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:

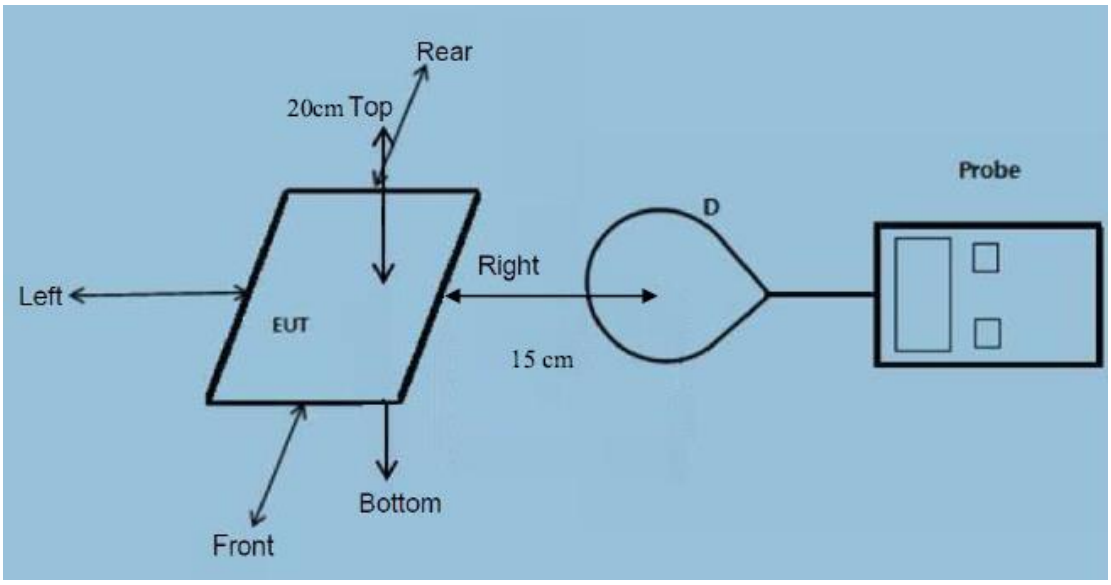
For device designed for typical desktop applications, RF exposure evaluation should be conducted assuming a user separation distance of 20cm (Top) and 15cm (Edge). E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides 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. 02, 2019

5. Test Result

The EUT does comply with item 5 KDB 680106 D01v03.

(1) Power transfer frequency is less than 1MHz. (Conform)
- The frequency for EUT is 110-205KHz.

(2) Output power from each primary coil is less than or equal to 15 watts. (Conform)
-10w max.

(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)
-only single coil.

(4) Client device is placed directly in contact with the transmitter. (Conform)
-yes, client device is put specification area of EUT directly.

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion.) (Conform)
-yes, EUT work with plug in and AC power.

(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)
-yes, please see data.

E-Filed Strength at 15cm surrounding the EUT and 20cm above the top surface of the EUT								
Charging	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits Test (V/m)	Limits Test (V/m)	Result
1% Battery	0.38	0.40	0.29	0.39	0.41	307	614	Pass
50% Battery	1.26	1.17	1.08	1.25	1.31	307	614	Pass
99% Battery	2.11	2.27	2.37	2.42	2.52	307	614	Pass
Standby	0.28	0.31	0.40	0.37	0.36	307	614	Pass

H-Filed Strength at 15cm surrounding the EUT and 20cm above the top surface of the EUT								
Charging	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits Test (A/m)	Limits Test (A/m)	Result
1% Battery	0.041	0.039	0.043	0.028	0.064	0.815	1.63	Pass
50% Battery	0.15	0.14	0.16	0.13	0.11	0.815	1.63	Pass
99% Battery	0.33	0.29	0.30	0.44	0.45	0.815	1.63	Pass
Standby	0.16	0.17	0.15	0.14	0.11	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