

Test Report

Report No. : CE2019-00155

Company : Bullsone

Representative : Lee Chang-hun

Address : #2302, M, 32, Songdogwahak-ro, Yeonsu-gu, Incheon, 21984, Republic of Korea

1. Product Name : Air therapy multiaction
- Type and Model : Bullsone air therapy multiaction plus
2. Use of Report : Evaluation of EMC test
3. Date of Receipt : 2019-10-25
4. Date of test : 2019-11-13 ~ 2019-11-28
5. Testing Method : FCC 47 CFR Part 15 Subpart B(B class)
ANSI C 63.4-2014
6. Test Results : as stated in the annexed paper

Tested by : Seok Hyeon, Woo

Seok Hyeon, Woo

Approved by : Yong Sung, Kim

Yong Sung, Kim

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2019-11-28



Korea Testing Certification

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1.0 Testing Program Details

| | |
|---|--|
| Testing procedure and testing location | |
| Testing Laboratory | KTC (Korea Testing Certification) |
| Testing location / address | [15809] 22 Heungan-daero27beon-gil, Gunpo-si, Gyeonggi-Do, Republic of Korea |
| Tested by (name) | Seok Hyeon, Woo |
| Approved by (name) | Yong Sung, Kim |
| Test item description | Air therapy multiaction |
| Trade Mark | Bullsone air therapy multiaction plus |
| Manufacturer | UIL CO., Ltd. 869-26 Bogwang-ro, Kwangtan-myeon, Paju, Gyeonggi-do, Republic of Korea |
| Model / Type reference | Bullsone air therapy multiaction plus |
| Ratings | DC 12 V |
| Hardware / Software version | N/A |
| Possible test case verdicts | |
| - test case does not apply to test object | N/A |
| - test object does meet requirement | P (Pass) |
| - test object does not meet requirement | F (Fail) |
| Testing | |
| Date of receipt of test item | 2019-10-25 |
| Date(s) of performance of tests | 2019-11-13 ~ 2019-11-28 |
| General remarks: The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. | |



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1.1 Applicant Information

| | |
|---------|---|
| Name | Bullsonne |
| Address | #2302, M, 32, Songdogwahak-ro, Yeonsu-gu, Incheon, 21984, Republic of Korea |

1.2 Supporting Equipment Used During Test

| Use | Product Type | Manufacturer | Model | Comments |
|---------|-------------------------|----------------------------------|---|-----------------------|
| EUT(#1) | Air therapy multiaction | UIL CO., Ltd. | Bullsonne air therapy multiaction plus | DC FAN FD4010H05TB |
| EUT(#2) | Air therapy multiaction | UIL CO., Ltd. | Bullsonne air therapy multiaction plus | DC FAN HXD4010B05M |
| AE | Cigar jack | Shenzhen BON Electronics Co.,LTD | Bullsonne Air therapy multiaction CigarJack | |

Supplementary information:

EUT = Equipment Under Test, AE = Auxiliary / Associated Equipment,
SIM = Simulator (Not Subjected to Test).

1.3 Input / Output Ports

| Port No. | Name | Type | Cable Max. > 3 m | Cable Shielded | Comments |
|----------|------------|------|---------------------|----------------|----------|
| 1 | Power port | DC | 1.2 | N | |

Supplementary information:

AC = AC Power Port,
DC = DC Power Port,
N/E = Non-Electrical,
TP = Telecommunication Ports,
I/O = Signal Input or Output Port (Not Involved in Process Control).

1.4 Power Interface

| Mode No. | Voltage (V) | Current (A) | Power (W) | Frequency (Hz) | Phases (No.) | Comments |
|----------|-------------|-------------|-----------|----------------|--------------|--------------------------|
| 1 | DC 12 V | - | - | - | 1 | Test voltage & Frequency |

Supplementary information :



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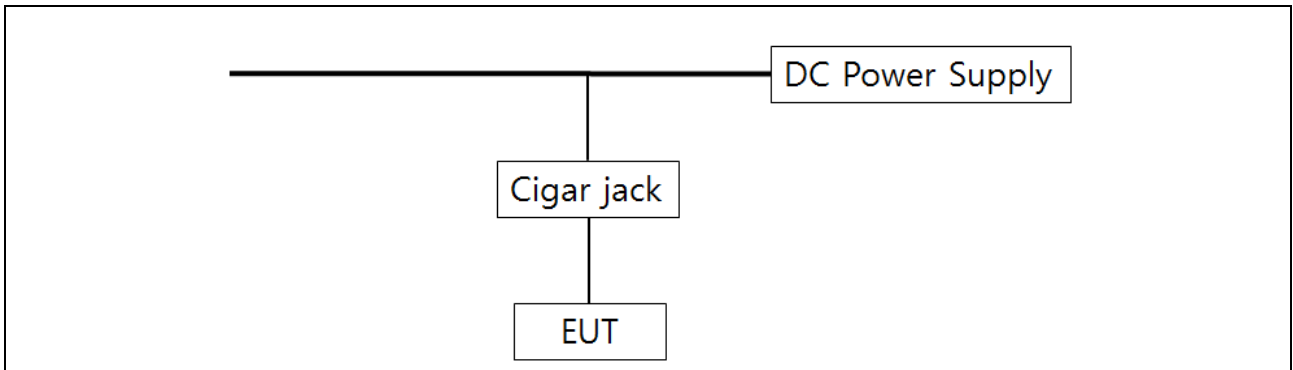
1.5 EUT Operation Modes

| Mode No. | Description |
|-----------------------------|----------------|
| 1 | Operating mode |
| Supplementary information : | |

1.6 EUT Configuration Modes

| Mode No. | Description |
|----------------------------|--|
| 1 | The EUT was connected with cigar jack. |
| Supplementary information: | |

1.7 Test System Layout



1.8 Modification

There was no modified item during the test.

1.9 Applicable Standards for Testing

| Standards | Status | Deviation |
|--|------------|--------------|
| FCC 47 CFR Part 15 Subpart B ANSI C 63.4-2014 | Applicable | No Deviation |

1.10 Summary of Test Results

| Requirement – Test | Result | Verdict |
|--------------------------------|--------|-----------------|
| Conducted Emission | N/A | No requirements |
| Radiated Emissions(Below 1GHz) | P | |
| Radiated Emissions(Above 1GHz) | P | |



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2.1 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range(30 MHz to 6 GHz) using a max hold mode incorporating a Peak detector and using the software of Radiated Emission Measurement Software EP5/RE(Version 6.0.10 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 GHz and a Peak and Average detector above 1 GHz. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.2 Limits of radiated emission measurement

- Below 1 GHz

| Frequency Range [MHz] | Limits ($\mu\text{V}/\text{m}$) | Measuring Distance |
|--------------------------|-----------------------------------|--------------------|
| | Quasi-peak | |
| 30 ~ 88 | 100 | Class B 3m |
| 88 ~ 216 | 150 | |
| 216 ~ 960 | 200 | |
| 960 ~ 1 000 | 500 | |

- Above 1 GHz

| Frequency Range [GHz] | Detector type | Limits ($\mu\text{V}/\text{m}$) | Measuring Distance |
|--------------------------|---------------|-----------------------------------|--------------------|
| 1 ~ 6 | Average | 54 | Class B 3m |
| 1 ~ 6 | Peak | 74 | |

2.3 Environment Conditions

- Below 1GHz

Temperature : 21 °C
Humidity : 42 %R.H.
Atmospheric Pressure : 100.9 kPa

- Above 1GHz

Temperature : 22 °C
Humidity : 43 %R.H.
Atmospheric Pressure : 101.2 kPa



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2.4 Test Site

10 m Semi-Anechoic Chamber in KTC Laboratory

2.5 Test Equipments

- Below 1 GHz

| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due |
|-------------------|-----------------------|--------------------|------------|------------|------------|
| EMI Test Receiver | Rohde/schwarz | ESR7 | 101368 | 2019-09-02 | 2020-09-02 |
| Pre amplifier | Sonoma Instrument Co. | 310N | 340215 | 2019-02-08 | 2020-02-08 |
| BiconiLog Antenna | Schwarzbeck | VULB9163 | 1044 | 2019-09-17 | 2021-09-17 |
| Antenna Master | innco systems | MA 4640-XP-ET-0800 | 7160519 | - | - |
| Turn Table | innco systems | DT3000-3t | - | - | - |

- Above 1 GHz

| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due |
|------------------------|---------------|-----------|------------|------------|------------|
| EMI Test Receiver | Rohde/schwarz | ESR7 | 101368 | 2019-09-02 | 2020-09-02 |
| Pre amplifier | Rohde/schwarz | SCU 18 | 10142 | 2019-09-03 | 2020-09-03 |
| High Gain Horn Antenna | Schwarzbeck | BBHA9120D | 918 | 2019-07-04 | 2020-07-04 |
| Antenna Mast | Maturo | AM2.0 | - | - | - |
| Turn Table | innco systems | DT3000-3t | - | - | - |



Test Result

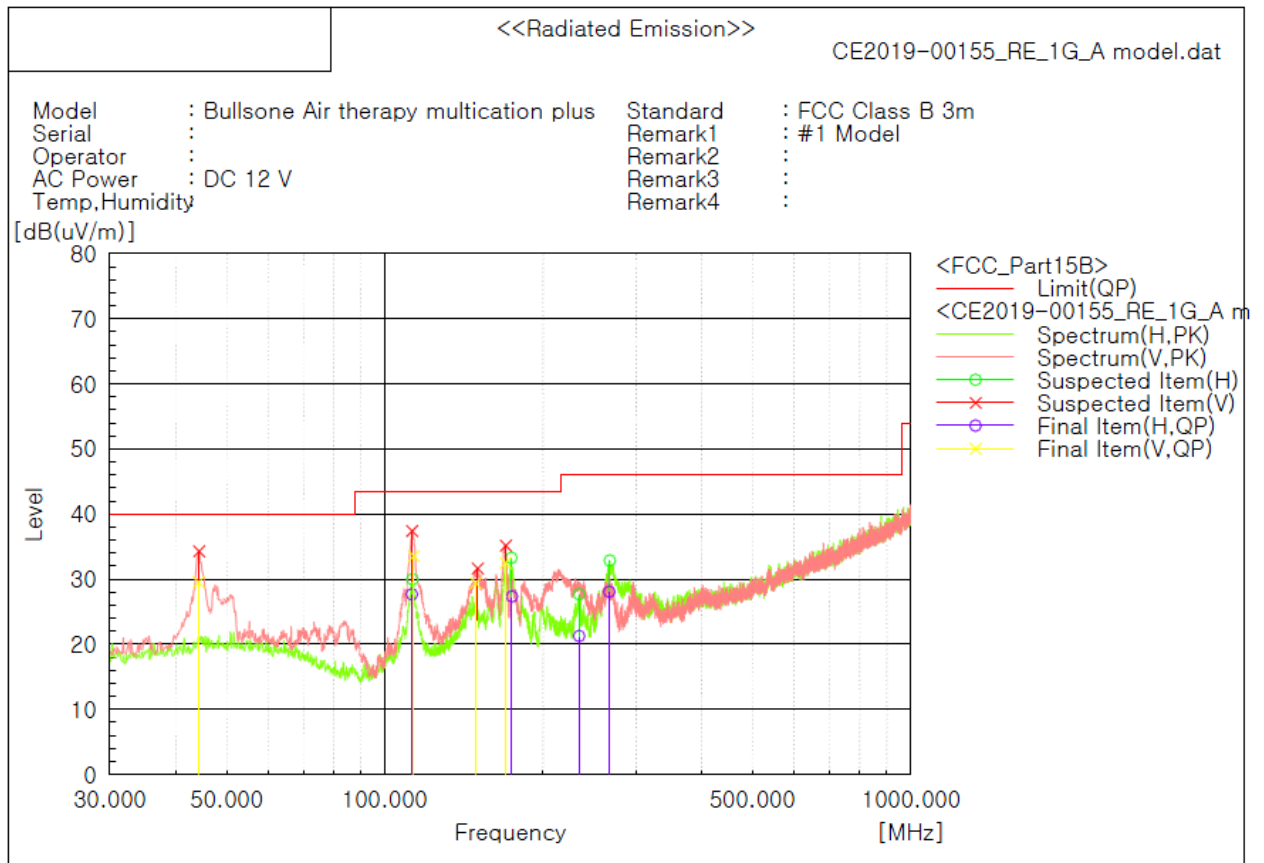
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2.6 Test Results

- Below 1GHz

Test Date : 2019. 11. 19

1) EUT(#1)



Final Result

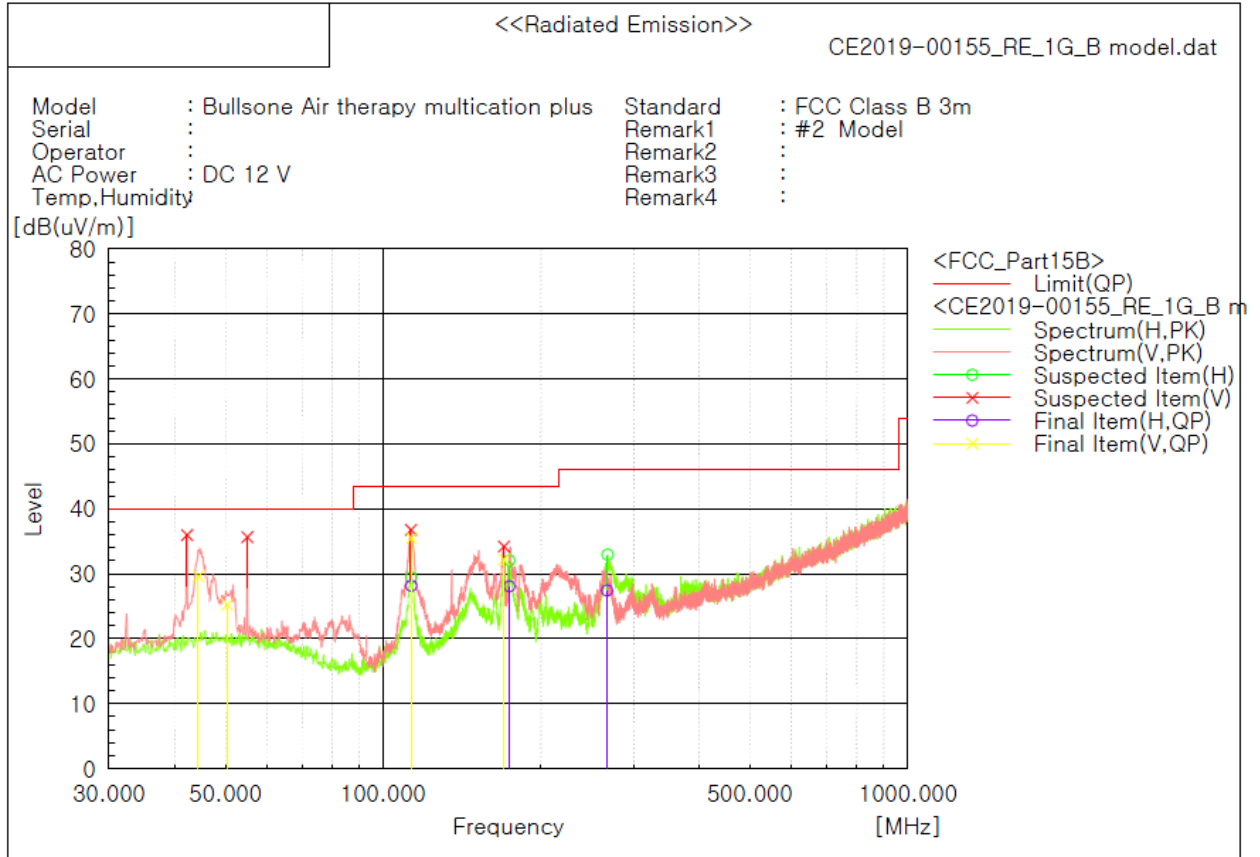
| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1 | 44.251 | V | 41.1 | -11.5 | 29.6 | 40.0 | 10.4 | 101.4 | 40.0 | |
| 2 | 113.225 | V | 47.2 | -13.6 | 33.6 | 43.5 | 9.9 | 101.8 | 21.8 | |
| 3 | 112.630 | H | 41.1 | -13.5 | 27.6 | 43.5 | 15.9 | 294.7 | 135.0 | |
| 4 | 148.737 | V | 39.8 | -10.4 | 29.4 | 43.5 | 14.1 | 102.8 | 190.7 | |
| 5 | 169.282 | V | 42.6 | -10.0 | 32.6 | 43.5 | 10.9 | 100.6 | 248.9 | |
| 6 | 174.332 | H | 38.1 | -10.7 | 27.4 | 43.5 | 16.1 | 335.6 | 135.0 | |
| 7 | 234.185 | H | 32.8 | -11.5 | 21.3 | 46.0 | 24.7 | 220.9 | 259.8 | |
| 8 | 267.183 | H | 37.7 | -9.6 | 28.1 | 46.0 | 17.9 | 178.6 | 56.9 | |



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2) EUT(#2)



Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1 | 44.395 | V | 41.2 | -11.5 | 29.7 | 40.0 | 10.3 | 101.7 | 172.6 | |
| 2 | 50.314 | V | 36.3 | -11.0 | 25.3 | 40.0 | 14.7 | 101.8 | 186.6 | |
| 3 | 113.021 | V | 49.1 | -13.6 | 35.5 | 43.5 | 8.0 | 101.8 | 40.5 | |
| 4 | 113.100 | H | 41.8 | -13.6 | 28.2 | 43.5 | 15.3 | 288.8 | 78.1 | |
| 5 | 169.846 | V | 42.2 | -10.0 | 32.2 | 43.5 | 11.3 | 101.8 | 264.1 | |
| 6 | 174.026 | H | 38.7 | -10.6 | 28.1 | 43.5 | 15.4 | 338.7 | 138.6 | |
| 7 | 267.223 | H | 37.1 | -9.6 | 27.5 | 46.0 | 18.5 | 172.6 | 58.7 | |



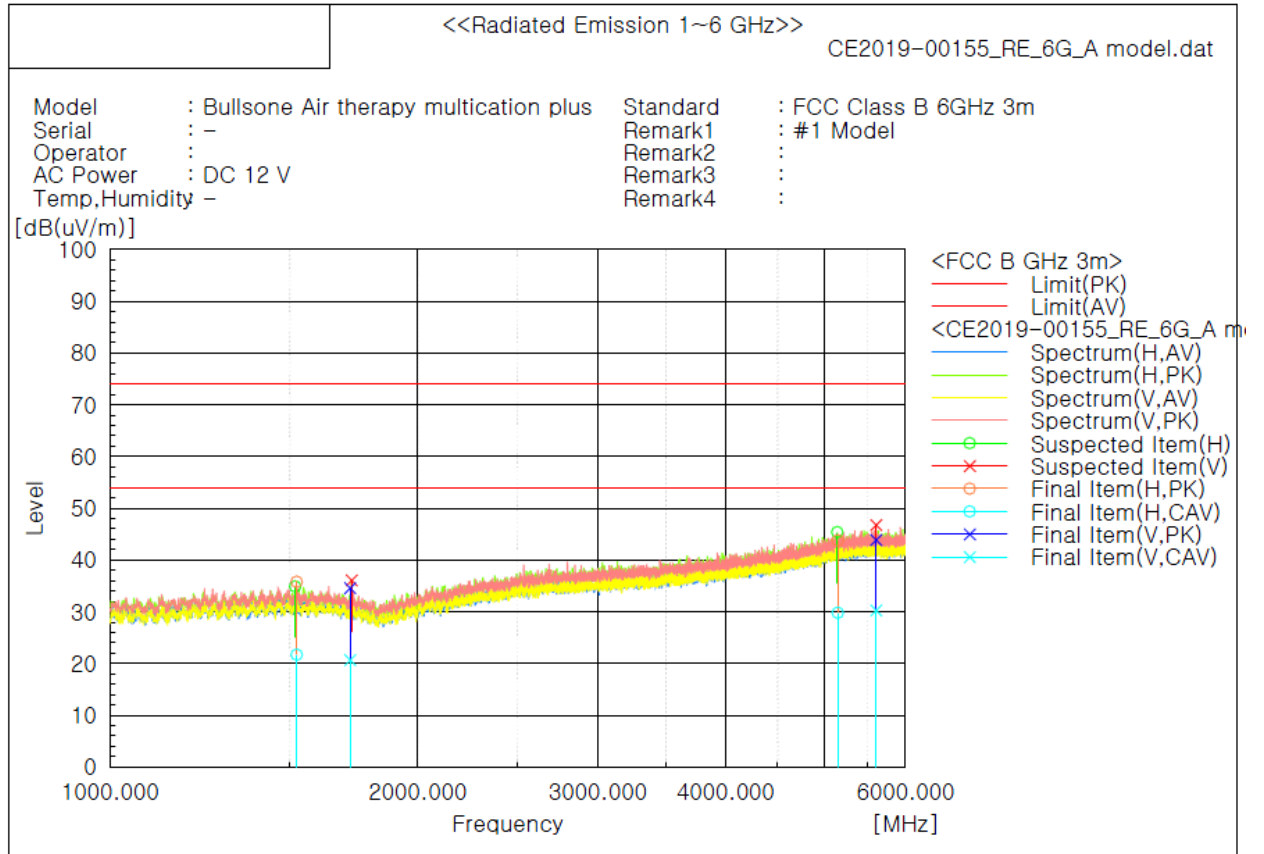
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- Above 1GHz

Test Date : 2019. 11. 22

1) EUT(#1)



Final Result

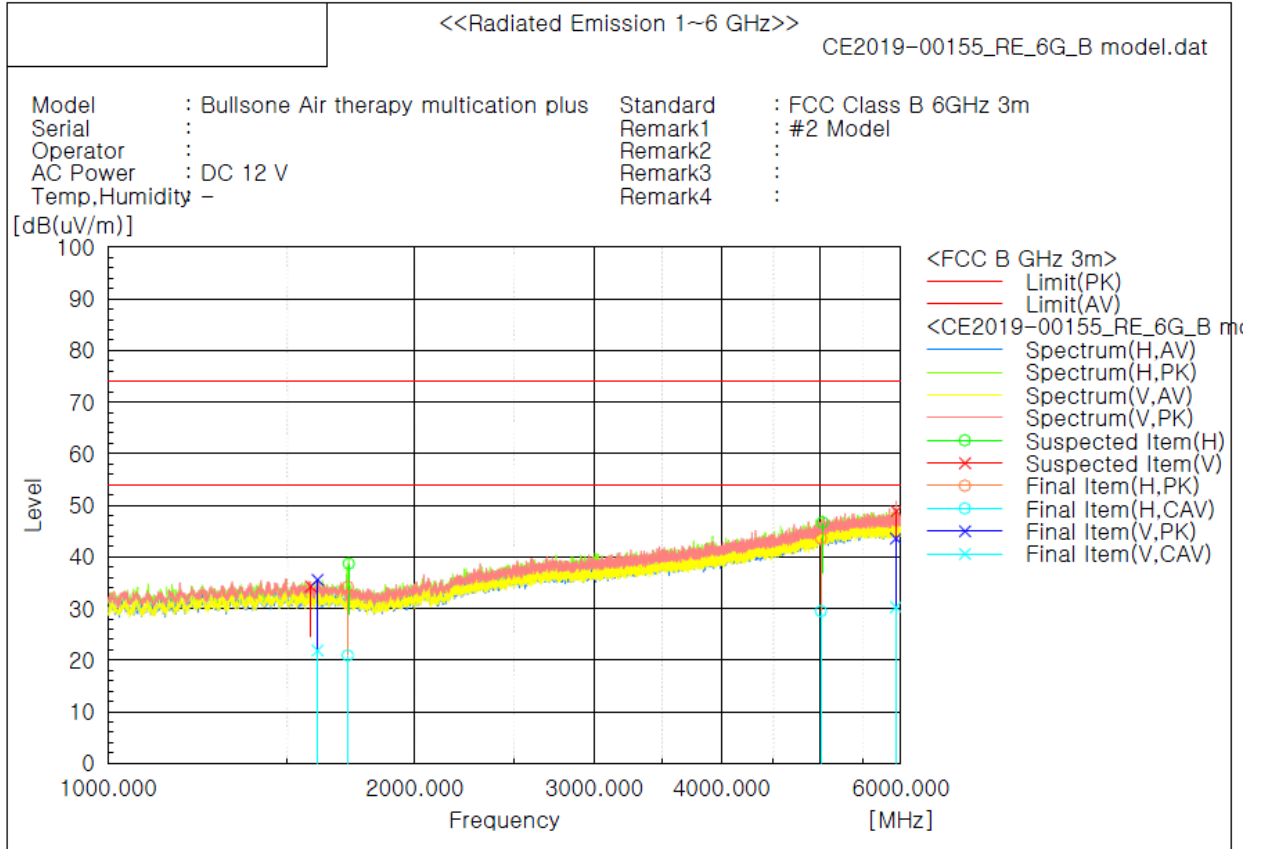
| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c. f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|----------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1 | 1522.506 | H | 49.4 | 35.3 | -13.6 | 35.8 | 21.7 | 74.0 | 54.0 | 38.2 | 32.3 | 100.0 | 349.7 | |
| 2 | 1716.670 | V | 47.6 | 33.7 | -13.0 | 34.6 | 20.7 | 74.0 | 54.0 | 39.4 | 33.3 | 100.0 | 147.0 | |
| 3 | 5148.481 | H | 43.9 | 29.9 | -0.1 | 43.8 | 29.8 | 74.0 | 54.0 | 30.2 | 24.2 | 100.0 | 288.8 | |
| 4 | 5617.488 | V | 43.0 | 29.4 | 0.9 | 43.9 | 30.3 | 74.0 | 54.0 | 30.1 | 23.7 | 100.0 | 230.2 | |



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2) EUT(#2)



Final Result

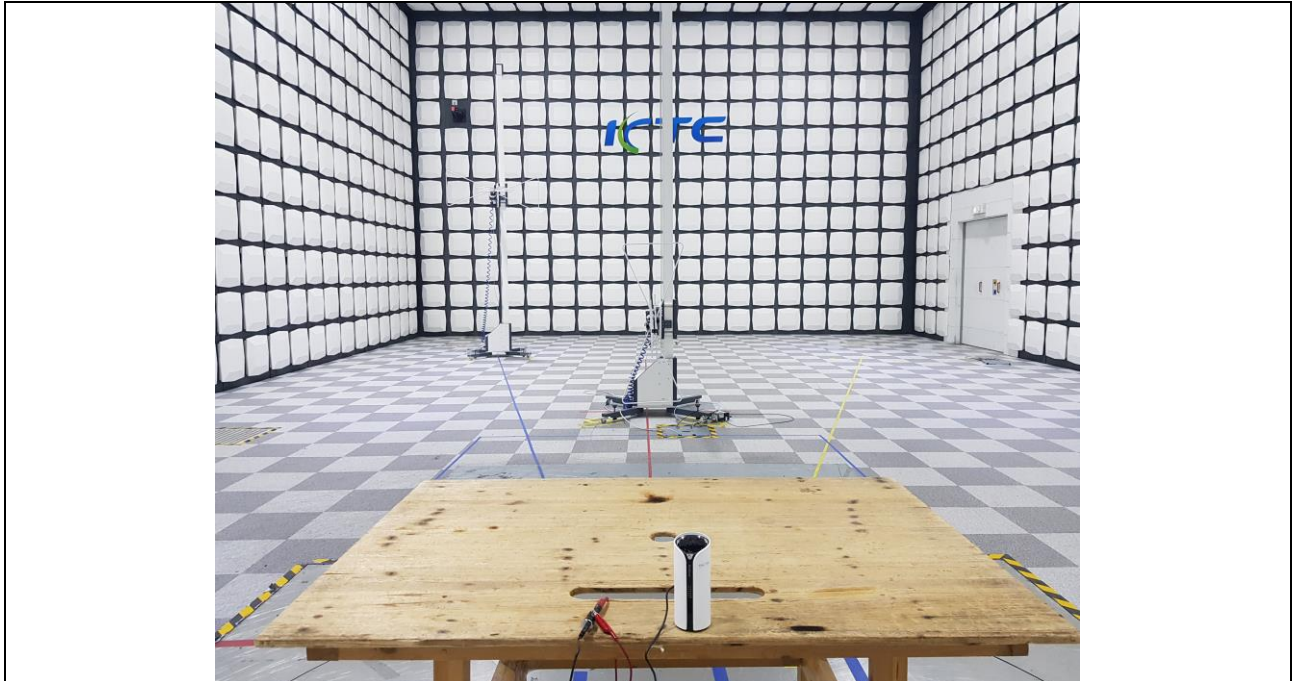
| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1 | 1605.335 | V | 49.0 | 35.3 | -13.4 | 35.6 | 21.9 | 74.0 | 54.0 | 38.4 | 32.1 | 100.0 | 12.9 | |
| 2 | 1719.019 | H | 47.2 | 33.9 | -13.0 | 34.2 | 20.9 | 74.0 | 54.0 | 39.8 | 33.1 | 100.0 | 68.3 | |
| 3 | 5007.684 | H | 44.3 | 30.2 | -0.7 | 43.6 | 29.5 | 74.0 | 54.0 | 30.4 | 24.6 | 100.0 | 0.2 | |
| 4 | 5929.576 | V | 42.6 | 29.3 | 1.0 | 43.6 | 30.3 | 74.0 | 54.0 | 30.4 | 23.7 | 100.0 | 359.8 | |



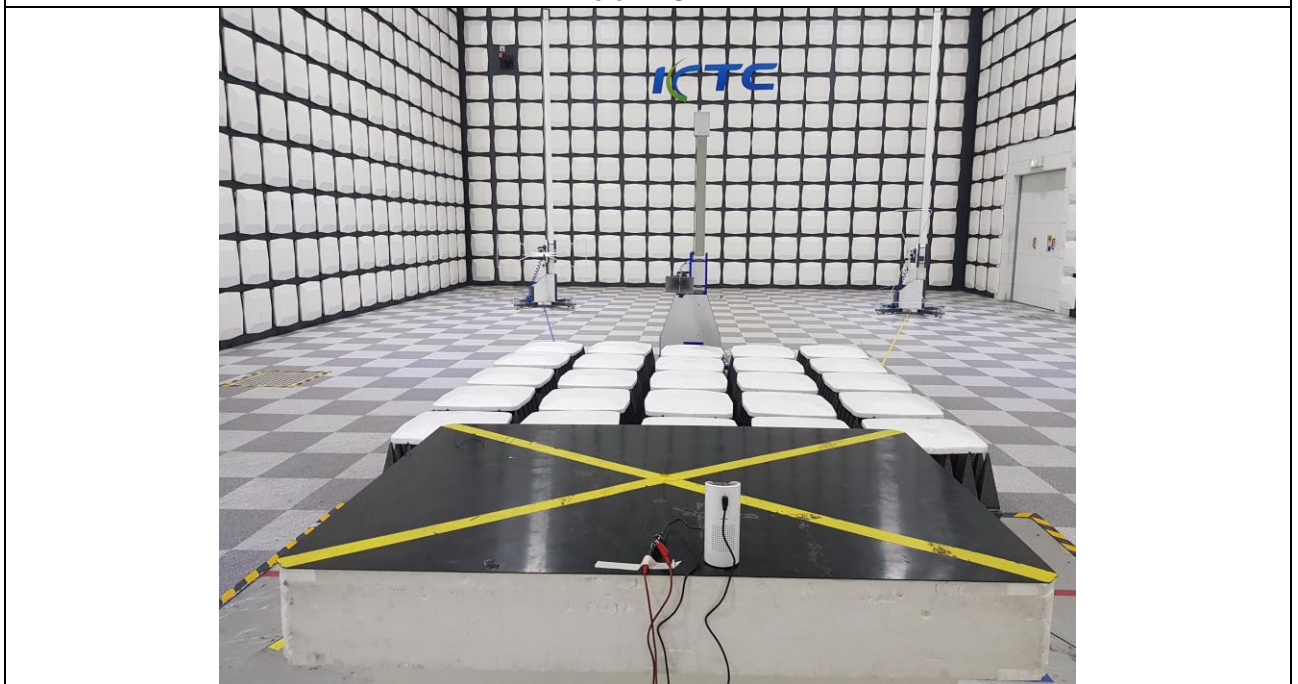
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2.7 Photographs of test setup



Below 1GHz



Above 1GHz



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3.1 Photographs of EUT

- EUT(#1)



Front of EUT



Rear of EUT



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Top of EUT

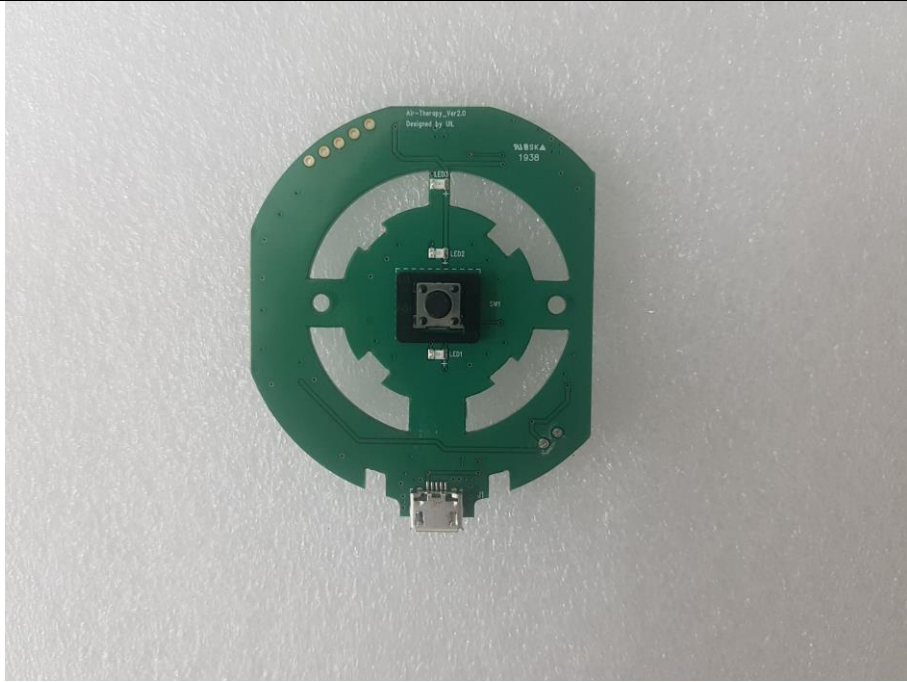


Bottom of EUT

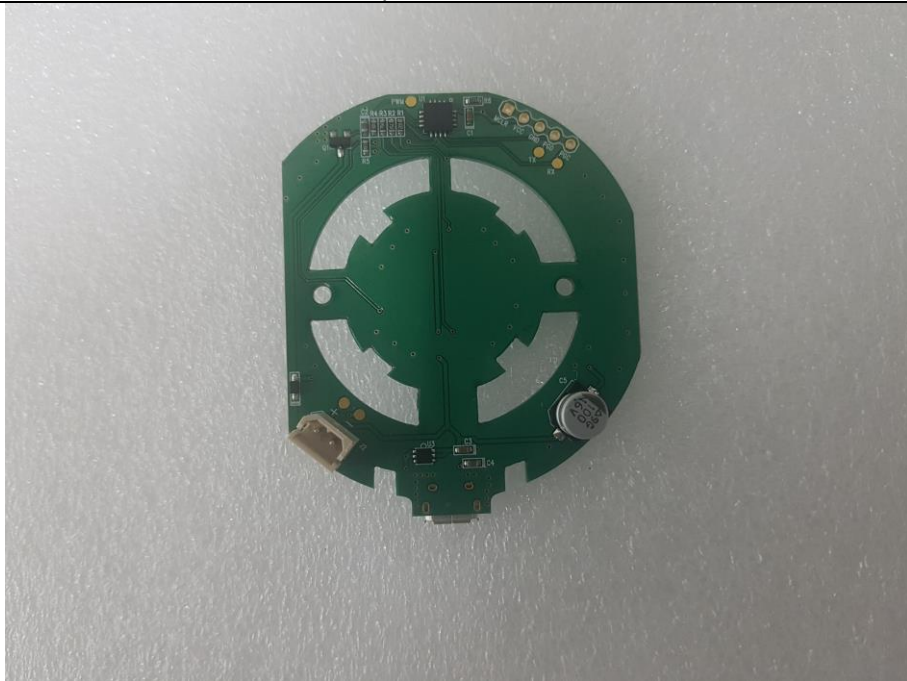


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Top of Main board

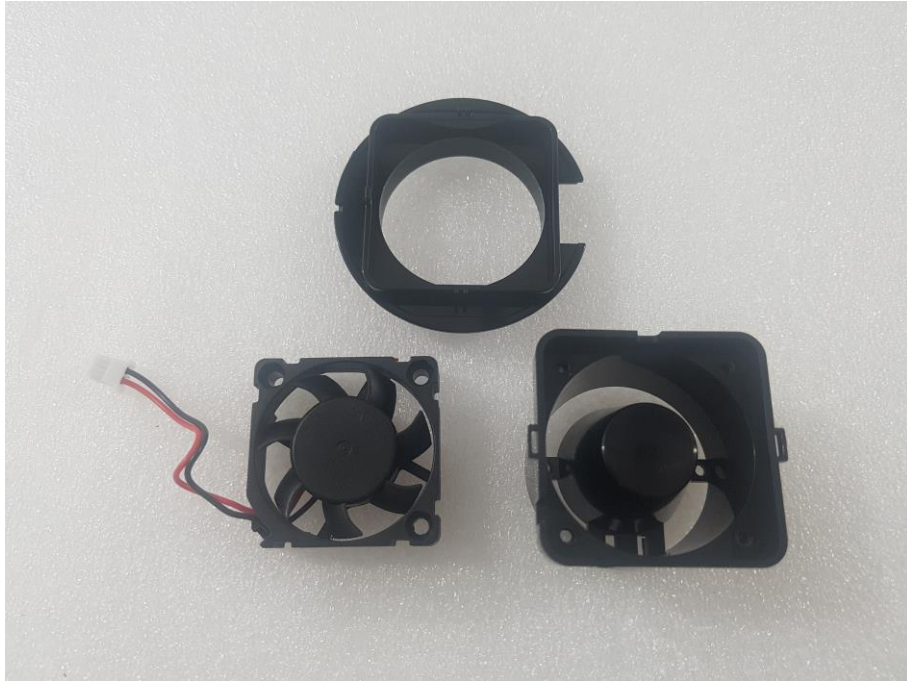


Bottom of Main board

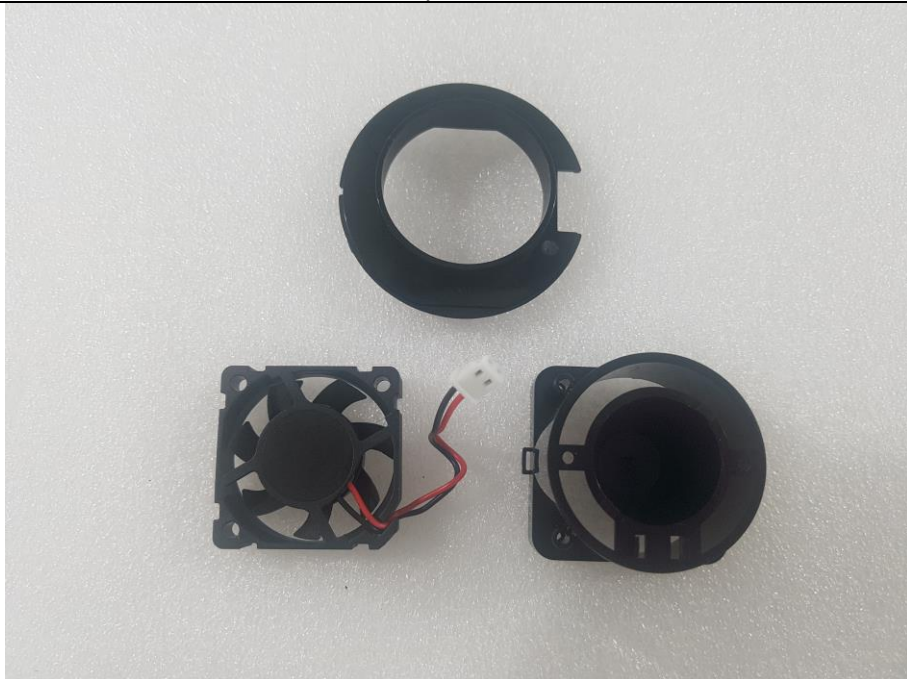


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Top of Fan

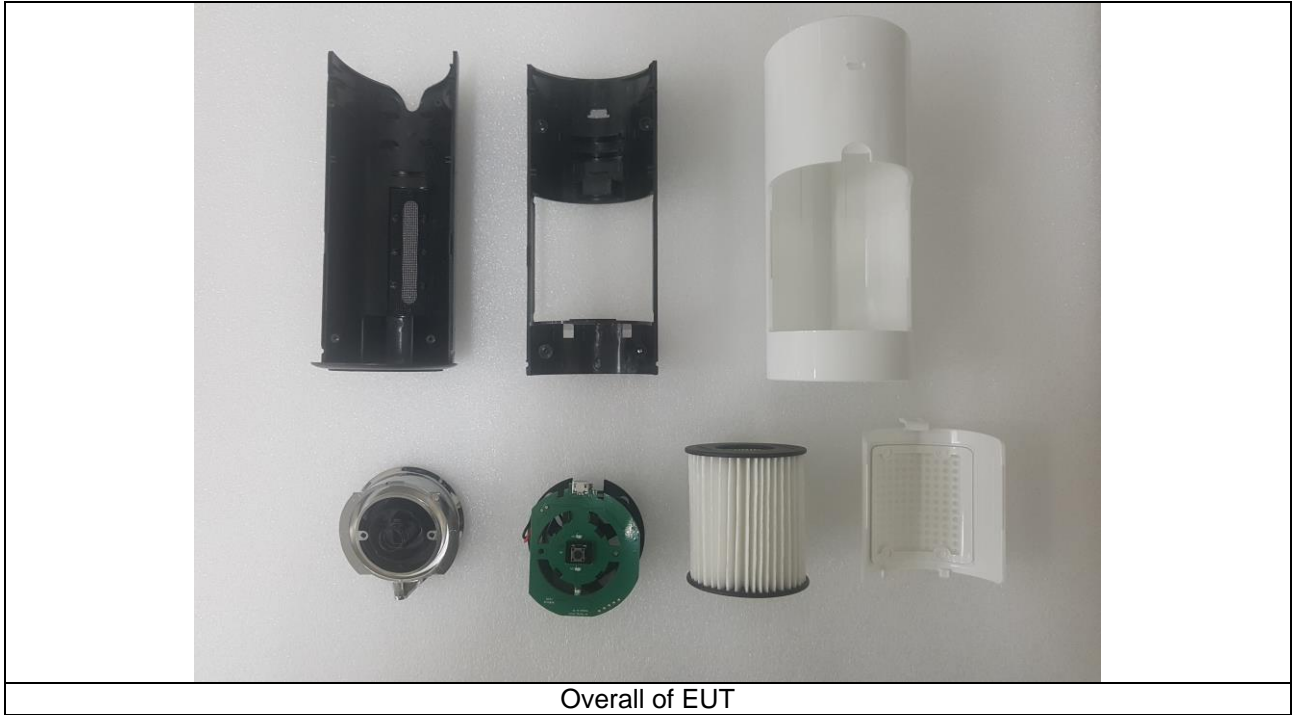


Bottom of Fan



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- EUT(#2)



Front of EUT



Rear of EUT



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Top of EUT

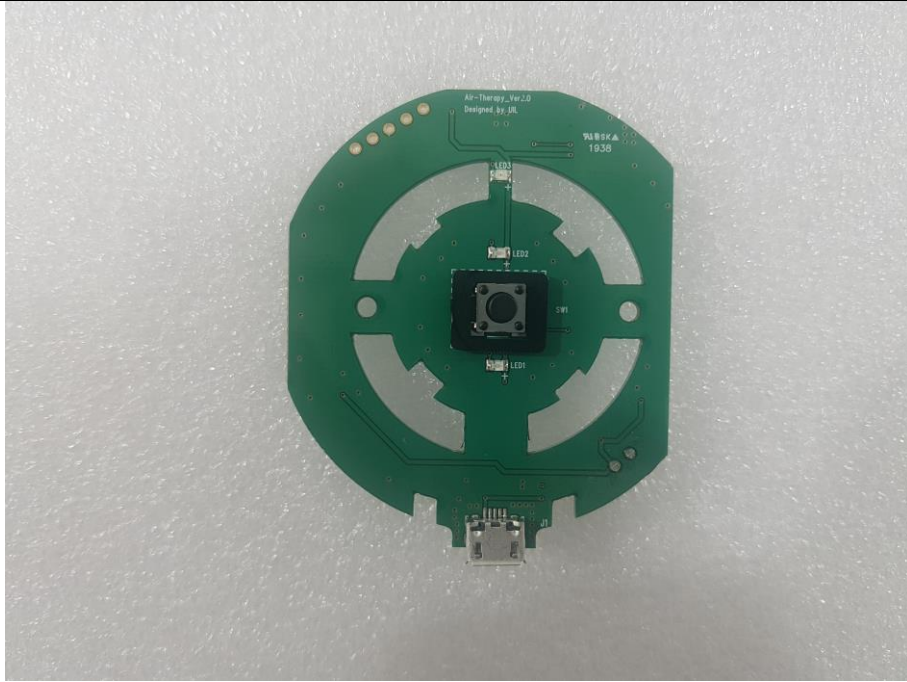


Bottom of EUT

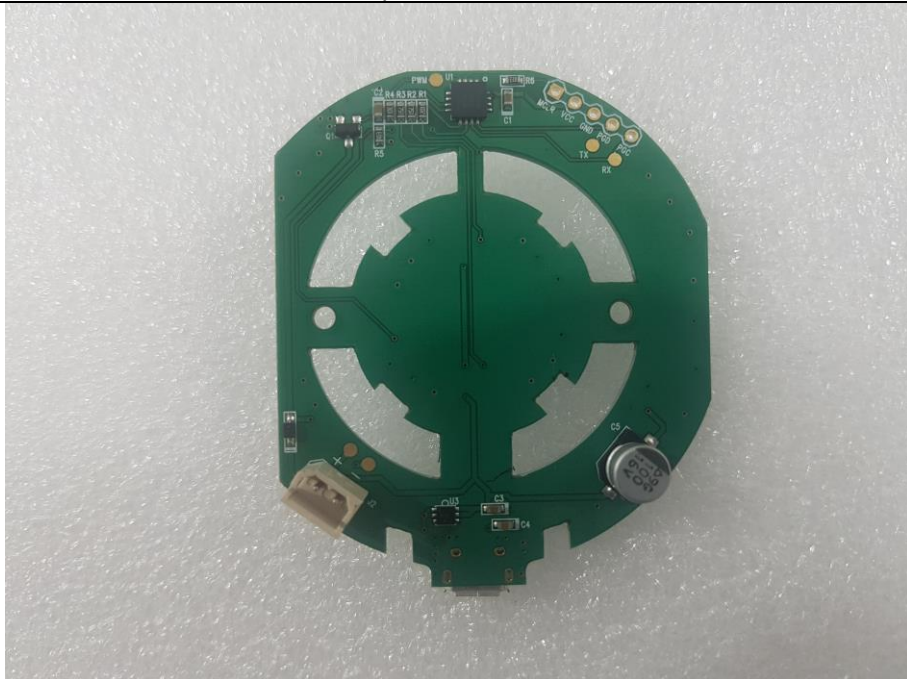


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Top of Main board

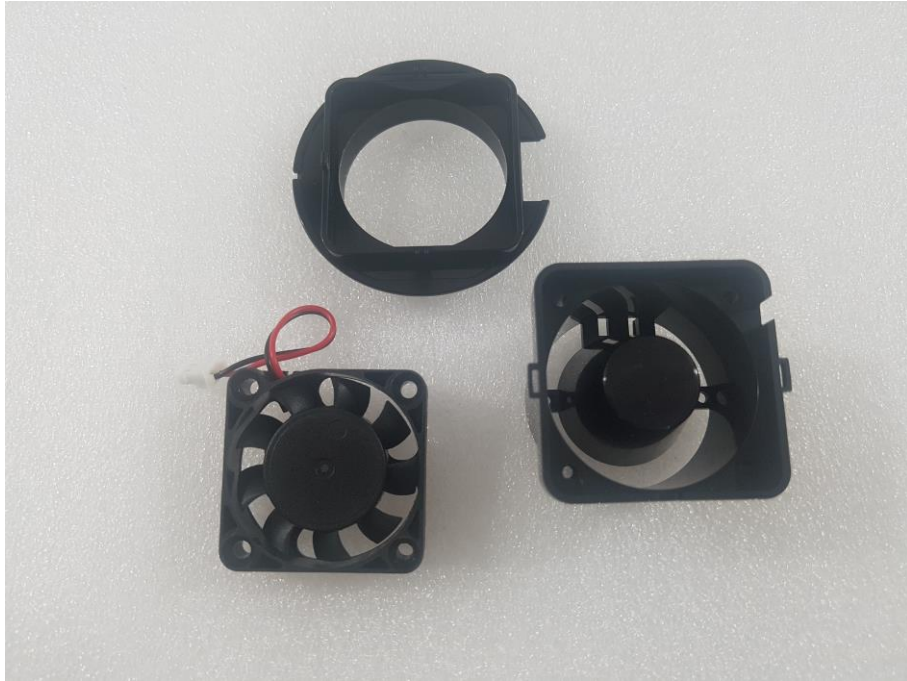


Bottom of Main board

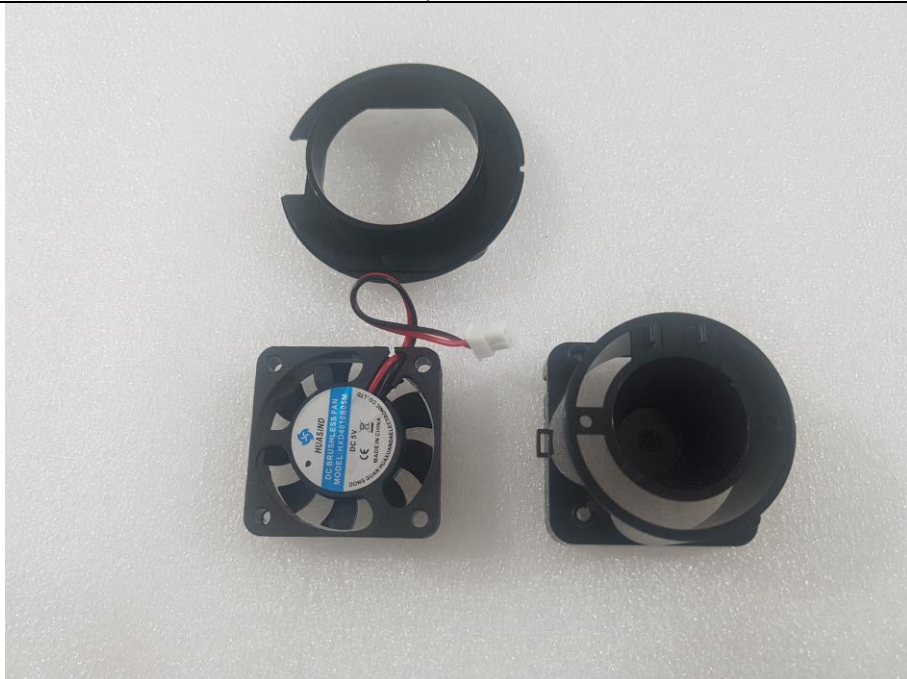


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Top of Fan



Bottom of Fan



Test Result

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End.

