SGS-CSTC Standards Technical Services Co., Ltd.

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

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FCC Test Report

Application No.:	SZEM1409005438IT
Applicant:	Master Hill Electric Wire & Cable Co., Ltd.
Manufacturer/Factory:	Shen Zhen Master Hill Technology Co., Ltd.
Equipment Under Test (EUT):	
EUT Name:	Wireless charger-Round type
Model No.:	MH-QIRTX
Trade mark:	MAXCABLE
FCC ID:	2ADO2-MHQITX
Standards:	47 CFR PART 18: 2014
Date of Receipt:	2014-10-23
Date of Test:	2015-01-19 to 2015-01-29
Date of Issue:	2015-02-10
Test Result :	**PASS***

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

Authorized Signature:

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150 kHz to 30 MHz)	47 CFR PART 18: 2014	FCC OST/ MP-5:1986	18.307(a)	Pass
Radiated Emission (9 kHz to 1GHz)	47 CFR PART 18: 2014	FCC OST/ MP-5:1986	18.305(b)	Pass

Model No.: MH-QIRTX

The model MH-QIRTX has 4 kinds of color including yellow, white, pink and green, only the green one was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all samples just different on appearance color.

3 Contents

Page

1 COVER PAGE 1

2 TEST SUMMARY 2

3 CONTENTS 3

4 GENERAL INFORMATION 4

4.1 CLIENT INFORMATION 4
4.2 GENERAL DESCRIPTION OF EUT 4
4.3 DESCRIPTION OF SUPPORT UNITS 4
4.4 TEST LOCATION 5
4.5 TEST FACILITY 5
4.6 DEVIATION FROM STANDARDS 5
4.7 ABNORMALITIES FROM STANDARD CONDITIONS 5

5 EQUIPMENT LIST 6

6 TEST RESULTS 9

6.1 CONDUCTED EMISSIONS 9
6.2 RADIATED EMISSIONS 13

7 PHOTOGRAPHS 16

7.1 CONDUCTED EMISSION TEST SETUP 16
7.2 RADIATED EMISSION TEST SETUP 16
7.3 EUT CONSTRUCTIONAL DETAILS 17

4 General Information

4.1 Client Information

Applicant:	Master Hill Electric Wire & Cable Co., Ltd
Address of Applicant:	Unit 505, 5/F., Sunbeam Centre, 27 Shing Yip Street, Kwun Tong, Kowloon Hong Kong SAR China
Manufacturer:	Shen Zhen Master Hill Technology Co., Ltd.
Address of Manufacturer:	Laowei Industry Zone, Longhua Street Longhua District, Shenzhen, China
Factory:	Master Hill Electric Wire & Cable Co., Ltd
Address of Factory:	Laowei Industry Zone, Longhua Street Longhua District, Shenzhen, China

4.2 General Description of EUT

Product Name:	Wireless charger-Round type
Model No.:	MH-QIRTX
Trade mark:	MAXCABLE
Sample Type:	Wireless charger
Wireless Charging Operation Frequency:	110kHz-205kHz
Power Supply:	Model: FY0502000 Input voltage: AC 100-240V 50/60Hz 0.6A Output voltage: DC 5V 2A
Test Voltage:	AC 120V 60Hz
USB Cable:	100cm unshielded

4.3 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Mobile phone	NOKIA	820.1

4.4 Test Location

Only the Radiate emission(9kHz-30MHz) was test in SGS GZ, the other tests were performed at:

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

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

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

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

  The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 No.: 556682.

- **Industry Canada (IC)**

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

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

5 Equipment List

Conducted Emission					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2015-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2015-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2015-05-16
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2015-08-30
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2015-08-30
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2015-08-30
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2015-05-16
8	Coaxial Cable	SGS	N/A	SEL0025	2015-05-29
9	Coaxial Cable	SGS	N/A	SEL0025	2015-05-29

RE in Chamber					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2015-06-10
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2015-05-29
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	2015-10-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2015-05-16
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24
9	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2015-10-24
10	Band filter	Amindeon	Asi 3314	SEL0094	2015-05-16
11	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015-10-24

RE in chamber(10m)					
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2015-04-19
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2015-03-03
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2015-05-09
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2017-07-14
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2016-08-31
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2016-05-04
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2016-08-31
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2015-07-01
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2015-03-03
EMC2065	Amplifier	HP	8447F	N/A	2015-08-25
EMC0075	310N Amplifier	Sonama	310N	272683	2015-03-03
EMC0523	Active Loop Antenna	EMCO	6502	42963	2016-03-03
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2017-05-26
EMC2069	2.4GHz filter	Micro-Tronics	BRM 50702	149	2015-04-19
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2016-06-05

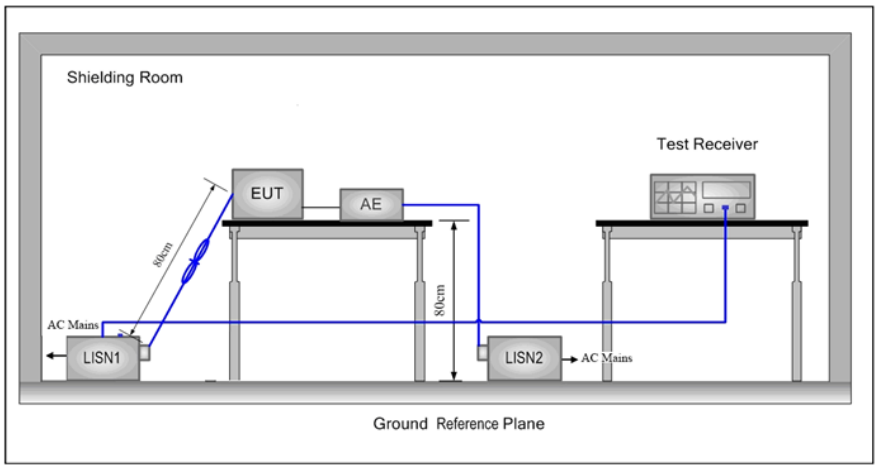
General used equipment					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2015-10-24
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102	2015-10-24
3	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0103	2015-10-24
4	Barometer	ChangChun	DYM3	SEL0088	2015-05-16

Note: The calibration interval is one year, all the instruments are valid.

6 Test Results

6.1 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>47 CFR PART 18</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test Procedure:</td><td>1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.</td></tr>
</table>

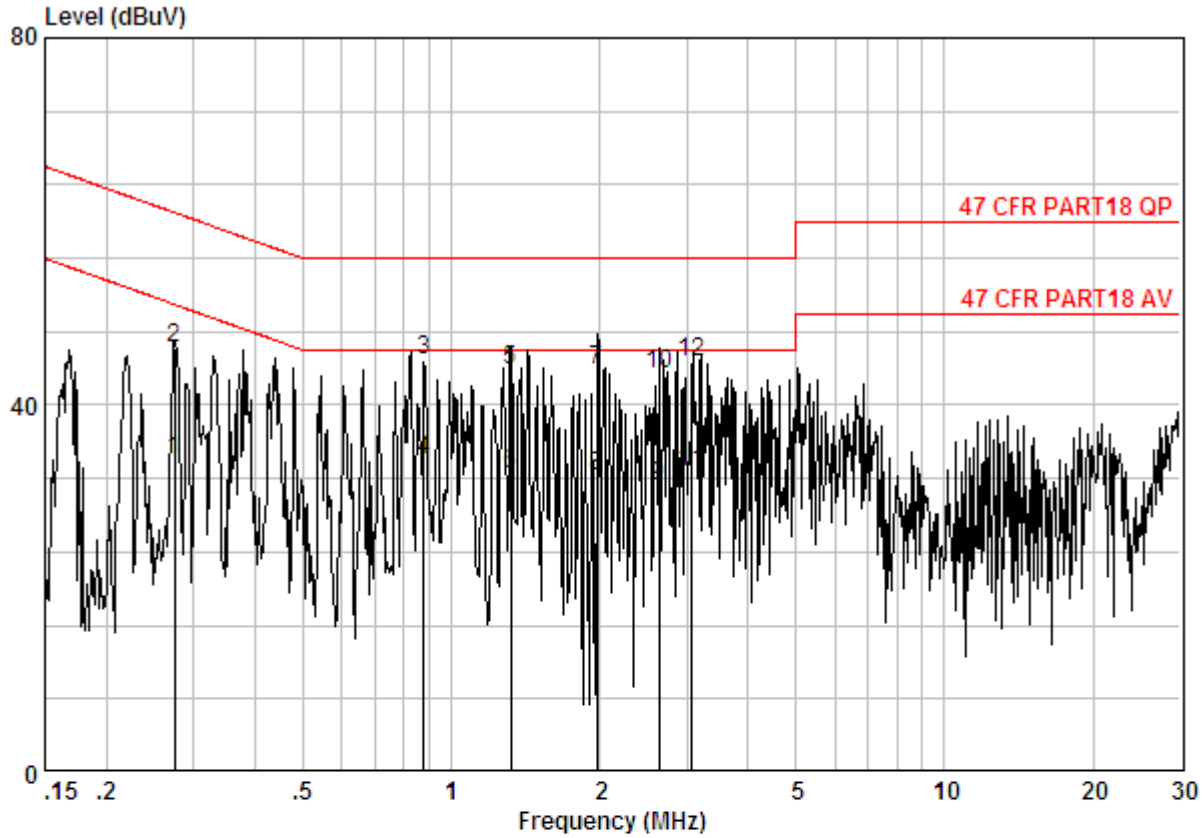
Test Setup:	
Test Mode:	Wireless charge mode. Keep EUT charging with full load and half load to find the worst cass. The compliance test performed at full load since no worst case was found.
Instruments Used:	Refer to section 5 for details
Test Results:	Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

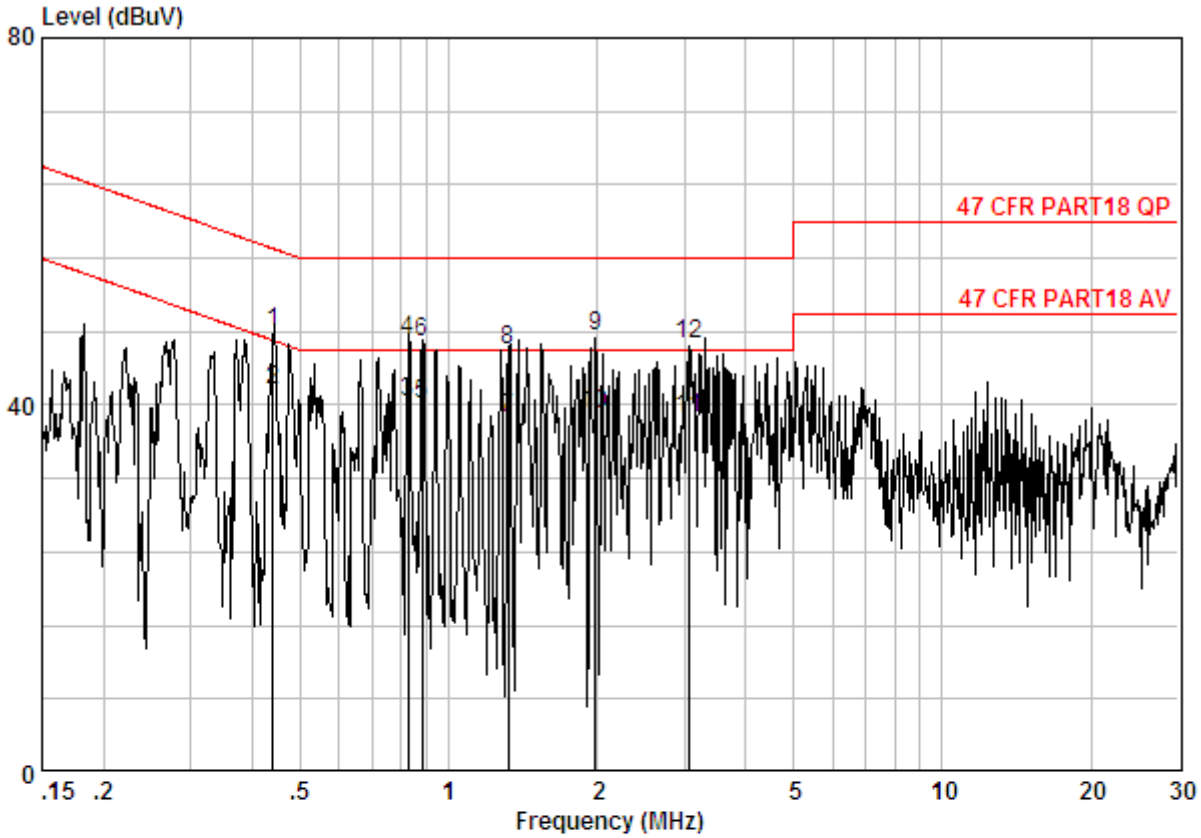
Live Line:



Site : Shielding Room
Condition : 47 CFR PART18 QP CE LINE
Job.No : 5438IT
Mode : Wireless charge mode

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.27500	0.01	9.70	24.40	34.11	50.92	-16.81	Average
2		0.27500	0.01	9.70	36.40	46.11	60.92	-14.81	QP
3	@	0.87900	0.02	9.80	35.00	44.82	56.00	-11.18	QP
4		0.87900	0.02	9.80	24.20	34.02	46.00	-11.98	Average
5		1.321	0.02	9.80	34.10	43.92	56.00	-12.08	QP
6		1.321	0.02	9.80	22.60	32.42	46.00	-13.58	Average
7		1.977	0.02	9.80	34.10	43.92	56.00	-12.08	QP
8		1.977	0.02	9.80	22.50	32.32	46.00	-13.68	Average
9		2.638	0.02	9.83	21.40	31.25	46.00	-14.75	Average
10		2.638	0.02	9.83	33.50	43.35	56.00	-12.65	QP
11		3.076	0.02	9.85	22.80	32.67	46.00	-13.33	Average
12		3.076	0.02	9.85	34.80	44.67	56.00	-11.33	QP

Neutral Line:



Site : Shielding Room
Condition : 47 CFR PART18 QP CE NEUTRAL
Job.No : 5438IT
Mode : Wireless charge mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.44100	0.01	9.80	38.10	47.91	57.03	-9.12	QP
2 @	0.44100	0.01	9.80	31.80	41.61	47.03	-5.42	Average
3 @	0.82600	0.02	9.80	30.60	40.42	46.00	-5.58	Average
4 @	0.82600	0.02	9.80	37.20	47.02	56.00	-8.98	QP
5 @	0.88200	0.02	9.80	30.20	40.02	46.00	-5.98	Average
6 @	0.88200	0.02	9.80	37.00	46.82	56.00	-9.18	QP
7 @	1.320	0.02	9.80	28.70	38.52	46.00	-7.48	Average
8 @	1.320	0.02	9.80	36.10	45.92	56.00	-10.08	QP
9 @	1.979	0.02	9.80	37.80	47.62	56.00	-8.38	QP
10 @	1.979	0.02	9.80	29.30	39.12	46.00	-6.88	Average
11 @	3.078	0.02	9.85	28.80	38.67	46.00	-7.33	Average
12 @	3.078	0.02	9.85	36.70	46.57	56.00	-9.43	QP

6.2 Radiated Emissions

Test Requirement:	47 CFR PART 18
Test Site:	Measurement Distance: 10m (Semi-Anechoic Chamber)
Receiver Setup:	

Frequency	Detector	RBW	VBW
9kHz~150kHz	Quasi-peak	200Hz	≥RBW
150kHz~30MHz	Quasi-peak	9kHz	≥RBW
30MHz~1GHz	Quasi-peak	100kHz	≥RBW

Limit:

Frequency	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009-30MHz	53.0	Quasi-peak	10
30MHz-88MHz	40.0	Quasi-peak	3
88MHz-216MHz	43.5	Quasi-peak	3
216MHz-1000MHz	46.0	Quasi-peak	3

Remark:According to the article 18.305(b), The operating frequency is non-ISM frequency;the RF Power generated by equipment is below 500(watts); According to the clause 18.305(c), the EUT belongs to Consumer equipment.

Test Setup:

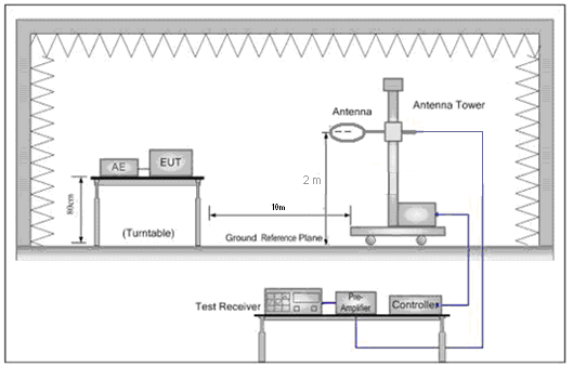


Figure 1. Below 30MHz

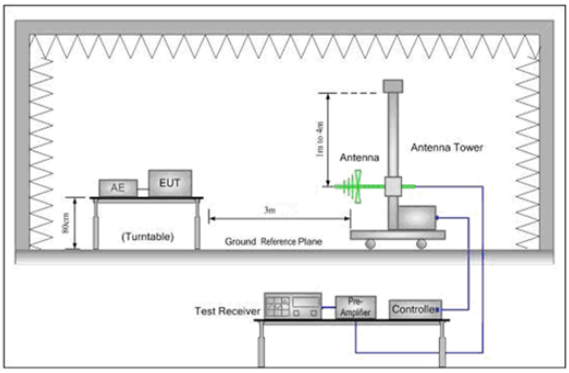


Figure 2. 30MHz to 1GHz

Test Procedure:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber(30MHz-1000MHz) and 10 meter semi-anechoic chamber(9kHz-30MHz). The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters(30MHz-1000MHz) and 10 meter(9kHz-30MHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

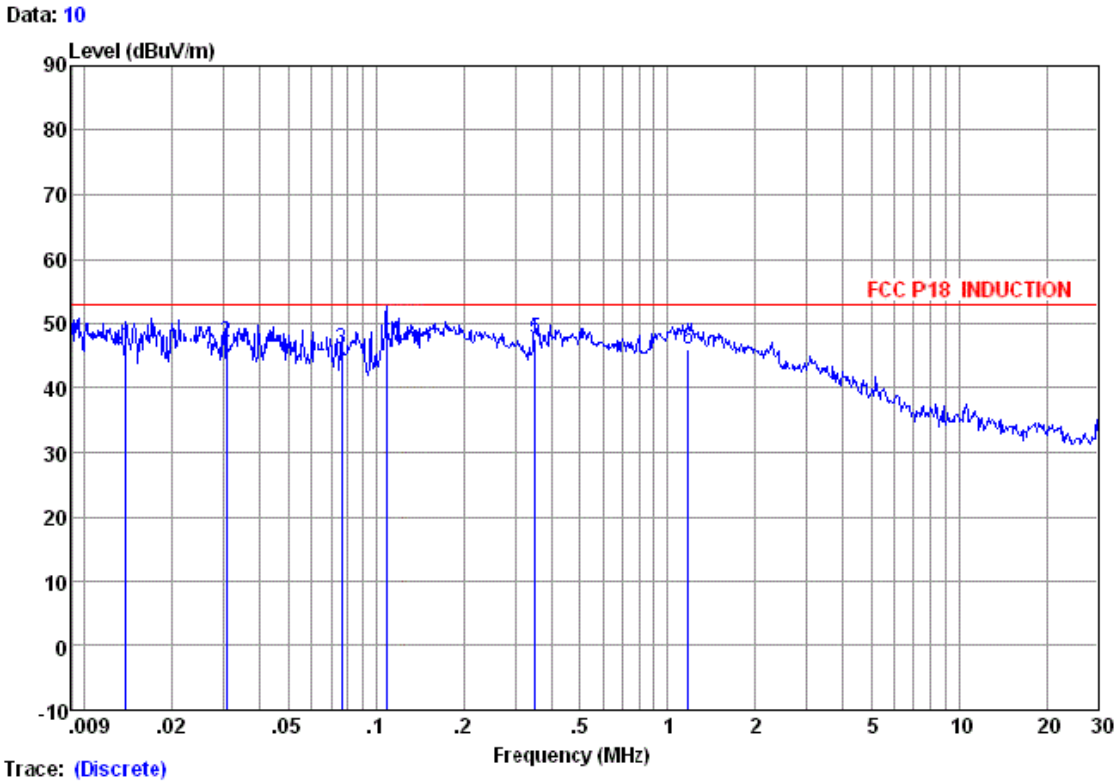
c. Above 30MHz:The Analyzer/Receiver scanned from 30MHz to 1000MHz.The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. Below 30MHz: The Analyzer/Receiver scanned from 9kHz to 30MHz.The antenna height is 2 meters above the ground to determine the maximum value of the field strength.

e. For each suspected emission, the EUT was arranged to its worst case

	and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 2 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. h. Repeat above procedures until all frequencies measured was complete. i. Measurement Requirement: According to the clause 18.305(c)notes 2. At frequencies at or above 30MHz: Limit3m(dBuV)=Limitxm(dBuV)+20log(xm/3m) At frequencies below 30MHz: Limit10m(dBuV)=Limitxm(dBuV)+20log(xm/3m) Remark: x replace the number 10,30,300.
Test Mode:	Wireless charge mode. Keep EUT charging with full load and half load to find the worst cass. The compliance test performed at full load since no worst case was found.
Instruments Used:	Refer to section 5 for details
Test Results:	Pass

0.009MHz-30MHz



Trace: (Discrete)
Site : SGS
Condition : FCC P18 INDUCTION 10m 0.6M LOOP E
Remark : Level=Read Level + Cable loss
: + Antenna Factor - Preamp factor

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.014	60.47	16.90	0.01	31.21	46.17	53.06	-6.89	QP
2	0.031	63.44	14.90	0.05	31.25	47.14	53.06	-5.92	QP
3	0.076	64.39	12.90	0.04	31.30	46.03	53.06	-7.03	QP
4	0.110	66.84	12.90	0.04	31.30	48.48	53.06	-4.58	QP
5	0.352	65.99	12.69	0.08	31.28	47.48	53.06	-5.58	QP
6	1.179	64.40	12.76	0.11	31.17	46.10	53.06	-6.96	QP

Remark:
1:The loop antenna rotated about both Vertical and Horizontal to find the maximum emission,So only the worst position(Horizontal) was report.

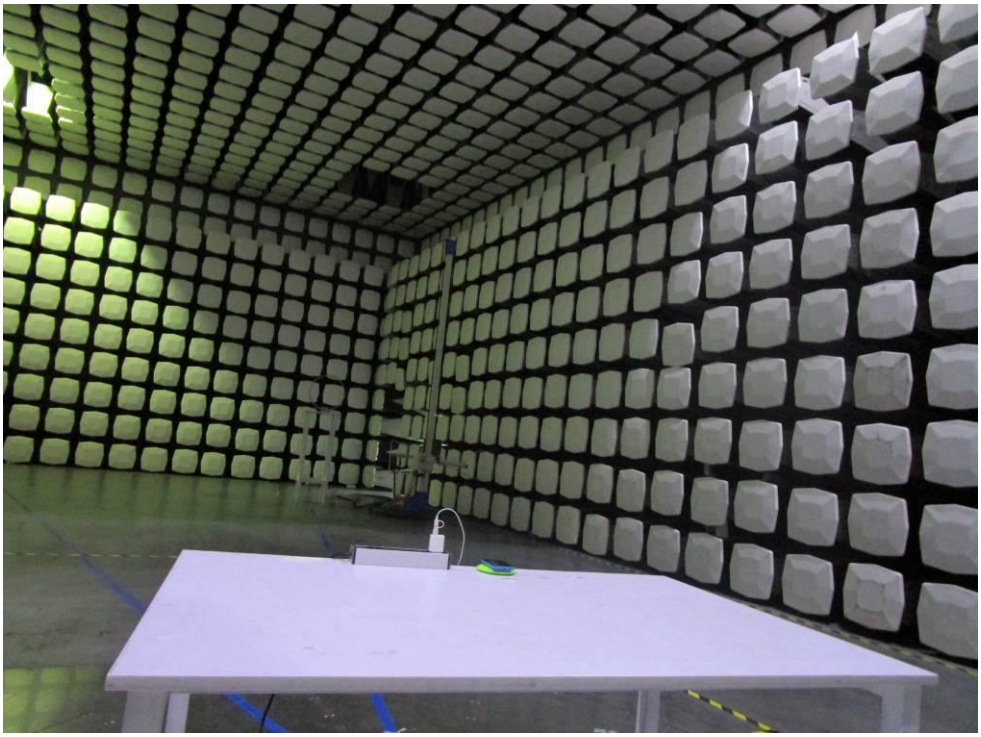
2:According to the clause 2.3 of MP-5:1986, the hightest frequency is 205kHz, So the Range of frequency measurements is 9kHz to 30MHz.

7 Photographs

Test Model No.: Wireless charger-Round type

7.1 Conducted Emission Test Setup

7.2 Radiated Emission Test Setup



7.3 EUT Constructional Details

The detailed internal and external Photo see:

Appendix A - Photographs of EUT Constructional Details