

FCC TEST REPORT FCC ID: 2AP2N-M51

On Behalf of

Shenzhen Esorun Technology Co., LTD

Magnetic Wireless Power Bank With Stand

Model No.: Fold M51, Fold M51M, Fold M51S

Prepared for : Shenzhen Esorun Technology Co., LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.

Address Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,

518103, Shenzhen, Guangdong, China

Report Number : A2307239-C01-R05 Date of Receipt : August 2, 2023

Date of Test : August 2, 2023-August 14, 2023

Date of Report : October 16, 2023

Version Number : v0

TABLE OF CONTENTS

	Description	Page
1.	Test Result Summary	5
2.	General Information	6
	2.1. DESCRIPTION OF DEVICE (EUT)	6
	2.2. Accessories of Device (EUT)	7
	2.3. TESTED SUPPORTING SYSTEM DETAILS	7
	2.4. BLOCK DIAGRAM OF CONNECTION BETWEEN EUT AND SIMULATORS	7
	2.5. DESCRIPTION OF TEST MODES	7
	2.6. TEST CONDITIONS	7
	2.7. TEST FACILITY	8
	2.8. MEASUREMENT UNCERTAINTY	8
	2.9. TEST EQUIPMENT LIST	g
3.	Test Results and Measurement Data	10
	3.1. CONDUCTED EMISSION	10
	3.2. RADIATED SPURIOUS EMISSION MEASUREMENT	14
	3.3. TEST SPECIFICATION	
4.	Photos of test setup	25
5.	Photographs of EUT	27

Report No.: A2307239-C01-R05

Lucas Vory

TEST REPORT DECLARATION

Applicant : Shenzhen Esorun Technology Co., LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

Manufacturer : Shenzhen Esorun Technology Co., LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

EUT Description : Magnetic Wireless Power Bank With Stand

(A) Model No. : Fold M51, Fold M51M, Fold M51S

(B) Trademark : ESORUN

Measurement Standard Used:

FCC CFR Title 47 Part 15 Subpart C Section 15.209

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature)......

Lucas Pang
Project Engineer

Approved by (name + signature).....: Reak Yang
Project Manager

Revision History

Revision	Issue Date	Revisions	Revised By
V0	October 16, 2023	Initial released Issue	Lucas Pang

1. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS
Occupied Bandwidth	§15.215 (c)	PASS

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.
- 5. Decision rules for the conclusion of this test report: decision by actual test data without considering neasurement uncertainty.

Report No.: A2307239-C01-R05

2. General Information

2.1. Description of Device (EUT)

EUT Name : Magnetic Wireless Power Bank With Stand

Model No. : Fold M51, Fold M51M, Fold M51S

DIFF. : There is no difference except the name of the model. All tests are made

with the Fold M51 model.

Power supply : DC 5V from adapter with AC 120V/60Hz, DC 3.7V from battery

Type-C Input: 5V==2A
Wireless Output: 5W
Type-C Output: 5V==2A
Max Multiplex output:

Type-C Output: 5V === 1A and Wireless Output: 5W

Radio Technology : Wireless power transmission systems

Operation frequency : 115-205KHz

Modulation : MSK

Antenna Type : Coil Antenna, Maximum Gain is 0dBi(This value is supplied by applicant).

Connector cable loss : 0.5dB (This value is supplied by applicant).

Software version : V1.0

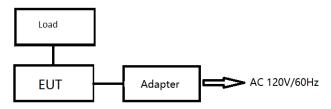
Hardware version : V1.1

Accessories	:	/
Manufacturer	:	/
Model	:	/
Input	:	/
Output	:	/

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDoC
1	Adapter	Huoniu	HNFCQC3024UU	N/A	N/A
2	Load	N/A	N/A	N/A	N/A

2.4. Block Diagram of connection between EUT and simulators



2.5. Description of Test Modes

Channel	Frequency (KHz)
1	121

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	24 °C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

July 15, 2019 Certificated by IC Registration Number: 12135A

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber	3.74dB(Polarize: V)
(30MHz to 1GHz)	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber	3.77dB(Polarize: V)
(1GHz to 25GHz)	3.80dB(Polarize: H)
Uncertainty for radio frequency	5.06×10 ⁻⁸ GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2.9. Test Equipment List

Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2022.05.17	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2022.08.22	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2022.08.22	1Year
Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-10 2082-Wa	2022.08.22	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2022.08.22	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2021.08.30	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2021.08.30	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00059	2021.08.30	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2022.08.22	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2022.08.22	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2022.08.22	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2022.08.22	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2022.08.22	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2022.08.22	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2022.08.23	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	/	00946	2021.08.30	2 Year
Preamplifier	SKET	LNPA_1840 -50	/	SK2018101801	2022.08.22	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2022.08.22	1 Year
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2022.08.22	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000 -40-880	/	100631	2022.08.22	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2022.08.22	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Page 9 of 36

Software Information						
Test Item	Software Name	Manufacturer	Version			
RE	EZ-EMC	Farad	Alpha-3A1			
CE	CE EZ-EMC Far		Alpha-3A1			
RF-CE	MTS 8310	MWRFtest	2.0.0.0			

3. Test Results and Measurement Data

3.1. Conducted Emission

3.1.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207			
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto			
		Limit (d	Du\/\	
	Frequency range (MHz)	Limit (dBuV) Quasi-peak Average		
Limits:	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
	Refere	nce Plane		
Test Setup:	Adapter Filter AC por		r — AC power	
Test Mode:	Transmitting Mode			
Test Procedure:	 The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/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 refer 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 C63.10: 2013 on conducted measurement. 			
Test Result:	PASS			

3.1.2. Test data

Please refer to following diagram for individual

Test Mode : 121KHz

Test Results : PASS

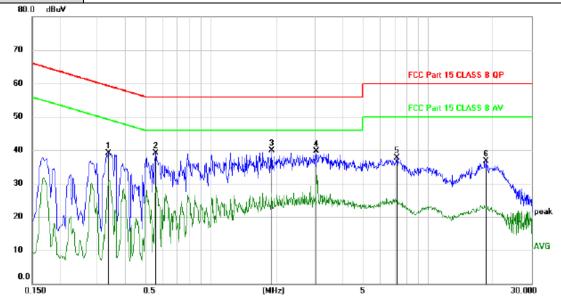
Note: The test results are listed in next pages.

All test modes has been tested, this report only reflected the worst mode.

If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.

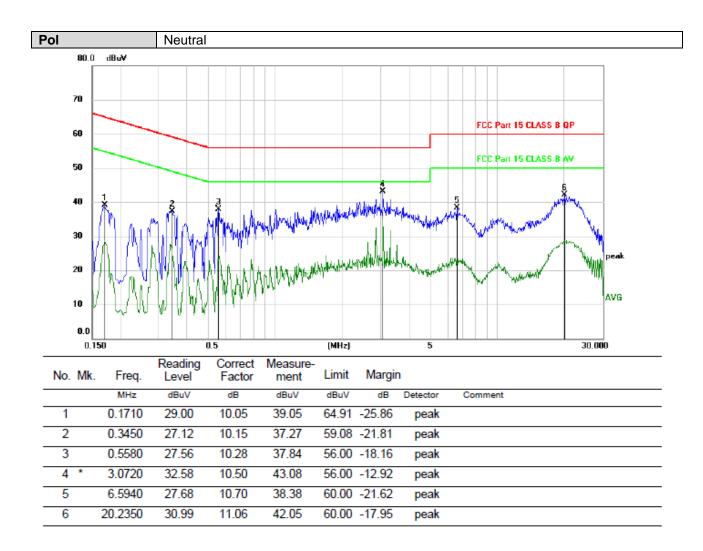
If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

EUT Description	Magnetic Wireless Power Bank With Stand	Model No.	Fold M51
Temperature	24 ℃	Humidity	56%
Test Voltage	AC 120V/60Hz		
Pol	Line		



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margir	1	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.3360	28.88	10.15	39.03	59.30	-20.27	peak	
2	0.5580	28.80	10.28	39.08	56.00	-16.92	peak	
3 *	1.8990	29.59	10.41	40.00	56.00	-16.00	peak	
4	3.0720	29.11	10.50	39.61	56.00	-16.39	peak	
5	7.2120	26.98	10.72	37.70	60.00	-22.30	peak	
6	18.6030	25.69	11.03	36.72	60.00	-23.28	peak	

^{*:}Maximum data x:Over limit !:over margin \(\text{Reference Only} \)
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable



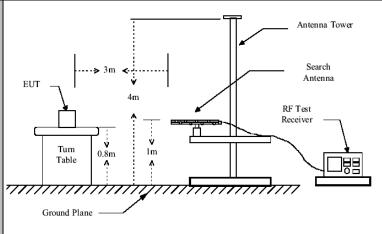
(Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

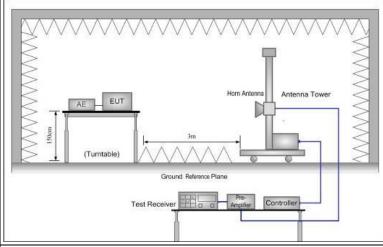
^{*:}Maximum data x:Over limit !:over margin

3.2.1. Test Specification

Test Requirement:	FCC Part15 C	Sectio	n 15.2	209						
Test Method:	ANSI C63.10: 2013 9 kHz to 25 GHz									
Frequency Range:										
Measurement Distance:	3 m									
Antenna Polarization:	Horizontal & Vertical									
Operation mode:	Refer to item 4.1									
	Frequency		tector	RBW	VBW		Remark			
	9kHz- 150kHz	Qua	si-pea k	200Hz	1kHz	Q	uasi-peak Value			
	150kHz-	Qua	si-pea	9kHz	30kHz	Q	uasi-peak			
Receiver Setup:	30MHz	0	k	4001411	0001411	_	Value			
	30MHz-1GH z	Qua	si-pea k	100KH	300KH z	Q	uasi-peak Value			
		Р	eak	1MHz	3MHz	Pe	eak Value			
	Above 1GHz		eak	1MHz	10Hz	Ave	erage Value			
				Field Stre	enath	_	asurement			
	Frequer	су		(microvolts		Distance (meters)				
	0.009-0.4		2400/F(h	(Hz)	(300				
	0.490-1.705			24000/F(30			
	1.705-3		30	,	30					
	30-88		100				3			
I too to	88-216		150				3			
Limit:	216-960 Above 960			200		3				
	Above 9	160		300 3						
			F:-1-1	l Otara a sath	Measure	eme				
	Frequency	,			nt		Detector			
	Trequency		(IIIICIC	r) Distance (meters)			Detector			
				500	(meter	S)	Average			
	Above 1GH	z		5000	3		Peak			
	For radiated en	nissio			Į.					
	'	Distance :	= 3m				Computer			
		-	-		-					
		I	1 (\vdash	Pre -Am	plifier			
Test setup:	EUT			\mathcal{L}	'					
	A 1	\neg	u.b.l.							
		_ Turn t	iable r				─ ┐			
			1			Rece	eiver			
			Grou	und Plane						
	30MHz to 1GH	Z					,			
		_								



Above 1GHz



1. For the radiated emission test below 1GHz:

The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:

Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- Corrected Reading: Antenna Factor + Cable Loss + Read Level -Preamp Factor = Level
- 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported.

Test Procedure:

Report No.: A2307239-C01-R05

	 Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: Span shall wide enough to fully capture the emission being measured; Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

3.2.2. Test Data

Please refer to following diagram for individual

Report No.: A2307239-C01-R05

Frequency Range : 9KHz~30MHz

Test Mode : 121kHz

Test Results : PASS

Note: 1. The test results are listed in next pages.

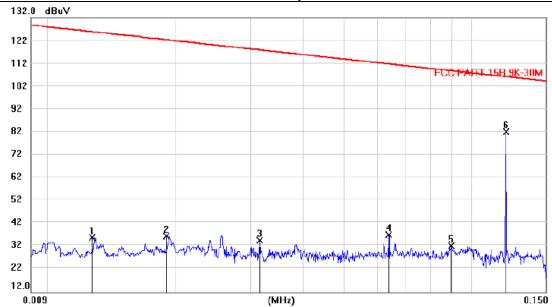
2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

For signal coil(121KHz):

Polarity: X axis

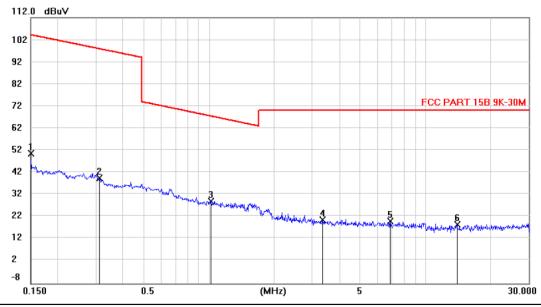
Page 18 of 36



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height		:
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	0.0126	14.34	21.43	35.77	125.6	-89.92	peak			
2	0.0189	15.08	21.27	36.35	122.1	-85.83	peak			
3	0.0314	13.74	20.91	34.65	117.7	-83.14	peak			
4	0.0637	16.93	20.11	37.04	111.6	-74.62	peak			
5	0.0898	12.41	19.90	32.31	108.6	-76.38	peak			
6 *	0.1208	62.14	19.81	81.95	106.1	-24.17	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.

^{2.}Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.1500	30.42	20.20	50.62	104.2	-53.63	peak			
2		0.3118	19.54	19.97	39.51	97.91	-58.40	peak			
3	*	1.0212	8.99	20.00	28.99	67.52	-38.53	peak			
4		3.3492	-0.02	20.69	20.67	70.00	-49.33	peak			
5		6.8871	-2.49	22.64	20.15	70.00	-49.85	peak			
6		14.0030	-2.20	20.75	18.55	70.00	-51.45	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Report No.: A2307239-C01-R05

Frequency Range : 30MHz~1000MHz

Test Mode : 121KHz

Test Results : PASS

Note: 1. The test results are listed in next pages.

2. All test modes has been tested, this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

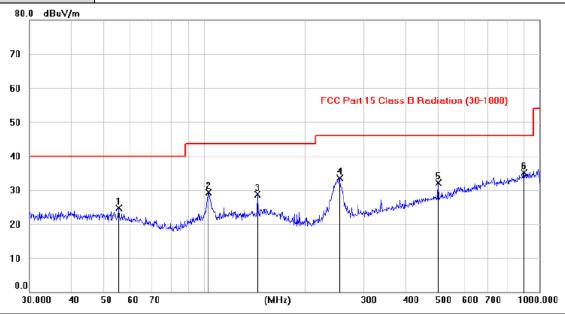
Frequency Range	:	Above 1GHz			
EUT	:	/	Test Date	:	/
M/N	:	1	Temperature	:	/
Test Engineer	:	/	Humidity	:	/
Test Mode	:	1			
Test Results	:	N/A			

Note:

1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.

30MHz-1GHz

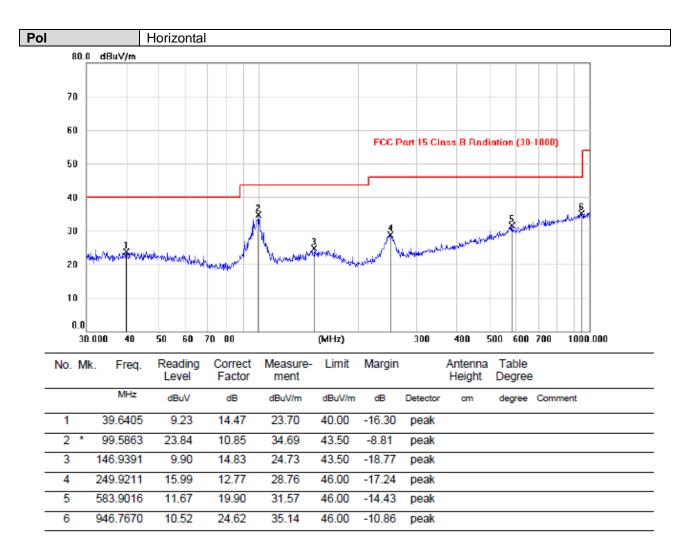
EUT Description	Magnetic Wireless Power Bank With Stand	Model No.	Fold M51
Temperature	24℃	Humidity	56%
Test Voltage	DC 3.7V from battery		
Pol	Vertical		



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		55.5769	11.07	13.57	24.64	40.00	-15.36	peak			
2		102.9717	18.12	11.14	29.26	43.50	-14.24	peak			
3		144.0146	14.03	14.61	28.64	43.50	-14.86	peak			
4		253.1848	20.69	12.83	33.52	46.00	-12.48	peak			
5		500.0088	13.88	18.21	32.09	46.00	-13.91	peak			
6	*	900.3579	11.15	24.04	35.19	46.00	-10.81	peak			

Note:1. *: Maximum data; x: Over limit; !: over margin.

^{2.}Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



Note:1. *: Maximum data; x: Over limit; !: over margin.

^{2.}Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

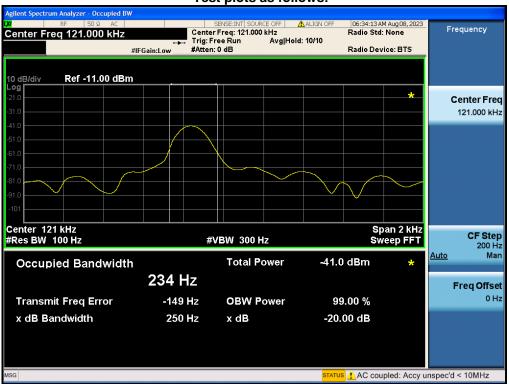
3.3. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set to the maximum power setting and enable the EUT transmit continuously. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. Measure and record the results in the test report.
Test setup:	Spectrum Analyzer EUT
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

3.3.1. Test data

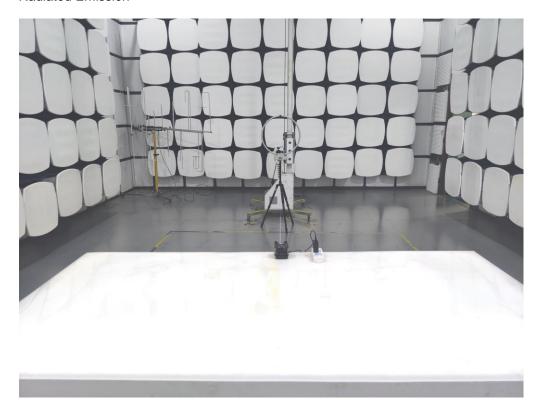
Frequency(kHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
121	0.250		Pass

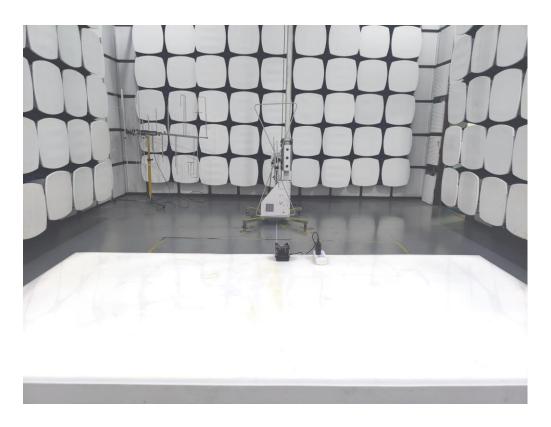
Test plots as follows:



4. Photos of test setup

Radiated Emission

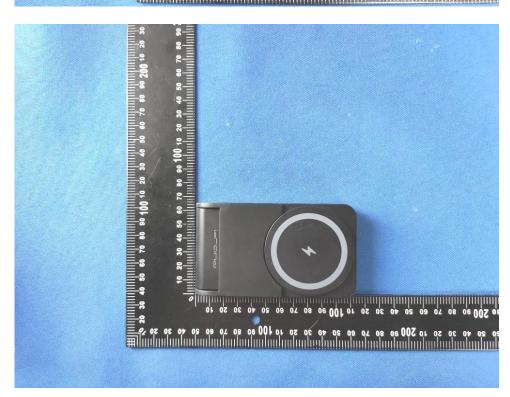


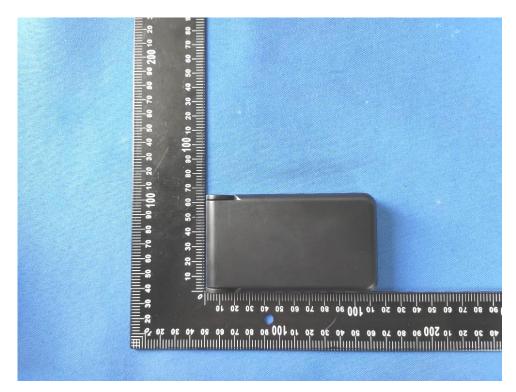


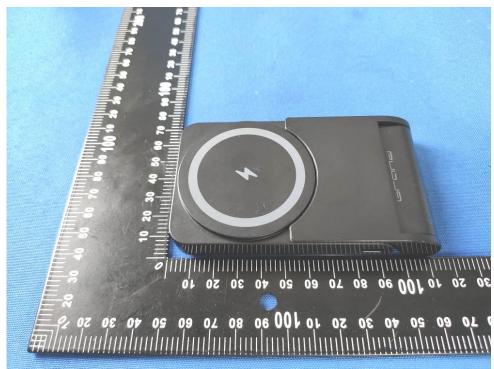


5. Photographs of EUT





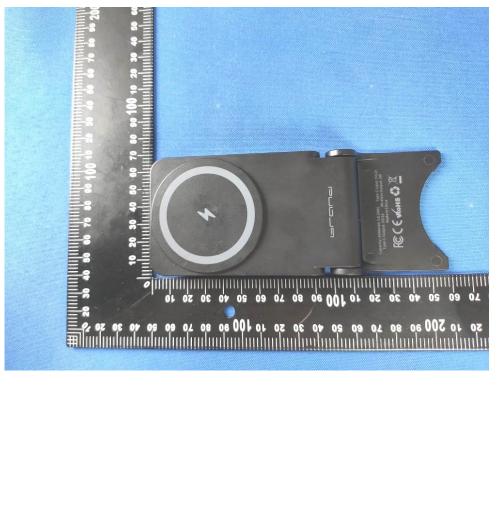






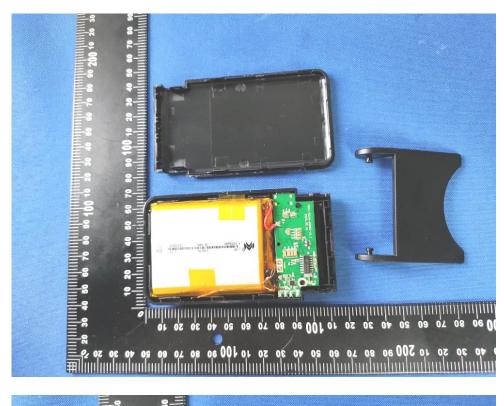


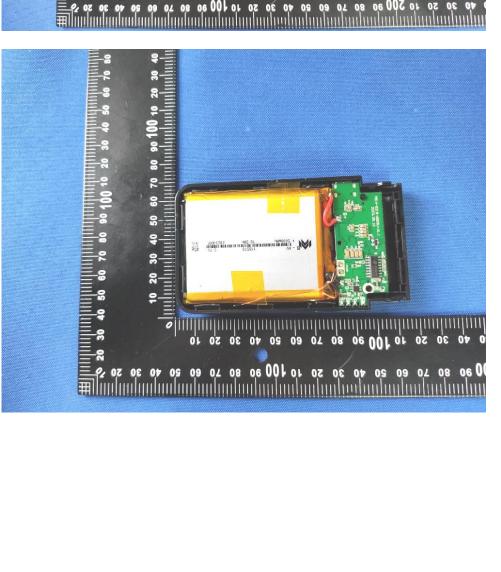


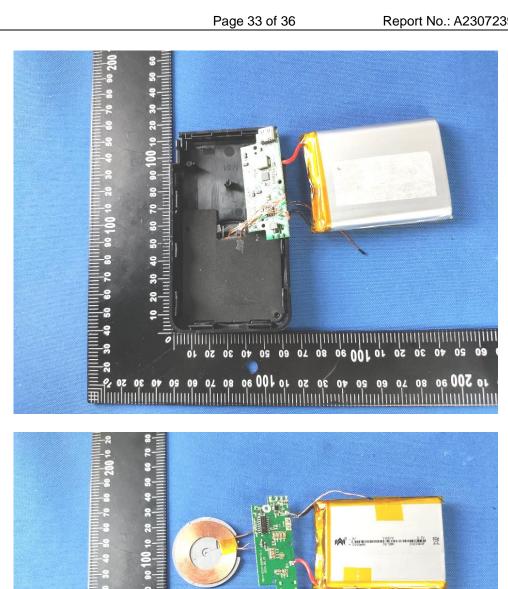


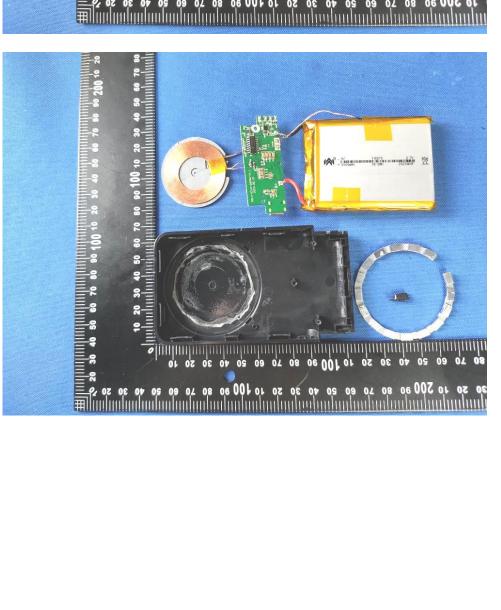


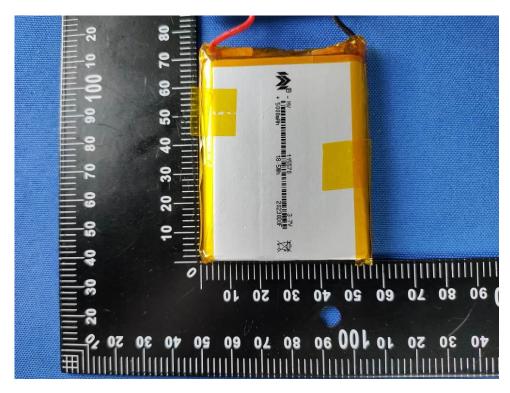


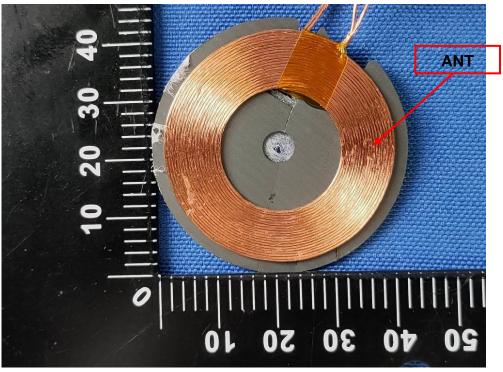


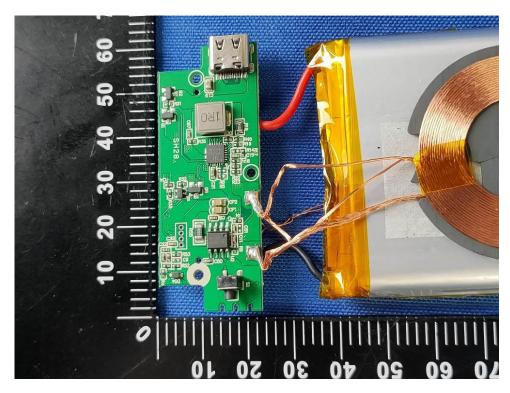




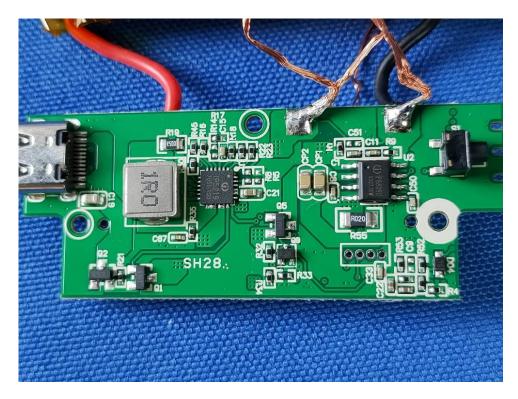


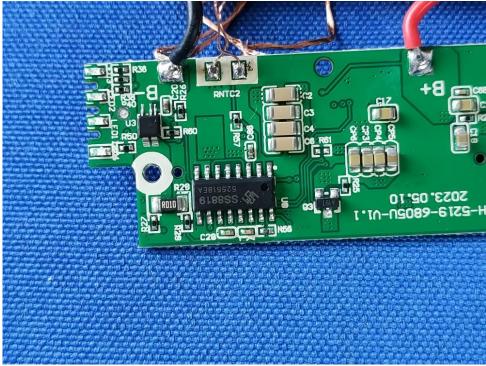












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