

FCC Test Report

Product Name	Wireless Charger
Model No.	PD100CS
FCC ID.	MSQ-PD100-80AH

Applicant	ASUSTeK COMPUTER INC.
Address	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

Date of Receipt	Mar. 21, 2021
Issued Date	May 10, 2021
Report No.	2130835R-E3032110102
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: May 10, 2021

Report No.: 2130835R-E3032110102



Product Name	Wireless Charger
Applicant	ASUSTeK COMPUTER INC.
Address	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Manufacturer	ASUSTeK COMPUTER INC.
Model No.	PD100CS
FCC ID.	MSQ-PD100-80AH
EUT Rated Voltage	AC 100-240~50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By

:

Jinn Chen

(Senior Adm. Specialist / Jinn Chen)

Tested By

:

Bill Lin

(Senior Engineer / Bill Lin)

Approved By

:



(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

Revision History

Report No.	Version	Description	Issued Date
2130835R-E3032110102	V1.0	Initial issue of report.	May 10, 2021

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Charger
Trade Name	ASUS
Model No.	PD100CS
FCC ID.	MSQ-PD100-80AH
Frequency Range	111kHz-205kHz
Type of Modulation	ASK
Type of antenna	Coil Antenna
Power Adapter	MFR: LEADER, M/N: MU10AE050200UA1 Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2.0A
Fruit and Vegetable Cleanliness Detector	MFR: ASUS, M/N: PD100

Note:

1. The EUT is a Wireless Charger with a built-in 111kHz-205kHz transceiver.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
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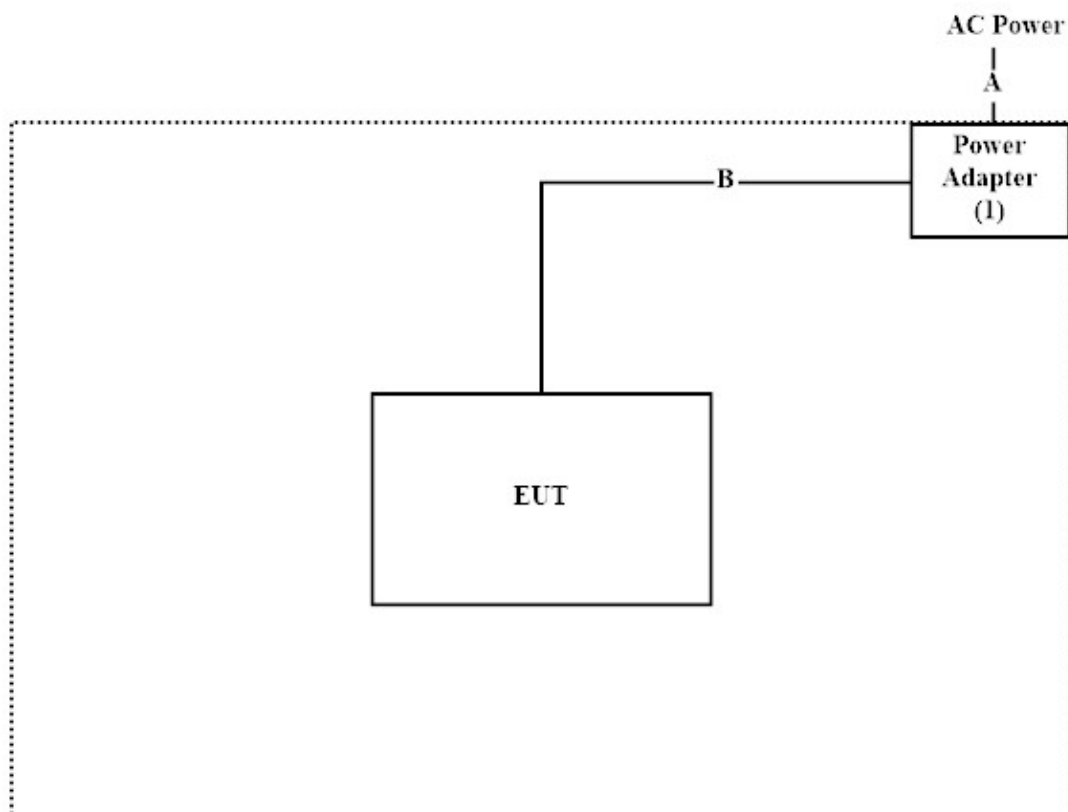
1.2. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Power Adapter	LEADER	MU10AE050200UA1	N/A	N/A

Signal Cable Type	Signal cable Description
A USB Cable	Non-shielded, 1.2m
B Power Cable	Non-shielded, 1.8m

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3.
- (2) Provide power to the EUT.
- (3) Start the continuous transmitter.
- (4) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23.8 °C
	Humidity (%RH)	10~90 %	59.9 %
Radiated Emission	Temperature (°C)	10~40 °C	24.5 °C
	Humidity (%RH)	10~90 %	58.4 %

USA : FCC Registration Number: TW0023

Canada : IC Registration Number: 25880

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No.159, Sec. 2, Wenhua 1st Rd., Linkou Dist.,
New Taipei City 24457, Taiwan, R.O.C.

Phone number : 886-2-2602-7968
Fax number : 866-2-2602-3286
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021.01.04	2022.01.03
X	Two-Line V-Network	R&S	ENV216	101306	2021.04.08	2022.04.07
X	Two-Line V-Network	R&S	ENV216	101307	2020.04.17	2021.04.16
X	Coaxial Cable	DEKRA	RG400_BNC	RF001	2020.05.24	2021.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

For Radiated measurements /ACB1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Loop Antenna	AMETEK	HLA6121	49611	2021.03.16	2022.03.15
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-953	2021.01.29	2022.01.28
	Horn Antenna	ETS-Lindgren	3117	00203800	2020.12.22	2021.12.21
	Horn Antenna	Com-Power	AH-840	101087	2020.06.08	2021.06.07
X	Pre-Amplifier	EMCI	EMC001330	980316	2020.06.23	2021.06.22
	Pre-Amplifier	EMCI	EMC051835SE	980311	2020.06.23	2021.06.22
	Pre-Amplifier	EMCI	EMC05820SE	980310	2020.06.24	2021.06.23
	Pre-Amplifier	EMCI	EMC184045SE	980314	2020.06.10	2021.06.09
	Filter	MICRO TRONICS	BRM50702	G251	2020.09.17	2021.09.16
	Filter	MICRO TRONICS	BRM50716	G188	2020.09.17	2021.09.16
X	EMI Test Receiver	R&S	ESR7	101602	2021.02.25	2022.02.24
X	Spectrum Analyzer	R&S	FSV40	101894	2021.03.10	2022.03.09
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2020.07.03	2021.07.02
	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2020.06.10	2021.06.09

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

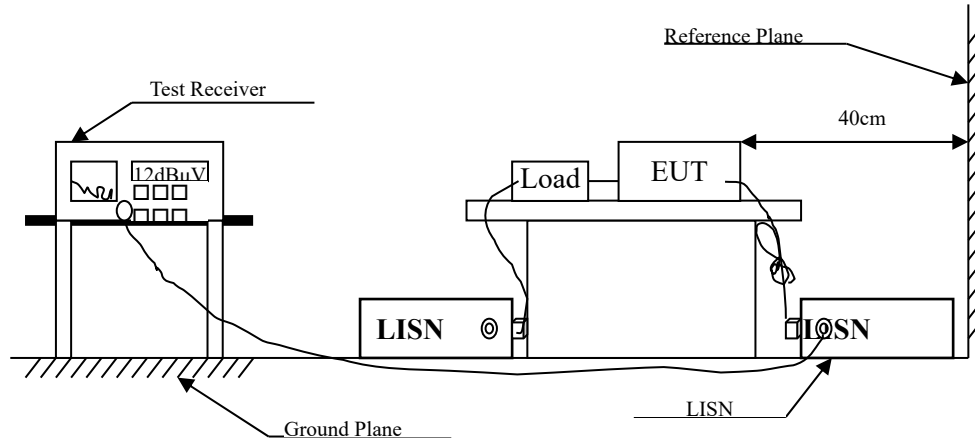
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56 _(註)	56-46 _(註)
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

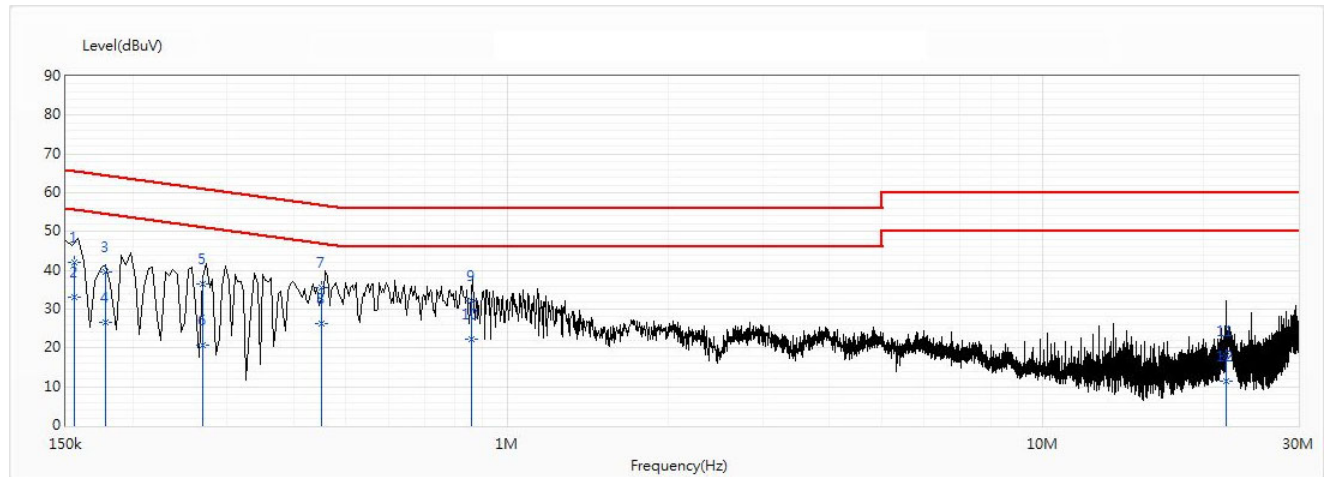
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Test Result of Conducted Emission

Product : Wireless Charger
 Test Item : Conducted Emission Test
 Power Line : L 1
 Test Mode : Mode 1: Transmit
 Test Date : 2020/08/17

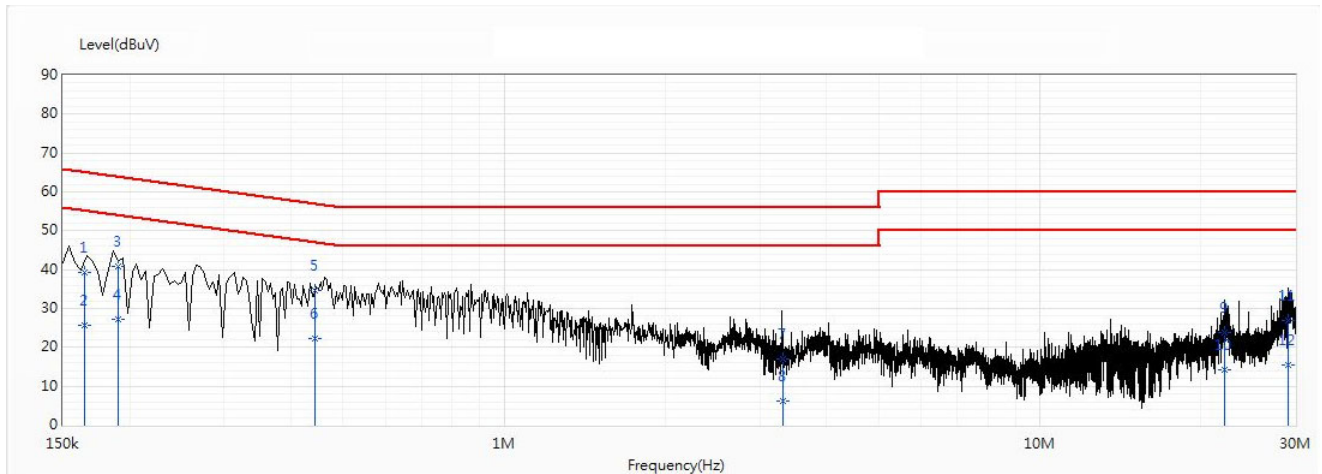


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.156	42.18	65.69	-23.52	32.52	9.66	QP
2	0.156	33.20	55.69	-22.49	23.54	9.66	AV
3	0.178	39.71	64.57	-24.86	30.05	9.65	QP
4	0.178	26.59	54.57	-27.98	16.94	9.65	AV
5	0.27	36.41	61.12	-24.71	26.76	9.65	QP
6	0.27	20.84	51.12	-30.28	11.19	9.65	AV
7	0.451	35.44	56.86	-21.42	25.79	9.66	QP
*8	0.451	26.39	46.86	-20.47	16.73	9.66	AV
9	0.859	32.25	56.00	-23.75	22.57	9.68	QP
10	0.859	22.18	46.00	-23.82	12.50	9.68	AV
11	21.974	18.09	60.00	-41.91	8.13	9.96	QP
12	21.974	11.32	50.00	-38.68	1.35	9.96	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless Charger
 Test Item : Conducted Emission Test
 Power Line : N
 Test Mode : Mode 1: Transmit
 Test Date : 2020/08/17



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.165	39.21	65.22	-26.01	29.54	9.67	QP
2	0.165	25.82	55.22	-29.40	16.15	9.67	AV
3	0.19	40.93	64.04	-23.11	31.26	9.67	QP
4	0.19	27.19	54.04	-26.85	17.52	9.67	AV
*5	0.443	34.63	57.00	-22.37	24.96	9.67	QP
6	0.443	22.38	47.00	-24.61	12.71	9.67	AV
7	3.307	17.01	56.00	-38.99	7.24	9.77	QP
8	3.307	6.18	46.00	-39.82	-3.59	9.77	AV
9	22.163	23.73	60.00	-36.27	13.67	10.06	QP
10	22.163	14.09	50.00	-35.91	4.03	10.06	AV
11	29.098	26.96	60.00	-33.04	16.87	10.09	QP
12	29.098	15.34	50.00	-34.66	5.24	10.09	AV

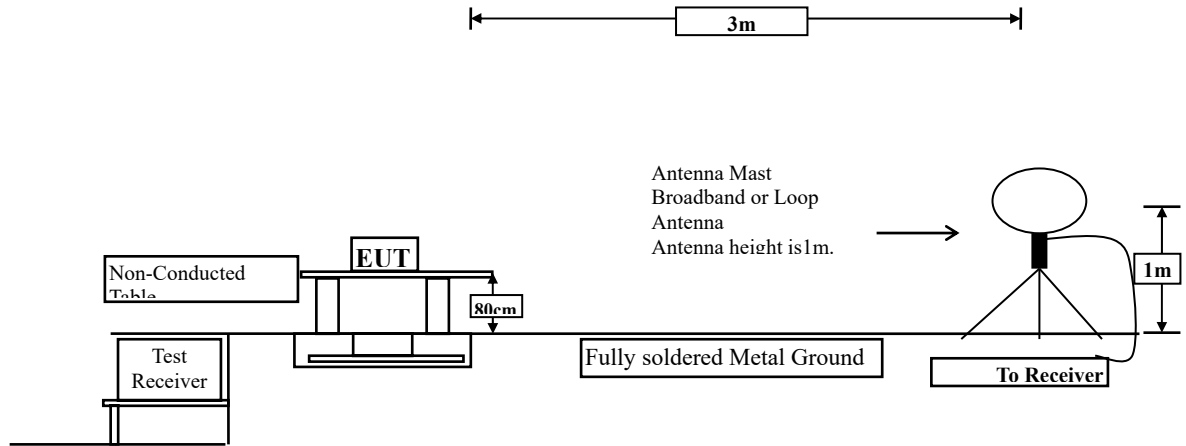
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

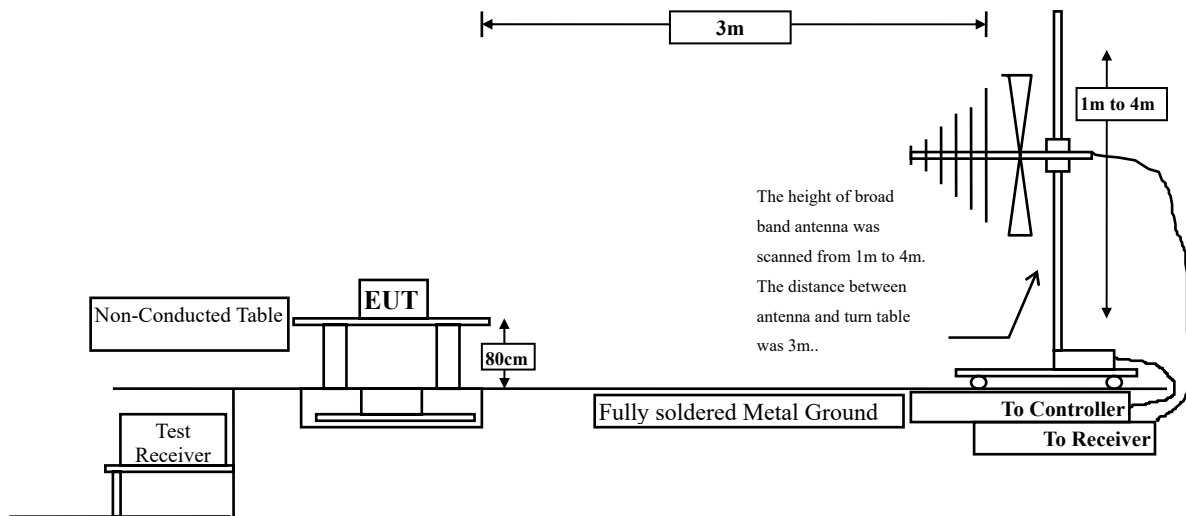
3. Radiated Emission

3.1. Test Setup

Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



3.2. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks :

1. RF Voltage (dB μ V) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.209 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz. Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

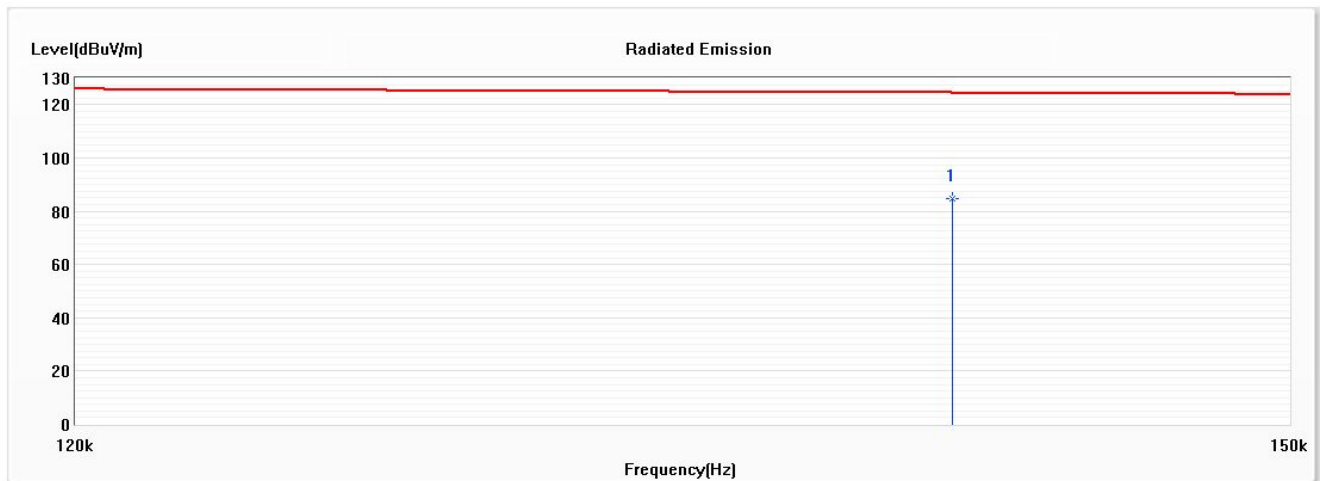
The worst radiated emission is measured on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

Horizontal



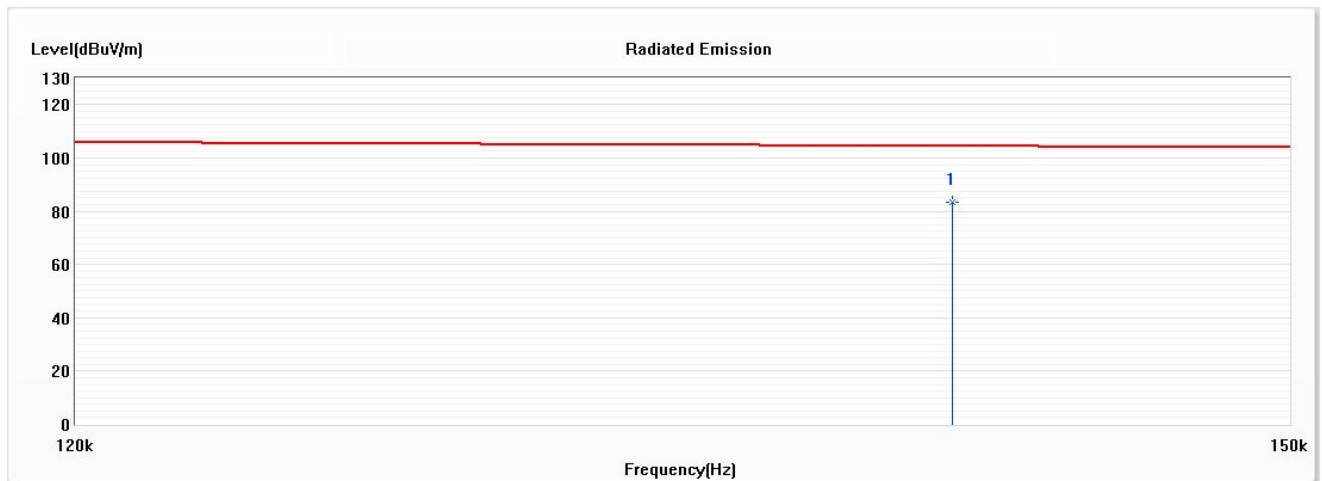
No	Frequency (MHz)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB)	Detector Type
* 1	0.141	84.90	124.62	-39.72	64.96	19.94	PK

Note:

1. The reading levels are peak values.
2. Measurement Level = Reading Level + Correct Factor.

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

Horizontal



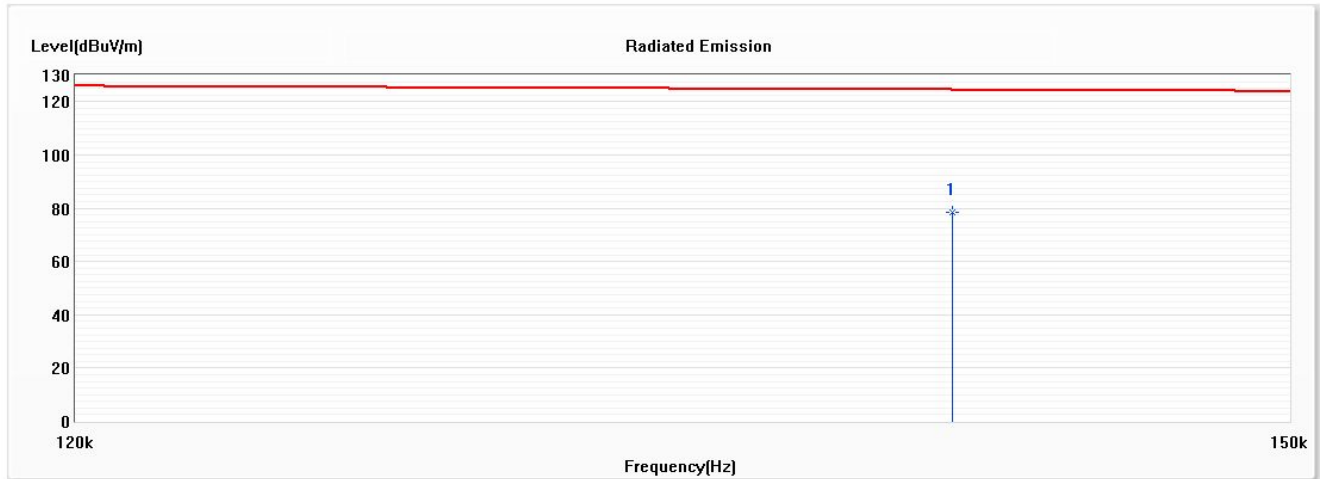
No	Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Reading Level (dB μ V)	Correct Factor (dB)	Detector Type
* 1	0.141	83.20	104.62	-21.42	63.26	19.94	AV

Note:

1. The reading levels are Average values.
2. Measurement Level = Reading Level + Correct Factor.

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

Vertical



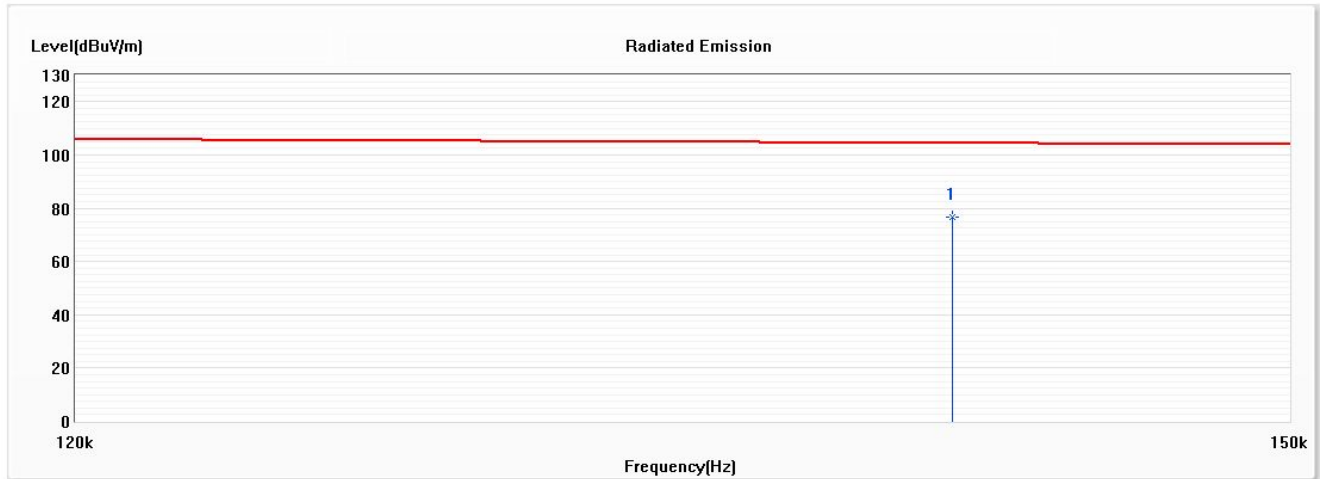
No	Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Reading Level (dB μ V)	Correct Factor (dB)	Detector Type
* 1	0.141	78.60	124.62	-46.02	58.66	19.94	PK

Note:

1. The reading levels are Average values.
2. Measurement Level = Reading Level + Correct Factor.

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

Vertical



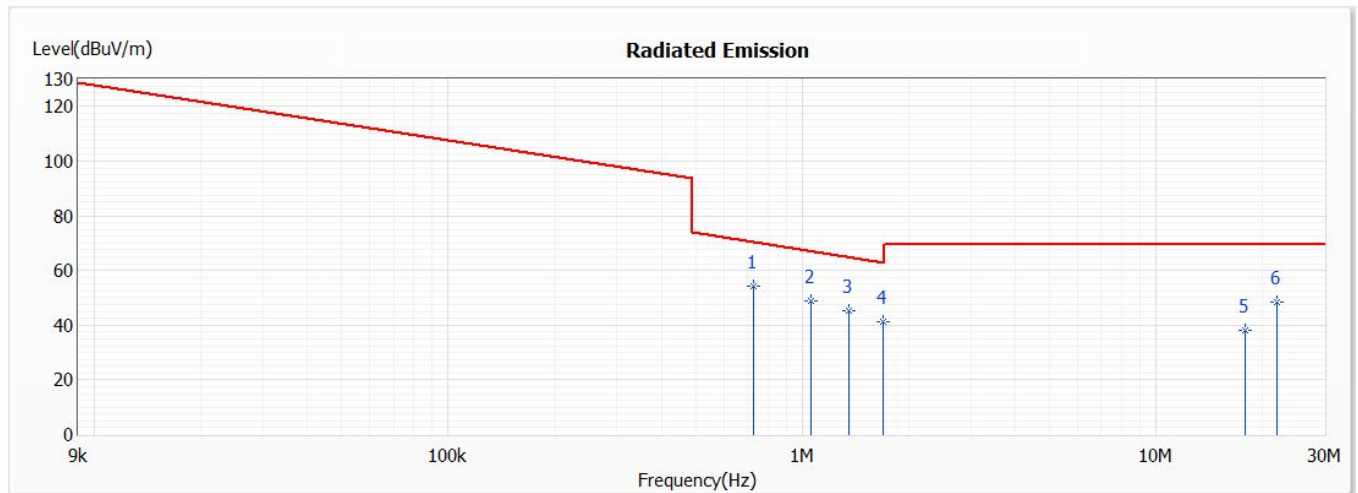
No	Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Reading Level (dB μ V)	Correct Factor (dB)	Detector Type
* 1	0.141	76.80	104.62	-27.82	56.86	19.94	AV

Note:

1. The reading levels are Average values.
2. Measurement Level = Reading Level + Correct Factor.

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2021/04/27
 Test Mode : Mode 1: Transmit

9kHz~30MHz_Horizontal



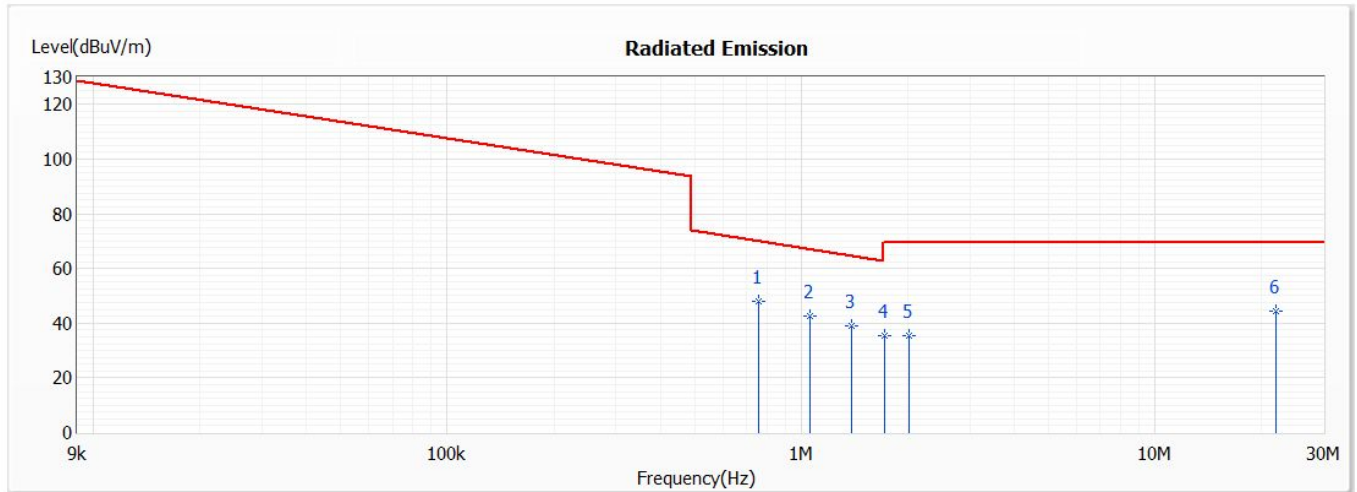
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	0.729	54.46	70.36	-15.90	34.39	20.07	QP
2	1.059	49.02	67.12	-18.11	28.94	20.08	QP
3	1.359	45.17	64.96	-19.80	25.09	20.08	QP
4	1.688	41.43	63.08	-21.65	21.34	20.09	QP
5	17.944	38.19	69.54	-31.35	18.32	19.87	QP
6	22.022	48.54	69.54	-21.00	28.83	19.71	QP

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Charger
 Test Item : Radiated Emission
 Test date : 2021/04/27
 Test Mode : Mode 1: Transmit

9kHz~30MHz_Vertical



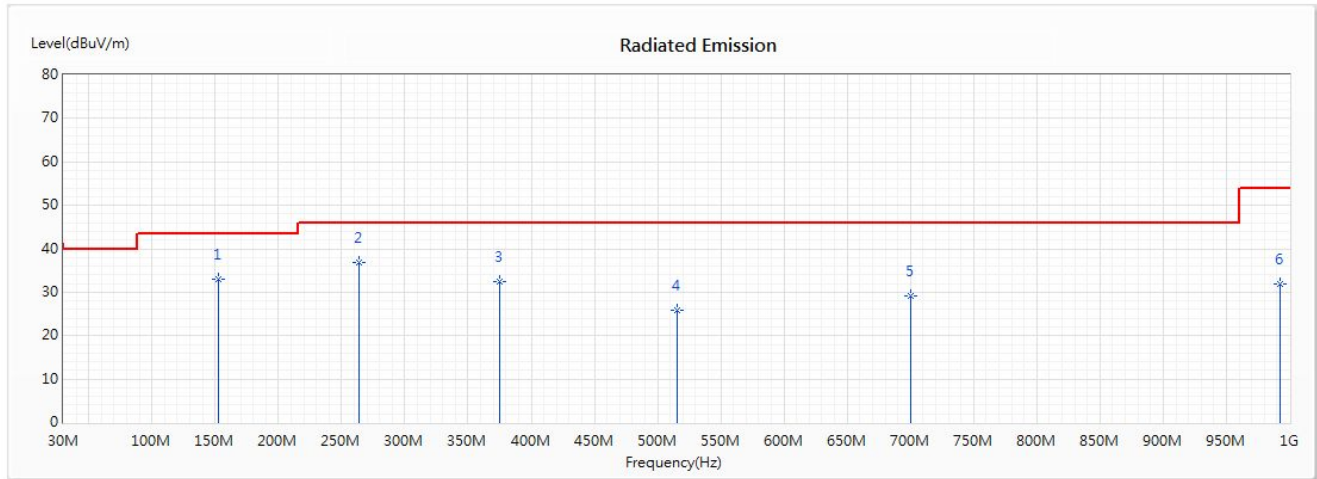
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	0.759	47.95	70.01	-22.06	27.87	20.08	QP
2	1.059	42.50	67.12	-24.62	22.42	20.08	QP
3	1.389	38.99	64.77	-25.79	18.91	20.08	QP
4	1.718	35.35	69.54	-34.19	15.26	20.09	QP
5	2.018	35.55	69.54	-33.99	15.46	20.09	QP
6	22.022	44.60	69.54	-24.94	24.89	19.71	QP

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. “*” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Charger
 Test Item : General Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

30MHz~1GHz_Horizontal



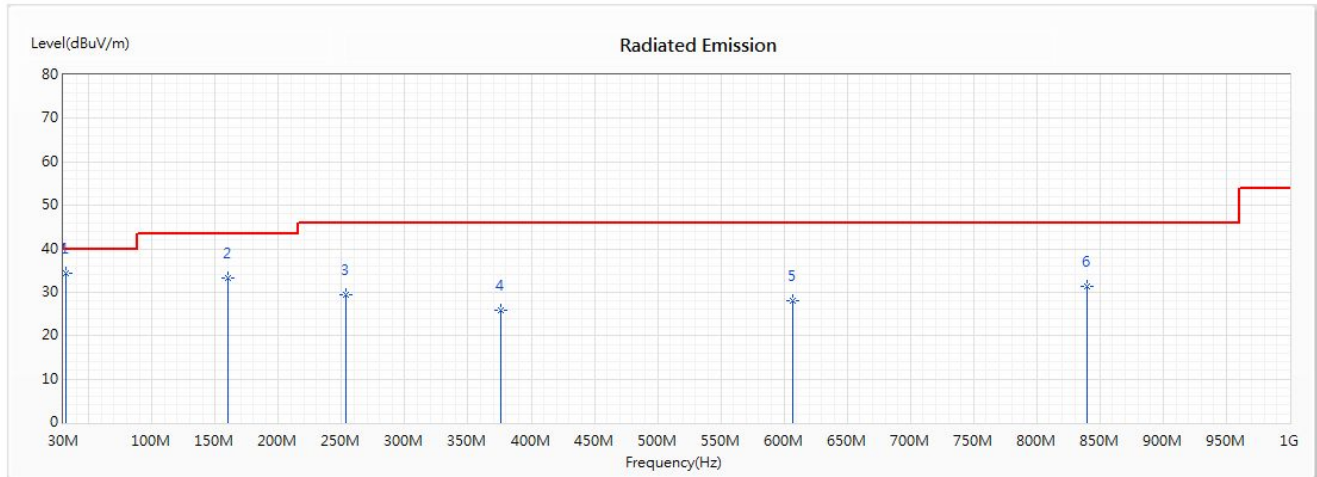
No	Frequency (MHz)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB/m)	Detector Type
1	152.22	33.05	43.50	-10.45	43.41	-10.36	QP
* 2	263.77	36.87	46.00	-9.13	47.09	-10.22	QP
3	375.32	32.53	46.00	-13.47	39.43	-6.90	QP
4	515	25.72	46.00	-20.28	29.72	-4.00	QP
5	700.27	29.21	46.00	-16.79	30.29	-1.08	QP
6	992.24	31.92	54.00	-22.08	29.05	2.87	QP

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Charger
 Test Item : General Radiated Emission
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

30MHz~1GHz_Vertical



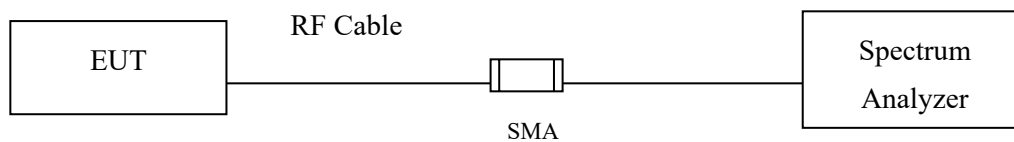
No	Frequency (MHz)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB/m)	Detector Type
* 1	31.94	34.41	40.00	-5.59	46.10	-11.69	QP
2	159.98	33.33	43.50	-10.17	43.42	-10.09	QP
3	253.1	29.54	46.00	-16.46	40.28	-10.74	QP
4	376.29	25.73	46.00	-20.27	32.60	-6.87	QP
5	607.15	27.91	46.00	-18.09	29.96	-2.05	QP
6	839.95	31.44	46.00	-14.56	30.33	1.11	QP

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

4. Occupied Bandwidth

4.1. Test Setup



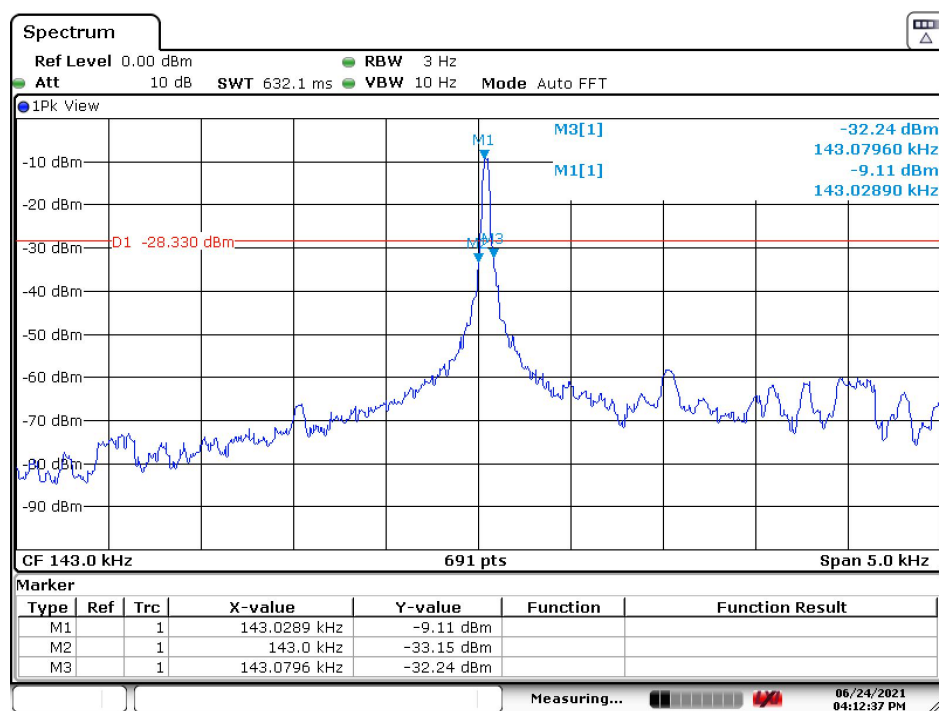
4.2. Test Procedure

The EUT was setup according to ANSI C63.4, 2014; tested according to IEEE C63.10 Section 6.9.2 for compliance to FCC 47CFR 15.215(c) requirements.

4.3. Test Result of Occupied Bandwidth

Product : Wireless Charger
 Test Item : Occupied Bandwidth
 Test date : 2021/06/24
 Test Mode : Mode 1: Transmit

Frequency (kHz)	Measurement Level (Hz)
143	79.6



Date: 24 JUN 2021 16:12:37

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.