



## FCC TEST REPORT

### FCC ID: 2AP2N-QICABLE

On Behalf of

Shenzhen Esorun Technology Co.,LTD

Wireless Charger

Model No.: Qicable

Prepared for : Shenzhen Esorun Technology Co.,LTD  
Address : 10F, Mingzhuo Building, Mingzhuoxing Industrial  
Address : Park,Guangming Street, Guangming District, Shenzhen,  
China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.  
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,  
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Report Number : T1880946 05  
Date of Receipt : June 20, 2018  
Date of Test : June 20, 2018- July 09, 2018  
Date of Report : July 09, 2018  
Version Number : REV0

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## TEST REPORT DECLARATION

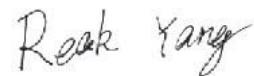
Applicant : Shenzhen Esorun Technology Co.,LTD  
Address : 10F, Mingzhuo Building, Mingzhuoxing Industrial Park,Guangming Street, Guangming District, Shenzhen, China  
Manufacturer : Shenzhen Esorun Technology Co.,LTD  
Address : 10F, Mingzhuo Building, Mingzhuoxing Industrial Park,Guangming Street, Guangming District, Shenzhen, China  
EUT Description : Wireless Charger  
(A) Model No. : Qicable  
(B) Trademark : ESORUN

Measurement Standard Used:

**FCC CFR Title 47 Part 15 Subpart C Section 15.209**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

Tested by (name + signature).....: Reak Yang  
Project Engineer



Approved by (name + signature).....: Simple Guan  
Project Manager



Date of issue.....: July 09, 2018

**Revision History**

| Revision | Issue Date    | Revisions              | Revised By  |
|----------|---------------|------------------------|-------------|
| 00       | July 09, 2018 | Initial released Issue | Simple Guan |

## 1. Test Result Summary

| Requirement                      | CFR 47 Section | Result |
|----------------------------------|----------------|--------|
| Antenna requirement              | §15.203        | PASS   |
| AC Power Line Conducted Emission | §15.207        | PASS   |
| Spurious Emission                | §15.209(a)(f)  | PASS   |
| Occupied Bandwidth               | §15.215 (c)    | PASS   |

**Note:**

1. PASS: *Test item meets the requirement.*
2. Fail: *Test item does not meet the requirement.*
3. N/A: *Test case does not apply to the test object.*
4. *The test result judgment is decided by the limit of test standard.*

## 2. General Information

### 2.1. Description of Device (EUT)

EUT Name : Wireless Charger

Model No. : Qicable

DIFF. : N/A

Trademark : ESORUN

Power supply : Input: DC 5V/3A; DC 9V/2A  
Connector output: DC 5V/1A  
Wireless Output: DC 5V/1A; DC 9V/1.1A

Operation frequency : 125-205KHz

Modulation : MSK

Antenna Type : Coil Antenna, Maximum Gain is 28dBi

Software version : V3.4

Hardware version : V1.0

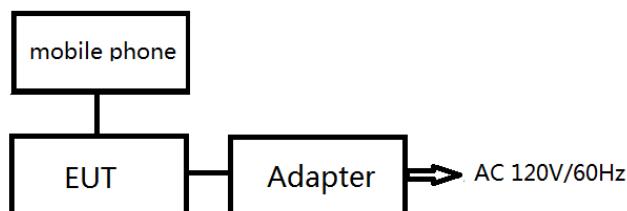
## 2.2. Accessories of Device (EUT)

Accessories1 : /  
 Manufacturer : /  
 Model : /  
 Ratings : /

## 2.3. Tested Supporting System Details

| No. | Description  | Manufacturer | Model              | Serial Number | Certification or DOC |
|-----|--------------|--------------|--------------------|---------------|----------------------|
| 1   | Mobile phone | APPLE        | IPHONE 8           | --            | --                   |
| 2   | Adapter      | --           | S005AYU090<br>0112 | --            | --                   |

## 2.4. Block Diagram of connection between EUT and simulators



## 2.5. Description of Test Modes

| Channel | Frequency (KHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 1       | 125             | 6       | 150             | 11      | 175             | 16      | 200             |
| 2       | 130             | 7       | 155             | 12      | 180             | 17      | 205             |
| 3       | 135             | 8       | 160             | 13      | 185             | 18      |                 |
| 4       | 140             | 9       | 165             | 14      | 190             | 19      |                 |
| 5       | 145             | 10      | 170             | 15      | 195             | 20      |                 |

Note: Pre-San all output power mode, and only worst data listed in report (DC 9V/1.1A).

## 2.6. Test Conditions

| Items              | Required  | Actual |
|--------------------|-----------|--------|
| Temperature range: | 15-35°C   | 27°C   |
| Humidity range:    | 25-75%    | 56%    |
| Pressure range:    | 86-106kPa | 980kPa |

## 2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission  
Registration Number: 293961

July 25, 2017 Certificated by IC  
Registration Number: 12135A

## 2.8. Measurement Uncertainty

(95% confidence levels, k=2)

| Item   | Uncertainty          |
|--|----------------------|
| Uncertainty for Power point Conducted Emissions Test                     | 2.42dB               |
| Uncertainty for Radiation Emission test in 3m chamber<br>(below 30MHz)   | 2.13 dB(Polarize: V) |
|  | 2.57dB(Polarize: H)  |
| Uncertainty for Radiation Emission test in 3m chamber<br>(30MHz to 1GHz) | 3.54dB(Polarize: V)  |
|  | 4.1dB(Polarize: H)   |
| Uncertainty for Radiation Emission test in 3m chamber<br>(1GHz to 25GHz) | 2.08dB(Polarize: H)  |
|  | 2.56dB(Polarize: V)  |
| Uncertainty for radio frequency  | $1 \times 10^{-9}$   |
| Uncertainty for conducted RF Power                                       | 0.65dB               |
| Uncertainty for temperature  | 0.2°C                |
| Uncertainty for humidity   | 1%                   |
| Uncertainty for DC and low frequency voltages                            | 0.06%                |

## 2.9. Test Equipment List

| Equipment                 | Manufacture       | Model No.                   | Serial No.        | Last cal.  | Cal Interval |
|---------------------------|-------------------|-----------------------------|-------------------|------------|--------------|
| 3m<br>Semi-Anechoic       | ETS-LINDGREN      | N/A                         | SEL0017           | 2017.09.22 | 1Year        |
| Spectrum<br>analyzer      | Agilent           | E4407B                      | MY46185649        | 2017.09.22 | 1Year        |
| Receiver                  | R&S               | ESCI                        | 1166.5950K03-1011 | 2017.09.22 | 1Year        |
| Receiver                  | R&S               | ESCI                        | 101202            | 2017.09.22 | 1Year        |
| Bilog Antenna             | Schwarzbeck       | VULB 9168                   | VULB9168-438      | 2016.09.30 | 2Year        |
| Active Loop<br>Antenna    | Beijing Daze      | ZN30900A                    | SEL0097           | 2016.09.30 | 2Year        |
| Cable                     | Resenberger       | N/A                         | No.1              | 2017.09.22 | 1Year        |
| Cable                     | SCHWARZBEC<br>K   | N/A                         | No.2              | 2017.09.22 | 1Year        |
| Cable                     | SCHWARZBEC<br>K   | N/A                         | No.3              | 2017.09.22 | 1Year        |
| Pre-amplifier             | Schwarzbeck       | BBV9743                     | 9743-019          | 2017.09.22 | 1Year        |
| Pre-amplifier             | R&S               | AFS33-18002650-<br>30-8P-44 | SEL0080           | 2017.09.22 | 1Year        |
| Temperature<br>controller | Terchy            | MHQ                         | 120               | 2017.09.22 | 1Year        |
| L.I.S.N.#1                | Schwarzbeck       | NSLK8126                    | 8126466           | 2017.09.22 | 1Year        |
| L.I.S.N.#2                | ROHDE&SCHW<br>ARZ | ENV216                      | 101043            | 2017.09.22 | 1 Year       |
| 20db Attenuator           | ICPROBING         | IATS1                       | 82347             | 2017.09.22 | 1 Year       |

### 3. Test Results and Measurement Data

#### 3.1. Conducted Emission

##### 3.1.1. Test Specification

| <b>Test Requirement:</b> | FCC Part15 C Section 15.207   |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
|--------------------------|---|--------------------------|--------------|--|------------|---------|----------|-----------|-----------|-------|----|----|------|----|----|
| <b>Test Method:</b>      | ANSI C63.10:2013  |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Frequency Range:</b>  | 150 kHz to 30 MHz   |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Receiver setup:</b>   | RBW=9 kHz, VBW=30 kHz, Sweep time=auto  |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Limits:</b>           | <table border="1"> <thead> <tr> <th rowspan="2">Frequency range<br/>(MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>   | Frequency range<br>(MHz) | Limit (dBuV) |  | Quasi-peak | Average | 0.15-0.5 | 66 to 56* | 56 to 46* | 0.5-5 | 56 | 46 | 5-30 | 60 | 50 |
| Frequency range<br>(MHz) | Limit (dBuV)  |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
|                          | Quasi-peak  | Average                  |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 0.15-0.5                 | 66 to 56*   | 56 to 46*                |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 0.5-5                    | 56  | 46                       |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 5-30                     | 60  | 50                       |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Test Setup:</b>       | <p><i>Remark:</i><br/>E.U.T: Equipment Under Test<br/>LISN: Line Impedance Stabilization Network<br/>Test table height=0.8m</p>   |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Test Mode:</b>        | Charging + Transmitting Mode  |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Test Procedure:</b>   | <ol style="list-style-type: none"> <li>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol> |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| <b>Test Result:</b>      | PASS  |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |

### 3.1.2. Test data

**Please refer to following diagram for individual**

|  |               |
|--|---------------|
| Test Mode  | : Full Load   |
| Test Results   | : <b>PASS</b> |
| Note: The test results are listed in next pages.   |               |
| This mode is worst case mode, so this report only reflected the worst mode.  |               |
| If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. |               |
| If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.                   |               |

Test result for Channel 125KHz, AC 120V/ 60Hz

Line:

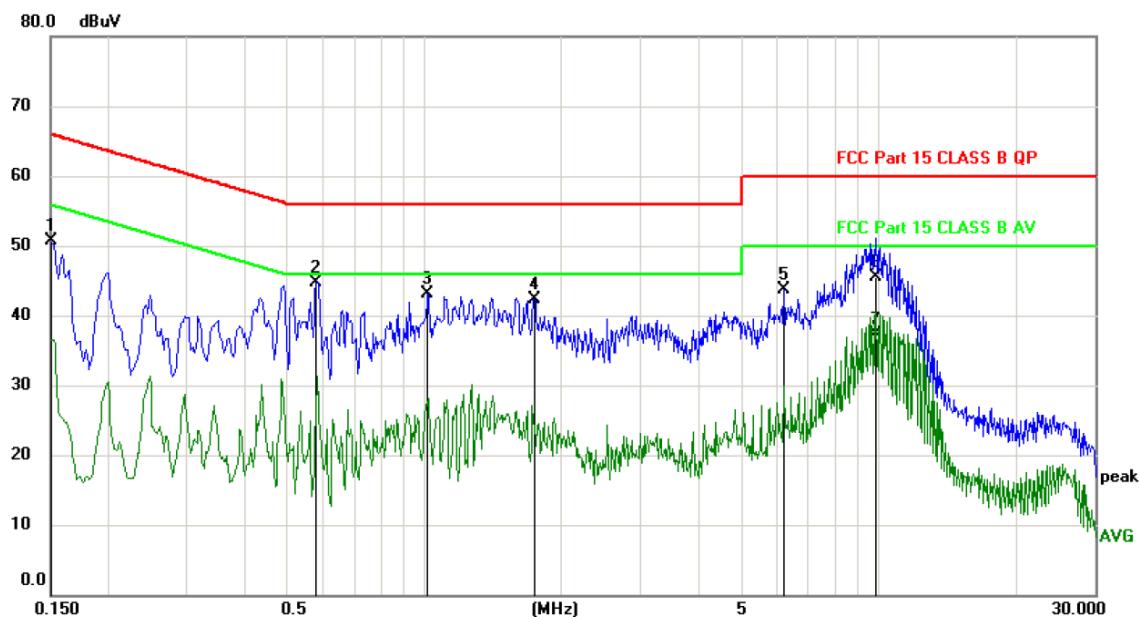
## Conducted Emission Measurement

File :06

Data :#6

Date: 2018-6-21

Time: 18:41:45



| No. | Mk. | Freq.  | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
|     |     |        | Level   | Factor  | ment     |       |        |          |         |
|     |     | MHz    | dBuV    | dB      | dBuV     | dBuV  | dB     |          |         |
| 1   |     | 0.1500 | 41.01   | 9.66    | 50.67    | 66.00 | -15.33 | peak     |         |
| 2   | *   | 0.5790 | 35.01   | 9.72    | 44.73    | 56.00 | -11.27 | peak     |         |
| 3   |     | 1.0200 | 33.28   | 9.77    | 43.05    | 56.00 | -12.95 | peak     |         |
| 4   |     | 1.7460 | 32.55   | 9.85    | 42.40    | 56.00 | -13.60 | peak     |         |
| 5   |     | 6.2040 | 33.40   | 10.23   | 43.63    | 60.00 | -16.37 | peak     |         |
| 6   |     | 9.8820 | 35.11   | 10.32   | 45.43    | 60.00 | -14.57 | QP       |         |
| 7   |     | 9.8820 | 27.03   | 10.32   | 37.35    | 50.00 | -12.65 | AVG      |         |

\*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Test result for Channel 125KHz, AC 120V/ 60Hz

Neutral:

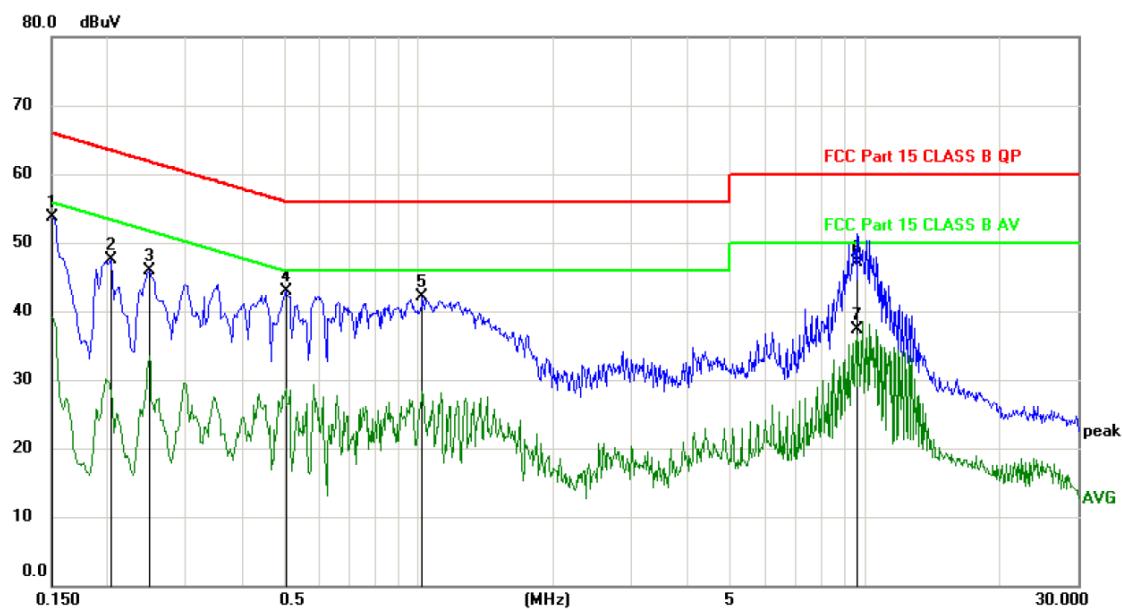
### Conducted Emission Measurement

File :06

Data :#5

Date: 2018-6-21

Time: 18:38:43



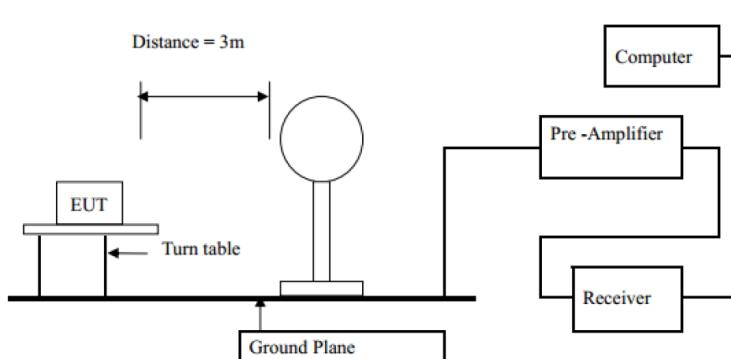
| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measure-ment | Limit | Margin   |         |
|-----|-----|--------|---------------|----------------|--------------|-------|----------|---------|
|     |     | MHz    | dBuV          | dB             | dBuV         | dB    | Detector | Comment |
| 1   | *   | 0.1500 | 44.03         | 9.66           | 53.69        | 66.00 | -12.31   | peak    |
| 2   |     | 0.2040 | 37.88         | 9.67           | 47.55        | 63.45 | -15.90   | peak    |
| 3   |     | 0.2490 | 36.21         | 9.69           | 45.90        | 61.79 | -15.89   | peak    |
| 4   |     | 0.5039 | 33.11         | 9.71           | 42.82        | 56.00 | -13.18   | peak    |
| 5   |     | 1.0170 | 32.42         | 9.77           | 42.19        | 56.00 | -13.81   | peak    |
| 6   |     | 9.6510 | 36.78         | 10.31          | 47.09        | 60.00 | -12.91   | QP      |
| 7   |     | 9.6510 | 26.95         | 10.31          | 37.26        | 50.00 | -12.74   | AVG     |

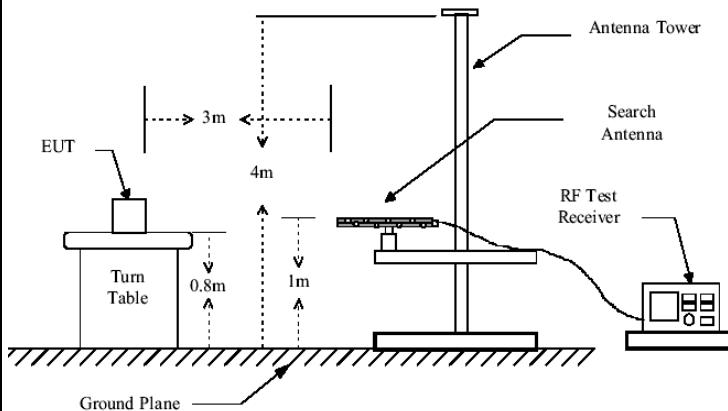
\*:Maximum data    x:Over limit    !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

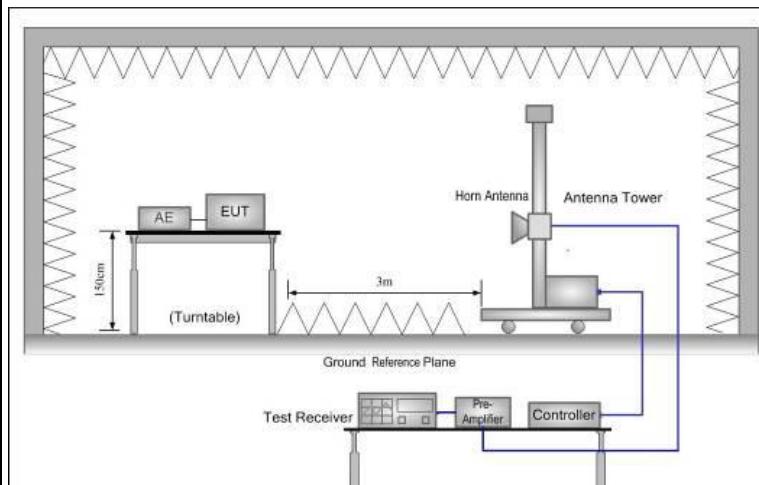
## 3.2. Radiated Spurious Emission Measurement

### 3.2.1. Test Specification

| <b>Test Requirement:</b>     | FCC Part15 C Section 15.209   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
|------------------------------|---|-------------------------------|----------|------------------|--|-----------|-----------------------------------|-------------------------------|-------------|-------------|--------------|-------------|--------------|------|------------------|---------------|------------|-------|-------|------------------|------------|------------|--------|---------|------------------|------------|-----------|------|------|------------|-----------------------------------|-------------------------------|----------|---------------|-----|---|---------|------|---|------|
| <b>Test Method:</b>          | ANSI C63.10: 2013   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Frequency Range:</b>      | 9 kHz to 25 GHz   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Measurement Distance:</b> | 3 m   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Antenna Polarization:</b> | Horizontal & Vertical   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Operation mode:</b>       | Refer to item 4.1   |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Receiver Setup:</b>       | <table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>9kHz- 150kHz</td> <td>Quasi-peak</td> <td>200Hz</td> <td>1kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>150kHz- 30MHz</td> <td>Quasi-peak</td> <td>9kHz</td> <td>30kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>100KHz</td> <td>300KHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td><td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>   |                               |          |                  |  | Frequency | Detector                          | RBW                           | VBW         | Remark      | 9kHz- 150kHz | Quasi-peak  | 200Hz        | 1kHz | Quasi-peak Value | 150kHz- 30MHz | Quasi-peak | 9kHz  | 30kHz | Quasi-peak Value | 30MHz-1GHz | Quasi-peak | 100KHz | 300KHz  | Quasi-peak Value | Above 1GHz | Peak      | 1MHz | 3MHz | Peak Value | Peak                              | 1MHz                          | 10Hz     | Average Value |     |   |         |      |   |      |
| Frequency                    | Detector  | RBW                           | VBW      | Remark           |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 9kHz- 150kHz                 | Quasi-peak  | 200Hz                         | 1kHz     | Quasi-peak Value |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 150kHz- 30MHz                | Quasi-peak  | 9kHz                          | 30kHz    | Quasi-peak Value |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 30MHz-1GHz                   | Quasi-peak  | 100KHz                        | 300KHz   | Quasi-peak Value |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| Above 1GHz                   | Peak  | 1MHz                          | 3MHz     | Peak Value       |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
|                              | Peak  | 1MHz                          | 10Hz     | Average Value    |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Limit:</b>                | <table border="1"> <thead> <tr> <th>Frequency</th> <th>Field Strength (microvolts/meter)</th> <th>Measurement Distance (meters)</th> </tr> </thead> <tbody> <tr> <td>0.009-0.490</td> <td>2400/F(KHz)</td> <td>300</td> </tr> <tr> <td>0.490-1.705</td> <td>24000/F(KHz)</td> <td>30</td> </tr> <tr> <td>1.705-30</td> <td>30</td> <td>30</td> </tr> <tr> <td>30-88</td> <td>100</td> <td>3</td> </tr> <tr> <td>88-216</td> <td>150</td> <td>3</td> </tr> <tr> <td>216-960</td> <td>200</td> <td>3</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>3</td> </tr> </tbody> </table><br><table border="1"> <thead> <tr> <th>Frequency</th> <th>Field Strength (microvolts/meter)</th> <th>Measurement Distance (meters)</th> <th>Detector</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td><td>500</td> <td>3</td> <td>Average</td> </tr> <tr> <td>5000</td> <td>3</td> <td>Peak</td> </tr> </tbody> </table> |                               |          |                  |  | Frequency | Field Strength (microvolts/meter) | Measurement Distance (meters) | 0.009-0.490 | 2400/F(KHz) | 300          | 0.490-1.705 | 24000/F(KHz) | 30   | 1.705-30         | 30            | 30         | 30-88 | 100   | 3                | 88-216     | 150        | 3      | 216-960 | 200              | 3          | Above 960 | 500  | 3    | Frequency  | Field Strength (microvolts/meter) | Measurement Distance (meters) | Detector | Above 1GHz    | 500 | 3 | Average | 5000 | 3 | Peak |
| Frequency                    | Field Strength (microvolts/meter)   | Measurement Distance (meters) |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 0.009-0.490                  | 2400/F(KHz)   | 300                           |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 0.490-1.705                  | 24000/F(KHz)  | 30                            |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 1.705-30                     | 30  | 30                            |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 30-88                        | 100   | 3                             |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 88-216                       | 150   | 3                             |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| 216-960                      | 200   | 3                             |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| Above 960                    | 500   | 3                             |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| Frequency                    | Field Strength (microvolts/meter)   | Measurement Distance (meters) | Detector |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| Above 1GHz                   | 500   | 3                             | Average  |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
|                              | 5000  | 3                             | Peak     |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |
| <b>Test setup:</b>           | <p>For radiated emissions below 30MHz</p>  <p>Distance = 3m</p> <p>Turn table</p> <p>Ground Plane</p> <p>30MHz to 1GHz</p>  |                               |          |                  |  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |            |           |      |      |            |                                   |                               |          |               |     |   |         |      |   |      |



Above 1GHz



#### Test Procedure:

1. For the radiated emission test below 1GHz:  
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.  
For the radiated emission test above 1GHz:  
Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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

|                      |  |
|----------------------|--|
|                      | <p>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.</p> <ol style="list-style-type: none"> <li>2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</li> <li>3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</li> <li>4. Use the following spectrum analyzer settings:             <ol style="list-style-type: none"> <li>(1) Span shall wide enough to fully capture the emission being measured;</li> <li>(2) Set RBW=100 kHz for <math>f &lt; 1</math> GHz; VBW <math>\geq</math> RBW; Sweep = auto; Detector function = peak; Trace = max hold;</li> <li>(3) Set RBW = 1 MHz, VBW= 3MHz for <math>f \geq 1</math> GHz for peak measurement.</li> </ol> </li> </ol> <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW <math>\geq 1/T</math>, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p> |
| <b>Test mode:</b>    | Refer to section 4.1 for details   |
| <b>Test results:</b> | PASS   |

### 3.2.2. Test Data

Please refer to following diagram for individual

|  |  |
|--|--|
| Frequency Range  | : 9KHz~30MHz                                 |
| Test Mode  | : TX: channel low, channel mid, channel high |
| Test Results   | : <b>PASS</b>                                |
| <p>Note: 1. The test results are listed in next pages.<br/> 2. This mode is worst case mode, so this report only reflected the worst mode.<br/> 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.</p> |  |

| Freq.<br>(MHz) | Reading<br>(dBuV/m) | Antenna Factor | Cable loss | Amp Factor | Result<br>(dBuV/m) | Limit<br>(dBuV/m)<br>at 3 m | Margin<br>(dB) | Detect<br>or | State |
|----------------|---------------------|----------------|------------|------------|--------------------|-----------------------------|----------------|--------------|-------|
|                |                     |                |            |            |                    |                             |                |              | P/F   |
| 0.125          | 47.87               | 48.34          | 0.16       | 29.87      | 66.50              | 126.77                      | -60.27         | PK           | PASS  |
| 0.125          | 46.38               | 48.34          | 0.16       | 29.87      | 65.01              | 106.77                      | -41.76         | AV           | PASS  |
| 0.175          | 92.56               | 48.34          | 0.16       | 29.87      | 111.19             | 122.95                      | -11.76         | PK           | PASS  |
| 0.175          | 68.60               | 48.34          | 0.16       | 29.87      | 87.23              | 102.95                      | -15.72         | AV           | PASS  |
| 0.205          | 48.02               | 48.38          | 0.17       | 29.89      | 66.68              | 120.76                      | -54.08         | PK           | PASS  |
| 0.205          | 43.75               | 48.38          | 0.17       | 29.89      | 62.41              | 100.76                      | -38.35         | AV           | PASS  |
| 0.35           | 50.06               | 48.44          | 0.19       | 29.89      | 68.80              | 117.78                      | -48.98         | PK           | PASS  |
| 0.35           | 45.90               | 48.44          | 0.19       | 29.89      | 64.64              | 97.78                       | -33.14         | AV           | PASS  |
| 0.45           | 48.63               | 48.47          | 0.19       | 29.89      | 67.40              | 115.35                      | -47.95         | PK           | PASS  |
| 0.45           | 44.72               | 48.47          | 0.19       | 29.89      | 63.49              | 95.35                       | -31.86         | AV           | PASS  |
| 1.928          | 16.20               | 49.12          | 0.2        | 29.94      | 35.58              | 60                          | -24.42         | QP           | PASS  |
| 1.920          | 21.46               | 49.12          | 0.2        | 29.94      | 40.84              | 60                          | -19.16         | QP           | PASS  |

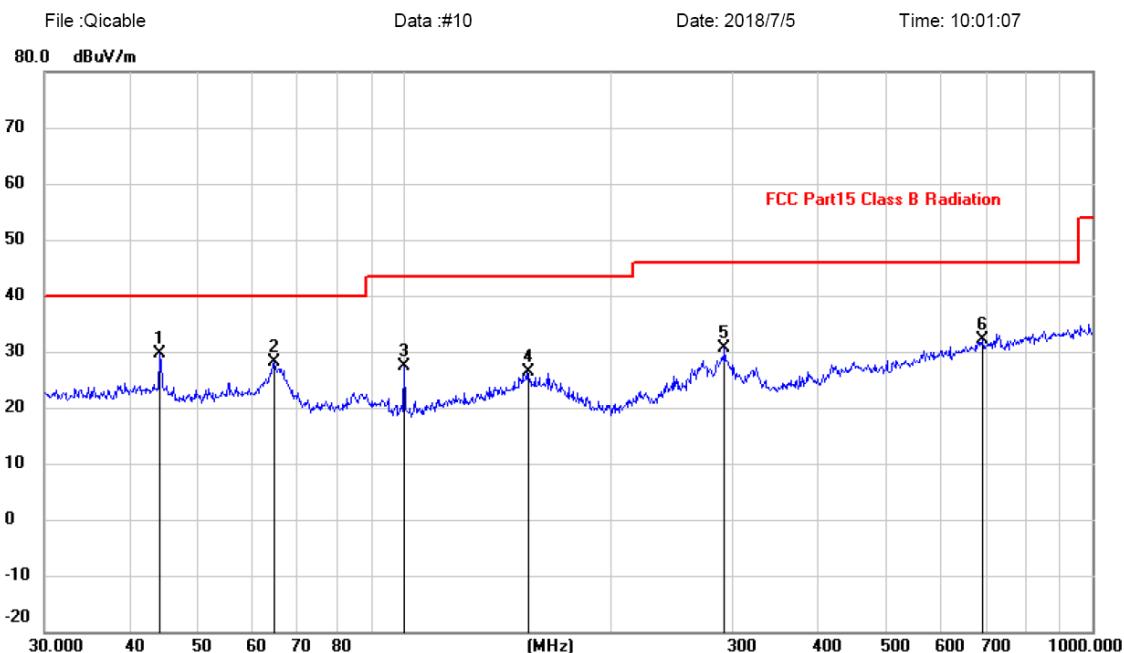
|   |                 |
|---|-----------------|
| Frequency Range   | : 30MHz~1000MHz |
| Test Mode   | : Full Load     |
| Test Results  | : <b>PASS</b>   |
| Note: 1. The test results are listed in next pages.<br>2. This mode is worst case mode, so this report only reflected the worst mode.<br>3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out. |                 |

|   |              |
|---|--------------|
| Frequency Range   | : Above 1GHz |
| EUT   | : /          |
| M/N   | : /          |
| Test Engineer   | : /          |
| Test Mode   | : /          |
| Test Results  | : N/A        |
| Note: 1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable. |              |

Test result for Channel 125KHz, AC 120V/ 60Hz  
**30MHz-1GHz**

Horizontal:

**Radiated Emission Measurement**



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-<br>ment | Limit  | Margin | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|------------------|--------|--------|----------------|--------------|---------|
|     |     |          |               |                |                  |        |        |                | cm           | degree  |
|     |     | MHz      | dBuV          | dB             | dBuV/m           | dBuV/m | dB     | Detector       |              | Comment |
| 1   | *   | 44.1202  | 15.74         | 13.85          | 29.59            | 40.00  | -10.41 | peak           |              |         |
| 2   |     | 64.6594  | 16.10         | 11.97          | 28.07            | 40.00  | -11.93 | peak           |              |         |
| 3   |     | 99.8777  | 16.79         | 10.60          | 27.39            | 43.50  | -16.11 | peak           |              |         |
| 4   |     | 151.0666 | 11.89         | 14.56          | 26.45            | 43.50  | -17.05 | peak           |              |         |
| 5   |     | 292.0583 | 17.34         | 13.20          | 30.54            | 46.00  | -15.46 | peak           |              |         |
| 6   |     | 691.9867 | 11.46         | 20.77          | 32.23            | 46.00  | -13.77 | peak           |              |         |

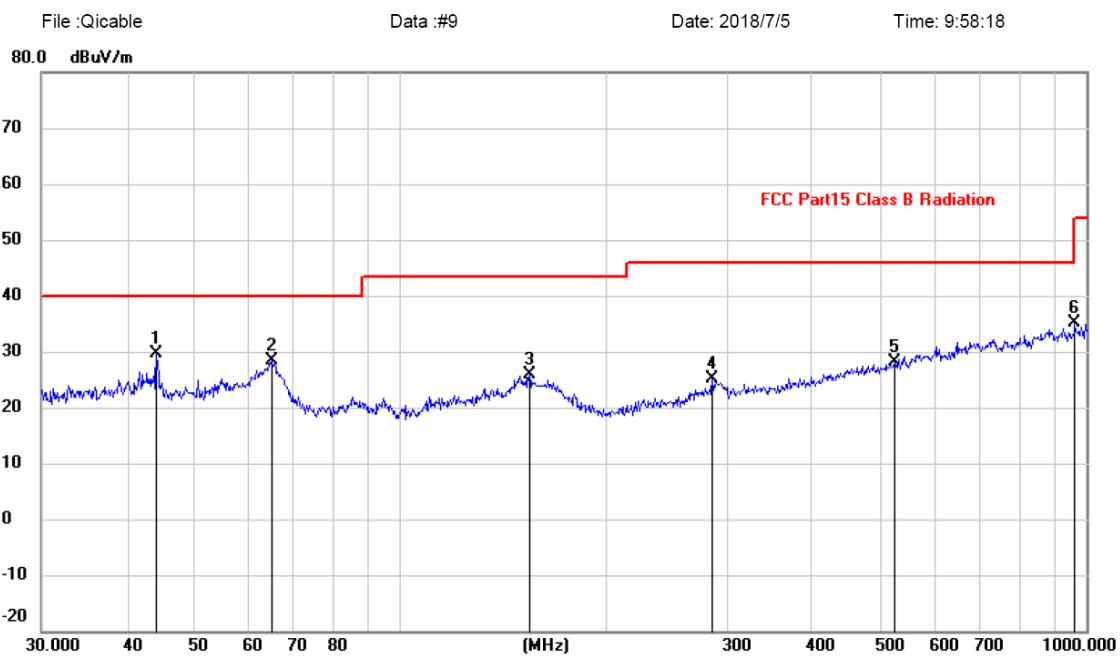
Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Test result for Channel 125KHz, AC 120V/ 60Hz

Vertical:

### Radiated Emission Measurement



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment |       | Margin | Antenna Height | Table Degree |          |    |        |
|-----|-----|----------|---------------|----------------|--------------|-------|--------|----------------|--------------|----------|----|--------|
|     |     |          |               |                | MHz          | dBuV  | dB     | dBuV/m         | dB           | Detector | cm | degree |
| 1   | *   | 44.1202  | 15.68         | 13.85          | 29.53        | 40.00 | -10.47 | peak           |              |          |    |        |
| 2   |     | 64.8865  | 16.54         | 11.88          | 28.42        | 40.00 | -11.58 | peak           |              |          |    |        |
| 3   |     | 154.2786 | 11.22         | 14.56          | 25.78        | 43.50 | -17.72 | peak           |              |          |    |        |
| 4   |     | 284.9767 | 12.14         | 13.04          | 25.18        | 46.00 | -20.82 | peak           |              |          |    |        |
| 5   |     | 526.3967 | 9.96          | 18.06          | 28.02        | 46.00 | -17.98 | peak           |              |          |    |        |
| 6   |     | 965.5421 | 11.18         | 23.88          | 35.06        | 54.00 | -18.94 | peak           |              |          |    |        |

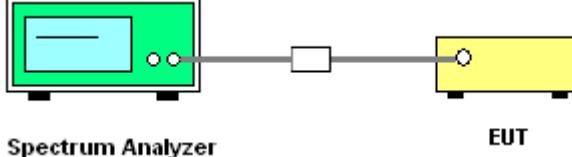
Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

**Note:**

*Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*

### 3.3. Test Specification

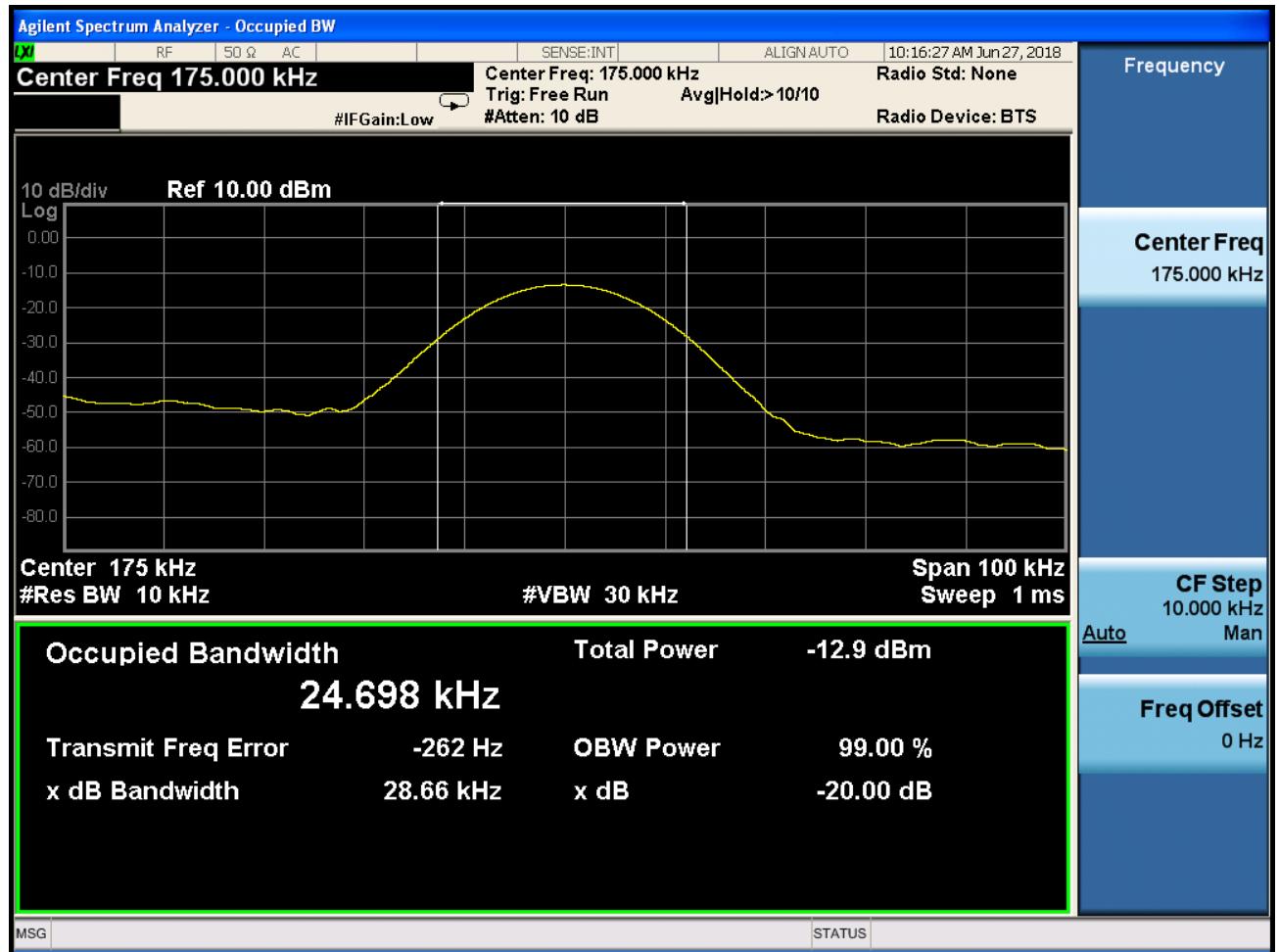
|                          |  |
|--------------------------|--|
| <b>Test Requirement:</b> | FCC Part15 C Section 15.215(c)   |
| <b>Test Method:</b>      | ANSI C63.10: 2013  |
| <b>Limit:</b>            | N/A  |
| <b>Test Procedure:</b>   | <ol style="list-style-type: none"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.<br/>Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW <math>\geq</math> 1% of the 20 dB bandwidth; VBW <math>\geq</math> RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>4. Measure and record the results in the test report.</li> </ol> |
| <b>Test setup:</b>       |  <p><b>Spectrum Analyzer</b>                                    <b>EUT</b></p>  |
| <b>Test Mode:</b>        | Refer to section 4.1 for details   |
| <b>Test results:</b>     | PASS   |

### 3.3.1. Test data

| Frequency(KHz) | 20dB Occupy Bandwidth (kHz) | Limit (kHz) | Conclusion |
|----------------|-----------------------------|-------------|------------|
| 175.0          | 28.66                       | ---         | PASS       |

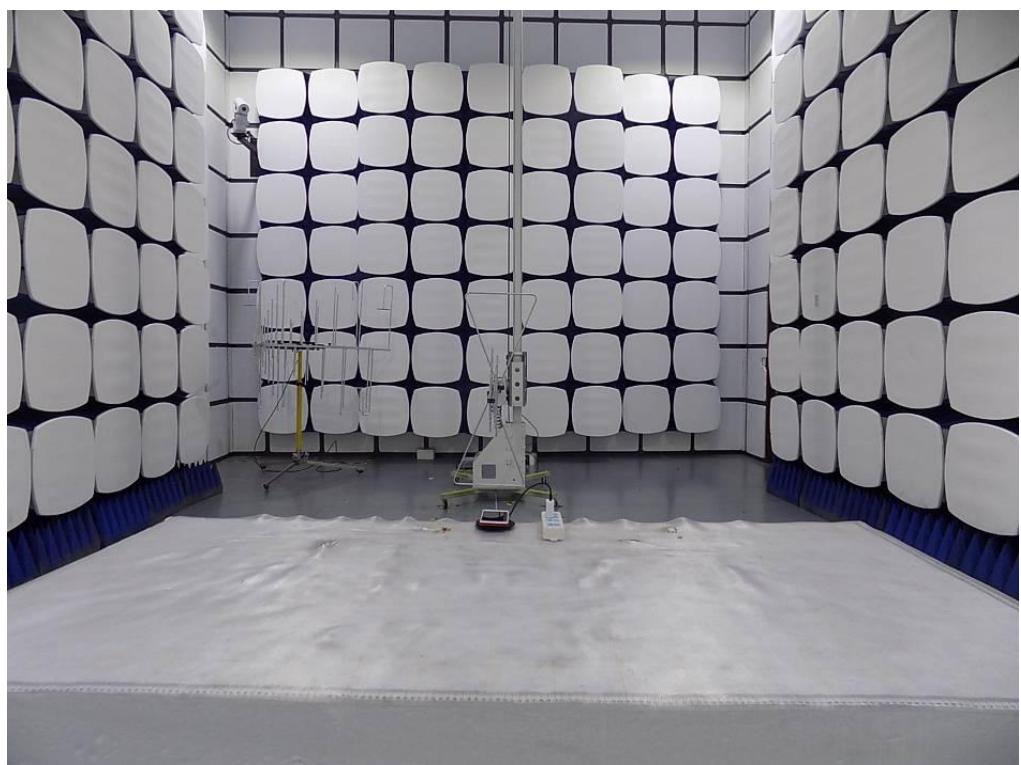
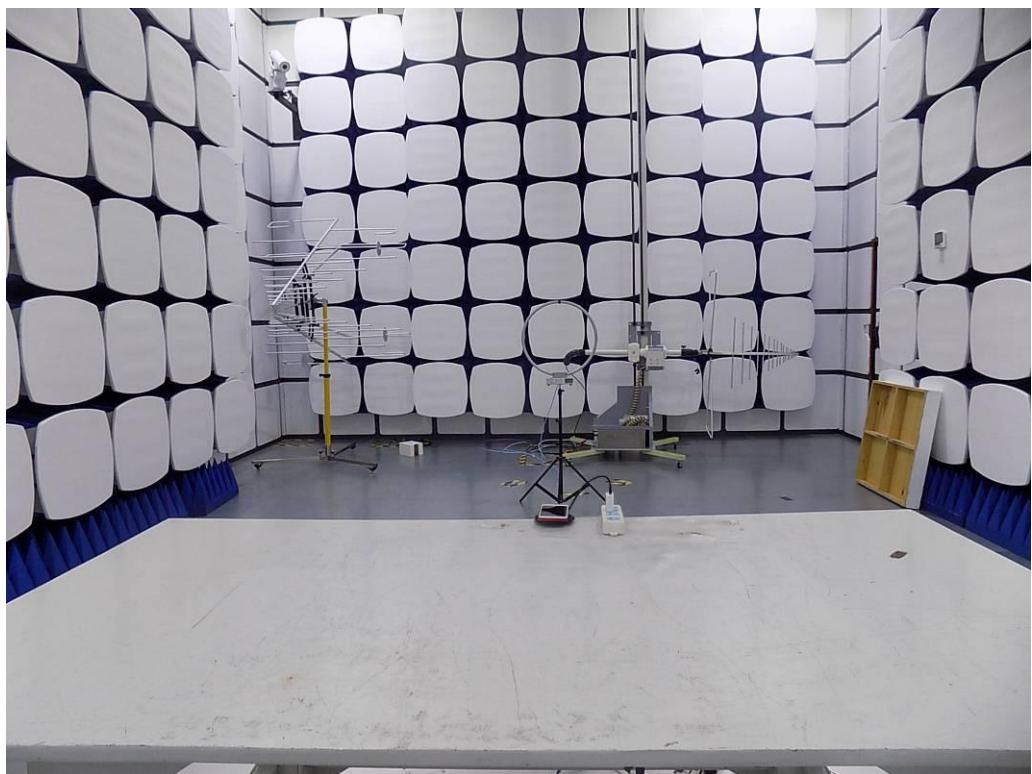
Test plots as follows:

Lowest channel



## 4. Photos of test setup

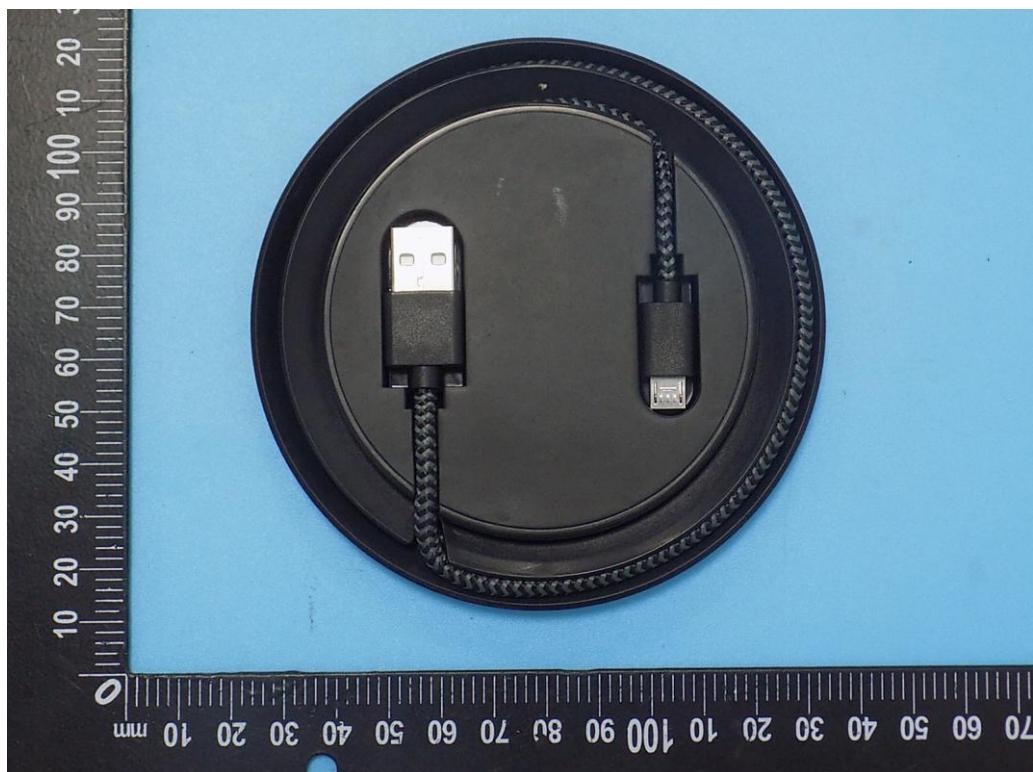
Radiated Emission

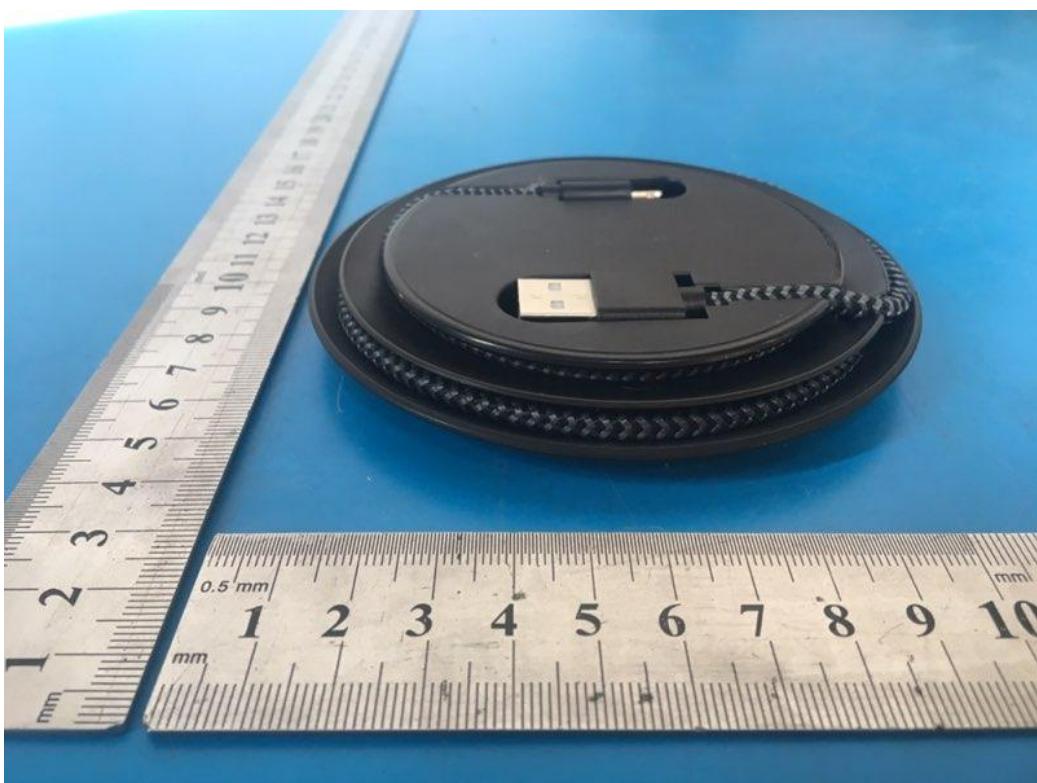


Conducted Emission

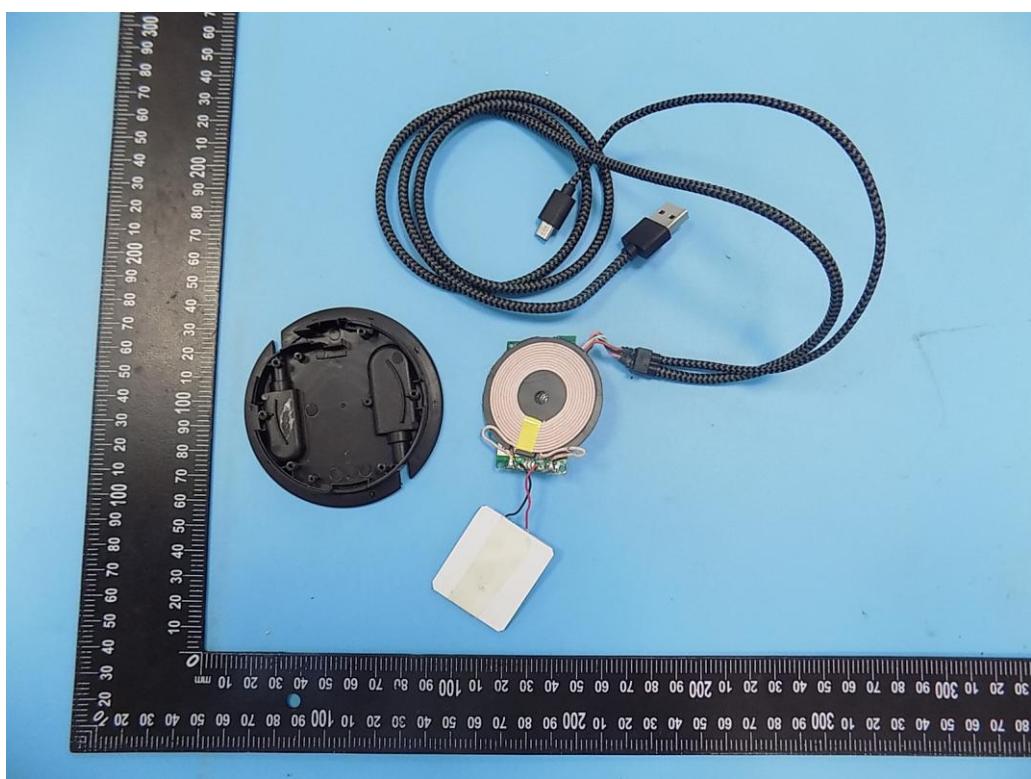


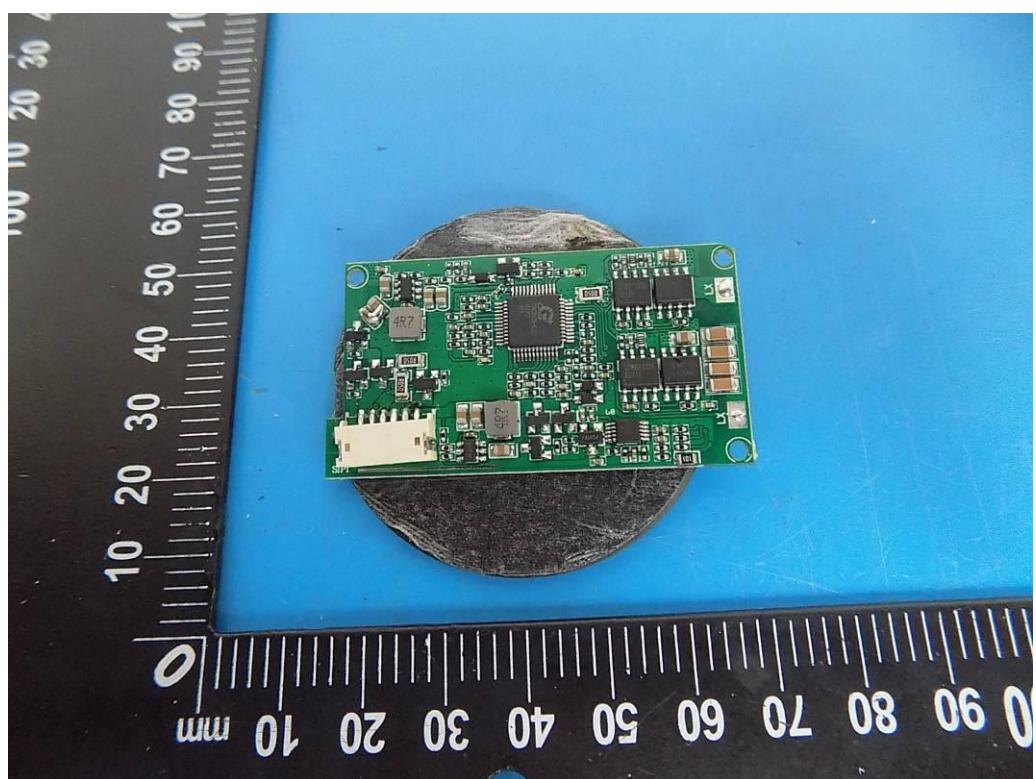
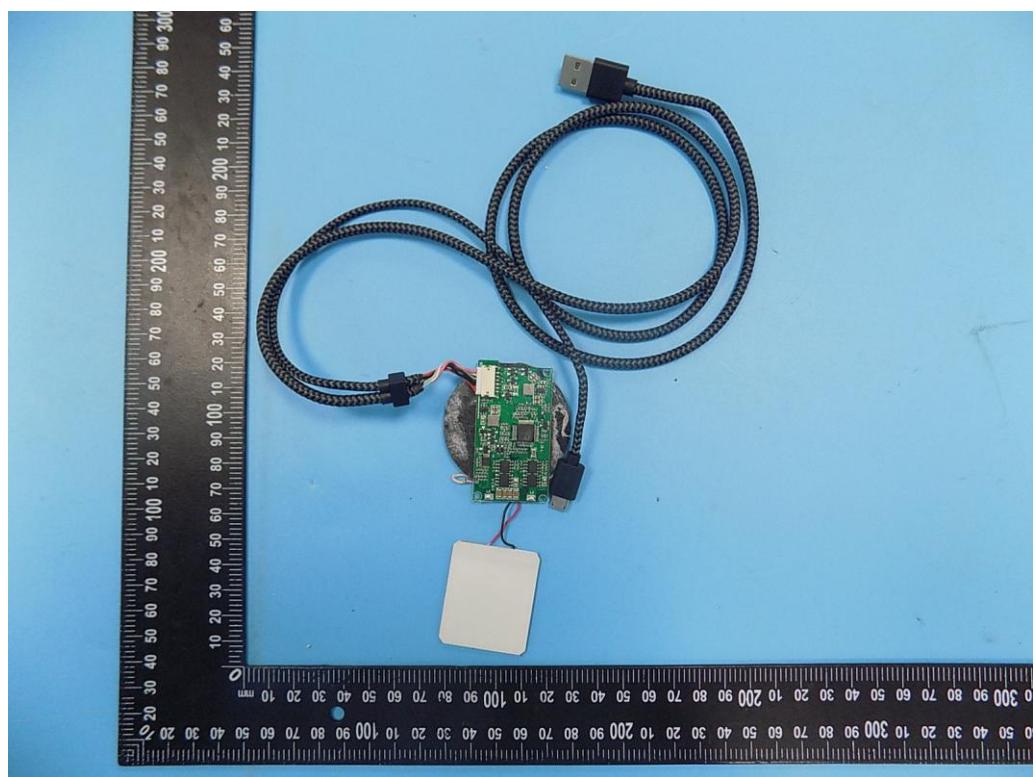
## 5. Photographs of EUT

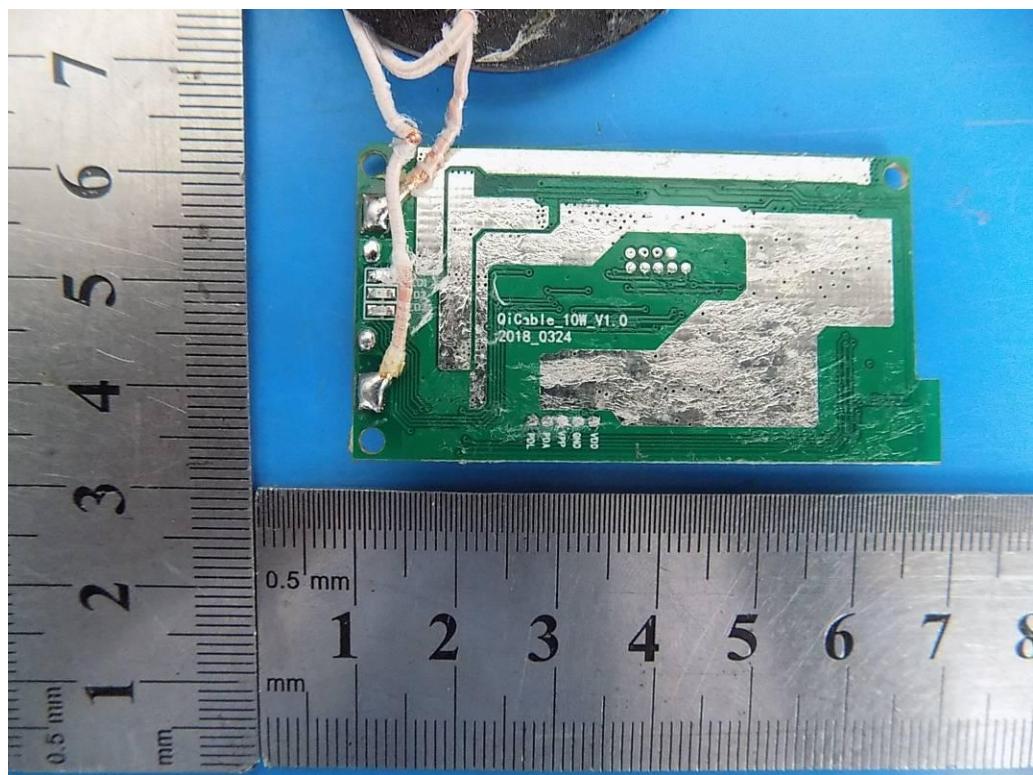












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