

Test Report

Report No.: MTi230525023-01E2
Date of issue: 2023-06-12
Applicant: Spigen Korea Co., Ltd.
Product: ArcField Dual Wireless Charger
Model(s): PF2100
FCC ID: 2AFKNPF2100

Shenzhen Microtest Co., Ltd.


<http://www.mtitest.com>

Instructions

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2. The test results in this test report are only responsible for the samples submitted
3. This test report is invalid without the seal and signature of the laboratory.
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5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

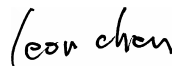
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Test Result Certification	
Applicant:	Spigen Korea Co., Ltd.
Address:	Spigen HQ-A, 446, Bongeunsa-ro, Gangnam-gu, Seoul, 06153, South Korea
Manufacturer:	Spigen Korea Co., Ltd.
Address:	Spigen HQ-A, 446, Bongeunsa-ro, Gangnam-gu, Seoul, 06153, South Korea
Product description	
Product name:	ArcField Dual Wireless Charger
Trademark:	
Model name:	PF2100
Series Model:	N/A
Standards:	FCC CFR 47 PART 1, § 1.1310
Test method:	KDB 680106 v03r01
Date of Test	
Date of test:	2023-06-05 ~ 2023-06-12
Test result:	Pass

Test Engineer :


(Yanice Xie)

Reviewed By: :


(Leon Chen)

Approved By: :


(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	ArcField Dual Wireless Charger
Model name:	PF2100
Series Model:	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V/3A, 9V/2.2A Output:Coil 1:5W/7.5W; Coil 2:5W
Accessories:	Cable: Type-C to Type-C cable 2m
Hardware version:	V10
Software version:	V10
RF specification:	
Operation frequency:	Transmitter 1 (Phone): 115 kHz – 205 kHz Transmitter 2 (Earphone): 115 kHz – 205 kHz
Modulation type:	ASK
Antenna type:	Coil Antenna

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

No.	Emission test modes
Mode 1	Wireless Output 1(5W)
Mode 2	Wireless Output 1(7.5W)
Mode 3	Wireless Output2(5W)
Mode 4	Wireless Output(5W+5W)
Mode 5	Wireless Output(7.5W+5W)
Mode 6	Stand-by

The test data only show worst test mode: Mode 5

1.3 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
Airpods	/	/	Apple
iPhone	iPhone 13	MGYJ0HNQHL	Apple
Adapter	HW-090200CH0	/	Huizhou BYD Electronics Co., Ltd.
Support cable list			
Description	Length (m)	From	To
/	/	/	/

2 Measurement uncertainty

Parameter	Expanded Uncertainty
Magnetic field measurement (9kHz~30MHz)	$\pm 18.6\%$
Electric field measurements (9kHz~30MHz)	$\pm 18.6\%$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3 Test facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTI-E115	Electric and Magnetic Field Probe – Analyzer	Narda	EHP-200A	101166	2022/08/15	2023/08/14

5 Test result

5.1.1 Requirement

§1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of FCC part 2.1093 of this chapter.

Table 1 to §1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1500			f/300	<6
1500-100000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500			f/1500	<30
1500-100000			1.0	<30

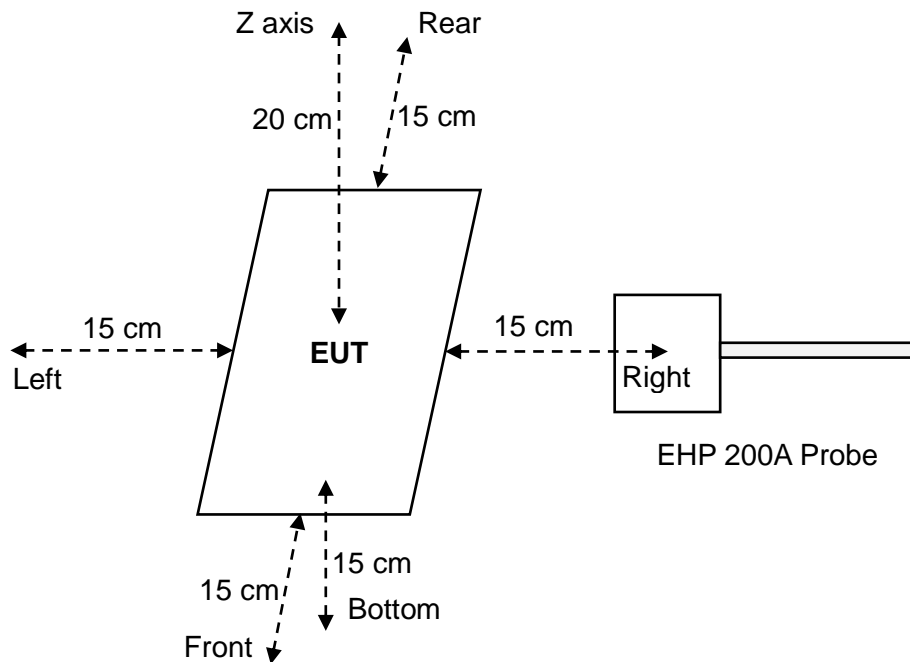
f = frequency in MHz

* = Plane-wave equivalent power density

Note 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

Note 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5.2 Test setup



5.3 Test Procedures

- The RF exposure test was performed in anechoic chamber.
- E and H-field measurements should be made with the center of the probe at a distance of 15 cm surrounding the device and 20 cm above the top surface of the primary/client pair.
- The highest emission level was recorded and compared with limit.
- The EUT was measured according to the dictates of KDB 680106 v03r01.

5.4 Equipment Approval Considerations item 5 b) of KDB 680106 D01 v03r01

Requirement	Device
1. Power transfer frequency is less than 1 MHz.	Yes. The operating frequencies are: Transmitter 1 (Phone): 115 kHz – 205 kHz Transmitter 2(Earphone): 115 kHz – 205 kHz
2. Output power from each primary coil is less than or equal to 15 watts	Yes. The maximum output power is: Coil 1:5W/7.5W Max; Coil 2:5W Max
3. The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.	Yes. The EUT has two source primary coils.
4. Client device is placed directly in contact with the transmitter.	Yes. The client device is placed directly in contact with the transmitter.
5. Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes. Mobile exposure conditions only.
6. The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.	Yes. See the test result in item 5.5.

5.5 Test results

Test condition 1: Mode 5 operating mode with client device (1 % battery status of client device)

Probe Position	E-field (V/m)			H-field (A/m)		
	Measurement	Limit	Max. Percentage (%)	Measurement	Limit	Max. Percentage (%)
Z axis	2.3445	614	0.38%	0.1490	1.63	45.75%
Left	1.7179			0.2975		
Right	1.8301			0.1471		
Front	1.0516			0.1081		
Rear	1.6230			0.1344		
Bottom	1.4515			0.7458		

Test condition 2: Mode 5 operating mode with client device (50 % battery status of client device)

Probe Position	E-field (V/m)			H-field (A/m)		
	Measurement	Limit	Percentage (%)	Measurement	Limit	Percentage (%)
Z axis	2.3299	614	0.38%	0.1399	1.63	45.58%
Left	1.7089			0.2921		
Right	1.8224			0.1563		
Front	1.0559			0.106		
Rear	1.6078			0.1271		
bottom	1.4365			0.743		

Test condition 3: Mode 5 operating mode with client device (99 % battery status of client device)

Probe Position	E-field (V/m)			H-field (A/m)		
	Measurement	Limit	Percentage (%)	Measurement	Limit	Percentage (%)
Z axis	2.3291	614	0.38%	0.1458	1.63	45.48%
Left	1.7129			0.2899		
Right	1.811			0.142		
Front	1.0396			0.107		
Rear	1.6218			0.1281		
bottom	1.4428			0.7413		

Photographs of the Test Setup

See the Appendix - Test Setup Photos.

Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----