

RF Exposure Evaluation Report

Product : Wireless charger Kit-K012
Trade mark : N/A
Model/Type reference : K012
Serial Number : N/A
Report Number : EED32Q80173002
FCC ID : 2A6J8-K012
Date of Issue : Mar. 05, 2024
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091(mobile devices)
47 CFR Part 2.1093(portable devices)
KDB 447498 D04 Interim General RF
Exposure Guidance v01
KDB 680106 D01 Wireless Power
Transfer v04
Test result : PASS

Prepared for:

Shenzhen Tuozhu Technology Co., Ltd.
**Room 201, Building A, No. 1 First Qianwan Road, Qianhai Shengang
Cooperation Zone.**

Prepared by:

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Mar. 05, 2024



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1 Version

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Tuozhu Technology Co., Ltd.
Address of Applicant:	Room 201, Building A, No. 1 First Qianwan Road, Qianhai Shengang Cooperation Zone.
Manufacturer:	Shenzhen Tuozhu Technology Co., Ltd.
Address of Manufacturer:	Room 201, Building A, No. 1 First Qianwan Road, Qianhai Shengang Cooperation Zone.
Factory:	Shenzhen Telesin Digital Co.,Ltd.
Address of Factory:	Room 526,5/F, Block B, Bairuida Building, Vanke City Community, Bantian Street, Longgang District, Shenzhen, Guangdong, China.

3.2 General Description of EUT

Product Name:	Wireless charger Kit-K012
Model No.(EUT):	K012
Trade Mark:	N/A

3.3 Product Specification subjective to this standard

Frequency Range:	111kHz-140kHz	
Center Frequency:	128kHz	
Modulation Type:	ASK	
Test Power Grade:	Default	
Test Software of EUT:	RF test	
Antenna Type:	Coil antenna	
Device type:	Desktop applications device	
Power Supply:	Input:	5V/1.5A;9V/1.5A;12V/1.5A
	Output:	5W/7.5W/10W/12W/15W
Sample Received Date:	Feb. 26, 2024	
Sample tested Date:	Feb. 26, 2024 to Feb. 29, 2024	
Remark:	Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.	

3.4 Test Environment and Mode

Operating Environment:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Test mode:Transmitting mode	
Mode a:	Wireless charging mode(Null load)(Connect to adapter)
Mode b:	Wireless charging mode(33.3% load)(Connect to adapter)
Mode c:	Wireless charging mode(66.7% load)(Connect to adapter)
Mode d:	Wireless charging mode(Half load)(Connect to adapter)
Mode e:	Wireless charging mode(Full load)(Connect to adapter)
Note:	
1.Wireless output:5W,7.5W,10W,15W(maximum wireless output 15W during charging);	
2.Through Pre-scan,when EUT power by DC 12.0V was the worst case, only the worst case data was recorded in the report.	

3.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
AC adapter	MI	MDY-11-EF	FCC ID and DOC	CTI
Intelligent wireless charging full function test kit	YBZ	/	FCC ID and DOC	CTI

3.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

3.7 Deviation from Standards

None.

3.8 Abnormalities from Standard Conditions

None.

3.9 Other Information Requested by the Customer

None.

4 Equipment List

RF test system					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-08-2023	06-07-2026
Electric and Magnetic field analyzer	Narda	EHP-200AC	180ZX11020	12-21-2023	12-20-2024
PC-1	HP	ZHAN200	--	--	--
EHP200-TS	Narda	--	Rel 1.95	07-28-2023	07-27-2024
Test software	Narda S.T.S./PMM	EHP200-TS	--	--	--
Steel Ruler	Wynn's	300mm	--	11-04-2021	11-03-2024

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

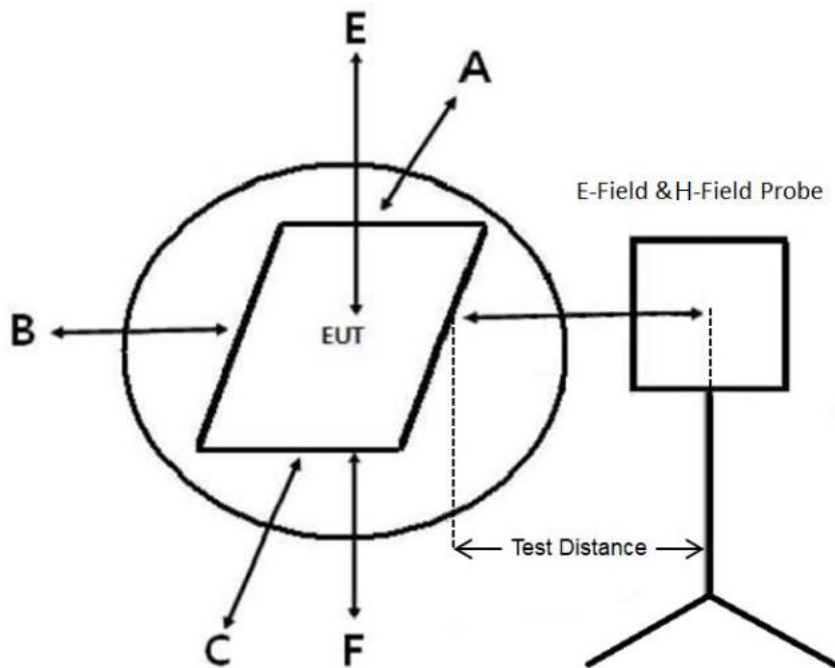
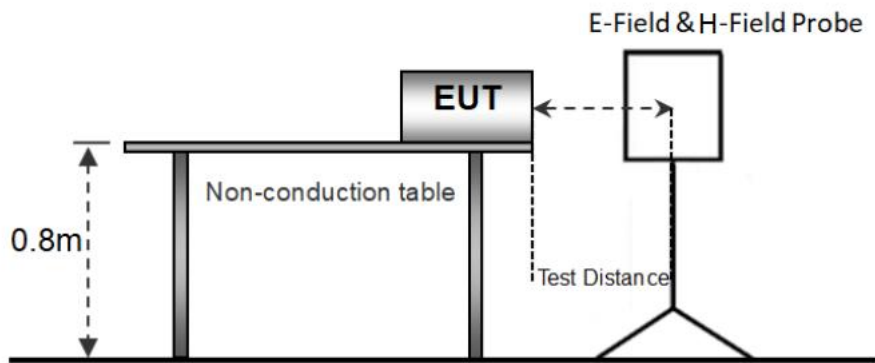
§ 1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency(RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter.

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
300–1,500			f/300	<6
1,500–100,000			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
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

5.1.2 Test Procedure



- The measurement probe was placed at test distance (15 cm for A, B, C, D, F and 20 cm for E) which is between the edge of the charger and the geometric center of probe.
- The highest emission level was recorded at the measurement points (A, B, C, D, E, F).
- The EUT was measured according to the distance of KDB 680106 D01 Wireless Power Transfer v04.

5.1.3 Equipment approval considerations

The EUT does comply with section 5.2 of KDB 680106 D01 Wireless Power Transfer v04.

(1) The power transfer frequency is below 1 MHz.

--Yes,the device operate in the frequency range 111kHz-140kHz.

(2) The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.

--Yes,the maximum output power for each primary coil is 15W.

(3) 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,client device is placed directly in contact with the transmitter.

(4) Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).

--Yes.

(5) 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. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.

--Yes, the EUT H-field strengths levels are less than 50% of MPE limit.

(6) 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. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.

--This product has only one radiating structure.

5.1.4 RF Exposure Evaluation

5.1.4.1 Field strengths Evaluation

1. According to April 27, 2022 TCB Workshop, for portable devices that do not physically attach to phone, desktop WPT testing guidance from FCC KDB 680106 D01 Wireless Power Transfer v04 is applied.
2. The equipment under test was placed on a wooden desk inside of shield room. The isotropic field probe was used to measure the field strength for 6 EUT surfaces. The detailed setup photo please refer to Appendix A.
3. Per FCC KDB 680106 D01 Wireless Power Transfer v04 and April 27, 2022 TCB Workshop, 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. And aggregate H-field strengths and E-field strengths from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
4. According to the KDB 680106 D01 Wireless Power Transfer v04, we tested at 20cm, 22cm and 24cm distance, and only the worst case of 20cm test data was recorded in the report.

Test data:

Mode a						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	0.3906	307	0.1780	0.815	Pass
Top	20	0.3808	307	0.1832	0.815	Pass
Left	20	0.4077	307	0.1727	0.815	Pass
Right	20	0.3984	307	0.1667	0.815	Pass
Rear	20	0.3887	307	0.1780	0.815	Pass
Bottom*	20	/	/	/	/	/

*This product is belongs to desktop applications device, therefore it doesn't apply.

Mode b						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	1.5388	307	0.1775	0.815	Pass
Top	20	1.5972	307	0.1783	0.815	Pass
Left	20	0.8763	307	0.1775	0.815	Pass
Right	20	2.8406	307	0.2097	0.815	Pass
Rear	20	1.1731	307	0.1829	0.815	Pass
Bottom*	20	/	/	/	/	/

*This product is belongs to desktop applications device, therefore it doesn't apply.

Mode c						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	2.6324	307	0.1452	0.815	Pass
Top	20	0.8421	307	0.2642	0.815	Pass
Left	20	0.9634	307	0.1673	0.815	Pass
Right	20	1.9542	307	0.1743	0.815	Pass
Rear	20	1.004	307	0.1356	0.815	Pass
Bottom*	20	/	/	/	/	/

*This product is belongs to desktop applications device,therefore it doesn't apply.

Mode d						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	2.7342	307	0.2563	0.815	Pass
Top	20	1.0641	307	0.2316	0.815	Pass
Left	20	1.1763	307	0.1485	0.815	Pass
Right	20	2.5312	307	0.1953	0.815	Pass
Rear	20	1.2534	307	0.1375	0.815	Pass
Bottom*	20	/	/	/	/	/

*This product is belongs to desktop applications device,therefore it doesn't apply.

Mode e						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	3.0411	307	0.2935	0.815	Pass
Top	20	1.4982	307	0.3376	0.815	Pass
Left	20	1.4589	307	0.2057	0.815	Pass
Right	20	3.0300	307	0.2717	0.815	Pass
Rear	20	1.7866	307	0.2477	0.815	Pass
Bottom*	20	/	/	/	/	/

*This product is belongs to desktop applications device,therefore it doesn't apply.

Conclusions:

From the measurement data obtained, the tested sample was considered to have complied with the requirements for the relevant §1.1310 Radio frequency radiation exposure limits and KDB 680106 D01 Wireless Power Transfer v04.