

RF Exposure Considerations

1. Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v03

2. Requirements

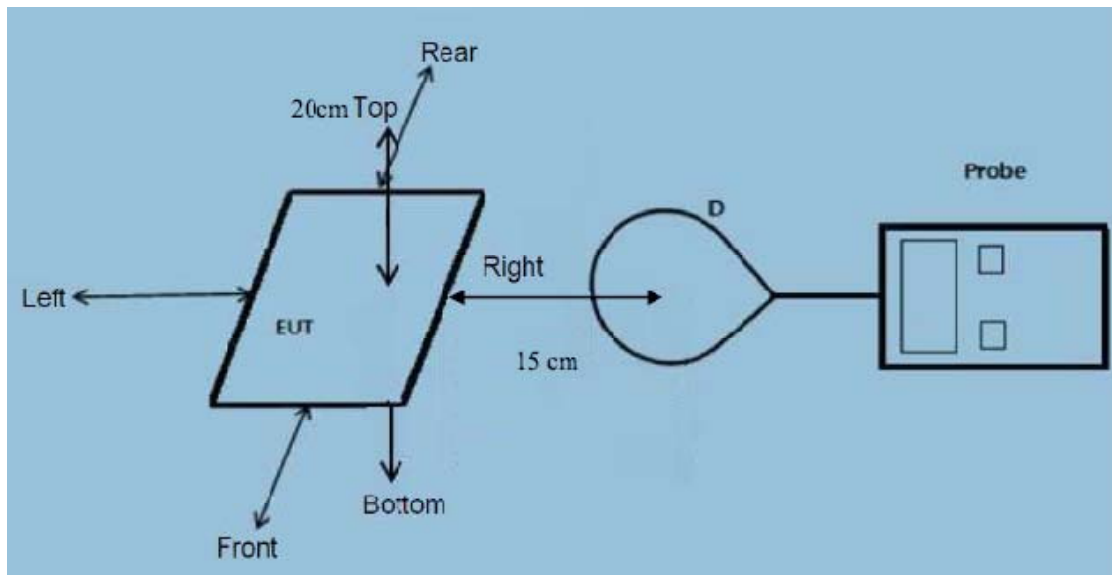
According to the item 5.2 of KDB 680106 D01v03:

For device designed for typical desktop applications, RF exposure evaluation should be conducted assuming a user separation distance of 20cm (Top) and 15cm (Edge). 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 20cm(Top) and 15cm(Edge) measured from the center of the probe(s) to the edge of the device.

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).				

3. Test Setup



Note:

1. The RF exposure test is performed in the shield room.
2. The test distance is between the edge of the charger and geometric centre of probe.

4. Test Equipment List

Test Equipment	Manufacturer	Model No.	Calibration Due
Magnetic field meter	NARDA	ELT-400	Sep. 03, 2018

5. Test Result

The EUT does comply with item 5 KDB 680106 D01v03.

- (1) Power transfer frequency is less than 1MHz. (Conform)
- (2) Output power from each primary coil is less than or equal to 15 watts. (Conform)
- (3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils. (Conform)
- (4) Client device is placed directly in contact with the transmitter. (Conform)
- (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion.) (Conform)
- (6) The aggregate H-field strengths at 15cm surrounding the device and 20cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. (Conform)

E-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
<1% Battery	Front	15	0.113	0.453	307	614	Pass
<1% Battery	Rear	15	0.116	0.438	307	614	Pass
<1% Battery	Left	15	0.107	0.437	307	614	Pass
<1% Battery	Right	15	0.122	0.449	307	614	Pass
<1% Battery	Top	20	0.126	0.458	307	614	Pass

H-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
<1% Battery	A	15	0.141	0.113	0.815	1.63	Pass
<1% Battery	B	15	0.145	0.116	0.815	1.63	Pass
<1% Battery	C	15	0.134	0.107	0.815	1.63	Pass
<1% Battery	D	15	0.153	0.122	0.815	1.63	Pass
<1% Battery	E	20	0.158	0.126	0.815	1.63	Pass

Note: The aggregate H-filed strengths at 15cm surrounding the device and 20cm above the top surface.

$$A/m = uT/1.25$$

E-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
50% Battery	Front	15	0.109	0.444	307	614	Pass
50% Battery	Rear	15	0.107	0.426	307	614	Pass
50% Battery	Left	15	0.123	0.429	307	614	Pass
50% Battery	Right	15	0.116	0.435	307	614	Pass
50% Battery	Top	20	0.121	0.451	307	614	Pass

H-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
50% Battery	A	15	0.136	0.109	0.815	1.63	Pass
50% Battery	B	15	0.134	0.107	0.815	1.63	Pass
50% Battery	C	15	0.154	0.123	0.815	1.63	Pass
50% Battery	D	15	0.145	0.116	0.815	1.63	Pass
50% Battery	E	20	0.151	0.121	0.815	1.63	Pass

Note: The aggregate H-filed strengths at 15cm surrounding the device and 20cm above the top surface.

$A/m = uT/1.25$

E-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
>99% Battery	Front	15	0.111	0.448	307	614	Pass
>99% Battery	Rear	15	0.117	0.436	307	614	Pass
>99% Battery	Left	15	0.108	0.425	307	614	Pass
>99% Battery	Right	15	0.115	0.437	307	614	Pass
>99% Battery	Top	20	0.119	0.450	307	614	Pass

H-Filed Strength							
Charging	Probe from EUT side	Test Distance (cm)	Calculated Value(A/m)	Calculated Value(V/m)	50% Limits Test (V/m)	Limits Test (V/m)	Result
>99% Battery	A	15	0.139	0.111	0.815	1.63	Pass
>99% Battery	B	15	0.146	0.117	0.815	1.63	Pass
>99% Battery	C	15	0.135	0.108	0.815	1.63	Pass
>99% Battery	D	15	0.144	0.115	0.815	1.63	Pass
>99% Battery	E	20	0.149	0.119	0.815	1.63	Pass

Note: The aggregate H-filed strengths at 15cm surrounding the device and 20cm above the top surface.

$A/m = uT/1.25$

6. Test Set-up Photo

