
FCC Test Report

Report No.: AGC02180191001FE06

FCC ID : IKQBTFM4B
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Wireless hands free car kit
BRAND NAME : Scosche
MODEL NAME : BTFM4PD, BTFM4, BTFM4-SP, BTFM4-SP1
APPLICANT : Scosche Industries Inc
DATE OF ISSUE : Nov. 07, 2019
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 | / | Nov. 07, 2019 | Valid | Initial Release |



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1. VERIFICATION OF CONFORMITY

| | |
|---------------------------------|---|
| Applicant | Scosche Industries Inc |
| Address | 1550 Pacific Ave Oxnard, CA, 93033 |
| Manufacturer | Scosche Industries Inc |
| Address | 1550 Pacific Ave Oxnard, CA, 93033 |
| Factory | Scosche Industries Inc |
| Address | 1550 Pacific Ave Oxnard, CA, 93033 |
| Product Designation | Wireless hands free car kit |
| Brand Name | Scosche |
| Test Model | BTFM4PD |
| Series Model | BTFM4, BTFM4-SP, BTFM4-SP1 |
| Difference description | All the same except for the model name and packaging colors |
| Date of test | Oct. 21, 2019 to Oct. 31, 2019 |
| 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 Dongguan Precise Testing Service 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

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Oct. 31, 2019

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Nov. 07, 2019

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Forrest Lei
Authorized Officer

Nov. 07, 2019

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) | 44.87dBuV/m(average)@3m |
| Modulation | FM |
| Number of channels | 199(Channel spacing 100kHz) |
| Hardware Version | HK-BTMF4-6926A-V2 |
| Software Version | V5.0 |
| Antenna Designation | Internal Antenna (Met 15.203 Antenna requirement) |
| Antenna Gain | 0.5dBi |
| Power Supply | DC 12V to 24V |

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

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB

Radiated measurement: +/- 3.91dB

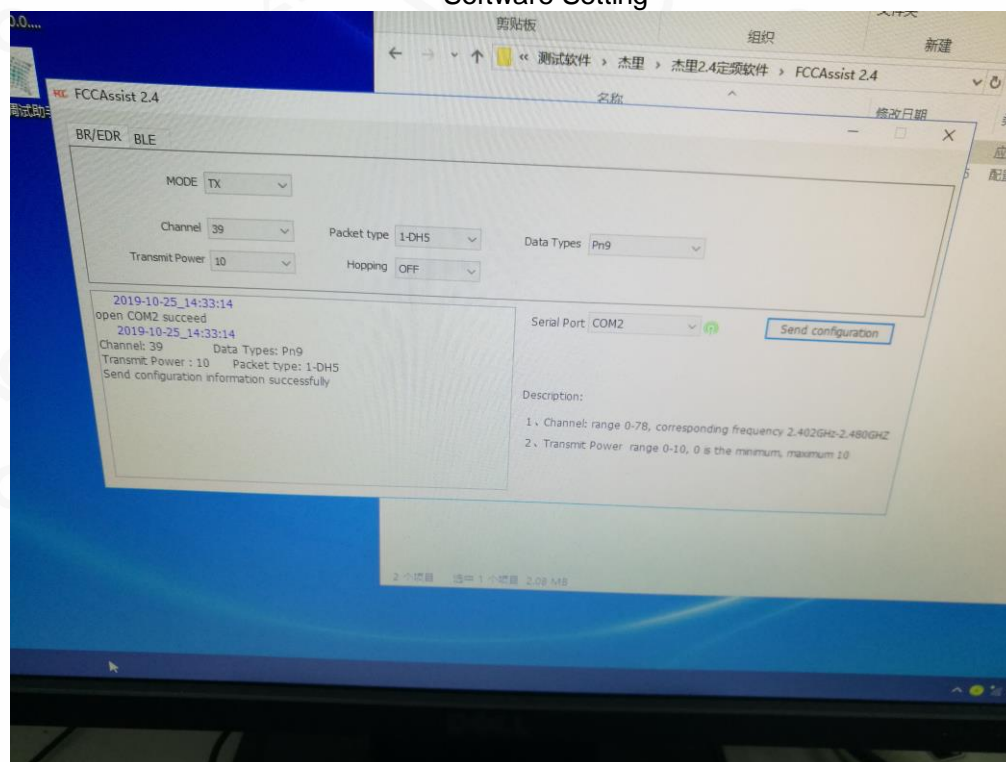
4. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION |
|-----|--|
| 1 | Sim TX BT Low channel GFSK + FM Low channel |
| 2 | Sim TX BT Middle channel GFSK+ FM Low channel |
| 3 | Sim TX BT High channel GFSK+ FM Low channel |
| 4 | Sim TX BT Low channel $\pi/4$ -DQPSK+ FM Low channel |
| 5 | Sim TX BT Middle channel $\pi/4$ -DQPSK+ FM Low channel |
| 6 | Sim TX BT High channel $\pi/4$ -DQPSK+ FM Low channel |
| 7 | Sim TX BT Low channel GFSK + FM Middle channel |
| 8 | Sim TX BT Middle channel GFSK+ FM Middle channel |
| 9 | Sim TX BT High channel GFSK+ FM Middle channel |
| 10 | Sim TX BT Low channel $\pi/4$ -DQPSK+ FM Middle channel |
| 11 | Sim TX BT Middle channel $\pi/4$ -DQPSK+ FM Middle channel |
| 12 | Sim TX BT High channel $\pi/4$ -DQPSK+ FM Middle channel |
| 13 | Sim TX BT Low channel GFSK + FM High channel |

| | |
|----|--|
| 14 | Sim TX BT Middle channel GFSK+ FM High channel |
| 15 | Sim TX BT High channel GFSK+ FM High channel |
| 16 | Sim TX BT Low channel $\pi/4$ -DQPSK+ FM High channel |
| 17 | Sim TX BT Middle channel $\pi/4$ -DQPSK+ FM High channel |
| 18 | Sim TX BT High channel $\pi/4$ -DQPSK+ FM High channel |

- Note: 1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
2. All the requirements have been tested 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.
4. Tuning-Range confirmed 88.1 ~ 107.9 MHz

Software Setting



5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

| Item | Equipment | Model No. | ID or Specification | Remark |
|------|-----------------------------|-----------|---------------------|--------|
| 1 | Wireless hands free car kit | BTFM4PD | IKQBTFM4B | EUT |
| 2 | Car battery | N/A | 12V 60Ah | AE |
| 3 | Car battery | N/A | 12V 60Ah | AE |
| 4 | Load | N/A | 1ohm | AE |
| 5 | Control Box | N/A | USB-TTL | 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.



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Service Hotline: 400 089 2118

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. 11, 2020 |
| EXA Signal Analyzer | Aglient | N9010A | MY53470504 | Dec. 20, 2018 | Dec. 19, 2019 |
| Attenuator | Warriors | W13 | 11324 | Sep. 09, 2019 | Sep. 08, 2020 |
| Active loop antenna (9K-30MHz) | ZHINAN | ZN30900C | 18051 | Jun. 14, 2018 | Jun. 13, 2020 |
| ANTENNA | SCHWARZBECK | VULB9168 | D69250 | Sep. 28, 2018 | Sep. 27, 2020 |
| Test software | FARA | EZ EMC(Ver. RA-03A) | N/A | N/A | N/A |



7. RADIATED EMISSION

7.1. MEASUREMENT PROCEDURE

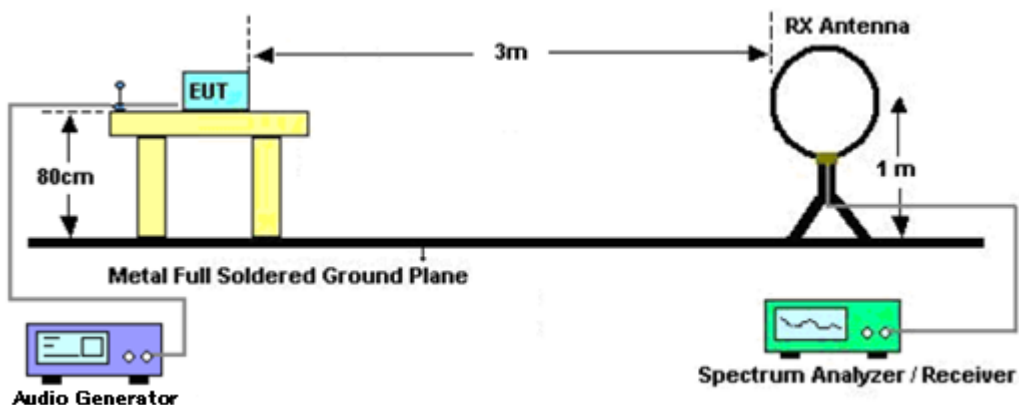
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground and opposite the horn antenna. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power 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.

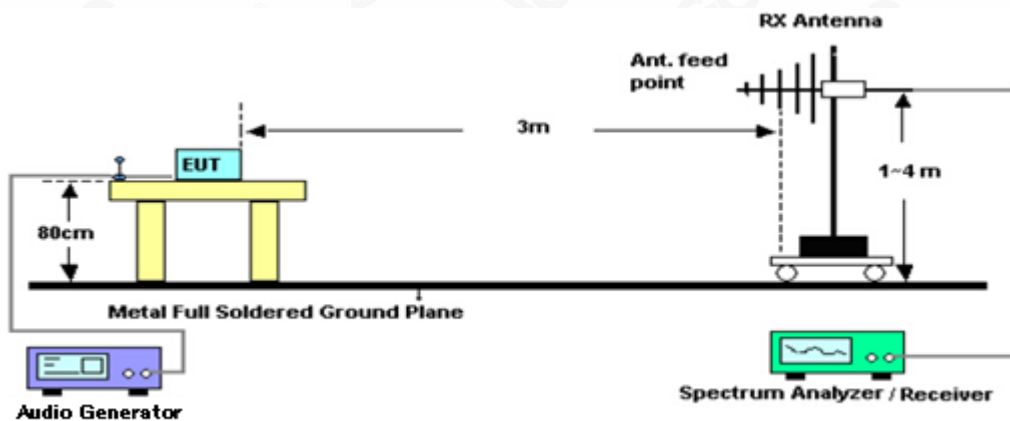
| Receiver Parameter | Setting |
|-----------------------|---------------------------------|
| Start ~Stop Frequency | 9KHz~150KHz/RBW 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RBW 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RBW 120KHz for QP |

7.2.TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.3. TEST RESULT FOR 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 | 46.15 | 67.96 | 21.81 | Pass | PK |
| 88.100 | V | 43.34 | 67.96 | 24.62 | Pass | PK |
| 98.000 | H | 45.67 | 67.96 | 22.29 | Pass | PK |
| 98.000 | V | 42.71 | 67.96 | 25.25 | Pass | PK |
| 107.900 | H | 45.62 | 67.96 | 22.34 | Pass | PK |
| 107.900 | V | 42.66 | 67.96 | 25.30 | Pass | PK |
| Frequency MHz | Polarization | Level dB(uV/m) AV | Limit dB(uV/m) AV | Margin dB | Pass/Fail | Detector |
| 88.100 | H | 44.53 | 47.96 | 3.43 | Pass | AV |
| 88.100 | V | 42.85 | 47.96 | 5.11 | Pass | AV |
| 98.000 | H | 44.87 | 47.96 | 3.09 | Pass | AV |
| 98.000 | V | 41.92 | 47.96 | 6.04 | Pass | AV |
| 107.900 | H | 44.67 | 47.96 | 3.29 | Pass | AV |
| 107.900 | V | 43.53 | 47.96 | 4.43 | 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 | 34.43 | 40 | 5.57 | Pass | QP |
| 88.000 | V | 32.85 | 40 | 7.15 | Pass | QP |
| 108.000 | H | 35.18 | 43.5 | 8.32 | Pass | QP |
| 108.000 | V | 30.31 | 43.5 | 13.19 | Pass | QP |

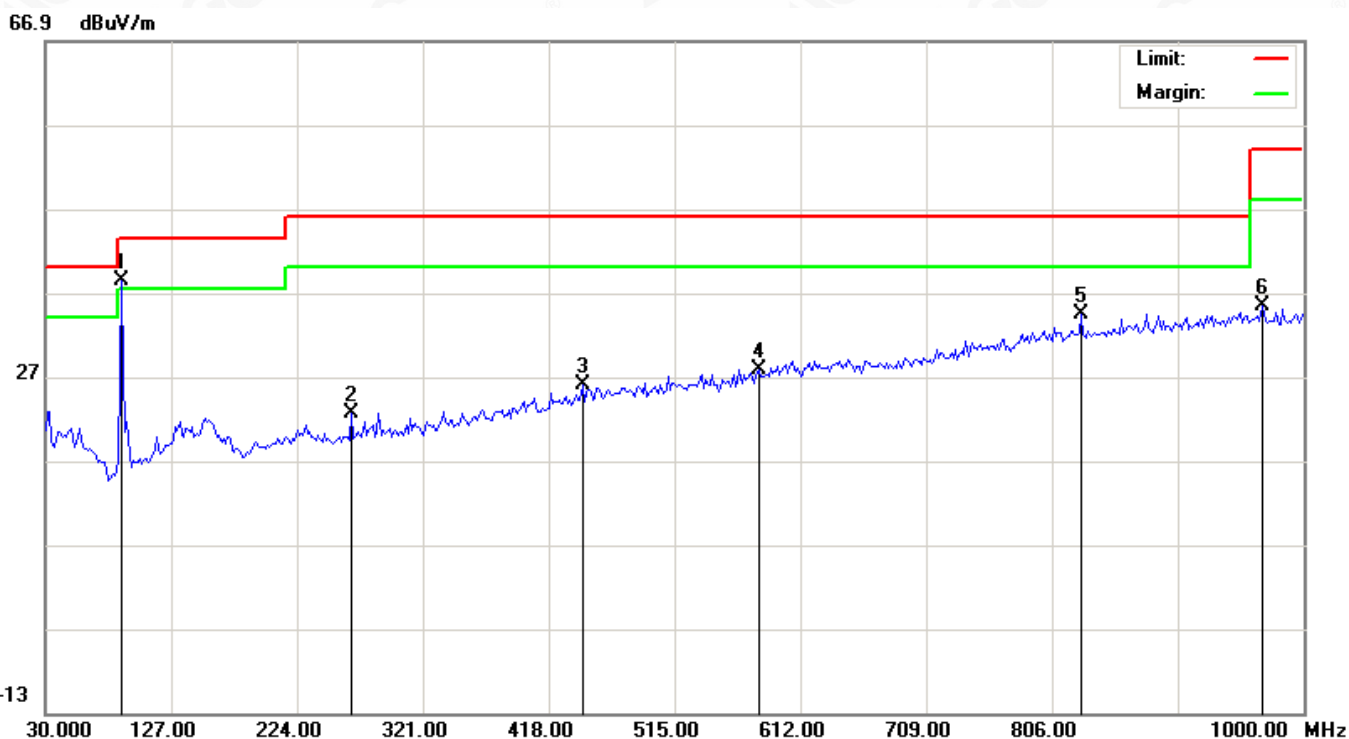
Note: The above two frequencies are the worst case for the band edge emission test.

7.5. TEST RESULT FOR SPURIOUS EMISSION

RADIATED EMISSION BELOW 30MHz

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

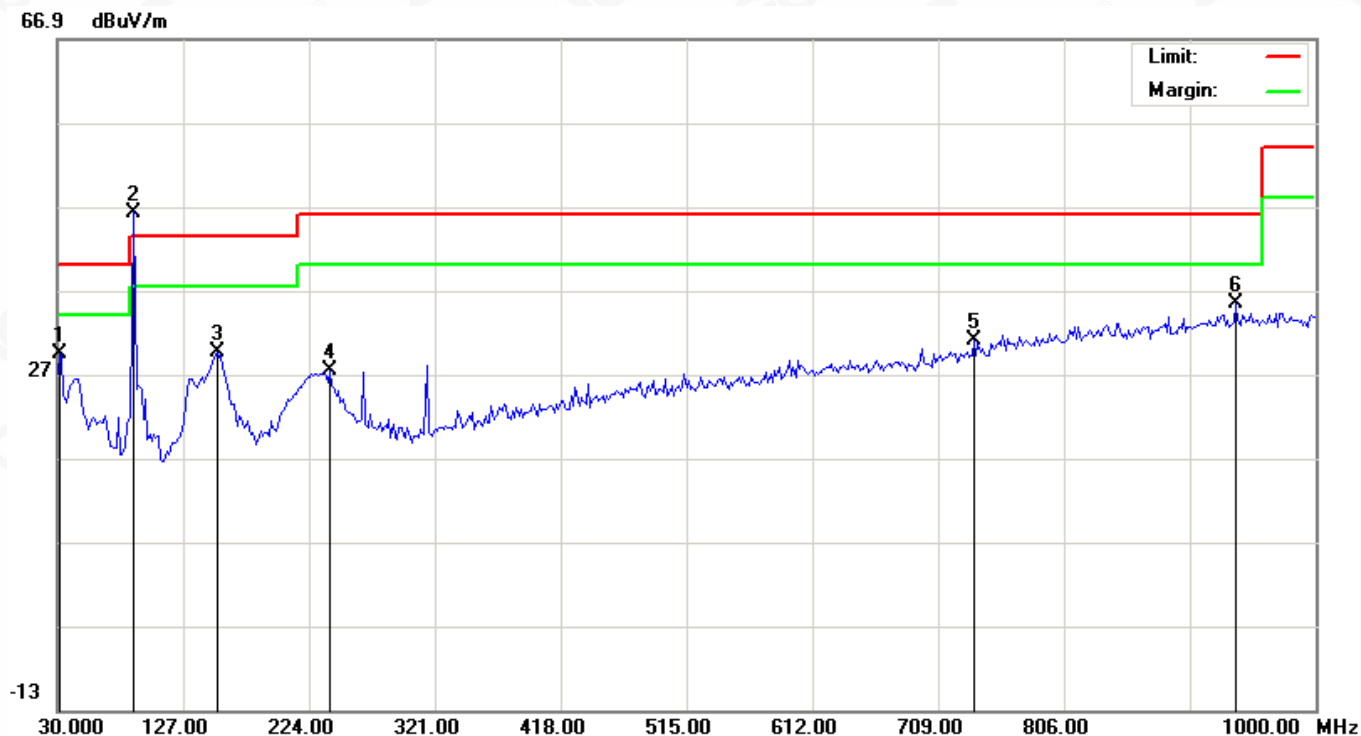
RADIATED EMISSION BELOW 1GHZ-Horizontal



| 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 | * | 88.2000 | 23.44 | 14.97 | 38.41 | 43.50 | -5.09 | peak | | | |
| 2 | | 266.0333 | 3.74 | 18.80 | 22.54 | 46.00 | -23.46 | peak | | | |
| 3 | | 443.8667 | 2.22 | 23.86 | 26.08 | 46.00 | -19.92 | peak | | | |
| 4 | | 579.6667 | 1.18 | 26.55 | 27.73 | 46.00 | -18.27 | peak | | | |
| 5 | | 828.6332 | 3.64 | 30.78 | 34.42 | 46.00 | -11.58 | peak | | | |
| 6 | | 967.6667 | 3.19 | 32.28 | 35.47 | 54.00 | -18.53 | 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 | 11.14 | 18.22 | 29.36 | 40.00 | -10.64 | peak | | | |
| 2 | * | 88.2000 | 31.33 | 14.97 | 46.30 | 43.50 | 2.80 | peak | | | |
| 3 | | 152.8667 | 10.37 | 19.20 | 29.57 | 43.50 | -13.93 | peak | | | |
| 4 | | 240.1667 | 8.73 | 18.66 | 27.39 | 46.00 | -18.61 | peak | | | |
| 5 | | 736.4833 | 2.00 | 28.97 | 30.97 | 46.00 | -15.03 | peak | | | |
| 6 | | 938.5667 | 3.30 | 32.03 | 35.33 | 46.00 | -10.67 | peak | | | |

RESULT: PASS

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

2. The "Factor" value can be calculated automatically by software of measurement system.

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

4. This 88.2MHz is the main frequency of FM.

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.

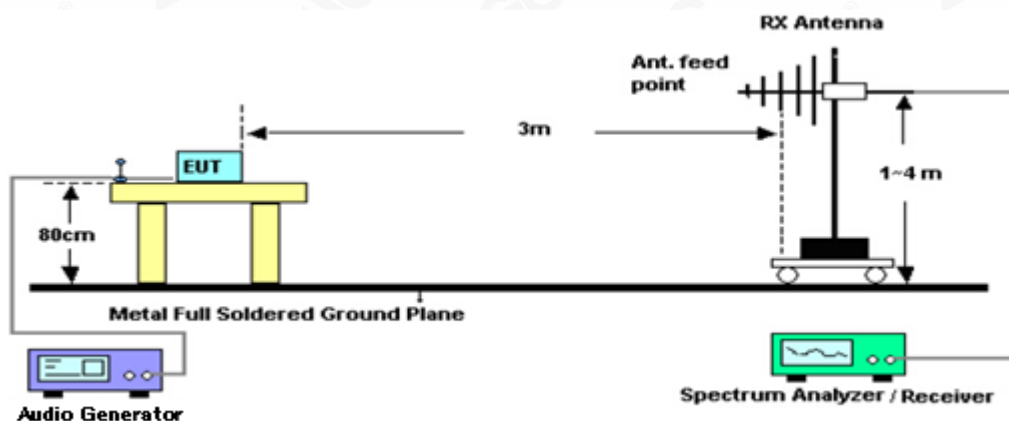
☐ The level of the tone shall be 16 dB higher than that required to produce a frequency deviation of 75 kHz, or 50% of the manufacturer's rated deviation, whichever is less.

☒ 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 the EUT 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.

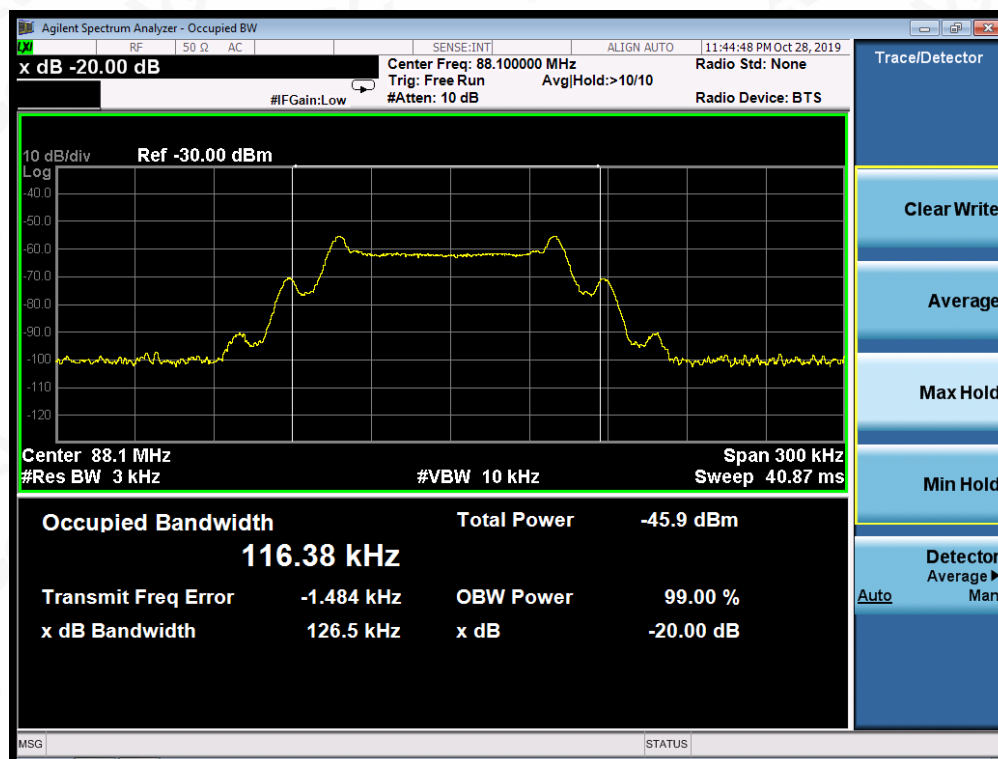
8.2. TEST SETUP



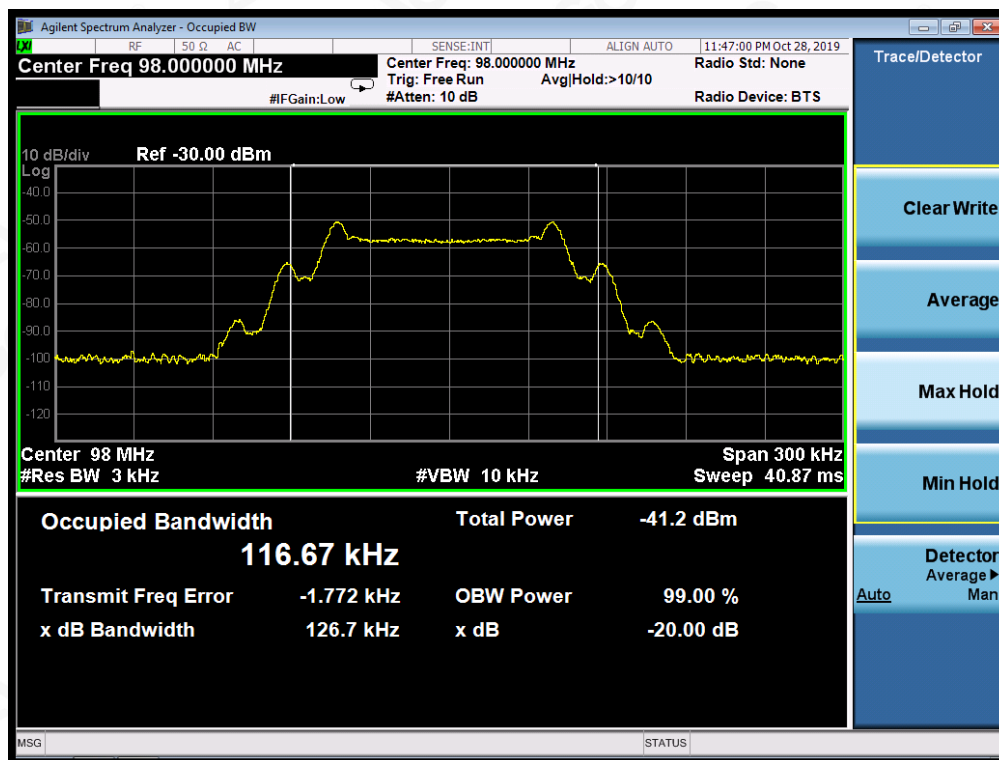
8.3. TEST RESULT

| Channel | Channel Frequency(MHz) | -20dB bandwidth (kHz) | Limit(kHz) |
|---------|------------------------|-----------------------|------------|
| Low | 88.1 | 126.5 | 200 |
| Middle | 98.0 | 126.7 | 200 |
| High | 107.9 | 126.8 | 200 |

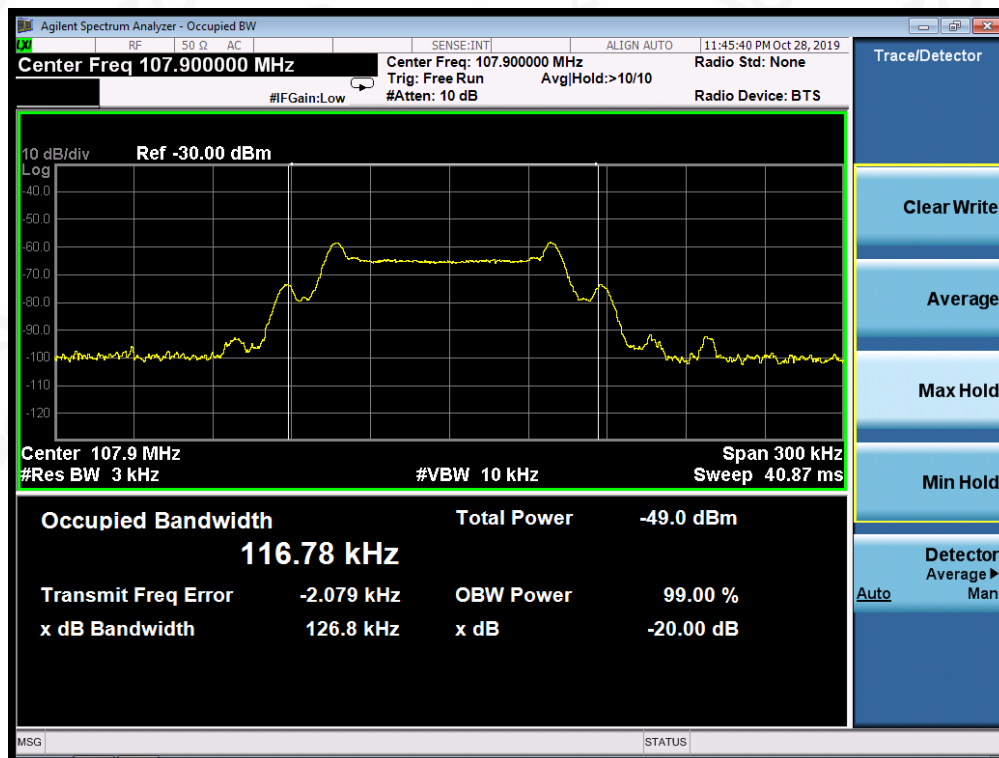
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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



RADIATED EMISSION TEST SETUP ABOVE 1G



APPENDIX B: PHOTOGRAPHS OF EUT

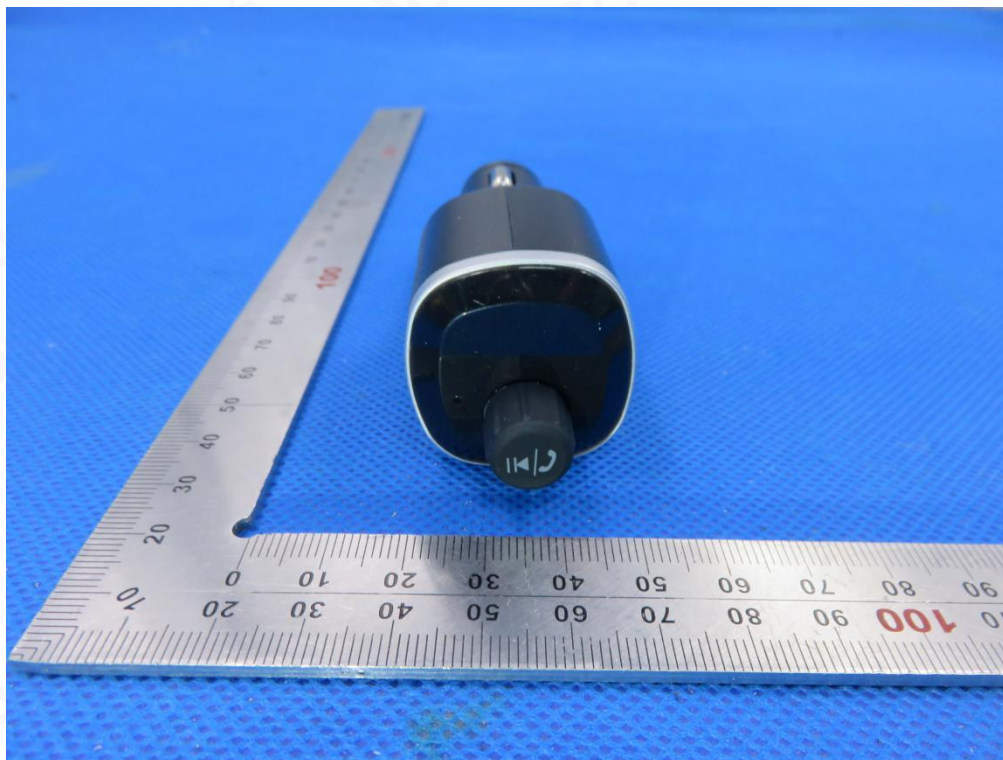
TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



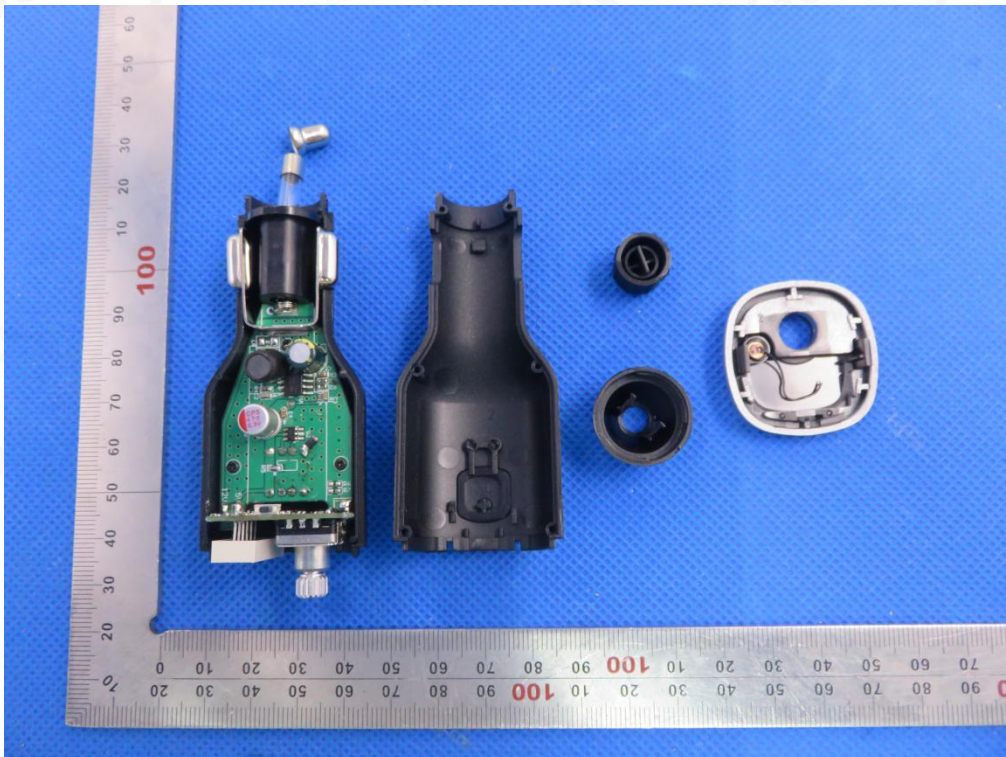
RIGHT VIEW OF EUT



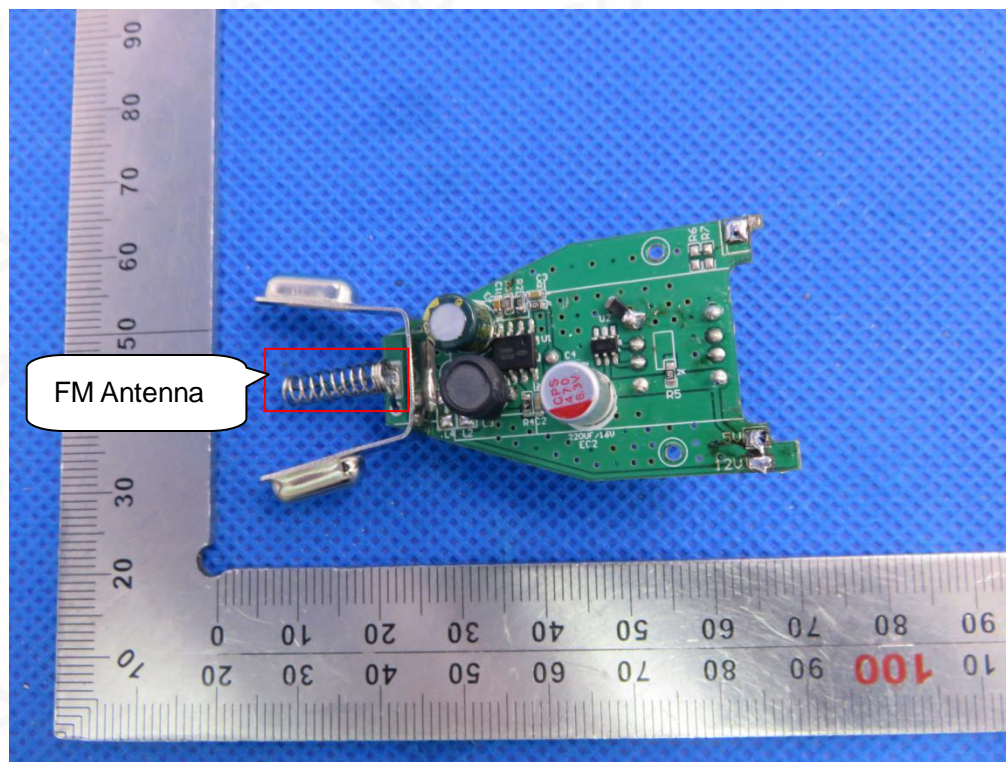
VIEW OF EUT(PORT)



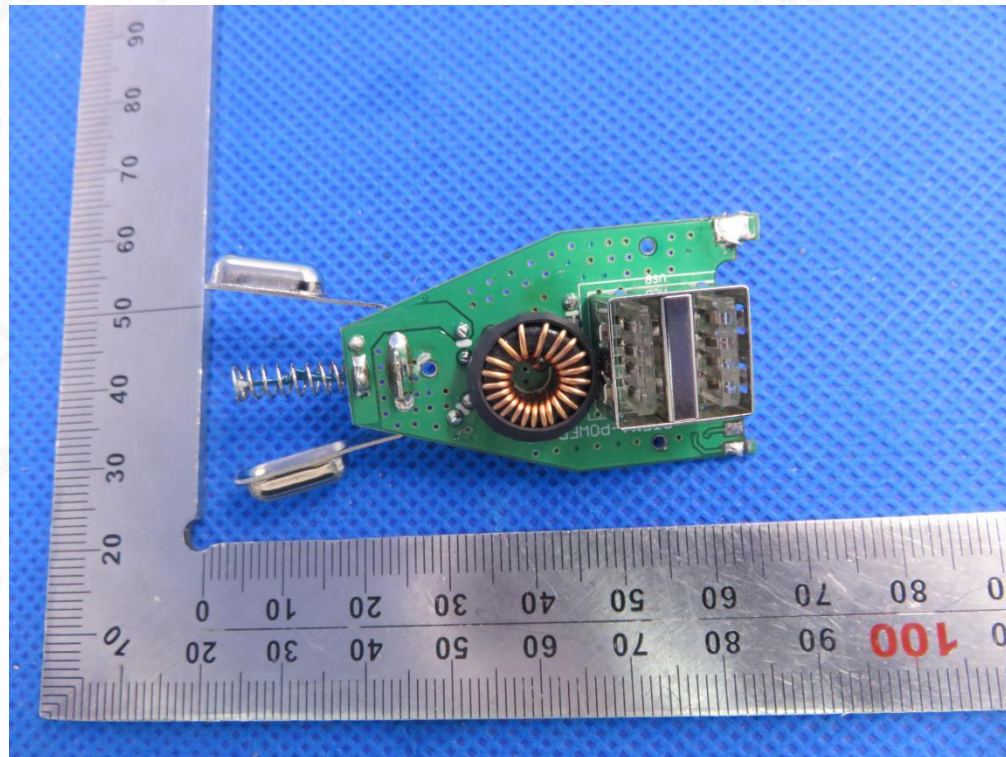
OPEN VIEW OF EUT



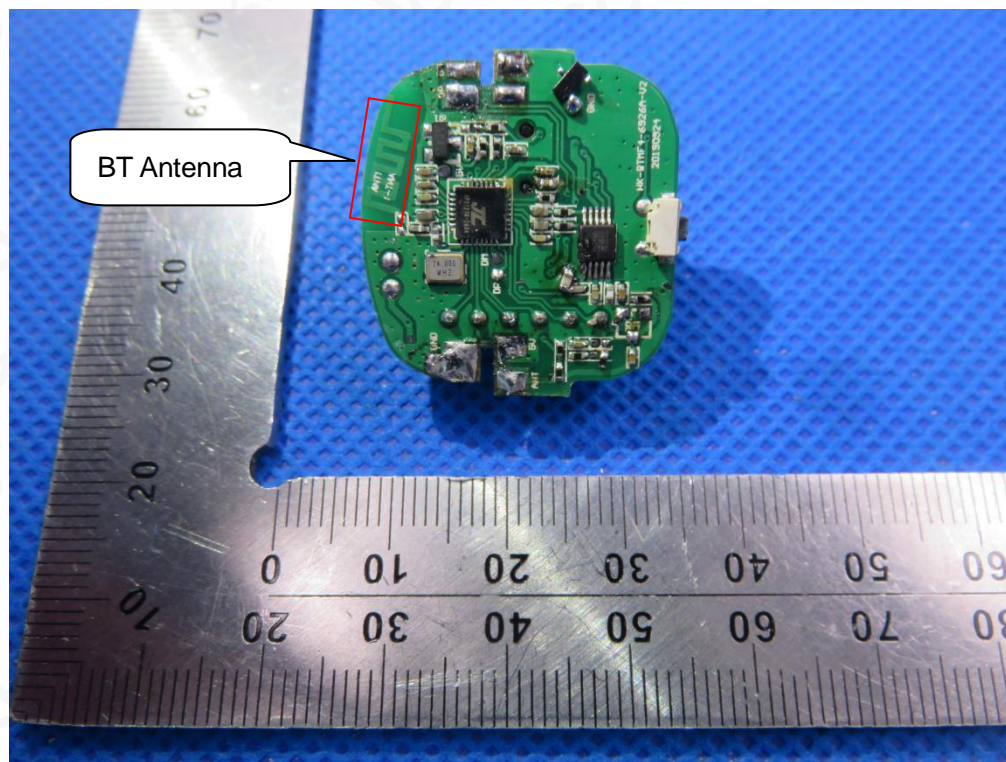
INTERNAL VIEW OF EUT-1



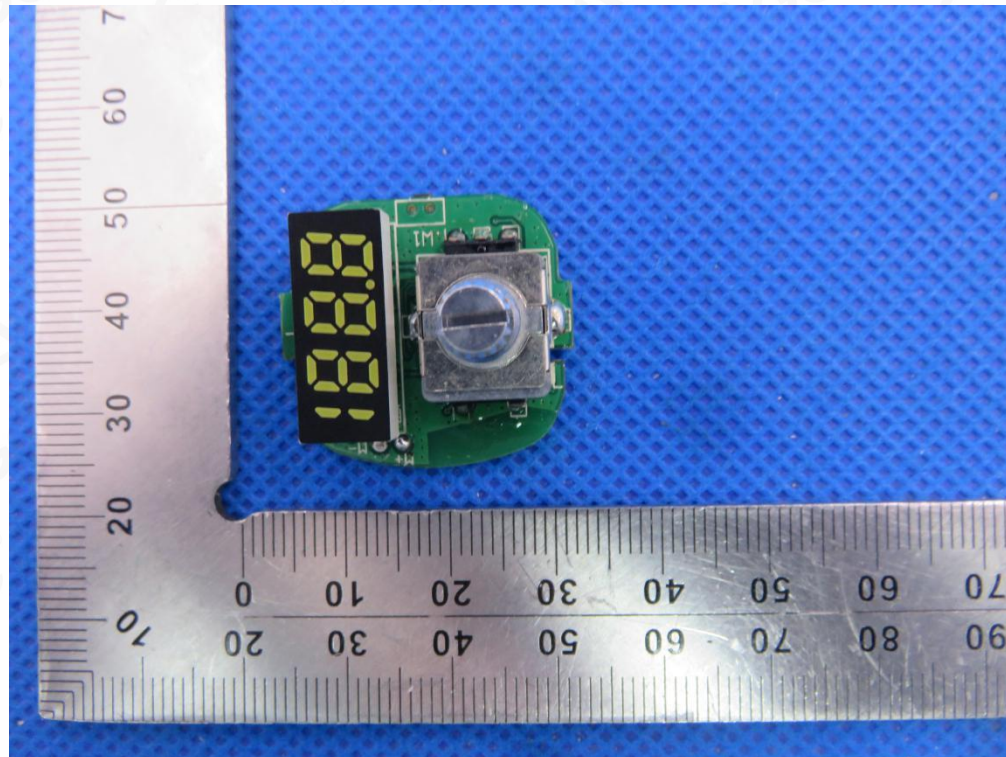
INTERNAL VIEW OF EUT-2



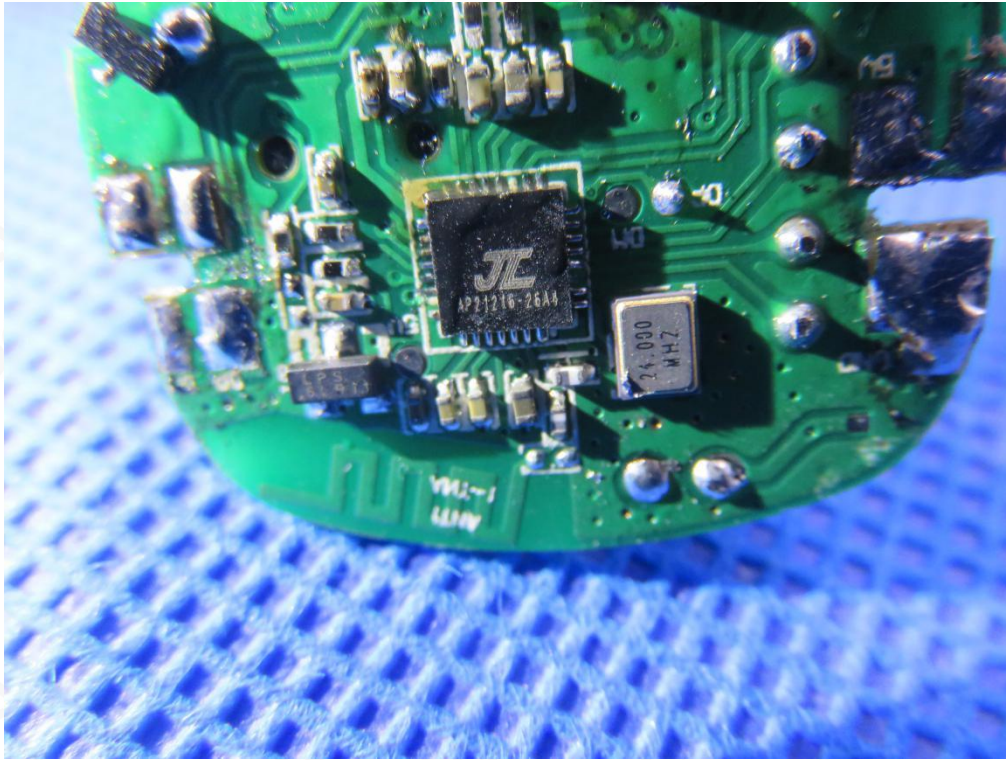
INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



INTERNAL VIEW OF EUT-5



----END OF REPORT----



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