**SGS-CSTC Standards Technical Services Co., Ltd.**
**Shenzhen Branch**

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com



# *TEST REPORT*

| | |
|---|---|
| **Application No.:** | SZEM1807006670BA |
| **Applicant:** | Flashbay Electronics |
| **Address of Applicant:** | Bldg. NO.1 101~501, Bldg. NO.2, Bldg. NO. 3 1~4F, Xifengcheng Industrial Park, No. 2 Fuyuan Rd, Heping, Fuhai, Bao'an District, Shenzhen City, Guangdong Province, P.R. China |
| **Manufacturer/ Factory:** | Flashbay Electronics |
| **Address of Manufacturer/ Factory:** | Bldg. NO.1 101~501, Bldg. NO.2, Bldg. NO. 3 1~4F, Xifengcheng Industrial Park, No. 2 Fuyuan Rd, Heping, Fuhai, Bao'an District, Shenzhen City, Guangdong Province, P.R. China |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Power banks |
| **Model No.:** | BigBoost |
| **Standard(s) :** | 47 CFR Part 15, Subpart B |
| **Date of Receipt:** | 2018-07-25 |
| **Date of Test:** | 2018-07-26 to 2018-07-30 |
| **Date of Issue:** | 2018-08-01 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 01 | | 2018-08-01 | | Original |
| | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | |  | | |
| | | **Foray Chen /Project Engineer** | | |
| | |  | | |
| | | **Eric Fu /Reviewer** | | |

# 2 Test Summary

| Emission Part | | | | |
|---|---|---|---|---|
| **Item** | **Standard** | **Method** | **Requirement** | **Result** |
| Conducted Emissions at Mains Terminals (150kHz-30MHz) | 47 CFR Part 15, Subpart B | ANSI C63.4:2014 | Class B | Pass |
| Radiated Emissions (30MHz-1GHz) | 47 CFR Part 15, Subpart B | ANSI C63.4:2014 | Class B | Pass |

| Internal Source | Upper Frequency |
|---|---|
| Below 1.705MHz | 30MHz |
| 1.705MHz to 108MHz | 1GHz |
| 108MHz to 500MHz | 2GHz |
| 500MHz to 1GHz | 5GHz |
| Above 1GHz | 5th harmonic of the highest frequency or 40GHz, whichever is lower |

# 3 Contents

Page

**1 COVER PAGE ..... 1**

**2 TEST SUMMARY ..... 3**

**3 CONTENTS ..... 4**

**4 GENERAL INFORMATION ..... 5**

4.1 DETAILS OF E.U.T. ..... 5
4.2 DESCRIPTION OF SUPPORT UNITS ..... 5
4.3 MEASUREMENT UNCERTAINTY ..... 5
4.4 TEST LOCATION ..... 6
4.5 TEST FACILITY ..... 6
4.6 DEVIATION FROM STANDARDS ..... 6
4.7 ABNORMALITIES FROM STANDARD CONDITIONS ..... 6

**5 EQUIPMENT LIST ..... 7**

**6 EMISSION TEST RESULTS ..... 8**

6.1 CONDUCTED EMISSIONS AT MAINS TERMINALS (150KHZ-30MHZ) ..... 8
*6.1.1 E.U.T. Operation ..... 8*
*6.1.2 Test Setup Diagram ..... 8*
*6.1.3 Measurement Data ..... 8*
6.2 RADIATED EMISSIONS (30MHZ-1GHZ) ..... 11
*6.2.1 E.U.T. Operation ..... 11*
*6.2.2 Test Setup Diagram ..... 11*
*6.2.3 Measurement Data ..... 11*

**7 PHOTOGRAPHS ..... 14**

7.1 CONDUCTED EMISSIONS AT MAINS TERMINALS (150KHZ-30MHZ) TEST SETUP ..... 14
7.2 RADIATED EMISSIONS (30MHZ-1GHZ) TEST SETUP ..... 14
7.3 EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS) ..... 15-20

# 4 General Information

## 4.1 Details of E.U.T.

| | |
|---|---|
| Power supply: | Input: DC5V 1A<br>Output: DC5V 1A<br>Rechargeable battery: 10050mAh 37.2Wh |
| Cable: | USB cable: 10cm unshielded<br>Micro USB cable: 10cm unshielded |

## 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| Adapter | Apple | A1357 W010A051 | REF. No.SEA0500 |
| iPhone 6 | Apple | MG472ZP/A | C34NHTMFG5MN |
| Load Resistor | SGS | N/A | REF. No.SEA0600 |
| Mobile Phone | LeTV | Le X620 | LP031262A6180395427 |
| USB Cable | PHILIPS | SWR2101 | REF. No.SEA0700 |

## 4.3 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Conduction Emission | ± 3.0dB (150kHz to 30MHz) |
| 2 | Radiated Emission | ± 4.5dB (30MHz-1GHz) |
| 3 | Temperature test | ± 1℃ |
| 4 | Humidity test | ± 3% |

## 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## 4.5 Test Facility

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

**• CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

**• A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

**• VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

**• FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

**• Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None

# 5 Equipment List

| Conducted Emissions at Mains Terminals (150kHz-30MHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| Shielding Room | ChangZhou ZhongYu | GB-88 | SEM001-06 | 2017-05-10 | 2020-05-09 |
| Measurement Software | AUDIX | e3 V5.4.1221d | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM024-01 | 2018-07-12 | 2019-07-11 |
| LISN | Rohde & Schwarz | ENV216 | SEM007-01 | 2017-09-27 | 2018-09-26 |
| LISN | ETS-LINDGREN | 3816/2 | SEM007-02 | 2018-04-02 | 2019-04-01 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | SEM004-02 | 2018-04-02 | 2019-04-01 |

| Radiated Emissions (30MHz-1GHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| 10m Semi-Anechoic Chamber | SAEMC | FSAC1018 | SEM001-03 | 2018-03-31 | 2021-03-30 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM029-01 | 2018-07-12 | 2019-07-11 |
| EMI Test Receiver (9kHz-7GHz) | Rohde & Schwarz | ESR | SEM004-03 | 2018-04-02 | 2019-04-01 |
| Trilog-Broadband Antenna (30MHz-1GHz) | Schwarzbeck | VULB9168 | SEM003-18 | 2016-06-29 | 2019-06-28 |
| Pre-amplifier | Sonoma Instrument Co | 310N | SEM005-04 | 2018-04-13 | 2019-04-12 |

| General used equipment | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | ZJ1-2B | SEM002-03 | 2017-09-29 | 2018-09-28 |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | ZJ1-2B | SEM002-04 | 2017-09-29 | 2018-09-28 |
| Humidity/ Temperature Indicator | Mingle | N/A | SEM002-08 | 2017-09-29 | 2018-09-28 |
| Barometer | Changchun Meteorological Industry Factory | DYM3 | SEM002-01 | 2018-04-08 | 2019-04-07 |

# 6 Emission Test Results

## 6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15, Subpart B |
| Test Method: | ANSI C63.4:2014 |
| Frequency Range: | 150kHz to 30MHz |
| Limit: | |
| 0.15M-0.5MHz | 66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average |
| 0.5M-5MHz | 56dB(μV) quasi-peak, 46dB(μV) average |
| 5M-30MHz | 60dB(μV) quasi-peak, 50dB(μV) average |
| Detector: | Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz |

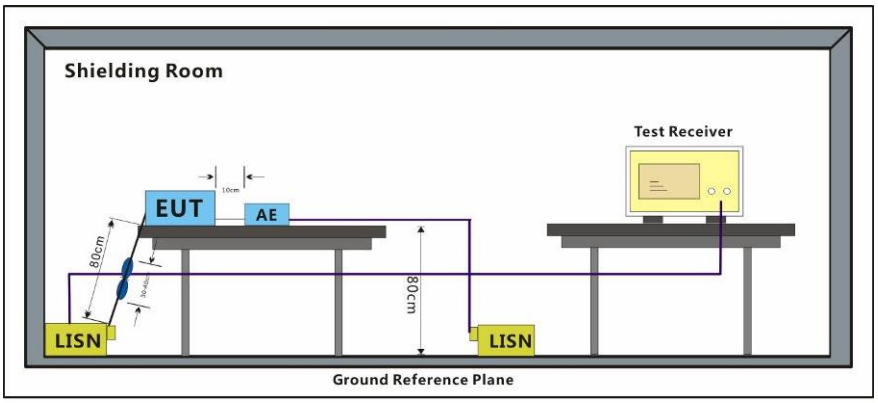
### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20.6 °C Humidity: 50.2 % RH Atmospheric Pressure: 1005 mbar

| | |
|---|---|
| Pretest these modes to find the worst case: | a: Charge mode, keep EUT being charged with adapter.<br>c: Charge and discharge mode, keep EUT being charged with adapter and working with full load. |
| The worst case for final test: | a: Charge mode, keep EUT being charged with adapter. |

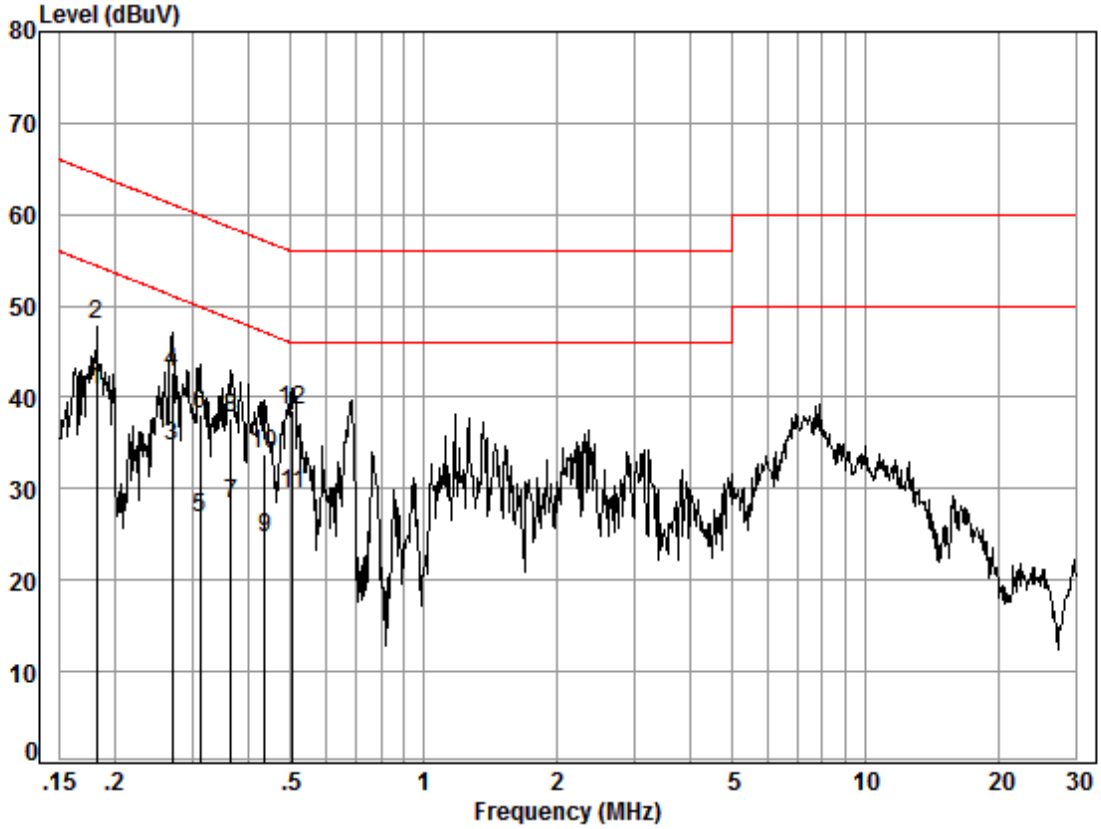
### 6.1.2 Test Setup Diagram




### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

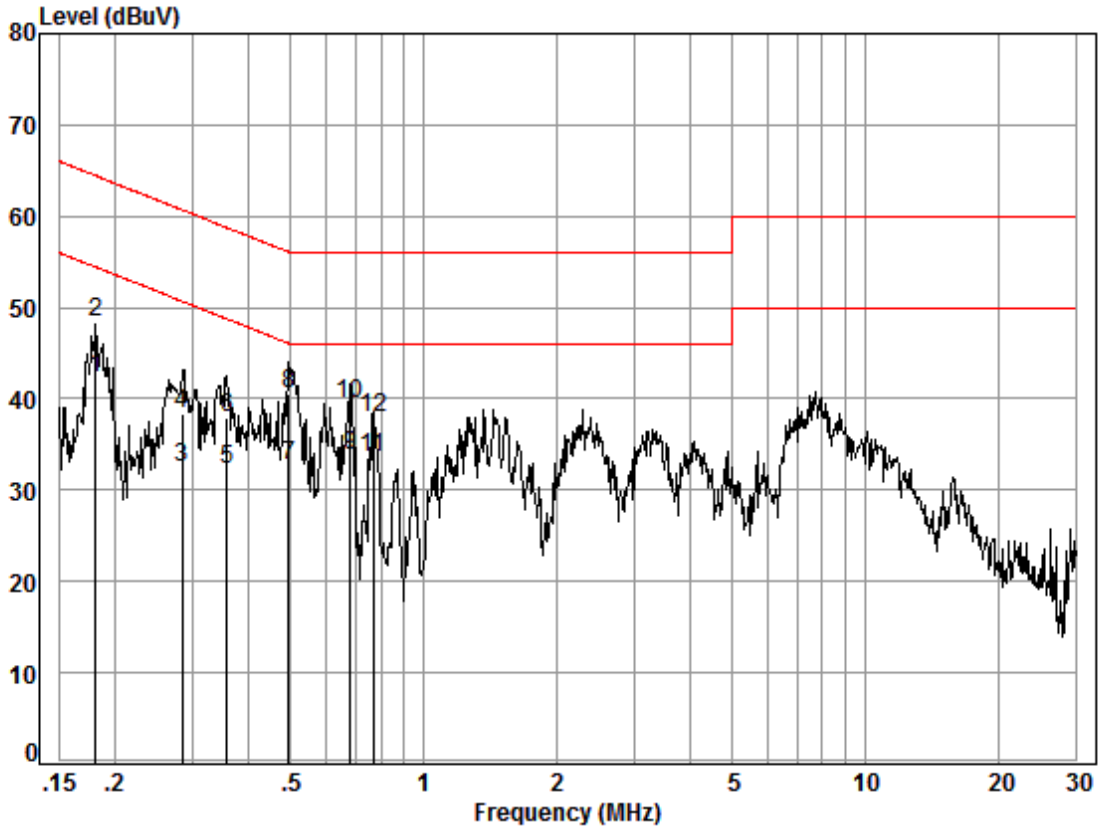
Mode:a; Line:Live Line




Site : Shielding Room
Condition: Line
Job No. : 06670BA
Test mode: a

| | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV | dB | |
| 1 | 0.18 | 0.03 | 9.51 | 31.24 | 40.78 | 54.42 | -13.64 | Average |
| 2 | 0.18 | 0.03 | 9.51 | 38.38 | 47.92 | 64.42 | -16.50 | QP |
| 3 | 0.27 | 0.03 | 9.51 | 25.22 | 34.76 | 51.12 | -16.36 | Average |
| 4 | 0.27 | 0.03 | 9.51 | 33.14 | 42.68 | 61.12 | -18.44 | QP |
| 5 | 0.31 | 0.03 | 9.51 | 17.31 | 26.85 | 49.93 | -23.08 | Average |
| 6 | 0.31 | 0.03 | 9.51 | 28.62 | 38.16 | 59.93 | -21.77 | QP |
| 7 | 0.37 | 0.03 | 9.50 | 18.82 | 28.35 | 48.56 | -20.21 | Average |
| 8 | 0.37 | 0.03 | 9.50 | 28.26 | 37.79 | 58.56 | -20.77 | QP |
| 9 | 0.44 | 0.04 | 9.49 | 15.20 | 24.73 | 47.11 | -22.38 | Average |
| 10 | 0.44 | 0.04 | 9.49 | 24.33 | 33.86 | 57.11 | -23.25 | QP |
| 11 | 0.50 | 0.04 | 9.49 | 19.98 | 29.51 | 46.00 | -16.49 | Average |
| 12 | 0.50 | 0.04 | 9.49 | 29.15 | 38.68 | 56.00 | -17.32 | QP |

Mode:a; Line:Neutral Line




Site : Shielding Room
Condition: Neutral
Job No. : 06670BA
Test mode: a

| | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV | dB | |
| 1 | 0.18 | 0.03 | 9.58 | 32.73 | 42.34 | 54.46 | -12.12 | Average |
| 2 | 0.18 | 0.03 | 9.58 | 38.77 | 48.38 | 64.46 | -16.08 | QP |
| 3 | 0.28 | 0.03 | 9.58 | 22.81 | 32.42 | 50.68 | -18.26 | Average |
| 4 | 0.28 | 0.03 | 9.58 | 28.73 | 38.34 | 60.68 | -22.34 | QP |
| 5 | 0.36 | 0.03 | 9.58 | 22.71 | 32.32 | 48.74 | -16.42 | Average |
| 6 | 0.36 | 0.03 | 9.58 | 28.35 | 37.96 | 58.74 | -20.78 | QP |
| 7 | 0.49 | 0.04 | 9.60 | 23.09 | 32.73 | 46.10 | -13.37 | Average |
| 8 | 0.49 | 0.04 | 9.60 | 30.81 | 40.45 | 56.10 | -15.65 | QP |
| 9 | 0.68 | 0.07 | 9.62 | 24.01 | 33.70 | 46.00 | -12.30 | Average |
| 10 | 0.68 | 0.07 | 9.62 | 29.71 | 39.40 | 56.00 | -16.60 | QP |
| 11 | 0.77 | 0.07 | 9.61 | 23.85 | 33.53 | 46.00 | -12.47 | Average |
| 12 | 0.77 | 0.07 | 9.61 | 28.26 | 37.94 | 56.00 | -18.06 | QP |

## 6.2 Radiated Emissions (30MHz-1GHz)

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15, Subpart B |
| Test Method: | ANSI C63.4:2014 |
| Frequency Range: | 30MHz to 1GHz |
| Measurement Distance: | 10m |
| Limit: | |
| 30MHz -88MHz | 29.5(dBμV/m) quasi-peak |
| 88MHz-216MHz | 33.1(dBμV/m) quasi-peak |
| 216MHz-960MHz | 35.6(dBμV/m) quasi-peak |
| 960MHz-1000MHz | 43.5(dBμV/m) quasi-peak |
| Detector: | Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz |

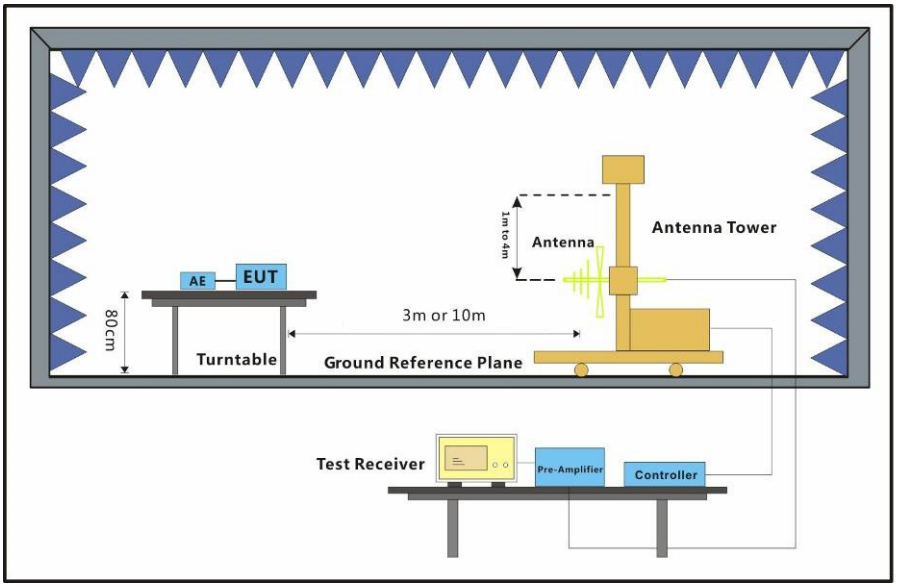
### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

| | |
|---|---|
| Pretest these modes to find the worst case: | a: Charge mode, keep EUT being charged with adapter.<br>b: Discharge mode, keep EUT working with full load.<br>c: Charge and discharge mode, keep EUT being charged with adapter and working with full load. |
| The worst case for final test: | c: Charge and discharge mode, keep EUT being charged with adapter and working with full load. |

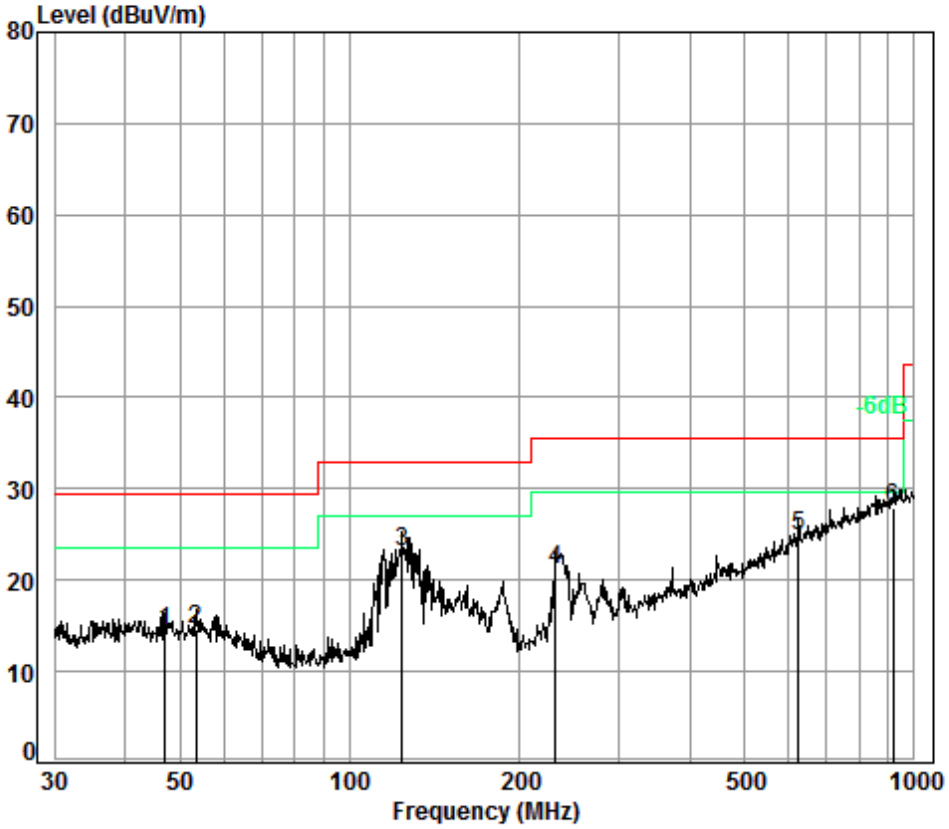
### 6.2.2 Test Setup Diagram




### 6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

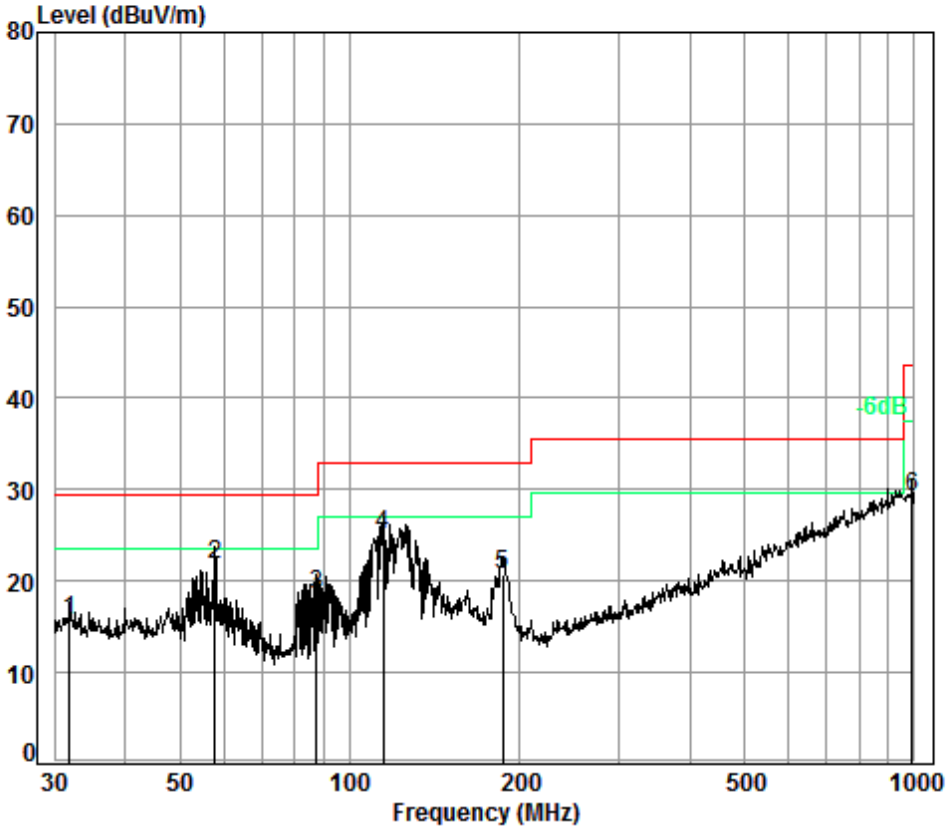
Mode:c; Polarization:Horizontal




Condition: 10m HORIZONTAL
Job No. : 06670BA
Test Mode: c

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 | 47.16 | 6.89 | 12.85 | 32.45 | 27.13 | 14.42 | 29.50 | -15.08 |
| 2 | 53.51 | 6.95 | 12.49 | 32.45 | 27.70 | 14.69 | 29.50 | -14.81 |
| 3 | 123.70 | 7.32 | 11.69 | 32.45 | 36.65 | 23.21 | 33.00 | -9.79 |
| 4 | 231.72 | 7.76 | 10.83 | 32.39 | 34.89 | 21.09 | 35.60 | -14.51 |
| 5 | 622.89 | 8.93 | 19.18 | 32.36 | 29.05 | 24.80 | 35.60 | -10.80 |
| 6 pp | 916.07 | 9.51 | 22.44 | 31.45 | 27.44 | 27.94 | 35.60 | -7.66 |

Mode:c; Polarization:Vertical



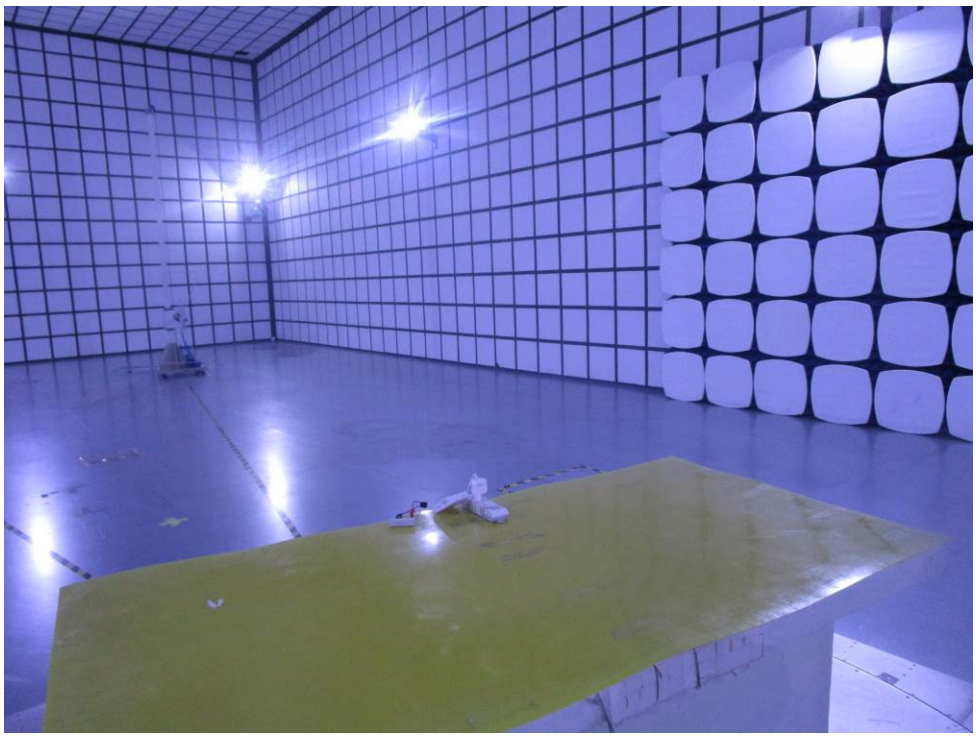

Condition: 10m VERTICAL
Job No. : 06670BA
Test Mode: c

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 | 31.95 | 6.73 | 12.54 | 32.47 | 28.85 | 15.65 | 29.50 | -13.85 |
| 2 pp | 57.80 | 7.00 | 12.16 | 32.45 | 35.10 | 21.81 | 29.50 | -7.69 |
| 3 | 87.42 | 7.17 | 8.65 | 32.47 | 35.28 | 18.63 | 29.50 | -10.87 |
| 4 | 114.51 | 7.27 | 10.89 | 32.46 | 39.41 | 25.11 | 33.00 | -7.89 |
| 5 | 187.10 | 7.58 | 10.11 | 32.41 | 35.39 | 20.67 | 33.00 | -12.33 |
| 6 | 989.54 | 9.57 | 22.83 | 30.85 | 27.73 | 29.28 | 43.50 | -14.22 |

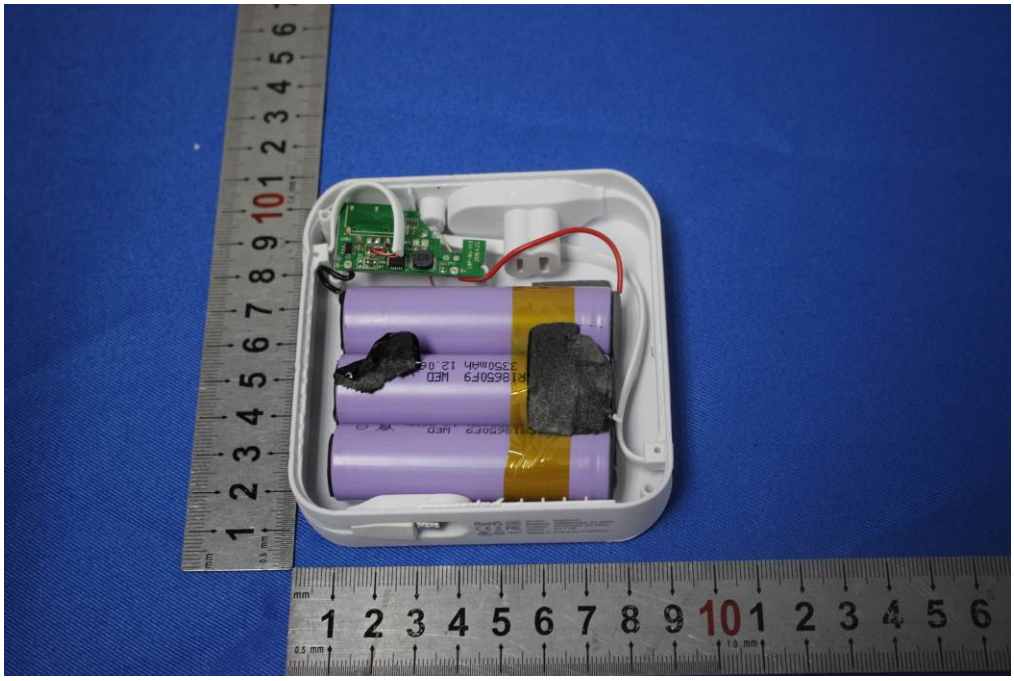
# 7 Photographs

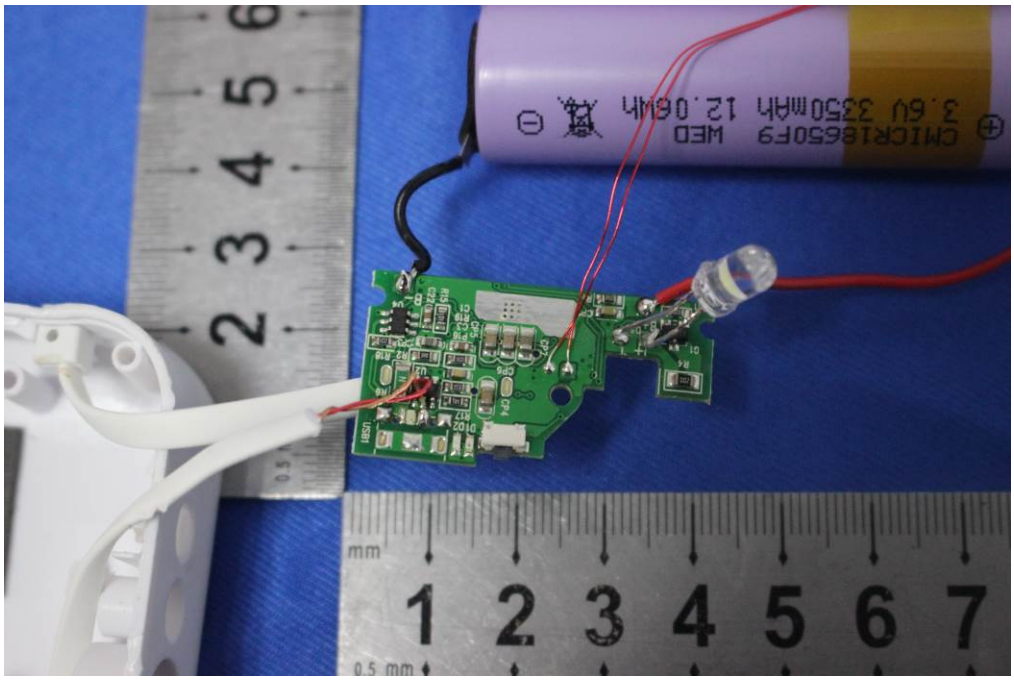
## 7.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup

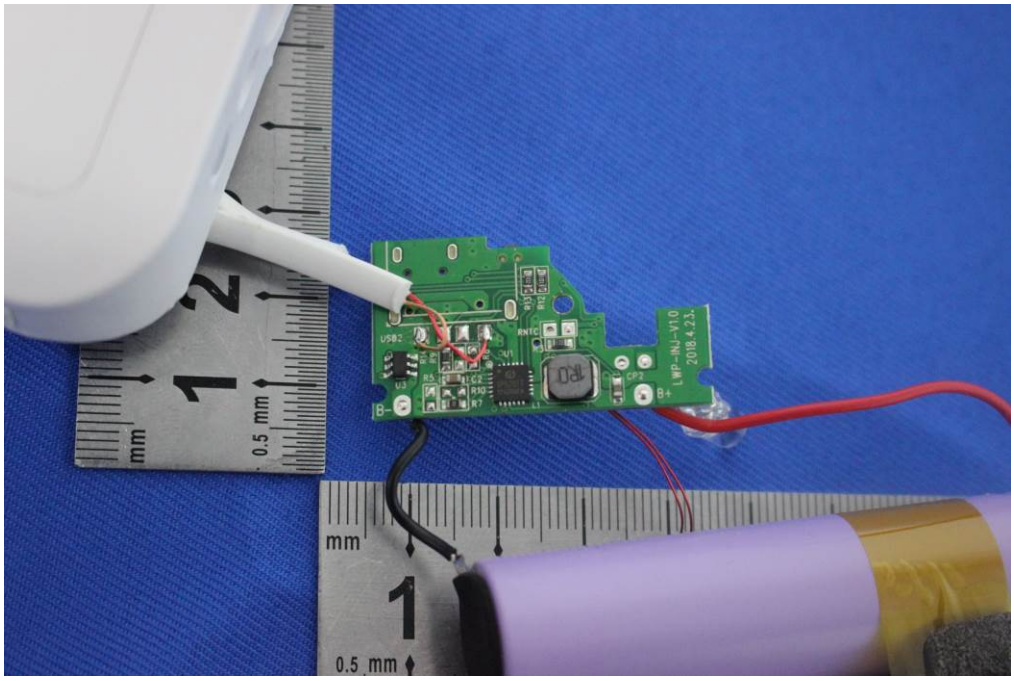
## 7.2 Radiated Emissions (30MHz-1GHz) Test Setup

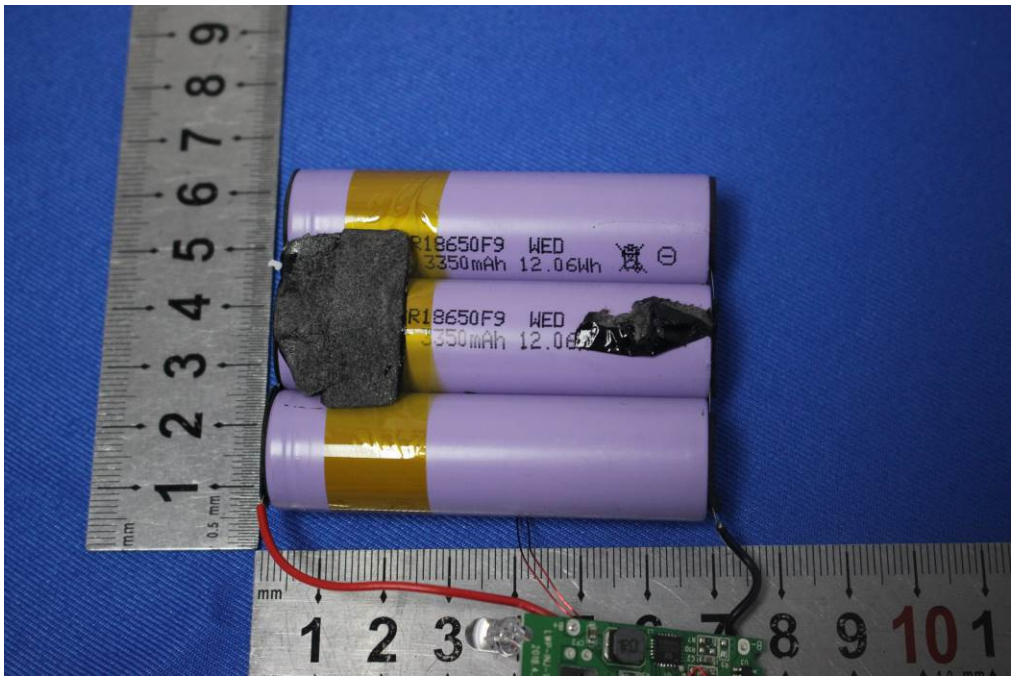


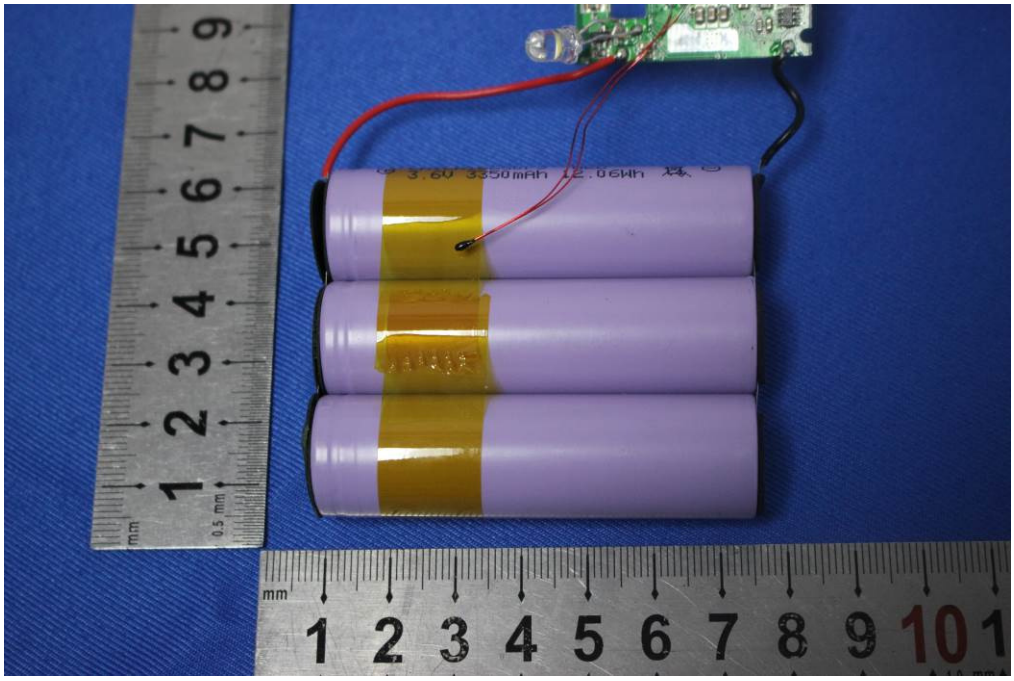
## 7.3 EUT Constructional Details (EUT Photos)

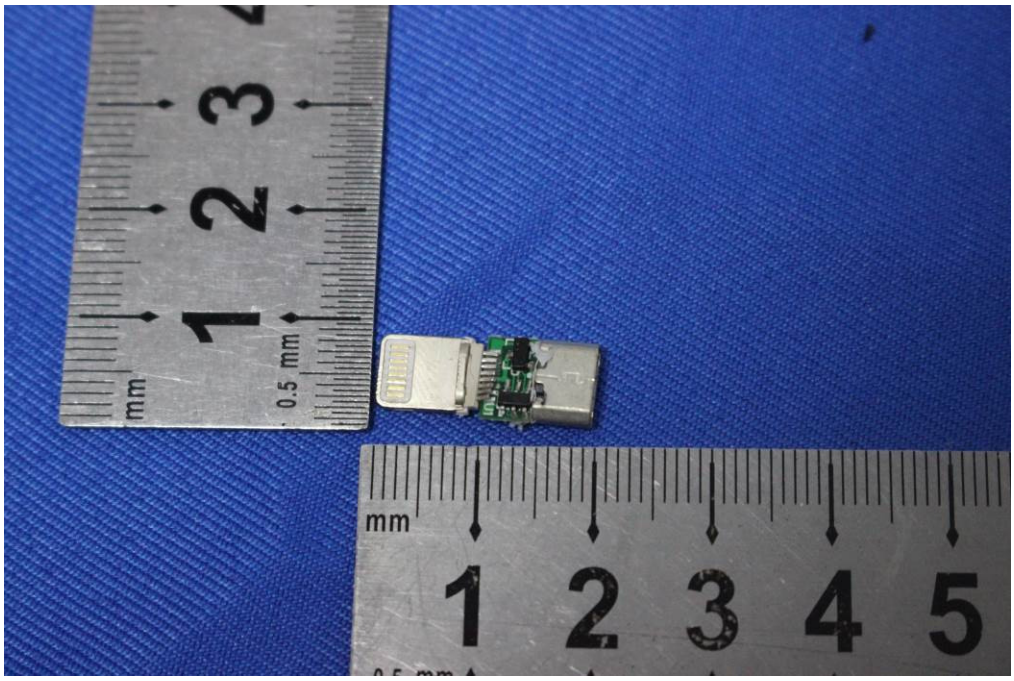


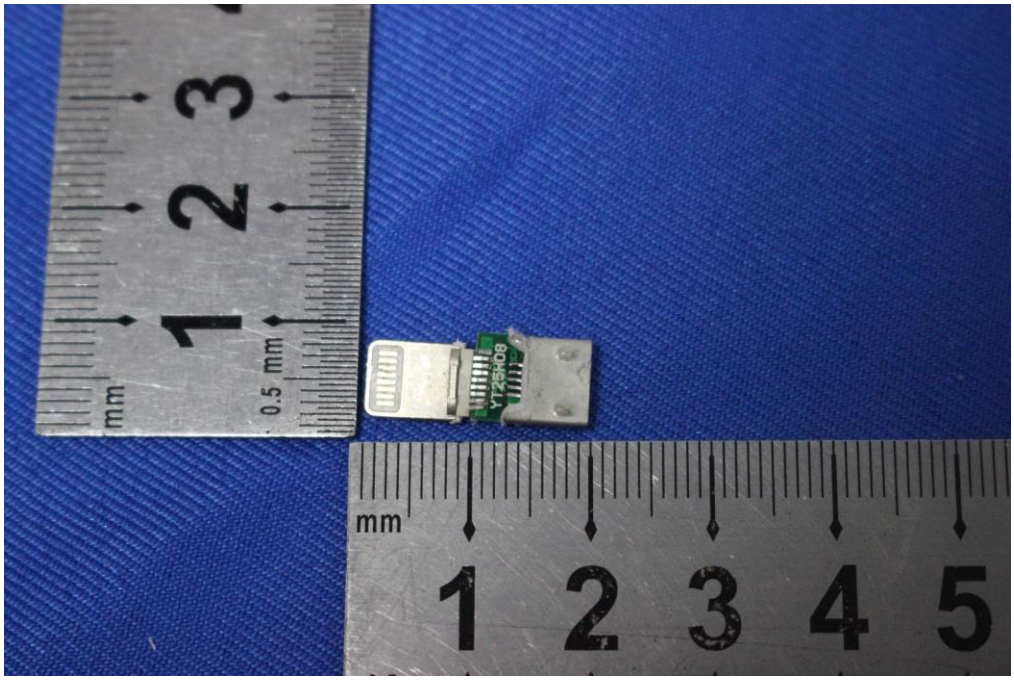











- End of the Report -