

TEST REPORT

Product Name : 15W Car Wireless Charging Module
Brand Mark : N/A
Model No. : W015CN-09
FCC ID : 2AZX2-DB000001
Report Number : BLA-EMC-202307-A3304
Date of Sample Receipt : 2023/7/13
Date of Test : 2023/7/13 to 2023/8/4
Date of Issue : 2023/8/4
Test Standard : KDB 680106 D01 RF Exposure Wireless Charging App v03r01;
KDB Publication 447498 D01 General RF Exposure Guidance v06 Clause 4.3.1
Test Result : Pass

Prepared for:

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Prepared by:

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REPORT REVISE RECORD

Version No.	Date	Description
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BlueAsia

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
2	GENERAL DESCRIPTION OF E.U.T.	4
3	LABORATORY LOCATION	5
4	RF EXPOSURE COMPLIANCE REQUIREMENT	6
4.1	WIRELESS CHARGING	6
4.1.1	Measuring Standard	6
4.1.2	Requirements	6
4.1.3	Limits	6
4.1.4	Test Setup	8
4.1.5	Test Procedure	9
4.1.6	Test Instruments list	9
4.1.7	Test Result	10
4.1.8	Test Set-up Photo	11
4.2	NFC	14

1 GENERAL INFORMATION

Applicant	An Energy Technology Co.,Ltd
Address	139 Huaye Road, Jintan District Changzhou City Jiang Su,213200 China
Manufacturer	An Energy Technology Co.,Ltd
Address	139 Huaye Road, Jintan District Changzhou City Jiang Su,213200 China
Factory	An Energy Technology Co.,Ltd
Address	139 Huaye Road, Jintan District Changzhou City Jiang Su,213200 China
Product Name	15W Car Wireless Charging Module
Test Model No.	W015CN-09

2 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	N/A
Software Version	N/A

Wireless charging:

Operation Frequency:	118.1KHz
Modulation type:	ASK
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi (Max)
Power supply	Input: 16V DC~20V DC, 1.5A (max) Output: 15W

NFC:

Operation Frequency:	13.56MHz
Channel Numbers:	1
Modulation Type:	ASK
Antenna Type:	Internal Antenna
Antenna Gain:	0.0dBi

3 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province,
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No tests were sub-contracted.

4 RF EXPOSURE COMPLIANCE REQUIREMENT

4.1 WIRELESS CHARGING

4.1.1 Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging App v03r01

And KDB Tracking Number 671578 ; TCB Workshop, October 2018, 5.2 RF Exposure Procedures

4.1.2 Requirements

According to the item 5 of KDB 680106 D01 RF Exposure Wireless Charging App v03:

(1) Power transfer frequency is less than 1 MHz.

Yes

(2) Output power from each primary coil is less than or equal to 15 watts.

No

(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

(4) Client device is placed directly in contact with the transmitter.

Yes

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

No

(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Yes

4.1.3 Limits

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)

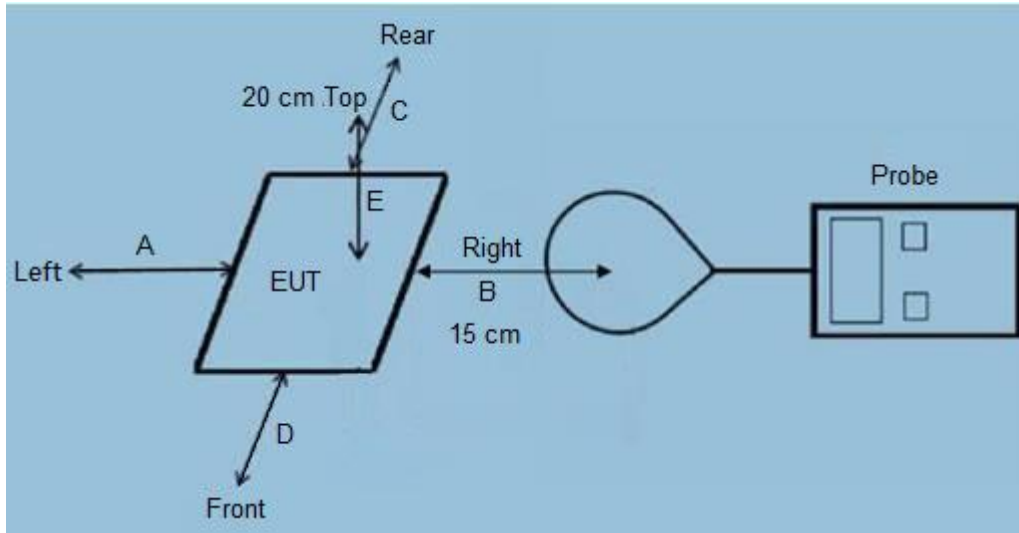
Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(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

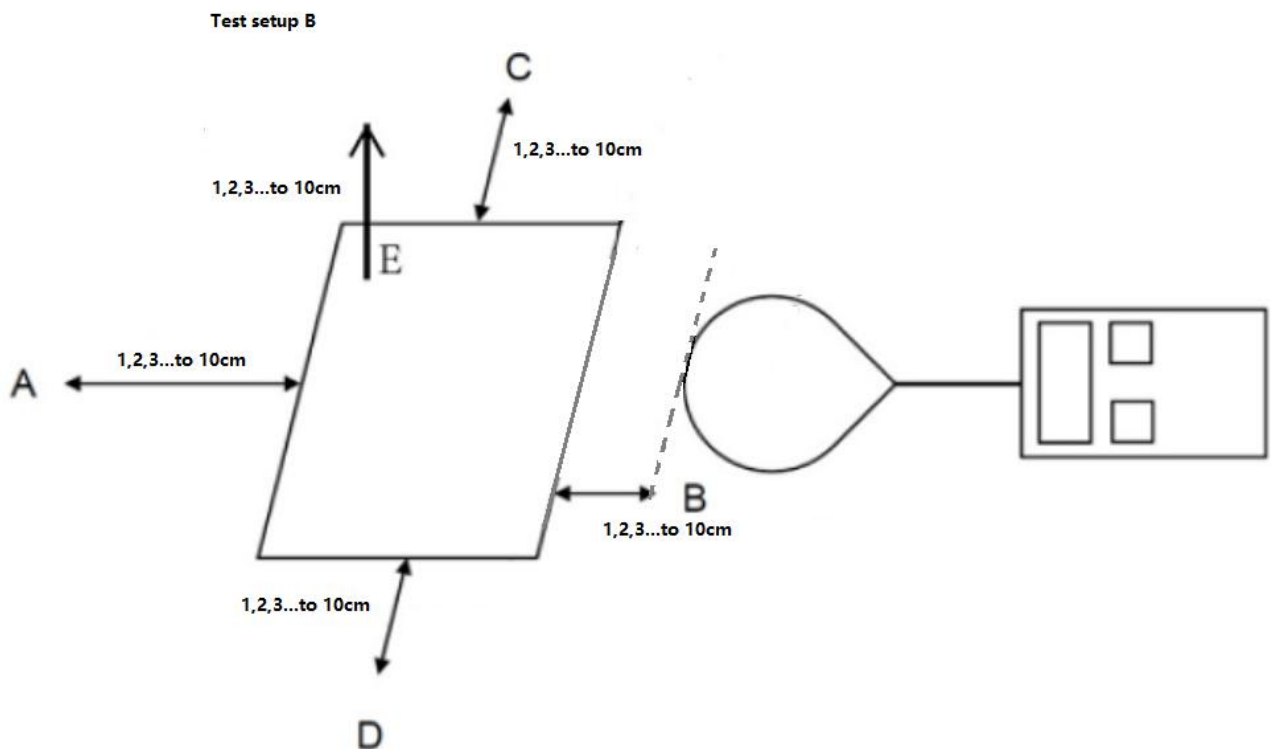
F=frequency in MHz
*=Plane-wave equivalent power density
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

4.1.4 Test Setup

A:



B:



4.1.5 Test Procedure

- 1) The RF exposure test was performed in an echoic chamber;
- 2) The measurement probe was placed at test distance(15 cm from edges, 20 cm from top) Which is between the edge of the charger and the geometric center of probe, for test setup A;
- 3) In addition to what is described in KDB 680106 D01, please measure and provide magnetic and electrical field strength at a distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm. Which is between the edge of the charger and the edge of of probe, for test setup B;
- 4) The highest emission level was recorded and compared with limit as soon as measurement of each points (A,B, C,D, E) were completed;
- 5) The EUT was measured according to the dictates of KDB680106D01v03; And KDB Tracking Number 671578 ; TCB Workshop, October 2018, 5.2 RF Exposure Procedures

Remark: The EUT' s test position A, B,C, D and E is valid for the E and H field measurements.

4.1.6 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Duedate (mm-dd-yy)
Electric and Magnetic Field Analyzer	Narda	EHP-200A	180ZX11016	04-24-2022	04-23-2023

4.1.7 Test Result

Test Result for Test setup A:

Connect AC power in mode:

E-Filed Strength at (15 cm from edges A,B,C,D,15cm and 20 cm from top E) surrounding the EUT (V/m)

Charging Load Worse case	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E 15cm	Test Position E 20cm	Limits (V/m)
<5%	0.55	0.81	0.57	0.56	0.87	0.79	614
50%	0.46	0.52	0.86	0.35	0.86	0.57	614
>90 %	0.49	0.39	0.68	0.37	0.46	0.80	614

H-Filed Strength at (15 cm from edges A,B,C,D, 15cm and 20 cm from top E) surrounding the EUT (A/m)

Charging Load Worse case	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E 15cm	Test Position E 20cm	Limits (A/m)
<5%	0.0411	0.0446	0.0622	0.0587	0.0734	0.0712	1.63
50%	0.0461	0.0381	0.0528	0.0474	0.0511	0.0379	1.63
>90 %	0.0521	0.0546	0.0475	0.0536	0.0287	0.0637	1.63

4.1.8 Test Set-up Photo

A

Test setup of A side



Test setup of B side



Test setup of C side



Test setup of D side



Test setup of E side



4.2 NFC

The device as documented in the exhibits for FCC ID: 2AZX2-DB000001 contains a NFC transmitter operating at 13.56 MHz and a WPT transmitter operating at 118.1 kHz. The following RF exposure evaluation is in accordance with the guidance as provided in KDB Publication 447498 D01 General RF Exposure Guidance v06. The NFC transmitter can not simultaneously transmit with the WPT transmitter.

Determination of the SAR test exclusion power thresholds:

KDB Publication 447498 D01 General RF Exposure Guidance v06 Clause 4.3.1 - Standalone SAR test exclusion considerations

Clause 4.3.1 a):

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$\left(\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right) \times \sqrt{f_{(\text{GHz})}} \leq 3.0 \text{ for 1-g SAR or } \leq 7.5 \text{ for 10-g extremity SAR}$$

$$\text{max. power of channel, including tune-up tolerance, mW} \leq \left(\frac{3.0}{\sqrt{f_{(\text{GHz})}}} \right) \times (\text{min. test separation distance, mm})$$

$$f_{(\text{GHz})} = 0.1 ; \text{ Minimum test separation distance} = 50 \text{ mm}$$

$$\text{1-g SAR test exclusion power threshold: max. power of channel, including tune-up tolerance, mW} \leq \left(\frac{3.0}{\sqrt{0.1}} \right) \times 50$$

$$\text{1-g SAR test exclusion power threshold: max. power of channel, including tune-up tolerance, mW} \leq 475 \text{ mW}$$

Clause 4.3.1 b):

For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

Clause 4.3.1 b) 1):

$$\text{Power allowed at numeric threshold for 50 mm in step 4.3.1 a) + } \left((\text{test separation distance} - 50 \text{ mm}) \times \left(\frac{f_{\text{MHz}}}{150} \right) \right) \text{ mW for 100 MHz to 1500 MHz}$$

$$f_{(\text{MHz})} = 100$$

$$\text{Minimum test separation distance} = 50 \text{ mm}$$

$$\text{1-g SAR test exclusion power threshold: } 475 \text{ mW} + \left((50 - 50) \times \left(\frac{100}{150} \right) \right) \text{ mW for 100 MHz to 1500 MHz}$$

$$\text{1-g SAR test exclusion power threshold: } 475 \text{ mW for 100 MHz to 1500 MHz}$$

Clause 4.3.1 c):

For frequencies below 100 MHz, the following may be considered for SAR test exclusion:

Clause 4.3.1 c) 1):

For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step 4.3.1 b) is multiplied by:

$$\left(1 + \log\left(\frac{100}{f_{\text{MHz}}}\right)\right)$$

f (MHz) = 13.56 ; 1-g SAR test exclusion threshold obtained in step 4.3.1 b) 1): 475 mW

1-g SAR test exclusion power threshold for step 4.3.1 c) 1) is:

$$475 \text{ mW} \times \left(1 + \log\left(\frac{100}{f_{\text{MHz}}}\right)\right) = 475 \text{ mW} \times \left(1 + \log\left(\frac{100}{13.56}\right)\right) = 475 \text{ mW} \times (1 + \log(7.375)) = 475 \text{ mW} \times 1.868 = 888 \text{ mW}$$

Clause 4.3.1 c) 2):

For test separation distances ≤ 50 mm, the power threshold determined by the equation in 4.3.1 c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$:

1-g SAR test exclusion power threshold for step 4.3.1 c) 2) is: $888 \text{ mW} \times \frac{1}{2} = 444 \text{ mW}$ (for operation on 13.56 MHz and where the minimum separation distance between the user and the transmitter is ≤ 50 mm).

Conversion of measured field strength on 13.56 MHz (NFC) from dBuV/m to mW:

$$PG / 4\pi D^2 = E^2 / 120\pi$$

Assuming $G = 1$ (unity gain antenna) and $D = 3$ meters;

$$P / 36\pi = E^2 / 120\pi$$

$$P = 0.3 \times E^2$$

$$\text{Measured field strength} = 45.42 \text{ dBuV/m @ } 3 \text{ m} = 186.64 \text{ uV/m @ } 3 \text{ m} = 0.00018664 \text{ V/m @ } 3 \text{ m}$$

$$P = 0.3 \times E^2 = 0.3 \times (0.00018664)^2 = 0.0105 \times 10^{-6} \text{ Watts}$$

$$P = 0.0105 \times 10^{-3} \text{ mW}$$

Conclusion:

The 1-g SAR test exclusion power threshold for operation on 13.56 MHz, and where the minimum separation distance between the user and the transmitter is ≤ 50 mm, is: 444 mW

The radiated RF output power of the NFC transmitter as contained in FCC ID: 2AZX2-DB000001 is determined as being:

$$0.0105 \times 10^{-3} \text{ mW.}$$

The NFC transmitter as contained in FCC ID: 2AZX2-DB000001 is deemed to comply with CFR 47, Part 1.1310 (Radiofrequency radiation exposure limits) and therefore meets the requirement for portable devices as stipulated by CFR 47, Part 2.1093.

----END OF REPORT----

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