

# FCC TEST REPORT FCC ID: 2AP2N-M51

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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
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Date of Test	:	August 2, 2023-August 14, 2023
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## **TEST REPORT DECLARATION**

Applicant	:	Shenzhen Esorun Technology Co., LTD				
Address	:	5Floor, B1 Building, Hongwan Industrial Zone Xixiang Gushu, Bao'an District ShenZhen GuangDong				
Manufacturer	:	Shenzhen Esorun Tech	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

Lucas Rong

Approved by (name + signature).....:

Reak Yang Project Manager

Date of issue.....:

October 16, 2023

#### **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.

## 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: 5V2A Wireless Output: 5W Type-C Output: 5V2A Max Multiplex output: Type-C Output: 5V1A 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			

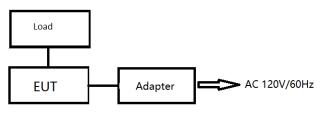
### 2.2. Accessories of Device (EUT)

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:	<b>15-35</b> ℃	<b>24</b> °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 <sup>-8</sup> GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

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

## 2.9. Test Equipment List

	Software Information							
Test Item	Software Name	Manufacturer	Version					
RE	EZ-EMC	Farad	Alpha-3A1					
CE	EZ-EMC	Farad	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

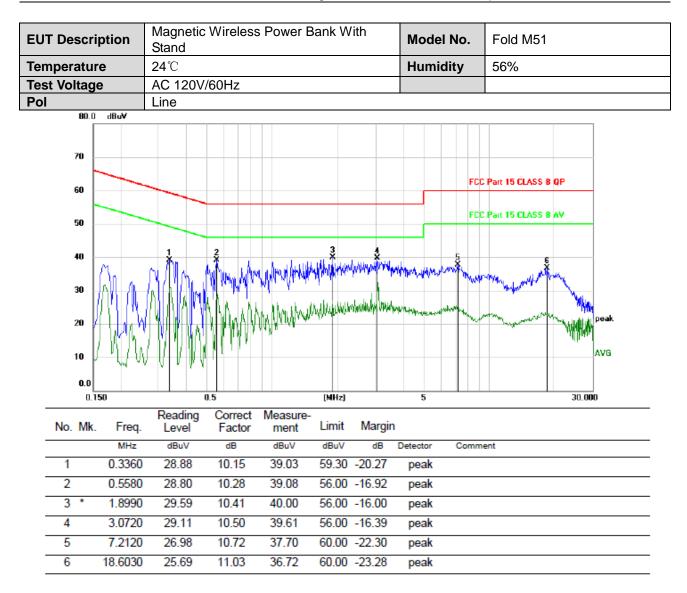
Test Requirement:	FCC Part15 C Section 15.20	07					
Test Method:	ANSI C63.10:2013						
Frequency Range:	150 kHz to 30 MHz						
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto						
	Frequency range (MHz)	Limit (d	/				
Limiter	0.15-0.5	Quasi-peak 66 to 56*	Average 56 to 46*				
Limits:	0.5-5	56	46				
	5-30	60	50				
	Reference Plane						
Test Setup:	40cm 80cm Filter AC power E.U.T Adapter Test table/Insulation plane Remark: E.U.T Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m						
Test Mode:	Transmitting Mode						
Test Procedure:	<ol> <li>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.</li> <li>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).</li> <li>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.</li> </ol>						
Test Result:	PASS						

#### 3.1.2. Test data

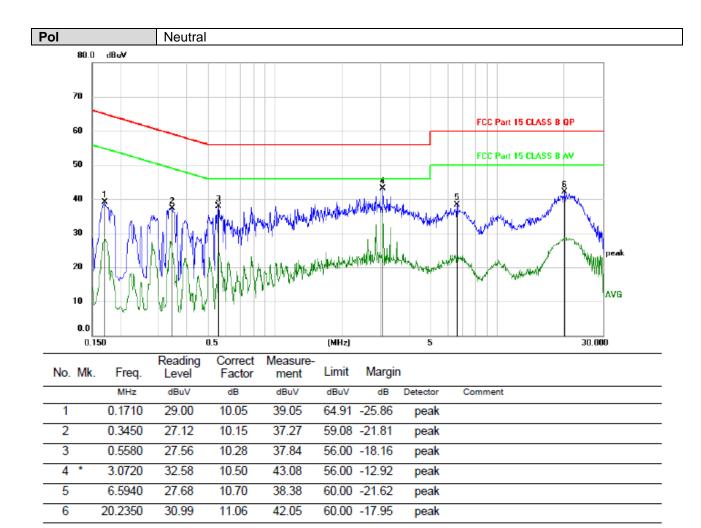
#### Please refer to following diagram for individual

Test Mo	ode : 121KHz
Test Re	sults : 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 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.

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*:Maximum data	x:Over limit	!:over margin	(Reference Only
Note: Measuremer	nt=Reading Le	vel+Correc Factor.	Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

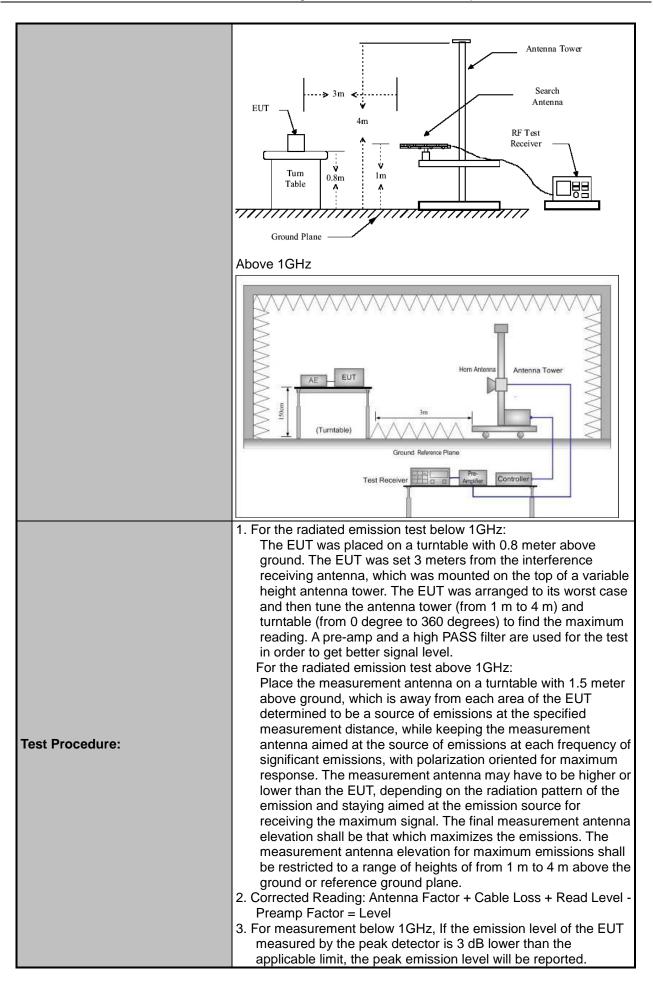


*:Maximum data	x:Over limit	!:over margin	<pre></pre>	leference Only
Note: Measuremer	nt=Reading Lev	el+Correc Factor.	Factor=(LISN or ISN or PLC or Current Probe)Factor	or+Cable

## 3.2. Radiated Spurious Emission Measurement

## 3.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209								
Test Method:	ANSI C63.10: 2	2013							
Frequency Range:	9 kHz to 25 GH	z							
Measurement Distance:	3 m								
Antenna Polarization:	Horizontal & Ve	ertical							
Operation mode:	Refer to item 4.	.1							
	Frequency 9kHz- 150kHz 150kHz-	Qua	tecto asi-pe k	ea	RBW 200Hz	VBW 1kHz	Q	Remark uasi-peak Value	
Receiver Setup:	30MHz 30MHz		asi-pe <u>k</u> asi-pe		9kHz 100KH	30kHz 300KH		uasi-peak Value uasi-peak	
	z	Que	k k	a	Z	Z	G	Value	
	Above 1GHz		Peak Peak		1MHz 1MHz	3MHz 10Hz		eak Value erage Value	
	Frequer	юу		Field Stre (microvolts/		ength Di		asurement Distance meters)	
	0.009-0.4			2400/F(k			300		
	0.490-1.705			24000/F(I		KHz)		30 30	
	30-88			30 100				30	
	88-210		150					3	
Limit:	216-96			200				3	
	Above 960 500 3						3		
	Frequency		Field Strength (microvolts/met r)		olts/mete	Measure nt Distan (meter	се	Detector	
	Above 1GHz			500 5000		3		Average	
	For radiated en	nissio	ns be			3		Peak	
		Distance					Γ	Computer	
Test setup:	EUT Pre -Amplifier						plifier		
	0.8m	Turn	_1	roun	d Plane	⊥ [ ┐	Rece	tiver	
	30MHz to 1GH	Z	3			<u> </u>			
	1								

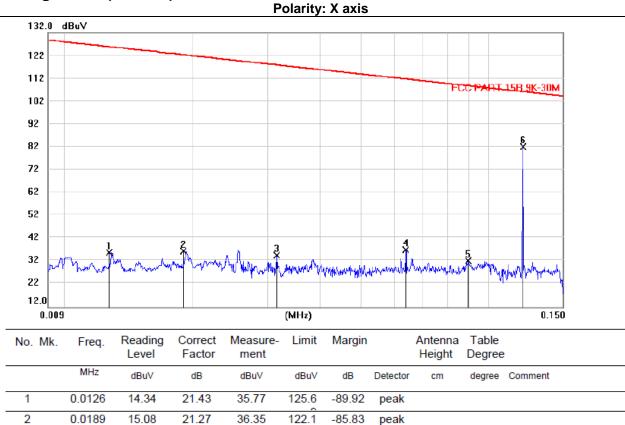


	<ul> <li>Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</li> <li>4. Use the following spectrum analyzer settings: <ul> <li>(1) Span shall wide enough to fully capture the emission being measured;</li> <li>(2) Set RBW=100 kHz for f &lt; 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold;</li> <li>(3) Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement.</li> <li>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.</li> </ul> </li> </ul>
Test mode:	Refer to section 4.1 for details
Test results:	PASS

### 3.2.2. Test Data

### Please refer to following diagram for individual

Freque	ncy Range	:	9KHz~30MHz					
Test Mo	ode	:	121kHz					
Test Re	sults	:	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):

3

4

5

6

\*

0.0314

0.0637

0.0898

0.1208

13.74

16.93

12.41

62.14

20.91

20.11

19.90

19.81

34.65

37.04

32.31

81.95

117.7

111.6

108.6

106.1

-83.14

-74.62

-76.38

-24.17

peak

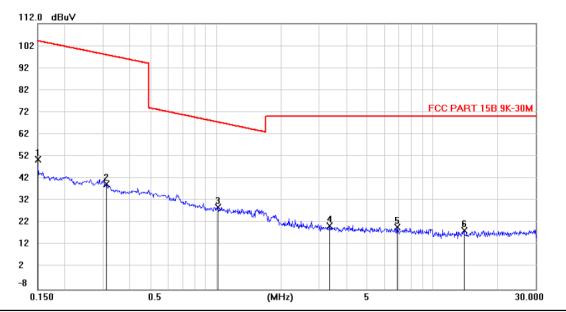
peak

peak

peak

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

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

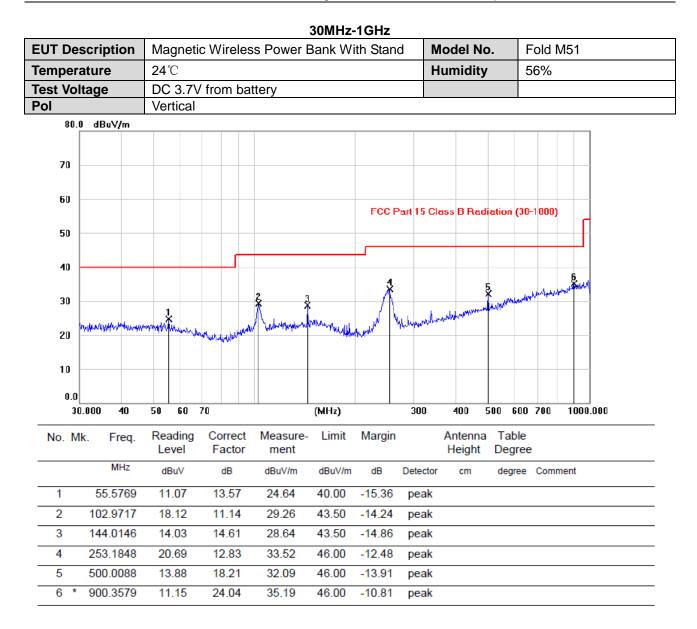


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.1500	30.42	20.20	50.62	104.2	-53.63	peak			
2		0.3118	19.54	19.97	39.51	97.91	-58.40	peak			
3	*	1.0212	8.99	20.00	28.99	67.52	-38.53	peak			
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			

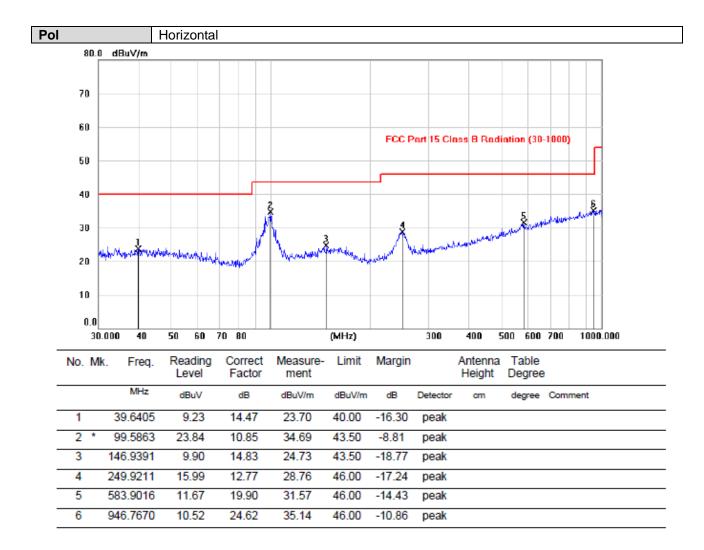
Note:1. \*:Maximum data; x:Over limit; !:over margin. 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Frequer	ncy Range	:	30MHz~1000MHz				
Test Mo	de	:	121KHz				
Test Re	sults	:	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.						

Frequer	ncy Range	:	Above	1GHz				
EUT		:	/			Test Date	:	/
M/N		:	/			Temperature	:	/
Test Eng	gineer	:	/			Humidity	:	/
Test Mo	de	:	/					
Test Re	sults	:	N/A					
1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the Note: measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.								



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
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Test Requirement:	FCC Part15 C Section 15.215(c)				
Test Method:	ANSI C63.10: 2013				
Limit:	N/A				
Test Procedure:	<ol> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.</li> <li>Measure and record the results in the test report.</li> </ol>				
Test setup:	Spectrum Analyzer EUT				
Test Mode:	Refer to section 4.1 for details				
Test results:	PASS				

#### 3.3.1. Test data

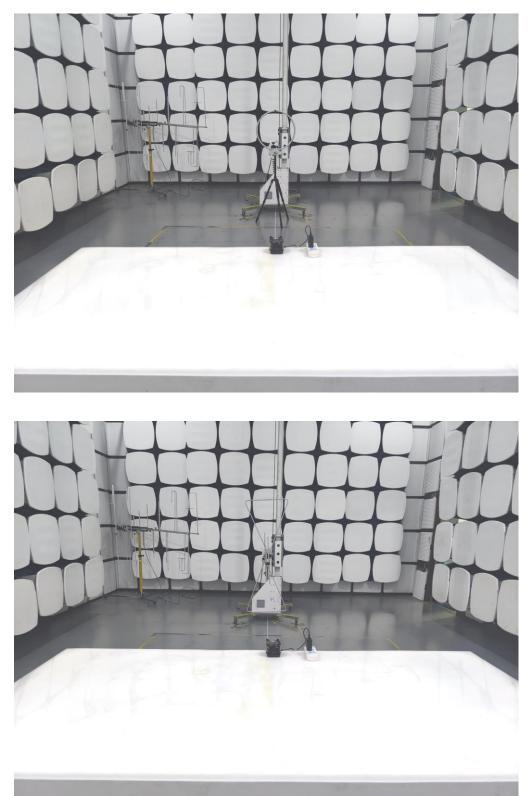
Frequency(kHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion	
121	0.250		Pass	

	Iea	st plots as lol	10w5.		
Agilent Spectrum Analyzer - Occupied BW					
<b>LX/</b> RF 50 Ω AC		SENSE:INT SOURCE OFF		:13 AM Aug 08, 2023	Frequency
Center Freq 121.000 kHz		er Freq: 121.000 kHz Free Run Avg Ho	Radio Id: 10/10	Std: None	Frequency
#IE		n:0 dB		Device: BTS	
	Gameon				
10 dB/div Ref -11.00 dBm					
-21.0				*	0
					Center Freq
-31.0					121.000 kHz
-41.0					
-51.0					
-61.0	<b>↓ / ↓ ↓</b>	X			
-71.0					
-81.0					
-91.0					
-101					
Center 121 kHz				Span 2 kHz	CF Step
#Res BW/ 100 Hz	77	VBW 300 Hz		Sweep FFT	200 Hz
Occupied Bondwidth		Total Power	-41.0 dBn	n *	<u>Auto</u> Man
Occupied Bandwidth		Total Lower	-41.0 GBH	· ^	
	234 Hz				Freq Offset
					0 Hz
Transmit Freq Error	-149 Hz	OBW Power	99.00 %	o	UHZ
x dB Bandwidth	250 Hz	x dB	-20.00 d	3	
MSG			STATUS 🥂 AC	coupled: Accy u	nspec'd < 10MHz

#### Test plots as follows:

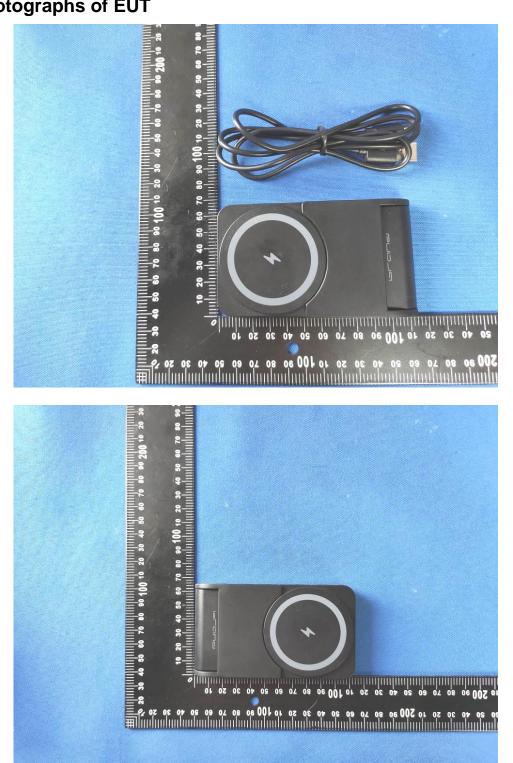
## 4. Photos of test setup

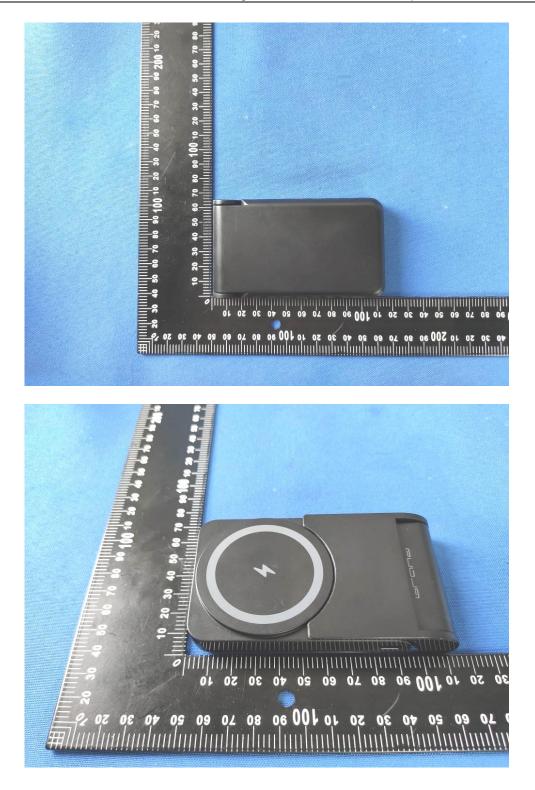
Radiated Emission

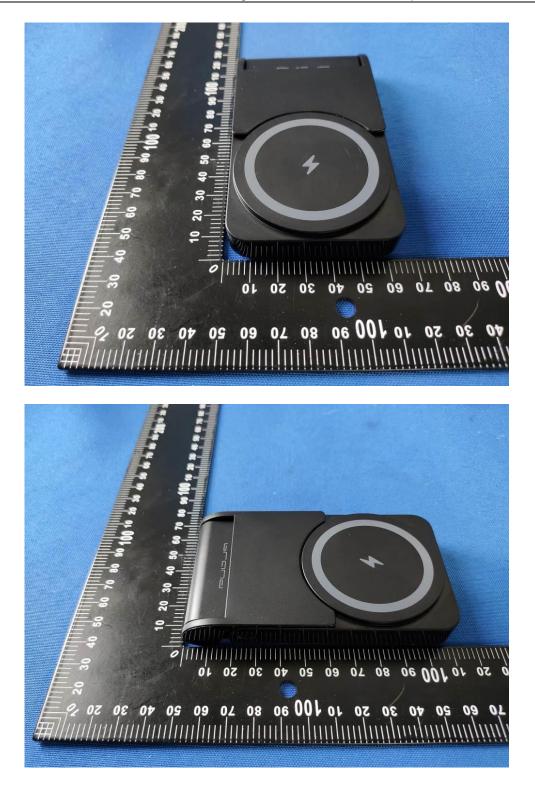


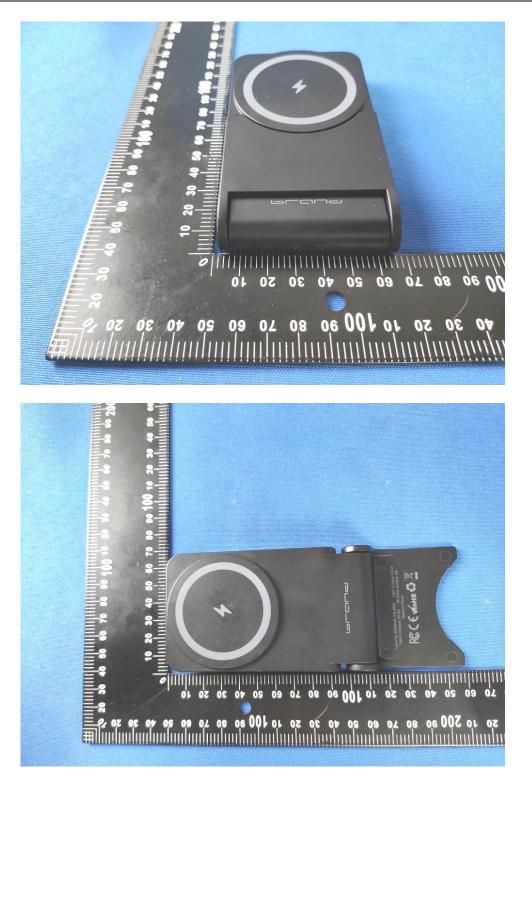


## 5. Photographs of EUT

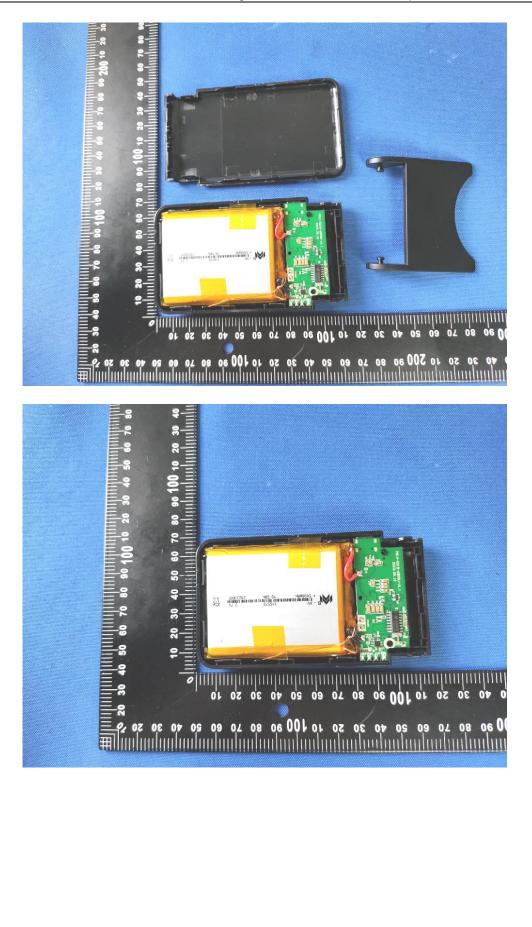


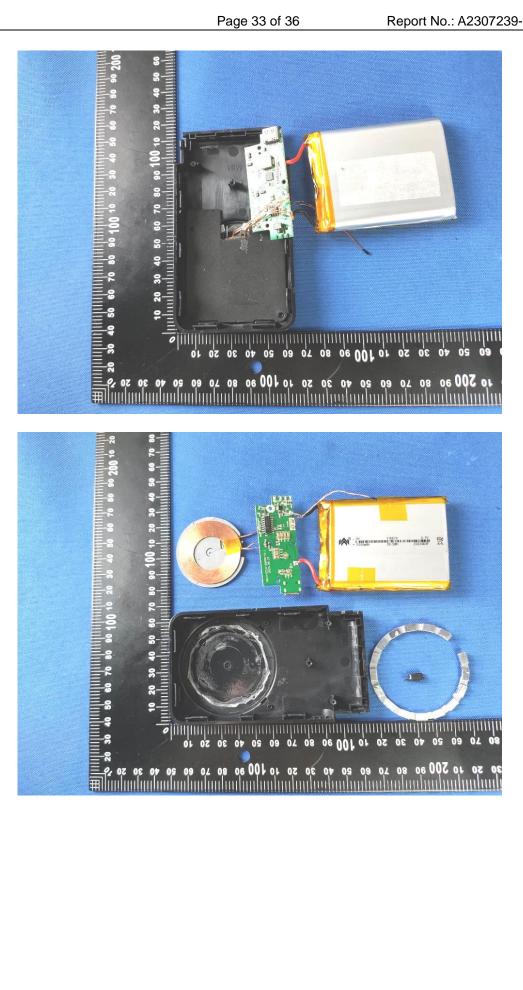


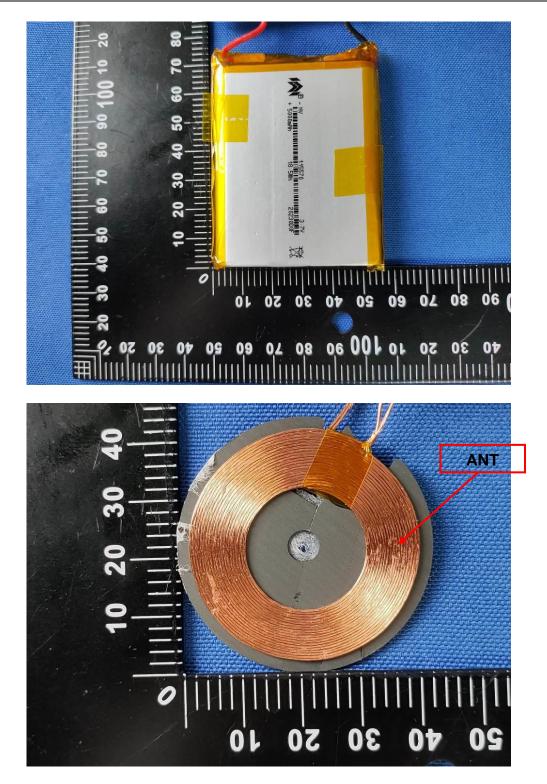


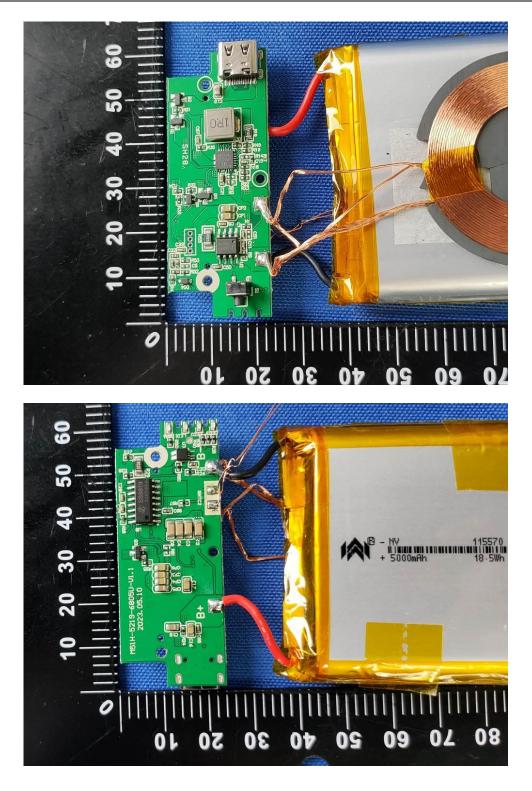


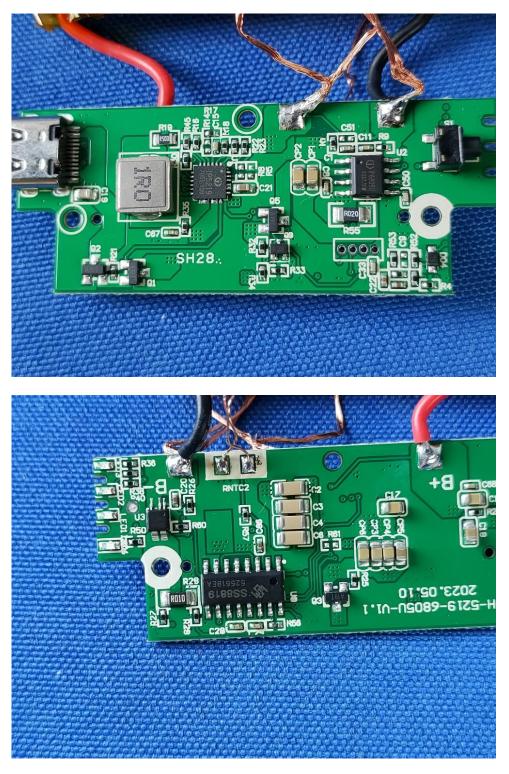












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