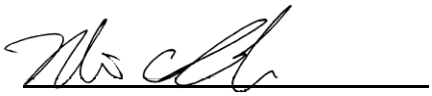
FCC RADIO TEST REPORT

Applicant	:	LIFEWORKS TECHNOLOGY GROUP LLC.
Address	:	1412 Broadway New York, NY 10018
Equipment	:	Brookstone10W Qi Charging Pad
Model No.	:	BRQI1020AB, BRQI1020AJ, BRQI1020AN, BRQI1020AR, BRQI1020ARG, BRQI1020AS
Trademark	:	Brookstone
FCC ID	:	WWEBRQI1020AB

I HEREBY CERTIFY THAT :

The sample was received on Jul. 08, 2019 and the test items were conducted during Jul. 12, 2019 at Cerpass Technology (Suzhou) Co., Ltd. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology (Suzhou) Co., Ltd., the test report shall not be reproduced except in full.

Approved by:



Miro Chueh
EMC/RF Manager

Laboratory Accreditation:
Cerpass Technology Corporation Test Laboratory

☐ **TAF LAB Code: 1439**
Cerpass Technology (SuZhou) Co., Ltd.

☒ **A2LA LAB Code: 4981.01**

Contents

History of this test report

■ ORIGINAL

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
SEFU1907093	Jul. 13, 2019	Original

1. Report of Measurements and Examinations

1.1 List of Measurements and Examinations

FCC CFR Title 47 Part 15 Subpart C Section 15.209

FCC Rule	. Description of Test	Result
§ 15.203	. Antenna Requirement	Pass
§ 15.207(a)	. Conducted Emission	Pass
§ 15.209(a)	. Radiated Emission	Pass

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Product	Brookstone10W Qi Charging Pad
Test Model	BRQI1020AB, BRQI1020AJ, BRQI1020AN, BRQI1020AR, BRQI1020ARG, BRQI1020AS
Model Discrepancy	Different in color.
Frequency Range	110KHz~205KHz
Antenna Type	Loop antenna
Modulation Type	ASK
Power Rating	Input:5V ⎓2.0A;9V ⎓1.67A Output:10W

Note: For more details, please refer to the User's manual of the EUT.

2.2 Description of the test mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

The following test mode was performed for conduction and radiation test:

Test Mode 1: TX+ Wireless Charging

2.3 Description of Test System

No	Device	Manufacturer	Model No.	Description
1	LOAD	N/A	9Ω	N/A
2	Adapter	ZEROTECH	DBS15Q	N/A

2.4 General Information of Test

☐	Test Site	**Cerpass Technology Corporation Test Laboratory** Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881
	FCC	TW1079, TW1061,TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399,R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
☒	Test Site	Cerpass Technology (Suzhou) Co.,Ltd Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666
	CNAS	L5515
	FCC	CN1243
	A2LA	4981.01
	IC	7290A-1, 7290A-2
	VCCI	T-1945 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz

2.5 Measurement Uncertainty

Measurement Item	Measurement Uncertainty
Conducted Emission	±2.71 dB
Radiation test (10m) below 1GHz	Vertical : ±3.89 dB
	Horizontal: ±4.11 dB
Radiation test (3m) below 1GHz	Vertical : ±4.11 dB
	Horizontal: ±4.10 dB

3. Test Equipment and Ancillaries Used for Tests

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100565	2018.07.18	2019.07.17
AMN	R&S	ESH2-Z5	100182	2018.08.25	2019.08.24
LISN	FCC	FCC-LISN-50-200-2-02	112087	2018.08.25	2019.08.24
LISN	SCHWARZBECK	NSLK 8127	8127-920	2018.08.25	2019.08.24
LISN	R&S	ENV216	100325	2018.08.25	2019.08.24
Pulse Limiter	R&S	ESH3-Z2	100529	2019.03.11	2020.03.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2019.03.17	2020.03.16
EZ-EMC	Fala	Ver CT3A1	N/A	N/A	N/A
EMI Test Receiver	R&S	ESCI	101183	2019.07.05	2020.07.04
Preamplifier	songyi	EM330	60618	2019.03.11	2020.03.10
Preamplifier	HP	8447F	3113A05582	2019.03.11	2020.03.10
Bilog Antenna	Sunol Science	JB1	A072414-1	2019.06.26	2020.06.26
Loop Antenna	R&S	HFH2-Z2	100150	2019.03.11	2020.03.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2019.03.17	2020.03.16
EZ-EMC	Fala	Ver CT3A1	N/A	N/A	N/A

4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

4.2 Antenna Construction

The antenna is Coil Antenna, and the antenna connector is de-signed with permanent attachment and on consideration of replacement. Please see the EUT photo for details.

4.3 Result

The EUT antenna is a Loop Antenna. It complies with the standard requirement.

5. Test of Conducted Emission

5.1 Test Limit

According to §15.207: For all the consumer devices which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

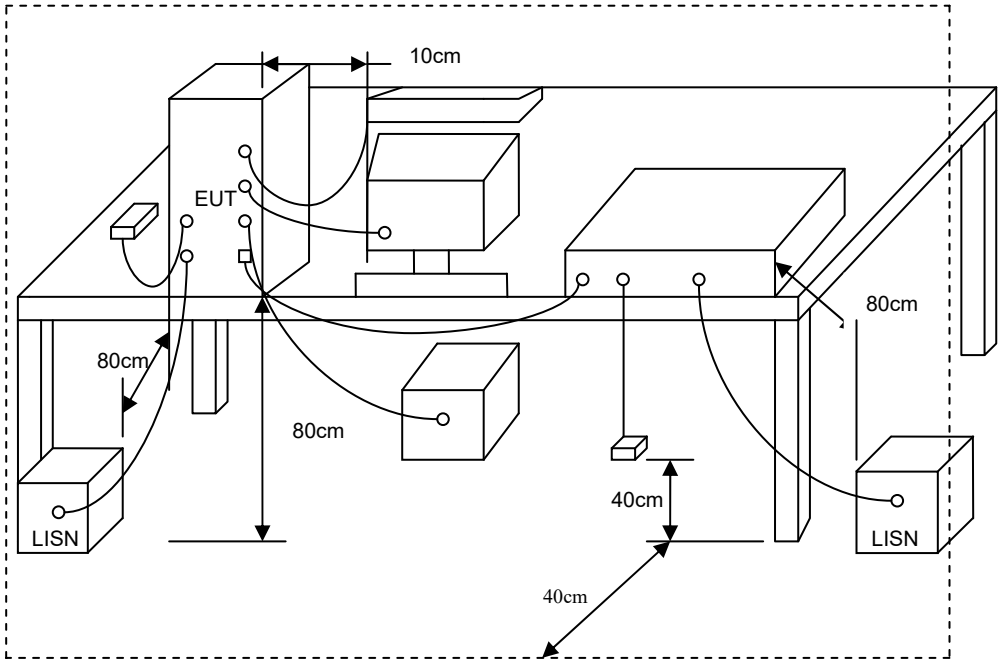
Remark: (1)*Decreases with the logarithm of the frequency.

(2)The lower limit shall apply at the transition frequency.

5.2 Test Procedures

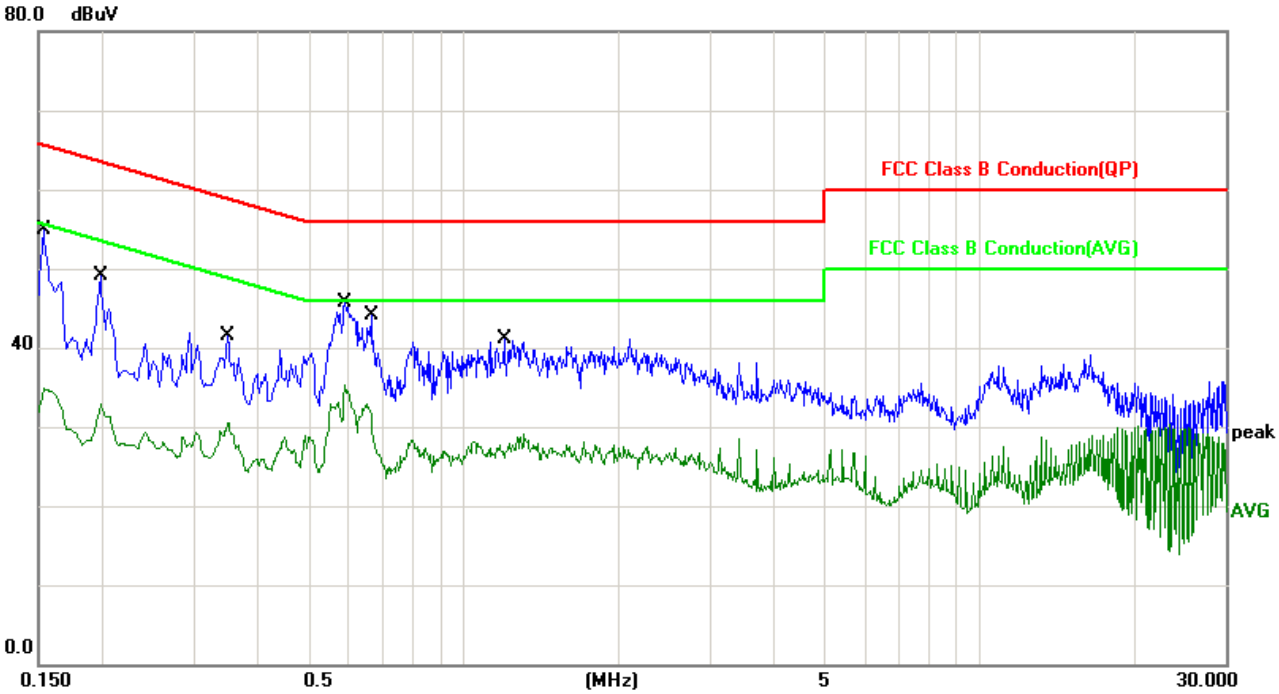
a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3 Typical Test Setup



5.4 Test Result and Data

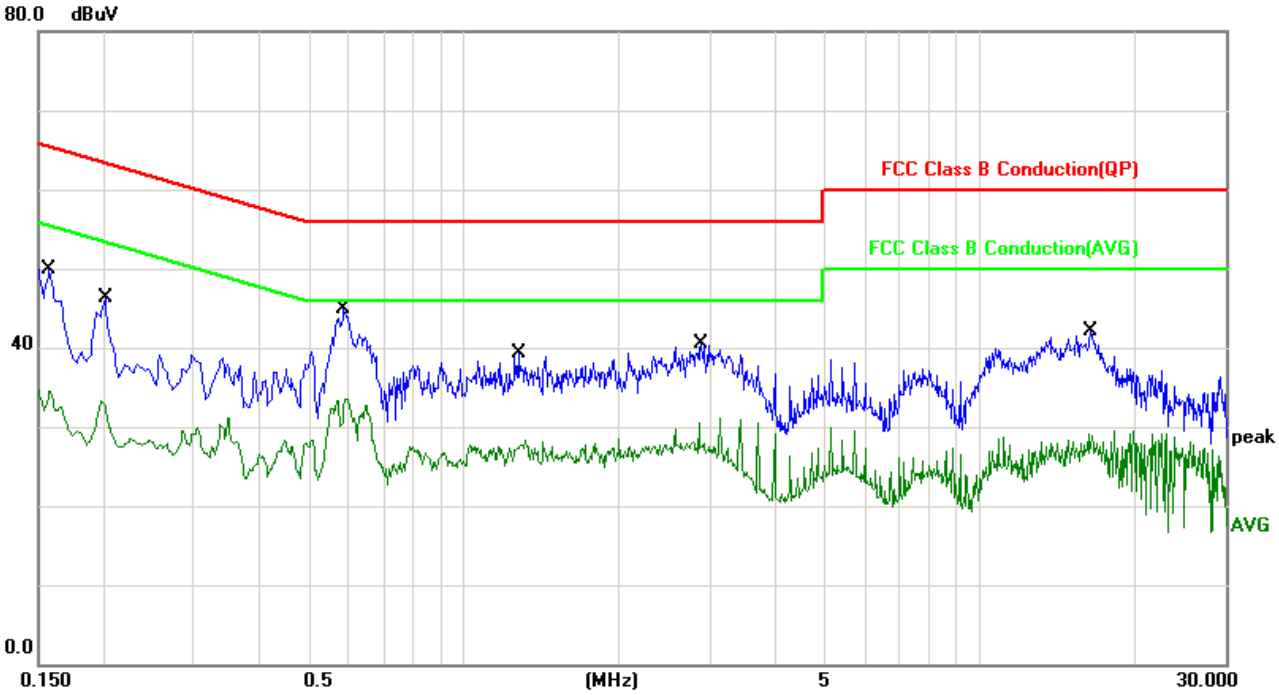
Test Mode :	TX+ Wireless Charging	Phase :	Line
Temperature :	20°C	Humidity:	51%
Pressur(mbar) :	1002	Date:	Jul. 10, 2019



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	10.06	35.45	45.51	65.78	-20.27	QP
2	0.1539	10.06	22.91	32.97	55.78	-22.81	AVG
3	0.1980	10.06	33.58	43.64	63.69	-20.05	QP
4	0.1980	10.06	22.19	32.25	53.69	-21.44	AVG
5	0.3500	9.97	25.80	35.77	58.96	-23.19	QP
6	0.3500	9.97	20.18	30.15	48.96	-18.81	AVG
7	0.5899	9.97	33.36	43.33	56.00	-12.67	QP
8	0.5899	9.97	25.15	35.12	46.00	-10.88	AVG
9	0.6620	10.04	27.09	37.13	56.00	-18.87	QP
10	0.6620	10.04	20.15	30.19	46.00	-15.81	AVG
11	1.1980	10.32	23.04	33.36	56.00	-22.64	QP
12	1.1980	10.32	16.19	26.51	46.00	-19.49	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator

Test Mode :	TX+ Wireless Charging	Phase :	Neutral
Temperature :	20°C	Humidity:	51%
Pressur(mbar) :	1002	Date:	Jul. 10, 2019



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	10.06	35.28	45.34	65.56	-20.22	QP
2	0.1580	10.06	23.96	34.02	55.56	-21.54	AVG
3	0.2020	10.06	31.64	41.70	63.52	-21.82	QP
4	0.2020	10.06	22.57	32.63	53.52	-20.89	AVG
5	0.5860	9.97	33.35	43.32	56.00	-12.68	QP
6	0.5860	9.97	23.57	33.54	46.00	-12.46	AVG
7	1.2820	10.14	23.70	33.84	56.00	-22.16	QP
8	1.2820	10.14	17.47	27.61	46.00	-18.39	AVG
9	2.8940	10.19	24.18	34.37	56.00	-21.63	QP
10	2.8940	10.19	17.05	27.24	46.00	-18.76	AVG
11	16.4260	10.42	24.20	34.62	60.00	-25.38	QP
12	16.4260	10.42	15.46	25.88	50.00	-24.12	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator

6. Test of Radiated Emission

6.1 Test Limit

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205 Section 8.10 table 6 must also comply with the radiated emission limits specified as below.

Radiated Emission Limit (9KHz~1000MHz)

FREQUENCIES(MHz)	FIELD STRENGTH(microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level(uV/m)

6.2 Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

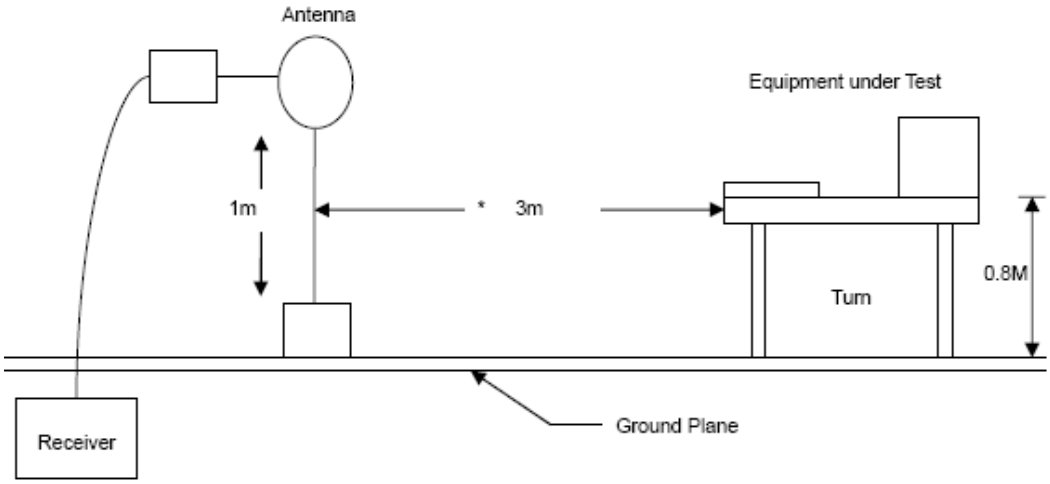
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

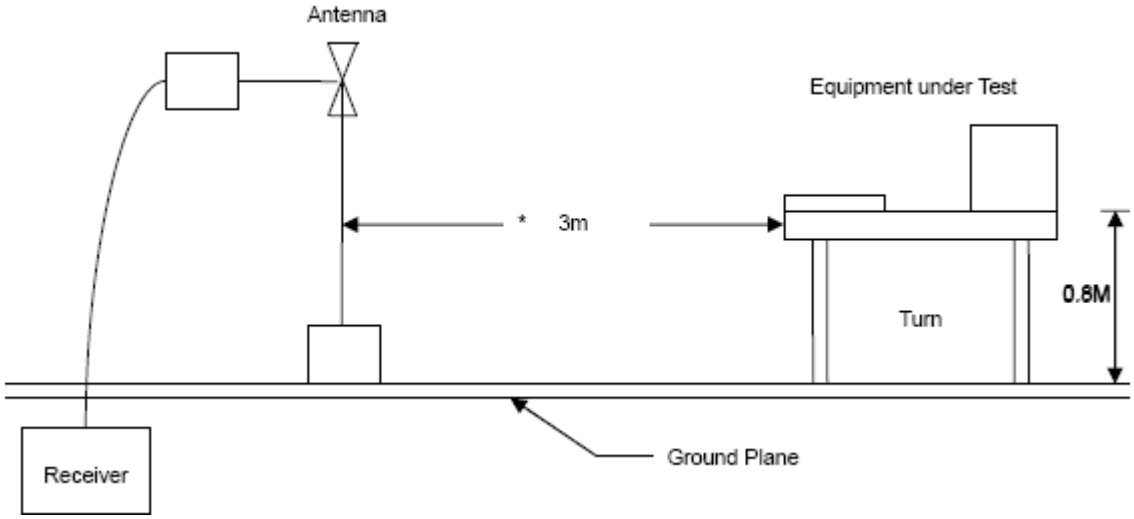
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

6.3 Typical Test Setup

Below 30MHz Test Setup



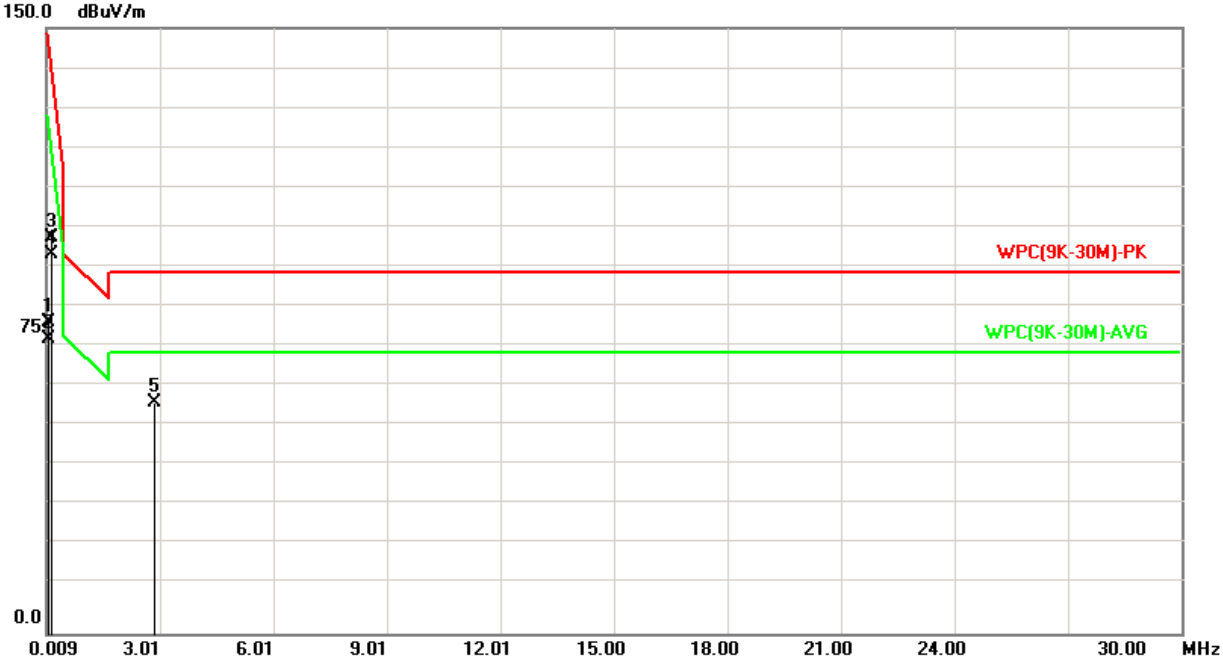
30M - 1GHz Test Setup



6.4 Test Result and Data

9KHz~30MHz

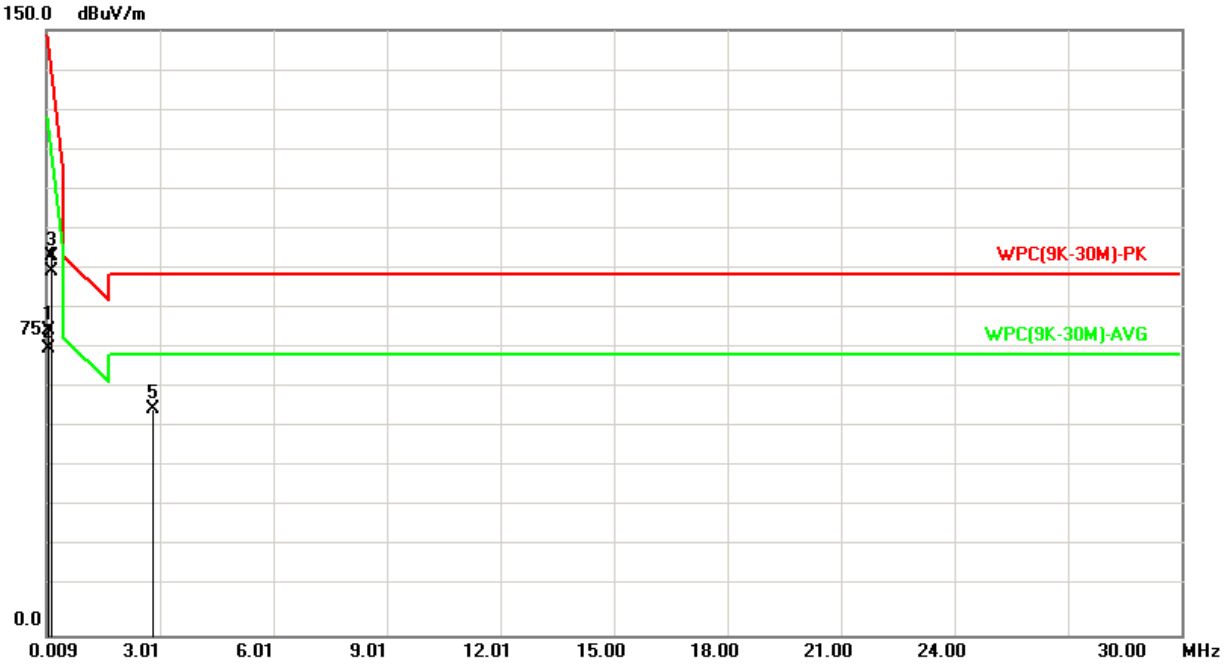
Power	:	AC 120V/60Hz	Temperature	:	23°C
Test Mode	:	TX+ Wireless Charging	Humidity	:	64 %
Test Date	:	Jul. 10, 2019	Polarization	:	X



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0715	20.70	56.37	77.07	130.52	-53.45	peak
2	0.0715	20.70	52.34	73.04	110.52	-37.48	AVG
3	0.1428	20.44	77.54	97.98	124.51	-26.53	peak
4	0.1428	20.44	73.45	93.89	104.51	-10.62	AVG
5	2.8564	20.66	36.51	57.17	89.54	-32.37	QP

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

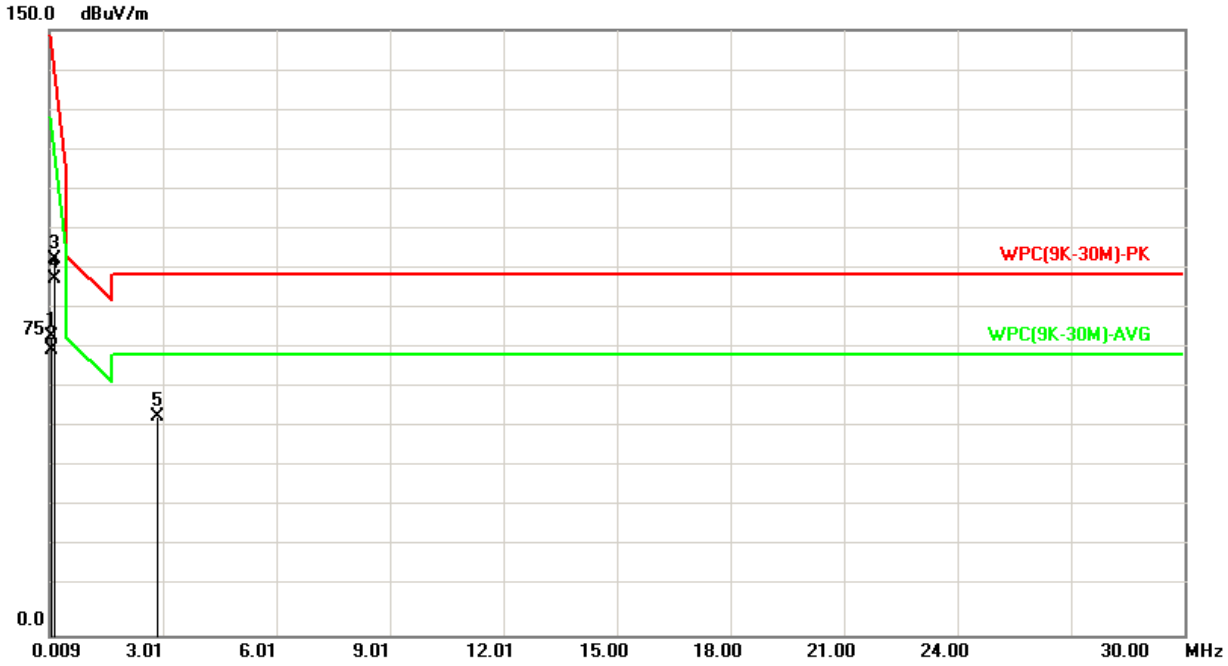
Power	:	AC 120V/60Hz	Temperature	:	23°C
Test Mode	:	TX+ Wireless Charging	Humidity	:	64 %
Test Date	:	Jul. 10, 2019	Polarization	:	Y



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0710	20.70	54.68	75.38	130.58	-55.20	peak
2	0.0710	20.70	50.23	70.93	110.58	-39.65	AVG
3	0.1416	20.45	73.65	94.10	124.58	-30.48	peak
4	0.1416	20.45	69.88	90.33	104.58	-14.25	AVG
5	2.8322	20.67	35.29	55.96	89.54	-33.58	QP

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V/60Hz	Temperature	:	23°C
Test Mode	:	TX+ Wireless Charging	Humidity	:	64 %
Test Date	:	Jul. 10, 2019	Polarization	:	Z

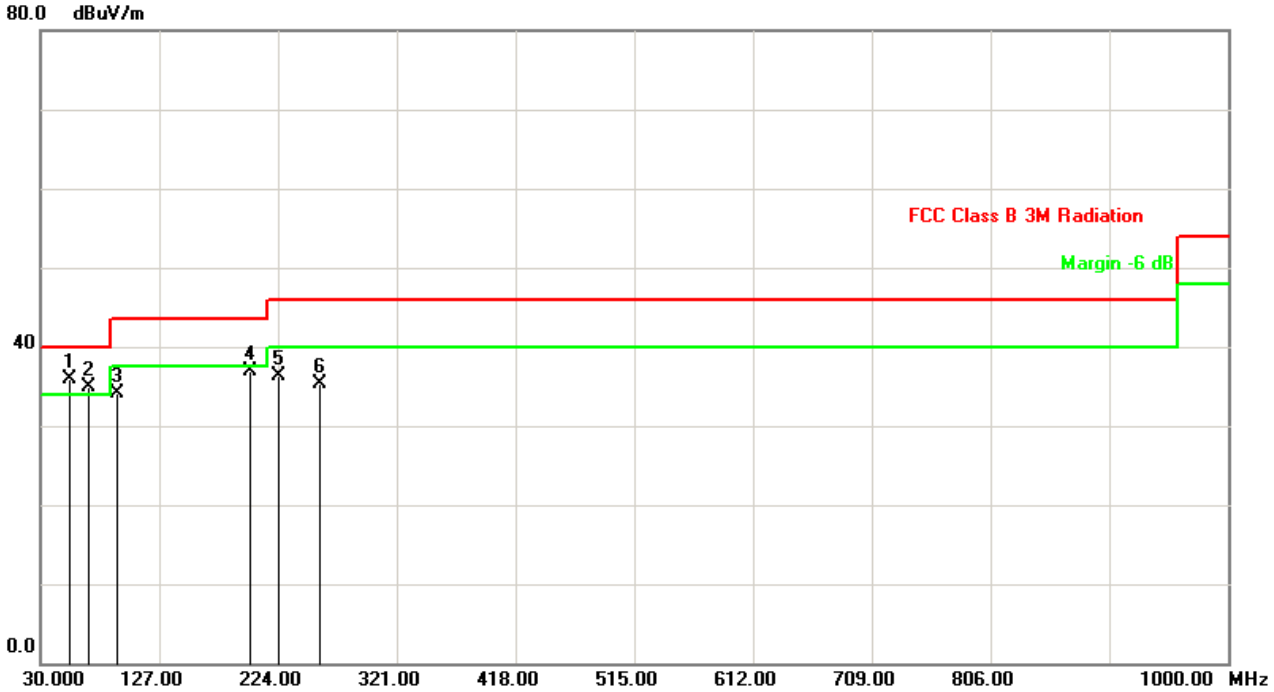


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0716	20.70	53.26	73.96	130.51	-56.55	peak
2	0.0716	20.70	49.97	70.67	110.51	-39.84	AVG
3	0.1432	20.44	72.69	93.13	124.49	-31.36	peak
4	0.1432	20.44	67.95	88.39	104.49	-16.10	AVG
5	2.8641	20.65	33.43	54.08	89.54	-35.46	QP

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

30MHz~1GHz

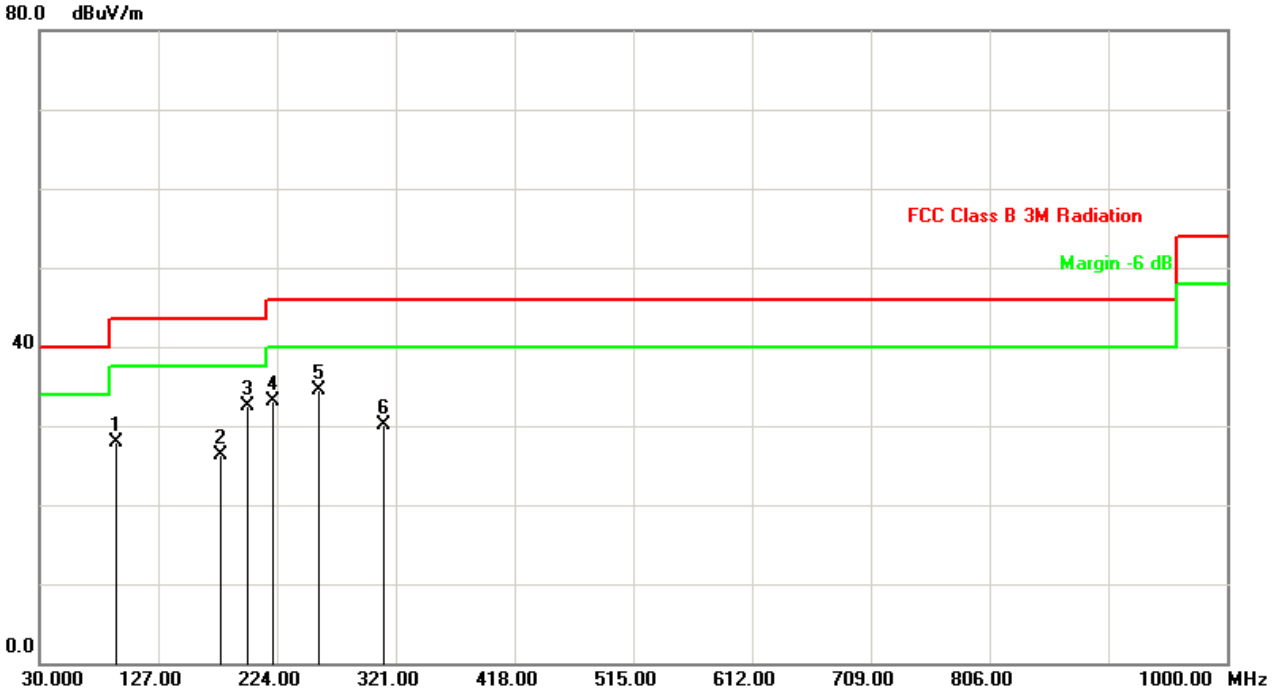
Power	:	AC 120V/60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	TX+ Wireless Charging	Temperature	:	18 °C
Test Date	:	Jul. 10, 2019	Humidity	:	49 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	54.2500	-17.38	53.31	35.93	40.00	-4.07	QP	143	301
2	69.7699	-17.78	52.64	34.86	40.00	-5.14	QP	152	25
3	92.0800	-13.20	47.25	34.05	43.50	-9.45	peak	100	118
4	200.7200	-8.76	45.57	36.81	43.50	-6.69	peak	100	13
5	224.0000	-7.60	43.98	36.38	46.00	-9.62	peak	100	247
6	257.9500	-9.97	45.26	35.29	46.00	-10.71	peak	100	59

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power	:	AC 120V/60Hz	Pol/Phase	:	HORIZONTAL
Test Mode	:	TX+ Wireless Charging	Temperature	:	18 °C
Test Date	:	Jul. 10, 2019	Humidity	:	49 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	93.0500	-13.00	40.83	27.83	43.50	-15.67	peak	100	62
2	178.4100	-10.09	36.49	26.40	43.50	-17.10	peak	200	130
3	199.7500	-9.80	42.35	32.55	43.50	-10.95	peak	100	57
4	221.0900	-8.51	41.64	33.13	46.00	-12.87	peak	200	128
5	257.9500	-5.97	40.43	34.46	46.00	-11.54	peak	300	19
6	311.3000	-10.02	40.19	30.17	46.00	-15.83	peak	100	316

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

---------- End of the report ----------