ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

All-in-one power bank

Model No.: TW1012

FCC ID: 2BBYY-TW1012

Report No.: E04A23090610F00501

Issue Date: Nov. 02, 2023

Prepared for

Shenzhen Tuwei Technology Co.,LTD.

A, Floor 2, No.3, Xialingpai New Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province

Prepared by

Guangdong Global Testing Technology Co., Ltd.

Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

VERIFICATION OF COMPLIANCE

Applicant:	Shenzhen Tuwei Technology Co.,LTD. A, Floor 2, No.3, Xialingpai New Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province
Manufacturer:	Shenzhen Tuwei Technology Co.,LTD. A, Floor 2, No.3, Xialingpai New Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province
Product Description:	All-in-one power bank
Model Number:	TW1012
Series Model:	N/A

We hereby certify that:

The above equipment was tested by Guangdong Global Testing Technology Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.209(2022).

Date of Test: Sep. 22, 2023 to Nov. 02, 2023

Prepared by: Alan He/Editor

Reviewer & Authorized Signer: Shawn Wen/ General Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	E04A23090610F00501

Table of Contents

1 General Information

1.1 Product Description

Characteristics	Description
Product Name	All-in-one power bank
Model number	TW1012
Series Model	N/A
Operation Mode	Wireless Charging
Rating	Adapter mode Input: AC 100V-240V 50/60Hz 0.5A Type-C+USB+Cable Output: 5V 2.4A Power bank mode: Battery Capacity: 10000mAh (37Wh/3.7V) USB Output:5V 3A,9V 2.2A,12V 1.67A,5V 4.5A,4.5V 5A Type-C Cable Output: 5V 3A,9V 2.2A,12V 1.67A,5V 4.5A,4.5V 5A Lightning Cable Output: 5V 3A Type-C+USB+Cable Output: 5V 3A Type-C In/ Output: 5V 3A,9V 2.2A,12V 1.67A Wireless Charging Power: 5W/7.5W/10W/15W
Battery Rating	3.7V, 10000mAh
Power Supply	AC 100V-240V
Operating Frequency	110-205KHz
Wireless Charging Power	5W/7.5W/10W/15W
Modulation Technique	ASK
Antenna Type	Coil Antenna
Sample receipt date	Sep. 22, 2023

1.2 Related Submittal(s) / Grant(s)

This submittal(s) (test report) is intended for FCC ID: 2BBYY-TW1012 filing to comply with the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Accreditation Certificate	**A2LA (Certificate No.: 6947.01)** Guangdong Global Testing Technology Co., Ltd. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1343)** Guangdong Global Testing Technology Co., Ltd. has been recognized to perform compliance testing on equipment subject to Supplier's Declaration of Conformity (SDoC) and Certification rules **ISED (Company No.: 30714)** Guangdong Global Testing Technology Co., Ltd. has been registered and fully described in a report filed with ISED. The Company Number is 30714 and the test lab Conformity Assessment Body Identifier (CABID) is CN0148.

Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People’s Republic of China, 523808

2 System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the fixed in a particular direction according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

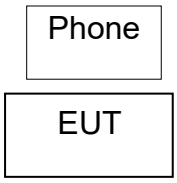


Table 2-1 Equipment Used in Tested System

Item	Equipment	Trade Mark	Model No.	FCC ID	Note
1.	All-in-one power bank	/	TW1012	2BBYY-TW1012	***EUT***
2.	Phone	Apple	A2176	N/A	***Support Equipment***

Note:
(1) Unless otherwise denoted as EUT in『Remark』column, device(s) used in tested system is a support equipment.

3 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	Compliant
§15.209	Radiated Emission	Compliant
§2.1049	20dB Bandwidth	Compliant
§15.203	Antenna Requirement	Compliant

4 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Temperature	±0.5℃
Humidity	±3%

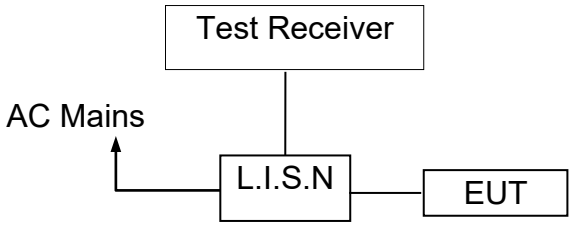
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%

5 Conducted Emissions Test

5.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Measurement Equipment Used

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Shielded Room	CHENG YU	8m*5m*4m	N/A	2022/10/29	2025/10/28
EMI Test Receiver	Rohde & Schwarz	ESR3	102647	2022/12/03	2023/12/02
LISN/AMN	Rohde & Schwarz	ENV216	102843	2023/09/18	2024/09/17
NNLK 8129 RC	Schwarzbeck	NNLK 8129 RC	5046	2023/03/30	2024/03/29
Test Software	Farad	EZ-EMC (Ver. EMC-con-3A1 1+)	N/A	N/A	N/A

5.4 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

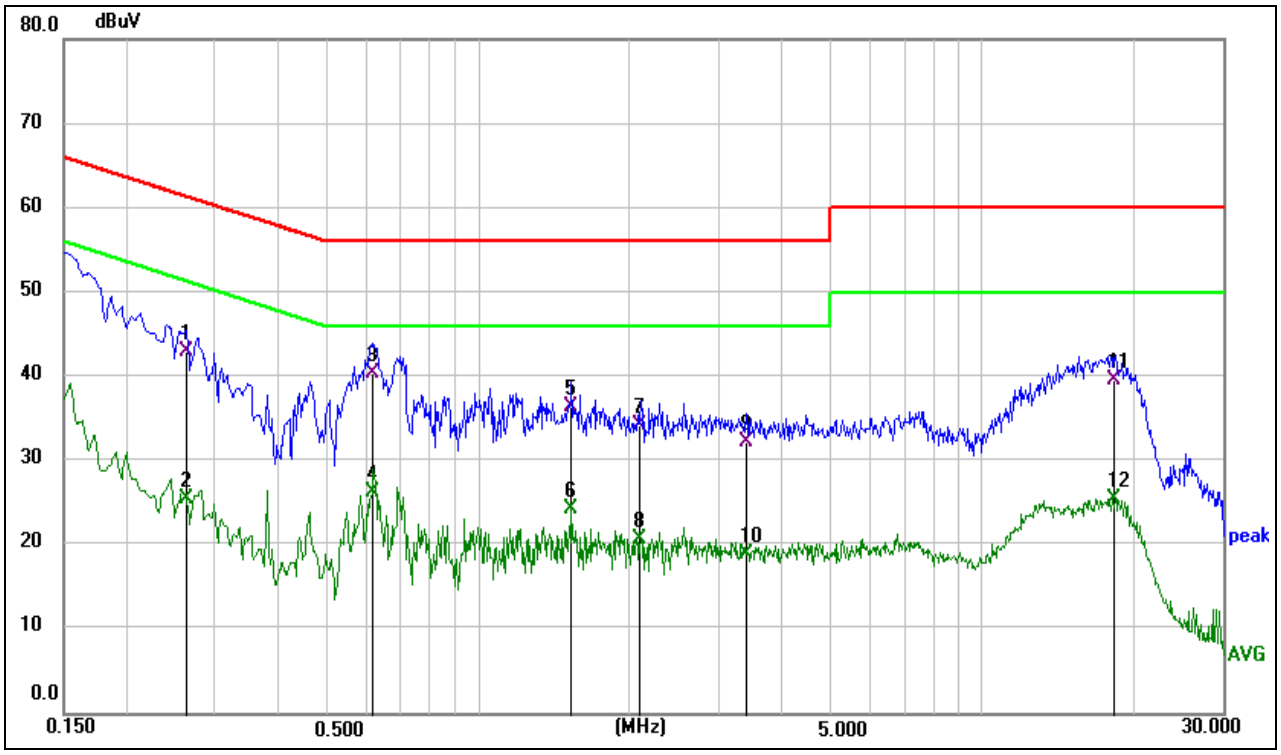
Note: 1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.5 Measurement Result

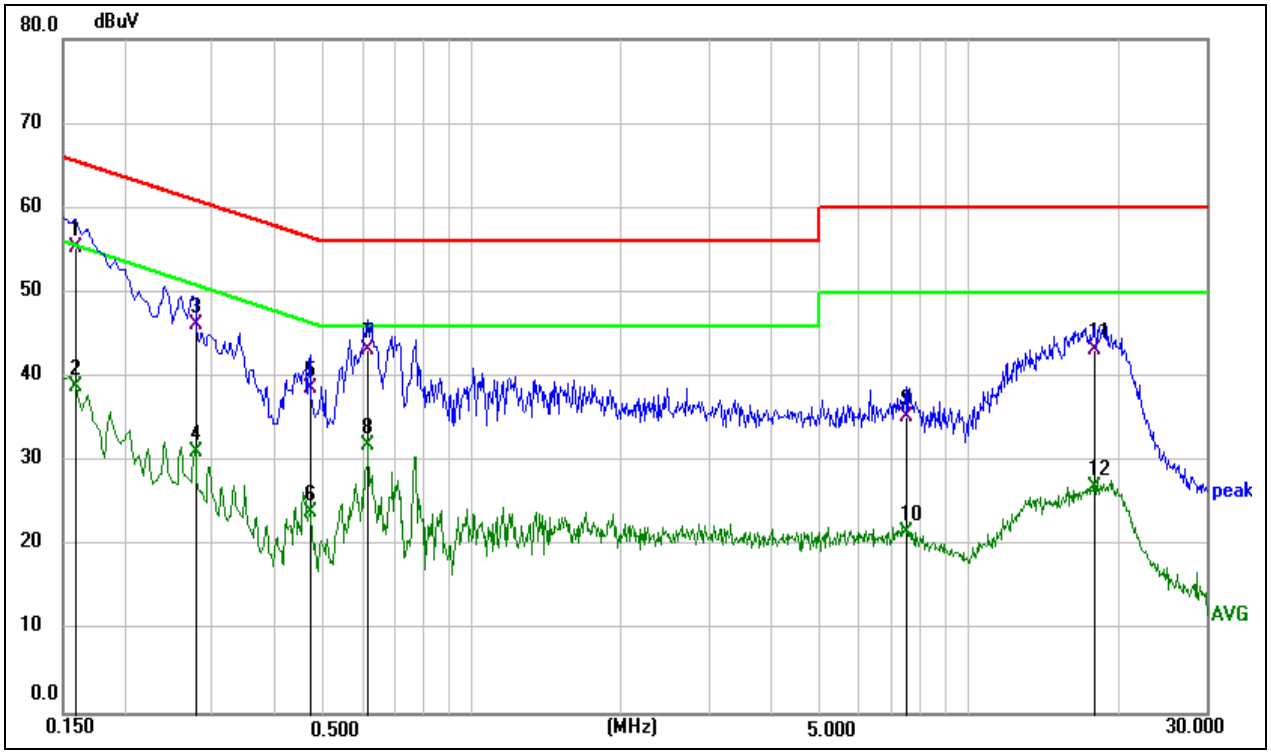
Operation Mode:	TX	Test Date:	2023/9/23
Frequency Range:	0.15MHz~30MHz	Temperature:	26℃
Test Result:	PASS	Humidity:	54 %RH
Test By:	Luffy		

Test mode: Charging



Limit:	**FCC Part 15 C Conduction(QP)**	**Phase:**	**L1**
EUT:	**All-in-one power bank**	**Test Time:**	**2023/9/23**
M/N.:	**TW1012**	**Power Rating:**	**AC120V/60Hz**
Mode:	**Charging**	**Test Engineer:**	**Luffy**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2630	33.28	9.70	42.98	61.34	-18.36	QP
2	0.2630	15.79	9.70	25.49	51.34	-25.85	AVG
3	0.6140	30.62	9.74	40.36	56.00	-15.64	QP
4	0.6140	16.61	9.74	26.35	46.00	-19.65	AVG
5	1.5274	26.69	9.83	36.52	56.00	-19.48	QP
6	1.5274	14.53	9.83	24.36	46.00	-21.64	AVG
7	2.0989	24.42	9.83	34.25	56.00	-21.75	QP
8	2.0989	10.92	9.83	20.75	46.00	-25.25	AVG
9	3.3994	22.19	9.97	32.16	56.00	-23.84	QP
10	3.3994	9.08	9.97	19.05	46.00	-26.95	AVG
11	18.3283	29.44	10.08	39.52	60.00	-20.48	QP
12	18.3283	15.45	10.08	25.53	50.00	-24.47	AVG



Limit:	**FCC Part 15 C Conduction(QP)**	**Phase:**	**N**
EUT:	**All-in-one power bank**	**Test Time:**	**2023/9/23**
M/N.:	**TW1012**	**Power Rating:**	**AC120V/60Hz**
Mode:	**Charging**	**Test Engineer:**	**Luffy**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1590	45.54	9.69	55.23	65.52	-10.29	QP
2	0.1590	29.10	9.69	38.79	55.52	-16.73	AVG
3	0.2760	36.40	9.76	46.16	60.94	-14.78	QP
4	0.2760	21.38	9.76	31.14	50.94	-19.80	AVG
5	0.4695	28.81	9.85	38.66	56.52	-17.86	QP
6	0.4695	14.04	9.85	23.89	46.52	-22.63	AVG
7	0.6180	33.32	9.94	43.26	56.00	-12.74	QP
8	0.6180	21.95	9.94	31.89	46.00	-14.11	AVG
9	7.4580	25.32	9.94	35.26	60.00	-24.74	QP
10	7.4580	11.53	9.94	21.47	50.00	-28.53	AVG
11	17.8755	33.05	10.07	43.12	60.00	-16.88	QP
12	17.8755	16.91	10.07	26.98	50.00	-23.02	AVG

5.6 Conducted Measurement Photo

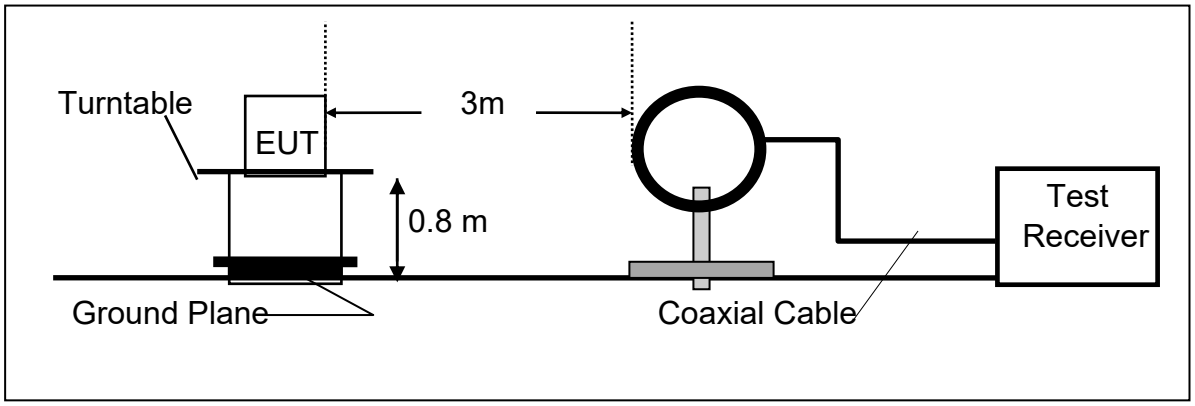
6 Radiated Emission Test

6.1 Measurement Procedure

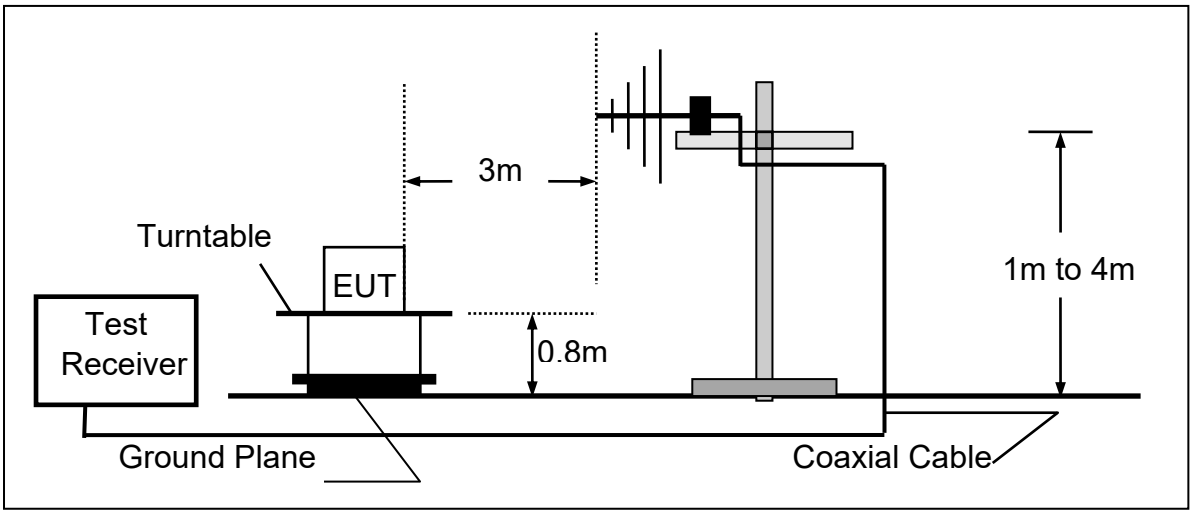
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3 Measurement Equipment Used

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
3m Semi-anechoic Chamber	ETS	9m*6m*6m	Q2146	2022/08/30	2025/08/29
EMI Test Receiver	Rohde & Schwarz	ESCI3	101409	2023/09/18	2024/09/17
Spectrum Analyzer	KEYSIGHT	N9020A	MY51283932	2023/09/18	2024/09/17
Pre-Amplifier	HzEMC	HPA-9K0130	HYPA21001	2023/09/18	2024/09/17
Biconilog Antenna	Schwarzbeck	VULB 9168	01315	2022/10/10	2025/10/09
Biconilog Antenna	ETS	3142E	00243646	2022/03/23	2025/03/22
Loop Antenna	ETS	6502	243668	2022/03/30	2025/03/29
Test Software	Farad	EZ-EMC (Ver.FA-03A2 RE)	N/A	N/A	N/A

6.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

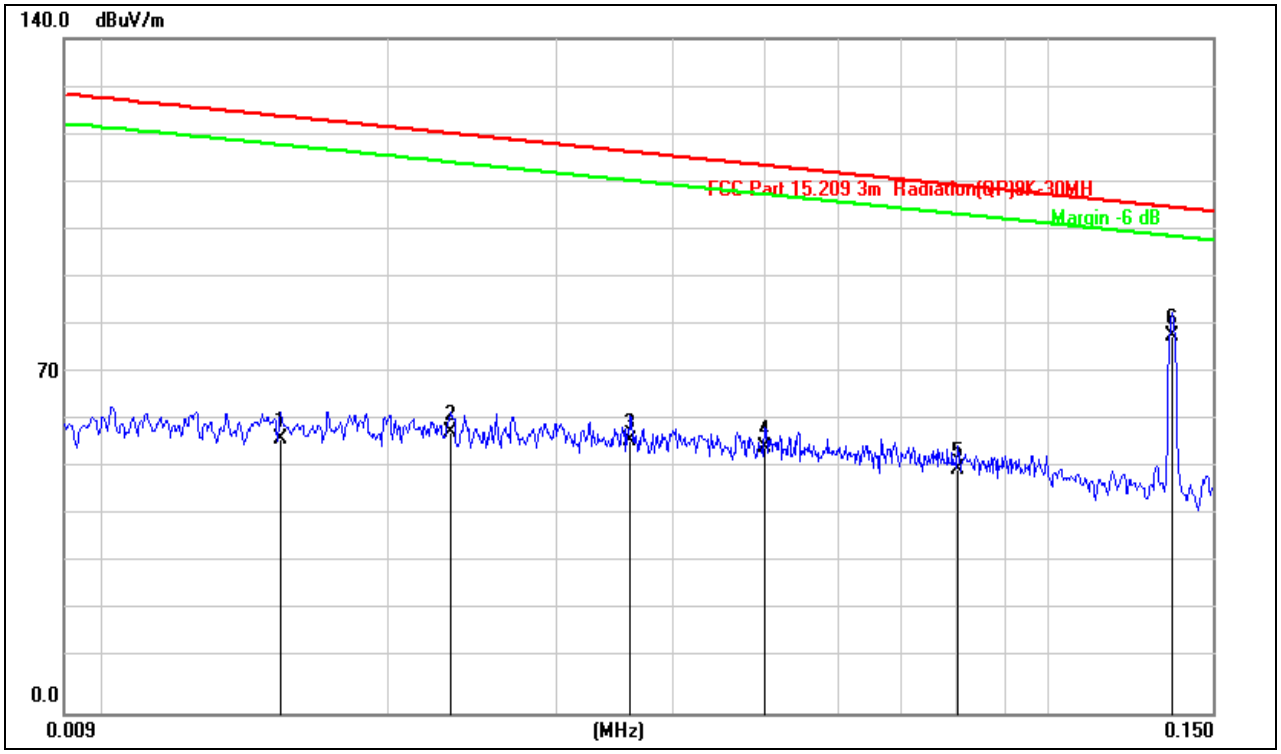
FCC Part 15.209				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation Frequency tion at 3m Measurement Dist	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
0.009 – 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 – 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40
1.705 – 30.00	30	30m	100* 30	20log 30 + 40
30.0 – 88.0	100	3m	100	20log 100
88.0 – 216.0	150	3m	150	20log 150
216.0 – 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

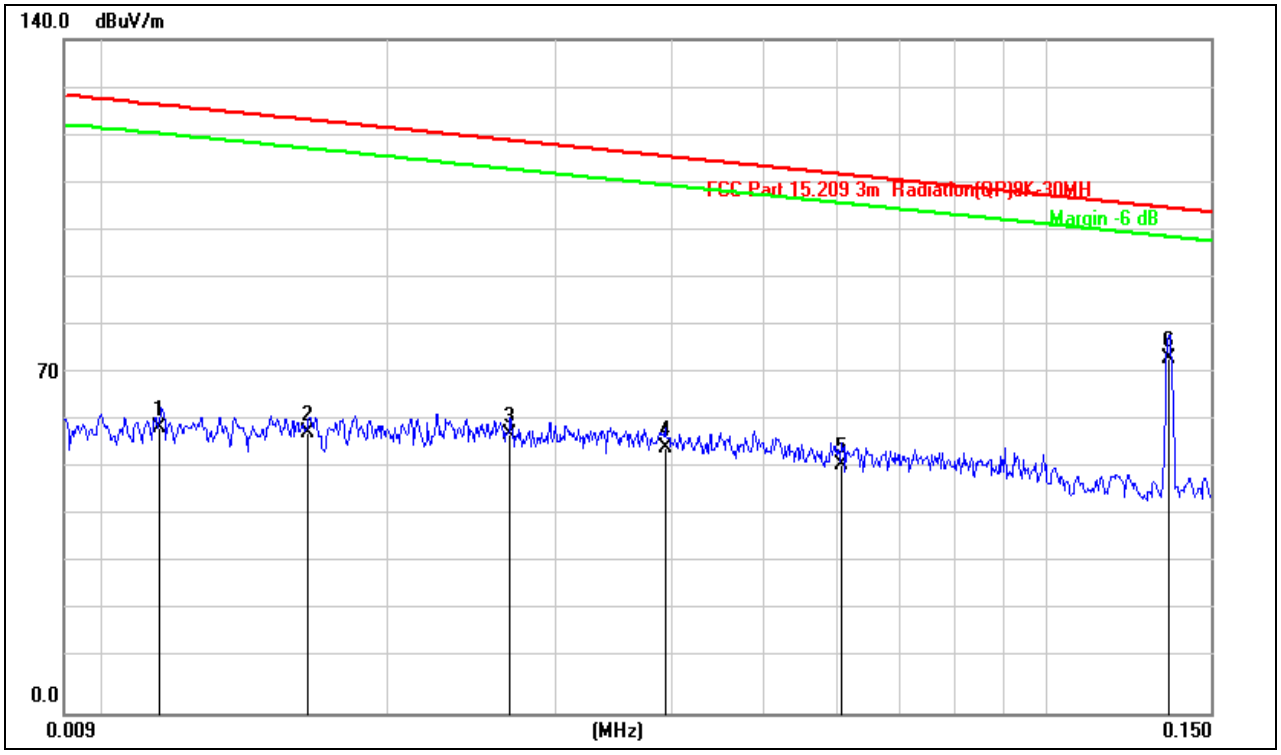
Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

6.5 Measurement Result



Limit:	**FCC Part 15C 3m Radiation(QP)**	**Antenna:**	**Horizontal**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**53.2%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

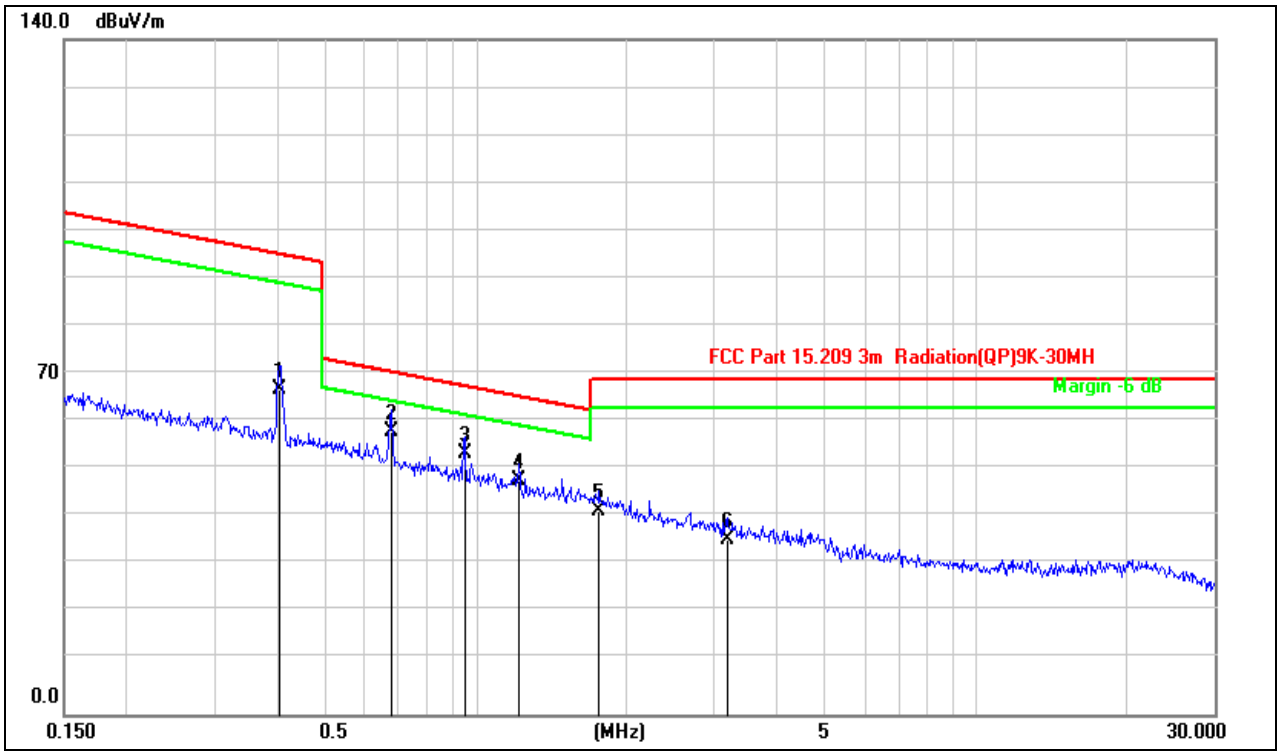
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	0.0152	36.61	20.36	56.97	123.95	-66.98	QP	
2	0.0231	37.97	20.25	58.22	120.32	-62.10	QP	
3	0.0359	36.33	20.08	56.41	116.49	-60.08	QP	
4	0.0500	35.08	19.94	55.02	113.61	-58.59	QP	
5	0.0802	30.76	19.69	50.45	109.51	-59.06	QP	
6 *	0.1358	58.70	19.64	78.34	104.94	-26.60	QP	



Limit:	**FCC Part 15C 3m Radiation(QP)**	**Antenna:**	**Vertical**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**53.2%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

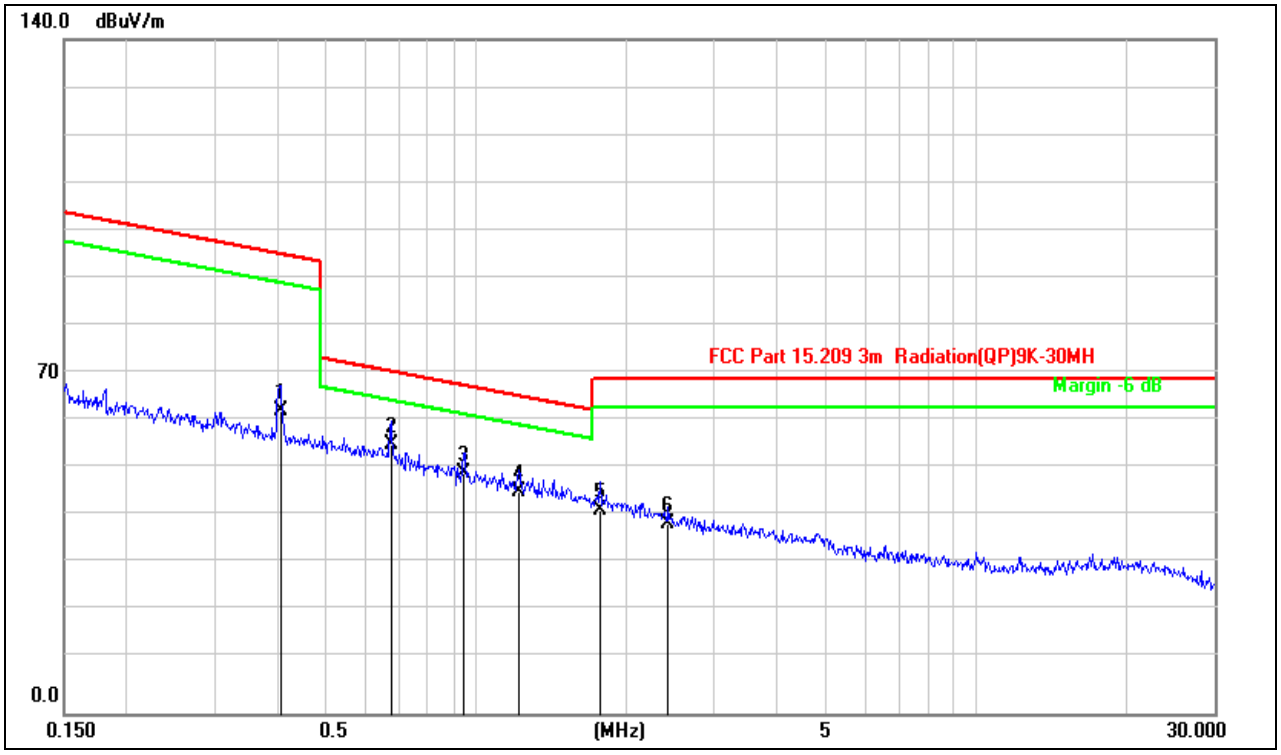
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	0.0114	38.76	20.41	59.17	126.45	-67.28	QP	
2	0.0164	37.99	20.34	58.33	123.29	-64.96	QP	
3	0.0269	37.75	20.19	57.94	119.00	-61.06	QP	
4	0.0393	35.03	20.05	55.08	115.70	-60.62	QP	
5	0.0606	31.86	19.78	51.64	111.94	-60.30	QP	
6 *	0.1351	53.96	19.64	73.60	104.98	-31.38	QP	

Note: (1) All Readings are Peak Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) The average measurement was not performed when the peak measured data under the limit of average detection.
(4) EUT lying on the table position is the worst case result in the report.



Limit:	**FCC Part 15C 3m Radiation(QP)**	**Antenna:**	**Horizontal**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**53.2%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

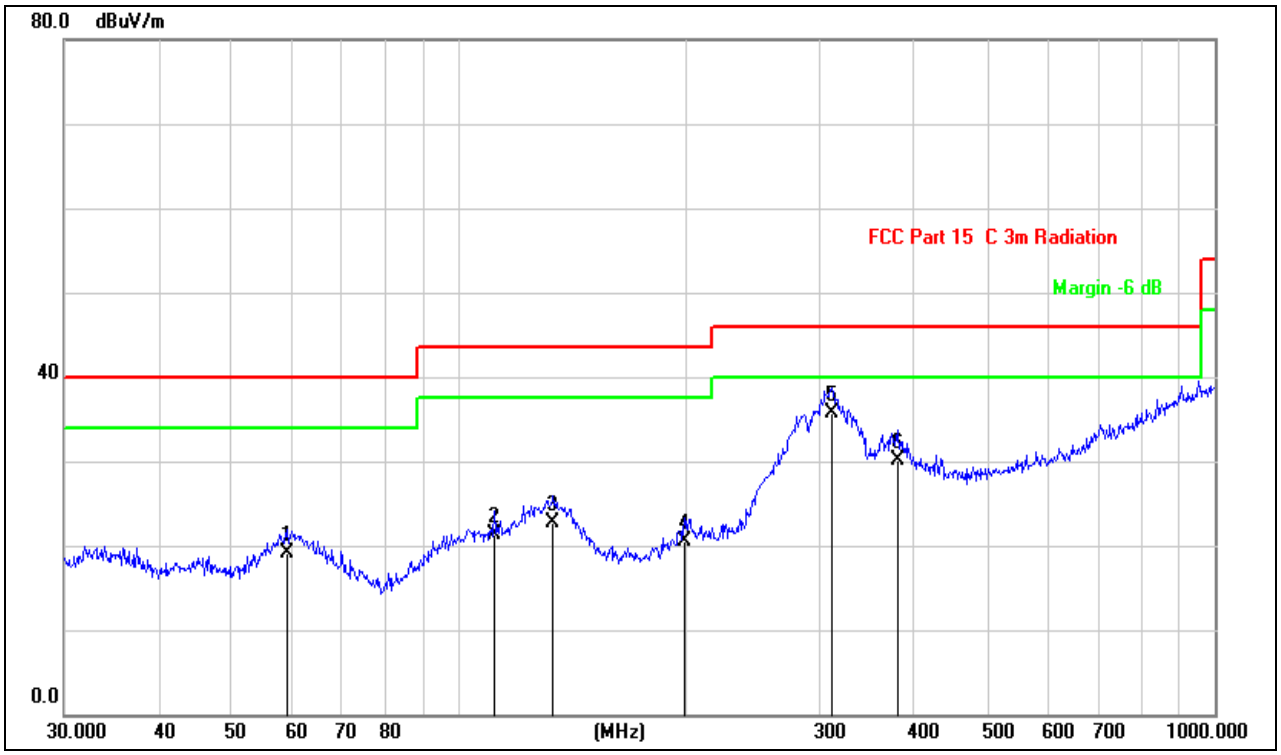
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	0.4040	47.87	19.61	67.48	95.48	-28.00	QP	
2 *	0.6753	39.13	19.54	58.67	71.02	-12.35	QP	
3	0.9481	34.76	19.45	54.21	68.08	-13.87	QP	
4	1.2161	28.91	19.46	48.37	65.93	-17.56	QP	
5	1.7622	22.62	19.51	42.13	69.50	-27.37	QP	
6	3.1730	16.57	19.65	36.22	69.50	-33.28	QP	



Limit:	**FCC Part 15C 3m Radiation(QP)**	**Antenna:**	**Vertical**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**53.2%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

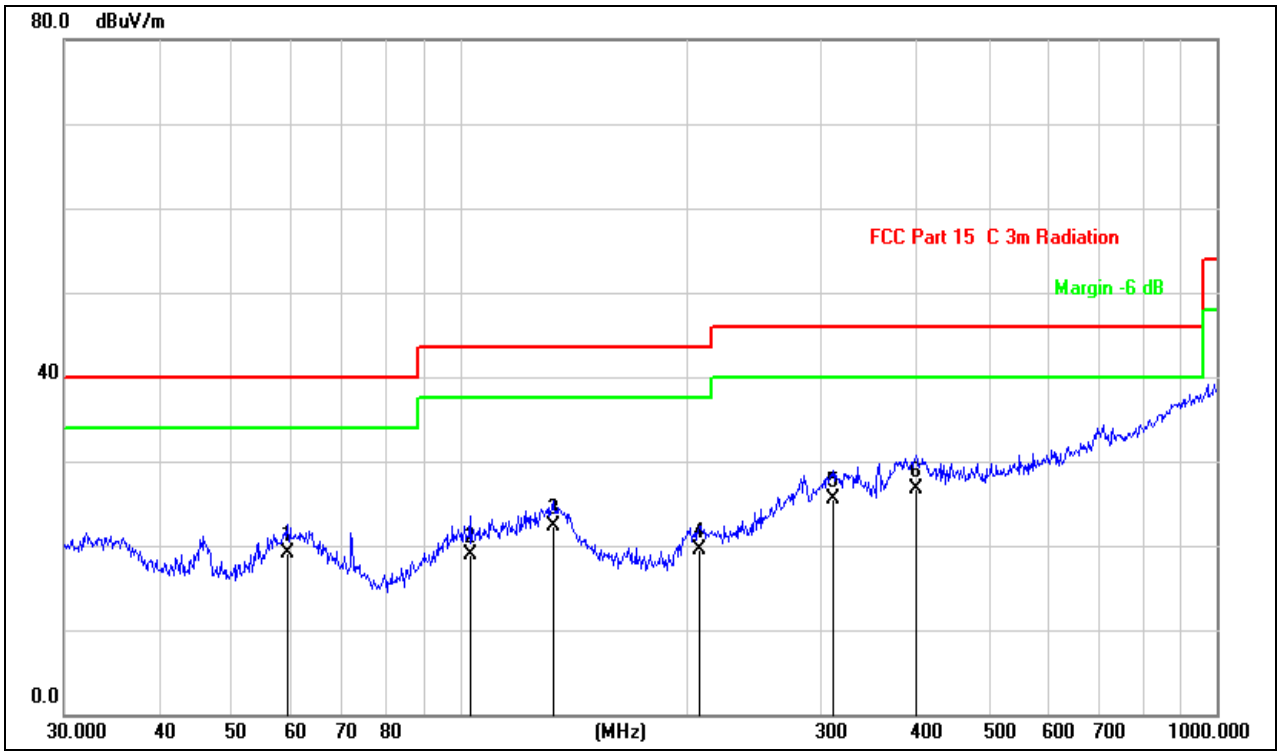
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	0.4061	43.13	19.61	62.74	95.43	-32.69	QP	
2 *	0.6753	36.16	19.54	55.70	71.02	-15.32	QP	
3	0.9431	30.51	19.45	49.96	68.13	-18.17	QP	
4	1.2161	26.57	19.46	46.03	65.93	-19.90	QP	
5	1.7716	22.64	19.51	42.15	69.50	-27.35	QP	
6	2.4218	19.91	19.57	39.48	69.50	-30.02	QP	

Note: (1) All Readings are Peak Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) The average measurement was not performed when the peak measured data under the limit of average detection.
(4) EUT lying on the table position is the worst case result in the report.



Limit:	**FCC Part 15C 3m Radiation**	**Antenna:**	**Horizontal**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**54%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	59.2325	24.21	-5.13	19.08	40.00	-20.92	QP	
2	111.3468	26.03	-4.63	21.40	43.50	-22.10	QP	
3	133.1511	30.35	-7.73	22.62	43.50	-20.88	QP	
4	198.5879	25.96	-5.43	20.53	43.50	-22.97	QP	
5 *	311.0867	37.52	-1.72	35.80	46.00	-10.20	QP	
6	379.9141	29.98	0.18	30.16	46.00	-15.84	QP	



Limit:	**FCC Part 15C 3m Radiation**	**Antenna:**	**Vertical**
EUT:	**All-in-one power bank**	**Temperature:**	**24.3℃**
M/N.:	**TW1012**	**Humidity:**	**54%RH**
Mode:	**Wireless Charging 15W**	**Power Rating:**	**DC 3.7V**
Test Engineer:	**Fink**	**Test Time:**	**2023/09/27**

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	59.2325	24.21	-5.13	19.08	40.00	-20.92	QP	
2	103.0800	23.65	-4.78	18.87	43.50	-24.63	QP	
3	132.6850	29.97	-7.64	22.33	43.50	-21.17	QP	
4	207.1226	24.37	-4.94	19.43	43.50	-24.07	QP	
5	311.0867	27.20	-1.72	25.48	46.00	-20.52	QP	
6 *	400.4319	25.96	0.75	26.71	46.00	-19.29	QP	

6.6 Radiated Measurement Photos

9kHz-30MHz

30MHz-1GHz

7 20db Bandwidth

7.1 20dB Bandwidth Limit

None: for reporting purposed only.

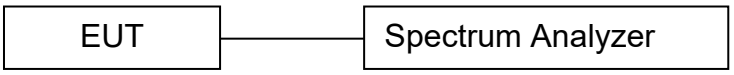
7.2 Test Instruments

Refer a test equipment and calibration data table in this test report.

7.3 Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1KHz RBW and 3KHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

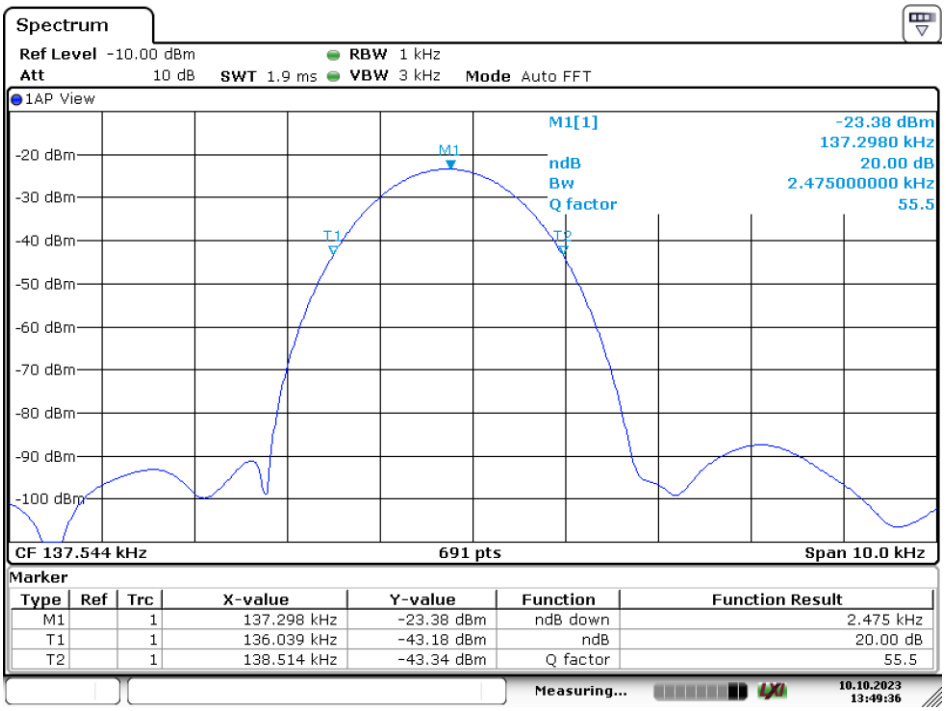
7.4 Test Setup



7.5 Test Result

Frequency (KHz)	20dB Bandwidth (KHz)	Results
137.544	2.475	PASS

20 dB Bandwidth Test plot



Date: 10.OCT.2023 13:49:36

8 Antenna Application

8.1 Antenna requirement

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.

8.2 Result

The EUT's antenna, permanent attached antenna, used an Induction coil and integrated on PCB, The antenna's gain meets the requirement.

APPENDIX

(Photos of EUT)

External-1

External-2

External-3

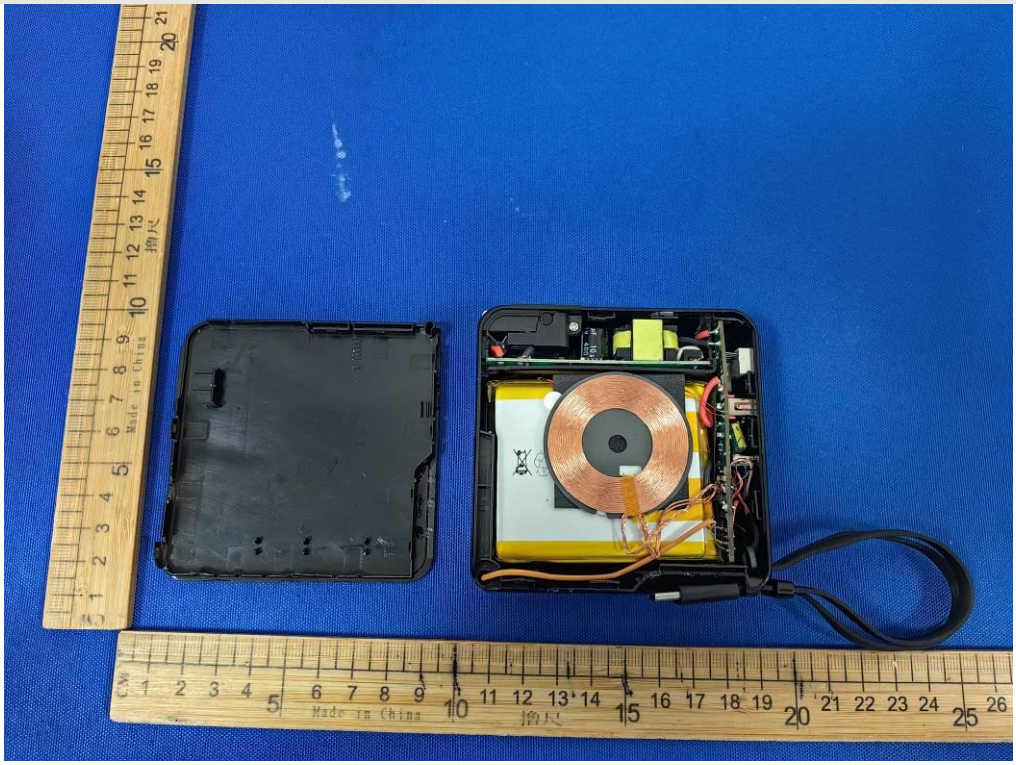
External-4

External-5

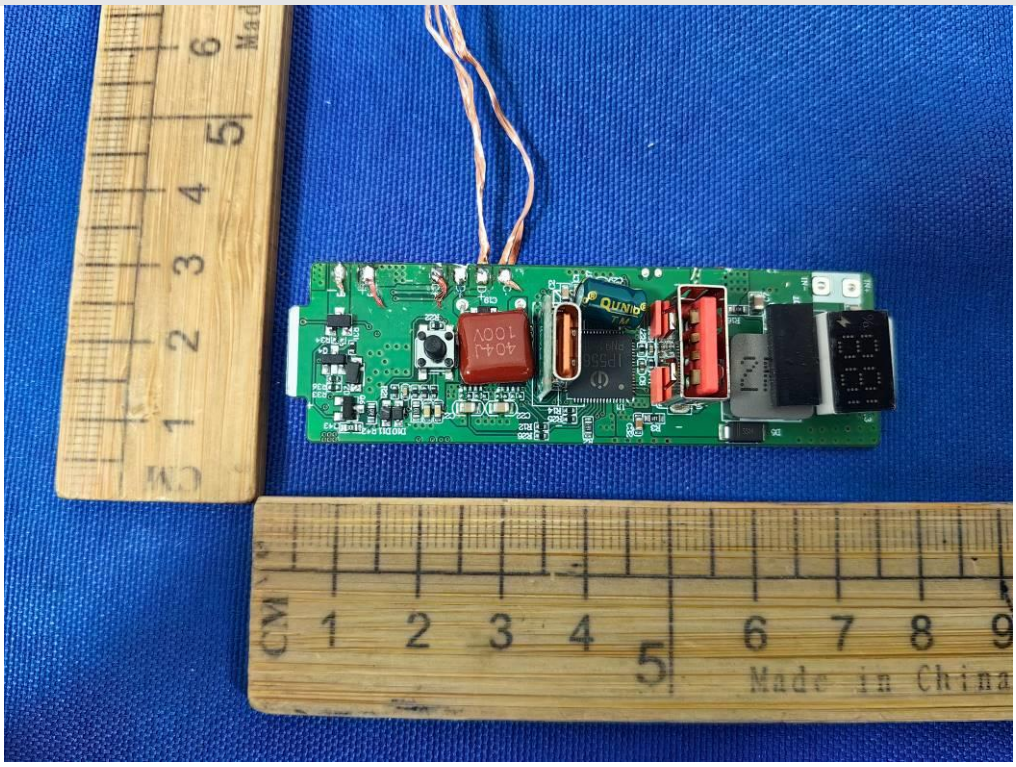
External-6

External-7

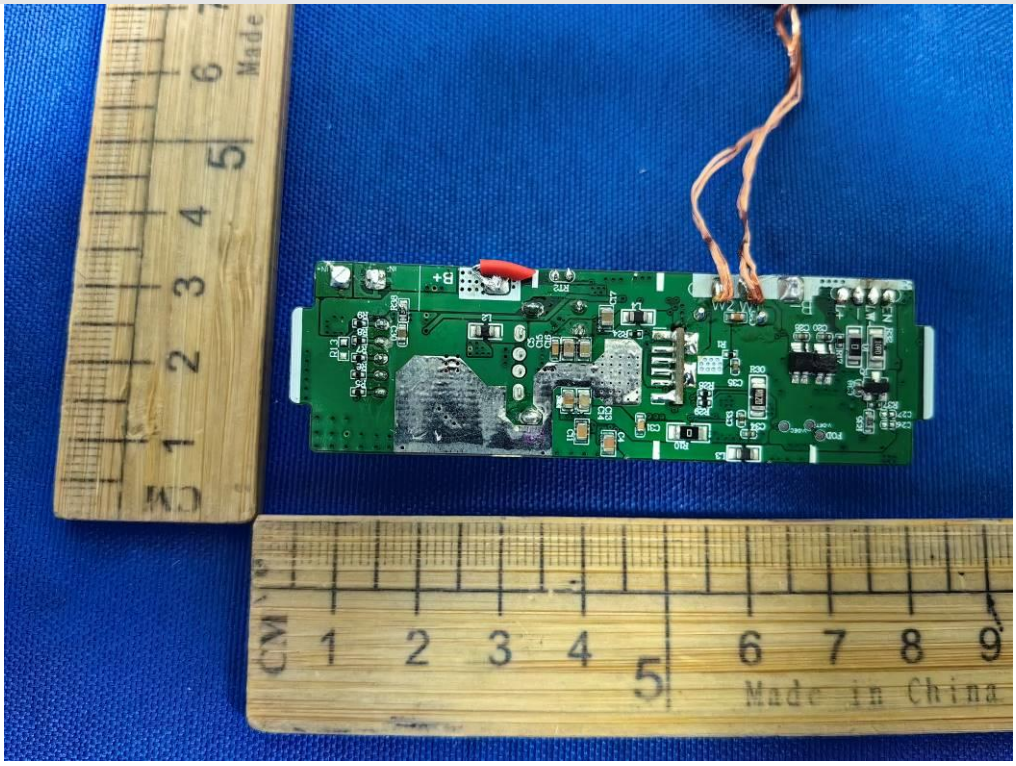
Internal-1



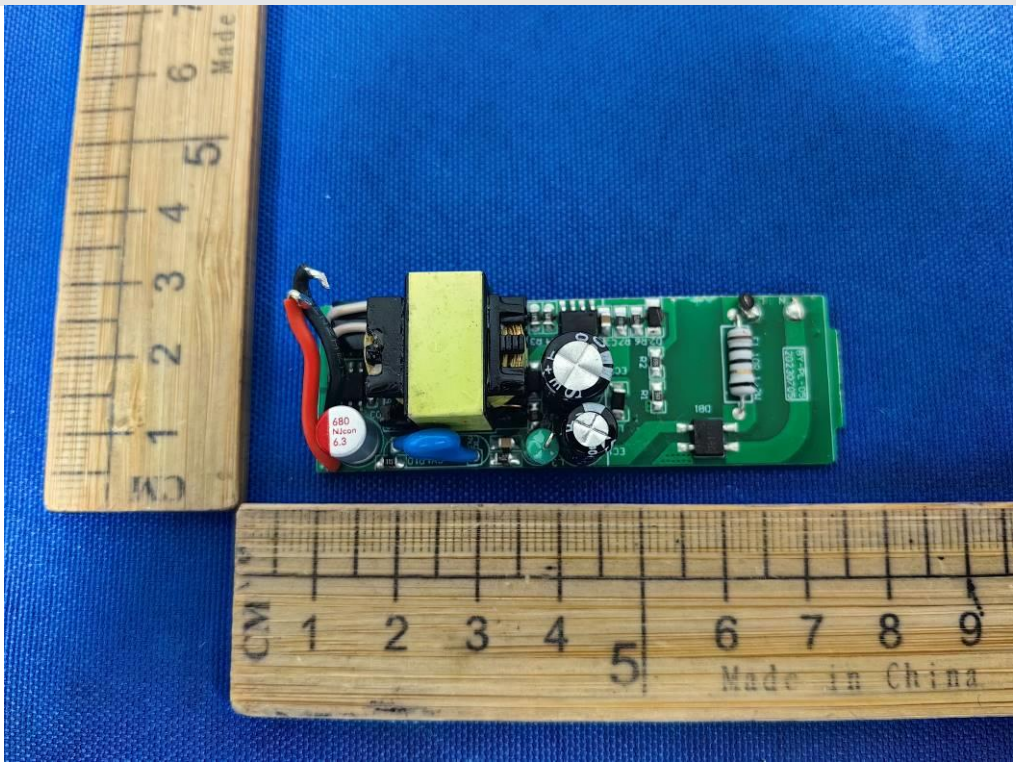
Internal-2



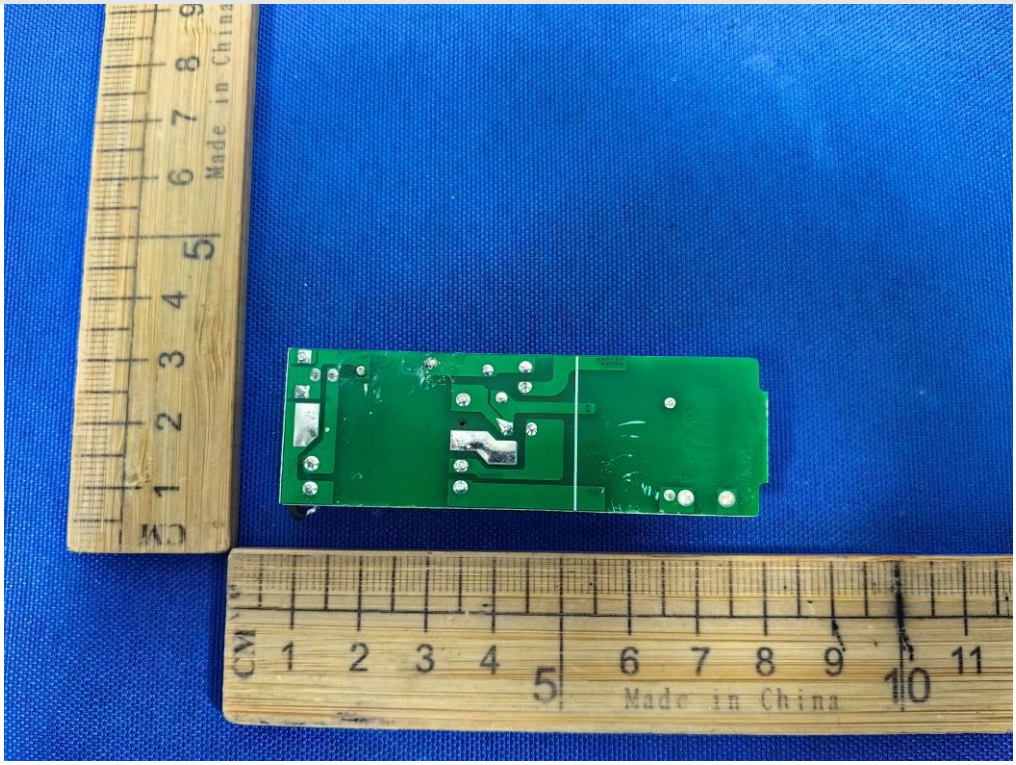
Internal-3



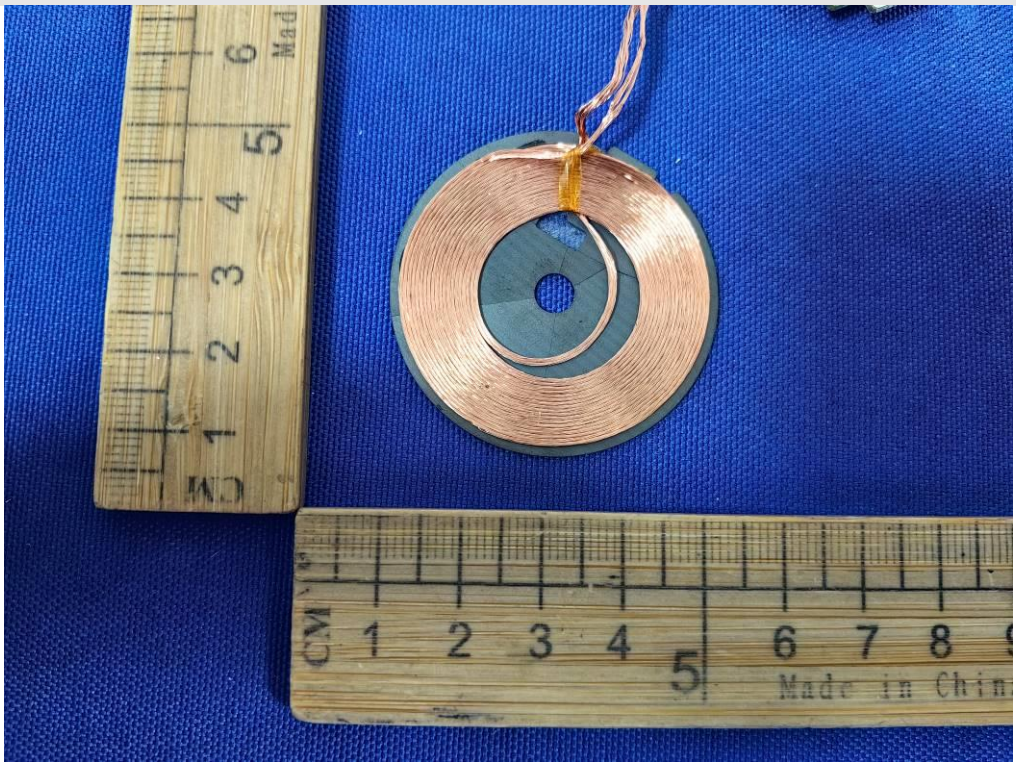
Internal-4



Internal-5



Internal-6



Internal-7

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