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Human Exposure Report

Application No.: SZEM1608007280CR
Applicant: Spigen Korea Co., Ltd.
Address of Applicant: NO.1709 STX-V TOWER,371-37,GASAN-DONG,GEUM CHEON-GU,KOREA
Manufacturer: Shenzhen Powerqi Technology Co.,Ltd.
Address of Manufacturer: 14F No.12 Building,Zhonghaixin Science and Technology Park,Bulan Road,
Buji Street,Longgang District,Shenzhen,China
Factory: Shenzhen Powerqi Technology Co.,Ltd.
Address of Factory: 14F No.12 Building,Zhonghaixin Science and Technology Park,Bulan Road,
Buji Street,Longgang District,Shenzhen,China

Equipment Under Test (EUT):

EUT Name: Fast Wireless Charger
Model No.: F301W
Trade Mark: Spigen
FCC ID: 2AFKNF301W
Standards: 47 CFR PART 1, Subpart I, Section 1.1310
Date of Receipt: 2016-09-09
Date of Test: 2016-09-13 to 2016-09-18
Date of Issue: 2016-09-18

Test Result :	Pass*
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* This report is just a test result base on the test method and limit requirement shown in the form on the second page. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government..

Authorized Signature:



Starry Li
EMC Laboratory Project Engineer



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Shenzhen Branch**

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3 General Information

3.1 Details of E.U.T.

Power Supply: DC 5V/9V from USB port by adapter of AC 120V/60Hz
Operation frequency: 110-205kHz
USB cable: 100cm, unshielded

3.2 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Adapter(output: DC 9V 10W)	Provided by client	EP-TA200(SAMSUNG)
Adapter(output: DC 5V 5W)	Provided by client	TPA101-08050-US(U)
Full load receiver	Provided by Client	10W
Adjustable load receiver	Provided by Client	0-10W

3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



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3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.



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4 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2017-06-10
2	Electric Field Meter	Schaffner	EMC20	EMC068	2017-03-27
3	DC Electronic Load	PRODIGIT	3302F	30802F00533	2016-12-05



5 Test Results

5.1 RF Exposure test

Test Requirement: 47 CFR PART 1, Subpart I, Section 1.1310
Measurement Distance: 10cm
Test voltage: AC 120V 60Hz
Limit:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
1500-100,000	/	/	5	6
(B) 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
1500-100,000	/	/	1.0	30
F=frequency in MHz *=Plane-wave equivalent power density RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).				

5.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 50% RH Atmospheric Pressure: 1005 mbar

EUT Operation:

This device has been tested the worst status of full load receiver and the device has been tested with adjusted load receiver at zero charge, intermediate charge, and full charge.



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5.1.2 Measurement Data

1: Output Voltage=DC 5V; The max output power =5W;Calculation of resistor value=5Ω

Electric Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result (V/m)	Limit (V/m)	30% Limit (V/m)
Side 1	10	4.35	614	184.2
Side 2	10	4.74	614	184.2
Side 3	10	4.81	614	184.2
Side 4	10	4.27	614	184.2
Top	10	6.68	614	184.2
Bottom	10	4.24	614	184.2

Magnetic Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result (A/m)	Limit (A/m)	30% Limit (A/m)
Side 1	10	0.0851	1.63	0.489
Side 2	10	0.0827	1.63	0.489
Side 3	10	0.0864	1.63	0.489
Side 4	10	0.0869	1.63	0.489
Top	10	0.1036	1.63	0.489
Bottom	10	0.0641	1.63	0.489



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2: Adjusted load receiver has been charge at zero charge, intermediate charge, and full charge.

Electric Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result(V/m)			Limit(V/m)/ 30%Limit(V/m)
		zero charge	intermediate charge	full charge	
Side 1	10	3.96	4.69	3.57	614
Side 2	10	3.84	4.42	3.91	614
Side 3	10	4.68	4.47	4.46	614
Side 4	10	3.84	3.95	3.48	614
Top	10	5.27	5.64	5.64	614
Bottom	10	2.84	2.82	2.71	614

Magnetic Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result(A/m)			Limit(A/m)/ 30%Limit(A/m)
		zero charge	intermediate charge	full charge	
Side 1	10	0.0184	0.0164	0.0191	1.63
Side 2	10	0.0162	0.0162	0.0186	1.63
Side 3	10	0.0187	0.0147	0.0215	1.63
Side 4	10	0.0174	0.0134	0.0173	1.63
Top	10	0.0278	0.0267	0.0326	1.63
Bottom	10	0.0155	0.0185	0.0215	1.63



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1: Output Voltage=DC 5V; The max output power =10W;Calculation of resistor value=2.5Ω

Electric Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result (V/m)	Limit (V/m)	30% Limit (V/m)
Side 1	10	4.83	614	184.2
Side 2	10	4.74	614	184.2
Side 3	10	4.81	614	184.2
Side 4	10	4.93	614	184.2
Top	10	6.87	614	184.2
Bottom	10	3.84	614	184.2

Magnetic Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result (A/m)	Limit (A/m)	30% Limit (A/m)
Side 1	10	0.0843	1.63	0.489
Side 2	10	0.0862	1.63	0.489
Side 3	10	0.0889	1.63	0.489
Side 4	10	0.0886	1.63	0.489
Top	10	0.1048	1.63	0.489
Bottom	10	0.0673	1.63	0.489



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2: Adjusted load receiver has been charge at zero charge, intermediate charge, and full charge.

Electric Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result(V/m)			Limit(V/m)/ 30%Limit(V/m)
		zero charge	intermediate charge	full charge	
Side 1	10	3.95	4.71	3.49	614
Side 2	10	3.92	4.61	3.76	614
Side 3	10	4.68	4.57	4.57	614
Side 4	10	3.55	3.54	3.54	614
Top	10	5.42	5.58	5.46	614
Bottom	10	2.68	2.73	2.72	614

Magnetic Field Emissions

Test Position	Test Distance (cm)	Probe Measure Result(A/m)			Limit(A/m)/ 30%Limit(A/m)
		zero charge	intermediate charge	full charge	
Side 1	10	0.0198	0.0161	0.0199	1.63
Side 2	10	0.0186	0.0163	0.0193	1.63
Side 3	10	0.0199	0.0157	0.0204	1.63
Side 4	10	0.0183	0.0134	0.0183	1.63
Top	10	0.0272	0.0262	0.0295	1.63
Bottom	10	0.0158	0.0176	0.0190	1.63

6 Photographs

6.1 Test photos

Test Model No.: F301W

Test with full load

Side 1



Side 2



Side 3



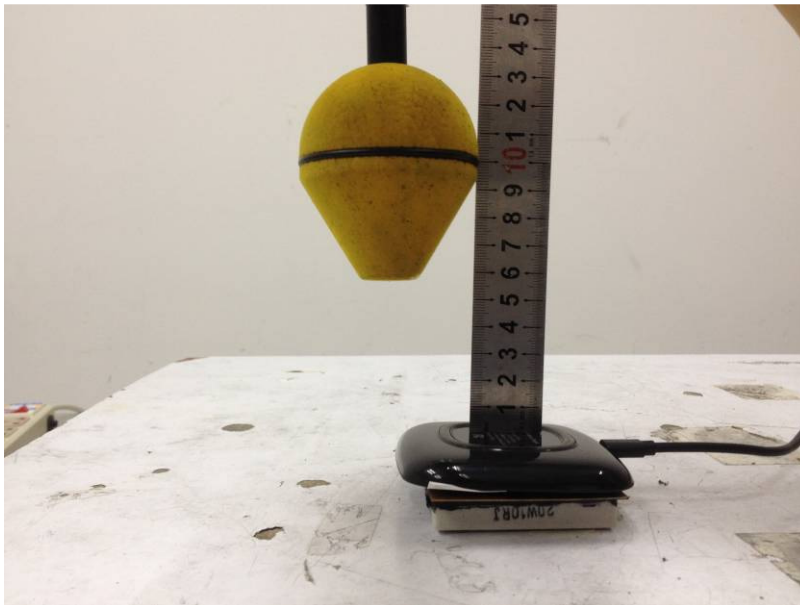
Side 4



Top

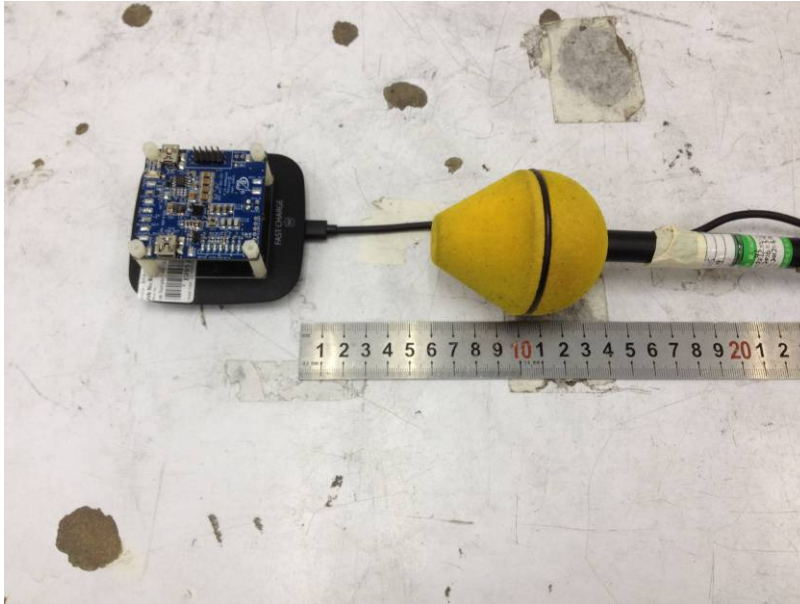


Bottom

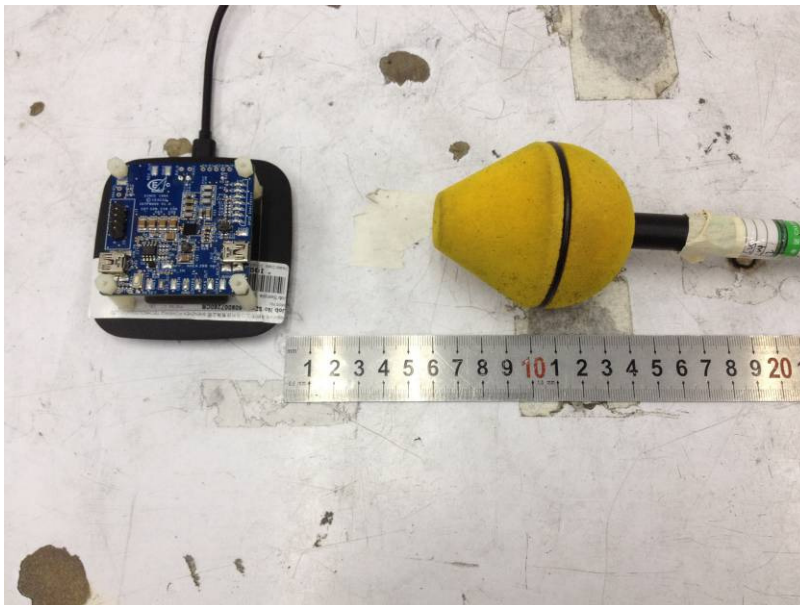


Test with adjusted load receiver at zero charge,intermediate charge,full charge

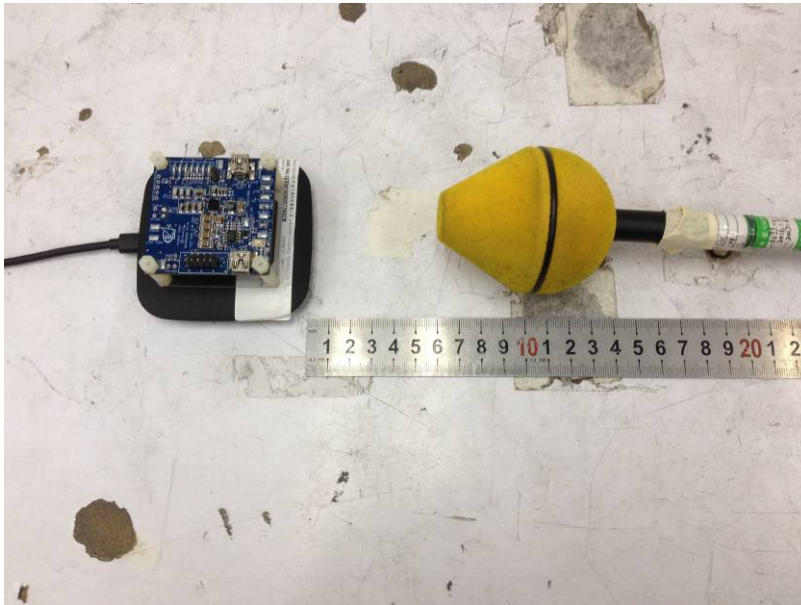
Side 1



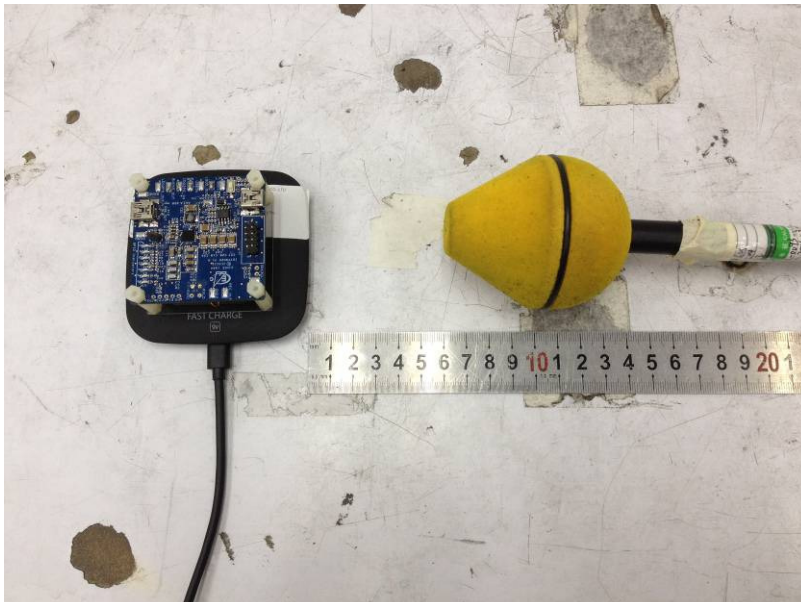
Side 2



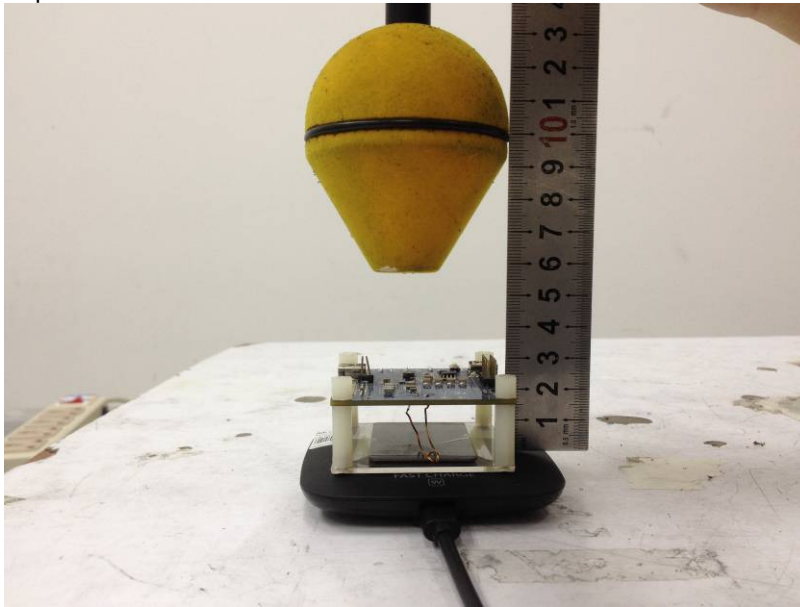
Side 3



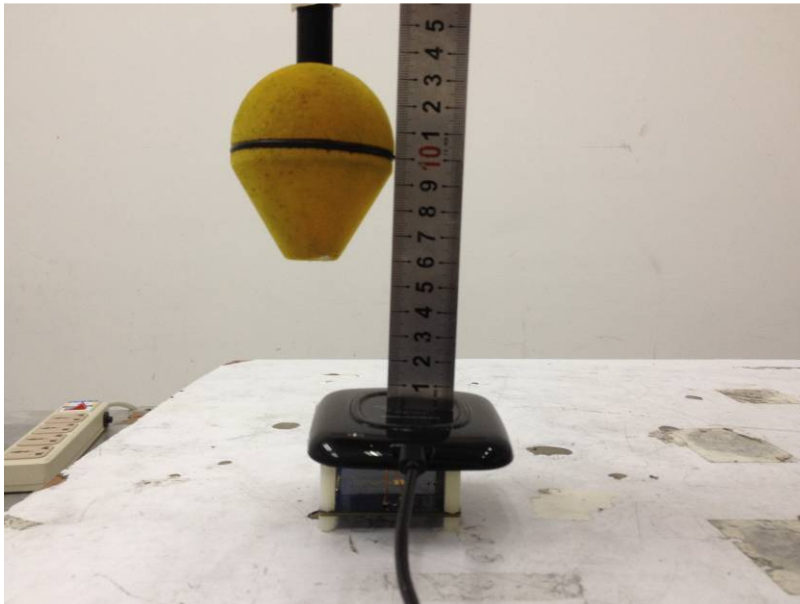
Side 4



Top



Bottom



6.2 EUT photos

Refer to Report No. SZEM160800728001 for EUT internal and external photos.