

FCC Part 15C

Measurement and Test Report

For
Sunlike Technology Co., Ltd.

FCC ID: 2APOS-SL-PWW-13

FCC Rules: FCC Part 15C

Product Description: Wireless Charging Pad

Tested Model: SL-PWW-13

Report No.: BSL18038502700002Y-ER-3

Tested Date: Apr. 16~20, 2018

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Sunlike Technology Co., Ltd.
Building 3, Shi'ao 2nd Industrial Zone, DaLang Street,
LongHua New District.Shenzhen City, Guangdong
Province, China 518109

Address of applicant:

Manufacturer: Sunlike Technology Co., Ltd.
Building 3, Shi'ao 2nd Industrial Zone, DaLang Street,
LongHua New District.Shenzhen City, Guangdong
Province, China 518109

Address of manufacturer:

General Description of EUT	
Product Name:	Wireless Charging Pad
Trade Name:	ZYD
Model No.:	SL-PWW-13
Adding Model(s):	N/A
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	112~205KHz
Rated Voltage:	DC 5V (Wireless output)
Rated Current:	1A (Wireless output)
Rated Power:	5W (Wireless output)

1.2 Test Standards

The following report is prepared on behalf of the Dolphin Electronics Co., Ltd in accordance with Part 2, Subpart J, and FCC Part 15, Subpart B, Subpart C, and section 15.203, 15.205 and 15.209 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.207, and 15.209 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

BSL Testing Co.,LTD.
NO. 24, ZH Park, Nantou, Shenzhen, 518000 China
Designation Number : CN1217
Test Firm Registration Number: 866035
Tel: 86- 755-26508703
Fax: 86- 755-26508703

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging	With load
TM2	Charging	With mobile phone

Note: Test was performed with TM1 and TM2, TM1 is the worst case so it is only showed in this report.

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
AUX Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Mobile Phone	SAMSUNG	SM-920V	/
Adapter	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-17	2018-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2017-06-17	2018-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-17	2018-06-16
Amplifier	Agilent	8447F	3113A06717	2017-06-17	2018-06-16
Amplifier	C&D	PAP-1G18	2002	2017-06-17	2018-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-17	2018-06-16
Horn Antenna	ETS	3117	00086197	2017-06-17	2018-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-17	2018-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-17	2018-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-17	2018-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-17	2018-06-16

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.207 (a) Conducted Emission	Compliant
§15.209(a) Radiated Emission	Compliant

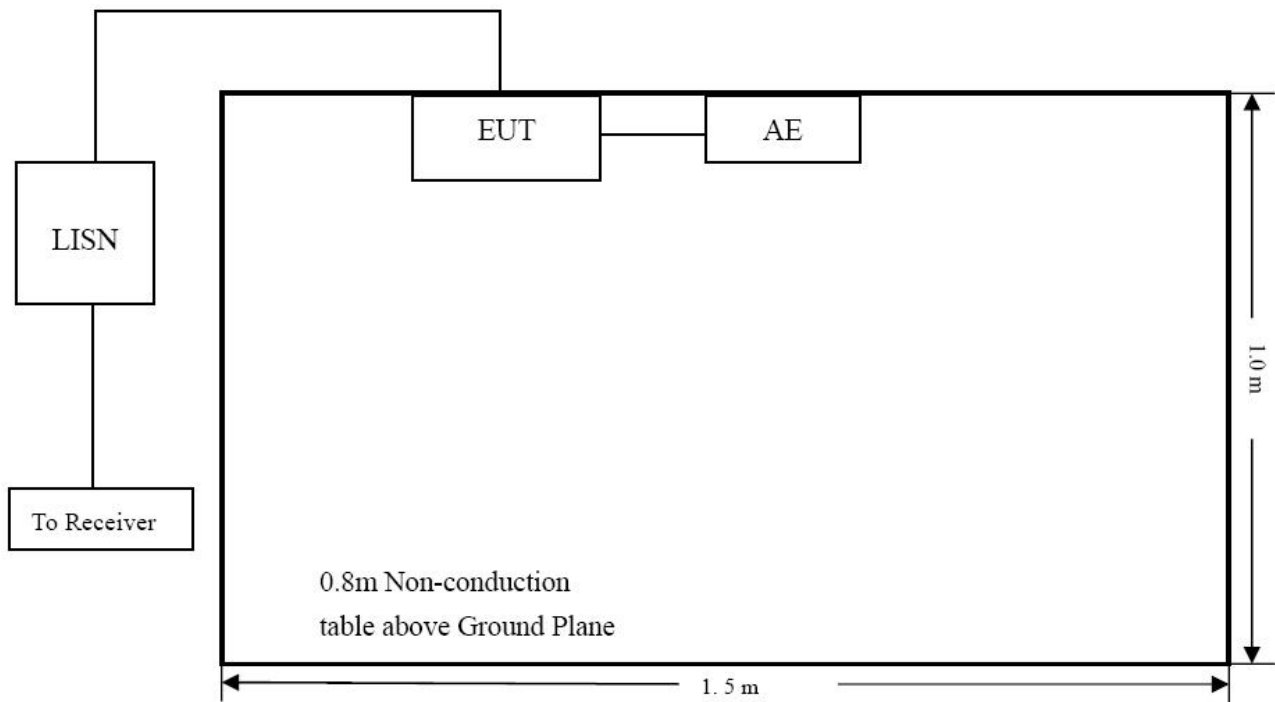
N/A: not applicable

3. CONDUCTED EMISSIONS

3.1 Test Procedure

Test is conducting under the description of ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results/Plots

According to the data in section 3.5, the EUT complied with the FCC Part 15.207(a) Conducted margin for this device, with the *worst* margin reading of:

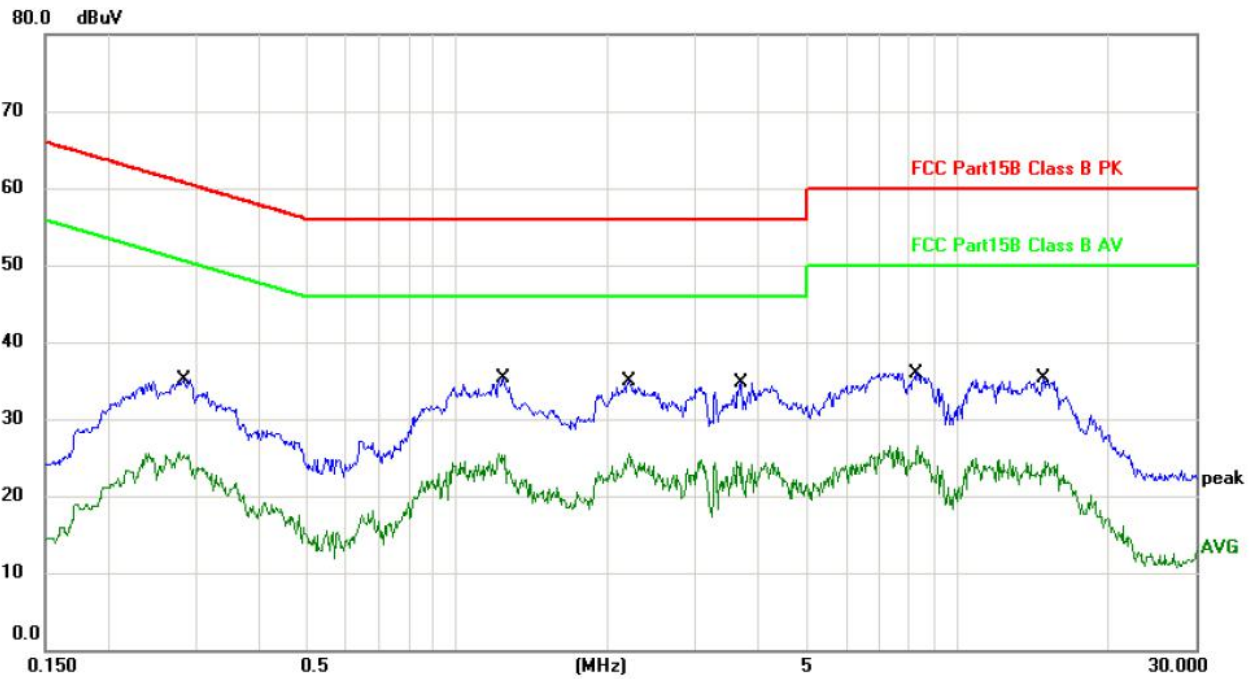
-20.80 dB at 1.2419 MHz in the **Neutral, QP** detector, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

EUT: Wireless Charging Pad
 Tested Model: SL-PWW-13
 Operating Condition: TMI
 Comment: 120V/60Hz; Adapter DC 5V

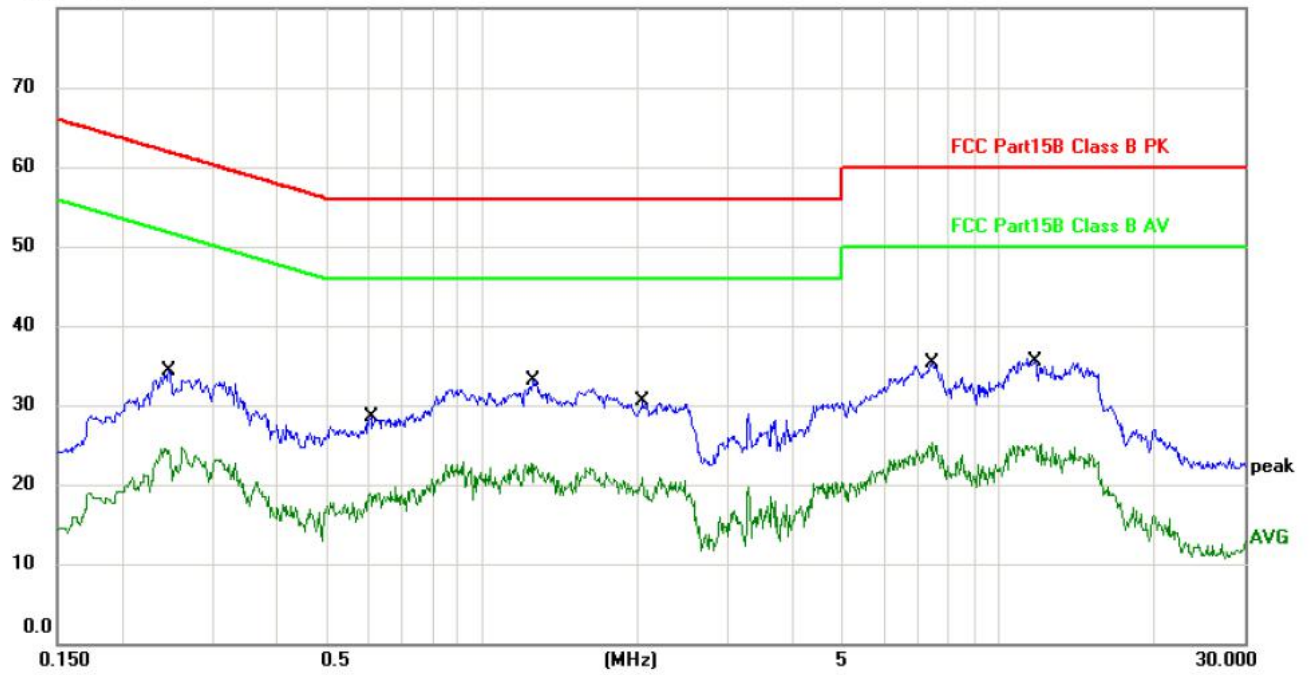
Test Specification: Neutral



No.	Mk.	Freq.	Measure- ment	Limit	Over		
		MHz	dBuV	dBuV	dB	Detector	Comment
1		0.2832	35.11	60.72	-25.61	QP	
2		0.2832	18.60	50.72	-32.12	AVG	
3	*	1.2419	35.20	56.00	-20.80	QP	
4		1.2419	19.09	46.00	-26.91	AVG	
5		2.2099	34.87	56.00	-21.13	QP	
6		2.2099	20.61	46.00	-25.39	AVG	
7		3.7139	34.68	56.00	-21.32	QP	
8		3.7139	20.18	46.00	-25.82	AVG	
9		8.2619	35.99	60.00	-24.01	QP	
10		8.2619	21.02	50.00	-28.98	AVG	
11		14.8818	35.21	60.00	-24.79	QP	
12		14.8818	19.11	50.00	-30.89	AVG	

Test Specification:
80.0 dBuV

Line



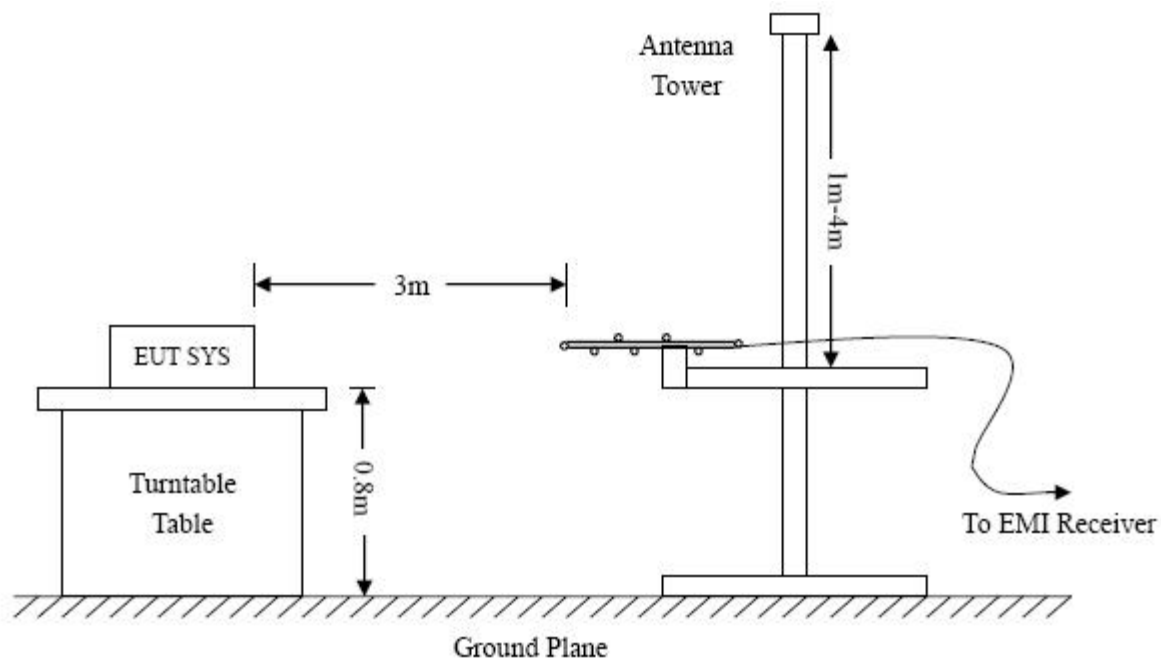
No.	Mk.	Freq.	Measure- ment	Limit	Over		
		MHz	dBuV	dBuV	dB	Detector	Comment
1		0.2467	34.30	61.86	-27.56	QP	
2		0.2467	19.02	51.86	-32.84	AVG	
3		0.6099	28.48	56.00	-27.52	QP	
4		0.6099	18.47	46.00	-27.53	AVG	
5	*	1.2620	33.15	56.00	-22.85	QP	
6		1.2620	19.46	46.00	-26.54	AVG	
7		2.0459	30.50	56.00	-25.50	QP	
8		2.0459	15.99	46.00	-30.01	AVG	
9		7.4698	35.31	60.00	-24.69	QP	
10		7.4698	23.68	50.00	-26.32	AVG	
11		11.7738	35.58	60.00	-24.42	QP	
12		11.7738	13.86	50.00	-36.14	AVG	

4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for this device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.209(a) Limit}$$

4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.209(a) rule, and had the worst margin of:

-9.38 dB at 679.9340 MHz in the Vertical polarization, 9 KHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data(Below 30MHz)

EUT: *Wireless Charging Pad*
Tested Model: *SL-PWW-13*
Operating Condition: *TM1*
Comment: *120V/60Hz; Adapter DC 5V*

Test Specification: *Loop Antenna*

No.	Frequency	Reading	Detector	Emission	Limit	Margin
	(KHz)	(dBuV)	(PK/QP/A)	(dBuV/m)	(dBuV/m)	(dB)
1	18	62.35	AV	81.61	122.50	-40.89
2	22	65.94	AV	85.35	120.76	-35.41
3	41	54.21	AV	70.52	115.35	-44.83
4	168	56.92	AV	74.63	103.10	-28.47
5	183	64.34	AV	71.02	102.36	-31.34
6*	295	76.27	AV	72.63	98.21	-25.58
7	334	64.74	AV	68.24	97.13	-28.89
8	642	58.68	QP	38.62	71.45	-32.83
9	5225	35.15	QP	22.92	53.24	-30.32

1. "*" Means Fundamental frequency

2. Emission Level [dBuV/m] = Reading [dBuV] + Ant. Factor [dB/m] + Cable Loss [dB]

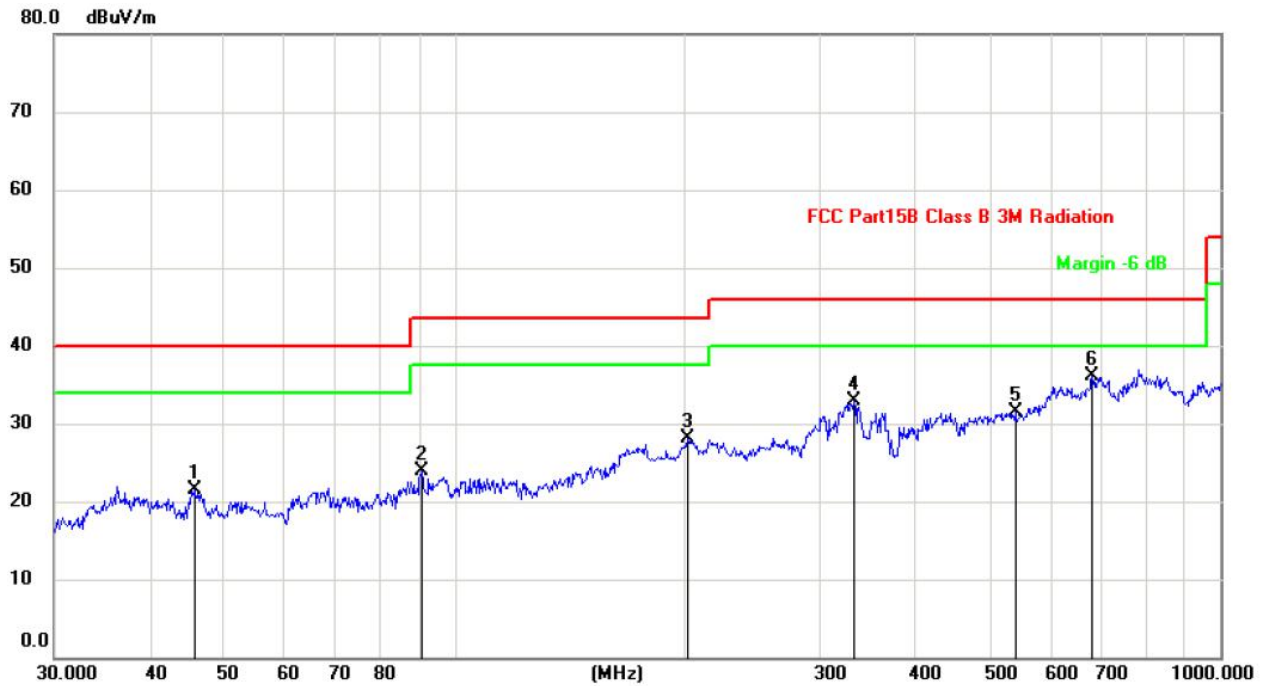
3. Margin [dB] = Emission Level [dBuV/m] – Limit [dBuV/m]

4. Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

Plot of Radiated Emissions Test Data (From 30MHz to 1GHz)

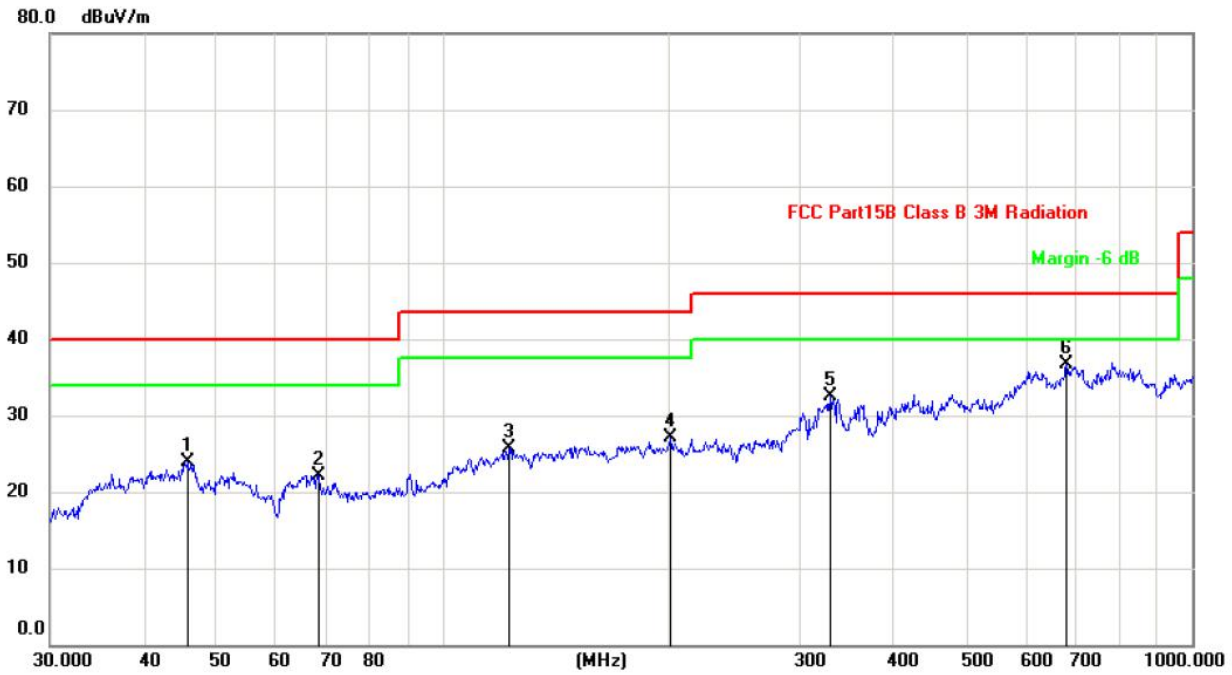
EUT: *Wireless Charging Pad*
 Tested Model: *SL-PWW-13*
 Operating Condition: *TM1*
 Comment: *120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Mk.	Freq. MHz	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		45.6948	21.43	40.00	-18.57	QP		
2		90.5374	23.84	43.50	-19.66	QP		
3		201.3930	28.06	43.50	-15.44	QP		
4		332.5187	32.84	46.00	-13.16	QP		
5		539.4773	31.45	46.00	-14.55	QP		
6	*	679.9687	36.12	46.00	-9.57	QP		

Test Specification: Vertical



No.	Mk.	Freq.	Measure- ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		45.6948	23.93	40.00	-16.07	QP		
2		68.3906	22.16	40.00	-17.84	QP		
3		122.8340	25.76	43.50	-17.74	QP		
4		201.3930	27.06	43.50	-16.44	QP		
5		329.0389	32.55	46.00	-13.45	QP		
6	*	679.9340	36.62	46.00	-9.38	QP		

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