6833	12.22	26.96	39.18	46.00	-6.82	peak			
6	*	864.2000	7.99	31.24	39.23	46.00	-6.77	peak			

RESULT: PASS

Note: 1. Factor=Antenna Factor+ Cable loss-Amplifier gain, Margin=Measurement-Limit.

2. The “Factor” valuecan be calculated automatically by software of measurement system.

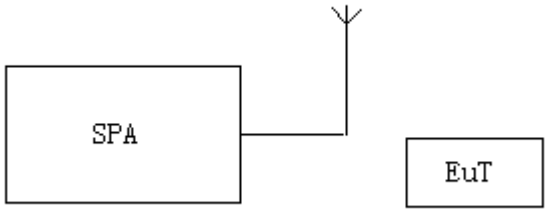
3. All test modes had been tested. The Low channel is the worst case and recorded in the report.

8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
   Centrefrequency = Operation Frequency
   RBW=3KHz
   VBW=10KHz
   Span: 300kHz
   Sweep time: Auto
   For the occupied bandwidth measurements, the input signal shall be a 2.5 kHz tone.
   ☐The level of the tone shall be 16 dB higher than that required to produce a frequency deviation of 75 kHz, or 50% of the manufacturer's rated deviation, whichever is less.
   ☒Alternatively, in the event that a 16 dB increase cannot be achieved, the level of the tone shall be set to the manufacturer's maximum rated input to the modulator.
2. Set theEUT to continue transmitting mode.Allow the trace to stabilize. Use the "N dB down" function of SPA to define the bandwidth.
3. Record the plots and Reported.

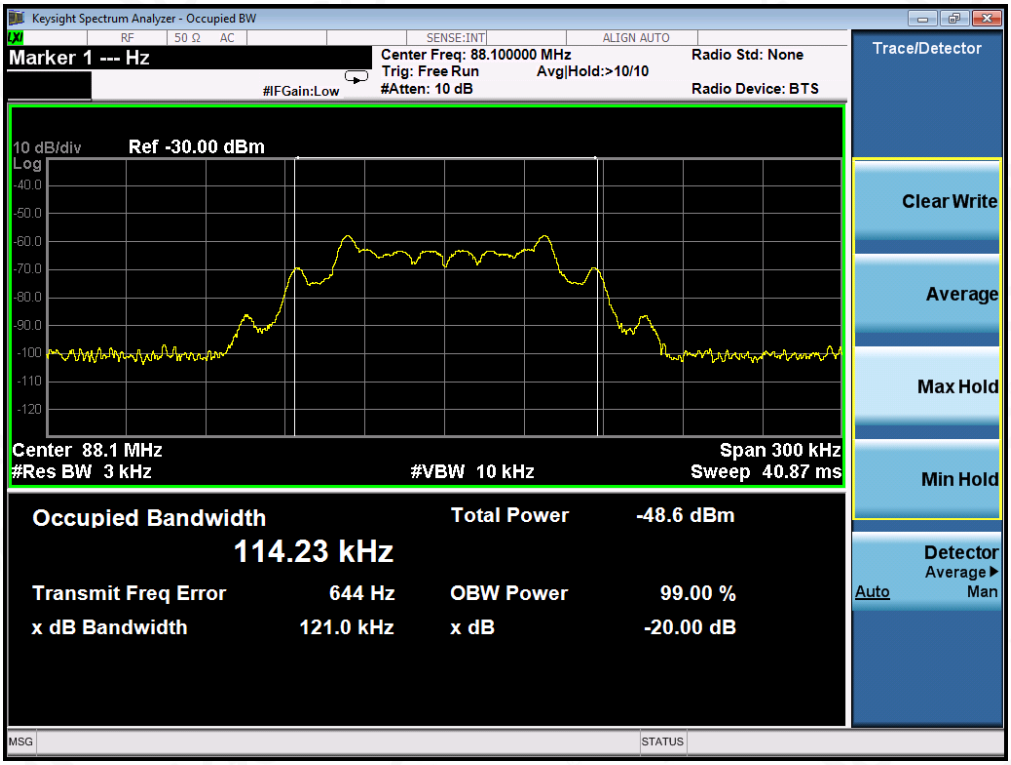
8.2. TEST SETUP



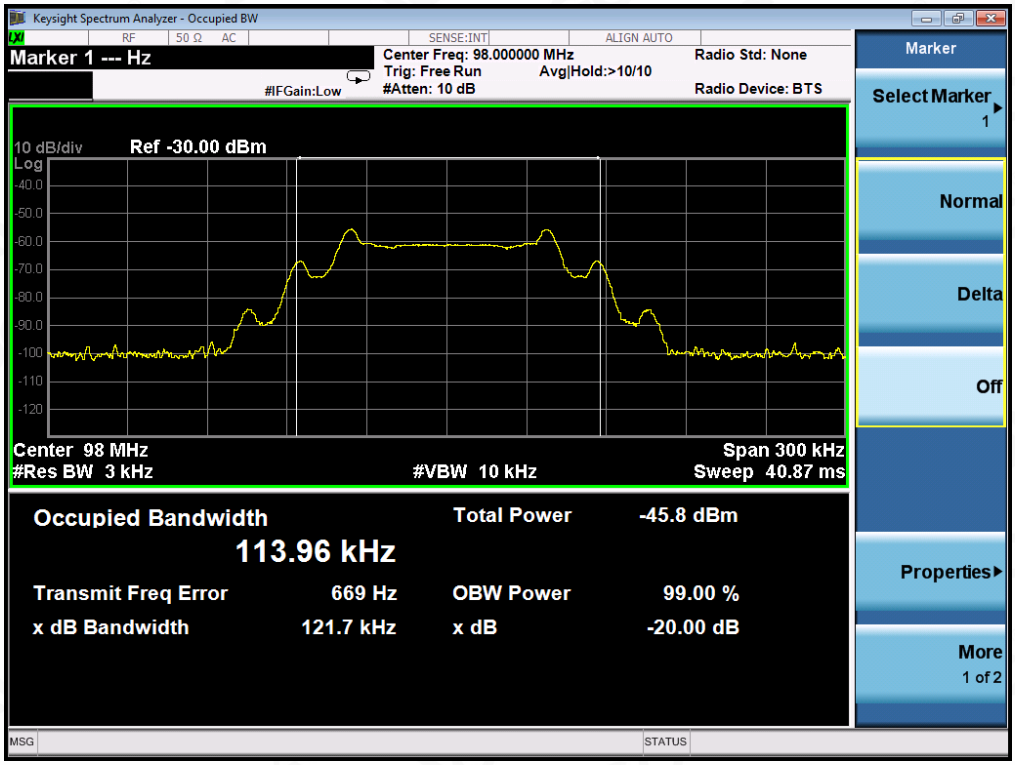
8.3. TEST RESULT

Channel	Channel Frequency(MHz)	-20dB bandwidth (kHz)	Limit(kHz)
Low	88.1	121.0	200
Middle	98.0	121.7	200
High	107.9	121.6	200

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



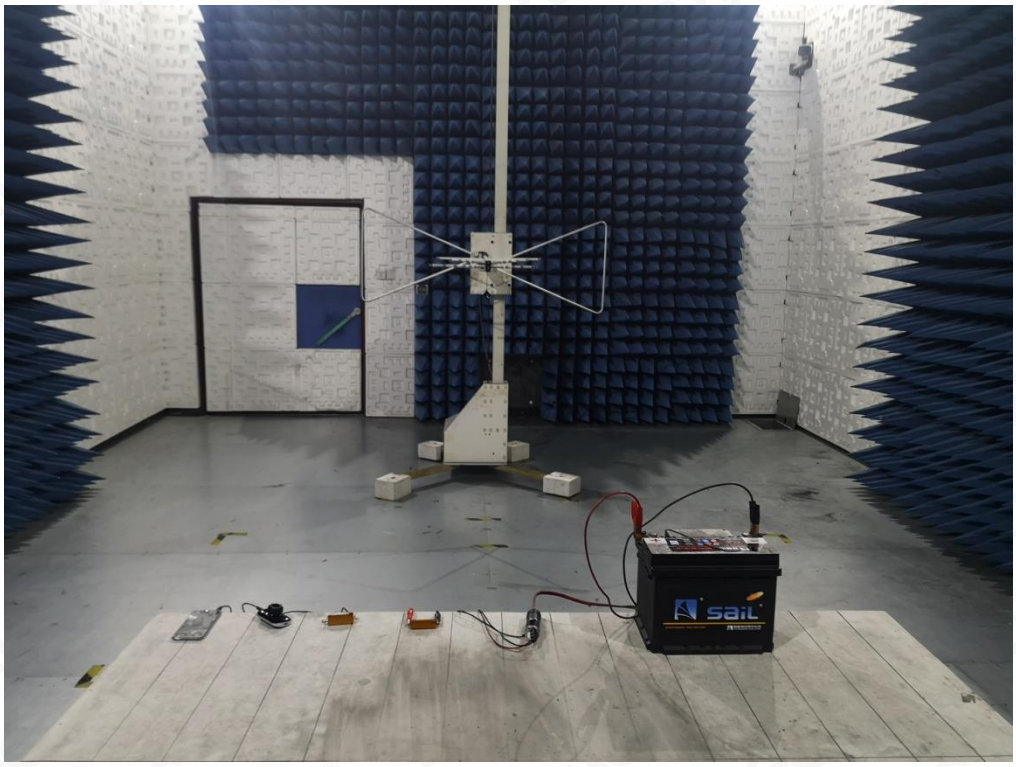
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1G



APPENDIX B:PHOTOGRAPHS OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

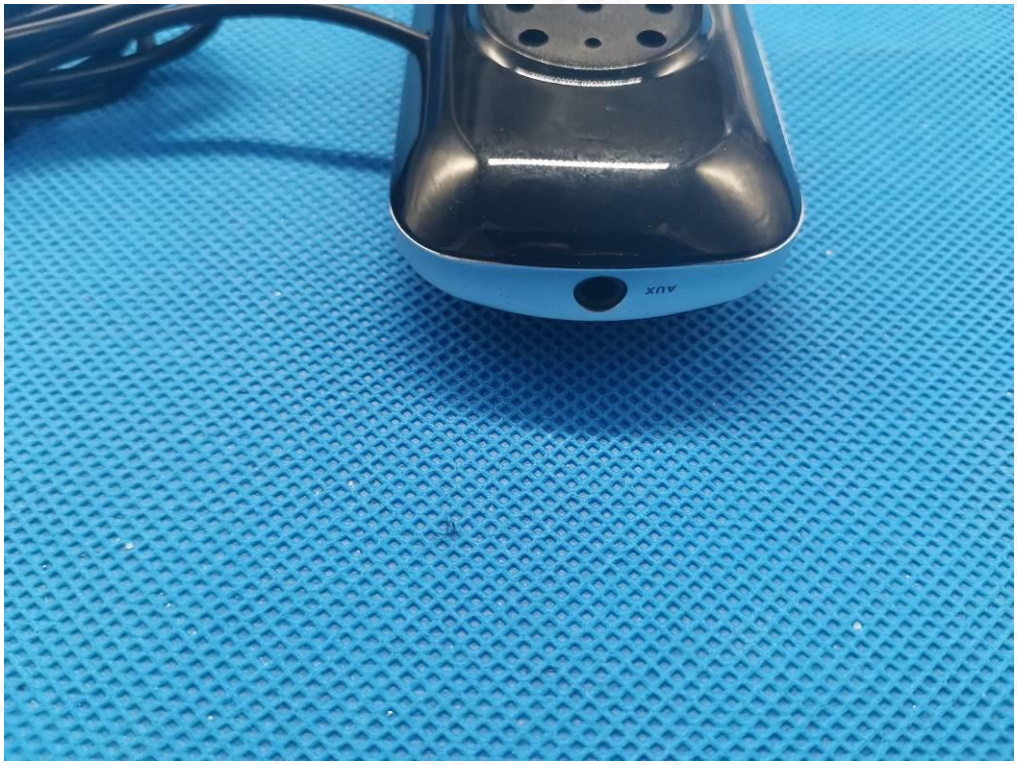
FRONT VIEW OF EUT

BACK VIEW OF EUT

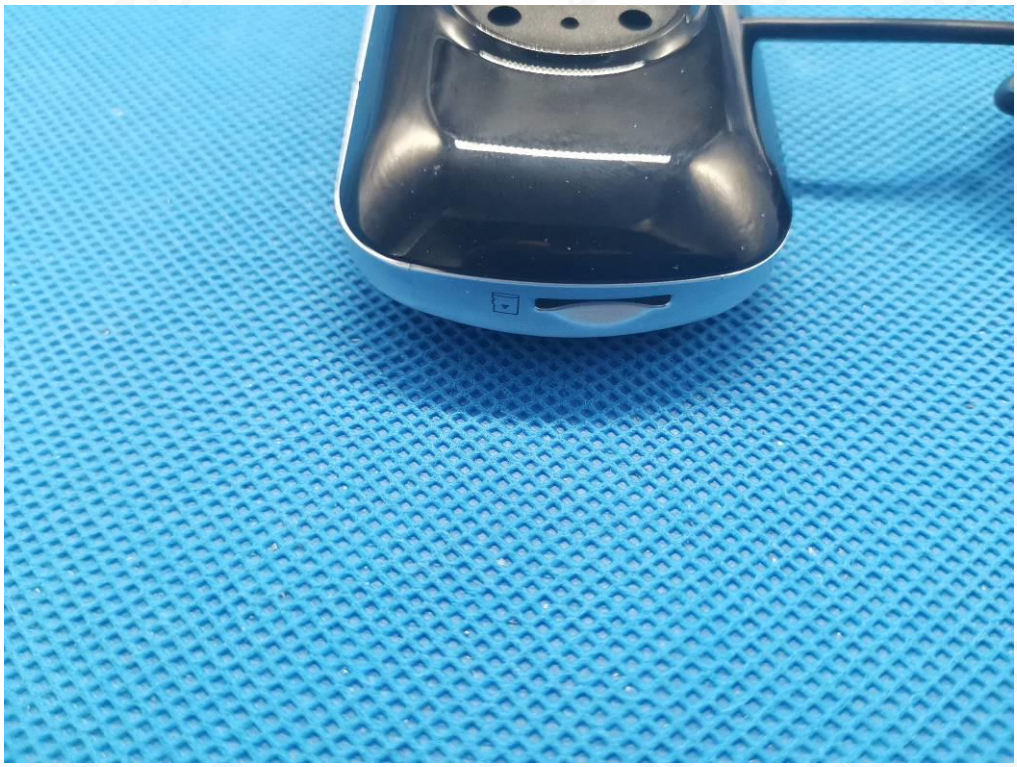
LEFT VIEW OF EUT

RIGHT VIEW OF EUT

VIEW OF EUT(PORT)-1

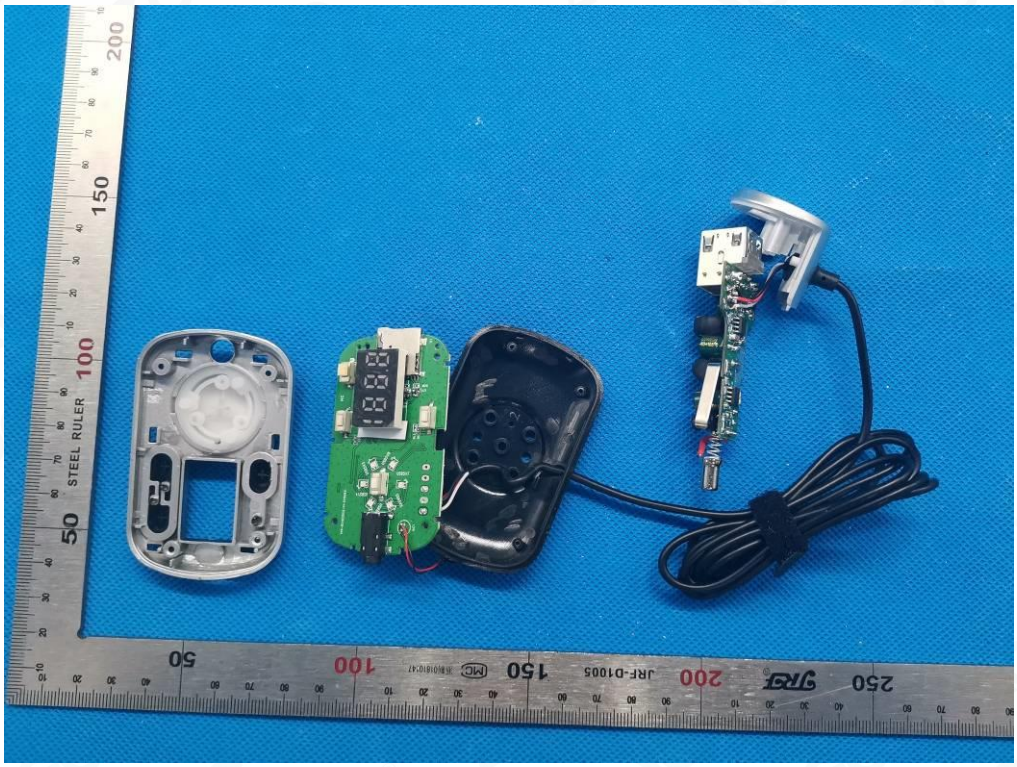


VIEW OF EUT(PORT)-2

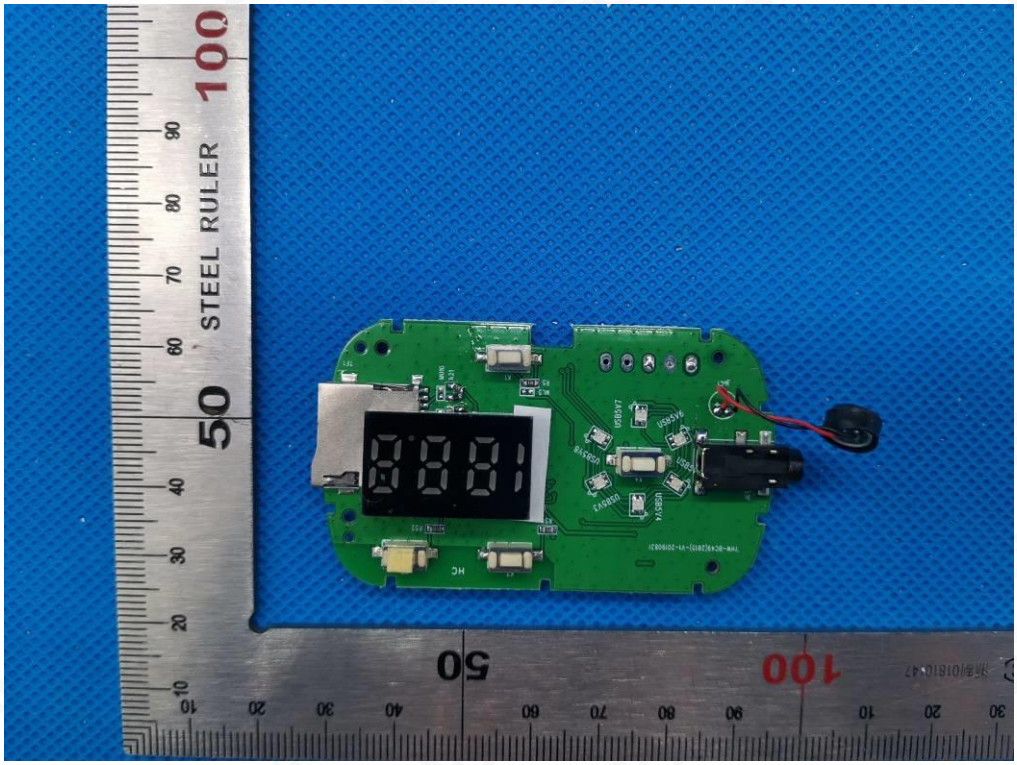


OPEN VIEW OF EUT-1

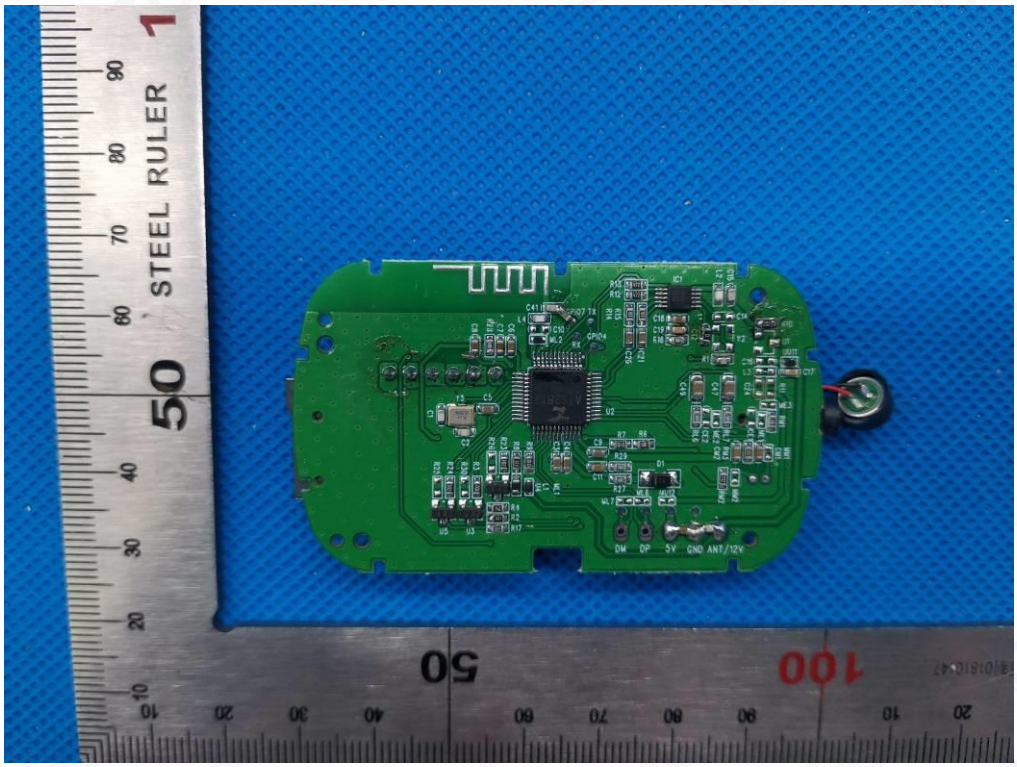
OPEN VIEW OF EUT-2



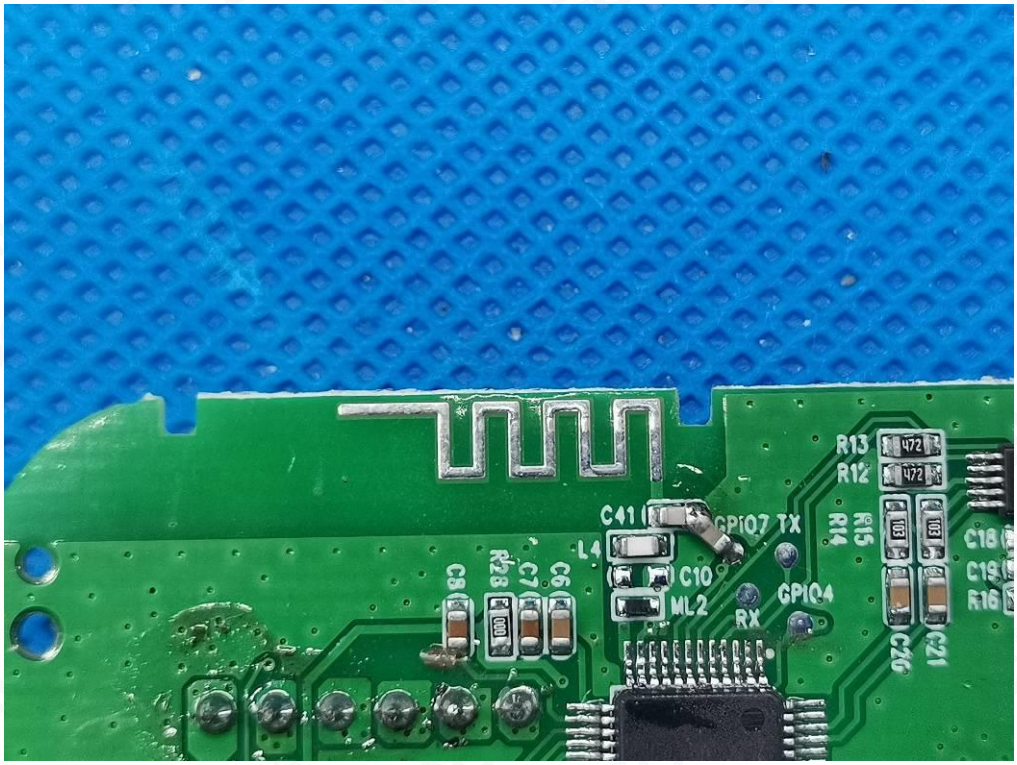
INTERNAL VIEW OF EUT-1



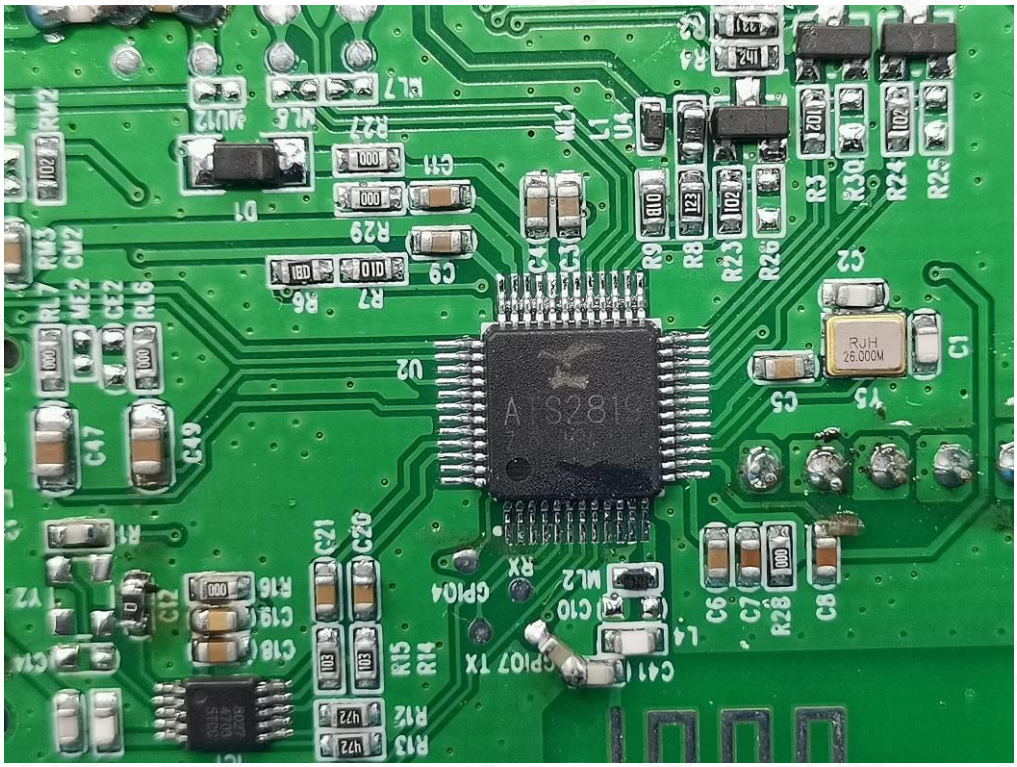
INTERNAL VIEW OF EUT-2



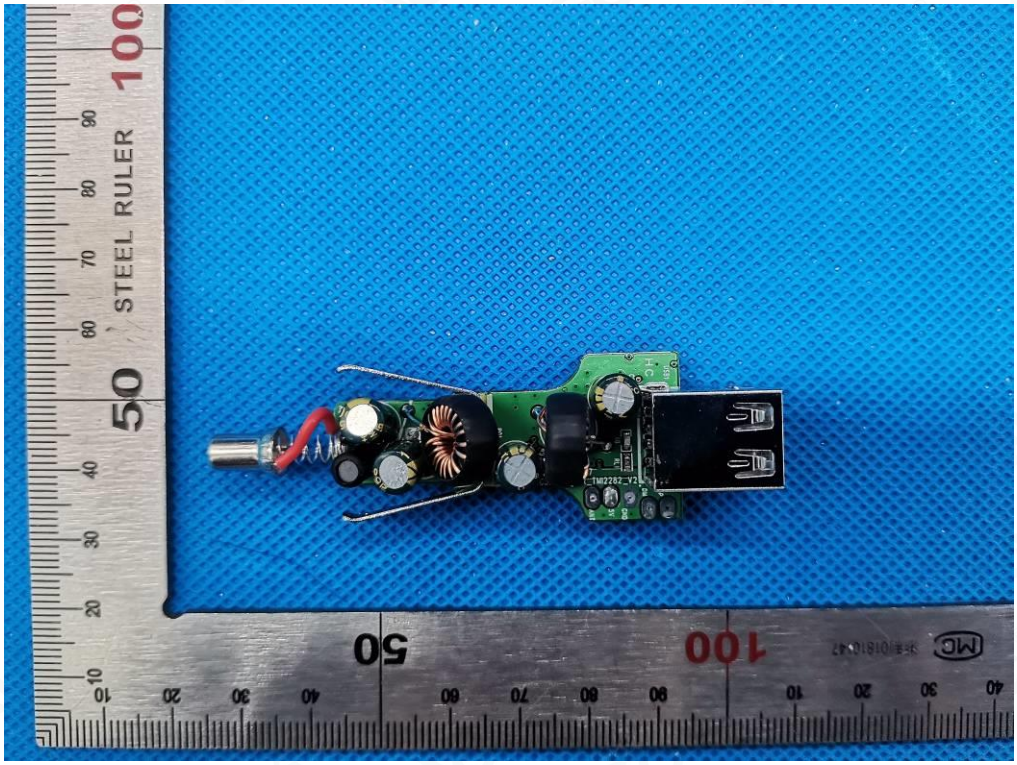
INTERNAL VIEW OF EUT-3



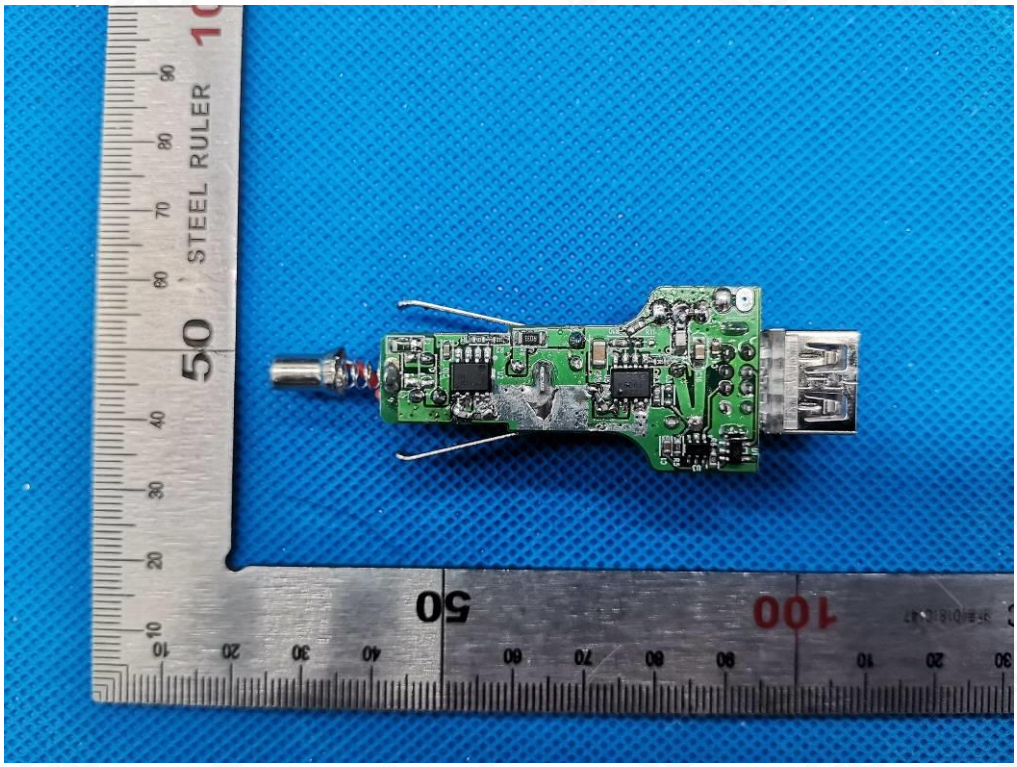
INTERNAL VIEW OF EUT-4



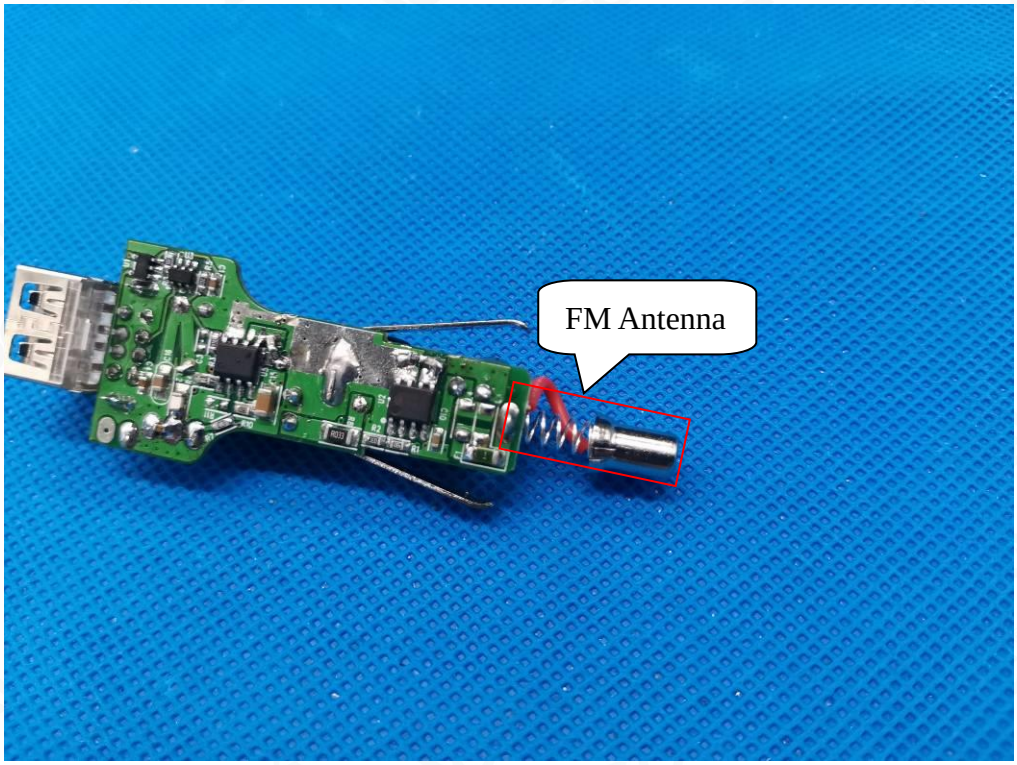
INTERNAL VIEW OF EUT-5



INTERNAL VIEW OF EUT-6



INTERNAL VIEW OF EUT-7



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