FCC ID: 2AOAF-150

1.Measuring Standard

FCC Part 1(1.1310) and Part 2(2.1091), KDB 680106 D01v03r01 RF Exposure Wireless Charging App v03

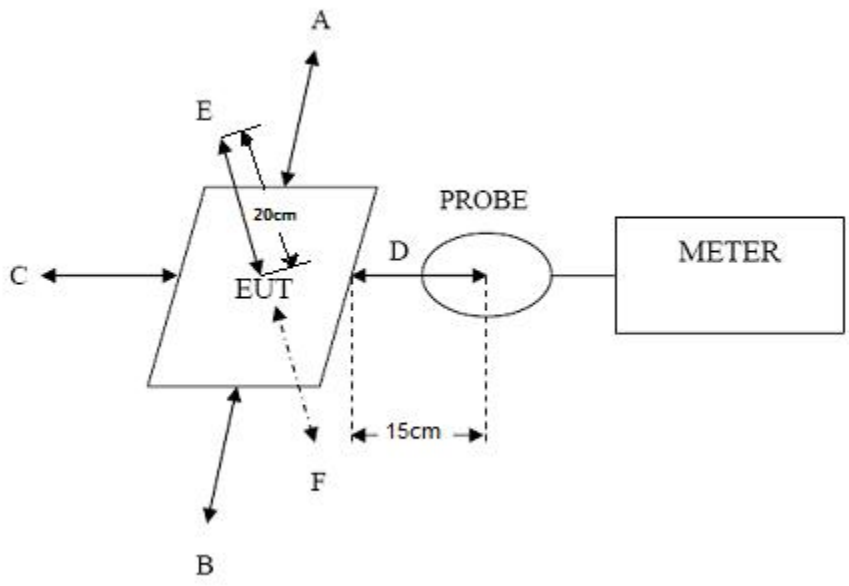
1.2. Requiments

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: 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:
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. 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.

1.3 Test configuration

1, The field strength of both E-field was measured at 15cm, H-field was measured at 15cm surrounding the device, and 20 cm away from the surface from all coils using the equipment list above for determining compliance with the MPE requirements of FCC Part 1.1310.
2, The RF power density was measured at Under maximum load test
3, Maximum E-field measurements was made 15cm from each side of the EUT and H-field measurements was made 15cm from surrounding the EUT and 20 cm away from the surface from all coils. Along the side of the EUT and still 20cm away from the edge of the EUT, the field probes were positioned at the location where there is maximum field strength. The maximum E-field and H-field is reported below.
4, This device uses a wireless charging circuit for power transfer operating at the frequency of 110.5–205kHz. Thus, the 300kHz limits were used: E-field Limit = 614 (V/m); H-field limit = 1.63 (A/m).

1.4 Test Setup



2. Limits

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 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
(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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

3. MEASURING DEVICE AND TEST EQUIPMENT

2.1For MPE Measurement

Equipment	Manufacturer	Model No.	Serial No.	Last calibration	Calibrated until	Cal. Interval
E-Field Probe(100kHz-3GHz)	Narda	EF0391	Q15221	Mar 29, 2022	Mar 28, 2023	1 Year
H-Field Probe(300KHz-30MHz)	Narda	HF3061	Q15835	Mar 29, 2022	Mar 28, 2023	1 Year
Broadband Field Meter	Narda	NBM-550	Q201455	Mar 29, 2022	Mar 28, 2023	1 Year
Load	N/A	N/A	N/A	N/A	N/A	N/A

4. Measuring Results

All test modes have been tested, and the worst result was output 20W mode report as below

EUT:	Wireless Charger	Model Name. :	QIVMS15DUOBK-T
Temperature:	24 ℃	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2022-04-29
Test Voltage:	DC 12V from battery		

half-load:

Table 1. H-Field MPE Data-Top

EUT Side	E (A/m)	Limits (A/m)
Max load	0.012	1.63

Table 2. H-Field MPE Data- Surrounding

EUT Side	B(A/m)	A(A/m)	C (A/m)	D(above) (A/m)	Limits (A/m)
Max load	0.054	0.023	0.037	0.045	1.63

Table 3. E-Field MPE

E-Field Measurement (15cm)						
EUT Side	B(V/m)	A(V/m)	E(V/m)	C (V/m)	D(above) (V/m)	Limits (V/m)
Max load	1.111	1.002	1.127	1.079	1.033	614

empty load:

Table 1. H-Field MPE Data-Top

EUT Side	E(A/m)	Limits (A/m)
Max load	0.011	1.63

Table 2. H-Field MPE Data- Surrounding

EUT Side	B(A/m)	A(A/m)	C (A/m)	D(above) (A/m)	Limits (A/m)
Max load	0.051	0018	0.033	0.040	1.63

Table 3. E-Field MPE

E-Field Measurement (15cm)						
EUT Side	B(V/m)	A(V/m)	E(V/m)	C (V/m)	D(above) (V/m)	Limits (V/m)
Max load	1.101	0.998	1.057	1.110	1.022	614

Fully loaded:

Table 1. H-Field MPE Data-Top

EUT Side	E(A/m)	Limits (A/m)
Max load	0.015	1.63

Table 2. H-Field MPE Data- Surrounding

EUT Side	B(A/m)	A(A/m)	C (A/m)	D(above) (A/m)	Limits (A/m)
Max load	0.062	0.019	0.052	0.063	1.63

Table 3. E-Field MPE

E-Field Measurement (15cm)						
EUT Side	B(V/m)	A(V/m)	E(V/m)	C (V/m)	D(above) (V/m)	Limits (V/m)
Max load	1.149	1.103	1.111	1.043	1.132	614

Remark: According KDB 680106 D01v03r01 RF Exposure Wireless Charging App v03r01, section 5, b). 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. The E- field evaluation conducted assuming a user separation distance of 15 cm according to the KDB 680106 D01v03r01 RF Exposure Wireless Charging App v03 r01 section 3, c).

Note: The EUT supports one voltage input and output. The EUT performs one voltage mode pretests.

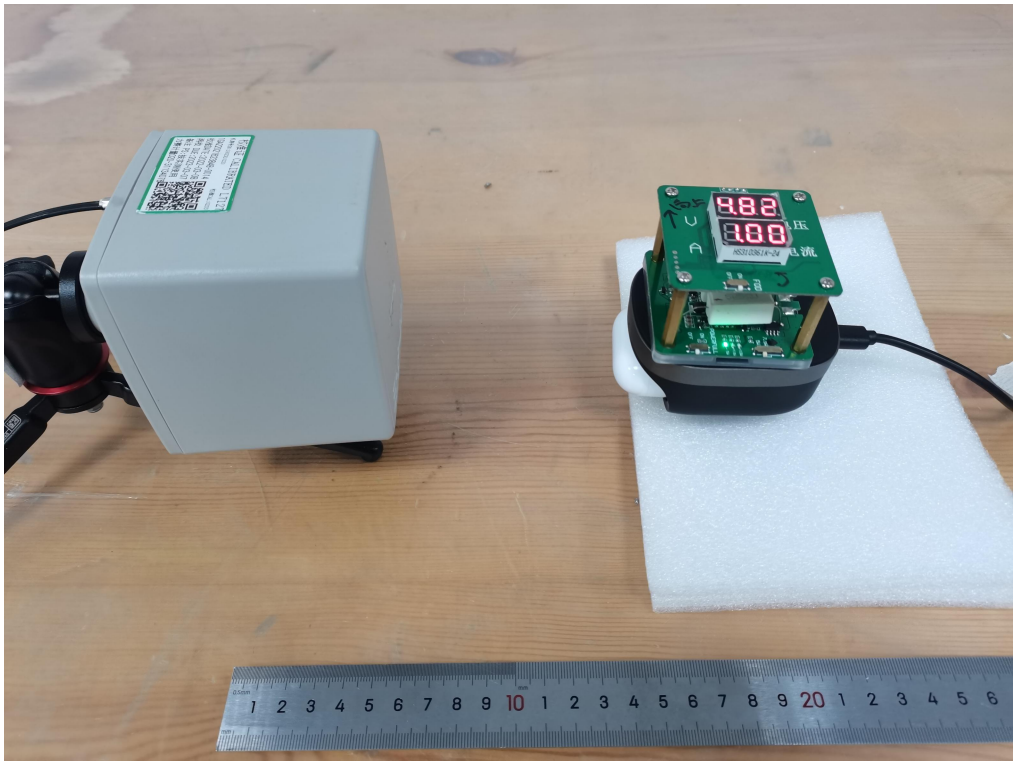
Result: The device comply with the RF exposure requirement according to 680106 D01v03r01, section 5, b):

(1) The operating frequency is 110.5kHz~205kHz, is less than 1MHz.
(2) The max Output power for coil is 15W.
(3) Client device is placed directly in contact with the transmitter.
(4) The EUT is a mobile device.
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.

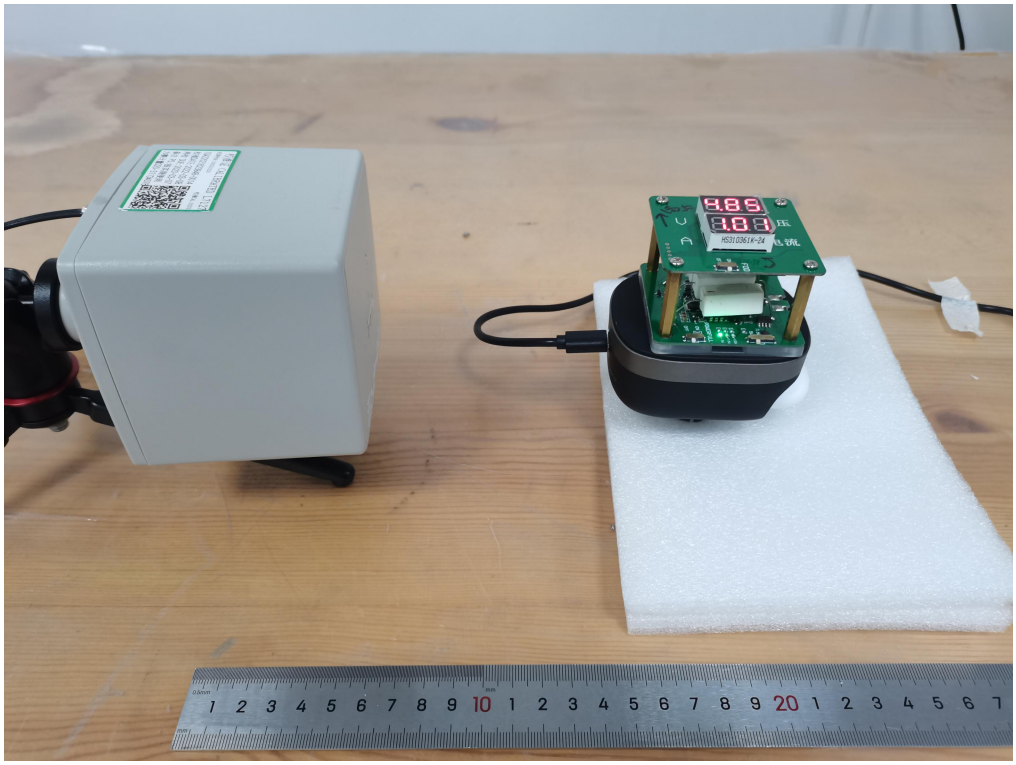
5. Test set-up

Top

Front



Rear



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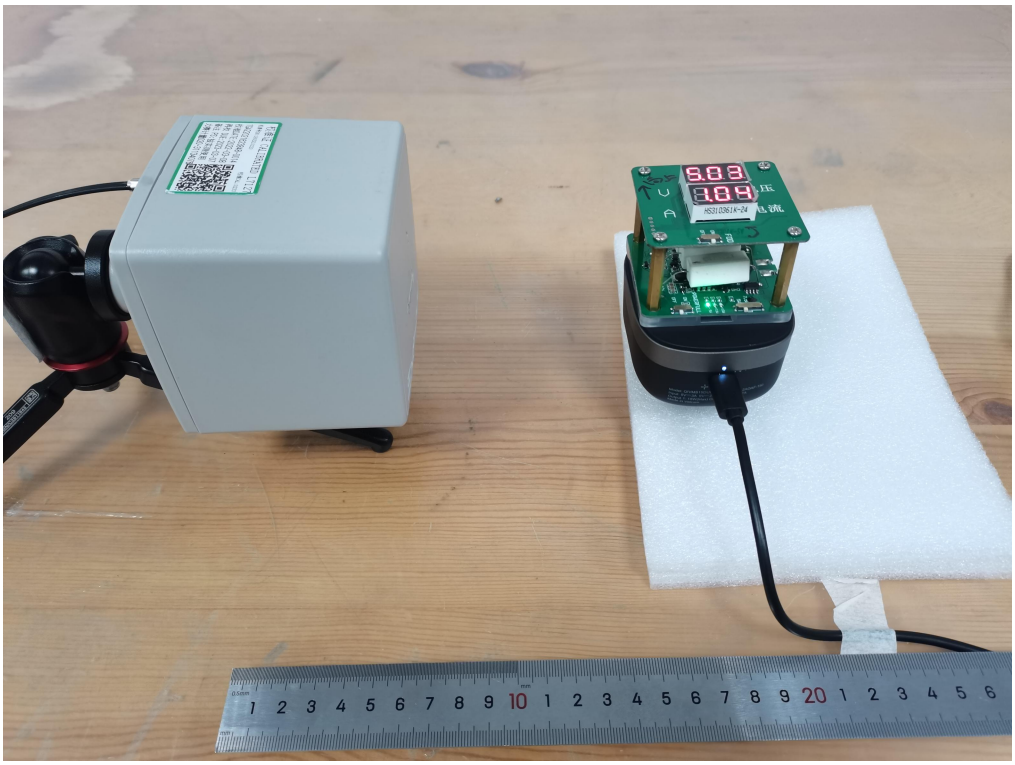

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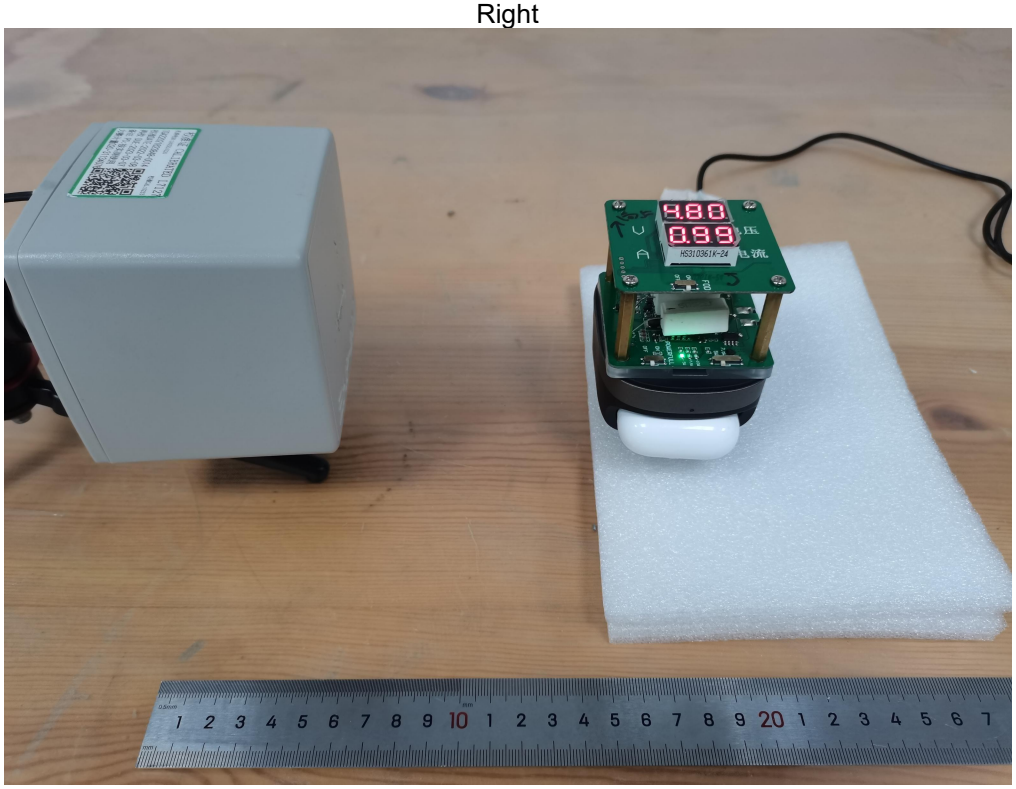

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Date: 2022-04-29

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