

MPE

For

4smarts Limited

Product Name: Wireless charger

Test Model(s).: 4S540998

Report Reference No. : POCE240311027RL002

FCC ID : 2BC6L-4S540998

Applicant's Name : 4smarts Limited

Address : Room 401, 4/F, Wanchai Central Building, 89 Lockhart Road, Wan Chai, Hongkong, China

FCC Part 1(1.1310) and Part 2(2.1091)
KDB 680106 D01 Wireless Power Transfer v04

Testing Laboratory : Shenzhen POCE Technology Co., Ltd.

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

Date of Receipt : March 11, 2024

Date of Test : March 11, 2024 to April 10, 2024

Date of Issue : April 10, 2024

Result : Pass

Compiled by:

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Ben Tang / Test Engineer

Supervised by:

Tom Chen

Tom Chen / Project Engineer

Approved by:

Machael Mo

Machael Mo / Manager

1 GENERAL INFORMATION

1.1 Description of Device (EUT)

Product Name:	Wireless charger
Model/Type reference:	4S540998
Series Model:	4S540999,4S540998a,4S540999a
Model Difference:	The product has many models, only the model name is different, and the other parts such as the circuit principle, pcb and electrical structure are the same.
Trade Mark:	N/A
Power Supply:	DC 12V/2.5A from adapter
Operation Frequency:	116KHz~205KHz
Number of Channels:	N/A
Modulation Type:	MSK
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi (Max)
Hardware Version:	V1.0
Software Version:	V1.0

1.2 Description of Test Modes

No	Title	Description
TM1	Full load test (Charging capacity 1%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 1%+Earbuds) ,OUT Wireless Phone Placed horizontally
TM2	half load test (Charging capacity 50%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 50%+Earbuds) ,OUT Wireless Phone Placed horizontally
TM3	No-load load test (Charging capacity 99%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 99%+Earbuds) ,OUT Wireless Phone Placed horizontally
TM4	Full load test (Charging capacity 1%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 1%+Earbuds) ,OUT Wireless Phone Vertically placed
TM5	half load test (Charging capacity 50%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 50%+Earbuds) ,OUT Wireless Phone Vertically placed
TM6	No-load load test (Charging capacity 99%+Earbuds)	Keep the EUT in wireless charging mode (Charging capacity 99%+Earbuds) ,OUT Wireless Phone Vertically placed
TM7	Full load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 1%) ,OUT Wireless Phone Placed horizontally
TM8	half load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 50%) ,OUT Wireless Phone Placed horizontally
TM9	No-load load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 99%) ,OUT Wireless Phone Placed horizontally
TM10	Full load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 1%) ,OUT Wireless Phone Vertically placed
TM11	half load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 50%) ,OUT Wireless Phone Vertically placed

TM12	No-load load test(mobile phone)	Keep the EUT in wireless charging mode (Charging capacity 99%) ,OUT Wireless Phone Vertically placed
TM13	Full load test(Earbuds)	Keep the EUT in wireless charging mode
TM14	half load test(Earbuds)	Keep the EUT in wireless charging mode
TM15	No-load load test(Earbuds)	Keep the EUT in wireless charging mode
Remark:TM1,TM2,TM3 is the full load mode, and the full load mode is the worst mode,Only the data of the worst mode would be recorded in this report.		

1.3 Description of Support Units

Title	Manufacturer	Model No.	Serial No.
AC-DC adapter	HUAWEI TECHNOLOGY	HW100400C01	
mobile phone	Apple	Apple XR	/
Earbuds	Apple	N/A	

1.4 Test Instruments list

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

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 POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shenzhen, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

Identification of the Responsible Testing Location

Company Name:	Shenzhen POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shenzhen, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
Designation Number:	CN1342

1.7 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by POCE and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 Evaluation Results (Evaluation)

2.1 Maximum Permissible Exposure

Test Requirement:	<p>Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile, and portable and are defined as follows:</p> <ul style="list-style-type: none">o Fixed Installations: fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.o Mobile Devices: a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR §2.1091.o Portable Devices: a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR§2.1093). The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/ Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows: <p>Occupational/Controlled Exposure: In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.</p> <p>General Population/Uncontrolled Exposure: The general population / uncontrolled exposure limits are applicable to 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 made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.</p>
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Test Limit:	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													
<table border="1"> <tr> <th>Frequency</th> <th>E-Field(V/m)</th> <th>A/m</th> <th>uT</th> </tr> <tr> <td>0.3 MHz – 3.0 MHz</td> <td>614</td> <td>1.613</td> <td>2.0</td> </tr> <tr> <td>3.0 MHz – 30 MHz</td> <td>824/f</td> <td>2.19/f</td> <td>--</td> </tr> </table>						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	--
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	--														
<p>1. The RF exposure test was performed in anechoic chamber. 2. E and H-field measurements should be made with these devices considered to meet the § 2.1091-Mobile conditions ("generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and [the nearest person]"). 3. The highest emission level was recorded and compared with limit. 4. The EUT was measured according to the dictates of KDB 680106 D01 Wireless Power Transfer v04.</p>																	
<p>Procedure:</p> <ol style="list-style-type: none"> 1) The RF exposure test was performed in anechoic chamber. 2) The measurement probe was placed at test distance (20 cm from the top) which is between the edge of the charger and the geometric center of probe. 3) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed. 4) The EUT was measured according to the dictates of KDB 680106 D01 Wireless Power Transfer v04 <p>Remark: 1. The EUT's test position A, B, C, D and E is valid for the E and H field measurements. 2. A/m=uT/1.25=(mT/1000)/1.25, V/m=10(((20lg(A/m*10⁶)+51.5)-120)/20)</p>																	

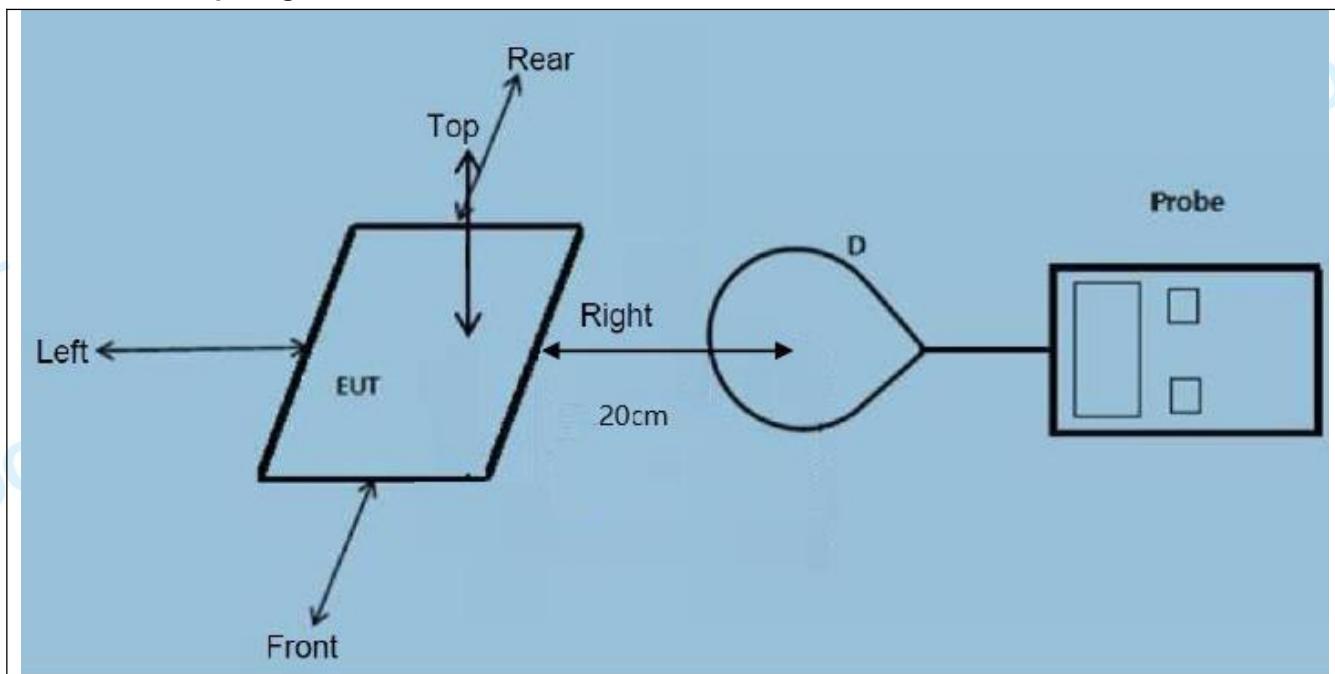
2.1.1

2.1.2 E.U.T. Operation:

Operating Environment:

Temperature:	23.2 °C	Humidity:	51.9 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1				
Final test mode:	TM1				

2.1.3 Test Setup Diagram:



2.1.4 Equipment Approval Considerations

The EUT does comply with item 5.2 of KDB 680106 D01 v04

1) The power transfer frequency is below 1 MHz

Yes, the device operates in the frequency range from 116-205KHz

2) The output power from each transmitting element is less than or equal to 15 watts.

Yes, the maximum output power of the primary coil is 15W.

3) A client device providing the maximum permitted load is placed in physical contact with the transmitter.

Yes, client device is placed directly in contact with the transmitter.

4) Only § 2.1091-Mobile exposure conditions apply

Yes, the EUT is mobile condition assessment

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.

Yes, Conform to

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.

Yes, Conform to,Please refer to RF exposure report

2.1.5 Test Data:

E-Field test results the electric field strength at 20cm around the EUT.

Battery Status Level: 1%

Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM1	116-205	uT	0.593	0.427	0.477	0.384	0.589	--	--
TM1	116-205	A/m	0.474	0.342	0.382	0.308	0.471	0.815	1.63
TM1	116-205	V/m	178.268	128.521	143.446	115.574	177.003	307.0	614.0
Results: Pass									

Battery Status Level: 50%

Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM2	116-205	uT	0.432	0.446	0.313	0.297	0.614	--	--
TM2	116-205	A/m	0.345	0.357	0.251	0.237	0.491	0.815	1.63
TM2	116-205	V/m	129.814	134.069	94.239	89.167	184.548	307.0	614.0
Results: Pass									

Battery Status Level: 99%

Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM3	116-205	uT	0.594	0.600	0.773	0.428	0.342	--	--
TM3	116-205	A/m	0.475	0.480	0.618	0.342	0.274	0.815	1.63
TM3	116-205	V/m	178.644	180.298	232.301	128.714	102.910	307.0	614.0
Results: Pass									

Battery Status Level: 1%

Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM4	116-205	uT	0.379	0.476	0.412	0.780	0.290	--	--
TM4	116-205	A/m	0.303	0.381	0.329	0.624	0.232	0.815	1.63
TM4	116-205	V/m	113.884	143.127	123.812	234.421	87.132	307.0	614.0
Results: Pass									

Battery Status Level: 50%

Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM5	116-205	uT	0.332	0.627	0.682	0.555	0.760	--	--
TM5	116-205	A/m	0.266	0.502	0.546	0.444	0.608	0.815	1.63
TM5	116-205	V/m	99.797	188.658	205.095	166.750	228.594	307.0	614.0
Results: Pass									

Battery Status Level: 99%									
Load mode	Frequency (KHz)	Field strength (uT) (V/m) (A/m)	Test Position A(15cm)	Test Position B(15cm)	Test Position C(15cm)	Test Position D(15cm)	Test Position E(20cm)	50% Limits	Limits
TM6	116-205	uT	0.369	0.375	0.519	0.294	0.637	--	--
TM6	116-205	A/m	0.295	0.300	0.416	0.236	0.509	0.815	1.63
TM6	116-205	V/m	110.920	112.682	156.189	88.542	191.468	307.0	614.0
Results: Pass									

3 TEST SETUP PHOTOS

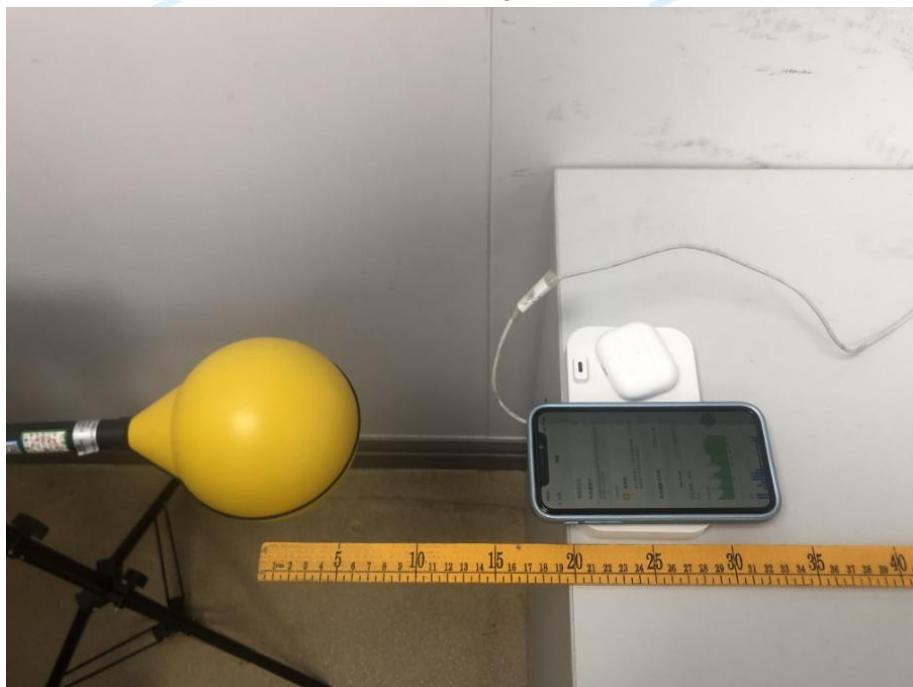
Position A



Position B

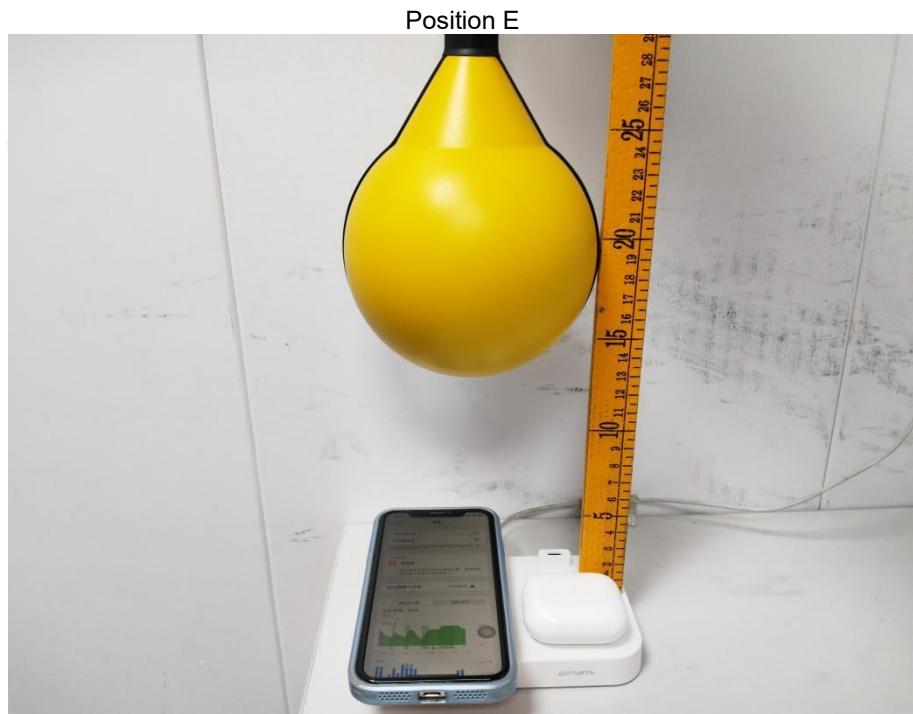


Position C



Position D





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