# TEST REPORT

## FCC CFR 47 PART 18

**Test report**
**On Behalf of**
**JMTek Industries（Shenzhen）Co.,Ltd**
**For**
**Wireless Power Bank**
**Model No.: PBWS10**

**FCC ID: 2APU5-PBWS10**

| | |
|---|---|
| **Prepared for :** | **JMTek Industries（Shenzhen）Co.,Ltd**<br>**14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China** |
| **Prepared By :** | **Shenzhen HUAK Testing Technology Co., Ltd.**<br>**1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China** |
| **Date of Test:** | **Jan. 06, 2020 ~ Jan. 13, 2020** |
| **Date of Report:** | **Jan. 13, 2020** |
| **Report Number:** | **HK2001080081-E** |

# TEST RESULT CERTIFICATION

| | | |
|---|---|---|
| **Applicant's name** | : | **JMTek Industries（Shenzhen）Co.,Ltd** |
| Address | : | **14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China** |
| **Manufacture's Name** | : | **JMTek Industries（Shenzhen）Co.,Ltd** |
| Address | : | **14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China** |

**Product description**

| | | |
|---|---|---|
| Trade Mark | : | N/A |
| Product name | : | Wireless Power Bank |
| Model and/or type reference | : | PBWS10 |
| **Standards** | : | **FCC CFR 47 PART 18** |



**Date of Test**

| | | |
|---|---|---|
| Date (s) of performance of tests | : | Jan. 06, 2020 ~ Jan. 13, 2020 |
| Date of Issue | : | Jan. 13, 2020 |
| Test Result | : | **Pass** |

Prepared by: Gary Qian
Project Engineer

Reviewed by: Eden Hu
Project Supervisor

Approved by: Jason Zhou
Technical Director

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# 1. SUMMARY

## 1.1. TEST PROCEDURES AND RESULTS

| DESCRIPTION OF TEST | FCC PART RULE | RESULT |
|---|---|---|
| CONDUCTED EMISSIONS TEST | 18.305 | COMPLIANT |
| RADIATED EMISSION TEST | 18.307(b) | COMPLIANT |
| ANTENNA REQUIREMENT | 15.203 | COMPLIANT |

## 1.2. Test Facility

Test Firm Shenzhen HUAK Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park,Heping Community, Fuhai Street, Bao'an District, Shenzhen, China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

## 1.3. Statement of the measurement uncertainty

Measurement Uncertainty

| | |
|---|---|
| Conducted Emission Expanded Uncertainty | = 2.23dB, k=2 |
| Radiated emission expanded uncertainty(9kHz-30MHz) | = 3.08dB, k=2 |
| Radiated emission expanded uncertainty(30MHz-1000MHz) | = 4.42dB, k=2 |
| Radiated emission expanded uncertainty(Above 1GHz) | = 4.06dB, k=2 |

# 2. GENERAL INFORMATION

## 2.1. General Description of EUT

| | |
|---|---|
| Product Name: | Wireless Power Bank |
| Model/Type reference: | PBWS10 |
| Serial Model: | N/A |
| Trade Mark | N/A |
| FCC ID | 2APU5-PBWS10 |
| Hardware Version: | V14 |
| Software Version: | / |
| Antenna type: | Coil Antenna |
| Antenna gain: | 0 dBi |
| Operation frequency: | 125kHz |
| Channel number: | 1 |
| Modulation: | ASK |
| Power Source: | 5V-2A(10W) |

Note: 1. For more details, refer to the user's manual of the EUT.

## 2.2. Carrier Frequency of Channels

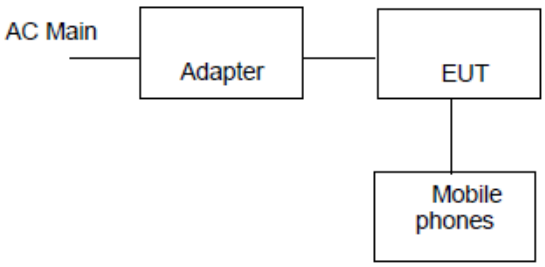
| Operation Frequency each of channel | |
|---|---|
| Channel | Frequency |
| 1 | 125KHz |

## 2.3. Operation of EUT during testing

Operating Mode
The mode is used: Transmitting mode

## 2.4. Description of Test Setup

Operation of EUT during testing




Mobile phones information
Model: S6
Input: 5VDC

Adapter information
Model: SAW30-050-3500U
Input: AC100-240V, 50/60Hz, 0.8A
Output: DC5V, 3.5A

The sample was placed 0.8m height above the ground plane of
3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position

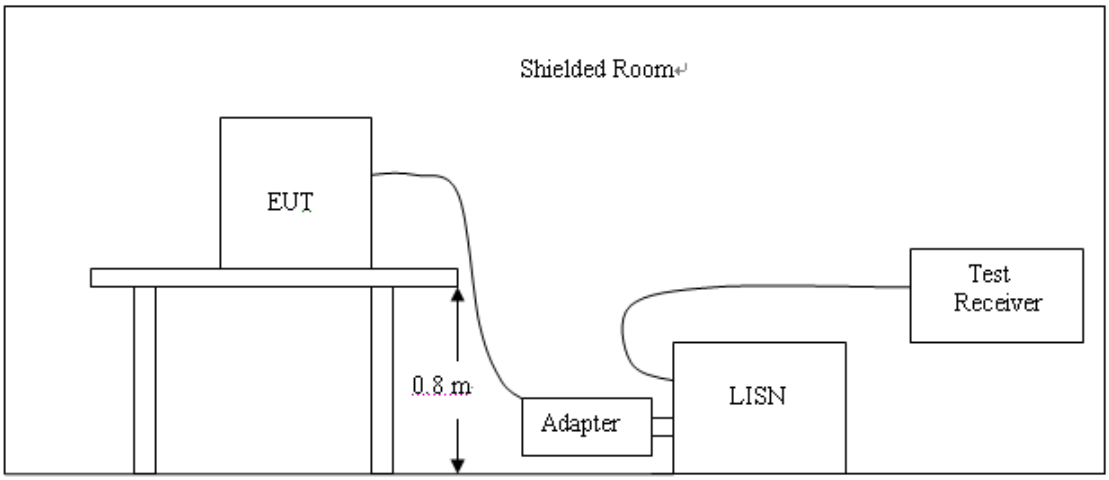
## 2.5. Equipments Used during the Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | L.I.S.N. Artificial Mains Network | R&S | ENV216 | HKE-002 | Dec. 26, 2019 | 1 Year |
| 2. | Receiver | R&S | ESCI 7 | HKE-010 | Dec. 26, 2019 | 1 Year |
| 3. | RF automatic control unit | Tonscend | JS0806-2 | HKE-060 | Dec. 26, 2019 | 1 Year |
| 4. | Spectrum analyzer | R&S | FSP40 | HKE-025 | Dec. 26, 2019 | 1 Year |
| 5. | Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 26, 2019 | 1 Year |
| 6. | Preamplifier | Schwarzbeck | BBV 9743 | HKE-006 | Dec. 26, 2019 | 1 Year |
| 7. | EMI Test Receiver | Rohde & Schwarz | ESCI 7 | HKE-010 | Dec. 26, 2019 | 1 Year |
| 8. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | HKE-012 | Dec. 26, 2019 | 1 Year |
| 9. | Loop Antenna | Schwarzbeck | FMZB 1519 B | HKE-014 | Dec. 26, 2019 | 1 Year |
| 10. | Horn Antenna | Schewarzbeck | 9120D | HKE-013 | Dec. 26, 2019 | 1 Year |
| 11. | Pre-amplifier | EMCI | EMC051845 SE | HKE-015 | Dec. 26, 2019 | 1 Year |
| 12. | Pre-amplifier | Agilent | 83051A | HKE-016 | Dec. 26, 2019 | 1 Year |
| 13. | EMI Test Software EZ-EMC | Tonscend | JS1120-B Version | HKE-083 | Dec. 26, 2019 | N/A |
| 14. | Power Sensor | Agilent | E9300A | HKE-086 | Dec. 26, 2019 | 1 Year |
| 15. | Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 26, 2019 | 1 Year |
| 16. | Signal generator | Agilent | N5182A | HKE-029 | Dec. 26, 2019 | 1 Year |
| 17. | Signal Generator | Agilent | 83630A | HKE-028 | Dec. 26, 2019 | 1 Year |

The calibration interval was one year

# 3. Conducted Emissions Test

## 3.1 Block Diagram of Test Setup




## 3.2 Conducted Power Line Emission Limit

According to FCC Part 18.307(b)

| Frequency of emission (MHz) | Conducted limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

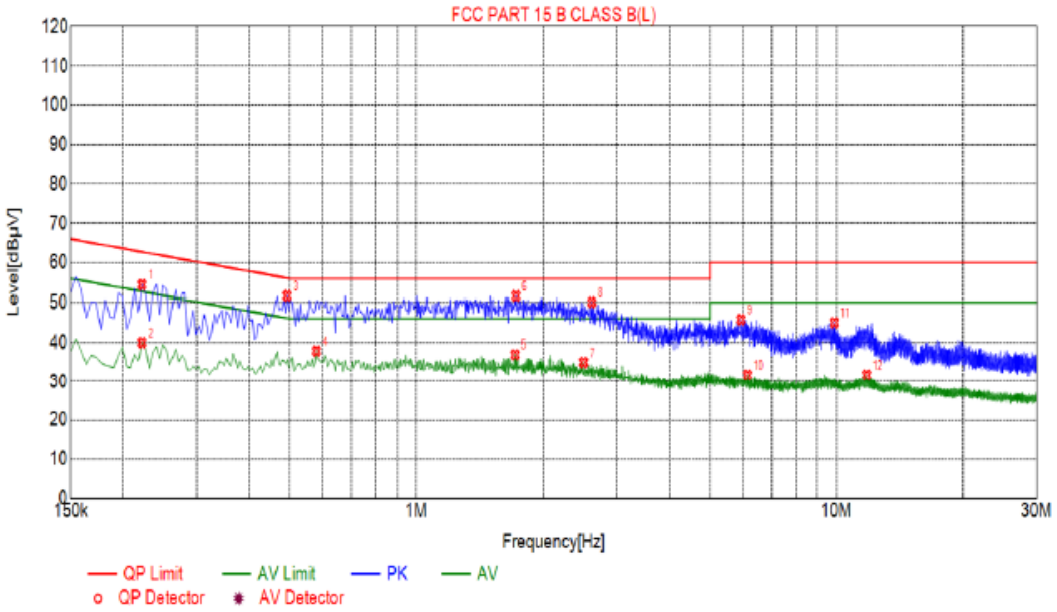
## 3.3 Test Procedure

1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes

**TEST RESULTS**

**PASS**

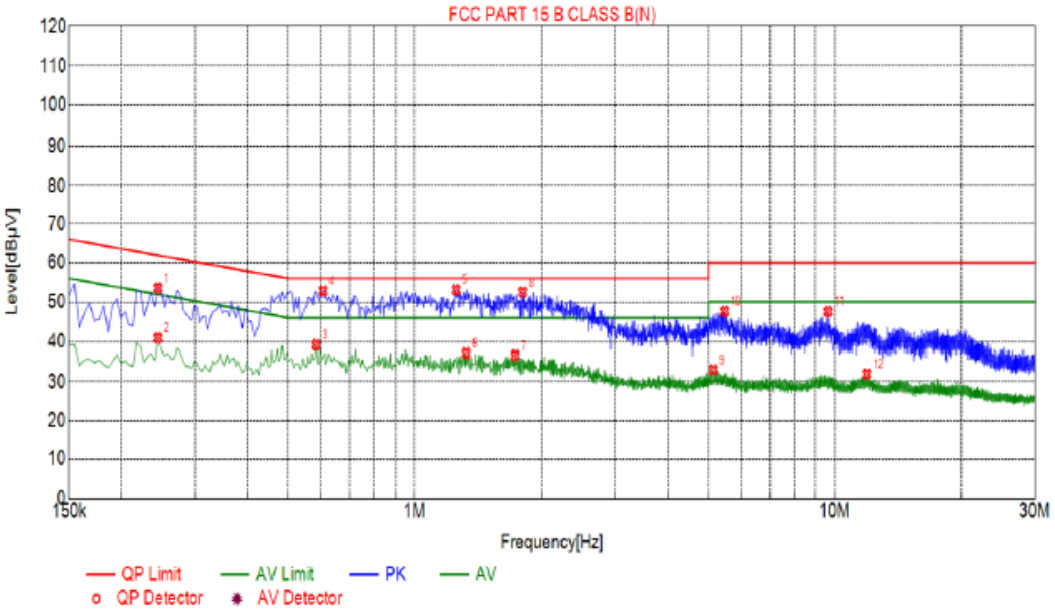
Test Specification: Line




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
| 1 | 0.2220 | 54.45 | 10.04 | 62.74 | 8.29 | 44.41 | PK | L |
| 2 | 0.2220 | 40.01 | 10.04 | 52.74 | 12.73 | 29.97 | AV | L |
| 3 | 0.4920 | 51.72 | 10.04 | 56.13 | 4.41 | 41.68 | PK | L |
| 4 | 0.5775 | 37.89 | 10.05 | 46.00 | 8.11 | 27.84 | AV | L |
| 5 | 1.7160 | 36.93 | 10.13 | 46.00 | 9.07 | 26.80 | AV | L |
| 6 | 1.7250 | 51.68 | 10.13 | 56.00 | 4.32 | 41.55 | PK | L |
| 7 | 2.4990 | 35.02 | 10.19 | 46.00 | 10.98 | 24.83 | AV | L |
| 8 | 2.6115 | 50.11 | 10.21 | 56.00 | 5.89 | 39.90 | PK | L |
| 9 | 5.9280 | 45.76 | 10.23 | 60.00 | 14.24 | 35.53 | PK | L |
| 10 | 6.1395 | 31.75 | 10.23 | 50.00 | 18.25 | 21.52 | AV | L |
| 11 | 9.8835 | 45.03 | 10.07 | 60.00 | 14.97 | 34.96 | PK | L |
| 12 | 11.8095 | 31.77 | 9.99 | 50.00 | 18.23 | 21.78 | AV | L |

Remark: Margin = Limit – Level
Correction factor = Cable lose + LISN insertion loss
Level=Test receiver reading + correction factor

Test Specification: Neutral




## Suspected List

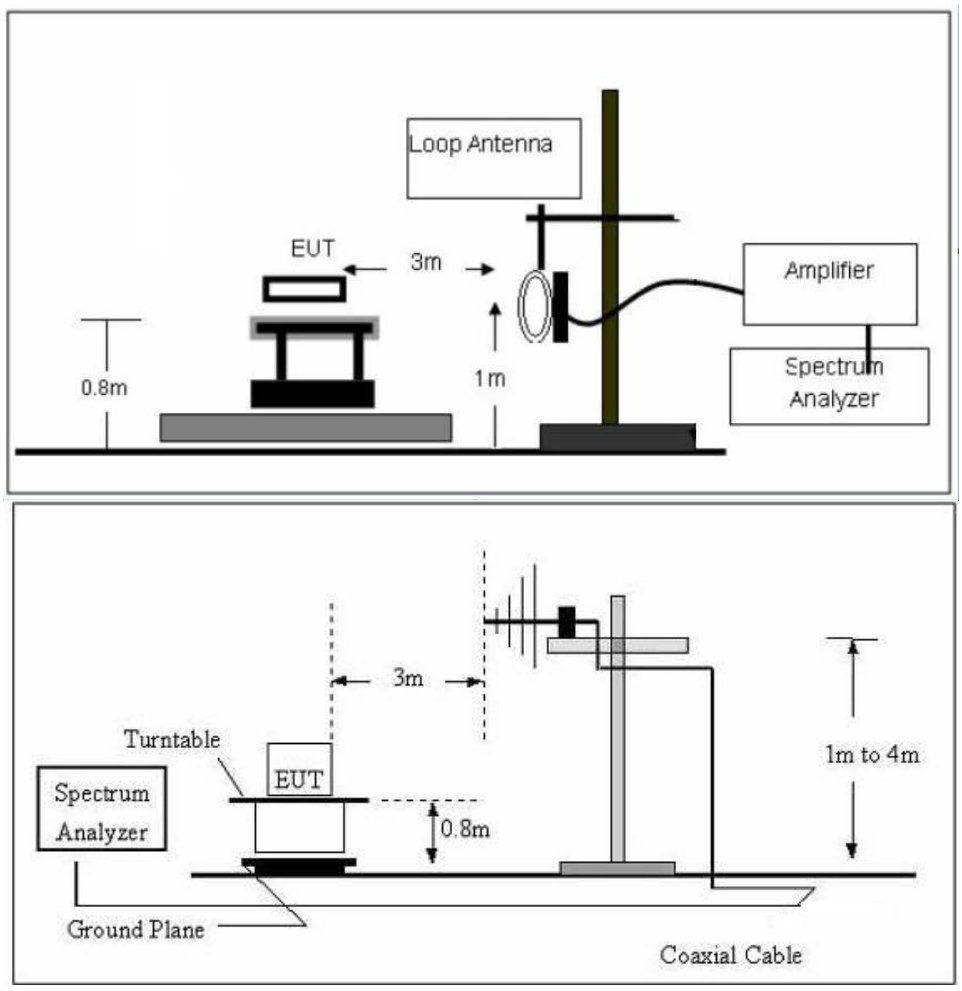
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.2445 | 53.55 | 10.03 | 61.94 | 8.39 | 43.52 | PK | N |
| 2 | 0.2445 | 40.92 | 10.03 | 51.94 | 11.02 | 30.89 | AV | N |
| 3 | 0.5820 | 39.15 | 10.05 | 46.00 | 6.85 | 29.10 | AV | N |
| 4 | 0.6045 | 52.82 | 10.05 | 56.00 | 3.18 | 42.77 | PK | N |
| 5 | 1.2525 | 53.08 | 10.09 | 56.00 | 2.92 | 42.99 | PK | N |
| 6 | 1.3245 | 37.11 | 10.10 | 46.00 | 8.89 | 27.01 | AV | N |
| 7 | 1.7340 | 36.62 | 10.13 | 46.00 | 9.38 | 26.49 | AV | N |
| 8 | 1.8060 | 52.48 | 10.14 | 56.00 | 3.52 | 42.34 | PK | N |
| 9 | 5.1315 | 33.05 | 10.26 | 50.00 | 16.95 | 22.79 | AV | N |
| 10 | 5.4735 | 47.61 | 10.26 | 60.00 | 12.39 | 37.35 | PK | N |
| 11 | 9.6360 | 47.56 | 10.08 | 60.00 | 12.44 | 37.48 | PK | N |
| 12 | 11.9355 | 31.94 | 9.99 | 50.00 | 18.06 | 21.95 | AV | N |

Remark: Margin = Limit – Level
Correction factor = Cable lose + LISN insertion loss
Level=Test receiver reading + correction factor

*Notes:*
*1. An initial pre-scan was performed on the line and neutral lines with peak detector.*
*2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
*3. Final Level =Receiver Read level + LISN Factor + Cable Loss.*
*If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

# 4. Radiated Emissions

## 4.1 Block Diagram of Test Setup




## 4.2 Rules and specifications

Except as provided elsewhere in this Subpart 18.305 (b), the field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following table:

| Frequency MHz | Distance Meters | Field Strengths Limit | |
|---|---|---|---|
| | | dBμV/m | Remark |
| 0.009~30MHz | 3 | 103.5 | Quasi-peak |
| 30~88 | 3 | 40.0 | Quasi-peak |
| 88~216 | 3 | 43.5 | Quasi-peak |
| 216~960 | 3 | 46.0 | Quasi-peak |
| 960~1000 | 3 | 54.0 | Quasi-peak |

Remark:
(1) Emission level dBuV/m for 0.009~30MHz = 20log (15) + 40log (300/3) dBuV/m;
(2) Calculated according FCC 18.305.
(3) The smaller limit shall apply at the cross point between two frequency bands.
(4) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

### 4.3 Test Procedure

Measurement distance 3m
For the measurement range up to 30MHz in the following plots the field strength result from 3m Distance measurement are extrapolated to 300m and 30m distance respectively, by 40dB/decade, Per antenna factor scaling.
Measurements below 1000MHz are performed with a peak detector and compared to average limits, Measurements with an average detector are not required.

Note:
For battery operated equipment, the equipment tests shall be performed using a new battery.

1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test the EUT in the lowest channel,the middle channel,the Highest channel
The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.Repeat above procedures until all frequencies measured was complete.

**TEST RESULTS**

**PASS**

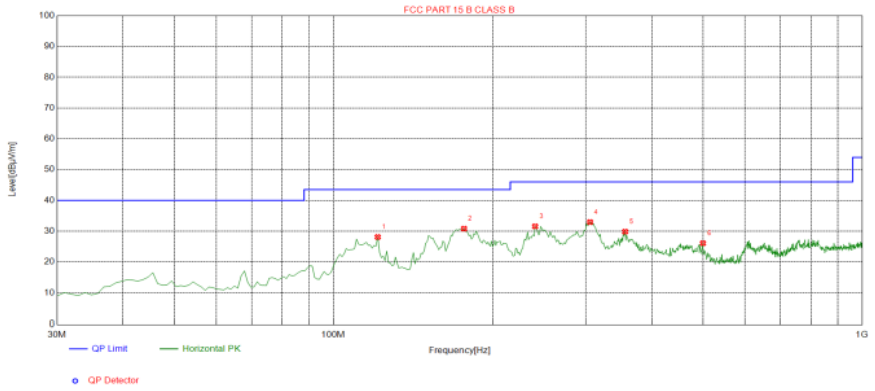
**For 9KHz-30MHz**

| Freq. (MHz) | Detector Mode (PK/QP/AV) | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Level (dBuV/m) | Limits 3m (dBuV/m) | Margin (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 0.110 | AV | PK | 21.52 | 24.8 | 46.32 | 103.5 | 57.18 |
| 0.125 | AV | PK | 46.20 | 24.8 | 71.00 | 103.5 | 32.50 |
| 0.486 | AV | PK | 26.06 | 25.03 | 51.09 | 103.5 | 52.41 |
| 0.500 | PK | PK | 26.47 | 25.03 | 51.50 | 103.5 | 52.00 |

**For30MHz-1GHz**

Antenna polarity: H

**Test Graph**



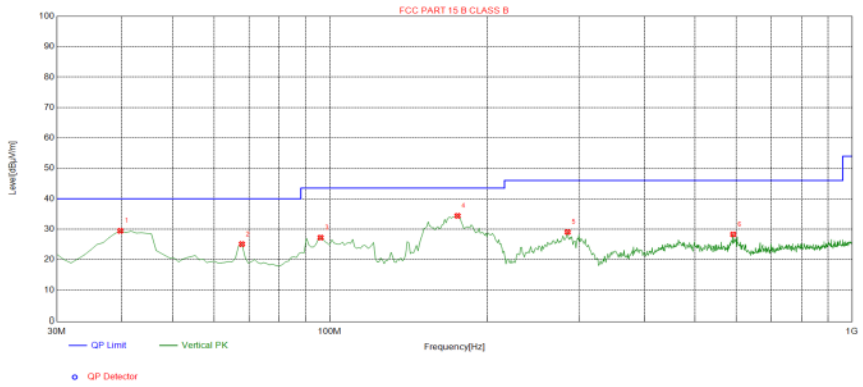

**Suspected List**

| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 121.2713 | -17.29 | 45.40 | 28.11 | 43.50 | 15.39 | 100 | 359 | Horizontal |
| 2 | 176.6166 | -17.01 | 47.82 | 30.81 | 43.50 | 12.69 | 100 | 234 | Horizontal |
| 3 | 240.7007 | -13.82 | 45.40 | 31.58 | 46.00 | 14.42 | 100 | 312 | Horizontal |
| 4 | 305.7558 | -12.66 | 45.61 | 32.95 | 46.00 | 13.05 | 100 | 278 | Horizontal |
| 5 | 356.2462 | -11.47 | 41.32 | 29.85 | 46.00 | 16.15 | 100 | 315 | Horizontal |
| 6 | 499.9500 | -8.30 | 34.39 | 26.09 | 46.00 | 19.91 | 100 | 182 | Horizontal |

Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor

Antenna polarity: V

**Test Graph**




**Suspected List**

| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 39.7097 | -14.64 | 44.10 | 29.46 | 40.00 | 10.54 | 100 | 348 | Vertical |
| 2 | 67.8679 | -17.13 | 42.23 | 25.10 | 40.00 | 14.90 | 100 | 60 | Vertical |
| 3 | 96.0260 | -16.06 | 43.29 | 27.23 | 43.50 | 16.27 | 100 | 209 | Vertical |
| 4 | 175.6456 | -17.05 | 51.44 | 34.39 | 43.50 | 9.11 | 100 | 218 | Vertical |
| 5 | 285.3654 | -13.03 | 42.11 | 29.08 | 46.00 | 16.92 | 100 | 152 | Vertical |
| 6 | 592.1922 | -6.63 | 34.91 | 28.28 | 46.00 | 17.72 | 100 | 307 | Vertical |

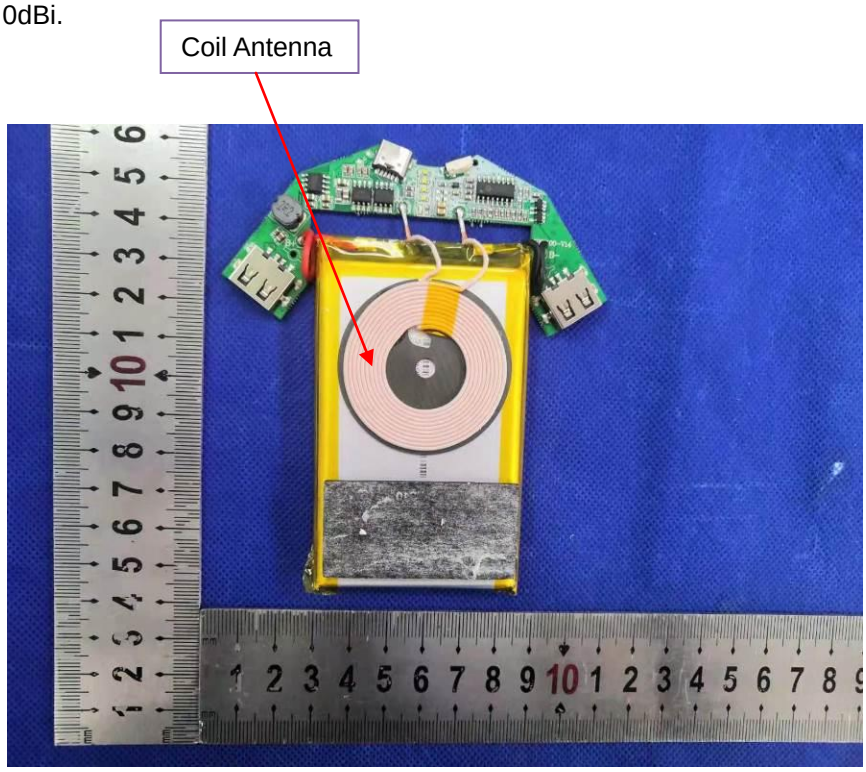
Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor

## 4.1. ANTENNA REQUIREMENT

**Standard Applicable**
For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

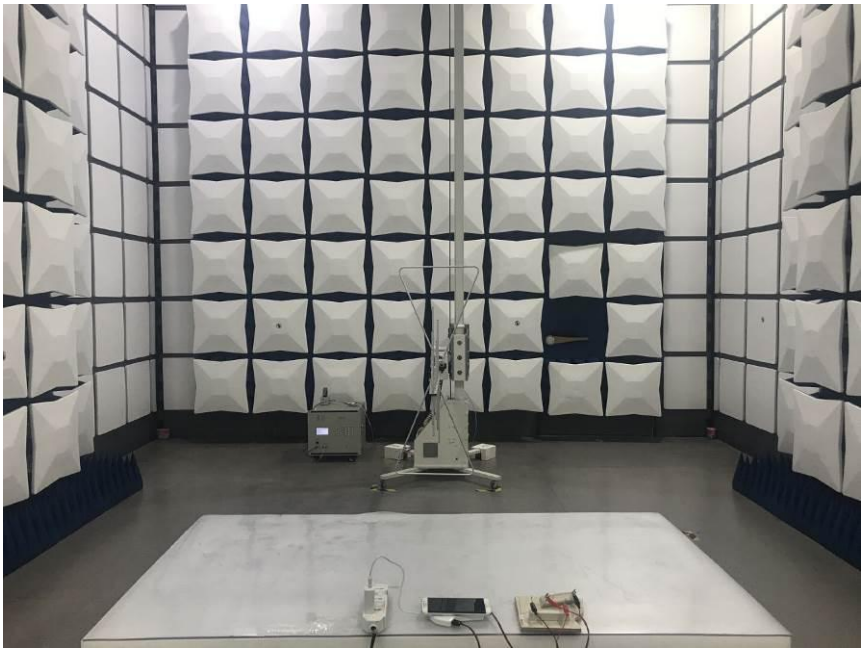
**Refer to statement below for compliance.**
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

**Antenna Connected Construction**
The antenna used in this product is a Coil Antenna, The directional gains of antenna used for transmitting is 0dBi.

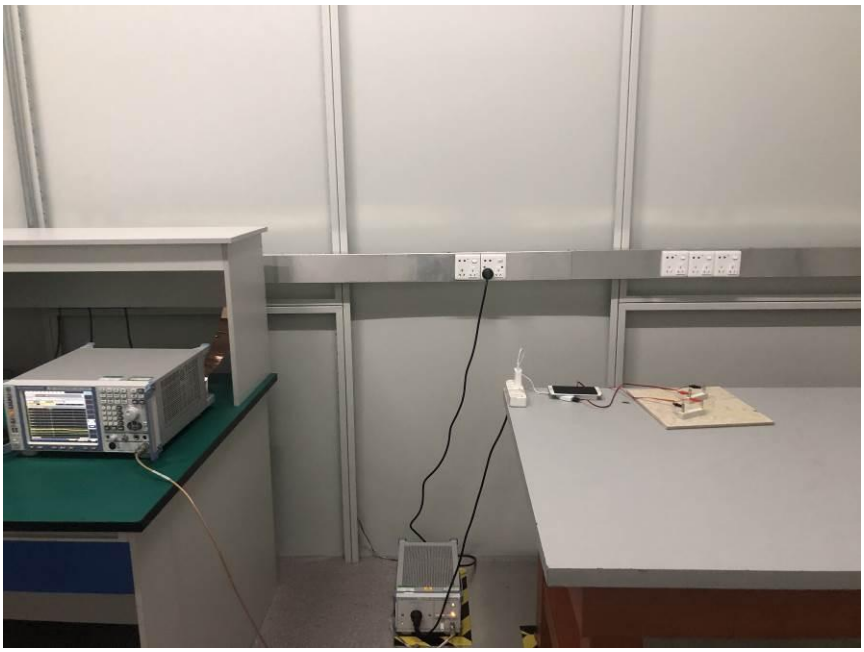


# 5. Test Setup Photos of the EUT

30MHz-1000MHz



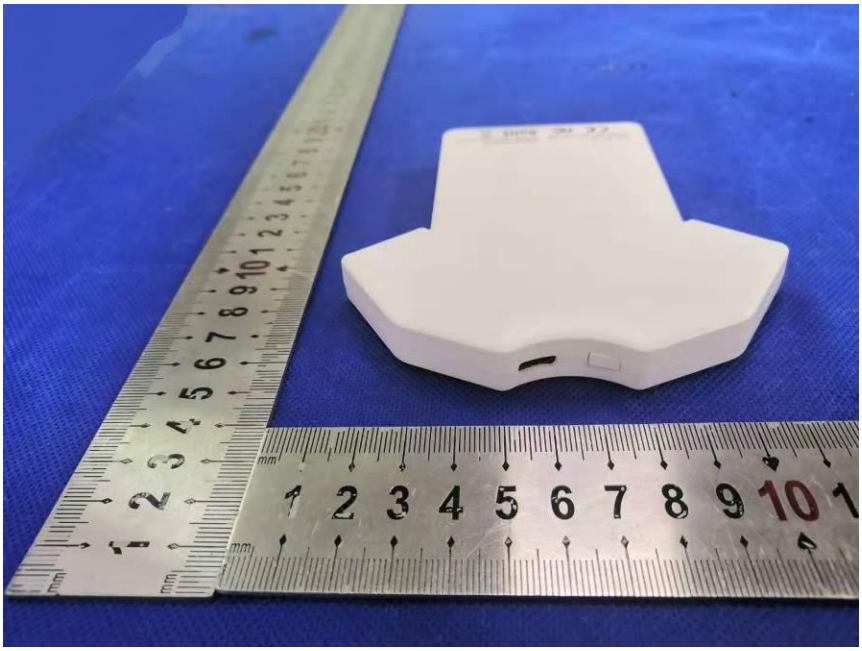
Conducted Emission



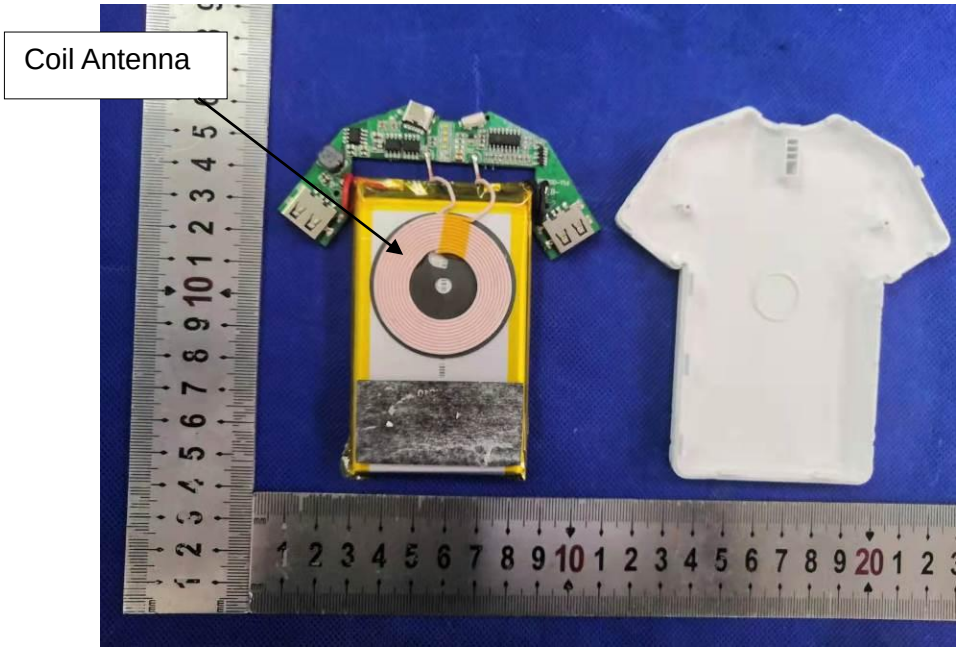
# 6. PHOTOS OF THE EUT

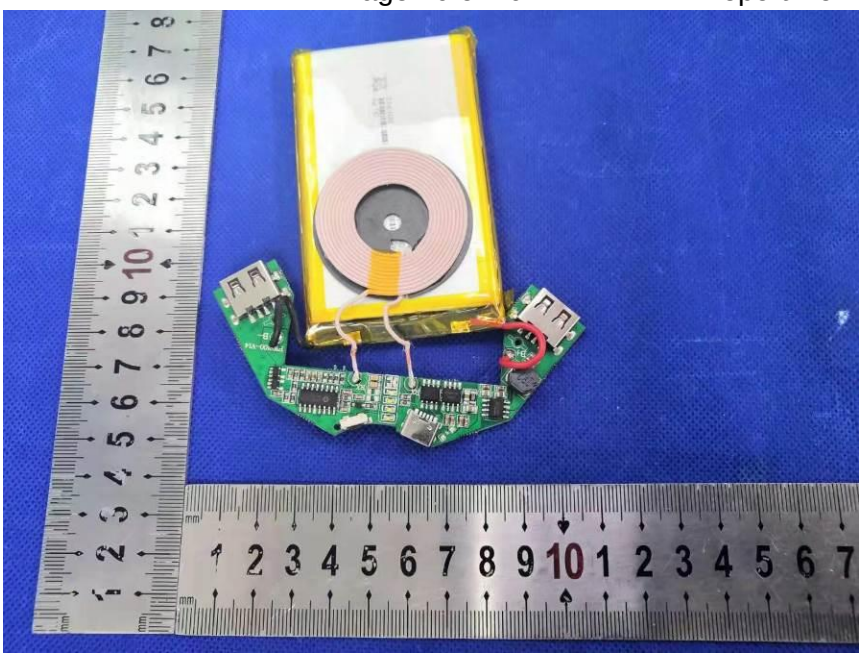
**External photos**

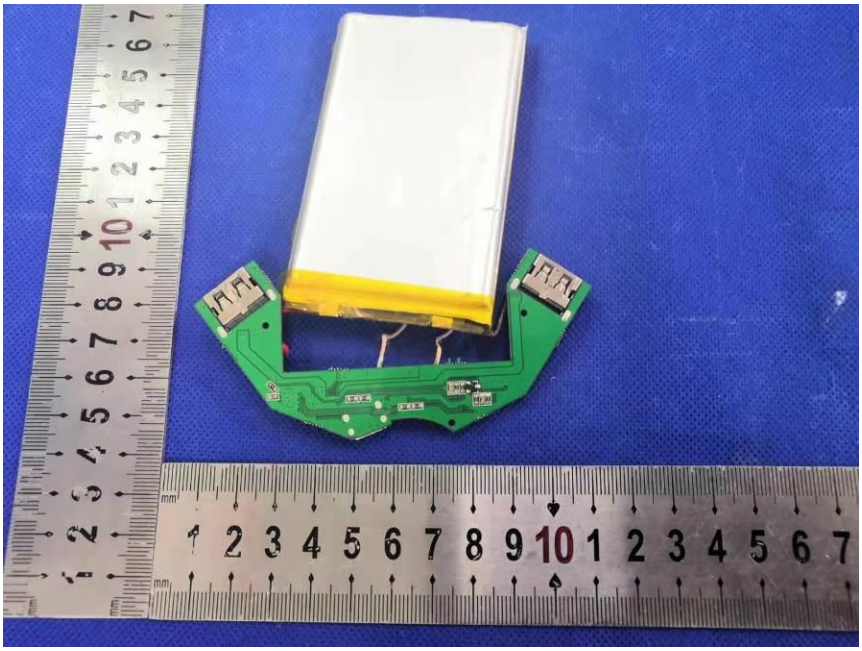

RoHS



**Internal photos**







**END**