

# TEST REPORT

**Reference No.**..... : WTS17S0476225-1E  
**FCC ID** ..... : 2ALUK-QI1606A  
**Applicant**..... : LF centennial service limited  
**Address**..... : 8F, HK Spinners Industrial Building, Phases I 7 UU, 800 Cheung Sha Wan Road, Kowloon, Hong Kong  
**Manufacturer** ..... : CCA Designing&manufacturing limited  
**Address**..... : Bld 120-121th, pinghuan ind.city pingshan town, shenzhen, 518118  
**Product Name**..... : Wireless Power Bank  
**Model No.**..... : Qi-Clip, Qi-Clip-BK, Qi-Clip-OR, QI-1606A, QI-1606A-BK, QI-1606A-OR  
**Standards**..... : FCC Part 15 subpart C  
**Date of Receipt sample** .... : Apr. 12, 2017  
**Date of Test** ..... : Apr. 13 – May. 01, 2017  
**Date of Issue**..... : May. 02, 2017  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

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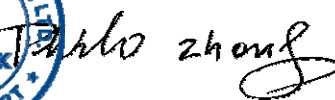
Fax:+86-755-83552400

Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

## 2 Test Summary

| Test Items                  | Test Requirement | Result |
|-----------------------------|------------------|--------|
| Conducted Emissions         | 15.207           | PASS   |
| Radiated Spurious Emissions | 15.209           | PASS   |
| Occupied Bandwidth          | 15.215           | PASS   |
| Antenna Requirement         | 15.203           | PASS   |

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## 4 General Information

### 4.1 General Description of E.U.T

|                        |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| Product Name:          | Wireless Power Bank                                                               |
| Model No.:             | Qi-Clip, Qi-Clip-BK, Qi-Clip-OR, QI-1606A, QI-1606A-BK, QI-1606A-OR               |
| Model Difference:      | Only the model names and colors are different. Model QI-1606A is the test sample. |
| Type of Modulation:    | ASK                                                                               |
| Frequency Range:       | 0.112~0.205MHz                                                                    |
| The Lowest Oscillator: | N/A                                                                               |
| Antenna installation:  | Coil Antenna                                                                      |

### 4.2 Details of E.U.T.

|                 |                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Technical Data: | Input: 5V $\overline{=}$ 2A<br>Output (USB-A): 5V $\overline{=}$ 2.1A;<br>Output (QI): 5V $\overline{=}$ 1A Max;<br>Battery: 3.7V, 5000mAh |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|

### 4.3 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, October 15, 2015.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. 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 328995, December 3, 2014.

## 5 Equipment Used during Test

### 5.1 Equipments List

| Conducted Emissions Test Site 1#                              |                              |                                  |               |            |                       |                      |
|---------------------------------------------------------------|------------------------------|----------------------------------|---------------|------------|-----------------------|----------------------|
| Item                                                          | Equipment                    | Manufacturer                     | Model No.     | Serial No. | Last Calibration Date | Calibration Due Date |
| 1.                                                            | EMI Test Receiver            | R&S                              | ESCI          | 100947     | Sep.12, 2016          | Sep.11, 2017         |
| 2.                                                            | LISN                         | R&S                              | ENV216        | 101215     | Sep.12, 2016          | Sep.11, 2017         |
| 3.                                                            | Cable                        | Top                              | TYPE16(3.5M)  | -          | Sep.12, 2016          | Sep.11, 2017         |
| 3m Semi-anechoic Chamber for Radiation Emissions Test site 2# |                              |                                  |               |            |                       |                      |
| Item                                                          | Equipment                    | Manufacturer                     | Model No.     | Serial No  | Last Calibration Date | Calibration Due Date |
| 1                                                             | Test Receiver                | R&S                              | ESCI          | 101296     | Apr.06, 2017          | Apr.05, 2018         |
| 2                                                             | Active Loop Antenna          | Beijing Dazhi                    | ZN30900A      | -          | Oct.17, 2016          | Oct.16, 2017         |
| 3                                                             | Trilog Broadband Antenna     | SCHWARZBECK                      | VULB9160      | 9160-3325  | Apr.07, 2017          | Apr.06, 2018         |
| 4                                                             | Amplifier                    | ANRITSU                          | MH648A        | M43381     | Apr.07, 2017          | Apr.06, 2018         |
| 5                                                             | Amplifier                    | Compliance pirection systems inc | PAP-0203      | 22024      | Sep.12, 2016          | Sep.11, 2017         |
| 6                                                             | Cable                        | HUBER+SUHNER                     | CBL2          | 525178     | Apr.07, 2017          | Apr.06, 2018         |
| RF Conducted Testing                                          |                              |                                  |               |            |                       |                      |
| Item                                                          | Equipment                    | Manufacturer                     | Model No.     | Serial No. | Last Calibration Date | Calibration Due Date |
| 1.                                                            | EMC Analyzer (9k~26.5GHz)    | Agilent                          | E7405A        | MY45114943 | Sep.15,2016           | Sep.14,2017          |
| 2.                                                            | Spectrum Analyzer (9k-6GHz)  | R&S                              | FSL6          | 100959     | Sep.15,2016           | Sep.14,2017          |
| 3.                                                            | Signal Analyzer (9k~26.5GHz) | Agilent                          | N9010A        | MY50520207 | Sep.15,2016           | Sep.14,2017          |
| 4.                                                            | Humidity Chamber             | GF                               | GTH-225-40-1P | IAA061213  | Sep.15,2016           | Sep.14,2017          |

### 5.2 Description of Auxiliary Equipment

| Equipment          | Manufacturer                        | Model No. | Series No. |
|--------------------|-------------------------------------|-----------|------------|
| Acer computer      | /                                   | E1-570G   | /          |
| Iphone             | apple                               | A1530     | /          |
| Qi Clip (Receiver) | CCA Designing&manufacturing limited | Qi Clip   | /          |

### 5.3 Measurement Uncertainty

| Test Item                   | Frequency Range | Uncertainty         | Note |
|-----------------------------|-----------------|---------------------|------|
| Conducted Emissions         | 150kHz~30MHz    | $\pm 3.64\text{dB}$ | (1)  |
| Radiated Spurious Emissions | 26KHz~30MHz     | $\pm 3.03\text{dB}$ | (1)  |
| Radiated Spurious Emissions | 30MHz~1000MHz   | $\pm 5.03\text{dB}$ | (1)  |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

## 6 Conducted Emission

|                   |                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC CFR 47 Part 15 Section 15.207                                                                                      |
| Test Method:      | ANSI C63.10:2013                                                                                                       |
| Test Result:      | PASS                                                                                                                   |
| Frequency Range:  | 150kHz to 30MHz                                                                                                        |
| Class/Severity:   | Class B                                                                                                                |
| Limit:            | 66-56 dB $\mu$ V between 0.15MHz & 0.5MHz<br>56 dB $\mu$ V between 0.5MHz & 5MHz<br>60 dB $\mu$ V between 5MHz & 30MHz |
| Detector:         | Peak for pre-scan (9kHz Resolution Bandwidth)                                                                          |

### 6.1 E.U.T. Operation

Operating Environment :

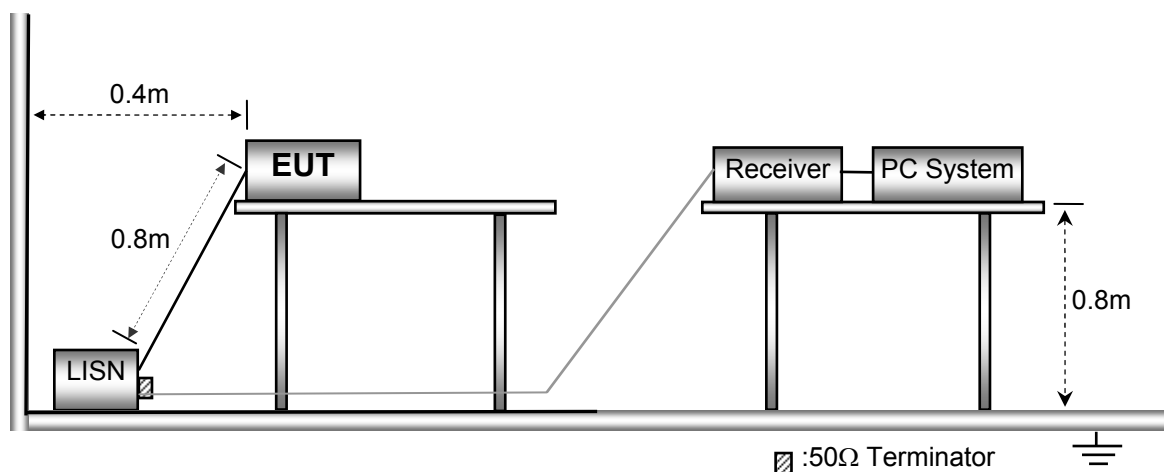
|                       |          |
|-----------------------|----------|
| Temperature:          | 25.5 °C  |
| Humidity:             | 51 % RH  |
| Atmospheric Pressure: | 101.2kPa |

EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

### 6.2 EUT Setup

The EUT was placed on the test table in shielding room.

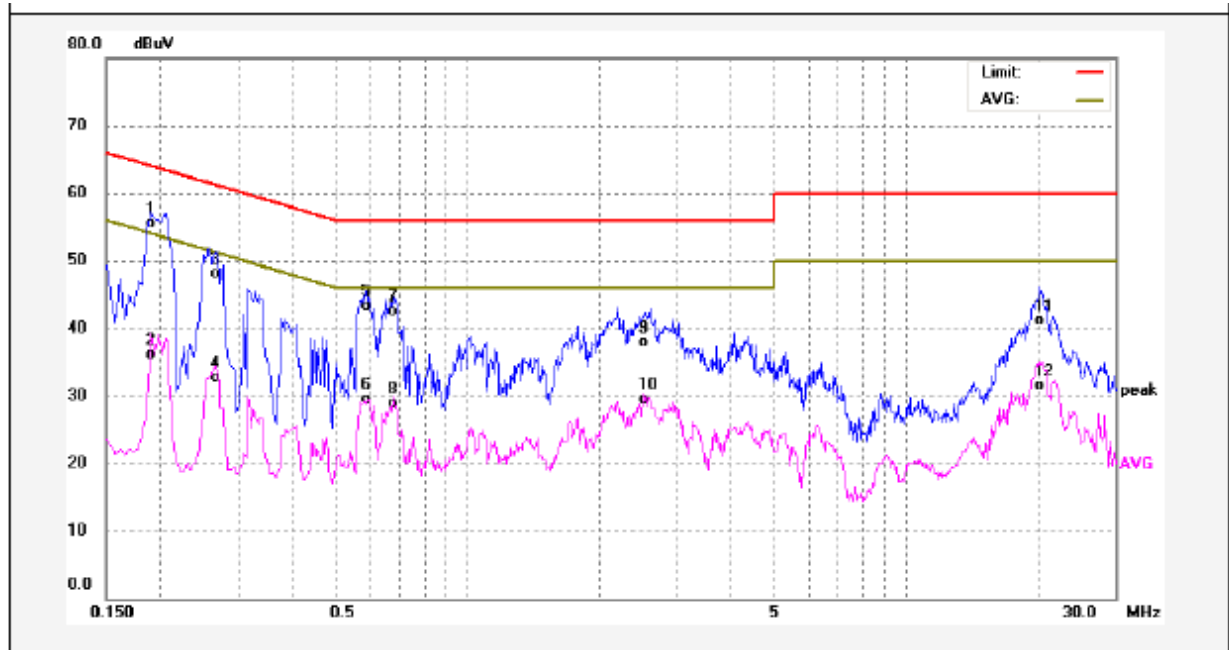


### 6.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

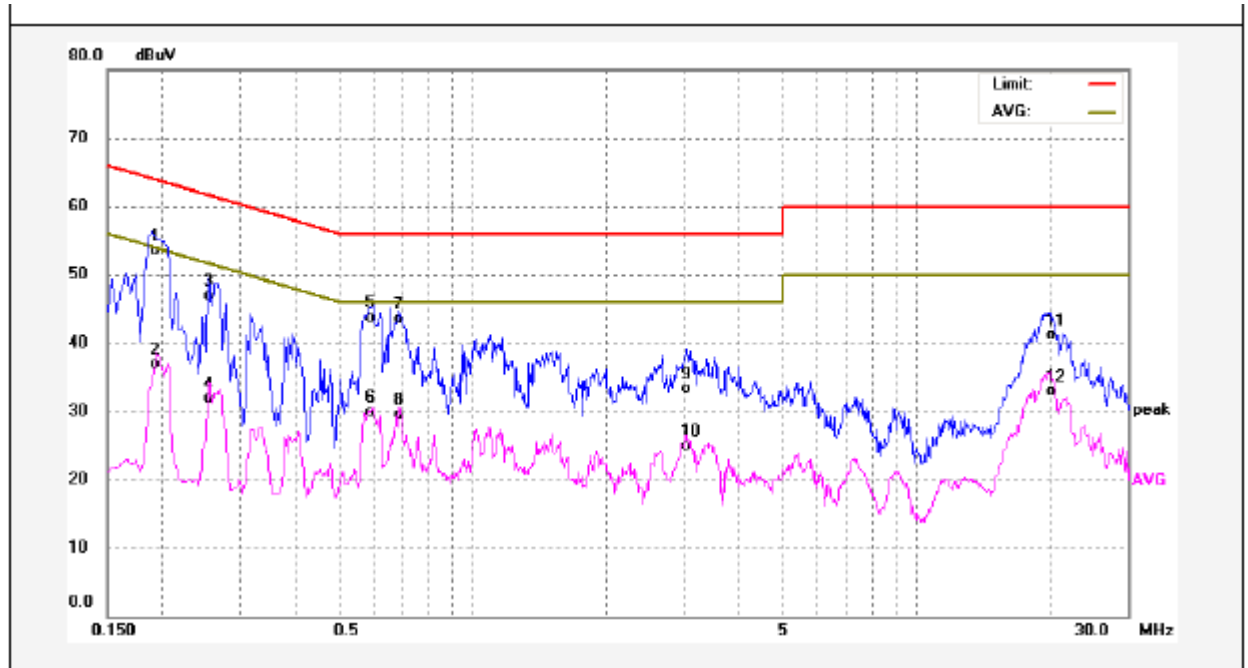
## 6.4 Conducted Emission Test Result

Live line:



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|------------|-------------|----------|--------|
| 1   | 0.1900      | 45.55          | 9.90        | 55.45         | 64.03      | -8.58       | QP       |        |
| 2   | 0.1900      | 26.18          | 9.90        | 36.08         | 54.03      | -17.95      | AVG      |        |
| 3   | 0.2660      | 38.01          | 10.00       | 48.01         | 61.24      | -13.23      | QP       |        |
| 4   | 0.2660      | 22.62          | 10.00       | 32.62         | 51.24      | -18.62      | AVG      |        |
| 5   | 0.5940      | 33.23          | 10.06       | 43.29         | 56.00      | -12.71      | QP       |        |
| 6   | 0.5940      | 19.54          | 10.06       | 29.60         | 46.00      | -16.40      | AVG      |        |
| 7   | 0.6820      | 32.34          | 10.10       | 42.44         | 56.00      | -13.56      | QP       |        |
| 8   | 0.6820      | 18.77          | 10.10       | 28.87         | 46.00      | -17.13      | AVG      |        |
| 9   | 2.5260      | 27.65          | 10.23       | 37.88         | 56.00      | -18.12      | QP       |        |
| 10  | 2.5260      | 19.26          | 10.23       | 29.49         | 46.00      | -16.51      | AVG      |        |
| 11  | 20.2580     | 30.65          | 10.47       | 41.12         | 60.00      | -18.88      | QP       |        |
| 12  | 20.2580     | 21.04          | 10.47       | 31.51         | 50.00      | -18.49      | AVG      |        |

Neutral line:



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|------------|-------------|----------|--------|
| 1   | 0.1940      | 43.61          | 9.90        | 53.51         | 63.86      | -10.35      | QP       |        |
| 2   | 0.1940      | 27.08          | 9.90        | 36.98         | 53.86      | -16.88      | AVG      |        |
| 3   | 0.2540      | 36.84          | 10.01       | 46.85         | 61.62      | -14.77      | QP       |        |
| 4   | 0.2540      | 21.88          | 10.01       | 31.89         | 51.62      | -19.73      | AVG      |        |
| 5   | 0.5940      | 33.72          | 10.06       | 43.78         | 56.00      | -12.22      | QP       |        |
| 6   | 0.5940      | 19.94          | 10.06       | 30.00         | 46.00      | -16.00      | AVG      |        |
| 7   | 0.6860      | 33.31          | 10.10       | 43.41         | 56.00      | -12.59      | QP       |        |
| 8   | 0.6860      | 19.50          | 10.10       | 29.60         | 46.00      | -16.40      | AVG      |        |
| 9   | 3.0260      | 23.13          | 10.24       | 33.37         | 56.00      | -22.63      | QP       |        |
| 10  | 3.0260      | 14.63          | 10.24       | 24.87         | 46.00      | -21.13      | AVG      |        |
| 11  | 19.9500     | 30.54          | 10.47       | 41.01         | 60.00      | -18.99      | QP       |        |
| 12  | 19.9500     | 22.39          | 10.47       | 32.86         | 50.00      | -17.14      | AVG      |        |

## 7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

| Frequency<br>(MHz) | Field Strength |                 | Field Strength Limit at 3m Measurement Dist |                                |
|--------------------|----------------|-----------------|---------------------------------------------|--------------------------------|
|                    | uV/m           | Distance<br>(m) | uV/m                                        | dBuV/m                         |
| 0.009 ~ 0.490      | 2400/F(kHz)    | 300             | 10000 * 2400/F(kHz)                         | $20\log^{(2400/F(kHz))} + 80$  |
| 0.490 ~ 1.705      | 24000/F(kHz)   | 30              | 100 * 24000/F(kHz)                          | $20\log^{(24000/F(kHz))} + 40$ |
| 1.705 ~ 30         | 30             | 30              | 100 * 30                                    | $20\log^{(30)} + 40$           |
| 30 ~ 88            | 100            | 3               | 100                                         | $20\log^{(100)}$               |
| 88 ~ 216           | 150            | 3               | 150                                         | $20\log^{(150)}$               |
| 216 ~ 960          | 200            | 3               | 200                                         | $20\log^{(200)}$               |
| Above 960          | 500            | 3               | 500                                         | $20\log^{(500)}$               |

### 7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

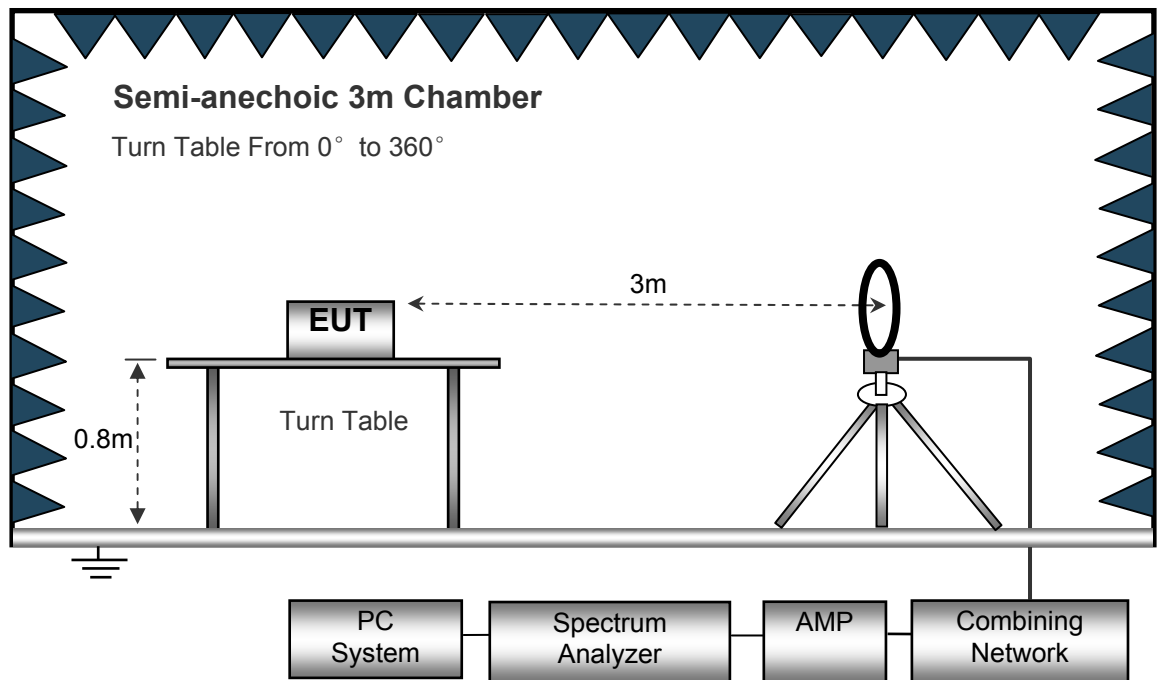
EUT Operation :

Only the worst case transmitting mode were record in the report.

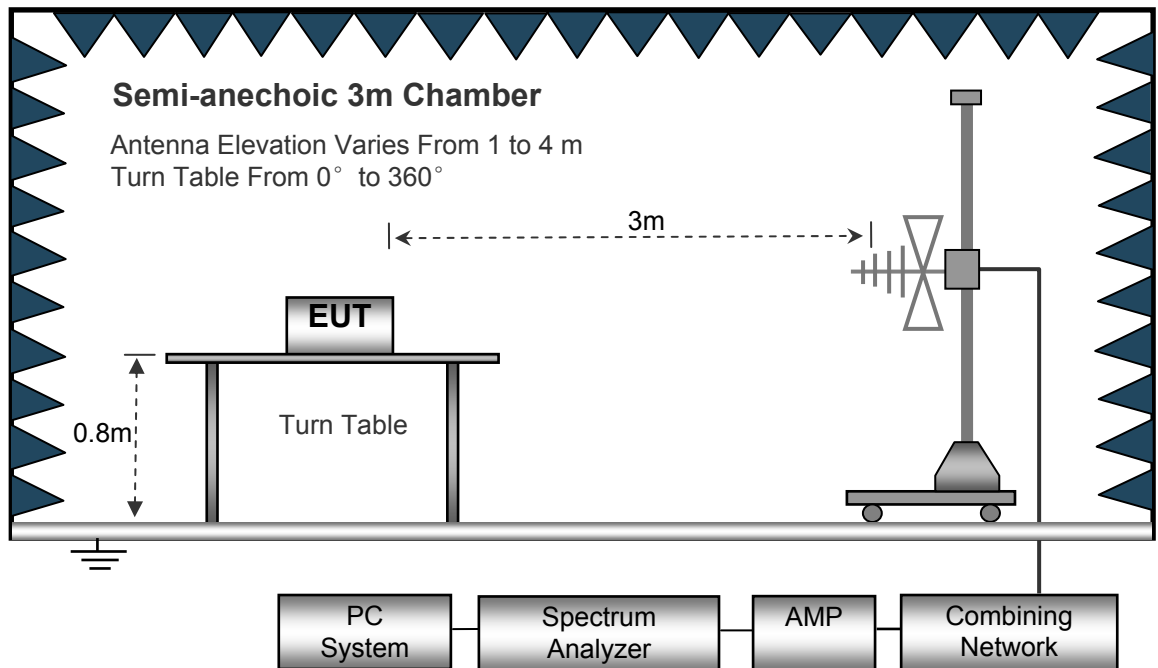
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



### 7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed .....Auto  
IF Bandwidth..... 10kHz  
Video Bandwidth..... 10kHz  
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed .....Auto  
Detector .....PK  
Resolution Bandwidth..... 100kHz  
Video Bandwidth..... 300kHz

### 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

## 7.5 Summary of Test Results

Test Frequency: 9KHz ~ 30MHz, Note: Correct factor = Cable loss + Antenna factor

| Frequency | Receiver Reading (AV) | Turn table Angle | RX Antenna |       | Corrected Factor | Corrected Amplitude (AV) | FCC Part 15.209 |        |
|-----------|-----------------------|------------------|------------|-------|------------------|--------------------------|-----------------|--------|
|           |                       |                  | Height     | Polar |                  |                          | Limit           | Margin |
| (MHz)     | (dBμV@3m)             | Degree           | (m)        | (H/V) | (dB/m)           | (dBμV/m)                 | (dBμV/m)@3m     | (dB)   |
| 0.140     | 44.17                 | 125              | 1.7        | H     | 20.58            | 64.75                    | 104.68          | -39.93 |
| 0.140     | 30.90                 | 214              | 1.8        | V     | 28.37            | 59.27                    | 104.68          | -45.41 |

| Frequency (MHz) | Measurement results | Detector | Correct factor | Extrapolation factor | Measurement results (calculated) | Limits     | Margin |
|-----------------|---------------------|----------|----------------|----------------------|----------------------------------|------------|--------|
|                 | dBμV @3m            | PK/QP    | dB/m           | dB                   | dBμV/m @3m                       | dBμV/m @3m | dB     |
| 2.896           | 20.04               | QP       | 24.27          | 40.00                | 4.31                             | 29.54      | -25.23 |
| 4.508           | 7.89                | QP       | 24.65          | 40.00                | -7.46                            | 29.54      | -37.00 |

Test Frequency: 30MHz ~ 1GHz

| Frequency | Receiver Reading | Detector     | Turn table Angle | RX Antenna |       | Corrected Factor | Corrected Amplitude | FCC Part 15. 209 |        |
|-----------|------------------|--------------|------------------|------------|-------|------------------|---------------------|------------------|--------|
|           |                  |              |                  | Height     | Polar |                  |                     | Limit            | Margin |
| (MHz)     | (dBμV)           | (PK/QP /Ave) | Degree           | (m)        | (H/V) | (dB)             | (dBμV/m)            | (dBμV /m)        | (dB)   |
| 34.22     | 32.51            | QP           | 17               | 2.0        | H     | -14.30           | 18.21               | 40.00            | -21.79 |
| 34.22     | 34.47            | QP           | 241              | 1.3        | V     | -14.30           | 20.17               | 40.00            | -19.83 |
| 220.34    | 37.16            | QP           | 186              | 1.2        | H     | -13.58           | 23.58               | 46.50            | -22.92 |
| 220.34    | 42.21            | QP           | 187              | 1.6        | V     | -13.58           | 28.63               | 46.50            | -17.87 |
| 519.67    | 37.73            | QP           | 75               | 1.9        | H     | -5.63            | 32.10               | 46.50            | -14.40 |
| 519.67    | 43.58            | QP           | 212              | 1.5        | V     | -5.63            | 37.95               | 46.50            | -8.55  |

8 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215

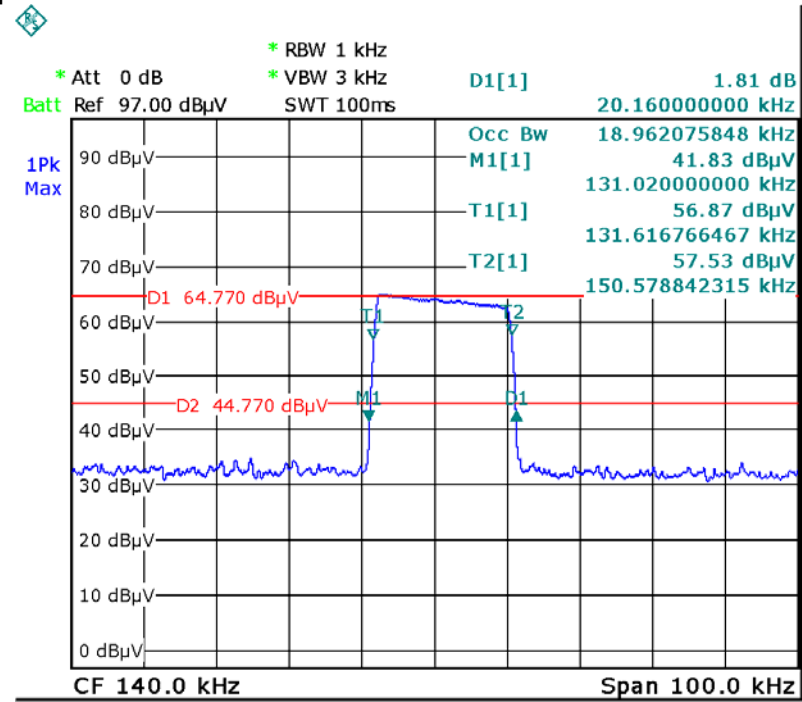
8.1 Test Procedure

- 1. The transmitter shall be operated at its maximum carrier power measured under normal test conditions;
- 2. The span of the analyzer shall be set to capture all products of the modulation process,including the emission skirts.
- 3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

8.2 Test Result Plot:

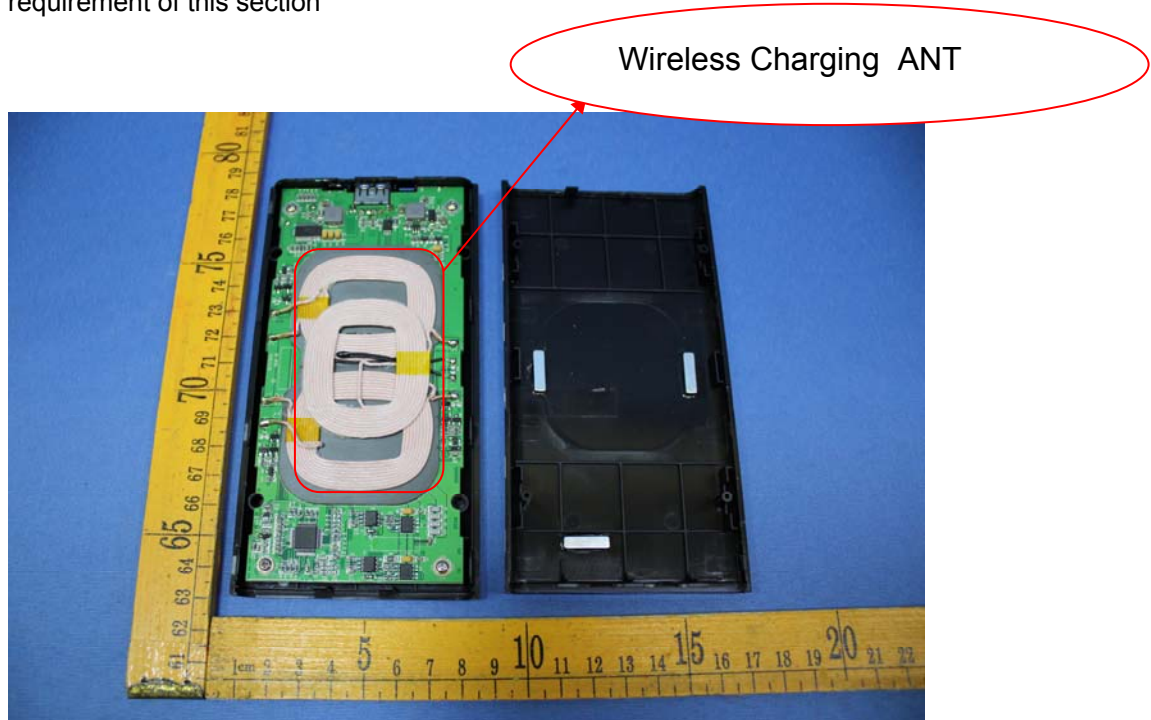
| Test Channel(kHz) | 99% Bandwidth(kHz) | 20dB Bandwidth Emission(KHz) |
|-------------------|--------------------|------------------------------|
| 140.00            | 18.962             | 20.160                       |

Test result plot as follows:



## 9 Antenna Requirement

According to the FCC Part 15 Paragraph 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. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent Coil antenna, fulfill the requirement of this section



## 10 Photographs- QI-1606A Test Setup

### 10.1 Radiation Emission Test Setup

Below 30MHz at Test Site 2#



From 30MHz to 1GHz at Test Site 2#



## 10.2 Photograph – Conducted Emission Test Setup

Conducted Emissions Test Site 1#



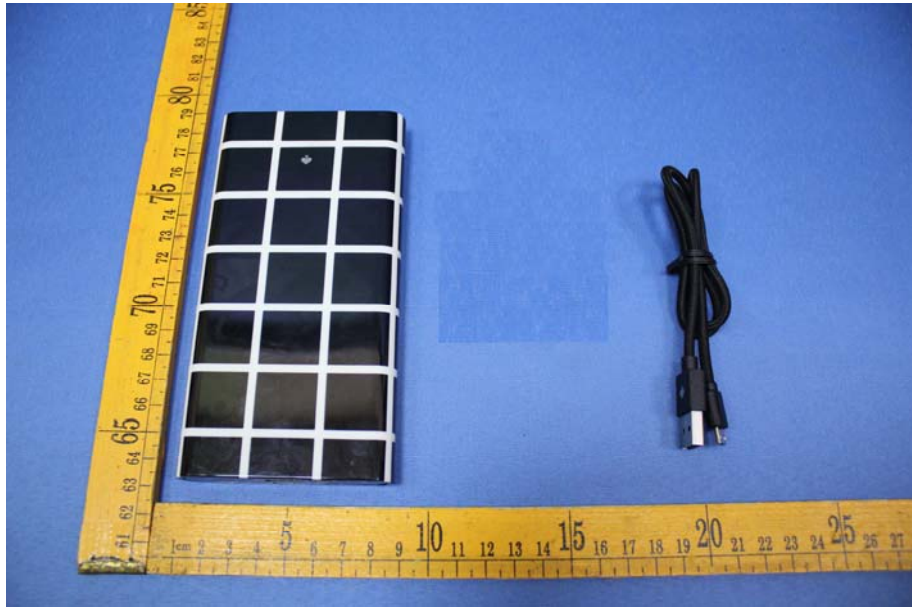
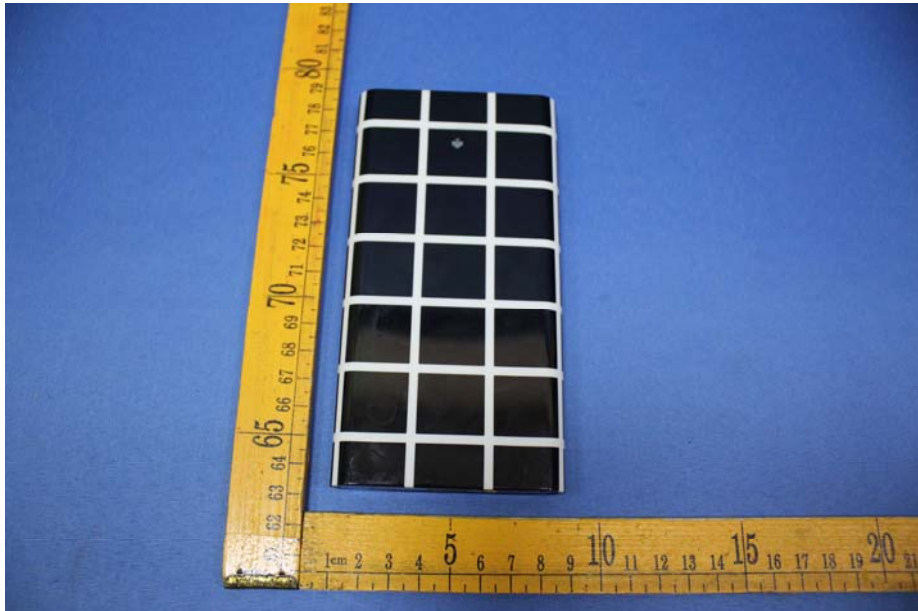
## 11 Photographs - Constructional Details

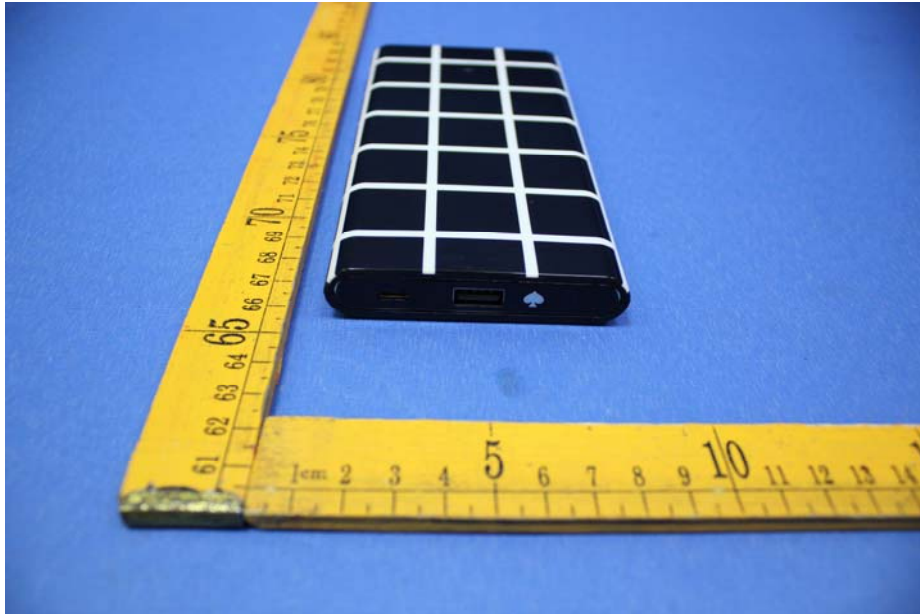
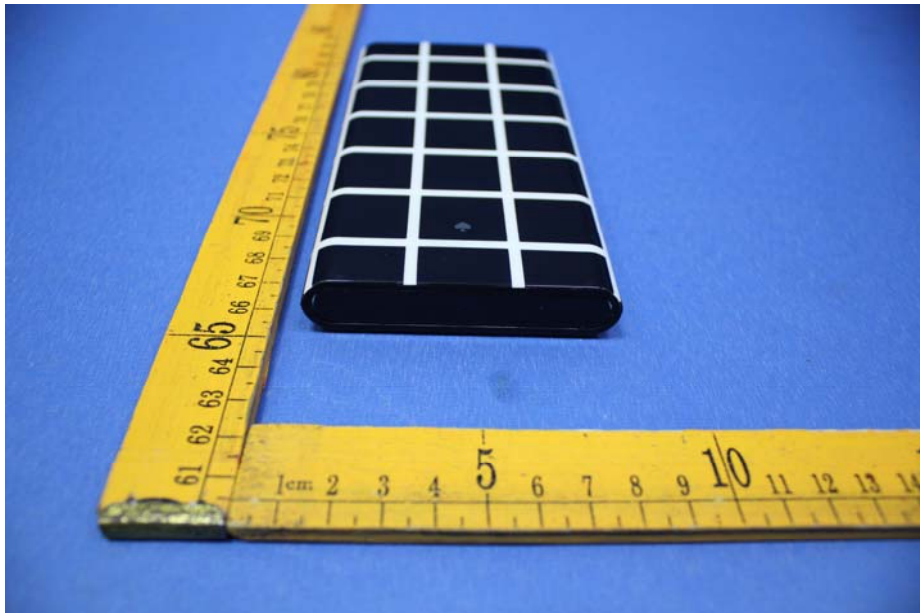
### 11.1 QI-1606A - Appearance View

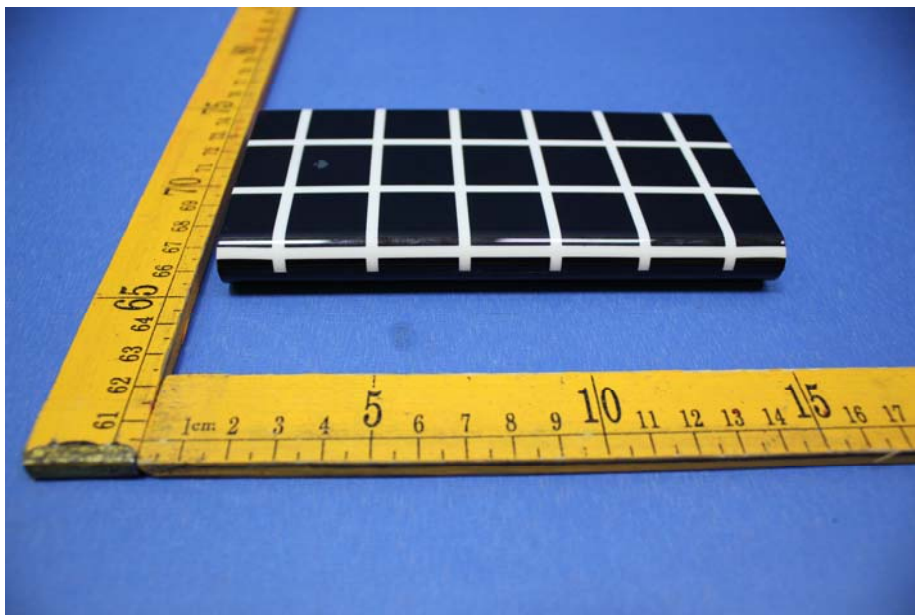
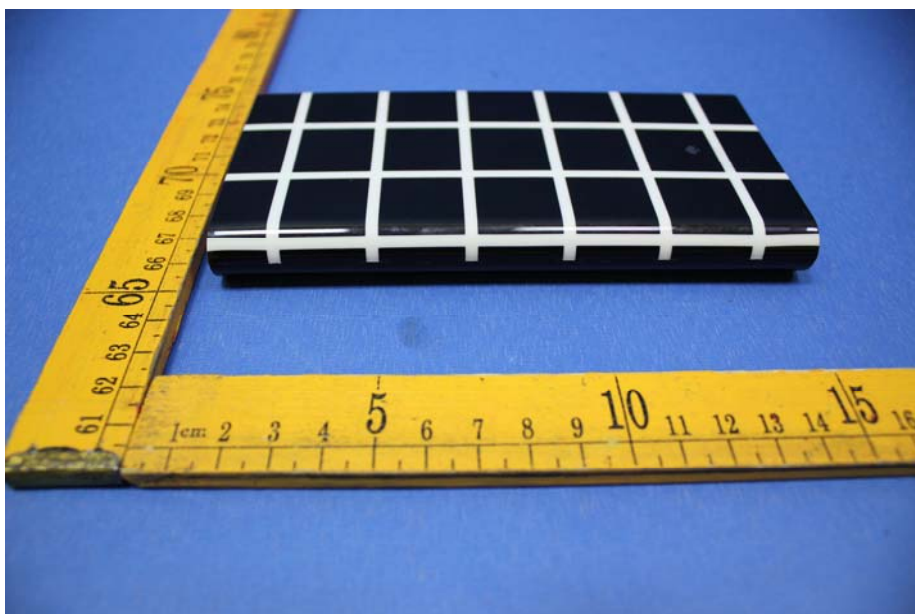






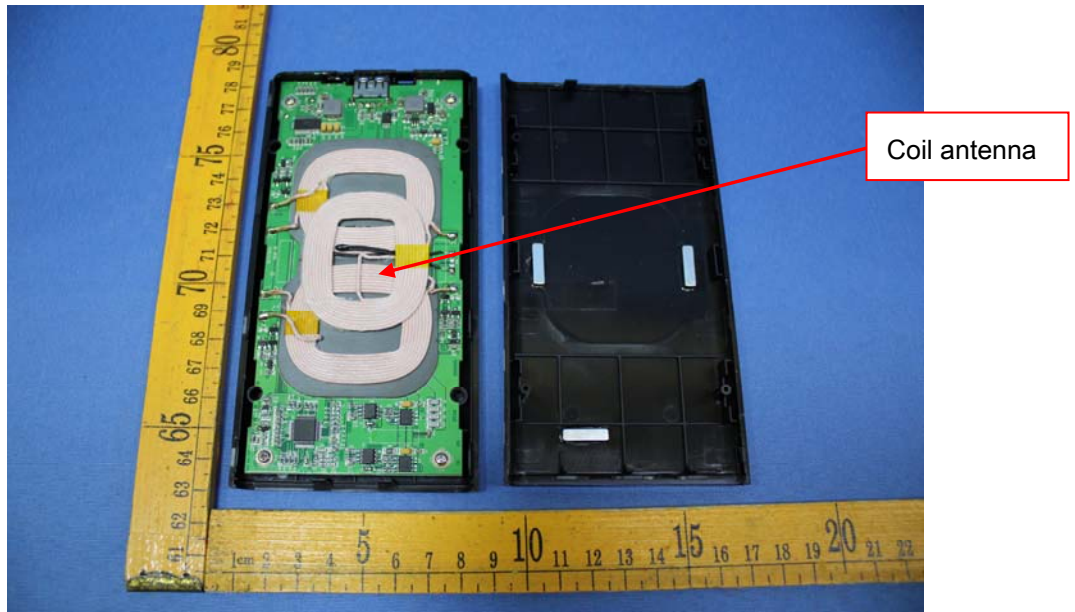
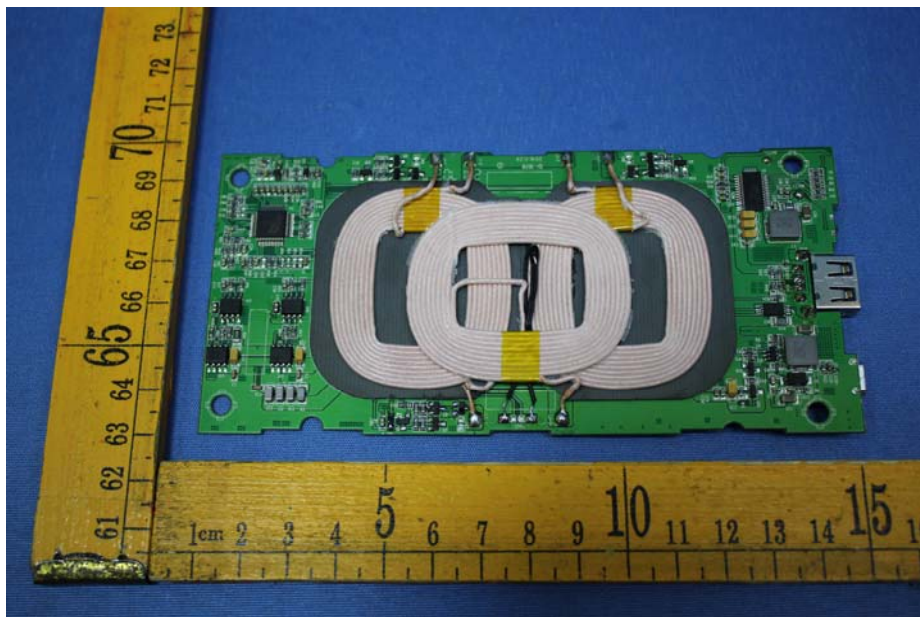


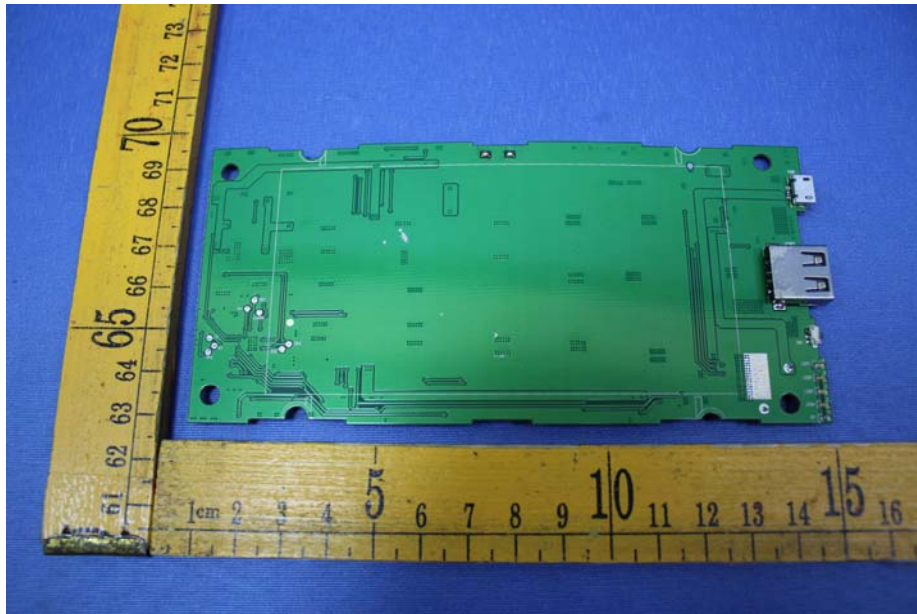
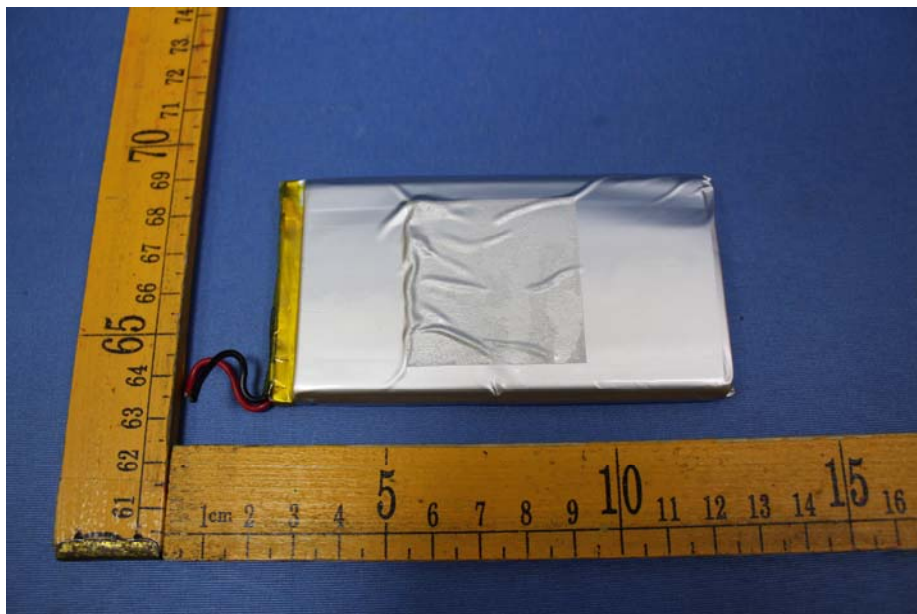






## 11.2 QI-1606A - Internal View







=====End of Report=====