

EMC TEST REPORT

For

Wireless charger

Model No.: P308.821, SW009

Prepared for :
Address :

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Report Number : ED180314035E
Date of Test : March 14, 2018 to March 26, 2018
Date of Report : March 27, 2018

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Appendix I (Photos of EUT) (3 pages)

TEST REPORT DESCRIPTION

Applicant :
Manufacturer :
EUT : Wireless charger
Model No. : P308.821, SW009
Input Rating : DC 5V from adapter

Measurement Procedure Used:

EN 55032: 2015+AC: 2016

EN 55024: 2010+A1: 2015

(IEC 61000-4-2: 2008, IEC61000-4-3: 2006+A1:2007+A2: 2010)

The device described above is tested by EMTEK(DONGGUAN) CO., LTD. and EMTEK (SHENZHEN) 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 measurement results are contained in this test report and EMTEK(DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN55032 and EN55024 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(DONGGUAN) CO., LTD.

Date of Test : March 14, 2018 to March 26, 2018

Lizzy Li

Prepared by :

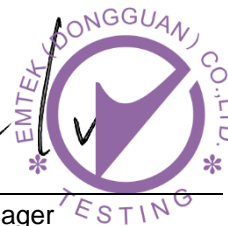
Lizzy Li/ Editor

Alak Ai

Reviewer :

Alak Ai/ Supervisor

Approved & Authorized Signer :

Sam Lv 

Sam Lv/ Manager

Modified Information

| Version | Summary | Revision Date | Report No. |
|---------|-----------------|---------------|--------------|
| Ver.1.0 | Original Report | / | ED180314035E |
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| | | | |

1. DESCRIPTION OF STANDARDS AND RESULTS

| EMISSION | | | |
|--|--|----------------------|---------|
| Description of Test Item | Standard | Limits | Results |
| Conducted Disturbance at Mains Terminals | EN 55032: 2015+AC: 2016 | Clause 5 | Pass |
| Radiated Disturbance | EN 55032: 2015+AC: 2016 | Clause 5 | Pass |
| Harmonic Current Emissions | EN 61000-3-2:2014 | Class A | N/A |
| Voltage Fluctuation and Flicker | EN 61000-3-3: 2013 | Clause 5 | N/A |
| IMMUNITY | | | |
| Description of Test Item | Basic Standard | Performance Criteria | Results |
| Electrostatic Discharge (ESD) | IEC 61000-4-2: 2008 | B | Pass |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3: 2006 +A1: 2007+A2: 2010 | A | Pass |
| EFT/B Immunity | IEC 61000-4-4: 2012 | B | N/A |
| Surge Immunity | IEC 61000-4-5: 2014 | B | N/A |
| Conducted RF Immunity | IEC 61000-4-6: 2013 | A | N/A |
| Voltage Dips, >95% Reduction | IEC 61000-4-11: 2004 | B | N/A |
| Voltage Dips, 30% Reduction | | C | N/A |
| Voltage Interruptions | | C | N/A |
| Note: N/A is an abbreviation for Not Applicable. | | | |

2. GENERAL INFORMATION

2.1 Description of Device (EUT)

| | |
|----------------------------|---|
| EUT | : Wireless charger |
| Model Number | : P308.821, SW009 (Note: The samples are the same except appearance and model number. So P308.821 was selected for full tested.) |
| Trade Mark | : N/A |
| Power Supply for Test | : DC 5V for adapter |
| Highest internal frequency | : < 108MHz |
| Operate Mode | : Charging |
| Applicant | : |
| Address | : |
| Manufacturer | : |
| Address | : |
| Date of sample receiver | : March 14, 2018 |
| Date of Test | : March 14, 2018 to March 26, 2018 |

2.2 Description of Support Device

| | |
|---------|--|
| Adapter | : Model : YSV6-0501000 Input: AC 100-240V, 50/60Hz Output: DC 5V, 1000mA |
|---------|--|

2.3 Description of Test Facility

| | |
|------------------|---|
| Site Description | |
| EMC Lab | : Accredited by CNAS, 2015.09.24 The certificate is valid until 2018.07.03 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006 The Certificate Registration Number is L3150 Registered on Industry Canada, January 13, 2017 The Certificate Number is 9444A. |
| Name of Firm | : EMTEK(DONGGUAN) CO., LTD. |
| Site Location | : No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China. |

2.4 Measurement Uncertainty

| | |
|--|--|
| Test Item | Uncertainty |
| Conducted Emission Uncertainty | : 2.42dB |
| Disturbance Power | : 2.86dB |
| Radiated Emission Uncertainty (3m Chamber) | : 3.45dB (30M~1GHz Polarize: H) 3.32dB (30M~1GHz Polarize: V) 3.7dB (1~18GHz Polarize: H) 3.6dB (1~18GHz Polarize: V) |
| Uncertainty for Flicker test | : 0.07% |
| Uncertainty for Harmonic test | : 1.8% |
| Uncertainty for C/S Test | : 1.45(Using CDN Test) 2.37(Using EM Clamp Test) |
| Uncertainty for R/S Test | : 2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz) |
| Uncertainty for test site temperature and humidity | : 0.6°C 4% |

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Power Line Conducted Emission

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|---------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | Rohde&Schwarz | ESCI | 100137 | May 16, 2017 | 1 Year |
| 2. | L.I.S.N. | Rohde&Schwarz | ENV216 | 100017 | May 16, 2017 | 1 Year |
| 3. | RF Switching Unit | CDS | RSU-M2 | 38401 | May 16, 2017 | 1 Year |

3.2 For Radiated Emission Measurement

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--------------------------------|-----------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | Rohde & Schwarz | ESCI | 100137 | May 16, 2017 | 1 Year |
| 2. | Bilog Antenna | Schwarzbeck | VULB9163 | 000141 | May 16, 2017 | 1 Year |
| 3. | Power Amplifier | CDS | RSU-M352 | 818 | May 16, 2017 | 1 Year |
| 4. | Power Amplifier | HP | 8447F | OPT H64 | May 16, 2017 | 1 Year |
| 5. | Color Monitor | SUNSPO | SP-140A | N/A | May 16, 2017 | 1 Year |
| 6. | Single Line Filter | JIANLI | XL-3 | N/A | May 16, 2017 | 1 Year |
| 7. | Single Phase Power Line Filter | JIANLI | DL-2X100B | N/A | May 16, 2017 | 1 Year |
| 8. | 3 Phase Power Line Filter | JIANLI | DL-4X100B | N/A | May 16, 2017 | 1 Year |
| 9. | DC Power Filter | JIANLI | DL-2X50B | N/A | May 16, 2017 | 1 Year |
| 10. | Cable | Schwarzbeck | PLF-100 | 519489 | May 16, 2017 | 1 Year |
| 11. | Cable | Rosenberger | CIL02 | A0783566 | May 16, 2017 | 1 Year |
| 12. | Cable | Rosenberger | RG 233/U | 525178 | May 16, 2017 | 1 Year |

3.3 For Harmonic / Flicker Measurement

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------------------|--------------|-----------|-------------|--------------|---------------|
| 1. | Power Frequency Test System | EMTEST | DPA500 | U0526100506 | May 16, 2017 | 1 Year |
| 2. | AC Frequency Conversion Power | EMTEST | ACS 500 | V526100507 | May 16, 2017 | 1 Year |
| 3. | PC | LENOVO | T2900D | SS12485803 | May 16, 2017 | 1 Year |

3.4 For Electrostatic Discharge Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|------------|--------------|-----------|------------|--------------|---------------|
| 1 | ESD Tester | TESEQ AG | NSG437 | EE166 | May 16, 2017 | 1 Year |

3.5 For RF Strength Susceptibility Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|------------------------------|--------------|--------------|-------------|--------------|---------------|
| 1. | RF Power Meter. Dual Channel | BOONTON | 4232A | 10539 | May 16, 2017 | 1 Year |
| 2. | 50ohm Diode Power Sensor | BOONTON | 51011EMC | 34236/34238 | May 16, 2017 | 1 Year |
| 3. | Broad-Band Horn Antenna | SCHWARZBECK | BBHA9120 L3F | 332 | May 16, 2017 | 1 Year |
| 4. | Power Amplifier | PRANA | AP32MT215 | N/A | May 16, 2017 | 1 Year |
| 5. | Power Amplifier | MILMEGA | AS0102-55 | N/A | May 16, 2017 | 1 Year |
| 6. | Signal Generator | AEROFLEX | 2023B | N/A | May 16, 2017 | 1 Year |
| 7. | Field Strength Meter | HOLADAY | HI-6005 | N/A | May 16, 2017 | 1 Year |
| 8. | RS232 Fiber Optic Modem | HOLADAY | HI-4413P | N/A | May 16, 2017 | 1 Year |
| 9. | Log.-Per. Antenna | SCHWARZBECK | VULP 9118E | N/A | May 16, 2017 | 1 Year |

3.6 For Electrical Fast Transient/Burst Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------|--------------|-----------|-------------|--------------|---------------|
| 1. | Burst Tester | EM TEST | UCS500M6B | V0526100502 | May 16, 2017 | 1 Year |
| 2. | Coupling Clamp | EM TEST | HFK | 0605-10 | May 16, 2017 | 1 Year |

3.7 For Surge Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-----------------|--------------|------------|-------------|--------------|---------------|
| 1. | Surge Generator | EM TEST | VCS 500M6T | V0526100503 | May 16, 2017 | 1 Year |

3.8 For Injected Currents Susceptibility Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-----------------|--------------|-------------|------------|--------------|---------------|
| 1. | Simulator | EM TEST | CWS500C | 0900-12 | May 17, 2017 | 1 Year |
| 2. | CDN | EM TEST | CDN-M2 | 5100100100 | May 17, 2017 | 1 Year |
| 3. | CDN | EM TEST | CDN-M3 | 0900-11 | May 17, 2017 | 1 Year |
| 4. | Injection Clamp | EM TEST | F-2031-23MM | 368 | May 17, 2017 | 1 Year |
| 5. | Attenuator | EM TEST | ATT6 | 0010222A | May 17, 2017 | 1 Year |

3.9 For Magnetic Field Immunity Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-----------------------|--------------|-----------|------------|--------------|---------------|
| 1. | Magnetic Field Tester | HAEFELY | MAG100 | 250040.1 | May 17, 2017 | 1Year |

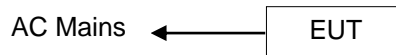
3.10 For Voltage Dips and Interruptions Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------|--------------|-----------|------------|--------------|---------------|
| 1. | Dips Tester | HAEFELY | Pline1610 | 083732-12 | May 17, 2017 | 1 Year |

4. POWER LINE CONDUCTED MEASUREMENT

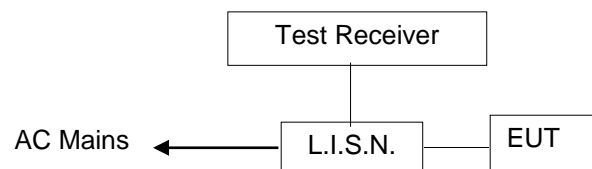
4.1 Block Diagram of Test Setup

4.1.1 Block diagram of connection between the EUT and simulators



(EUT: Wireless charger)

4.1.2 Block diagram of test setup



(EUT: Wireless charger)

4.2 Conducted Power Line Emission Measurement Standard and Limits

4.2.1 Standard: EN 55032: 2015+AC: 2016

4.2.2 Limits

| Frequency | At mains terminals (dB μ V) | |
|-----------------|---------------------------------|---------------|
| | Quasi-peak Level | Average Level |
| 150KHz ~ 0.5MHz | 66 ~ 56* | 56 ~ 46* |
| 0.5MHz ~ 5MHz | 56 | 46 |
| 5.0MHz ~ 30MHz | 60 | 50 |

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 2.1.

4.4 Operating Condition of EUT

4.4.1 Setup the EUT as shown in Section 4.1.

4.4.2 Turn on the power of all equipments.

4.4.3 Let the EUT work in measuring mode (Charging) and measure it.

4.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN55032 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN55032 standard.

The bandwidth of the test receiver (ESCI) is set at 200Hz in 9K~150KHz range and 9KHz in 150K~30MHz range.

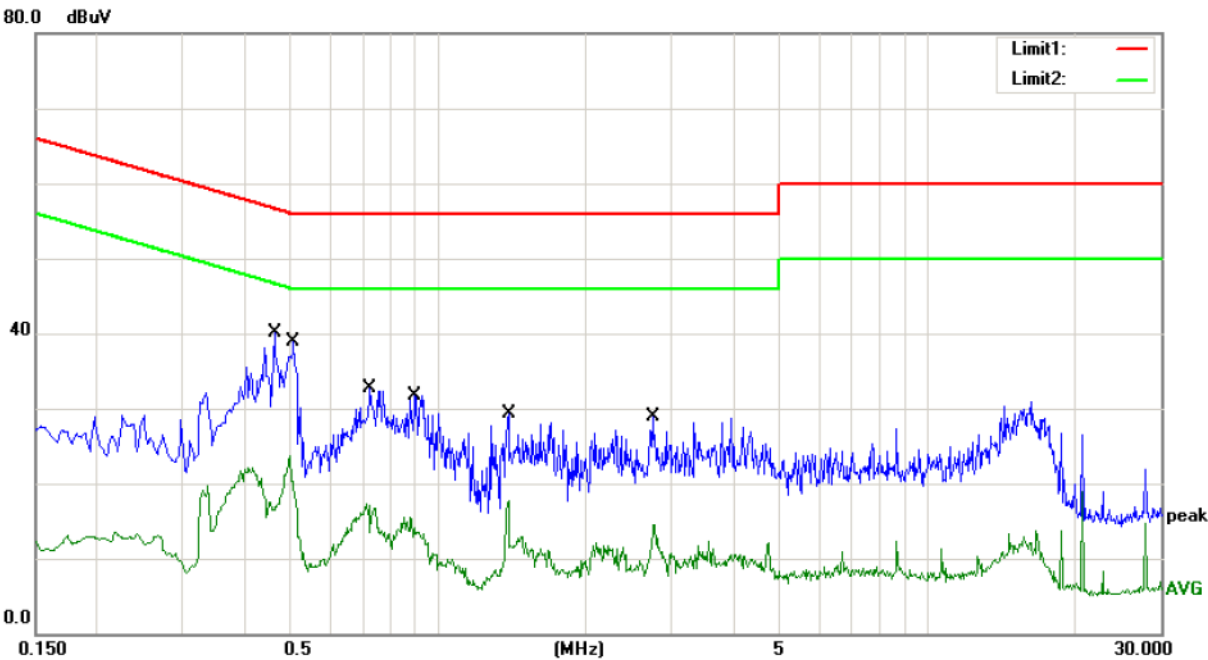
The frequency range from 150KHz to 30MHz is checked.

4.6 Measurement Results

PASS.

The frequency range from 150KHz to 30MHz is investigated.

The test data are listed the following pages.

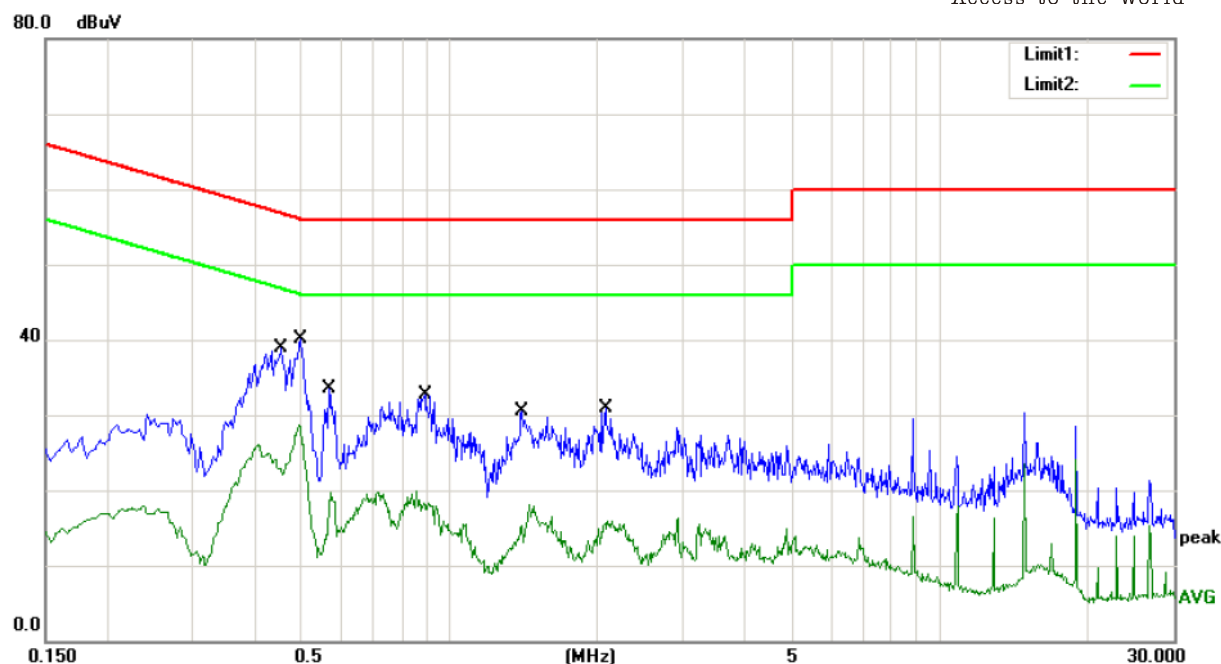


Site site #1
Limit: (CE)EN55032 class B_QP
Mode: Charging
Note:

Phase: L1
Power: DC 5V
Temperature: 25
Humidity: 55 %

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | | |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
| | | MHz | Level | Factor | ment | | | Detector | Comment |
| | | | dBuV | dB | dBuV | dBuV | dB | | |
| 1 | * | 0.4620 | 27.67 | 9.83 | 37.50 | 56.66 | -19.16 | QP | |
| 2 | | 0.4620 | 7.05 | 9.83 | 16.88 | 46.66 | -29.78 | AVG | |
| 3 | | 0.5060 | 25.76 | 9.84 | 35.60 | 56.00 | -20.40 | QP | |
| 4 | | 0.5060 | 10.44 | 9.84 | 20.28 | 46.00 | -25.72 | AVG | |
| 5 | | 0.7260 | 18.76 | 9.84 | 28.60 | 56.00 | -27.40 | QP | |
| 6 | | 0.7260 | 6.09 | 9.84 | 15.93 | 46.00 | -30.07 | AVG | |
| 7 | | 0.8980 | 18.66 | 9.84 | 28.50 | 56.00 | -27.50 | QP | |
| 8 | | 0.8980 | 3.55 | 9.84 | 13.39 | 46.00 | -32.61 | AVG | |
| 9 | | 1.3900 | 17.36 | 9.84 | 27.20 | 56.00 | -28.80 | QP | |
| 10 | | 1.3900 | 1.79 | 9.84 | 11.63 | 46.00 | -34.37 | AVG | |
| 11 | | 2.7460 | 15.76 | 9.84 | 25.60 | 56.00 | -30.40 | QP | |
| 12 | | 2.7460 | 4.75 | 9.84 | 14.59 | 46.00 | -31.41 | AVG | |

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Washington



Site site #1

Phase: **N**

Temperature: 25

Limit: (CE)EN55032 class B_QP

Power: DC 5V

Humidity: 55 %

Mode: Charging

Note:

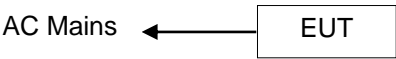
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | | |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
| | | MHz | dBuV | Factor | ment | dBuV | dB | Detector | Comment |
| 1 | | 0.4540 | 25.77 | 9.83 | 35.60 | 56.80 | -21.20 | QP | |
| 2 | | 0.4540 | 13.15 | 9.83 | 22.98 | 46.80 | -23.82 | AVG | |
| 3 | | 0.4980 | 27.36 | 9.84 | 37.20 | 56.03 | -18.83 | QP | |
| 4 | * | 0.4980 | 18.66 | 9.84 | 28.50 | 46.03 | -17.53 | AVG | |
| 5 | | 0.5700 | 21.76 | 9.84 | 31.60 | 56.00 | -24.40 | QP | |
| 6 | | 0.5700 | 8.91 | 9.84 | 18.75 | 46.00 | -27.25 | AVG | |
| 7 | | 0.8940 | 18.76 | 9.84 | 28.60 | 56.00 | -27.40 | QP | |
| 8 | | 0.8940 | 8.23 | 9.84 | 18.07 | 46.00 | -27.93 | AVG | |
| 9 | | 1.4060 | 19.06 | 9.84 | 28.90 | 56.00 | -27.10 | QP | |
| 10 | | 1.4060 | 5.48 | 9.84 | 15.32 | 46.00 | -30.68 | AVG | |
| 11 | | 2.0820 | 17.16 | 9.84 | 27.00 | 56.00 | -29.00 | QP | |
| 12 | | 2.0820 | 6.09 | 9.84 | 15.93 | 46.00 | -30.07 | AVG | |

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Washington

5. RADIATED EMISSION MEASUREMENT

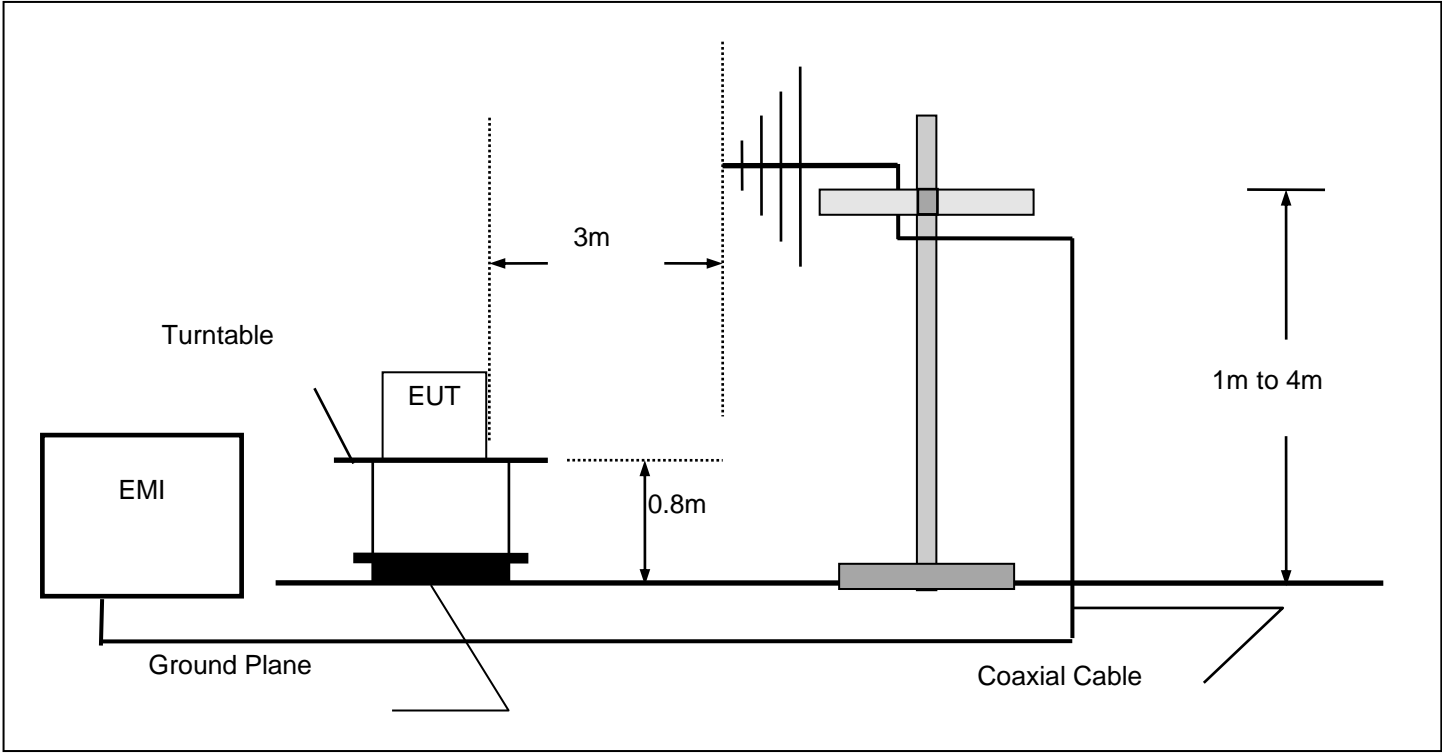
5.1 Block Diagram of Test

5.1.1 Block diagram of connection between the EUT and simulators



(EUT: Wireless charger)

5.1.2 Block diagram of test setup (In chamber)



(EUT: Wireless charger)

5.2 Measuring Standard

EN 55032: 2015+AC: 2016

5.3 Radiated Emission Limits

All emanations from a device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Limits below 1GHz

| FREQUENCY (MHz) | DISTANCE (Meters) | FIELD STRENGTHS LIMIT (dB μ V/m) |
|--------------------|----------------------|---|
| 30 ~ 230 | 3 | 40 |
| 230 ~ 1000 | 3 | 47 |

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4 EUT Configuration on Test

The EN55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : Wireless charger
Model Number : P308.821

5.5 Operating Condition of EUT

5.5.1 Turn on the power.

5.5.2 Let the EUT work in test mode (Charging) and measure it.

5.6 Test Procedure

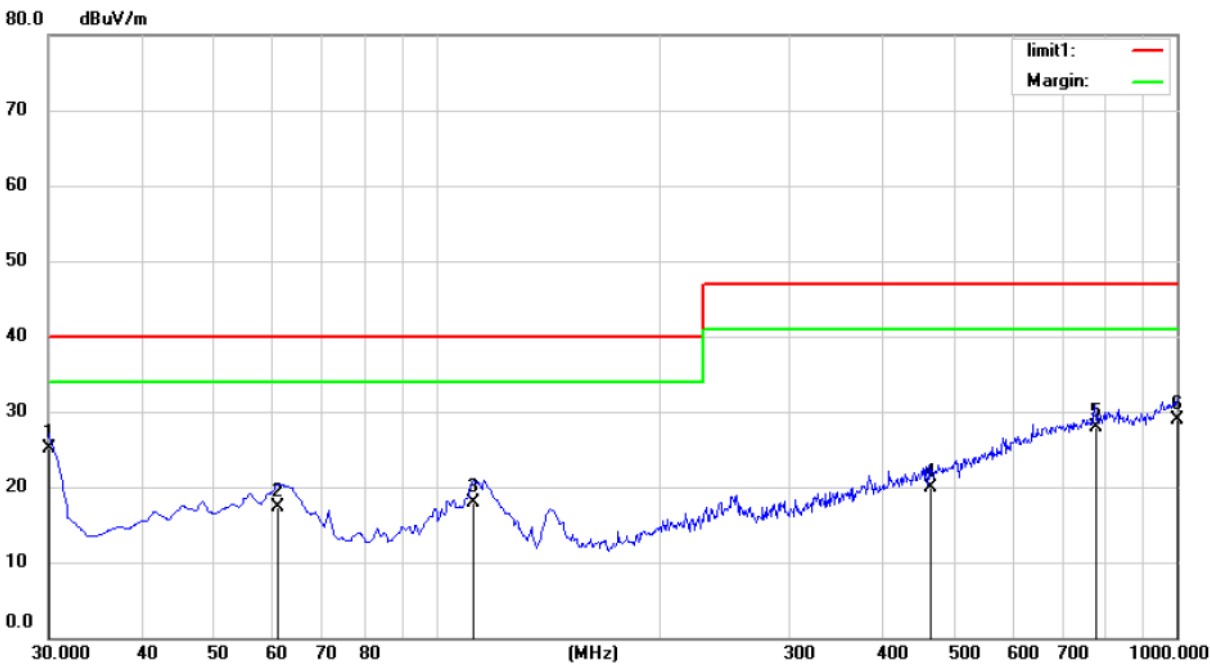
The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test. The bandwidth of the Receiver (ESCI) is set at 120kHz.

5.7 Test Results

PASS.

The frequency range from 30MHz to 6000MHz is investigated.

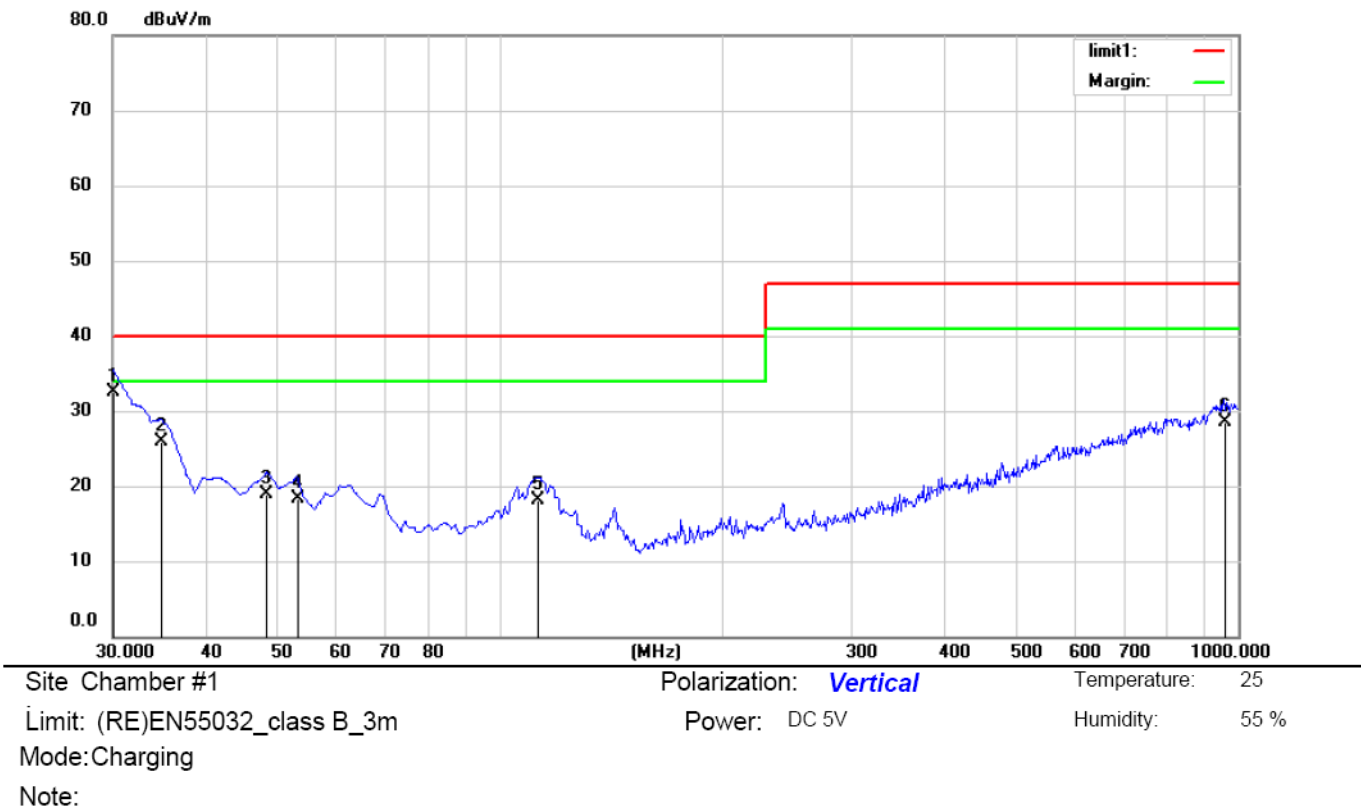
The test data are listed the following pages.



Site Chamber #1 Polarization: **Horizontal** Temperature: 25
Limit: (RE)EN55032_class B_3m Power: DC 5V Humidity: 55 %
Mode: Charging
Note:

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | Antenna | Table | |
|-----|-----|-----------|---------|---------|----------|--------|--------|---------|--------|---------|
| | | MHz | Level | Factor | ment | | | Height | Degree | |
| | | | dBuV | dB | dBuV/m | dBuV/m | dB | cm | degree | Comment |
| 1 | * | 30.0000 | 43.85 | -18.76 | 25.09 | 40.00 | -14.91 | QP | | |
| 2 | | 61.0400 | 34.58 | -17.22 | 17.36 | 40.00 | -22.64 | QP | | |
| 3 | | 112.4500 | 36.72 | -18.76 | 17.96 | 40.00 | -22.04 | QP | | |
| 4 | | 465.5300 | 29.66 | -9.67 | 19.99 | 47.00 | -27.01 | QP | | |
| 5 | | 774.9600 | 31.37 | -3.54 | 27.83 | 47.00 | -19.17 | QP | | |
| 6 | | 1000.0000 | 29.74 | -0.85 | 28.89 | 47.00 | -18.11 | QP | | |

*:Maximum data x:Over limit !:over margin Operator: huang



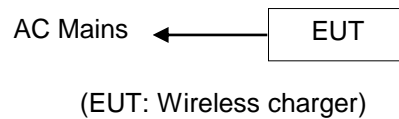
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | Antenna | Table | |
|-----|-----|----------|---------|---------|----------|--------|--------|---------|--------|---------|
| | | MHz | Level | Factor | ment | | | Height | Degree | |
| | | | dBuV | dB | dBuV/m | dBuV/m | dB | cm | degree | Comment |
| 1 | * | 30.0000 | 51.28 | -18.76 | 32.52 | 40.00 | -7.48 | QP | | |
| 2 | | 34.8500 | 44.48 | -18.63 | 25.85 | 40.00 | -14.15 | QP | | |
| 3 | | 48.4300 | 34.53 | -15.67 | 18.86 | 40.00 | -21.14 | QP | | |
| 4 | | 53.2800 | 34.81 | -16.50 | 18.31 | 40.00 | -21.69 | QP | | |
| 5 | | 112.9196 | 36.73 | -18.53 | 18.20 | 40.00 | -21.80 | QP | | |
| 6 | | 956.3500 | 30.43 | -1.92 | 28.51 | 47.00 | -18.49 | QP | | |

*:Maximum data x:Over limit !:over margin Operator: huang

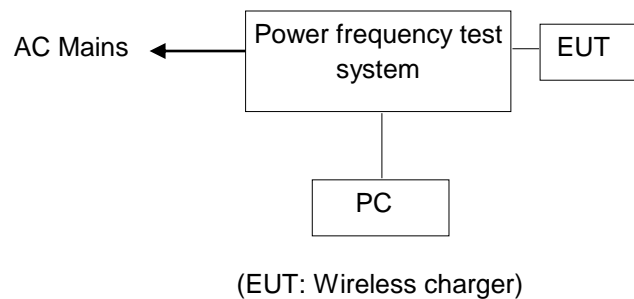
6. HARMONIC CURRENT MEASUREMENT

6.1 Block Diagram of Test Setup

6.1.1 Block diagram of connection between the EUT and simulators



6.1.2 Block Diagram of Harmonic Test Setup



6.2 Measuring Standard

EN 61000-3-2: 2014 Class A Power ≤ 75W

6.3 Operating Condition of EUT

Same as Section 4.4. Except the test setup replaced by Section 6.1.

6.4 Test Results

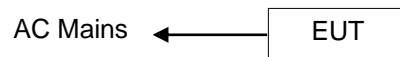
Not Applicable.

Because power of EUT is less than 75W, according to standard EN61000-3-2, Harmonics Current is not required.

7. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

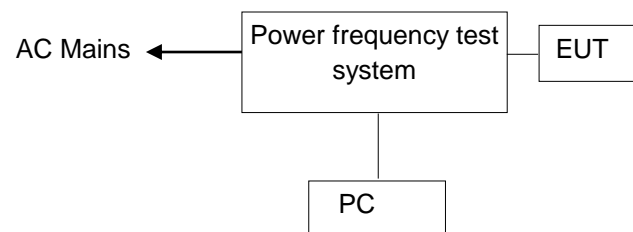
7.1 Block Diagram of Test Setup

7.1.1 Block diagram of connection between the EUT and simulators



(EUT: Wireless charger)

7.1.2 Block Diagram of Flicker Test Setup



(EUT: Wireless charger)

7.2 Measuring Standard

EN 61000-3-3: 2013

7.3 Operating Condition of EUT

Same as Section 4.4 except the test setup replaced by Section 7.1.

7.4 Test Results

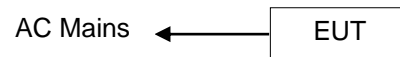
Not Applicable.

This product is DC product, not applicable

8. ELECTROSTATIC DISCHARGE TEST

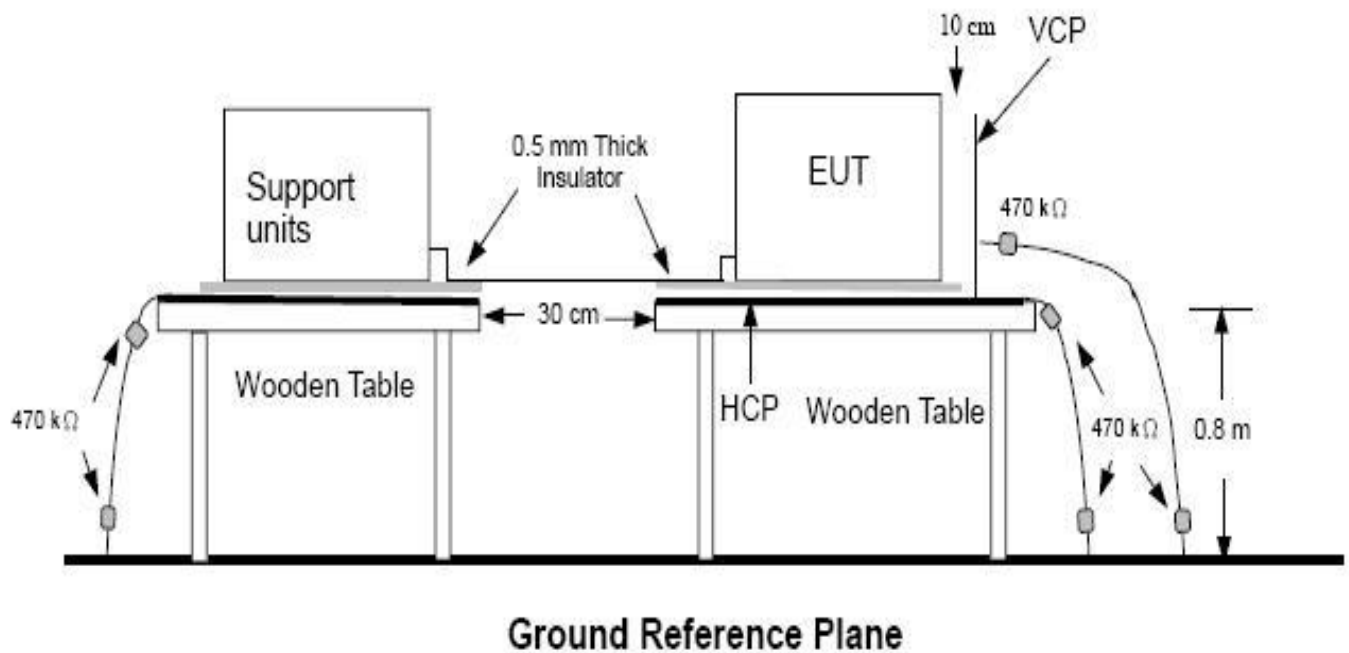
8.1 Block Diagram of Test Setup

8.1.1 Block diagram of connection between the EUT and simulators



(EUT: Wireless charger)

8.1.2 Block Diagram of ESD Test Setup



(EUT: Wireless charger)

8.2 Test Standard

EN 55024: 2010+A1: 2015

(IEC 61000-4-2: 2008 (Severity Level: 2 / Contact Discharge: ±4KV

Severity Level: 3 / Air Discharge: ±8KV))

8.3 Severity Levels and Performance Criterion

8.3.1 Severity level

| Level | Test Voltage Contact Discharge (KV) | Test Voltage Air Discharge (KV) |
|-------|--|------------------------------------|
| 1. | ±2 | ±2 |
| 2. | ±4 | ±4 |
| 3. | ±6 | ±8 |
| 4. | ±8 | ±15 |
| X | Special | Special |

8.3.2 Performance criterion: **B**

8.4 EUT Configuration

The configuration of EUT is listed in Section 2.1

8.5 Operating Condition of EUT

8.5.1 Setup the EUT as shown in Section 8.1.

8.5.2 Turn on the power of all equipments.

8.5.3 Let the EUT work in test mode (Charging) and measure it.

8.6 Test Procedure

8.6.1 Air Discharge:

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 25 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.6.2 Contact Discharge:

All the procedure shall be same as Section 8.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.6.3 Indirect discharge for horizontal coupling plane:

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

8.6.4 Indirect discharge for vertical coupling plane:

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.7 Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK(DONGGUAN) CO., LTD.

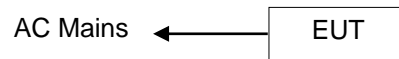
| | | | |
|---|---|---|----------------|
| Applicant : | | Test Date : | March 23, 2018 |
| EUT : | Wireless charger | Temperature : | 25°C |
| M/N : | P308.821 | Humidity : | 50% |
| Power Supply : | DC 5V | Test Engineer: | Lin |
| Test Mode : | Charging | Criterion : | B |
| Air Discharge: ± 4 , 6,8KV | | | |
| Contact Discharge: ± 2 , 4KV # For each point positive 25 times and negative 25 times | | | |
| Location | | Kind A-Air Discharge C-Contact Discharge | Result |
| Slot of the EUT | 5 points | A | PASS |
| Aperture | 5 point | A | PASS |
| Non-Metal | 5 point | A | PASS |
| HCP | | C | PASS |
| VCP | | C | PASS |
| | | | |
| | | | |
| | | | |
| | | | |
| Remark : | Test Equipment : ESD Tester (TESEQ AG, NSG437) | | |

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

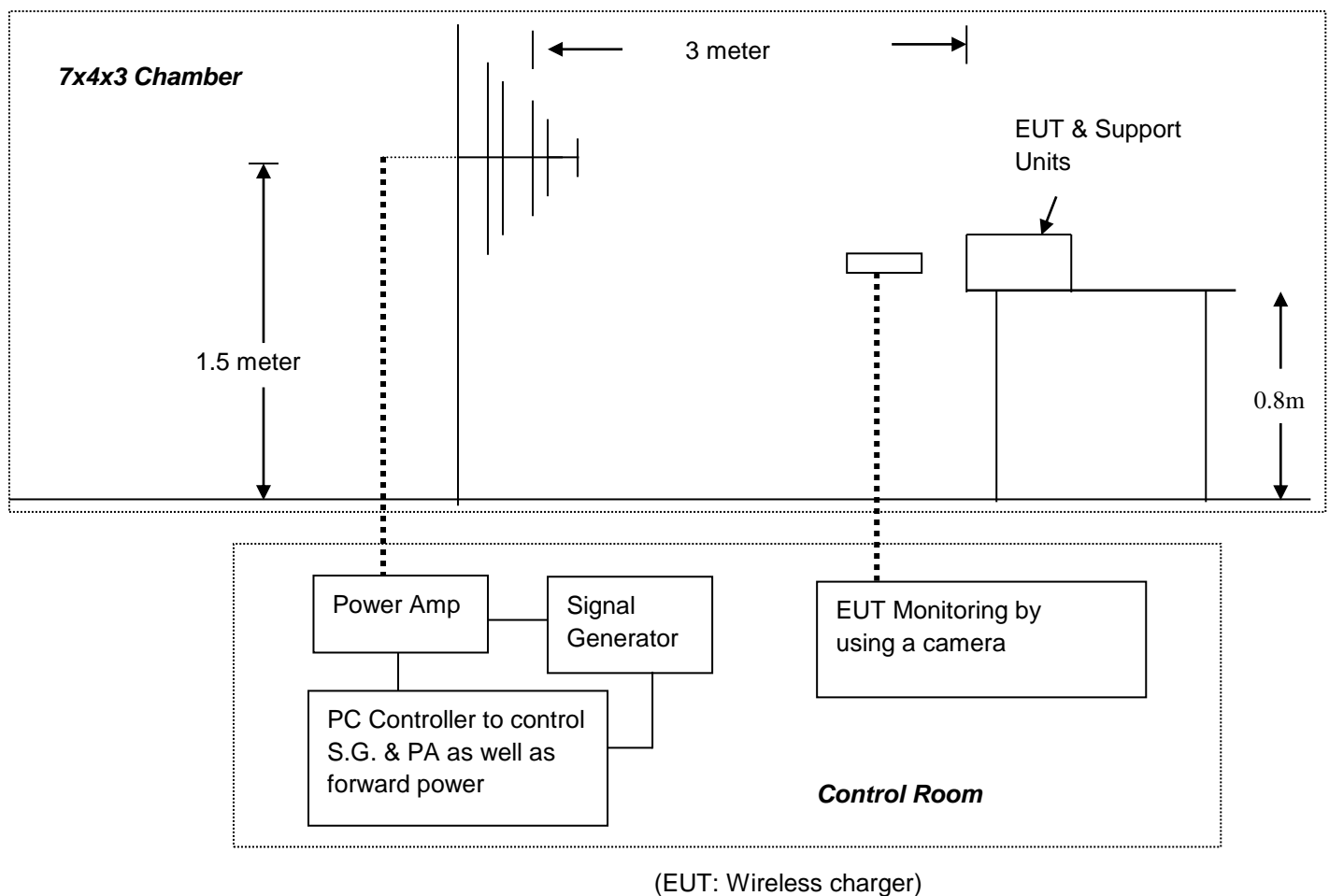
9.1 Block Diagram of Test Setup

9.1.1 Block diagram of connection between the EUT and simulators



(EUT: Wireless charger)

9.1.2 Block diagram of R/S test set up



9.2 Test Standard

EN 55024: 2010+A1: 2015

(IEC 61000-4-3: 2006+A1: 2007+A2: 2010 (Severity Level 2, 3V / m))

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

| Level | Field Strength V/m |
|-------|--------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

9.3.2 Performance criterion: **A**

9.4 EUT Configuration

The configuration of EUT are listed in Section 2.1.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (Charging) and measure it.

9.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

| Condition of Test | Remarks |
|---------------------------|--------------------------|
| 1. Fielded Strength | 3 V/m (Severity Level 2) |
| 2. Radiated Signal | Unmodulated |
| 3. Scanning Frequency | 80 - 1000 MHz |
| 4. Dwell time of radiated | 0.0015 decade/s |
| 5. Waiting Time | 1 Sec. |

9.7 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

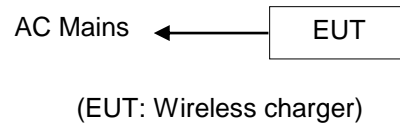
EMTEK(SHENZHEN) CO., LTD.

| | | | |
|---|------------------|--------------------------------|--------------|
| Applicant: | | Test Date : March 26, 2018 | |
| EUT : | Wireless charger | Temperature : | 25°C |
| M/N : | P308.821 | Humidity : | 50% |
| Field Strength: | 3 V/m | Criterion: | A |
| Power Supply: | DC 5V | Frequency Range: | 80 - 1000MHz |
| Test Engineer: Lin | | | |
| Modulation: <input checked="" type="checkbox"/> AM <input type="checkbox"/> Pulse <input type="checkbox"/> none 1 KHz 80% | | | |
| Test Mode : Charging | | | |
| | | Frequency Range : 80 - 1000MHz | |
| Steps | 1 % | | |
| | Horizontal | Vertical | |
| Front | PASS | PASS | |
| Right | PASS | PASS | |
| Rear | PASS | PASS | |
| Left | PASS | PASS | |
| <p>Test Equipment :</p> <ol style="list-style-type: none"> 1. Signal Generator : 2023B (AEROFLEX) 2. Power Amplifier : AS0102-55 (MILMEGA)& AP32MT215 (PRANA) 3. Log.-Per. Antenna: VULP 9118E(SCHWARZBECK) 4. Broad-Band Horn Antenna: BBHA9120L3F (SCHWARZBECK) 5. RF Power Meter. Dual Channel : 4232A (BOONTON) 6. Field Strength Meter: HI-6005(HOLADAY) | | | |
| Note: | | | |

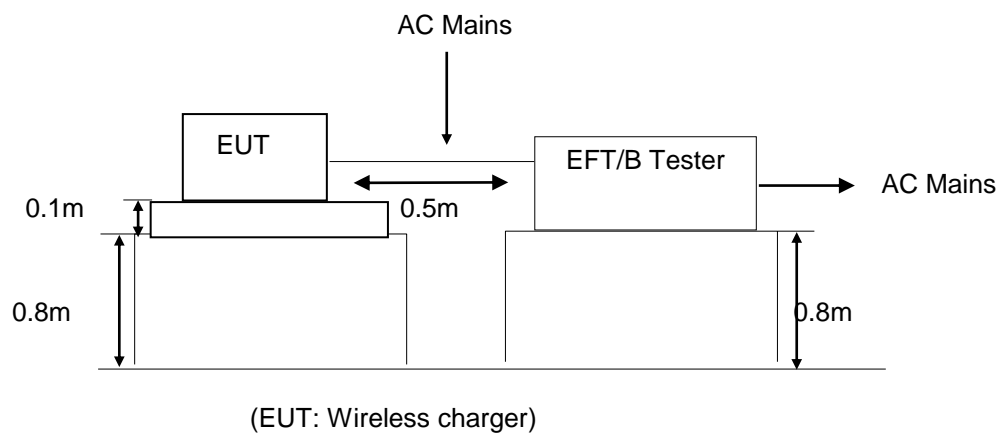
10. ELECTRICAL FAST TRANSIENT/BURST TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of connection between the EUT and simulators



10.1.2 Block Diagram of EFT Test Setup



10.2 Test Standard

EN 55024: 2010+A1: 2015
(IEC 61000-4-4: 2012, Severity Level, Level 2: 1KV)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

| Open circuit output test voltage and repetition rate of the impulses | | | | |
|--|--------------------|------------------------|---|------------------------|
| Level | On power port, PE | | On I/O (Input/Output) Signal data and control ports | |
| | Voltage peak KV | Repetition rate KHz | Voltage peak KV | Repetition rate KHz |
| 1. | 0.5 KV | 5 or 100 | 0.25 KV | 5 or 100 |
| 2. | 1 KV | 5 or 100 | 0.5 KV | 5 or 100 |
| 3. | 2 KV | 5 or 100 | 1 KV | 5 or 100 |
| 4. | 4 KV | 5 or 100 | 2 KV | 5 or 100 |
| X | Special | Special | Special | Special |
| NOTE 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. | | | | |
| NOTE 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes. | | | | |
| "X" is an open level. The level has to be specified in the dedicated equipment specification. | | | | |

10.3.2 Performance criterion: **B**

10.4 EUT Configuration

The configuration of EUT are listed in Section 2.1.

10.5 Operating Condition of EUT

- 10.5.2 Setup the EUT as shown in Section 10.1.
- 10.5.3 Turn on the power of all equipments.
- 10.5.4 Let the EUT work in test mode (Charging) and measure it.

10.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

10.6.2 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

10.6.3 For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

10.7 Test Results

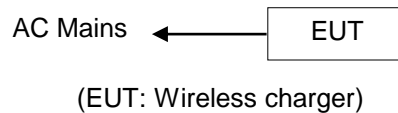
Not Applicable.

This product is DC product, not applicable

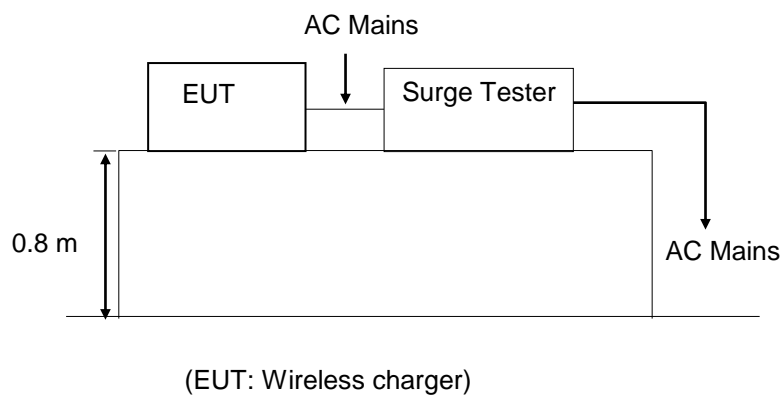
11. SURGE IMMUNITY TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



11.1.2 Surge Test Setup



11.2 Test Standard

EN 55024: 2010+A1: 2015

(IEC 61000-4-5: 2014, Severity Level: Line to Line: Level 2, 1.0KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

| Severity Level | Open-Circuit Test Voltage KV |
|----------------|---------------------------------|
| 1 | 0.5 |
| 2 | 1.0 |
| 3 | 2.0 |
| 4 | 4.0 |
| * | Special |

11.3.2 Performance criterion: **B**

11.4 EUT Configuration

The configuration of EUT are listed in Section 2.1.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (Charging) and measure it.

11.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.2.
- 2) For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.7 Test Results

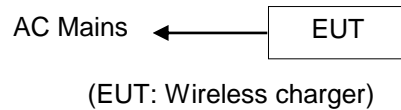
Not Applicable.

This product is DC product, not applicable

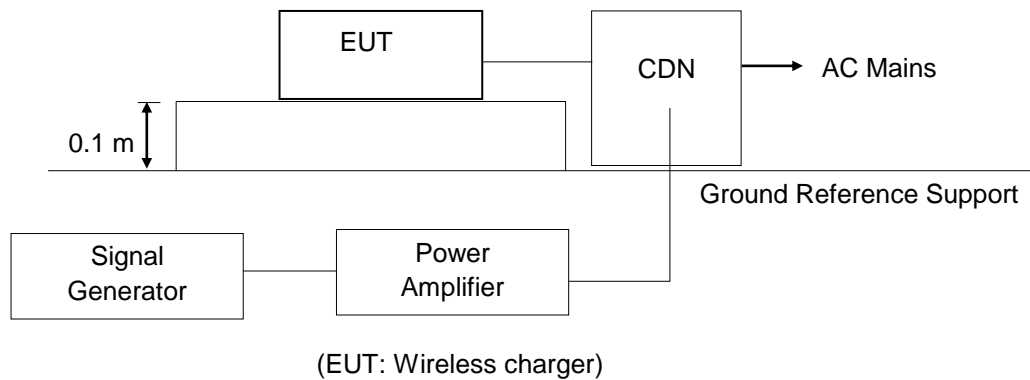
12. INJECTED CURRENTS SUSCEPTIBILITY TEST

12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



12.1.2 Block Diagram of Test Setup



12.2 Test Standard

EN 55024: 2010+A1: 2015
(IEC 61000-4-6: 2008, Severity Level 2: 3V (rms), 0.15MHz ~ 80MHz)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

| Level | Field Strength V |
|-------|------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

12.3.2 Performance criterion: **A**

12.4 EUT Configuration

The configuration of EUT are listed in Section 2.1.

12.5 Operating Condition of EUT

12.5.2 Setup the EUT as shown in Section 12.1.

12.5.3 Turn on the power of all equipments.

12.5.4 Let the EUT work in test mode (Charging) and measure it.

12.6 Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed $1.5 \cdot 10^{-3}$ decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.7 Test Results

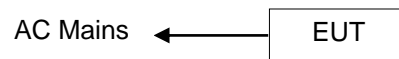
Not Applicable.

This product is DC product, not applicable

13. VOLTAGE DIPS AND INTERRUPTIONS TEST

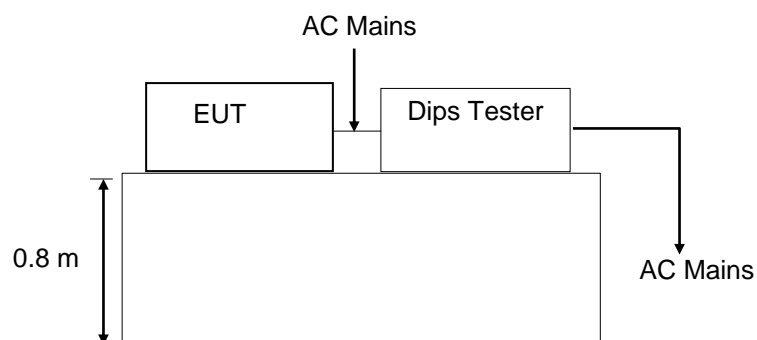
13.1 Block Diagram of Test Setup

13.1.1 Block Diagram of the EUT



(EUT: Wireless charger)

13.1.2 Dips Test Setup



(EUT: Wireless charger)

13.2 Test Standard

EN 55024: 2010+A1: 2015
(IEC 61000-4-11: 2004)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

| Test Level %UT | Voltage dip and short interruptions %UT | Duration (in period) |
|-------------------|---|-------------------------|
| 0 | 100 | 0.5 |
| 40 | 60 | 1 |
| 70 | 30 | 5 |
| | | 10 |
| | | 25 |
| | | 50 |
| | | * |

13.3.2 Performance criterion: **B, C**

13.4 EUT Configuration

The configuration of EUT are listed in Section 2.1.

13.5 Operating Condition of EUT

- 13.5.1 Setup the EUT as shown in Section 14.1.
- 13.5.2 Turn on the power of all equipments.
- 13.5.3 Let the EUT work in test mode (Charging) and measure it.

13.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 14.1.2.
- 2) The interruptions is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

13.7 Test Results

Not Applicable.

This product is DC product, not applicable

14. PHOTOGRAPH

14.1 Photo of Conducted Emission Measurement



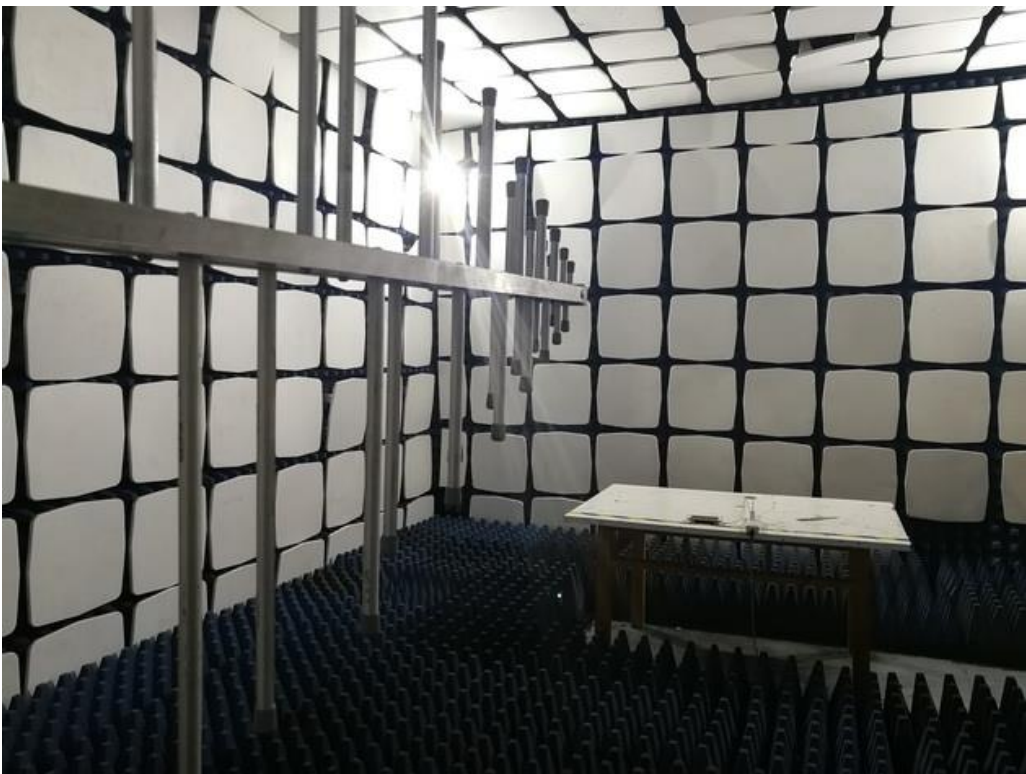
14.2 Photo of Radiation Emission Measurement



14.3 Photo of Electrostatic Discharge Test



14.4 Photo of RF Field Strength susceptibility Test



APPENDIX I (Photos of EUT)

