

# FCC PART 15C TEST REPORT

For  
**Slightech, Inc.**

C602, 530 Building, Tai Lake T-Park, No. 18 Qingyuan Road, Xin District, Wuxi, China 214135

**FCC ID: 2AEIWWB01**

|                                                                                                                                                                                                                                                |                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>Report Type:</b><br>Original Report                                                                                                                                                                                                         | <b>Product Type:</b><br>MYNT WIRELESS CHARGER  |
| <b>Test Engineer:</b> <u>Stone Zhang</u> <i>Stone Zhang</i>                                                                                                                                                                                    |                                                |
| <b>Report Number:</b> <u>RSHA181016001-00B</u>                                                                                                                                                                                                 |                                                |
| <b>Report Date:</b> <u>2018-11-22</u>                                                                                                                                                                                                          |                                                |
| <b>Reviewed By:</b>                                                                                                                                                                                                                            | <u>Oscar Ye</u> <i>Oscar Ye</i><br>EMC Manager |
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|              |                            |
|--------------|----------------------------|
| Applicant    | Slightech, Inc.            |
| Tested Model | WB01                       |
| Product Type | MYNT WIRELESS CHARGER      |
| Dimension    | 91mm(L)*91 mm(W)*7.5 mm(H) |
| Power Supply | DC 5V/9V                   |

*\*All measurement and test data in this report was gathered from production sample serial number: 20181016001. (Assigned by BACL, Kunshan). The EUT was received on 2018-10-16.*

### Objective

This report is prepared on behalf of *Slightech, Inc.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207 and 15.209 rules.

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

No Related Submittal(s)/Grant(s).

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Measurement Uncertainty**

| Item                               |            | Uncertainty |
|------------------------------------|------------|-------------|
| AC Power Lines Conducted Emissions |            | 3.19 dB     |
| Radiated emission                  | 9kHz~30MHz | 3.19dB      |
|                                    | 30MHz~1GHz | 6.11dB      |
| Temperature                        |            | 1.0°C       |
| Humidity                           |            | 6%          |

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user)

### Equipment Modifications

No modification was made to the EUT tested.

### EUT Exercise Software

No Exercise Software was used.

### Support Equipment List and Details

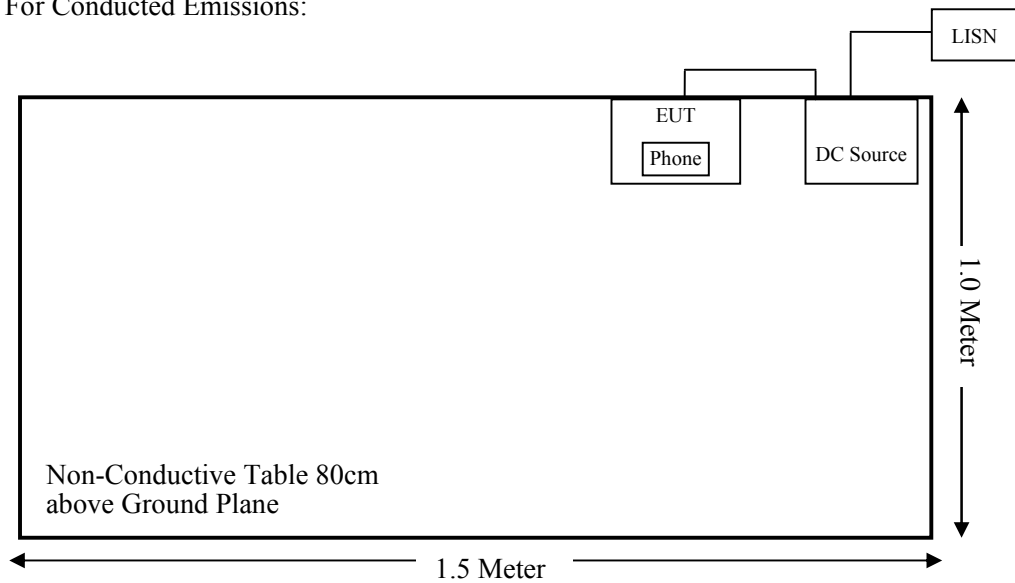
| Manufacturer | Description  | Model       | Serial Number |
|--------------|--------------|-------------|---------------|
| MCH          | DC Source    | MCH-303D-II | 14070562      |
| Apple        | Mobile Phone | MQ6MZCH/A   | C7CV95M4JC6F  |

### External I/O Cable

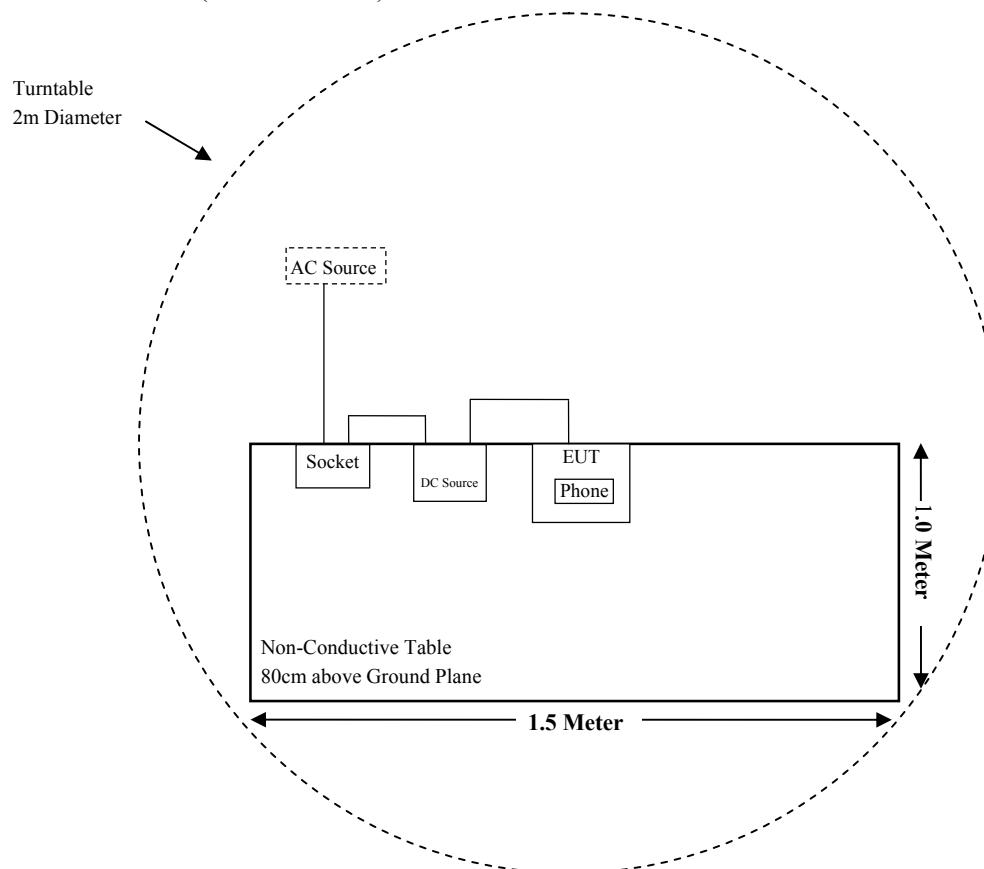
| Cable Description | Length (m) | From Port | To        |
|-------------------|------------|-----------|-----------|
| Power Cable-1     | 0.5        | EUT       | DC Source |
| Power Cable-2     | 1.0        | DC Source | Socket    |

## Block Diagram of Test Setup

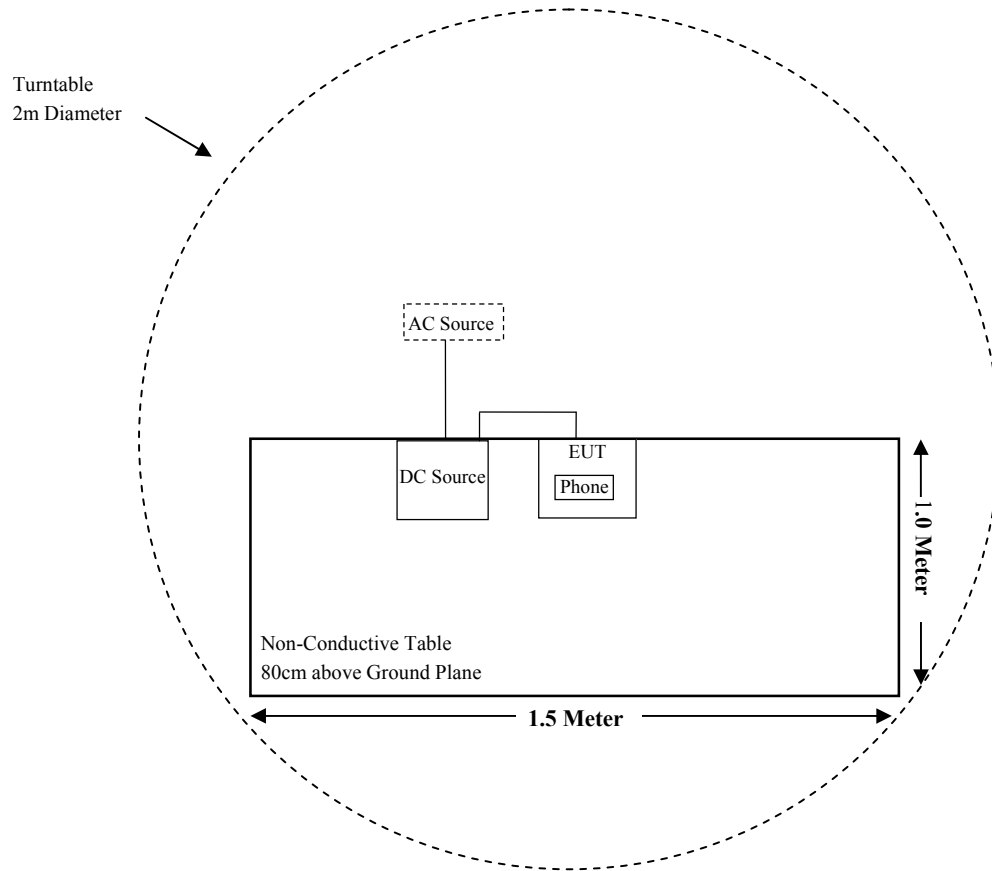
For Conducted Emissions:



For Radiated Emissions(Below 30MHz):



For Radiated Emissions(Above 30MHz):



**SUMMARY OF TEST RESULTS**

| FCC Rules         | Description of Test         | Result     |
|-------------------|-----------------------------|------------|
| §1.1307 & §1.1310 | RF Exposure                 | Compliance |
| §15.203           | Antenna Requirement         | Compliance |
| §15.207 (a)       | AC Line Conducted Emissions | Compliance |
| §15.205, §15.209  | Spurious Emissions          | Compliance |

**TEST EQUIPMENT LIST**

| Manufacturer                              | Description                 | Model                        | Serial Number | Calibration Date | Calibration Due Date |
|-------------------------------------------|-----------------------------|------------------------------|---------------|------------------|----------------------|
| <b>Radiated Emission Test(Chamber 1#)</b> |                             |                              |               |                  |                      |
| Rohde & Schwarz                           | EMI Test Receiver           | ESCI                         | 100195        | 2017-11-12       | 2018-11-11           |
| Rohde & Schwarz                           | EMI Test Receiver           | ESCI                         | 100195        | 2018-11-12       | 2019-11-11           |
| Sunol Sciences                            | Broadband Antenna           | JB3                          | A090413-1     | 2016-12-26       | 2019-12-25           |
| Sonoma Instrument                         | Pre-amplifier               | 310N                         | 171205        | 2018-08-15       | 2019-08-14           |
| Rohde & Schwarz                           | Auto test Software          | EMC32                        | 100361        | /                | /                    |
| MICRO-COAX                                | Coaxial Cable               | Cable-8                      | 008           | 2018-08-15       | 2019-08-14           |
| MICRO-COAX                                | Coaxial Cable               | Cable-9                      | 009           | 2018-08-15       | 2019-08-14           |
| MICRO-COAX                                | Coaxial Cable               | Cable-10                     | 010           | 2018-08-15       | 2019-08-14           |
| ZHAOXIN                                   | DC Power Supply             | RXN-605D                     | DC002         | 2018-10-10       | 2019-10-09           |
| <b>Radiated Emission Test(Chamber 2#)</b> |                             |                              |               |                  |                      |
| Rohde & Schwarz                           | EMI Test Receiver           | ESU40                        | 100207        | 2018-08-27       | 2019-08-26           |
| ETS-LINDGREN                              | PASSIVE LOOP                | 6512                         | 108100        | 2016-01-09       | 2019-01-08           |
| Sonoma Instrument                         | Pre-amplifier               | 310N                         | 185700        | 2018-08-15       | 2019-08-14           |
| Rohde & Schwarz                           | Auto test Software          | EMC32                        | 100361        | /                | /                    |
| MICRO-COAX                                | Coaxial Cable               | Cable-6                      | 006           | 2018-08-15       | 2019-08-14           |
| MICRO-COAX                                | Coaxial Cable               | Cable-11                     | 011           | 2018-08-15       | 2019-08-14           |
| MICRO-COAX                                | Coaxial Cable               | Cable-12                     | 012           | 2018-08-15       | 2019-08-14           |
| MICRO-COAX                                | Coaxial Cable               | Cable-13                     | 013           | 2018-08-15       | 2019-08-14           |
| ZHAOXIN                                   | DC Power Supply             | RXN-605D                     | DC002         | 2018-10-10       | 2019-10-09           |
| <b>Conducted Emission Test</b>            |                             |                              |               |                  |                      |
| Rohde & Schwarz                           | EMI Test Receiver           | ESCS30                       | 834115/007    | 2018-11-12       | 2019-11-11           |
| ZHAOXIN                                   | DC Power Supply             | RXN-605D                     | DC002         | 2018-10-10       | 2019-10-09           |
| Rohde & Schwarz                           | LISN                        | ESH3-Z5                      | 862770/011    | 2018-11-12       | 2019-11-11           |
| BACL                                      | Auto test Software          | BACL-EMC                     | CE001         | /                | /                    |
| Narda                                     | Attenuator/6dB              | 10690812-2                   | 26850-6       | 2018-01-10       | 2019-01-09           |
| MICRO-COAX                                | Coaxial Cable               | Cable-15                     | 015           | 2018-08-15       | 2019-08-14           |
| <b>RF Exposure</b>                        |                             |                              |               |                  |                      |
| Narda                                     | Electromagnetic Field Meter | ELT-400                      | N-0215        | 2018-02-22       | 2019-02-21           |
| Narda                                     | B field probe               | ELT Probe 100cm <sup>2</sup> | M-0658        | 2018-02-22       | 2019-02-21           |
| ETS-Lindgren                              | Isotropic probe /           | HI-6005                      | 00069461      | 2016-02-29       | 2019-02-28           |
| ZHAOXIN                                   | DC Power Supply             | RXN-605D                     | DC002         | 2018-10-10       | 2019-10-09           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## FCC §1.1307& §1.1310 – RF EXPOSURE

### Applicable Standard

FCC §1.1307 & 1.1310

According to the item 5.2 of KDB 680106 D01 RF Exposure Wireless Charging Apps v03: Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF evaluation.

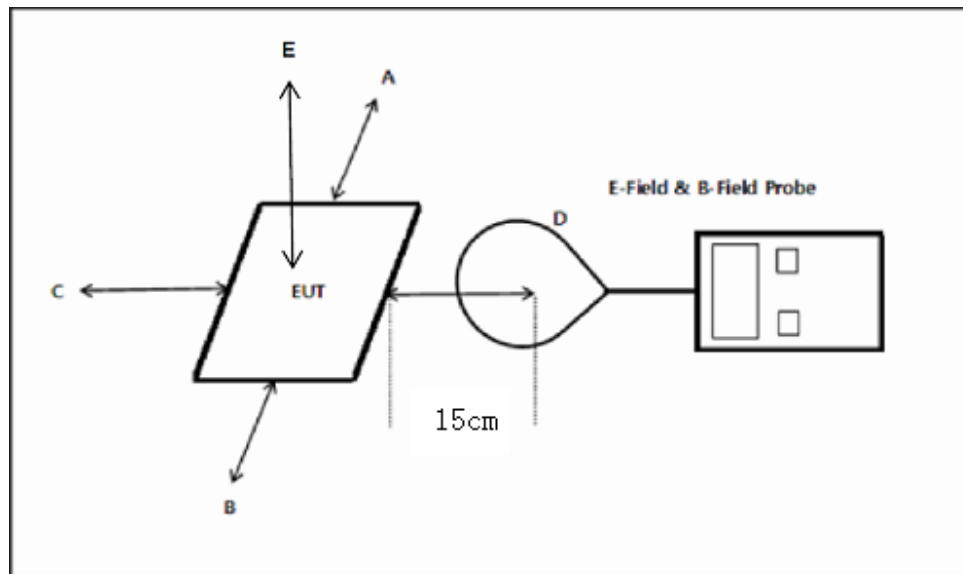
- Power transfer frequency is less than 1 MHz.
- Output power from each primary coil is less than or equal to 15 watts.
- The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
- Client device is placed directly in contact with the transmitter.
- Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
- The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

### Limits for Maximum Permissible Exposure (MPE)

| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz)                                   | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (minutes) |
| (A) Limits for Occupational/Controlled Exposure         |                               |                               |                                     |                          |
| 0.3-3.0                                                 | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30                                                  | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300                                                  | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500                                               | /                             | /                             | f/300                               | 6                        |
| 1,500-100,000                                           | /                             | /                             | 5                                   | 6                        |
| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
| 0.3-1.34                                                | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34-30                                                 | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30-300                                                  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1500                                                | /                             | /                             | f/1500                              | 30                       |
| 1500-100,000                                            | /                             | /                             | 1.0                                 | 30                       |

f = frequency in MHz; \* = Plane-wave equivalent power density;

## EUT Setup



## Result

a) Power transfer frequency is less than 1 MHz.

Yes, the device operates in the frequency 110 kHz-205kHz.

b) Output power from each primary coil is less than or equal to 15 watts.

Yes, the maximum output power of the primary coil is  $10W < 15W$ .

c) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils..

Yes, the transfer system including a charging system with only single primary coils is to detect and allow only between individual of coils.

d) Client device is inserted in or placed directly in contact with the transmitter.

Yes, client device is placed directly in contact with the transmitter.

e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

Yes, this is a mobile device.

f) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

The EUT H-field Strength levels at 15cm surrounding the device and 20 cm above the top surface are less than 50% the MPE limit.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.2℃     |
| <b>Relative Humidity:</b> | 51 %      |
| <b>ATM Pressure:</b>      | 101.2 kPa |

The testing was performed by Stone Zhang on 2018-11-12.

**For DC 5V**

*H-Filed Strength*

| Frequency Range (kHz) | Position A (A/m) | Position B (A/m) | Position C (A/m) | Position D (A/m) | Position E (A/m) | Limit Test (A/m) | Maximum ration of MPE limit |
|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| 110-205               | 0.175            | 0.198            | 0.258            | 0.189            | 0.457            | 1.63             | 28.03%                      |

*E-Filed Strength*

| Frequency Range (kHz) | Position A (V/m) | Position B (V/m) | Position C (V/m) | Position D (V/m) | Position E (V/m) | Limit Test (V/m) | Maximum ration of MPE limit |
|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| 110-205               | 2.35             | 2.23             | 2.46             | 3.23             | 5.90             | 614              | 0.96%                       |

**For DC 9V**

*H-Filed Strength*

| Frequency Range (kHz) | Position A (A/m) | Position B (A/m) | Position C (A/m) | Position D (A/m) | Position E (A/m) | Limit Test (A/m) | Maximum ration of MPE limit |
|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| 110-205               | 0.177            | 0.201            | 0.262            | 0.191            | 0.459            | 1.63             | 28.16%                      |

*E-Filed Strength*

| Frequency Range (kHz) | Position A (V/m) | Position B (V/m) | Position C (V/m) | Position D (V/m) | Position E (V/m) | Limit Test (V/m) | Maximum ration of MPE limit |
|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| 110-205               | 2.37             | 2.26             | 2.49             | 3.28             | 5.93             | 614              | 0.97%                       |

**Note:**

1: According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03, Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614V/m and 1.63 A/m.

2: The distance for position A, B, C, D are 15cm, the distance for position E is 20cm.

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## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

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 or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### **Antenna Connector Construction**

The EUT has a loop antenna arrangement, which the antenna gain is 0 dBi; fulfill the requirement of this section. Please refer to the EUT photos.

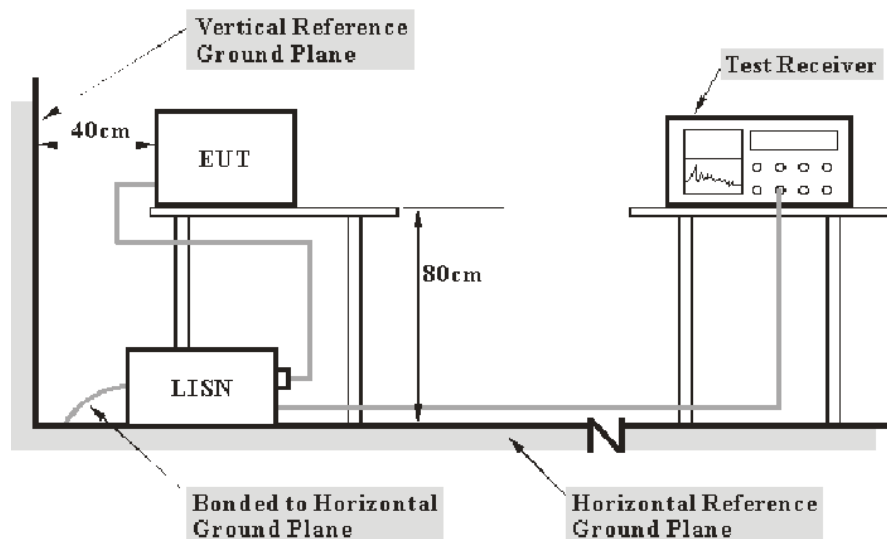
**Result:** Compliance.

## **FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS**

### **Applicable Standard**

FCC §15.207(a)

### **EUT Setup**



Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

### **EMI Test Receiver Setup**

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

### **Test Procedure**

During the conducted emission test, the DC source was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Corrected Factor & Margin Calculation

The Corrected Factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Corrected Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Corrected Amplitude (dB}\mu\text{V)}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

### Test Data

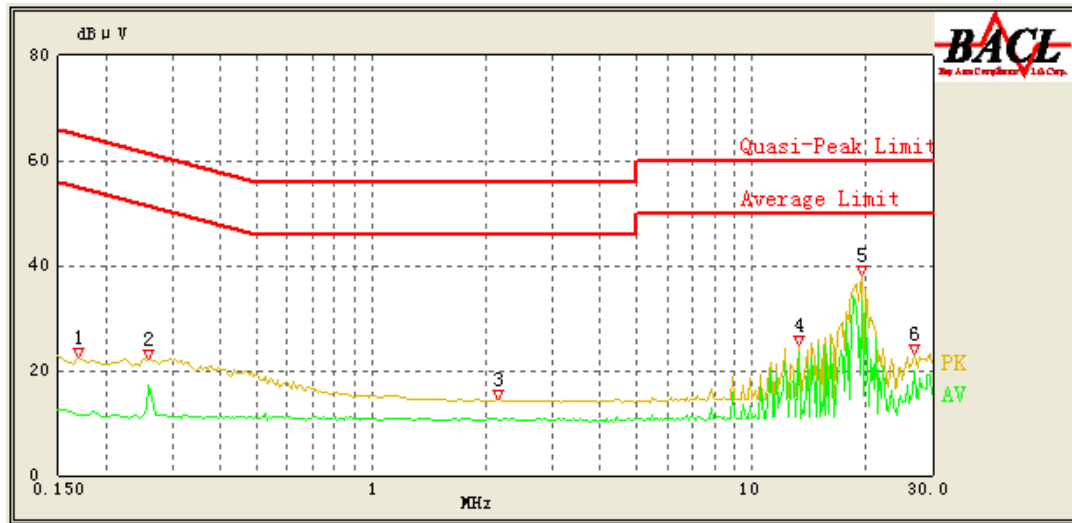
#### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.2°C    |
| <b>Relative Humidity:</b> | 51 %      |
| <b>ATM Pressure:</b>      | 101.2 kPa |

*The testing was performed by Stone Zhang on 2018-11-12.*

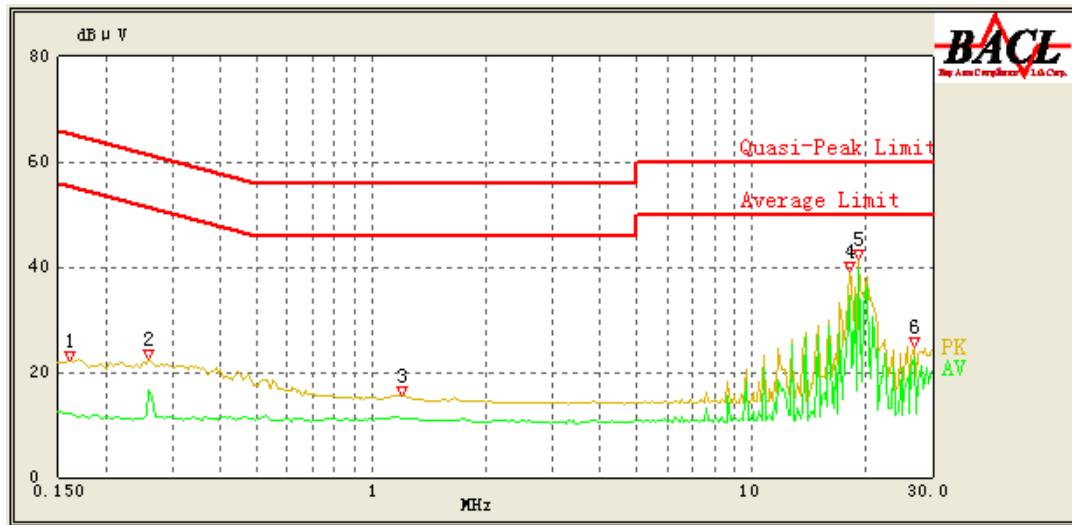
*EUT operation mode: charging and communication*

AC 120V/60 Hz, Line



| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment    |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.170           | 22.57                      | QP                  | 9.000           | L1   | 16.04                 | 65.43        | 42.86       | Compliance |
| 0.170           | 11.35                      | AV                  | 9.000           | L1   | 16.04                 | 55.43        | 44.08       | Compliance |
| 0.260           | 22.30                      | QP                  | 9.000           | L1   | 16.02                 | 62.86        | 40.56       | Compliance |
| 0.260           | 17.03                      | AV                  | 9.000           | L1   | 16.02                 | 52.86        | 35.83       | Compliance |
| 2.150           | 14.38                      | QP                  | 9.000           | L1   | 15.85                 | 56.00        | 41.62       | Compliance |
| 2.150           | 10.44                      | AV                  | 9.000           | L1   | 15.85                 | 46.00        | 35.56       | Compliance |
| 13.350          | 24.68                      | QP                  | 9.000           | L1   | 16.16                 | 60.00        | 35.32       | Compliance |
| 13.350          | 23.57                      | AV                  | 9.000           | L1   | 16.16                 | 50.00        | 26.43       | Compliance |
| 19.500          | 38.24                      | QP                  | 9.000           | L1   | 16.42                 | 60.00        | 21.76       | Compliance |
| 19.500          | 33.17                      | AV                  | 9.000           | L1   | 16.42                 | 50.00        | 16.83       | Compliance |
| 26.700          | 23.29                      | QP                  | 9.000           | L1   | 16.50                 | 60.00        | 36.71       | Compliance |
| 26.700          | 19.86                      | AV                  | 9.000           | L1   | 16.50                 | 50.00        | 30.14       | Compliance |

## AC 120V/60 Hz, Neutral



| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment    |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.160           | 22.17                      | QP                  | 9.000           | N    | 16.06                 | 65.71        | 43.54       | Compliance |
| 0.160           | 12.17                      | AV                  | 9.000           | N    | 16.06                 | 55.71        | 43.54       | Compliance |
| 0.260           | 22.43                      | QP                  | 9.000           | N    | 16.06                 | 62.86        | 40.43       | Compliance |
| 0.260           | 16.51                      | AV                  | 9.000           | N    | 16.06                 | 52.86        | 36.35       | Compliance |
| 1.200           | 15.59                      | QP                  | 9.000           | N    | 15.93                 | 56.00        | 40.41       | Compliance |
| 1.200           | 11.25                      | AV                  | 9.000           | N    | 15.93                 | 46.00        | 34.75       | Compliance |
| 18.100          | 39.10                      | QP                  | 9.000           | N    | 16.10                 | 60.00        | 20.90       | Compliance |
| 18.100          | 34.45                      | AV                  | 9.000           | N    | 16.10                 | 50.00        | 15.55       | Compliance |
| 19.150          | 41.66                      | QP                  | 9.000           | N    | 16.13                 | 60.00        | 18.34       | Compliance |
| 19.150          | 39.51                      | AV                  | 9.000           | N    | 16.13                 | 50.00        | 10.49       | Compliance |
| 26.950          | 25.00                      | QP                  | 9.000           | N    | 16.28                 | 60.00        | 35.00       | Compliance |
| 26.950          | 22.99                      | AV                  | 9.000           | N    | 16.28                 | 50.00        | 27.01       | Compliance |

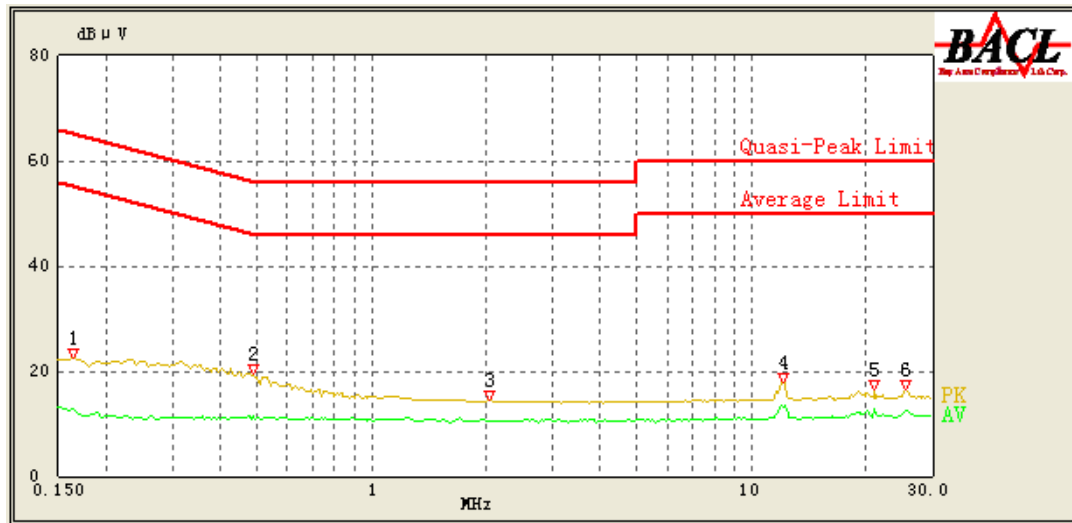
**Note:**

1) Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

2) Margin (dB) = Limit (dBμV) – Corrected Amplitude (dBμV)

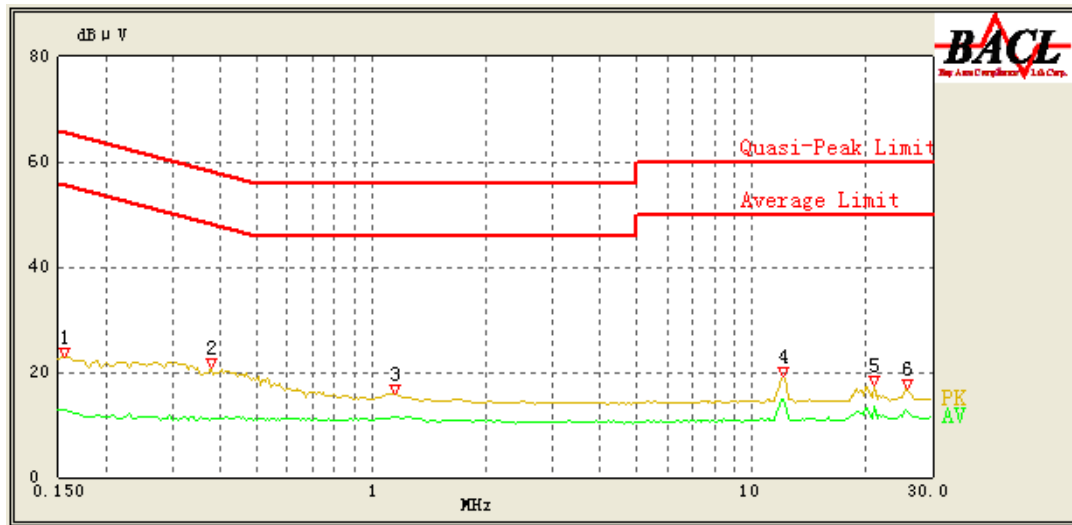
For DC 9V

## AC 120V/60 Hz, Line



| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment    |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.165           | 22.57                      | QP                  | 9.000           | L1   | 16.05                 | 65.57        | 43.00       | Compliance |
| 0.165           | 12.69                      | AV                  | 9.000           | L1   | 16.05                 | 55.57        | 42.88       | Compliance |
| 0.490           | 19.65                      | QP                  | 9.000           | L1   | 16.08                 | 56.29        | 36.64       | Compliance |
| 0.490           | 11.39                      | AV                  | 9.000           | L1   | 16.08                 | 46.29        | 34.90       | Compliance |
| 2.050           | 14.48                      | QP                  | 9.000           | L1   | 15.85                 | 56.00        | 41.52       | Compliance |
| 2.050           | 10.53                      | AV                  | 9.000           | L1   | 15.85                 | 46.00        | 35.47       | Compliance |
| 12.100          | 17.93                      | QP                  | 9.000           | L1   | 16.12                 | 60.00        | 42.07       | Compliance |
| 12.100          | 13.27                      | AV                  | 9.000           | L1   | 16.12                 | 50.00        | 36.73       | Compliance |
| 21.050          | 16.43                      | QP                  | 9.000           | L1   | 16.44                 | 60.00        | 43.57       | Compliance |
| 21.050          | 12.84                      | AV                  | 9.000           | L1   | 16.44                 | 50.00        | 37.16       | Compliance |
| 25.350          | 16.54                      | QP                  | 9.000           | L1   | 16.47                 | 60.00        | 43.46       | Compliance |
| 25.350          | 12.51                      | AV                  | 9.000           | L1   | 16.47                 | 50.00        | 37.49       | Compliance |

## AC 120V/60 Hz, Neutral



| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment    |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.155           | 22.93                      | QP                  | 9.000           | N    | 16.06                 | 65.86        | 42.93       | Compliance |
| 0.155           | 12.96                      | AV                  | 9.000           | N    | 16.06                 | 55.86        | 42.90       | Compliance |
| 0.380           | 20.91                      | QP                  | 9.000           | N    | 16.09                 | 59.43        | 38.52       | Compliance |
| 0.380           | 11.18                      | AV                  | 9.000           | N    | 16.09                 | 49.43        | 38.25       | Compliance |
| 1.150           | 15.85                      | QP                  | 9.000           | N    | 15.94                 | 56.00        | 40.15       | Compliance |
| 1.150           | 11.40                      | AV                  | 9.000           | N    | 15.94                 | 46.00        | 34.60       | Compliance |
| 12.100          | 19.02                      | QP                  | 9.000           | N    | 16.00                 | 60.00        | 40.98       | Compliance |
| 12.100          | 14.74                      | AV                  | 9.000           | N    | 16.00                 | 50.00        | 35.26       | Compliance |
| 21.050          | 17.59                      | QP                  | 9.000           | N    | 16.18                 | 60.00        | 42.41       | Compliance |
| 21.050          | 13.40                      | AV                  | 9.000           | N    | 16.18                 | 50.00        | 36.60       | Compliance |
| 25.650          | 16.78                      | QP                  | 9.000           | N    | 16.25                 | 60.00        | 43.22       | Compliance |
| 25.650          | 12.63                      | AV                  | 9.000           | N    | 16.25                 | 50.00        | 37.37       | Compliance |

**Note:**

1) Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

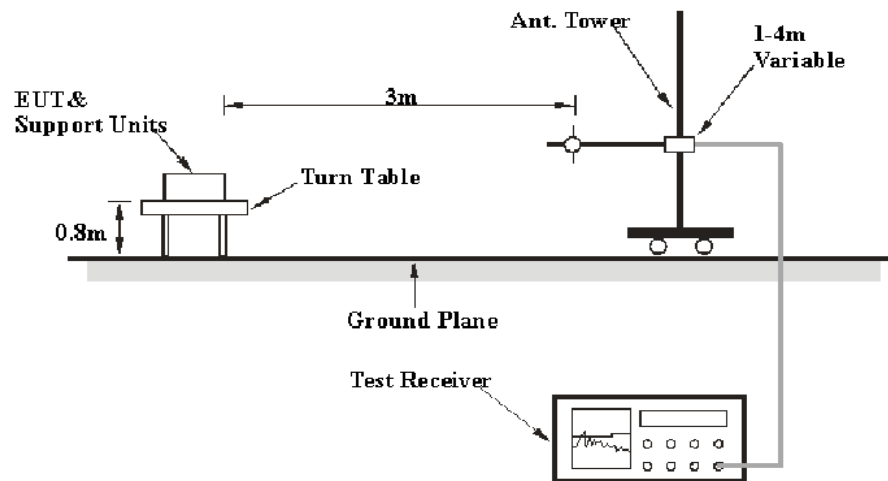
2) Margin (dB) = Limit (dBμV) – Corrected Amplitude (dBμV)

## FCC §15.209 & §15.205 - SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.209; §15.205;

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

### EMI Test Receiver Setup

The system was investigated from 9 kHz to 1GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

| Frequency Range   | RBW     | Video B/W | Detector |
|-------------------|---------|-----------|----------|
| 9 kHz – 150 kHz   | 200 Hz  | 1 kHz     | QP       |
| 150 kHz – 30MHz   | 9kHz    | 30kHz     | QP       |
| 30 MHz – 1000 MHz | 120 kHz | 300 kHz   | QP       |

Note: For the frequency bands 9-90 kHz and 110-490 kHz, the test was based on average detector.

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude (dB}\mu\text{V /m)} = \text{Meter Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V /m)}$$

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205 and 15.209.

### Test Data

#### Environmental Conditions

|                    |                     |
|--------------------|---------------------|
| Temperature:       | 24.2°C~25.0°C       |
| Relative Humidity: | 51 %~52 %           |
| ATM Pressure:      | 101.2 kPa~102.0 kPa |

*The testing was performed by Stone Zhang on 2018-10-31 to 2018-11-09.*

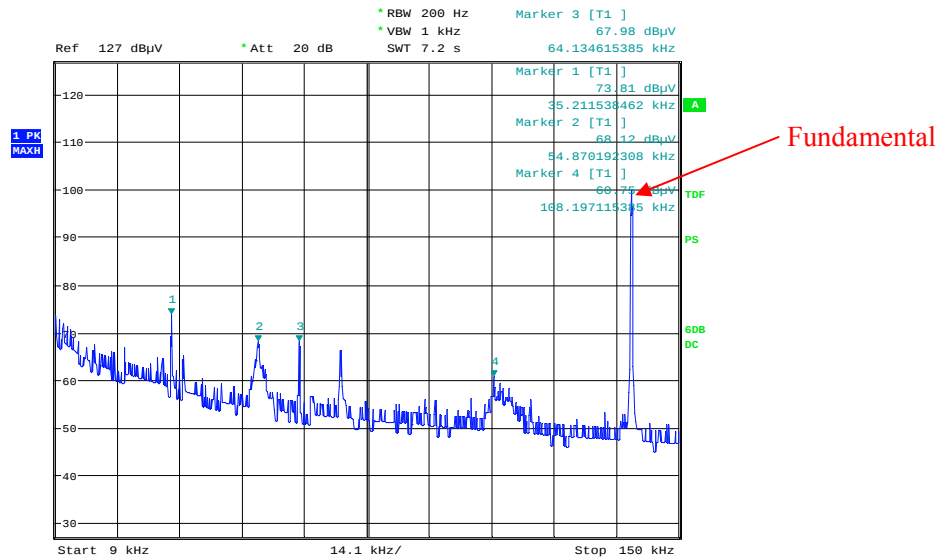
*EUT operation mode: charging and communication*

**9kHz-30MHz:**

**(For DC 5V)**

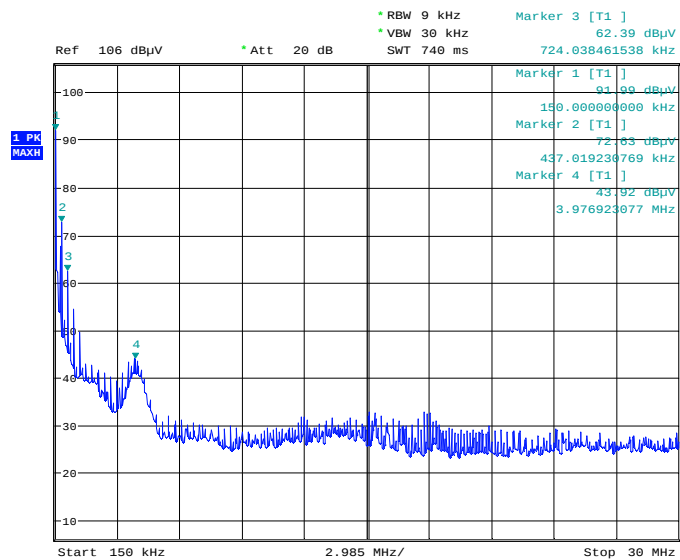
*(Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)*

**9kHz-150kHz (PK)**



Date: 31.OCT.2018 10:07:33

**150kHz-30MHz (PK)**



Date: 31.OCT.2018 09:59:15

9kHz-490kHz:

| Indicated       |                                        | PK/QP/Ave. | Corrected Factor (dB/m) | FCC Part 15.209          |                            |             |
|-----------------|----------------------------------------|------------|-------------------------|--------------------------|----------------------------|-------------|
| Frequency (kHz) | Corrected Amplitude (dB $\mu$ V/m) @3m |            |                         | Limit (dB $\mu$ V/m) @3m | Limit (dB $\mu$ V/m) @300m | Margin (dB) |
| 35.21           | 73.81                                  | PK         | 38.1                    | 116.67                   | 36.67                      | 42.86       |
| 54.87           | 68.12                                  | PK         | 32.4                    | 112.82                   | 32.82                      | 44.70       |
| 64.13           | 67.98                                  | PK         | 31.3                    | 111.46                   | 31.46                      | 43.48       |
| 108.20          | 60.75                                  | PK         | 28.2                    | 106.92                   | 26.92                      | 46.17       |
| 139.95          | 100.02                                 | PK         | 27.3                    | 104.68                   | 24.68                      | 4.66        |
| 150.00          | 91.99                                  | PK         | 27.1                    | 104.08                   | 24.08                      | 12.09       |
| 437.02          | 72.63                                  | PK         | 16.1                    | 94.79                    | 14.79                      | 22.16       |

Note: The average emissions which fall into frequencies 9-90 kHz, 110-490 kHz was not recorded, because the peak emissions are below the average limit.

490kHz-30MHz

| Indicated       |                                        | PK/QP/Ave. | Corrected Factor (dB/m) | FCC Part 15.209          |                           |             |
|-----------------|----------------------------------------|------------|-------------------------|--------------------------|---------------------------|-------------|
| Frequency (MHz) | Corrected Amplitude (dB $\mu$ V/m) @3m |            |                         | Limit (dB $\mu$ V/m) @3m | Limit (dB $\mu$ V/m) @30m | Margin (dB) |
| 0.724           | 62.39                                  | PK         | 12.5                    | 70.41                    | 30.41                     | 8.02        |
| 3.98            | 43.92                                  | PK         | 0.3                     | 69.54                    | 29.54                     | 25.62       |

**Note:**

Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

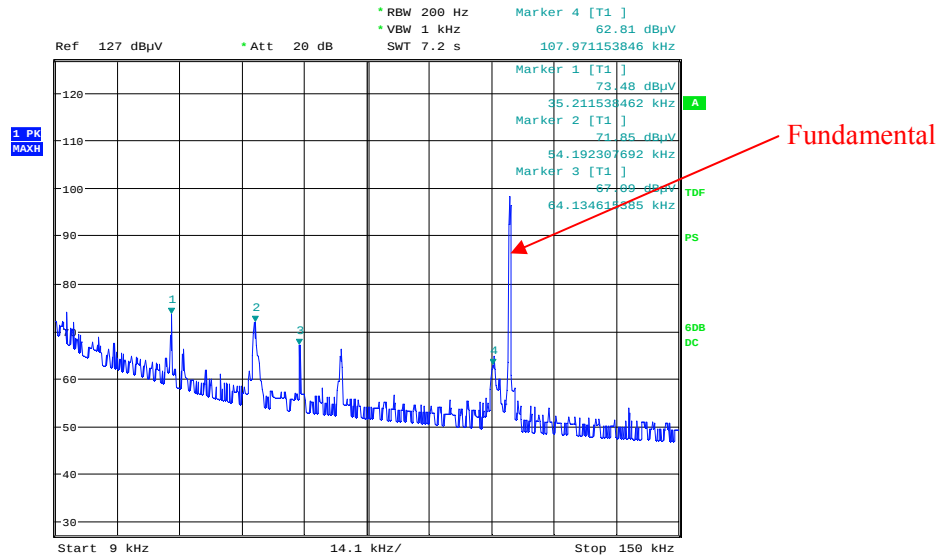
Corrected Amplitude (dB $\mu$ V /m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)

Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V /m)

(For DC 9V)

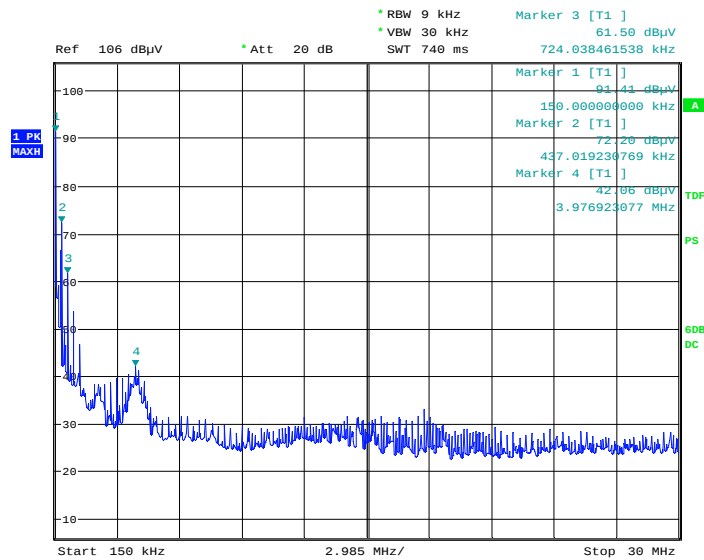
(Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

### 9kHz-150kHz (PK)



Date: 31.OCT.2018 09:37:10

### 150kHz-30MHz (PK)



Date: 31.OCT.2018 09:46:10

9kHz-490kHz:

| Indicated       |                                        | PK/QP/Ave. | Corrected Factor (dB/m) | FCC Part 15.209          |                            |             |
|-----------------|----------------------------------------|------------|-------------------------|--------------------------|----------------------------|-------------|
| Frequency (kHz) | Corrected Amplitude (dB $\mu$ V/m) @3m |            |                         | Limit (dB $\mu$ V/m) @3m | Limit (dB $\mu$ V/m) @300m | Margin (dB) |
| 35.21           | 73.48                                  | PK         | 38.1                    | 116.67                   | 36.67                      | 43.19       |
| 54.19           | 71.85                                  | PK         | 32.4                    | 112.93                   | 32.93                      | 41.08       |
| 64.13           | 67.09                                  | PK         | 31.3                    | 111.46                   | 31.46                      | 44.37       |
| 107.97          | 62.81                                  | PK         | 28.2                    | 106.94                   | 26.94                      | 44.13       |
| 112.45          | 98.43                                  | PK         | 27.6                    | 106.59                   | 26.59                      | 8.16        |
| 150.00          | 91.41                                  | PK         | 27.1                    | 104.08                   | 24.08                      | 12.67       |
| 437.02          | 72.20                                  | PK         | 16.1                    | 90.79                    | 14.79                      | 18.59       |

Note: The average emissions which fall into frequencies 9-90 kHz, 110-490 kHz was not recorded, because the peak emissions are below the average limit.

490kHz-30MHz

| Indicated       |                                        | PK/QP/Ave. | Corrected Factor (dB/m) | FCC Part 15.209          |                           |             |
|-----------------|----------------------------------------|------------|-------------------------|--------------------------|---------------------------|-------------|
| Frequency (MHz) | Corrected Amplitude (dB $\mu$ V/m) @3m |            |                         | Limit (dB $\mu$ V/m) @3m | Limit (dB $\mu$ V/m) @30m | Margin (dB) |
| 0.724           | 61.50                                  | PK         | 12.5                    | 70.41                    | 30.41                     | 8.91        |
| 3.98            | 42.06                                  | PK         | 0.3                     | 69.54                    | 29.54                     | 27.48       |

**Note:**

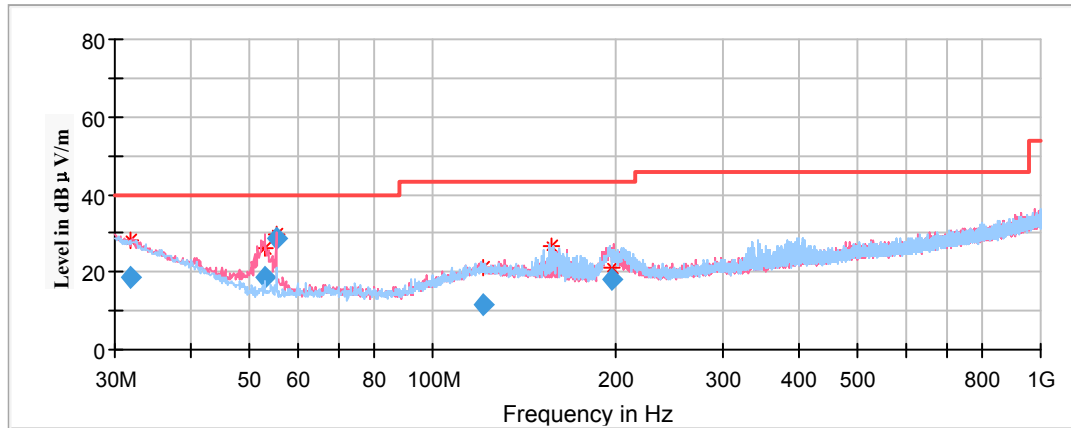
Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

Corrected Amplitude (dB $\mu$ V /m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)

Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V /m)

**30MHz-1GHz (For DC 5V)**

(Pre-scan in the X,Y and Z axes of orientation, the worst case **in X-axis of orientation** was recorded)



| Frequency (MHz) | Corrected Amplitude  | Rx Antenna  |             | Turntable Degree | Corrected Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------|-------------|-------------|------------------|-------------------------|----------------|-------------|
|                 | QuasiPeak (dB μ V/m) | Height (cm) | Polar (H/V) |                  |                         |                |             |
| 31.794900       | 18.57                | 101.0       | V           | 248.0            | -5.1                    | 40.00          | 21.43       |
| 53.104950       | 18.72                | 101.0       | V           | 11.0             | -17.6                   | 40.00          | 21.28       |
| 55.348150       | 28.78                | 101.0       | V           | 263.0            | -17.7                   | 40.00          | 11.22       |
| 120.944350      | 11.53                | 199.0       | H           | 247.0            | -11.2                   | 43.50          | 31.97       |
| 156.722150      | 21.45                | 199.0       | H           | 279.0            | -12.6                   | 43.50          | 22.05       |
| 197.394650      | 18.09                | 101.0       | V           | 198.0            | -12.5                   | 43.50          | 25.41       |

**Note:**

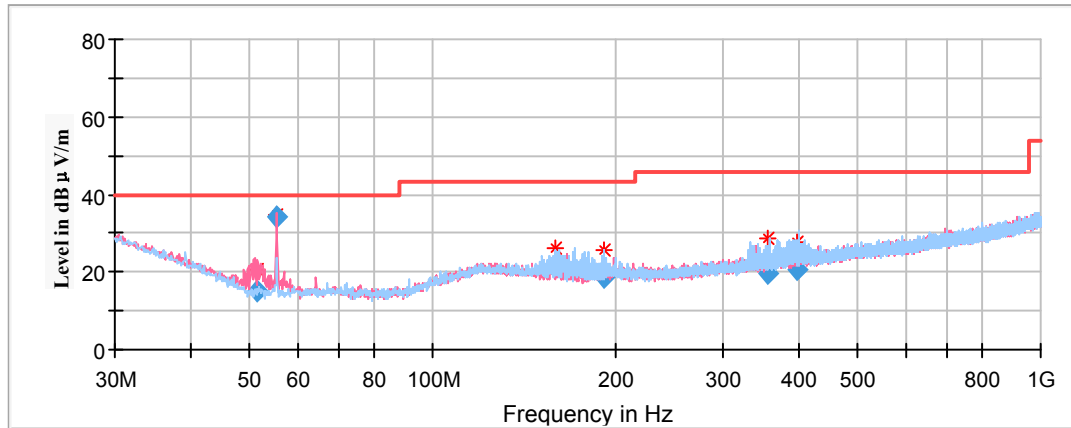
Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

**30MHz-1GHz (For DC 9V)**

(Pre-scan in the X,Y and Z axes of orientation, the worst case **in X-axis of orientation** was recorded)



| Frequency (MHz) | Corrected Amplitude  | Rx Antenna  |             | Turntable Degree | Corrected Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------|-------------|-------------|------------------|-------------------------|----------------|-------------|
|                 | QuasiPeak (dB μ V/m) | Height (cm) | Polar (H/V) |                  |                         |                |             |
| 51.554050       | 15.10                | 199.0       | V           | 117.0            | -17.6                   | 40.00          | 24.90       |
| 55.379050       | 34.29                | 101.0       | V           | 269.0            | -17.7                   | 40.00          | 5.71        |
| 159.390300      | 21.35                | 199.0       | H           | 281.0            | -12.7                   | 43.50          | 22.15       |
| 190.768250      | 18.40                | 199.0       | H           | 297.0            | -12.9                   | 43.50          | 25.10       |
| 356.926950      | 19.82                | 101.0       | H           | 255.0            | -9.1                    | 46.00          | 26.18       |
| 398.869250      | 20.49                | 101.0       | H           | 102.0            | -8.2                    | 46.00          | 25.51       |

**Note:**

Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

Corrected Amplitude (dBμV /m) = Corrected Factor (dB/m) + Reading (dBμV)

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

**\*\*\*\*\* END OF REPORT \*\*\*\*\***