

TEST REPORT

For

Shenzhen Heshan Technology Co.,Ltd

Product Name: Wireless charging

Test Model(s): V10

Report Reference No. : DACE240911001RF002

FCC ID : 2A4ZB-V10

Applicant's Name : Shenzhen Heshan Technology Co.,Ltd

Address : Third floor, No.8,Zone D, Tangtou third industrial zone, Tangtou Community, Shiyan street, Bao'an District, Shenzhen, China

Testing Laboratory : Shenzhen DACE Testing Technology Co., Ltd.

Address : 102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

Date of Receipt : September 11, 2024

Date of Test : September 11, 2024 to September 30, 2024

Data of Issue : September 30, 2024

Result : Pass

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1 GENERAL INFORMATION

1.1 Client Information

Applicant's Name : Shenzhen Heshan Technology Co.,Ltd
Address : Third floor, No.8,Zone D, Tangtou third industrial zone, Tangtou Community, Shiyan street, Bao'an District,Shenzhen

Manufacturer : Shenzhen Heshan Technology Co.,Ltd
Address : Third floor, No.8,Zone D, Tangtou third industrial zone, Tangtou Community, Shiyan street, Bao'an District,Shenzhen

1.2 Description of Device (EUT)

Product Name:	Wireless charging
Model/Type reference:	V10
Series Model:	N/A
Trade Mark:	Te-rich
Power Supply:	Input:DC5V-2A/DC9V-2A/DC12V-1.5A; Output: 5W/7.5W/10W/15W
Operation Frequency:	125KHz --205KHz
Number of Channels:	N/A
Modulation Type:	FSK
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi (Max)
Hardware Version:	V2
Software Version:	/

1.3 Description of Support Units

Title	Manufacturer	Model No.	Serial No.
AC-DC adapter	PHOTON	ATXC-069AC65B	/
USB Cable	POCE	USB01	/
Phone	APPLE	IPHONE14PRO	/
Wireless Charging Load Module	HANWEI	/	Wireless Input Power:5W/7.5W/10W/15W

1.4 Equipments Used During The Test

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Exposure Level Tester	Narda	ELT-400	N-0231	2023-12-14	2024-12-13
Magnetic field probe 100cm ²	Narda	ELT probe 100cm ²	M0675	2023-12-14	2024-12-13

Common parameter	
Operating temperature	-10 °C ~ +50 °C
Operation humidity	< 95 % (30 °C) or < 29 g/m ³
Weight	910 g
Size	180 mm x 100 mm x 55 mm(Main engine) / 290 mm x 125 mm Ø (Probe)
Display	LCD backlit display, 4 refresh rates per second
Battery	Nimh battery (4 x Mignon, AA), rechargeable
Operating time, typical	12 h
Power supply	100 ~240 V AC / 47 ~ 63 Hz
Charging time, typical	2 hours
Recommended calibration cycle	24 months
Country of origin	Germany

1.5 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Exposure Level Tester	0.8dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.6 Identification of Testing Laboratory

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102 Building H1 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao' an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

Identification of the Responsible Testing Location

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102 Building H1 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao' an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
Designation Number:	CN1342
Test Firm Registration Number:	778666
A2LA Certificate Number:	6270.01

2 Evaluation Results (Evaluation)

2.1 Refer Evaluation Method

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 680106 D01 v04 RF Exposure Wireless Charging Apps v03: RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

FCC CFR 47 part2 2.1093: Radiofrequency radiation exposure evaluation: portable devices

FCC CFR 47 part 18.107: Industrial, Scientific, and Medical Equipment

2.2 Evaluation Requirements

Per KDB 680106 D01 v04 Section 3. RF Exposure Requirements;

- 1) Consumer wireless power transfer devices approved under Part 18 in some cases have to demonstrate compliance with RF exposure requirements. The potential for exposure must be assessed according to the operating configurations of the wireless system and the exposure conditions of users and bystanders. RF exposure must be evaluated with the client device(s) being charged by the primary at maximum output power. The RF exposure requirements must be determined in conjunction with the device operating characteristics, according to the mobile and portable exposure requirements in Section 2.1091 and Section 2.1093 of the rules. SAR and MPE limits do not cover the frequency range for wireless power transfer applications which operate below 100 kHz and 300 kHz respectively; therefore, RF exposure compliance needs to be determined with respect to 1.1307 (c) and (d) of the FCC rules.
- 2) Based on the design and implementation of the power transfer application, it must be clearly identified if mobile or portable RF exposure conditions apply. Devices that are installed to provide separation of at least 20 cm from users and bystanders may qualify for mobile exposure conditions. For some conditions where users and bystanders may be exposed at closer than 20 cm, section 2.1091(d) (4) of the rules may apply.
- 3) For devices designed for typical desktop applications, such as wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.
- 4) Portable exposure conditions from 100 kHz to 6 GHz are determined with respect to SAR requirements. Existing SAR systems and test procedures are generally intended for measurements above 100 MHz. While numerical modeling can be an alternative, the constraints of substantial computational resources at low frequencies could introduce further limitations. Under these circumstances, including operations below 100 kHz, the Commission may consider a combination of analytical analysis, field strength, radiated and conducted power measurements, in conjunction with some limited numerical modeling to assess compliance.
- 5) Depending on the operating frequency, existing SAR and MPE measurement procedures may be adapted to evaluate wireless power transfer devices for compliance with respect to mobile or portable exposure conditions. If the grantee or its test lab have any questions regarding RF exposure evaluation they should contact the FCC Laboratory with sufficient system operating configuration details to determine if RF exposure evaluation is necessary and, if required, how to apply specific test procedures. Below 100 MHz, when SAR testing is required and the device is operating at close proximity to persons, information on device design, implementation, operating configurations, exposure conditions of users and bystanders are needed to determine the evaluation and testing requirements. In addition, the influence of nearby objects may also need consideration according to the wireless power transfer system implementation; for example, the effects of placing

the device, its coils or radiating elements on or near metallic surfaces

2.3 Limits

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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
300-1,500	/	/	f/300	6
1,500-100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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
300-1,500	/	/	f/1500	30
1,500-100,000	/	/	1.0	30

F=frequency in MHz

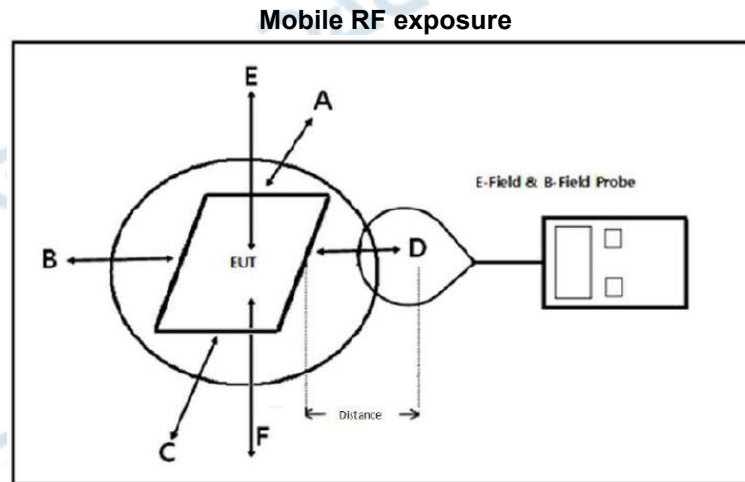
*=Plane-wave equivalent power density

According to FCC KDB 680106 D01 v04Section 3. RF Exposure Requirements clause 3 the Emission-Limits in the frequency range from 100 KHz to 300 KHz should be assessed versus the limits at 300 KHz in Table 1 of CFR 47 – Section1.310 as following (measured distance shall be 15cm from the center of the probe to the edge of the device):

Frequency	E-Field(V/m)	A/m	uT
0.3 MHz – 3.0 MHz	614	1.613	2.0
3.0 MHz – 30 MHz	824/f	2.19/f	--

A KDB inquire was required to determine/confirm the applicable limits below 100 KHz.

2.4 Test Setup Diagram



Note: The distance of the points A/B/C/D is 15cm, and the point E is 20cm.

2.5 Measurement Procedure

For mobile exposure conditions:

- 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 EUT 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 KDB 680106 D01 v04 Wireless Power Transfer v04.

2.6 Equipment Approval Considerations

The EUT does comply with item 5.2 of KDB 680106 D01 v04 as follows table;

1.WPT operating frequency (or frequencies).	The device operate in the frequency range 115KHz~205KHz
2.Output power for each radiating structure.	Maximum 15W
3.Number of radiating structure(Coil)	Only one radiated Coil
4.A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact).	Yes, the surfaces of the transmitter and client device enclosures are in physical contact
5.Only §2.1091-Mobile exposure conditions apply (i.e., this provision does not cover §2.1093-Portable exposure conditions).	Yes, the EUT do not contains battery,it is mobile exposure condition only.
6.The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498,Table 1.	Yes, the EUT field strength levels are less 50% * MPE limit.
7.For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions.	Yes, the EUT has only one coil, all test modes met the conditions specified in (5).

2.7 Test mode

Mode	Description	Test	Record
TM1	AC/DC Adapter + EUT + Mobile Phone (Battery Status: <1%)	Pre-tested	Yes
TM2	AC/DC Adapter + EUT + Mobile Phone (Battery Status: <50%)	Pre-tested	No
TM3	AC/DC Adapter + EUT + Mobile Phone (Battery Status: <100%)	Pre-tested	No

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

NOTE: 1. $A/m = uT/1.25 = (mT/1000)/1.25$, $V/m = 10(((20 \lg(A/m \cdot 10^6) + 51.5) - 120)/20)$

2. H-Field Strength at 15 cm from the edges surrounding and 20cm from the top surface of the EUT

2.8 Test Result:

Field Strength surrounding the EUT.

Load mode	Frequency (KHz)	Field strength	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM1	115-205	uT	0.209	0.226	0.248	0.215	0.115	--	--
TM1	115-205	A/m	0.167	0.181	0.198	0.172	0.092	0.815	1.63
TM1	115-205	V/m	62.840	67.951	74.566	64.644	34.457	307.0	614.0

Position A:Front , Position B:Back, Position C:Left, Position D:Right, Position E: Up

2.9 Conclusion

A minimum safety distance of 15cm/20 cm to the antenna is required when the device is charging a smart phone for mobile exposure. The detected emissions are below the limitations according FCC KDB 680106 and confirmed by the FCC according to KDB Inquire.

3 TEST SETUP PHOTOS



***** End of Report *****