**Shenzhen CTL Testing Technology Co., Ltd.**
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# FCC Part 15 Subpart B Test Report

## FCC PART 15 Subpart B Class B

| | |
|---|---|
| **Report Reference No**.....: | **CTL1710236072-F** |
| Compiled by ( position+printed name+signature)..: | File administrators Lucy Xu |
| Supervised by ( position+printed name+signature)..: | Technique principal Ivan Xie |
| Approved by ( position+printed name+signature)..: | Manager Tracy Qi |
| Date of issue.....: | Oct. 27, 2017 |
| **Representative Laboratory Name** .: | **Shenzhen CTL Testing Technology Co., Ltd.** |
| Address.....: | Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055 |
| **Test Firm**.....: | **Shenzhen CTL Testing Technology Co., Ltd.** |
| Address.....: | Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055 |
| **Applicant's name**.....: | |
| Address.....: | |
| **Test specification:** | |
| Standard.....: | **FCC PART 15 Subpart B Class B** |
| TRF Originator.....: | Shenzhen CTL Testing Technology Co., Ltd. |
| Master TRF.....: | Dated 2011-01 |



| | |
|---|---|
| **Test item description** ..... : | **POWERBANK** |
| Trade Mark .....: | Spector&co |
| Test voltage.....: | DC 5V |
| Result.....: | **Pass** |

# FCC Test Report

| Test Report No. : | CTL1710236072-F | Oct. 27, 2017<br>Date of issue |
|---|---|---|

| | | |
|---|---|---|
| Equipment under Test | : | POWERBANK |
| Type / Model | : | T154 |
| Listed Models | : | / |
| **Applicant** | : | |
| Address | : | |
| **Manufacturer** | : | **shenzhen LDTEX technology co.ltd** |
| Address | : | No 19th, building of Fenghuang Industrial area, Fenghuang Road, Pinghu Town, Bao'an disctric, Shenzhen |

| Test Result | Pass |
|---|---|

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| CTL1710236072-F | V1.0 | Initial Issued Report | Oct. 27, 2017 |

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# 1. TEST STANDARDS

The tests were performed according to following standards:

**FCC Rules Part 15 Subpart B - Unintentional Radiators**

**ANSI C63.4-2014**

# 2 . SUMMARY

## 2.1. General Remarks

| | | |
|---|---|---|
| Date of receipt of test sample | : | Oct. 25, 2017 |
| Testing commenced on | : | Oct. 25, 2017 |
| Testing concluded on | : | Oct. 26, 2017 |

## 2.2. Equipment Under Test

## Power supply system utilised

Power supply voltage : o 120V / 60 Hz o 115V / 60Hz
o 12 V DC o 24 V DC
■ Other (specified in blank below)

DC 5V

## 2.3. Short description of the Equipment under Test (EUT)

POWERBANK .

## 2.4. EUT operation mode

The EUT has been tested under typical operating condition.

## 2.5. EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**

● - supplied by the manufacturer

o - supplied by the lab

## 2.6. Related Submittal(s) / Grant (s)

This test report is intended for T154 filing to comply with the FCC Part 15, Subpart B Rules.

## 2.7. Modifications

No modifications were implemented to meet testing criteria.

## 2.8. Test Result Summary

| Test Item | Test Requirement | Standard Paragrph | Result |
|---|---|---|---|
| Radiated Emission | FCC PART 15 Subpart B Class B | Section 15.109 | PASS |
| Conducted Emission | FCC PART 15 Subpart B Class B | Section 15.107 | N/A |

# 3. TEST ENVIRONMENT

## 3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55032 requirements.

## 3.2. Test Facility

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

### IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

### FCC-Registration No.: 970318

Shenzhen CTL Testing Technology 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 970318, December 19, 2013.

## 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature: | 15-35 ° C |
| Humidity: | 30-60 % |
| Atmospheric pressure: | 950-1050mbar |

## 3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

| Test | Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 30~1000MHz | ±3.56dB | (1) |
| Radiated Emission | 1~12.75GHz | ±4.32dB | (1) |
| Conducted Emission | 0.15~30MHz | ±2.66dB | (1) |

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

## 3.5. Equipments Used during the Test

| Radiated Emission | | | | | | |
|---|---|---|---|---|---|---|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal.Due |
| 1 | ULTRA-BROADBAND ANTENNA | Sunol Sciences Corp. | JB1 Antenna | A061713 | 2017/06/01 | 2018/05/31 |
| 2 | EMI Test Receiver | ROHDE & SCHWARZ | ESCI | 1166.5950.03 | 2017/06/01 | 2018/05/31 |
| 3 | Horn Antenna | Sunol Sciences Corp | DRH-118 | A062013 | 2017/06/01 | 2018/05/31 |

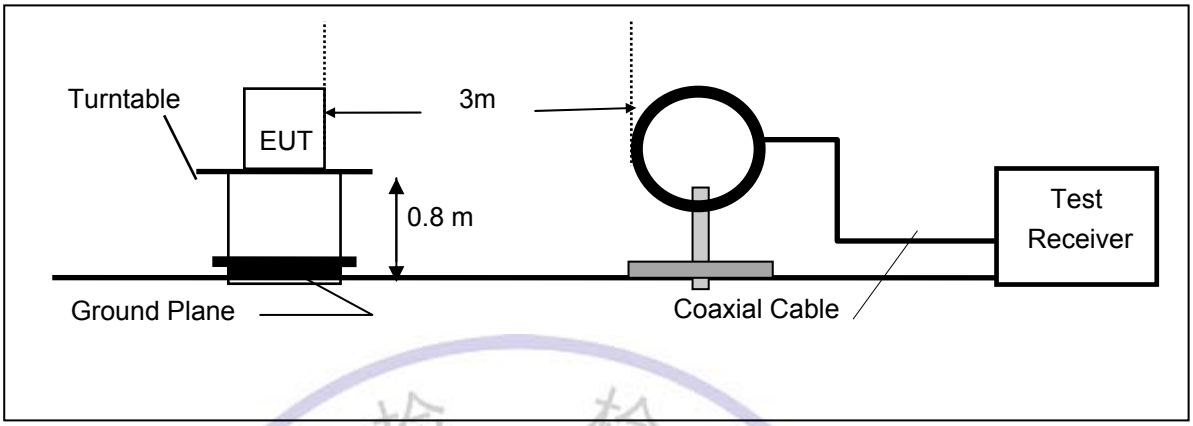
| Conducted Emission | | | | | | |
|---|---|---|---|---|---|---|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal.Due |
| 1 | EMI Test Receiver | ROHDE & SCHWARZ | ESCI | 1166.5950.03 | 2017/06/01 | 2018/05/31 |
| 2 | LISN | ROHDE & SCHWARZ | ESH2-Z5 | 860014/010 | 2017/06/01 | 2018/05/31 |

# 4. TEST CONDITIONS AND RESULTS

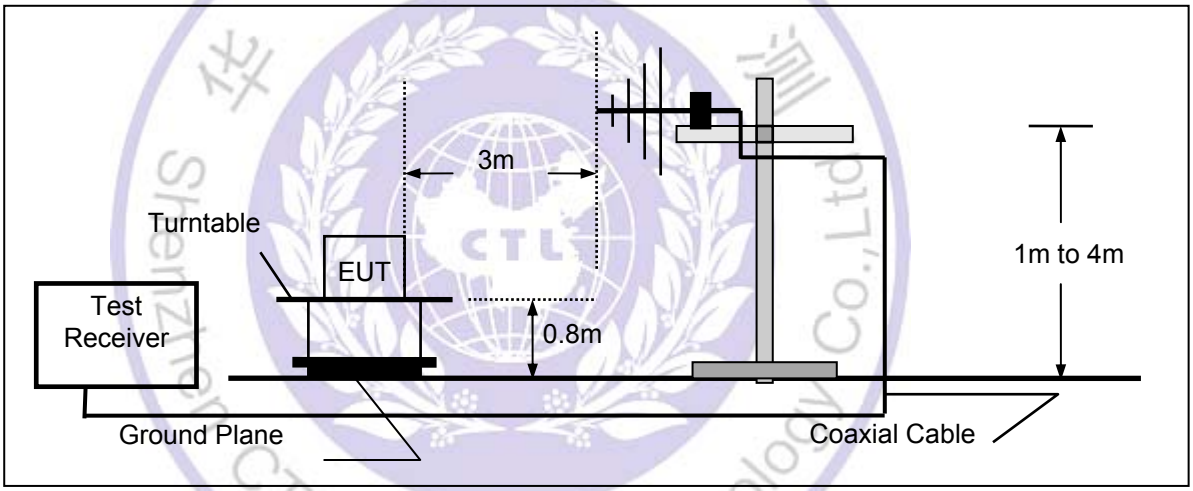
## 4.1. Radiated Emission Test

**TEST CONFIGURATION**

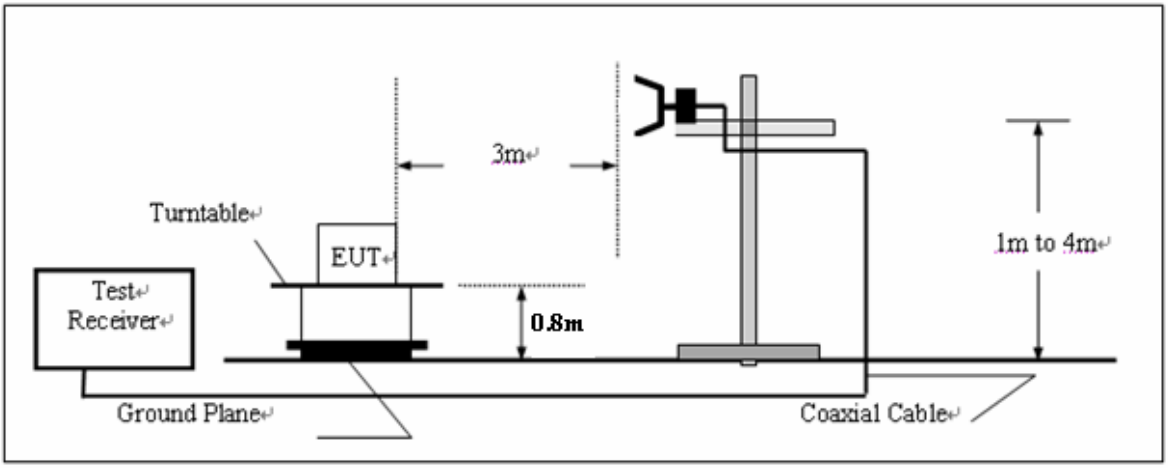
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz




(B) Radiated Emission Test Set-Up, Frequency below 1000MHz




(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

**FS = RA + AF + CL - AG**

| | |
|---|---|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude | AG = Amplifier Gain |
| AF = Antenna Factor | |

**RADIATION LIMIT**

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m) | Radiated (μV/m) |
|---|---|---|---|
| 30-88 | 3 | 40.0 | 100 |
| 88-216 | 3 | 43.5 | 150 |
| 216-960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

**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 varied from 1m to 4m to find out the highest emissions.
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.

**Radiation Test Results**

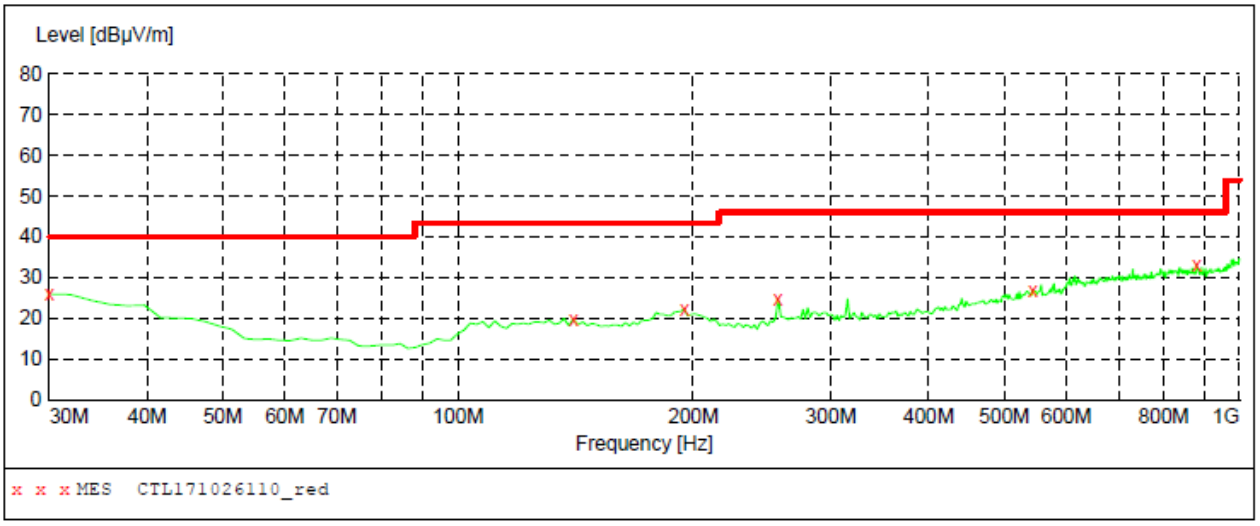
***Shenzhen CTL Testing Technology Co.,Ltd***

***Radiation Emission Test FCC PART15 B***

```
EUT:                    T154
Manufacturer:           shenzhen LDTEX technology co.ltd
Operating Condition:    WORKING
Test Site:              3m Chamber
Operator:               WZ
Test Specification:     DC 5V
Comment:
Start of Test:          10/26/2017 / 4:13:32PM
```

***SWEEP TABLE: "test (30M-1G)"***

| Short Description: | | | Field Strength | | |
|---|---|---|---|---|---|
| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
| 30.0 MHz | 1.0 GHz | MaxPeak | 300.0 ms | 120 kHz | JB1 |




***MEASUREMENT RESULT: "CTL171026110_red"***

10/26/2017 4:15PM

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---|---|---|---|---|---|---|---|---|
| 30.000000 | 25.90 | 22.1 | 40.0 | 14.1 | --- | 0.0 | 0.00 | VERTICAL |
| 140.580000 | 19.90 | 14.8 | 43.5 | 23.6 | --- | 0.0 | 0.00 | VERTICAL |
| 194.900000 | 22.30 | 14.6 | 43.5 | 21.2 | --- | 0.0 | 0.00 | VERTICAL |
| 256.980000 | 24.90 | 14.7 | 46.0 | 21.1 | --- | 0.0 | 0.00 | VERTICAL |
| 544.100000 | 26.90 | 21.7 | 46.0 | 19.1 | --- | 0.0 | 0.00 | VERTICAL |
| 881.660000 | 33.20 | 26.1 | 46.0 | 12.8 | --- | 0.0 | 0.00 | VERTICAL |

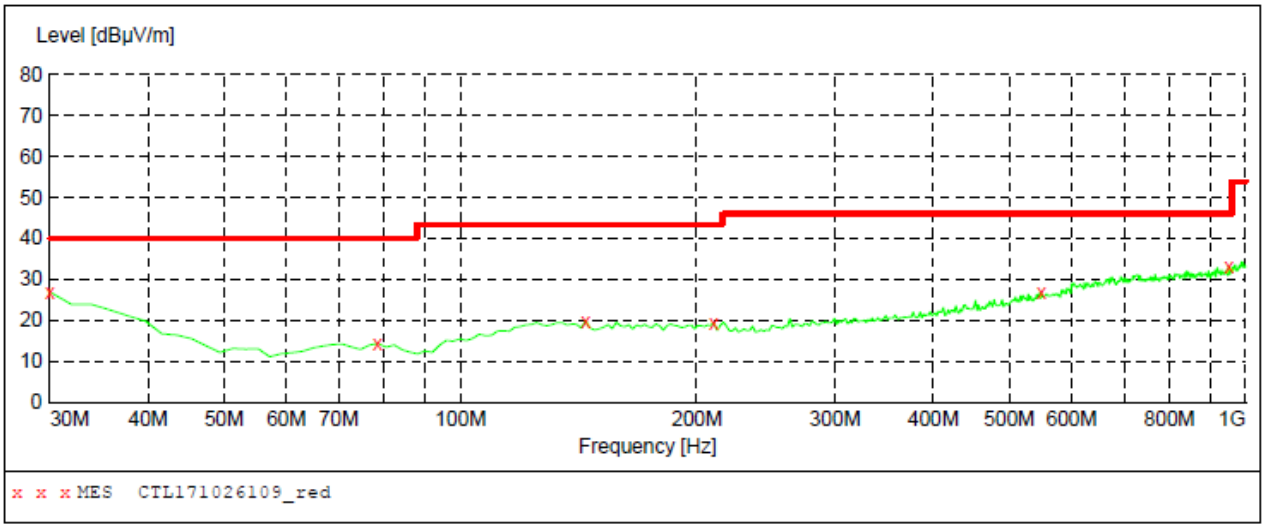
***Shenzhen CTL Testing Technology Co.,Ltd***

***Radiation Emission Test FCC PART15 B***

```
EUT:                    T154
Manufacturer:           shenzhen LDTEX technology co.ltd
Operating Condition:    WORKING
Test Site:              3m Chamber
Operator:               WZ
Test Specification:     DC 5V
Comment:
Start of Test:          10/26/2017 / 4:11:40PM
```

***SWEEP TABLE: "test (30M-1G)"***

| Short Description: | | | Field Strength | | |
|---|---|---|---|---|---|
| Start Frequency | Stop Frequency | Detector | Meas. Time | IF Bandw. | Transducer |
| 30.0 MHz | 1.0 GHz | MaxPeak | 300.0 ms | 120 kHz | JB1 |



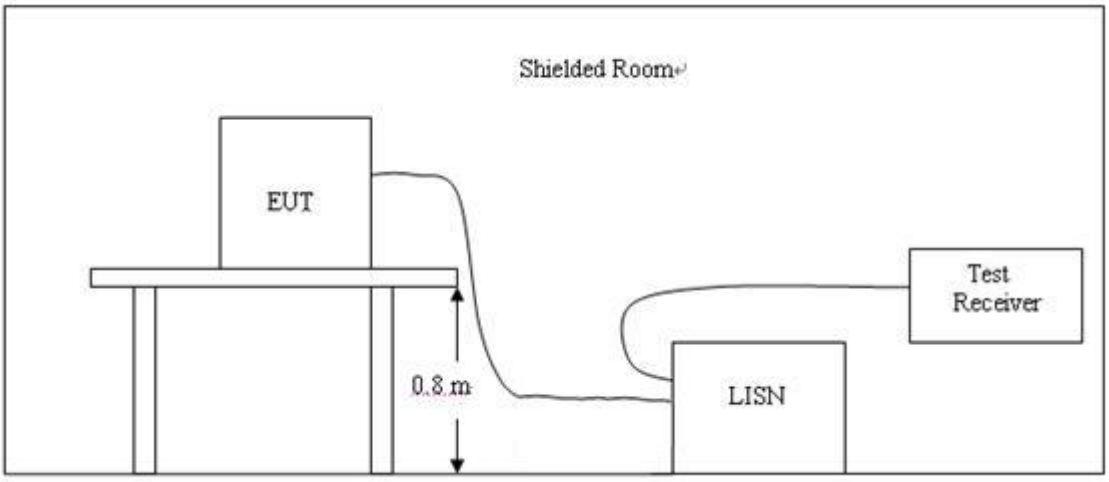

***MEASUREMENT RESULT: "CTL171026109_red"***

10/26/2017 4:13PM

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---|---|---|---|---|---|---|---|---|
| 30.000000 | 26.90 | 22.1 | 40.0 | 13.1 | --- | 0.0 | 0.00 | HORIZONTAL |
| 78.500000 | 14.30 | 9.0 | 40.0 | 25.7 | --- | 0.0 | 0.00 | HORIZONTAL |
| 144.460000 | 19.90 | 14.6 | 43.5 | 23.6 | --- | 0.0 | 0.00 | HORIZONTAL |
| 210.420000 | 19.40 | 14.5 | 43.5 | 24.1 | --- | 0.0 | 0.00 | HORIZONTAL |
| 549.920000 | 26.70 | 21.8 | 46.0 | 19.3 | --- | 0.0 | 0.00 | HORIZONTAL |
| 953.440000 | 32.90 | 27.3 | 46.0 | 13.1 | --- | 0.0 | 0.00 | HORIZONTAL |

## 4.2. Conducted Emissions Test

**TEST CONFIGURATION**




**TEST PROCEDURE**

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

**Conducted Power Line Emission Limit**

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following：

| Frequency (MHz) | Maximum RF Line Voltage (dBμV) | | | |
|---|---|---|---|---|
| | CLASS A | | CLASS B | |
| | Q.P. | Ave. | Q.P. | Ave. |
| 0.15 - 0.50 | 79 | 66 | 66-56* | 56-46* |
| 0.50 - 5.00 | 73 | 60 | 56 | 46 |
| 5.00 - 30.0 | 73 | 60 | 60 | 50 |

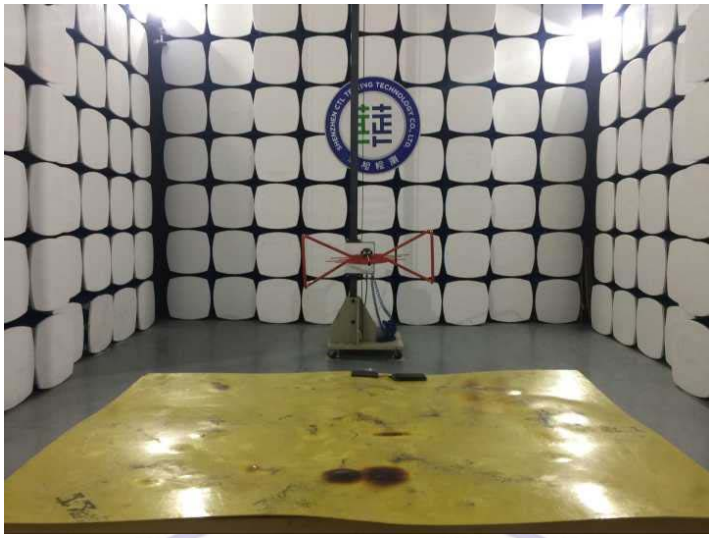
* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

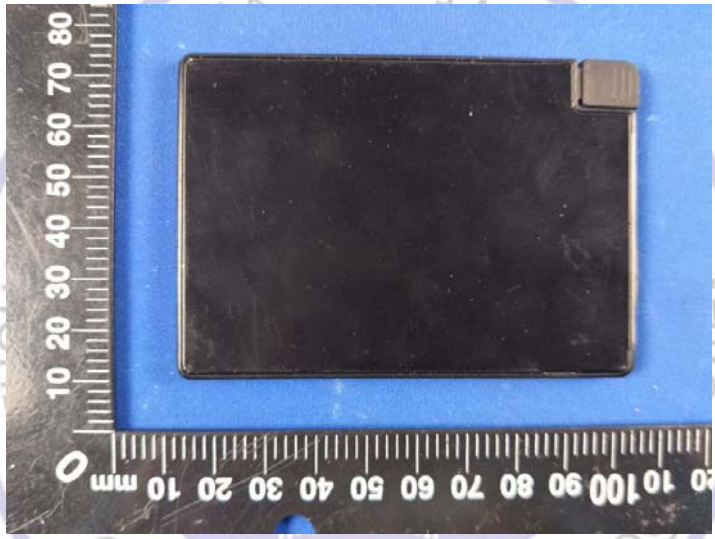
**TEST RESULTS**

The test is not applicable.

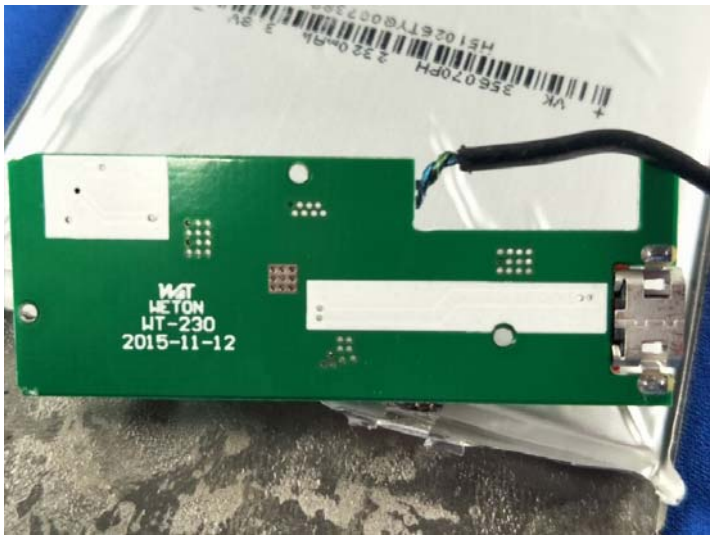
# 5. Test Setup Photos of the EUT



# 6. Photos of the EUT




B-
B+




**.....End of Report.....**