

FCC Part 15C

Measurement and Test Report

For
Sunlike Technology Co., Ltd.

FCC ID: 2APOS-SL-PWW-11

FCC Rules: FCC Part 15C

Product Description: Fast Wireless Charging Pad

Tested Model: SL-PWW-11

Report No.: BSL18038502700004Y-ER-3

Tested Date: May 22~25, 2018

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TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.1 Product Description for Equipment Under Test (EUT).....	3
1.2 Test Standards.....	4
1.3 Test Methodology.....	4
1.4 Test Facility.....	4
1.5 EUT Setup and Operation Mode.....	5
1.6 Measurement Uncertainty.....	5
1.7 Test Equipment List and Details.....	6
2. SUMMARY OF TEST RESULTS.....	7
3. CONDUCTED EMISSIONS.....	8
3.1 Test Procedure.....	8
3.2 Basic Test Setup Block Diagram.....	8
3.3 Environmental Conditions.....	8
3.4 Summary of Test Results/Plots.....	9
3.5 Conducted Emissions Test Data.....	10
4. RADIATED EMISSION.....	12
4.1 Test Procedure.....	12
4.2 Test Receiver Setup.....	12
4.3 Corrected Amplitude & Margin Calculation.....	13
4.4 Environmental Conditions.....	13
4.5 Summary of Test Results/Plots.....	14

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:	Fast Wireless Charging Pad
Trade Name:	ZYD
Model No.:	SL-PWW-11
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
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
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 No.	Cal Date	Due. Date
Communication Tester	Rohde & Schwarz	CMW500	100358	2017-10-21	2018-10-20
Spectrum Analyzer	R&S	FSP40	100550	2017-10-21	2018-10-20
Test Receiver	R&S	ESC17	US47140102	2017-10-21	2018-10-20
Signal Generator	HP	83630B	3844A01028	2017-10-22	2018-10-21
Test Receiver	R&S	ESPI-3	100180	2017-10-21	2018-10-20
Amplifier	Agilent	8449B	4035A00116	2017-10-22	2018-10-21
Amplifier	HP	8447E	2945A02770	2017-10-22	2018-10-21
Signal Generator	IFR	2023A	202307/242	2017-10-22	2018-10-21
Broadband Antenna	SCHAFFNER	2774	2774	2017-10-17	2018-10-16
Biconical and log periodic antennas	ELECTRO-METRICS	EM-6917B-1	171	2017-10-17	2018-10-16
Horn Antenna	R&S	HF906	100253	2017-10-17	2018-10-16
Horn Antenna	EM	EM-6961	6462	2017-10-17	2018-10-16
LISN	R&S	ESH3-Z5	100196	2017-10-17	2018-10-16
LISN	COM-POWER	LI-115	02027	2017-10-17	2018-10-16
3m Semi-Anechoic Chamber	Chengyu Electron	9 (L)*6 (W)* 6 (H)	BSL086	2017-10-21	2018-10-20
Horn Antenna	A-INFOMW	LB-180400KF	BSL088	2017-10-21	2018-10-20
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-10-21	2018-10-20

2. SUMMARY OF TEST RESULTS

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

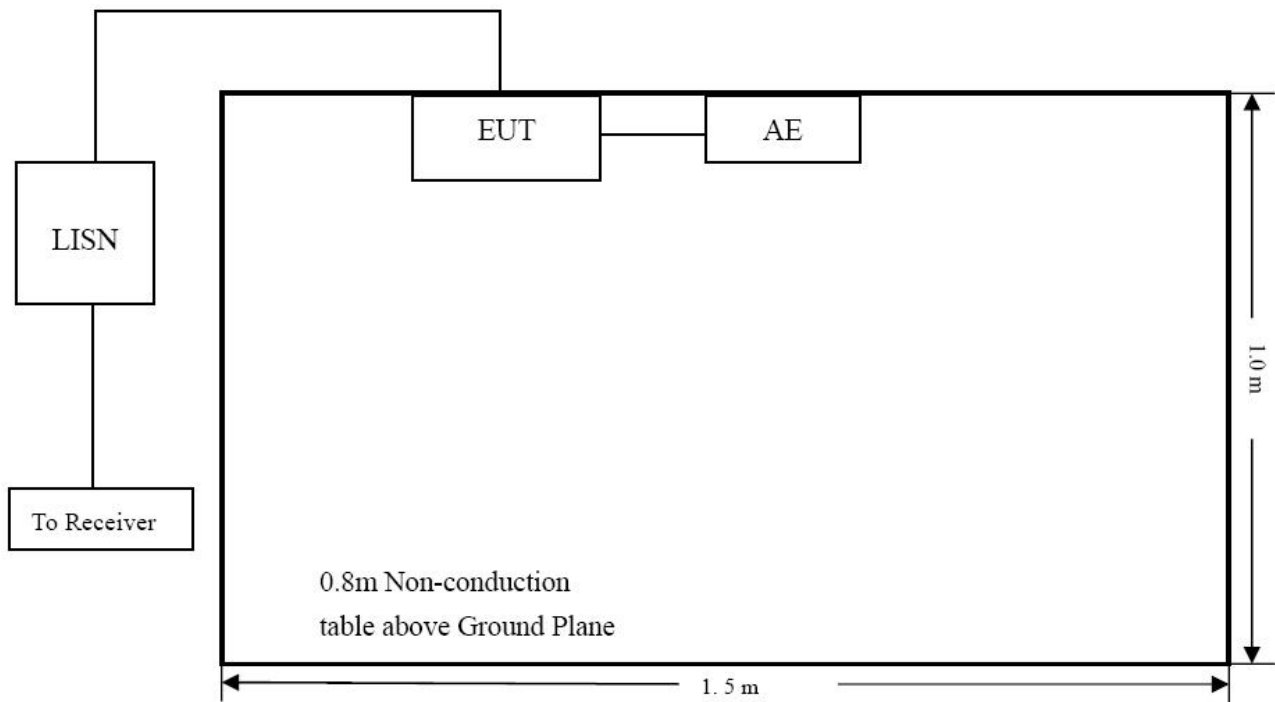
N/A: not applicable

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:

-20.57 dB at 3.2820 MHz in the **Neutral, QP** detector, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

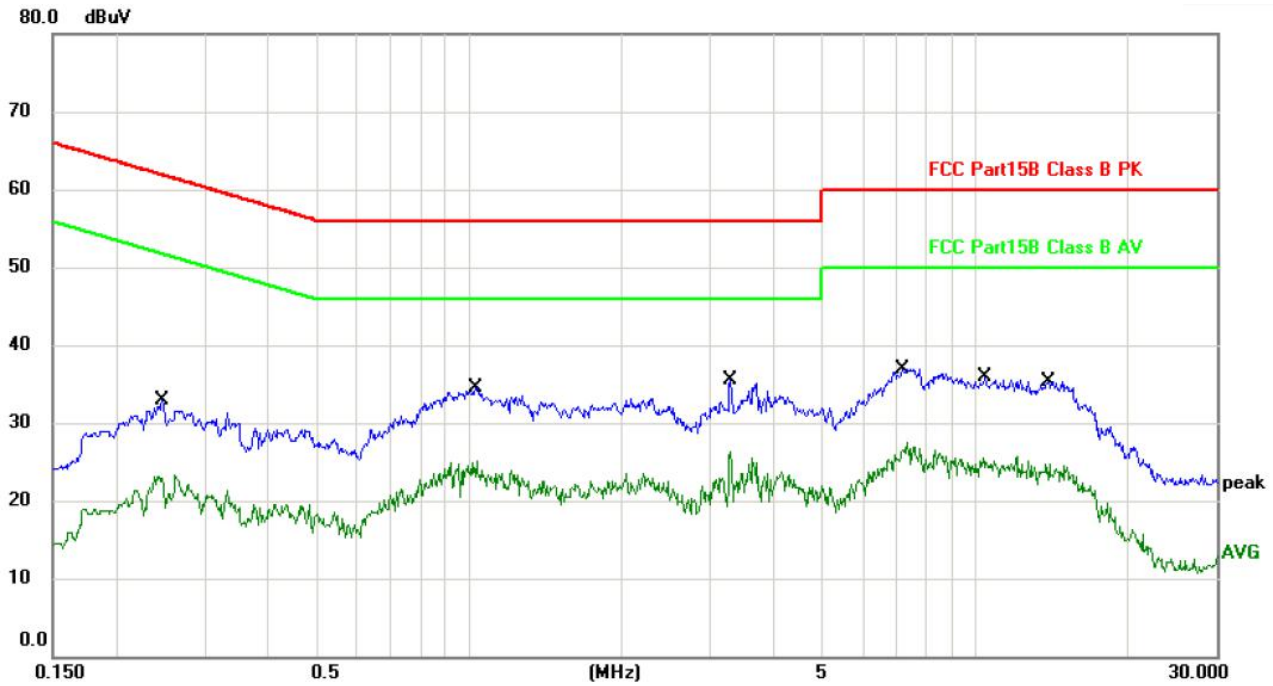
EUT: Fast Wireless Charging Pad

Tested Model: SL-PWW-11

Operating Condition: TMI

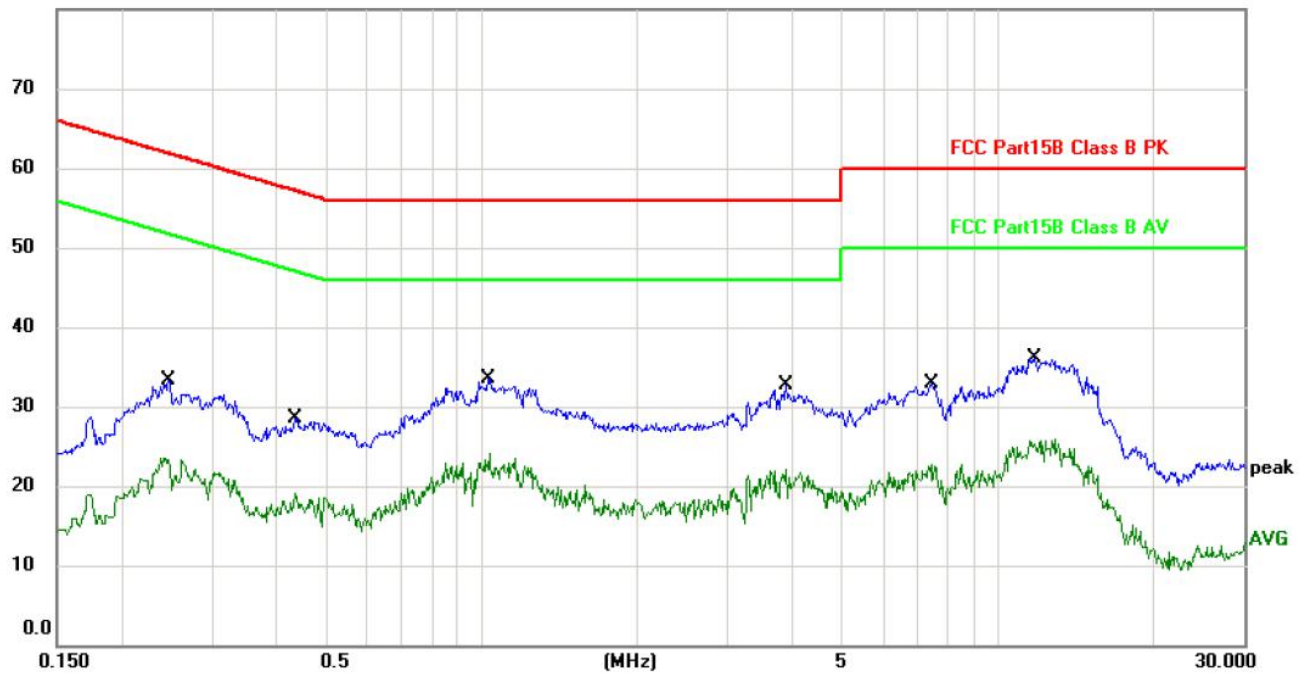
Comment: 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Mk.	Freq.	Measure- ment	Limit	Over		
		MHz	dBuV	dBuV	dB	Detector	Comment
1		0.2467	32.80	61.86	-29.06	QP	
2		0.2467	19.42	51.86	-32.44	AVG	
3		1.0300	34.52	56.00	-21.48	QP	
4		1.0300	21.80	46.00	-24.20	AVG	
5	*	3.2820	35.43	56.00	-20.57	QP	
6		3.2820	21.93	46.00	-24.07	AVG	
7		7.1779	36.99	60.00	-23.01	QP	
8		7.1779	25.62	50.00	-24.38	AVG	
9		10.4818	35.86	60.00	-24.14	QP	
10		10.4818	20.72	50.00	-29.28	AVG	
11		13.9618	35.33	60.00	-24.67	QP	
12		13.9618	13.07	50.00	-36.93	AVG	

Test Specification: Line
80.0 dBuV



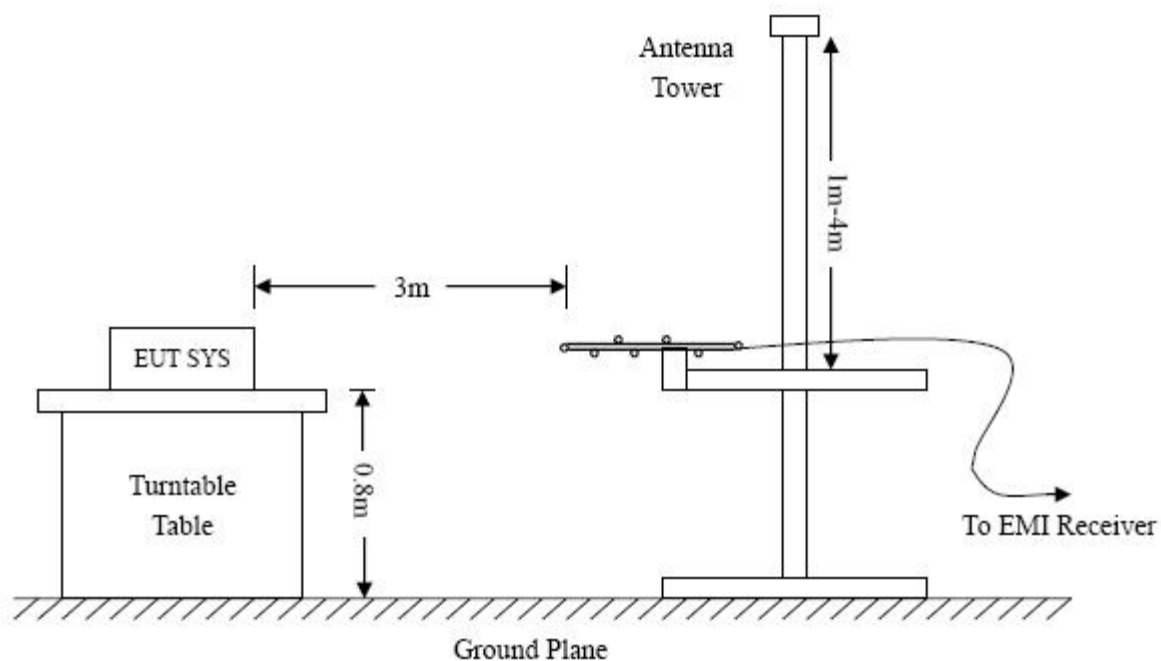
No.	Mk.	Freq.	Measure- ment	Limit	Over		
		MHz	dBuV	dBuV	dB	Detector	Comment
1		0.2467	33.30	61.86	-28.56	QP	
2		0.2467	16.32	51.86	-35.54	AVG	
3		0.4339	28.59	57.18	-28.59	QP	
4		0.4339	17.32	47.18	-29.86	AVG	
5	*	1.0300	33.52	56.00	-22.48	QP	
6		1.0300	17.80	46.00	-28.20	AVG	
7		3.8980	32.61	56.00	-23.39	QP	
8		3.8980	19.68	46.00	-26.32	AVG	
9		7.4698	32.81	60.00	-27.19	QP	
10		7.4698	21.52	50.00	-28.48	AVG	
11		11.7738	36.08	60.00	-23.92	QP	
12		11.7738	14.54	50.00	-35.46	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:

-12.13 dB at 675.2078 MHz in the Horizontal polarization, 9 KHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data(Below 30MHz)

EUT: Fast Wireless Charging Pad

Tested Model: SL-PWW-11

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	24	62.45	AV	82.65	120.00	-37.35
2	38	63.56	AV	86.52	116.01	-29.49
3	68	54.35	AV	75.51	110.95	-35.44
4	265	58.84	AV	77.35	99.14	-21.79
5*	395	66.92	AV	75.24	95.67	-20.43
6	420	75.61	AV	71.18	95.14	-23.96
7	480	61.82	AV	66.38	93.98	-27.6
8	925	55.15	QP	37.92	68.28	-30.36
9	6952	36.94	QP	21.84	50.76	-28.92

1. "*" Means Fundamental frequency

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

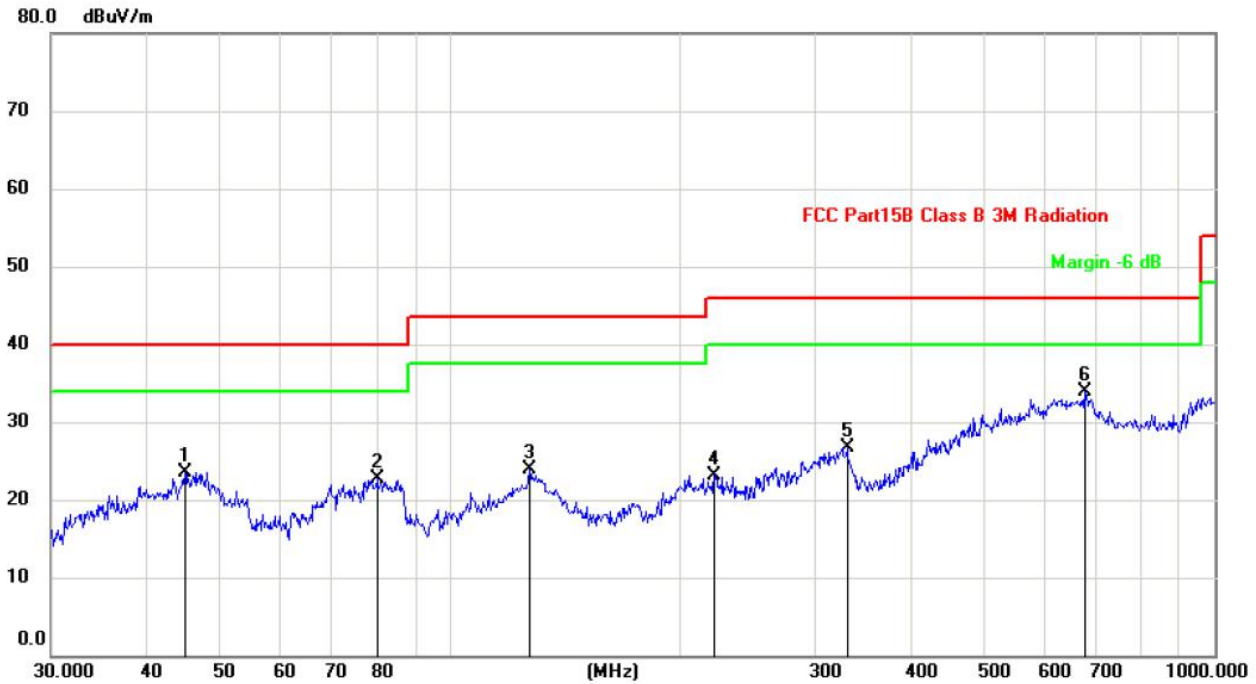
3. Margin [dB] = Emission Level [dBuV/m] – Limit [dBuV/m]

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)

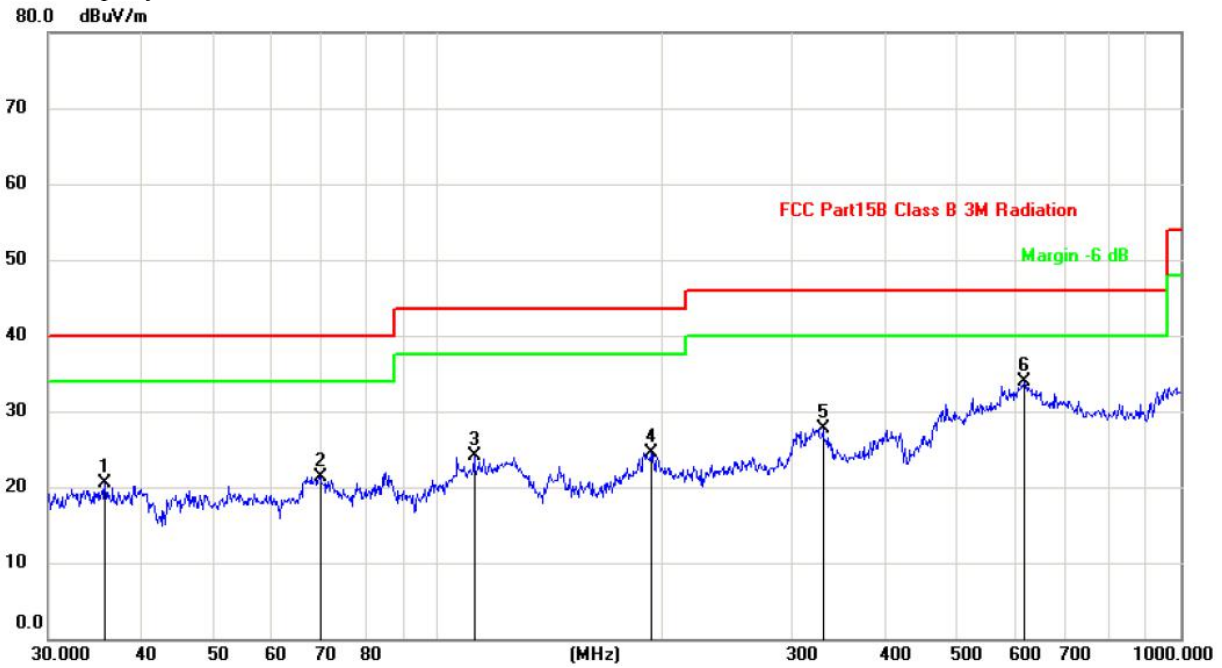
EUT: *Fast Wireless Charging Pad*
 Tested Model: *SL-PWW-11*
 Operating Condition: *TM1*
 Comment: *120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Mk.	Freq.	Measure- ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		44.9004	23.55	40.00	-16.45	QP		
2		80.0806	22.68	40.00	-17.32	QP		
3		126.7723	23.90	43.50	-19.60	QP		
4		221.3918	23.20	46.00	-22.80	QP		
5		330.1949	26.77	46.00	-19.23	QP		
6	*	675.2078	33.87	46.00	-12.13	QP		

Test Specification: Vertical



No.	Mk.	Freq.	Measure- ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		35.7490	20.41	40.00	-19.59	QP		
2		69.6003	21.38	40.00	-18.62	QP		
3		112.1303	24.15	43.50	-19.35	QP		
4		193.7726	24.51	43.50	-18.99	QP		
5		330.1949	27.77	46.00	-18.23	QP		
6	*	616.3718	33.84	46.00	-12.16	QP		

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