

Prüfbericht-Nr.: <i>Test report no.:</i>	CN222MMF 001	Auftrags-Nr.: <i>Order no.:</i>	168357898	Seite 1 von 22 Page 1 of 22
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-01-20	
Auftraggeber: <i>Client:</i>	SRP Companies 85 Rio Grande Drive, SECOND FLOOR CASTLE ROCK, Colorado, 80104 United States			
Prüfgegenstand: <i>Test item:</i>	Wireless charger			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	EPB-17031-B			
Auftrags-Inhalt: <i>Order content:</i>	Type test			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart C Section 15.215			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-01-21	Refer to photos document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003197305-029 A003206679-014~015			
Prüfzeitraum: <i>Testing period:</i>	2022-04-21 – 2022-04-24			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2022-05-06				
	Signed by: Alex Lan		Signed by: Winnie Hou	
Stellung / Position	Senior Project Engineer	Ausstellungsdatum: <i>Issue date:</i> 2022-05-09	Stellung / Position Department Manager	
Sonstiges / Other:	FCC ID: 2ATF51604861			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>			
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 99% BANDWIDTH

RESULT: Pass

5.1.3 20dB BANDWIDTH

RESULT: Pass

5.1.4 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.5 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China

FCC Registration No.: CN1260

IC Registration No.: 25069 and the CAB identifier is CN0078.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Radio Spectrum Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
Signal Analyzer	Rohde & Schwarz	FSV 40	101441	2022-08-09
OSP	Rohde & Schwarz	OSP 150	101017	2022-12-02
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	Rohde & Schwarz	WMS32 (V10.40.10)	N/A	N/A
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09
Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

Conducted Emission				
Description	Manufacturer	Model	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102428	2022-08-10
Artificial Mains Network	R&S	ENV216	102333	2022-08-10
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Parameter	Uncertainty
Radiated Emission, valid up to 26.5 GHz	±6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	±3.70 dB / ±3.30 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a **Wireless charger** which supports wireless charging function.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Wireless charger
Type Designation	EPB-17031-B
Operating Voltage	DC 5V, 2A or DC 9V, 1.67A via USB port
Testing Voltage	AC 120V, 60Hz
Technical Specification of WPT	
Operating Frequency	111-205KHz
Modulation	FSK
Antenna Type	Induction Coil Antenna
Antenna Gain	0 dBi
Antenna number	1
Wireless Charger output power	Max. 10W

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Wireless charging
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- User Manual

- ID Label and Location Info

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	Salcomp	S11C02	143801627408	Input: 100-240V, 50/60Hz, 450mA Output: DC 5V, 2.1A or DC 9V, 2A
Adapter	HUAWEI	HW-100400C01	N/A	Input: 100-240V, 50/60Hz, 1.2A Output: DC 5V, 2.A or DC 9V, 2A or DC 10V, 4A
Dummy Load	N/A	N/A	N/A	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

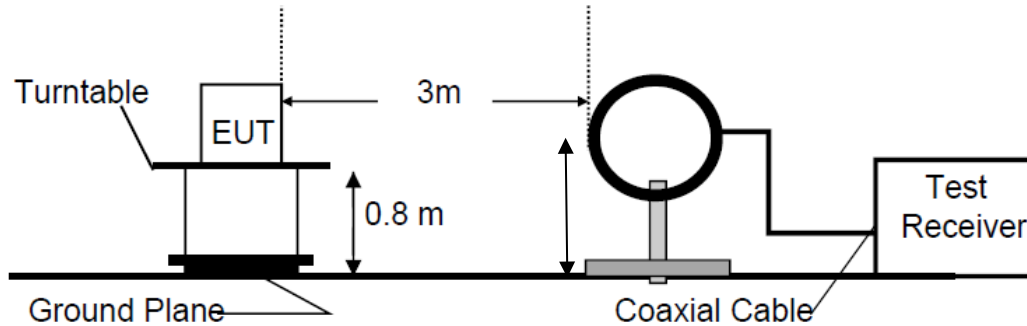


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

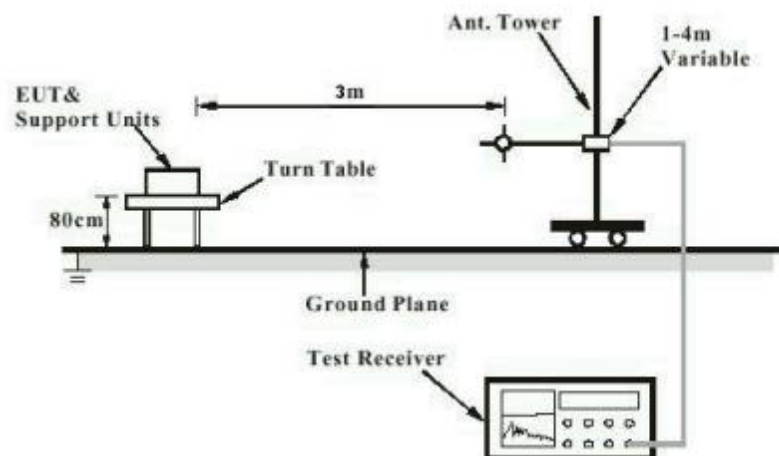
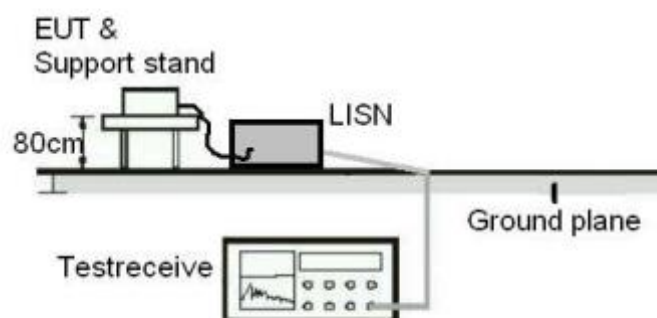


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : Part 15.203

According to the manufacturer declared, the EUT has an internal antenna, and the antenna is permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 99% Bandwidth

RESULT:

Pass

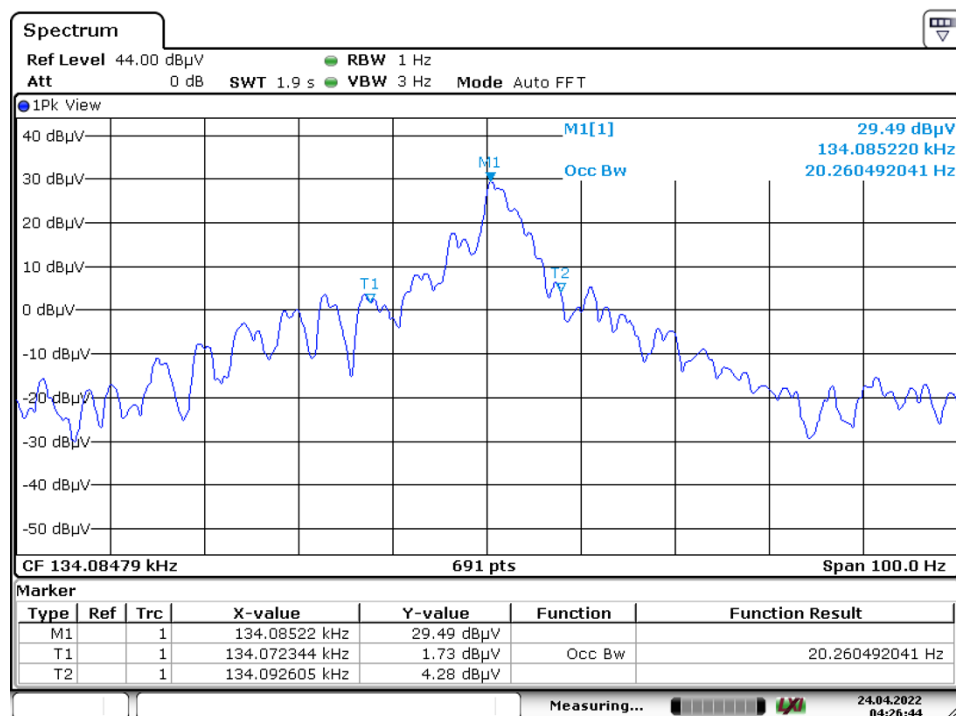
Test Specification

Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-04-24
Input voltage : AC 120V, 60Hz
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 45 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the following test plots.



Date: 24.APR.2022 04:26:44

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5.1.3 20dB Bandwidth

RESULT:

Pass

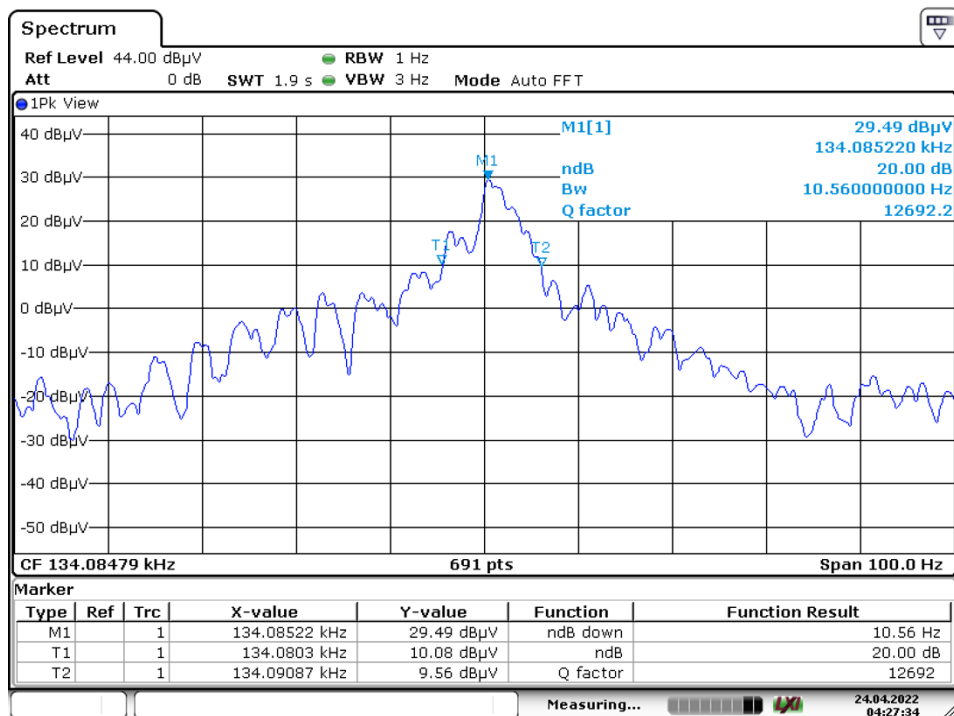
Test Specification

Test standard : FCC Part 15.215(c)
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-04-24
Input voltage : AC 120V, 60Hz
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 45 %
Atmospheric pressure : 101 kPa

For details refer to following test result.



Date: 24.APR.2022 04:27:35

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5.1.4 Radiated Spurious Emission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.209 & 15.205
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a)
Kind of test site	: 3m Semi-anechoic Chamber

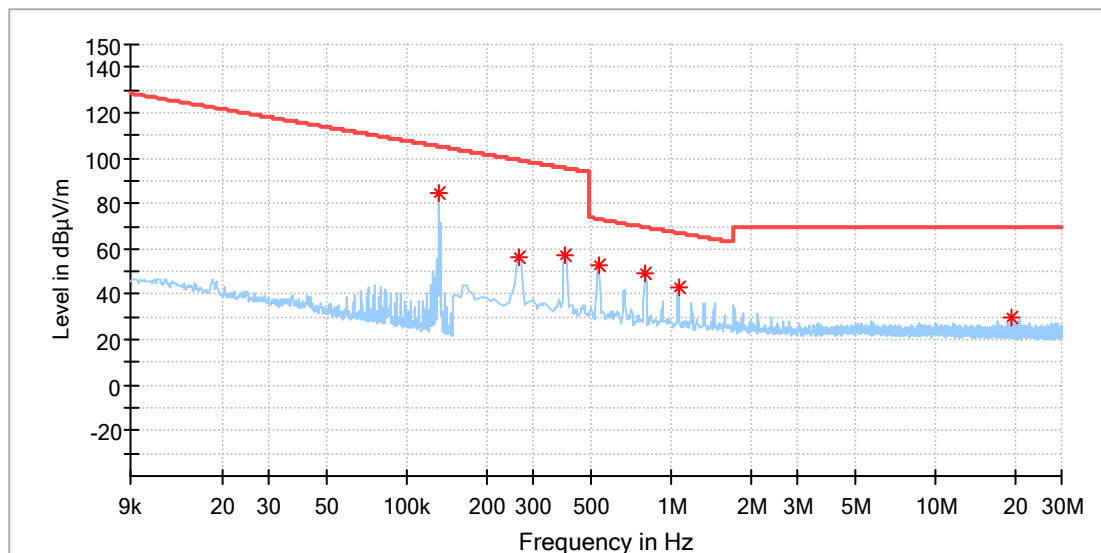
Test Setup

Date of testing	: 2022-04-21 – 2022-04-24
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 23 °C
Relative humidity	: 58 %
Atmospheric pressure	: 101 kPa

Refer to following test plots for details of test result.

EUT Information

EUT Name:	Wireless Charger
Model:	EPB-17031-B
Test Mode:	Charging
Order No/Sample No:	168357898/A003197305-029
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:58%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

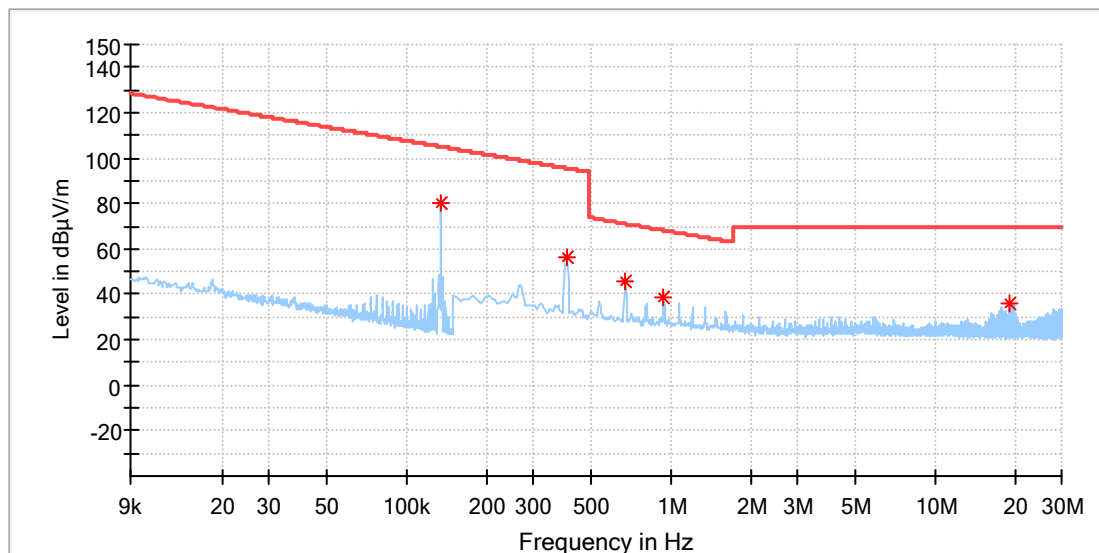


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.132274	85.04	105.17	20.13	100.0	X	112.0	20.1
0.264133	56.40	99.17	42.76	100.0	X	116.0	20.1
0.395824	57.39	95.65	38.26	100.0	X	130.0	20.1
0.531905	53.02	73.09	20.07	100.0	X	138.0	20.1
0.799677	49.46	69.56	20.10	100.0	X	134.0	20.1
1.063059	43.19	67.09	23.91	100.0	X	123.0	20.1
19.284728	29.63	69.50	39.87	100.0	X	281.0	20.6

EUT Information

EUT Name:	Wireless Charger
Model:	EPB-17031-B
Test Mode:	Charging
Order No/Sample No:	168357898/A003197305-029
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:58%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

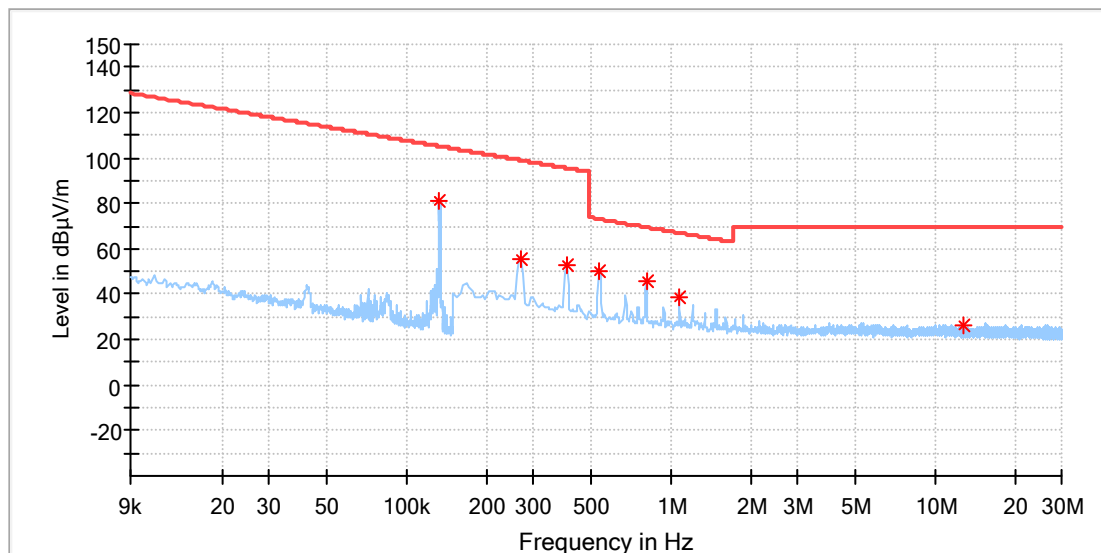


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.134087	80.32	105.05	24.73	100.0	Y	208.0	20.1
0.400213	56.21	95.56	39.35	100.0	Y	206.0	20.1
0.672375	45.71	71.06	25.35	100.0	Y	220.0	20.1
0.940147	38.84	68.16	29.32	100.0	Y	231.0	20.1
19.218882	36.10	69.50	33.40	100.0	Y	332.0	20.6

EUT Information

EUT Name: Wireless Charger
Model: EPB-17031-B
Test Mode: Charging
Order No/Sample No: 168357898/A003197305-029
Test Voltage:: AC 120V/60Hz
Remark: Temp 23 Humi:58%
Test Standard: FCC Part 15C
Tested By: Kei Zhang
Reviewed By: Terry Yin

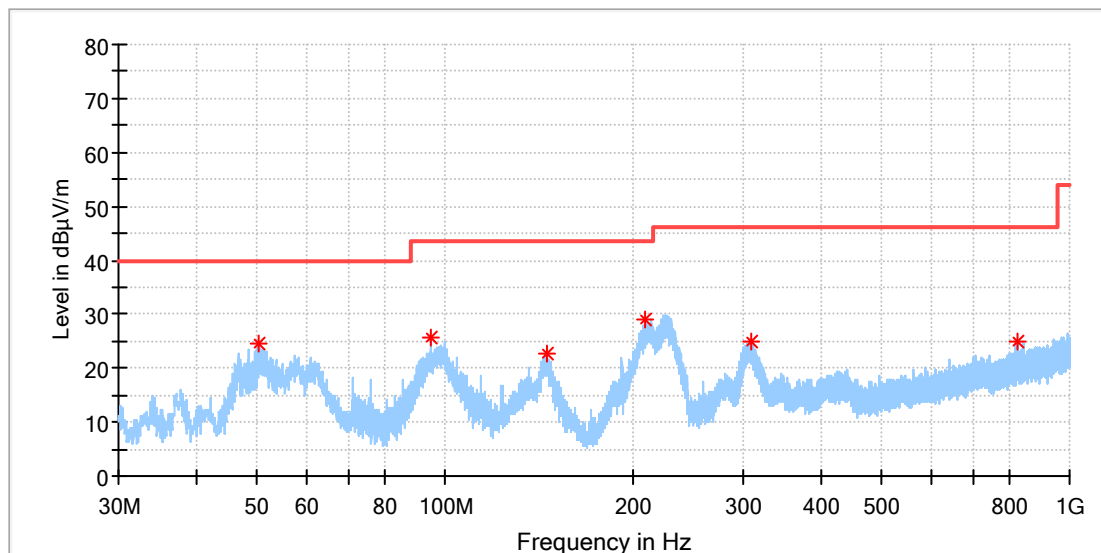


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.132979	80.65	105.12	24.47	100.0	Z	136.0	20.1
0.268522	55.19	99.02	43.83	100.0	Z	120.0	20.1
0.400213	52.68	95.56	42.88	100.0	Z	159.0	20.1
0.536294	50.33	73.02	22.69	100.0	Z	148.0	20.1
0.804066	45.50	69.51	24.01	100.0	Z	123.0	20.1
1.076228	38.26	66.99	28.73	100.0	Z	127.0	20.1
12.779184	26.48	69.50	43.02	100.0	Z	141.0	20.5

EUT Information

EUT Name:	Wireless Charger
Model:	EPB-17031-B
Test Mode:	Charging
Order No/Sample No:	168357898/A003197305-029
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:58%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

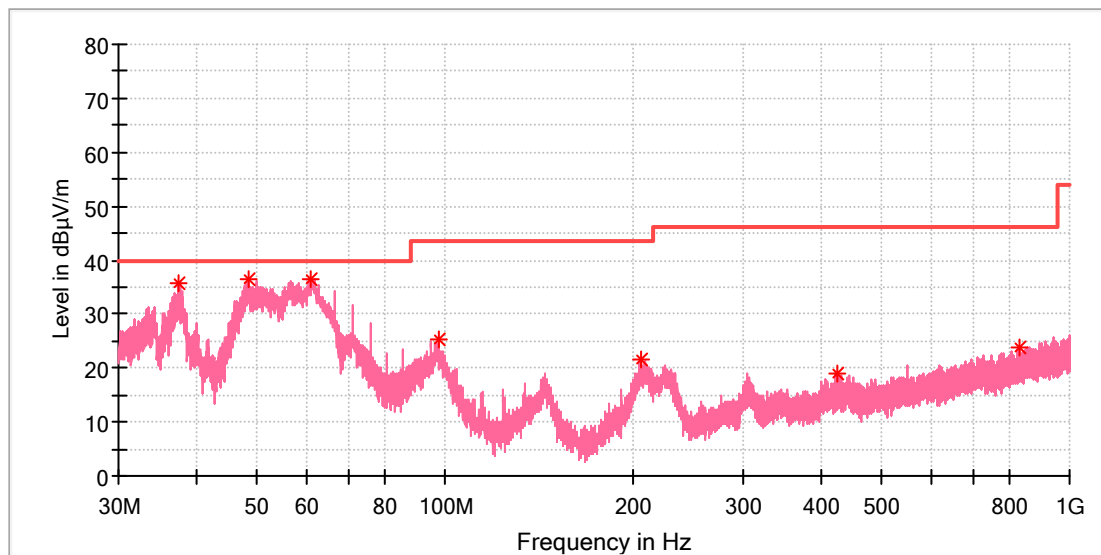


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.220769	24.45	40.00	15.55	100.0	H	0.0	-18.6
94.952692	25.77	43.50	17.73	100.0	H	199.0	-20.1
145.840385	22.56	43.50	20.94	100.0	H	282.0	-22.6
208.629231	29.16	43.50	14.34	100.0	H	299.0	-19.2
309.471923	24.82	46.00	21.18	100.0	H	152.0	-16.4
823.348077	24.80	46.00	21.20	100.0	H	130.0	-6.3

EUT Information

EUT Name: Wireless Charger
Model: EPB-17031-B
Test Mode: Charging
Order No/Sample No: 168357898/A003197305-029
Test Voltage:: AC 120V/60Hz
Remark: Temp 23 Humi:58%
Test Standard: FCC Part 15C
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.573462	35.88	40.00	4.12	100.0	V	0.0	-21.2
48.355385	36.61	40.00	3.39	100.0	V	287.0	-18.7
60.816154	36.57	40.00	3.43	100.0	V	287.0	-19.5
97.452308	25.17	43.50	18.33	100.0	V	31.0	-19.7
206.092308	21.45	43.50	22.05	100.0	V	241.0	-19.2
425.424231	19.08	46.00	26.92	100.0	V	178.0	-13.7
833.645000	23.82	46.00	22.18	100.0	V	154.0	-6.1

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5.1.5 Conducted Emission on AC Mains

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.207
Basic standard	: ANSI C63.10: 2013
Frequency range	: 150KHz - 30MHz
Limits	: FCC Part 15.207(a)
Kind of test site	: Shielded Room

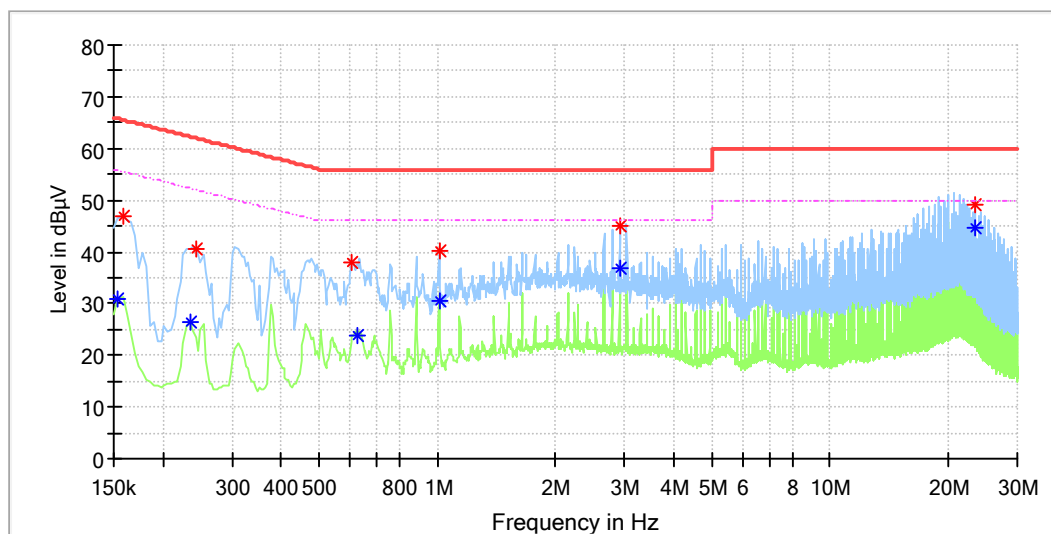
Test Setup

Date of testing	: 2022-04-21 – 2022-04-24
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Earthing	: Not connected
Ambient temperature	: 23.1 °C
Relative humidity	: 52 %
Atmospheric pressure	: 101 kPa

Refer to following test plots for details of test result.

EUT Information

EUT Name: Wireless Charger
Model: EPB-17031-B
Test Mode: On, charging max 10W
Test Voltage: AC 120V/60Hz
Test By: Richard Lin
Review By: Gary Chen
Remark: SR1

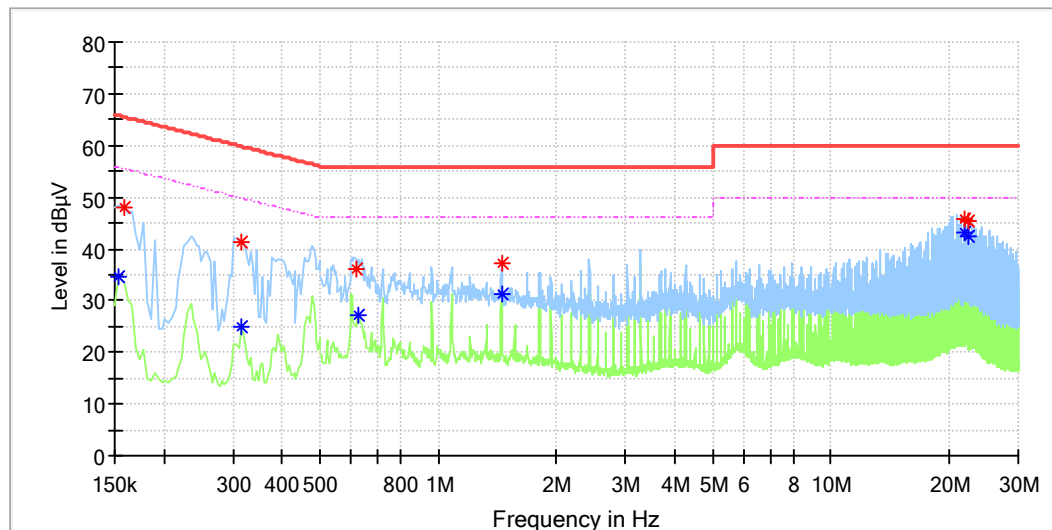


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	30.88	55.78	24.90	L1	9.6
0.158000	46.91	---	65.57	18.66	L1	9.6
0.234000	---	26.31	52.31	26.00	L1	9.6
0.242000	40.62	---	62.03	21.41	L1	9.6
0.604000	38.08	---	56.00	17.92	L1	9.7
0.628000	---	23.81	46.00	22.19	L1	9.7
1.012000	40.14	---	56.00	15.86	L1	9.7
1.016000	---	30.55	46.00	15.45	L1	9.7
2.912000	---	36.90	46.00	9.10	L1	9.9
2.912000	45.10	---	56.00	10.90	L1	9.9
23.540000	49.04	---	60.00	10.96	L1	10.4
23.540000	---	44.60	50.00	5.40	L1	10.4

EUT Information

EUT Name: Wireless Charger
Model: EPB-17031-B
Test Mode: On, charging max 10W
Test Voltage: AC 120V/60Hz
Test By: Richard Lin
Review By: Gary Chen
Remark: SR1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	34.57	55.78	21.21	N	9.6
0.158000	48.12	---	65.57	17.45	N	9.6
0.314000	41.31	---	59.86	18.55	N	9.6
0.314000	---	24.92	49.86	24.94	N	9.6
0.620000	36.21	---	56.00	19.79	N	9.7
0.624000	---	27.30	46.00	18.70	N	9.7
1.448000	---	31.40	46.00	14.60	N	9.7
1.448000	37.28	---	56.00	18.72	N	9.7
21.864000	45.61	---	60.00	14.39	N	10.3
21.864000	---	43.18	50.00	6.82	N	10.3
22.484000	45.34	---	60.00	14.66	N	10.4
22.484000	---	42.59	50.00	7.41	N	10.4

6 Photographs of the Test Set-Up

Refer to test photo document.

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