

5 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1 Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
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;

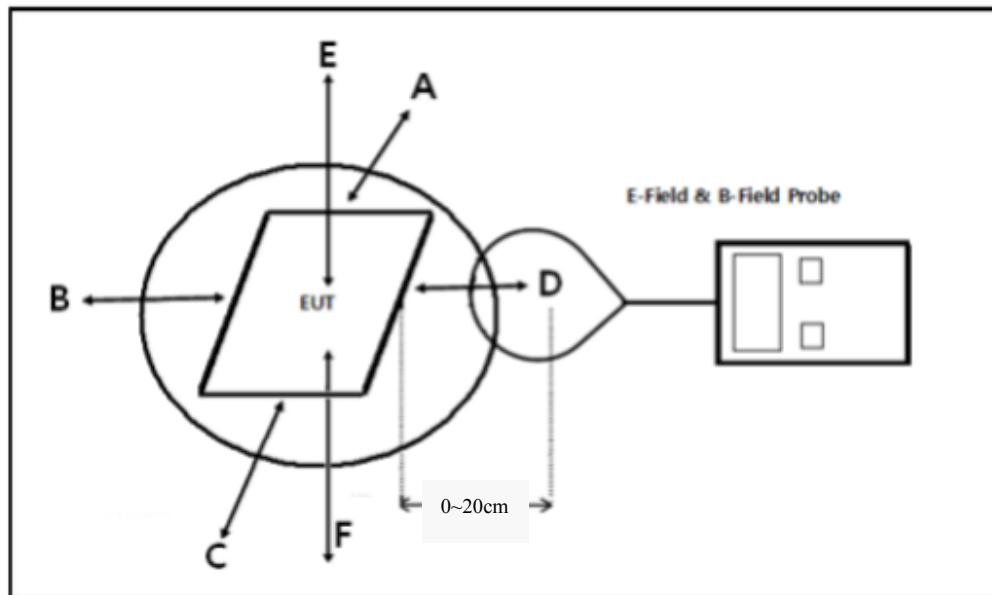
According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03r01 clause 3 c)

- c) For devices designed for typical desktop applications, such a 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.

According to 680106 D01 RF Exposure Wireless Charging App v03r01 clause 5 b)

- b) Inductive wireless power transfer applications with supporting field strength results and meeting all of the following requirements are not required to submit a KDB inquiry for devices approved using SDoC² or a PAG³ for equipment approved using certification to address RF exposure compliance. However, the responsible party is required to keep a copy of the test report in accordance with KDB 865664 D02. A copy of the test report is to be submitted with the application if the device is approved using certification.
- (1) Power transfer frequency is less than 1 MHz
 - (2) Output power from each primary coil is less than or equal to 15 watts.
 - (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.
 - (4) Client device is placed directly in contact with the transmitter.
 - (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
 - (6) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

5.2 Block Diagram of Test Setup



Note: The EHP-200AC Probe has a diameter of 9.2cm and a radius of 4.6cm.

5.3 Test Procedures

- 1) Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm
- 2) The highest emission level was recorded and compared with limit.
- 3) The EUT was measured according to the dictates of TCB Workshop “41-Part-18-&-Wireless-Power-Transfer - April 27, 2022”

5.4 Test Data:

Serial Number:	229P_1	Test Date:	2023/7/21
Test Site:	RF	Test Mode:	M3: Wireless Output 10W was the worst
Tester:	Vic Du	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.3	Relative Humidity: (%)	24	ATM Pressure: (kPa)	100.5
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Narda	Electric and Magnetic Field Probe-Analyzer	EHP-200AC	180ZX10204	2021/06/07	2024/06/06

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:**Test distance: 0-4cm****H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1205	0.7251	0.2642	0.4084	0.4638	0.2707	44.48	1.63

Test distance: 6cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1301	0.6221	0.2638	0.3488	0.4552	0.2504	38.17	1.63

Test distance: 8cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1344	0.253	0.2541	0.3417	0.2649	0.3158	20.96	1.63

Test distance: 10cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1309	0.2119	0.1802	0.1664	0.1908	0.2867	17.59	1.63

Test distance: 12cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1197	0.1864	0.143	0.1247	0.1482	0.1224	11.44	1.63

Test distance: 14cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1221	0.1268	0.1242	0.1249	0.1309	0.1243	8.03	1.63

Test distance: 16cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1204	0.1274	0.1211	0.1254	0.1411	0.1223	8.66	1.63

Test distance: 18cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1278	0.1277	0.1244	0.1255	0.1204	0.1201	7.84	1.63

Test distance: 20cm**H-Field Strength:**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1246	0.1235	0.1256	0.1211	0.1235	0.1205	7.71	1.63

Considerations of compliance 680106 D01 RF Exposure Wireless Charging App v03r01 clause 5 b:

(1) Power transfer frequency is less than 1 MHz

Yes, the operation frequency is 137 kHz.

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

Yes, the maximum output power of primary coil is **10 Watts**.

(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.

The transfer system includes only single primary coil, and system detect and allow coupling only between individual pairs of coils.

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

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

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

No, both mobile and portable exposure conditions apply.

(6) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

Yes, the H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm were also evaluated for portable use condition.

******* END OF REPORT *******