TEST REPORT

| | |
|---|---|
| Report No.: | TW2203083E |
| File reference No.: | 2022-04-24 |
| Applicant: | Hangzhou Yige Cross-Border E-Commerce Co., Ltd |
| Product: | Level Wizard |
| Model No.: | CTK-WIZ-001, CTK-WIZ-002, CTK-WIZ-003 |
| Trademark: | Carmtek |
| Test Standards: | FCC Part 15.249 |
| Test result: | It is herewith confirmed and found to comply with the requirements set up by ANSI C63.10 & FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of electromagnetic compatibility |

Approved By:

Terry Tang

Terry Tang

Manager

Dated: April 24, 2022

**Results appearing herein relate only to the sample tested**
**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**


**SHENZHEN TIMEWAY TESTING LABORATORIES**

**Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China**

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

## Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

**CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

**FCC-Registration No.: 744189**

The 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 No.: 744189.

**Industry Canada (IC) —Registration No.:5205A**

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

**A2LA (Certification Number:5013.01)**

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

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Test Report Conclusion

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## 1.0 General Details

### 1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189

For 3m Anechoic Chamber

### 1.2 Applicant Details

Applicant: Hangzhou Yige Cross-Border E-Commerce Co., Ltd

Address: Room 2-407 No. 519, No.2 Street, Baiyang Street, Qiantang District, Hangzhou, Zhejiang, China

Telephone: --

Fax: 057187718086

### 1.3 Description of EUT

| | |
|---|---|
| Product: | Level Wizard |
| Manufacturer: | Hangzhou Yige Cross-Border E-Commerce Co., Ltd |
| Address: | Room 2-407 No. 519, No.2 Street, Baiyang Street, Qiantang District, Hangzhou, Zhejiang, China |
| Trademark: | Carmtek |
| Model Number: | CTK-WIZ-001 |
| Additional Model Name | CTK-WIZ-002, CTK-WIZ-003 |
| Rating: | DC3.0V |
| Battery | 2pcs AAA batteries |
| Modulation Type: | GFSK |
| Operation Frequency: | 2406MHz |
| Channel Number: | 1 |
| Hardware Version: | V1.0 |
| Software Version: | V1.0 |
| Antenna Designation | PCB antenna with gain 2.0dBi Max (Declared by the applicant) |

### 1.4 Submitted Sample: 1 Sample

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1.5 Test Duration

2022-03-07 to 2022-04-24

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty =6.0dB

Occupied Channel Bandwidth Uncertainty =5%

Conducted Emissions Uncertainty =3.6dB

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

The sample tested by _____

Print Name: Andy Xing

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| 2.0 Test Equipment | | | | | |
|---|---|---|---|---|---|
| Instrument Type | Manufacturer | Model | Serial No. | Date of Cal. | Due Date |
| ESPI Test Receiver | R&S | ESPI 3 | 100379 | 2021-06-18 | 2022-06-17 |
| LISN | R&S | EZH3-Z5 | 100294 | 2021-06-18 | 2022-06-17 |
| LISN | R&S | EZH3-Z5 | 100253 | 2021-06-18 | 2022-06-17 |
| Impuls-Begrenzer | R&S | ESH3-Z2 | 100281 | 2021-06-18 | 2022-06-17 |
| Loop Antenna | EMCO | 6507 | 00078608 | 2021-06-18 | 2024-06-17 |
| Spectrum | R&S | FSIQ26 | 100292 | 2021-06-18 | 2022-06-17 |
| Horn Antenna | A-INFO | LB-180400-KF | J211060660 | 2021-07-02 | 2024-07-01 |
| Horn Antenna | R&S | BBHA 9120D | 9120D-631 | 2021-07-02 | 2024-07-01 |
| Power meter | Anritsu | ML2487A | 6K00003613 | 2021-06-18 | 2022-06-17 |
| Power sensor | Anritsu | MA2491A | 32263 | 2021-06-18 | 2022-06-17 |
| Bilog Antenna | Schwarebeck | VULB9163 | 9163/340 | 2021-07-02 | 2024-07-01 |
| 9*6*6 Anechoic | -- | -- | N/A | 2021-07-02 | 2022-07-01 |
| EMI Test Receiver | RS | ESVB | 826156/011 | 2021-06-18 | 2022-06-17 |
| EMI Test Receiver | RS | ESH3 | 860904/006 | 2021-06-18 | 2022-06-17 |
| Spectrum | HP/Agilent | ESA-L1500A | US37451154 | 2021-06-18 | 2022-06-17 |
| Spectrum | HP/Agilent | E4407B | MY50441392 | 2021-06-18 | 2022-06-17 |
| Spectrum | RS | FSP | 1164.4391.38 | 2022-01-15 | 2023-01-14 |
| RF Cable | Zhengdi | ZT26-NJ-NJ-8M/FA | -- | 2021-06-18 | 2022-06-17 |
| RF Cable | Zhengdi | 7m | -- | 2021-06-18 | 2022-06-17 |
| RF Switch | EM | EMSW18 | 060391 | 2021-06-18 | 2022-06-17 |
| Pre-Amplifier | Schwarebeck | BBV9743 | #218 | 2021-06-18 | 2022-06-17 |
| Pre-Amplifier | HP/Agilent | 8449B | 3008A00160 | 2021-06-18 | 2022-06-17 |
| LISN | SCHAFFNER | NNB42 | 00012 | 2022-01-05 | 2023-01-04 |

2.2 Automation Test Software

For Conducted Emission Test

| Name | Version |
|---|---|
| EZ-EMC | Ver.EMC-CON 3A1.1 |

For Radiated Emissions

| Name | Version |
|---|---|
| EMI Test Software BL410-EV18.91 | V18.905 |
| EMI Test Software BL410-EV18.806 High Frequency | V18.06 |

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## 3.0 Technical Details

### 3.1 Summary of test results

**The EUT has been tested according to the following specifications:**

| Standard | Test Type | Result | Notes |
|---|---|---|---|
| FCC Part 15, Paragraph 15.203 | Antenna Requirement | Pass | Complies |
| FCC Part 15, Paragraph 15.207 | Conducted Emission Test | N/A | N/A |
| FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit | Field Strength of Fundamental | Pass | Complies |
| FCC Part 15, Paragraph 15.209 and RSS-210 | Radiated Emission Test | Pass | Complies |
| FCC Part 15 Subpart C Paragraph 15.249(d) Limit | Band Edge Test | Pass | Complies |

### 3.2 Test Standards

**FCC Part 15 Subpart C, Paragraph 15.249 , ANSI C63.4 :2014 and ANSI C63.10 :2013**

## 4.0 EUT Modification

**No modification by SHENZHEN TIMEWAY TESTING LABORATORIES**

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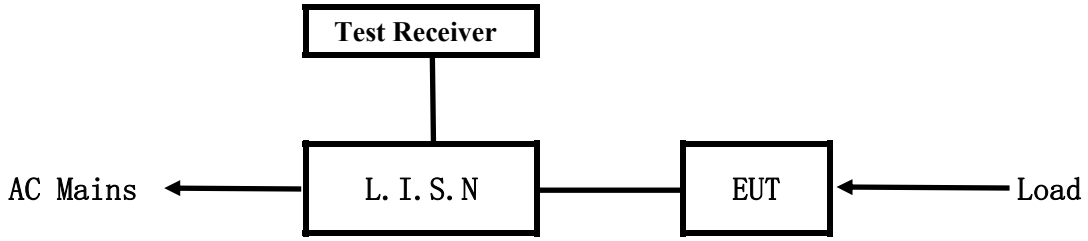
## 5. Power Line Conducted Emission Test

5.1 Schematics of the test

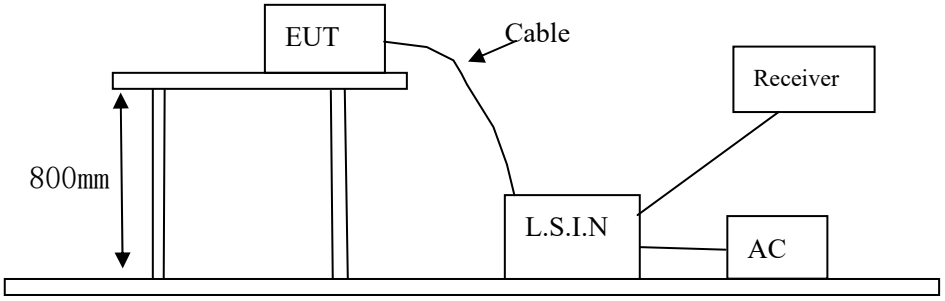



EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2014.

Block diagram of Test setup




5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channel is provided to the EUT

A. EUT

| Device | Manufacturer | Model | FCC ID |
|---|---|---|---|
| Level Wizard | Hangzhou Yige Cross-Border E-Commerce Co., Ltd | CTK-WIZ-001, CTK-WIZ-002, CTK-WIZ-003 | 2A6GF-CTK-WIZ-001 |

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B. Internal Device

| Device | Manufacturer | Model | FCC ID/DOC |
|---|---|---|---|
| N/A | | | |

C. Peripherals

| Device | Manufacturer | Model | Rating |
|---|---|---|---|
| N/A | | | |

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

| Frequency (MHz) | Limits (dB μ V) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 0.15 ～ 0.50 | 66.0～56.0* | 56.0～46.0* |
| 0.50 ～ 5.00 | 56.0 | 46.0 |
| 5.00 ～ 30.00 | 60.0 | 50.0 |

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results:

N/A

**Note: EUT powered by AAA battery, this test item not applicable.**

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## 6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.

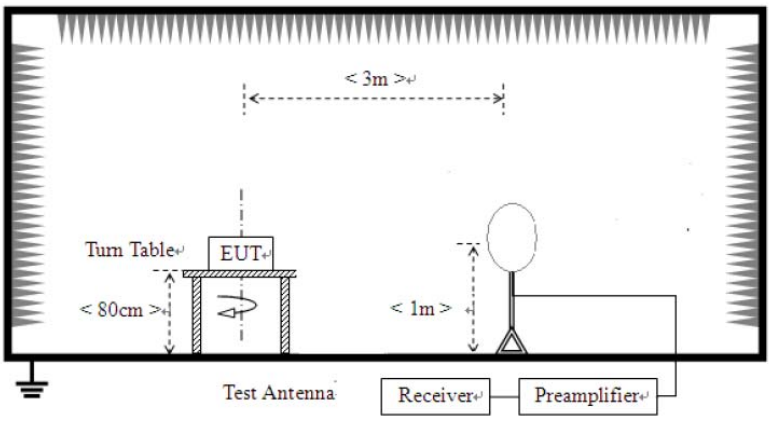
(3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

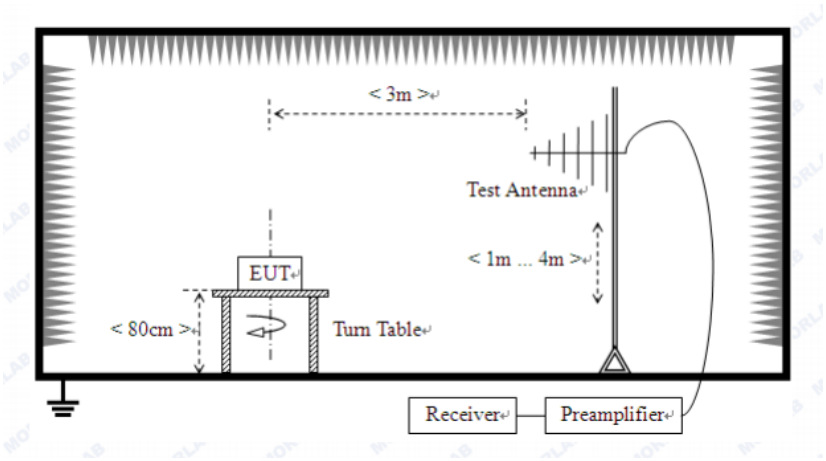
(5) The antenna polarization: Vertical polarization and Horizontal polarization.

**Block diagram of Test setup**

For radiated emissions from 9kHz to 30MHz




For radiated emissions from 30MHz to1GHz

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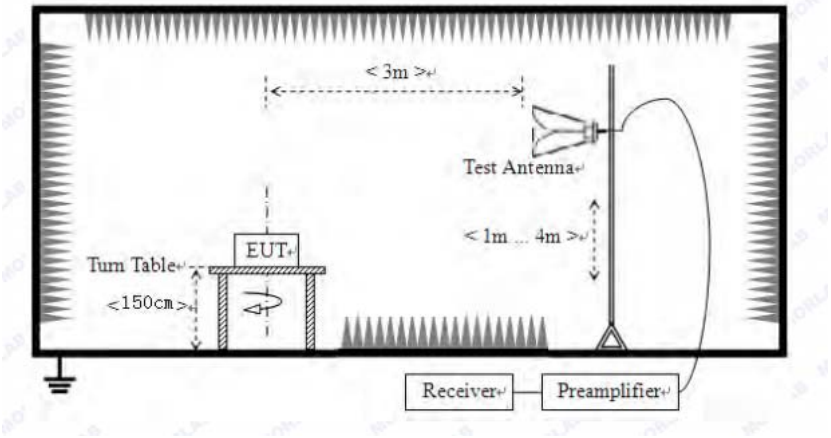
For radiated emissions above 1GHz




6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**A FCC Part 15 Subpart C Paragraph 15.249(a) Limit**

| Fundamental Frequency (MHz) | Field Strength of Fundamental (3m) | | | Field Strength of Harmonics (3m) | | |
|---|---|---|---|---|---|---|
| | **mV/m** | **dBuV/m** | | **uV/m** | **dBuV/m** | |
| 2400-2483.5 | 50 | 94 (Average) | 114 (Peak) | 500 | 54 (Average) | 74 (Peak) |

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

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

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

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**B. Frequencies in restricted band are complied to limit on Paragraph 15.209.**

| Frequency Range (MHz) | Distance (m) | Field strength (dB μ V/m) |
|---|---|---|
| 0.009-0.490 | 3 | 20log(2400/F(kHz)) +40log (300/3) |
| 0.490-1.705 | 3 | 20log(24000/F(kHz)) +40log (30/3) |
| 1.705-30 | 3 | 69.5 |
| 30-80 | 3 | 40.0 |
| 88-216 | 3 | 43.5 |
| 216-960 | 3 | 46.0 |
| Above 960 | 3 | 54.0 |

Note: 1. RF Voltage (dBuV) = 20 log RF 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 EUT

4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK. For fundamental measurement, PK detector used.

5. For radiated emissions from 9kHz to 30MHz，the emission level is much less than the limit for more than 20dB. No necessary to take down the record.

6. New Battery was used during tests.

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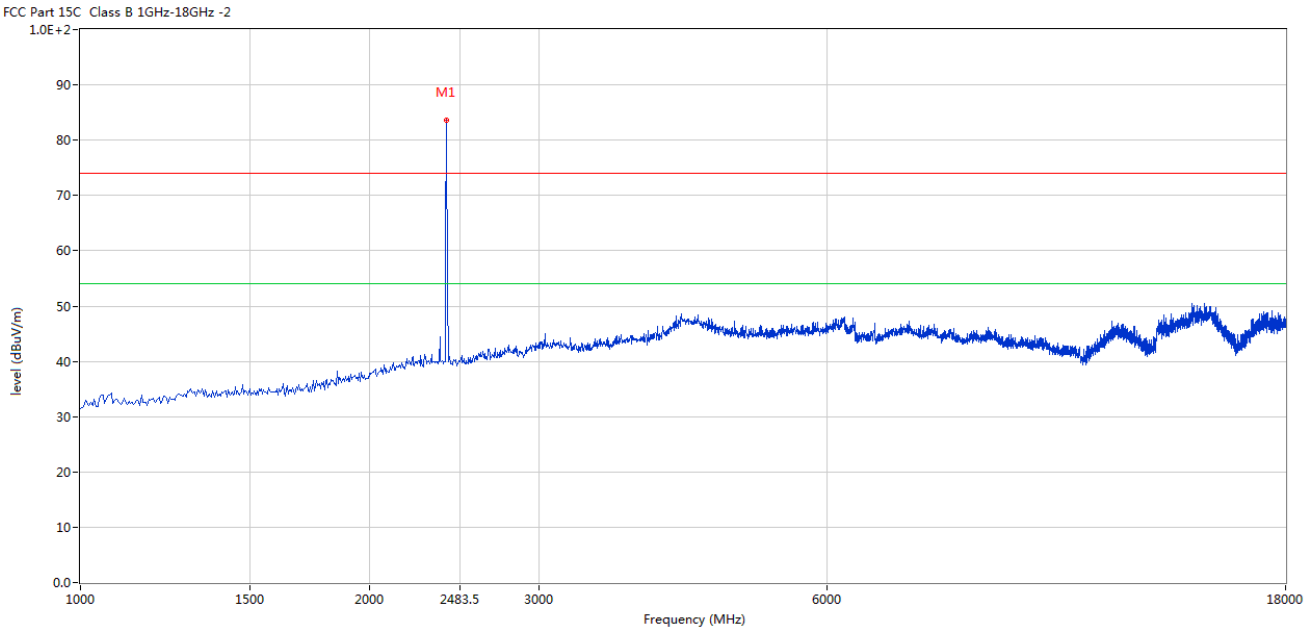
## 6.5 Test result

## A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2406MHz

**Horizontal**




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2406.398 | 83.11 | -3.57 | 114.0 | -30.89 | Peak | 297.00 | 100 | Horizontal | Pass |

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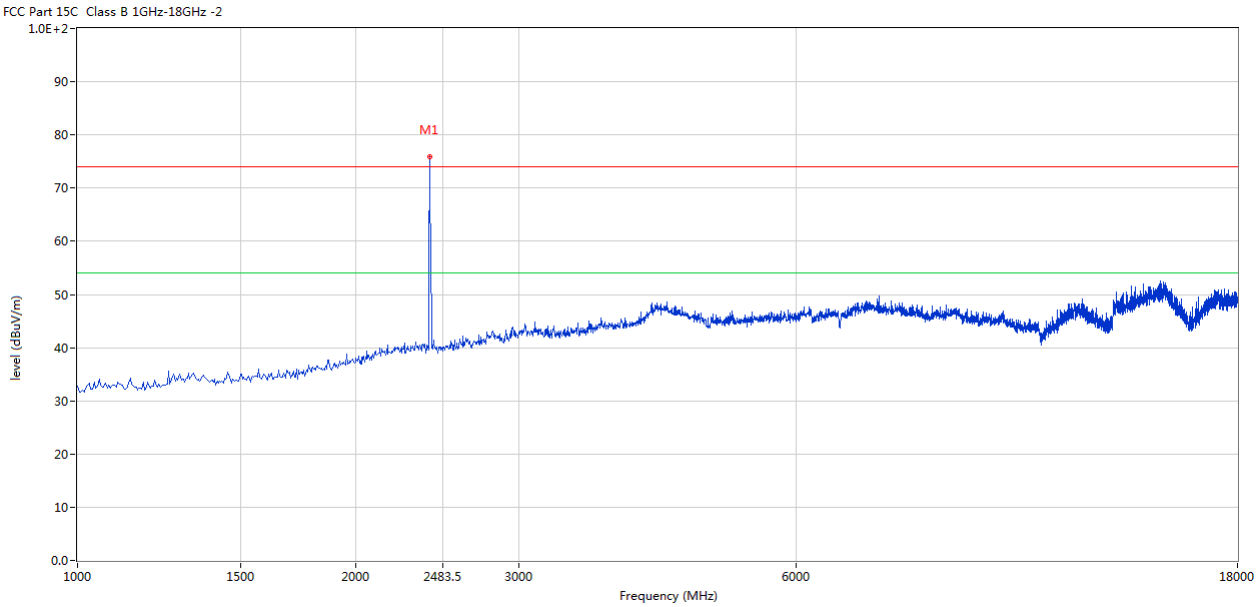
**Vertical**




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2406.398 | 75.80 | -3.57 | 114.0 | -38.20 | Peak | 17.00 | 100 | Vertical | Pass |

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier
(3)Margin=Emission-Limits
(4)According to section 15.35(b), the peak limit is 20dB higher than the average limit
(5) For test purpose, keep EUT continuous transmitting
(5)For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.
(6) the measured PK value less than the AV limit.

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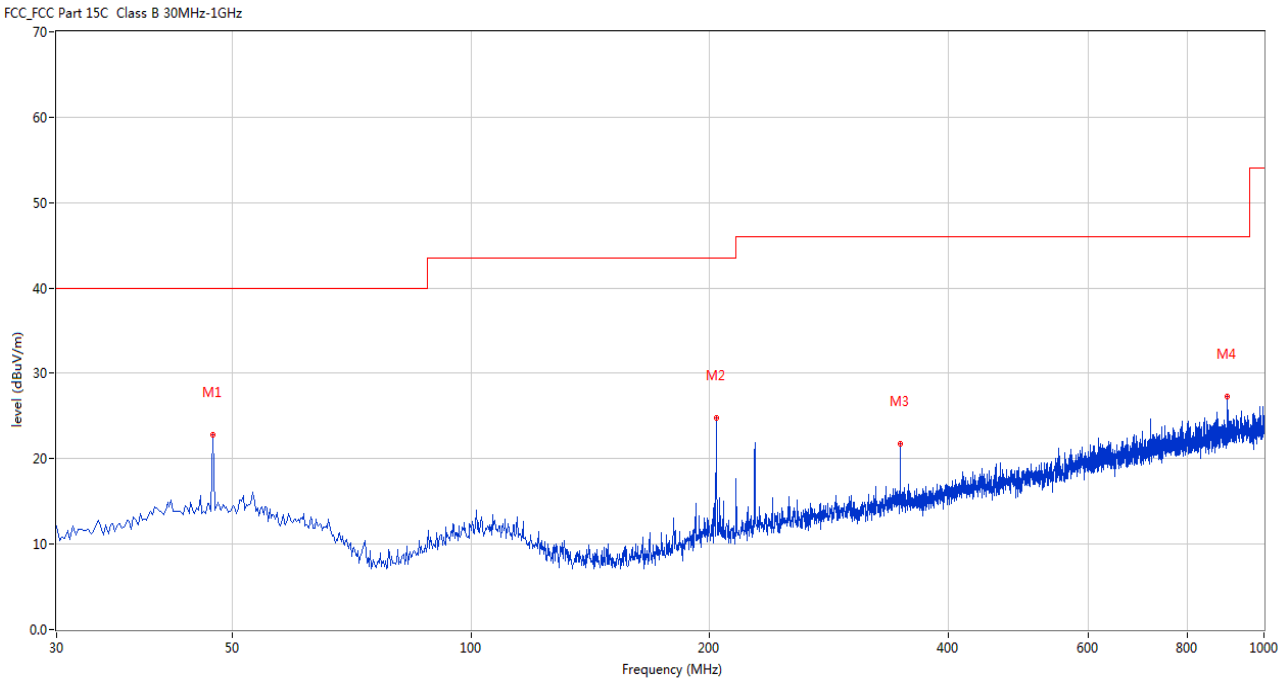
B. **General Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: Keep Tx transmitting

**Results: Pass**

Please refer to following diagram for individual




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 47.213 | 22.75 | -11.41 | 40.0 | -17.25 | Peak | 299.00 | 100 | Horizontal | Pass |
| 2 | 203.829 | 24.77 | -13.50 | 43.5 | -18.73 | Peak | 262.00 | 100 | Horizontal | Pass |
| 3 | 347.838 | 21.76 | -9.43 | 46.0 | -24.24 | Peak | 256.00 | 100 | Horizontal | Pass |
| 4 | 899.873 | 27.32 | -1.85 | 46.0 | -18.68 | Peak | 267.00 | 100 | Horizontal | Pass |

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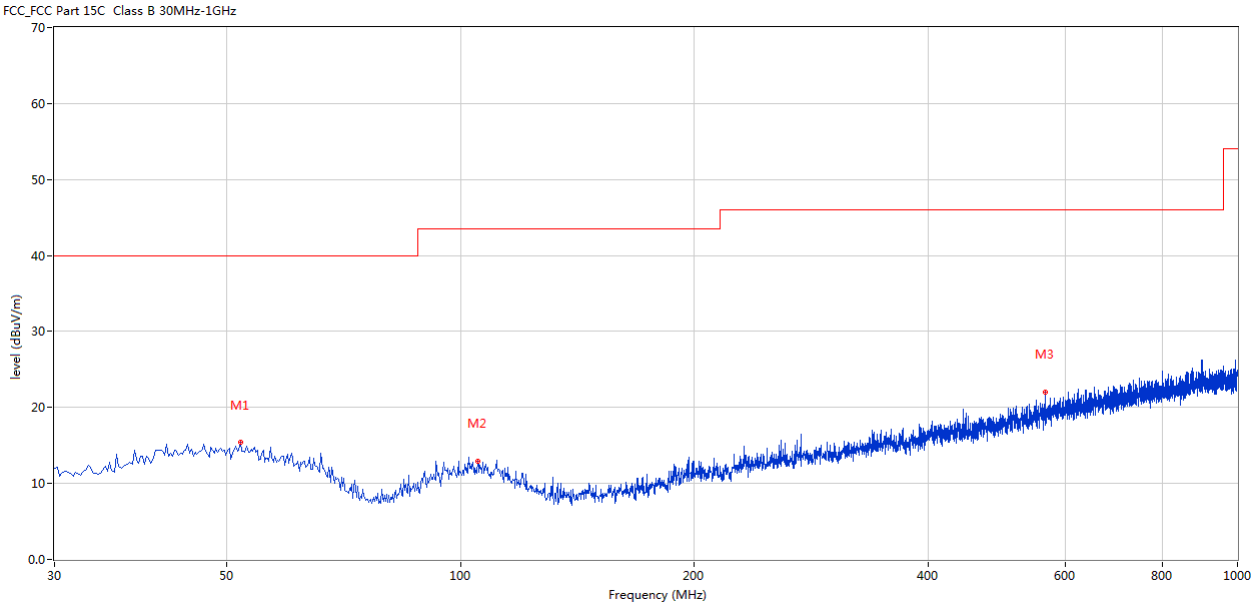
**Radiated Emission In Vertical (30MHz----1000MHz)**

EUT set Condition: Keep Tx transmitting

**Results: Pass**

Please refer to following diagram for individual




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 52.062 | 15.37 | -11.43 | 40.0 | -24.63 | Peak | 129.00 | 100 | Vertical | Pass |
| 2 | 105.156 | 12.97 | -13.23 | 43.5 | -30.53 | Peak | 129.00 | 100 | Vertical | Pass |
| 3 | 565.306 | 21.98 | -6.00 | 46.0 | -24.02 | Peak | 57.00 | 100 | Vertical | Pass |

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## 7. Band Edge

### 7.1 Test Method and test Procedure:

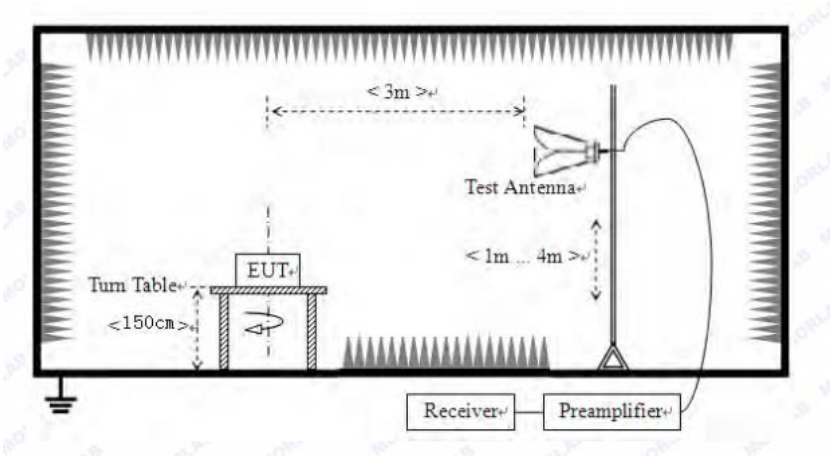
(1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189

(2) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.

(3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(4) The antenna polarization: Vertical polarization and Horizontal polarization.

### 7. 2 Radiated Test Setup




For the actual test configuration , please refer to the related items – Photos of Testing

### 7.3 Configuration of The EUT

Same as section 5.3 of this report

### 7.4 EUT Operating Condition

Same as section 5.4 of this report.

### 7.5 Band Edge Limit

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.

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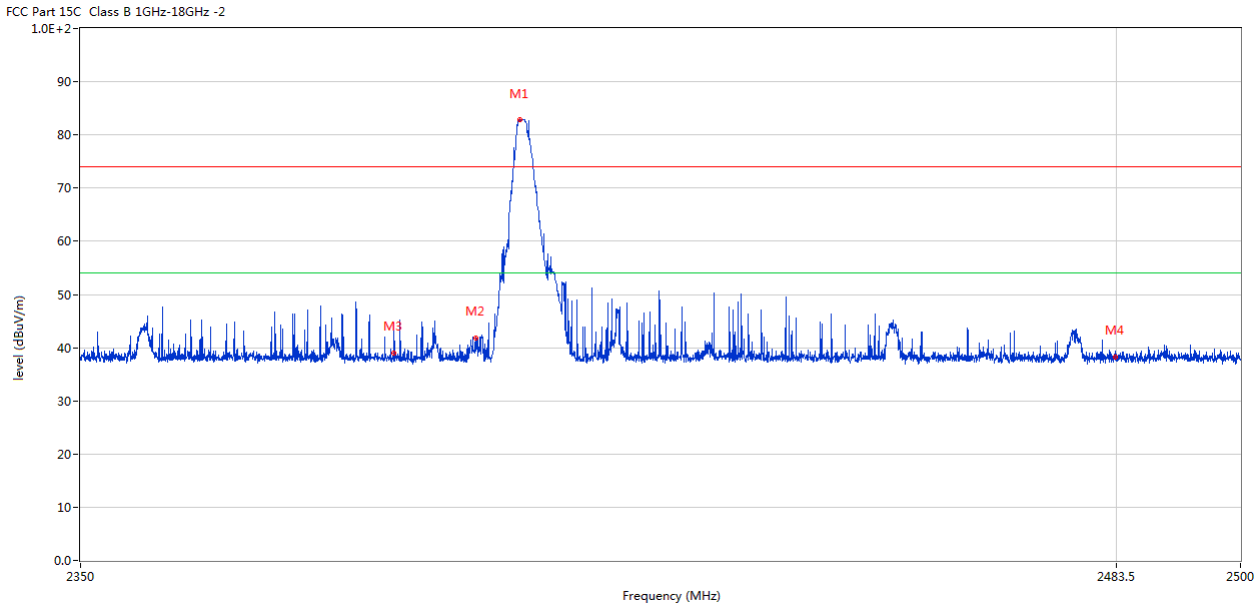
**7.6 Test Result**

| Product: | Level Wizard | Polarity | Horizontal |
|---|---|---|---|
| Mode | Keeping Transmitting | Test Voltage | DC3.0V |
| Temperature | 24 deg. C, | Humidity | 56% RH |
| Test Result: | Pass | -- | -- |




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2405.674 | 82.88 | -3.57 | 74.0 | 8.88 | Peak | 219.00 | 100 | Horizontal | N/A |
| 2 | 2400.050 | 41.74 | -3.57 | 74.0 | -32.26 | Peak | 209.00 | 100 | Horizontal | Pass |
| 3 | 2389.553 | 39.07 | -3.53 | 74.0 | -34.93 | Peak | 209.00 | 100 | Horizontal | Pass |
| 4 | 2483.317 | 38.21 | -3.57 | 74.0 | -35.79 | Peak | 250.00 | 100 | Horizontal | Pass |

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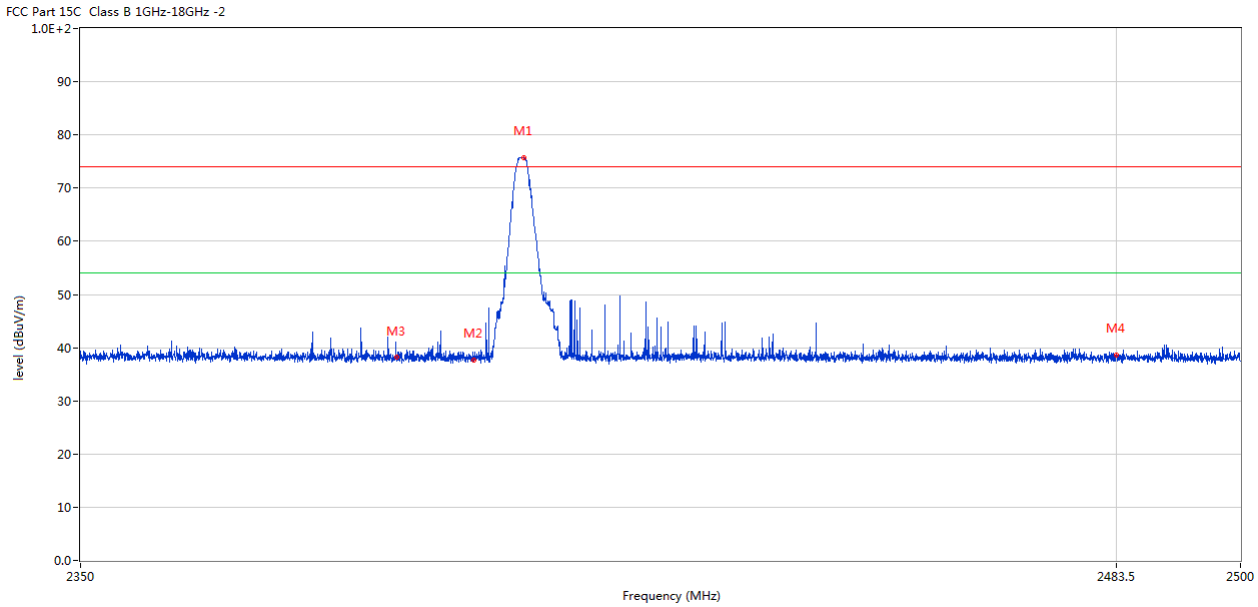
| Product: | Level Wizard | Detector | Vertical |
|---|---|---|---|
| Mode | Keeping Transmitting | Test Voltage | DC3.0V |
| Temperature | 24 deg. C, | Humidity | 56% RH |
| Test Result: | Pass | -- | -- |




| No. | Frequency (MHz) | Results (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Over Limit (dB) | Detector | Table (o) | Height (cm) | ANT | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2406.236 | 75.75 | -3.57 | 74.0 | 1.75 | Peak | 0.00 | 100 | Vertical | N/A |
| 2 | 2399.825 | 37.69 | -3.57 | 74.0 | -36.31 | Peak | 181.00 | 100 | Vertical | Pass |
| 3 | 2390.002 | 38.21 | -3.53 | 74.0 | -35.79 | Peak | 360.00 | 100 | Vertical | Pass |
| 4 | 2483.467 | 38.64 | -3.57 | 74.0 | -35.36 | Peak | 241.00 | 100 | Vertical | Pass |

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

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## 8.0 Antenna Requirement

**Applicable Standard**

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.

This product has a PCB antenna. The antenna gain is 2.0dBi Max. It fulfills the requirement of this section.

Test Result: Pass

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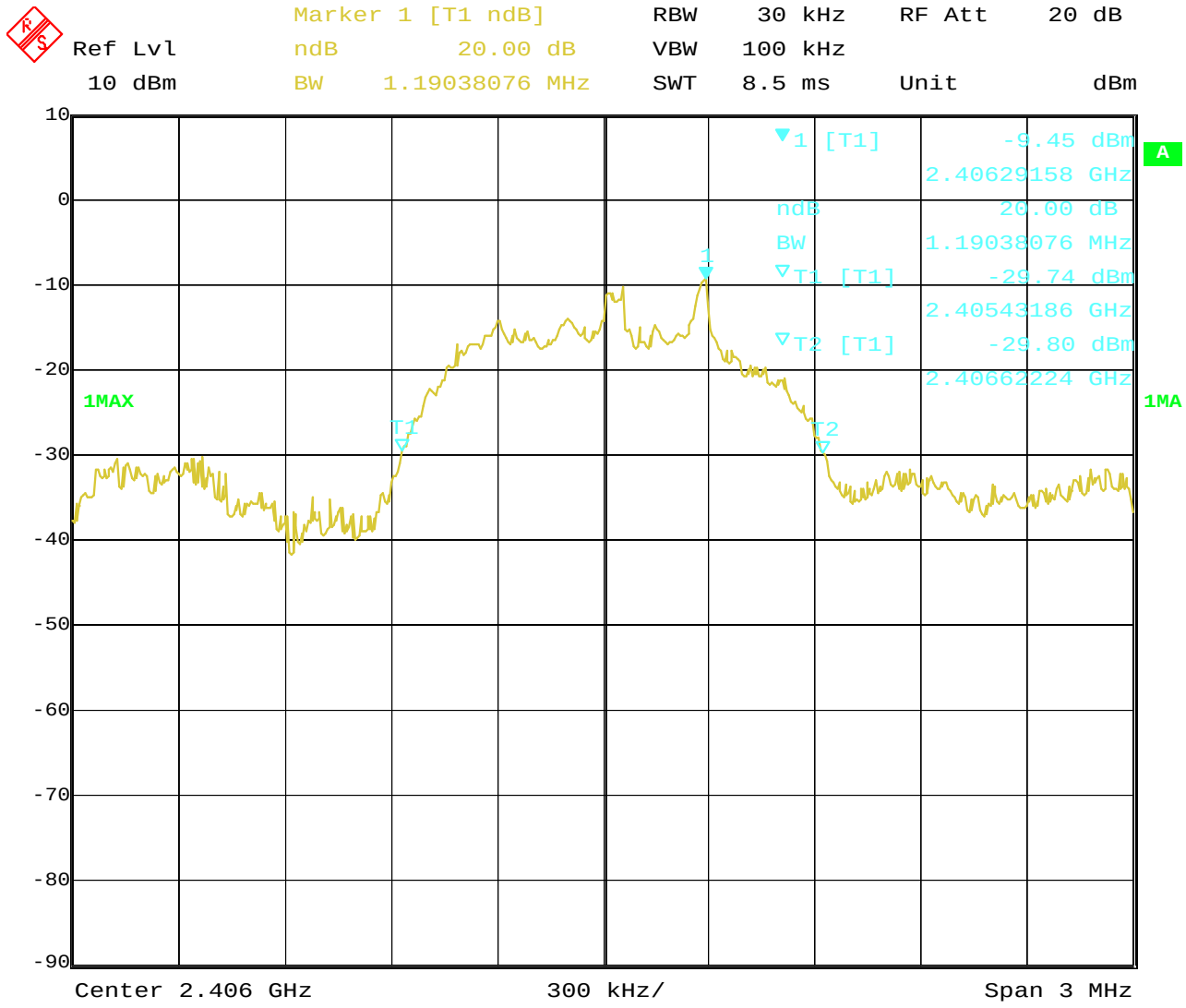
| **9.0** 20dB Bandwidth Measurement | | | |
|---|---|---|---|
| Product: | Level Wizard | Test Mode: | Keep transmitting |
| Mode | Keeping Transmitting | Test Voltage | DC3.0V |
| Temperature | 24 deg. C, | Humidity | 56% RH |
| Test Result: | Pass | Detector | PK |
| 20dB Bandwidth | 1.190MHz | -- | -- |




Date: 20.APR.2022 16:38:29

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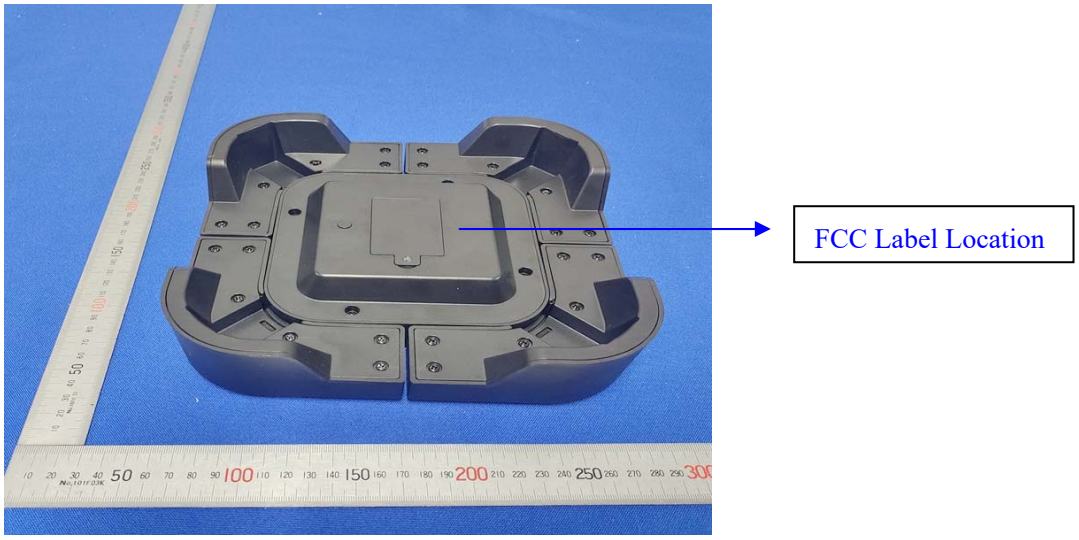
## 10.0 FCC ID Label

**FCC ID: 2A6GF-CTK-WIZ-001**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

**Mark Location:**

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**11.0** Photo of testing

11.1 Conducted test View—N/A

Radiated emission test view

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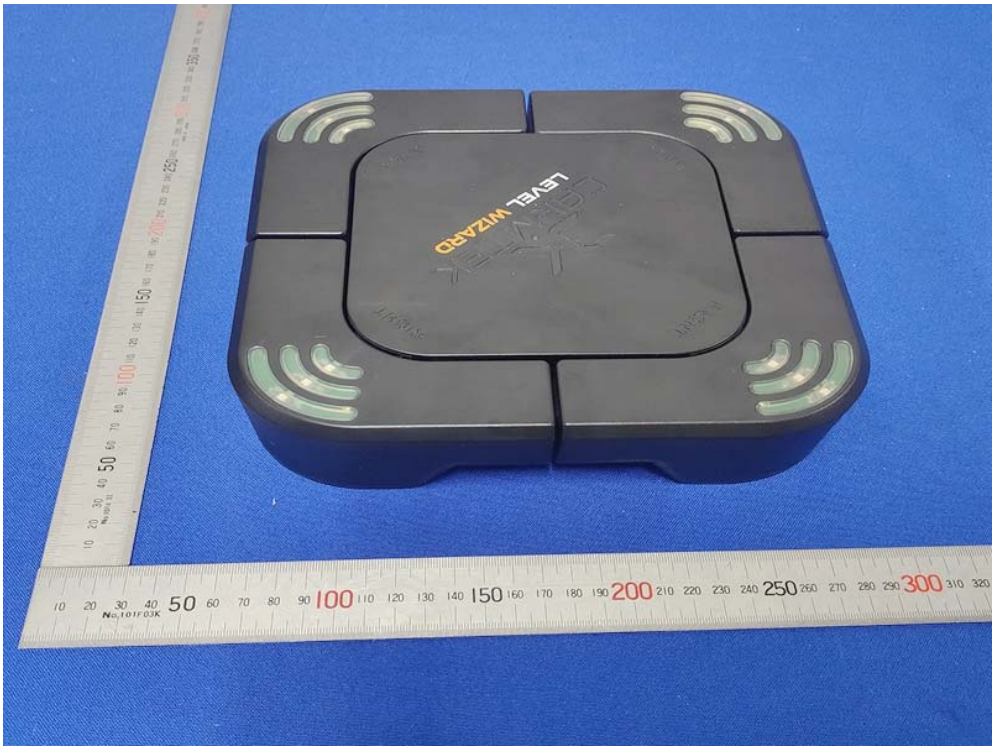
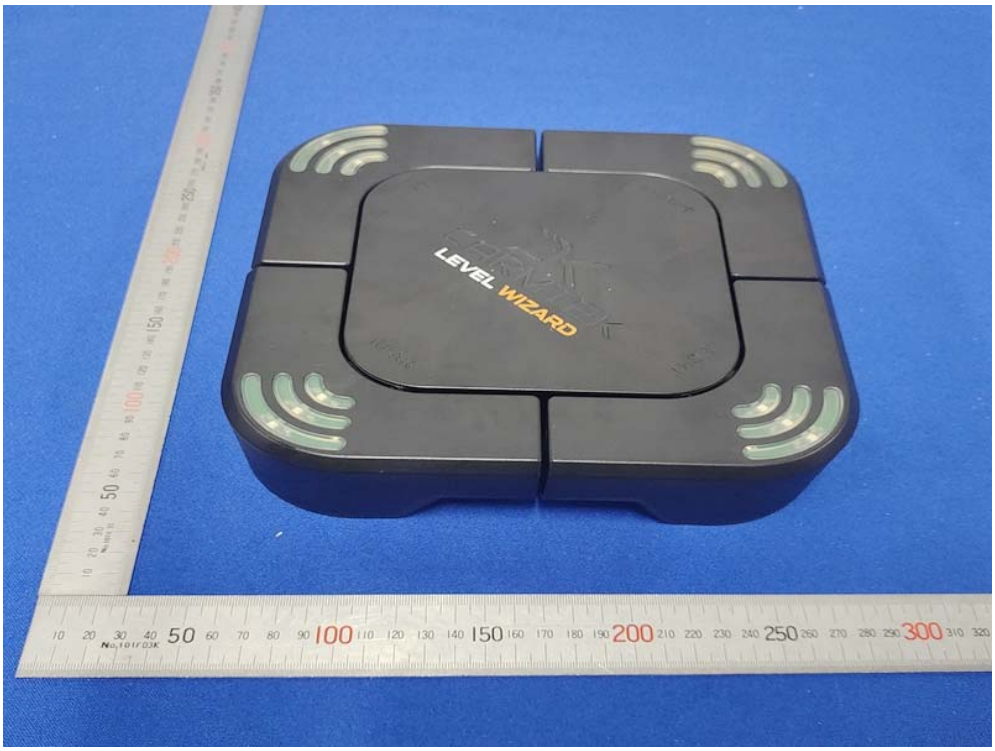
11.2 Photographs – EUT

Outside View

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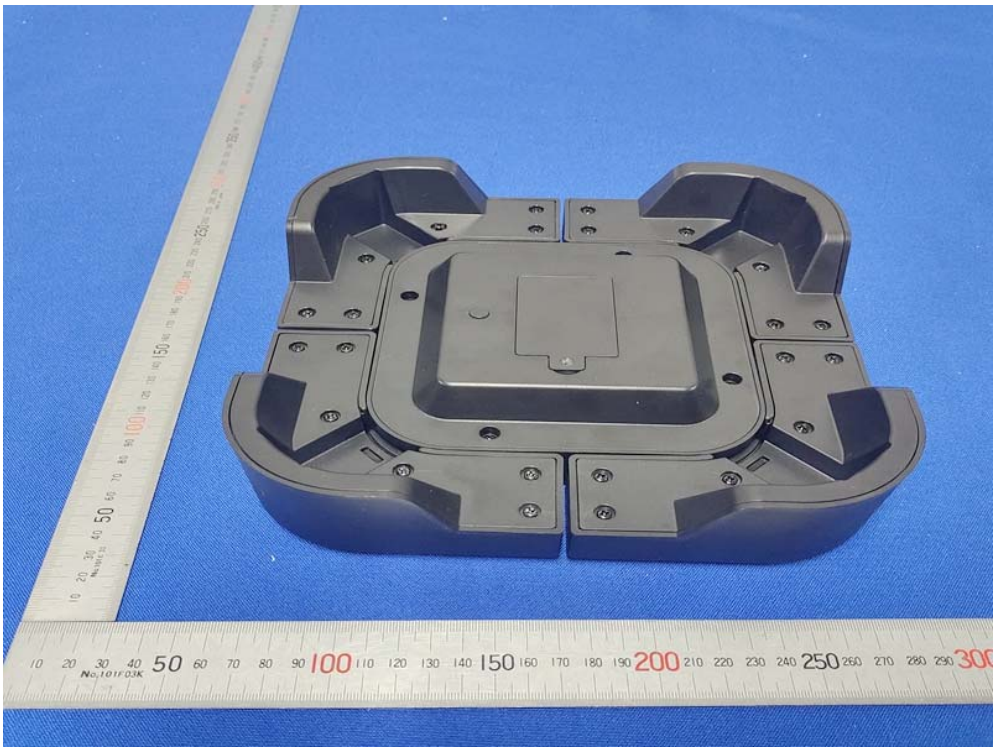
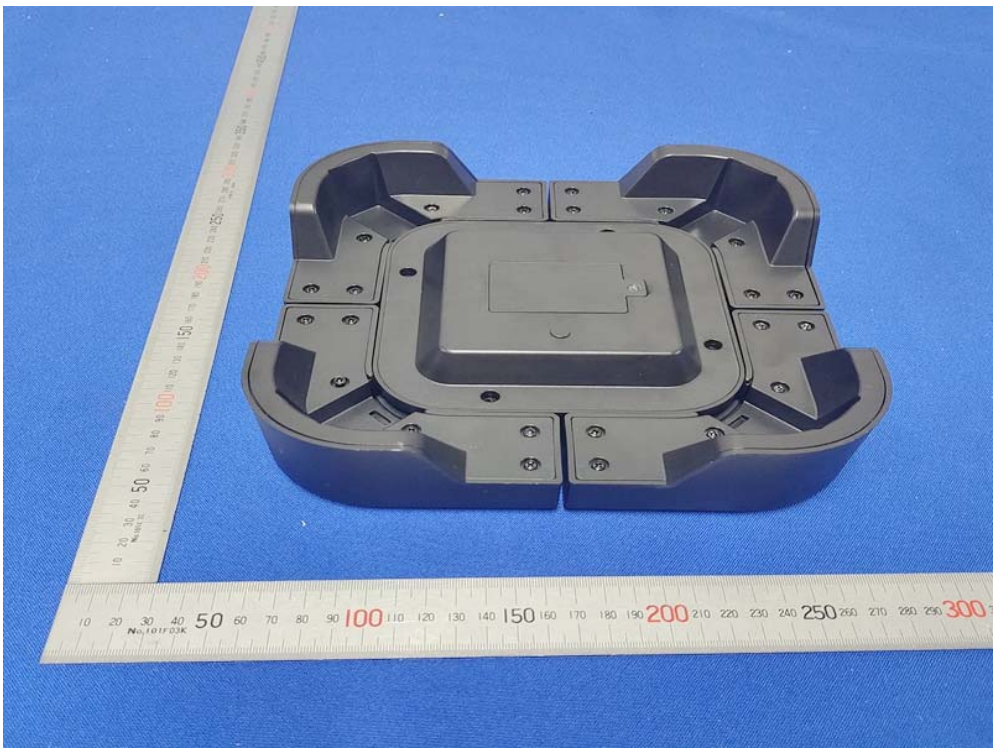
Outside View





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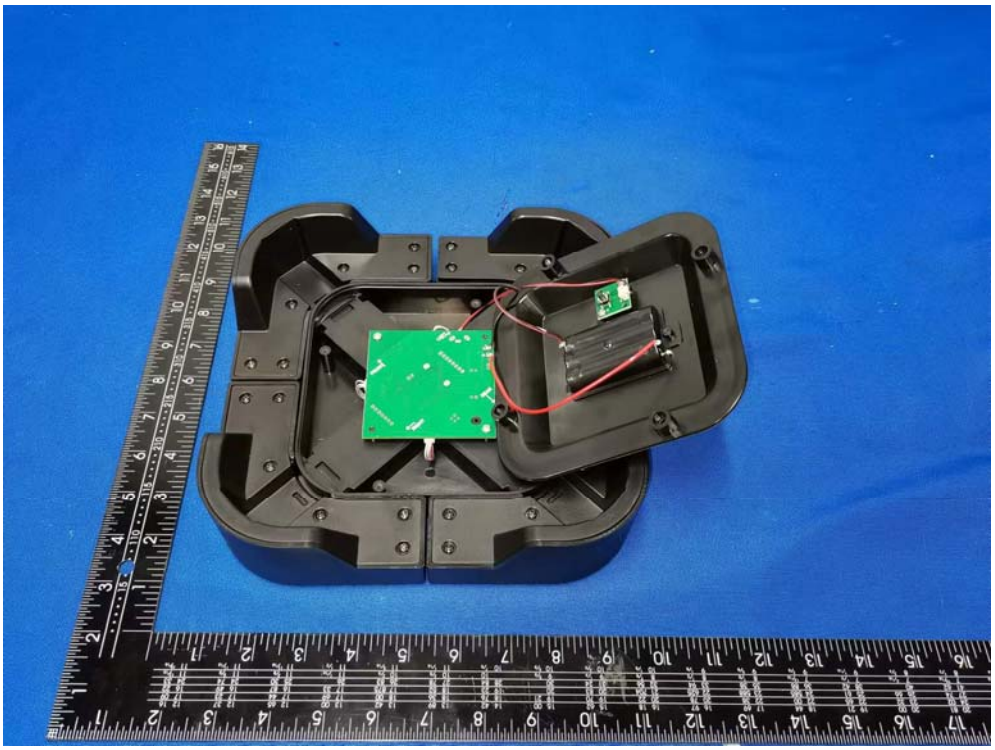

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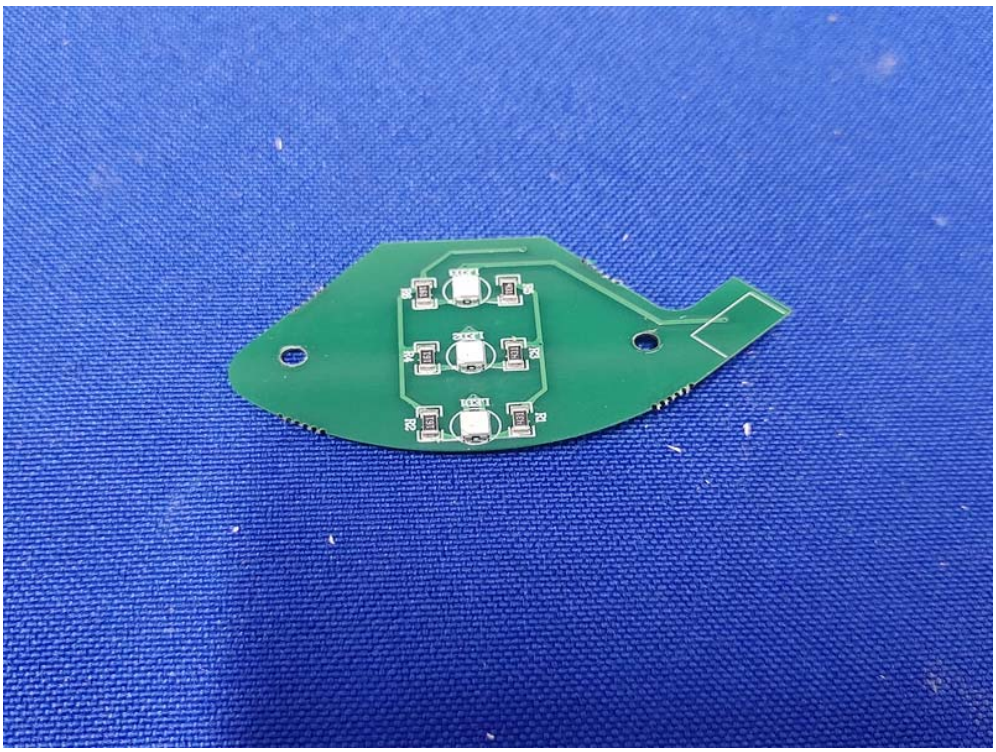
Inside view



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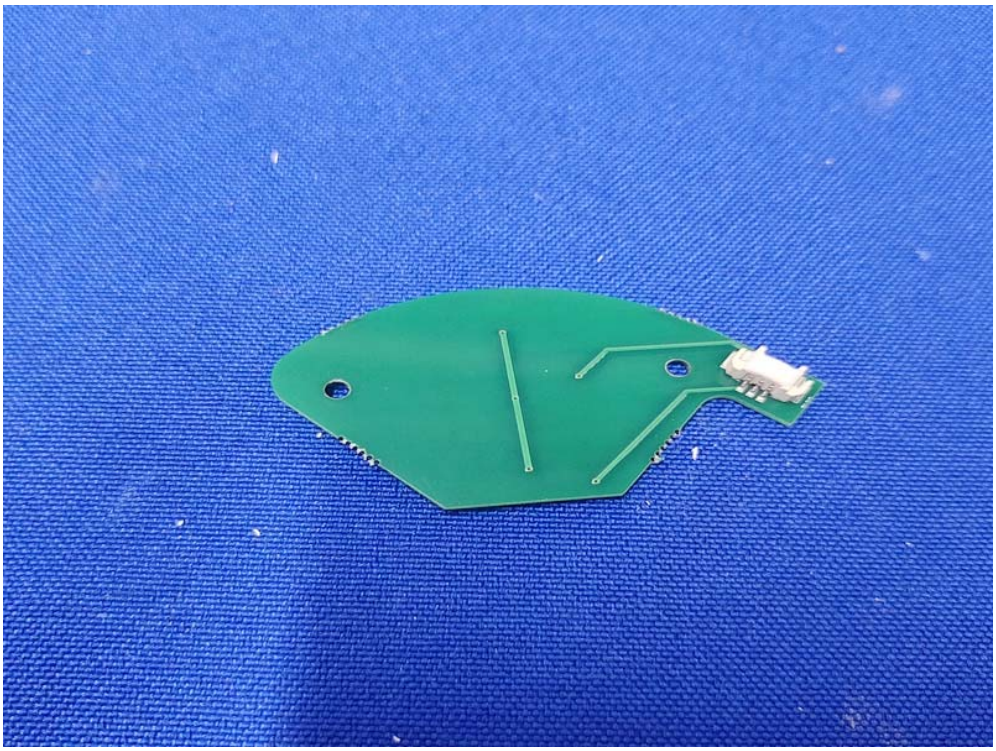
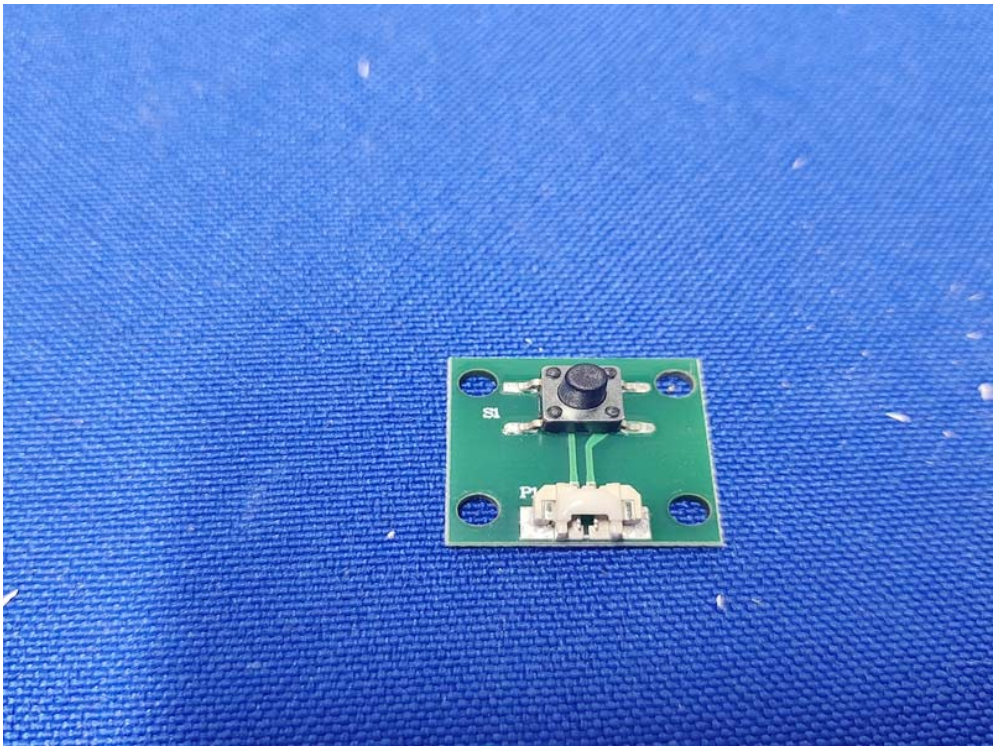
Inside view



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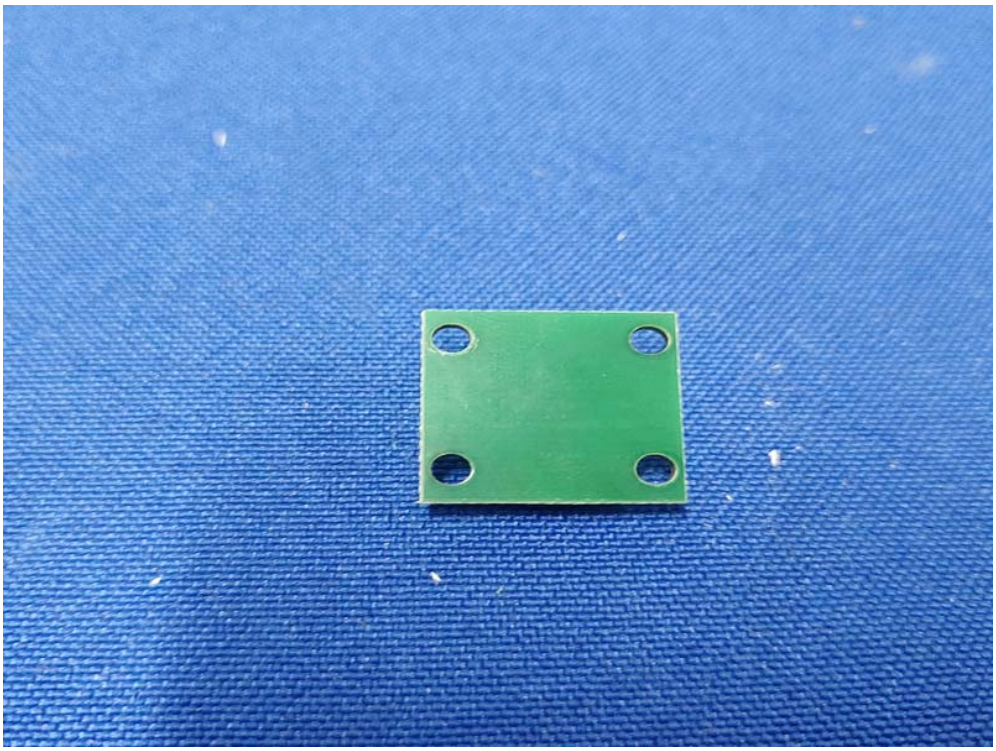
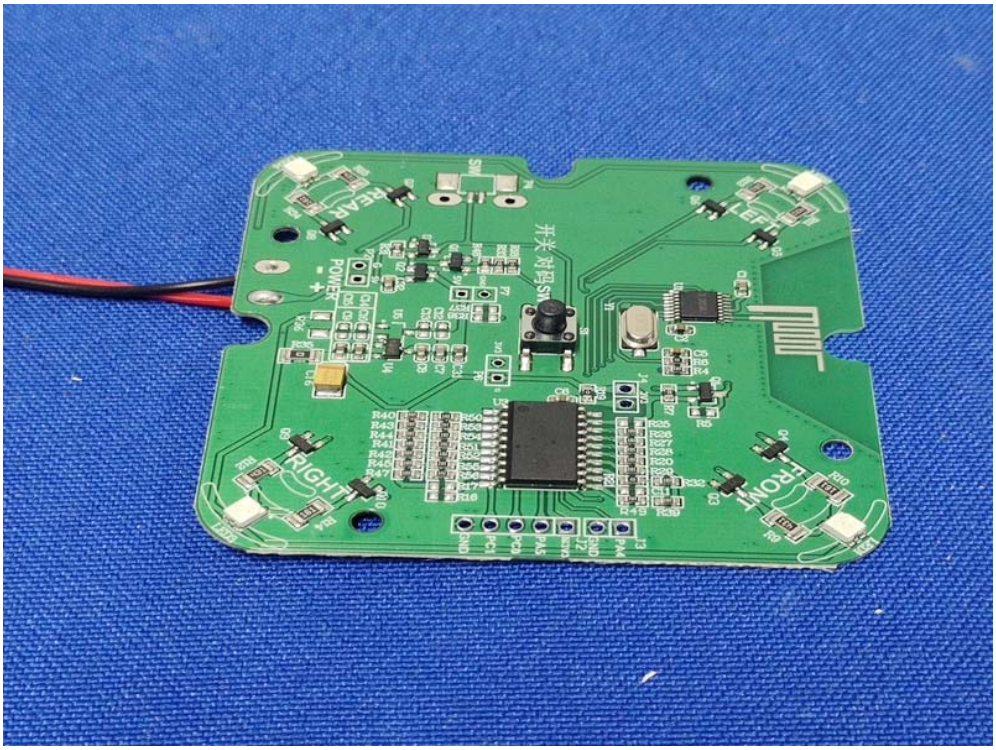
Inside view



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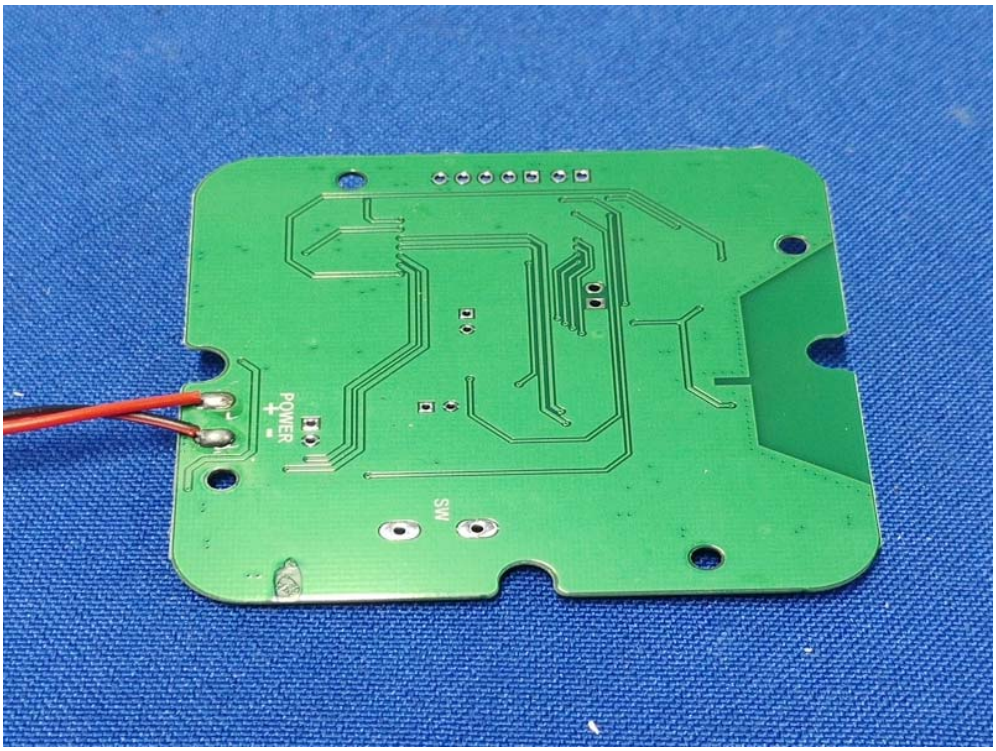
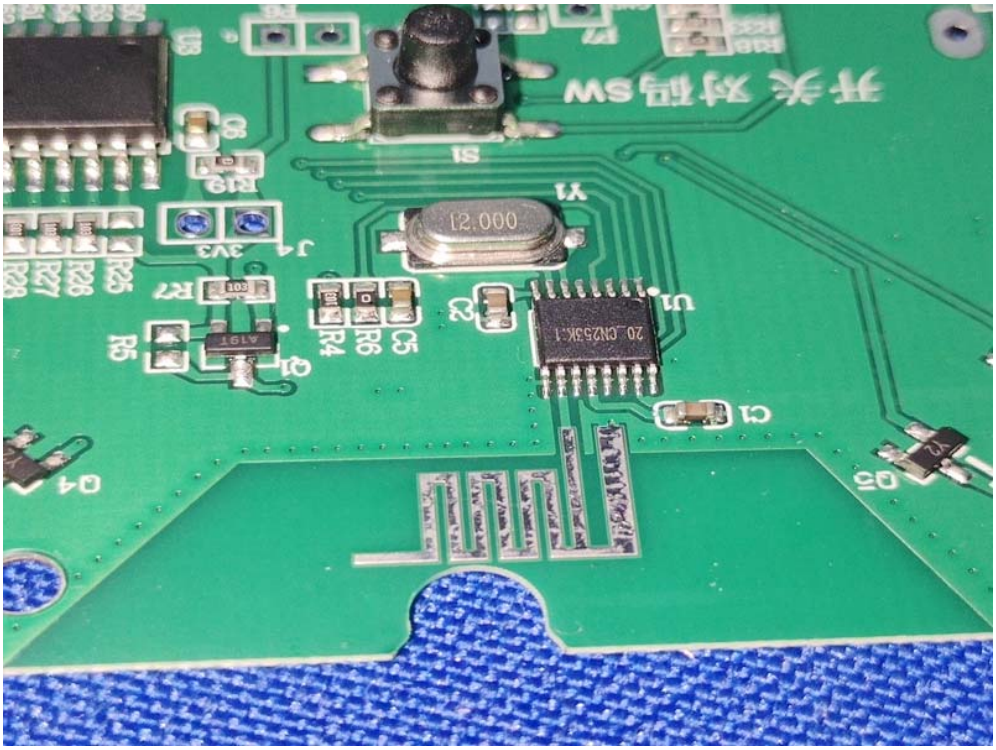
Inside view




**--End of the report--**

The report refers only to the sample tested and does not apply to the bulk.
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