

RF Exposure Considerations

1. Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v03

2. Requirements

According to the item 5(b) of KDB 680106 D01v03:

Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF exposure evaluation.

a) Power transfer frequency is less than 1 MHz.

Yes, the device operate in the frequency range from 110-205KHz

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

YES, the maximum output power of the primary coil is 1.5W.

c) 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

Yes, the transfer system includes only single primary.

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

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

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

EUT application and mobile exposure condition only.

f) 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, the EUT field strength levels are 50% X MPE limit.

TABLE 1—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 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. Test Equipment List

Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
Exposure Level Tester	Narda	ELT-400	F-0010	2020/10/12	2021/10/11

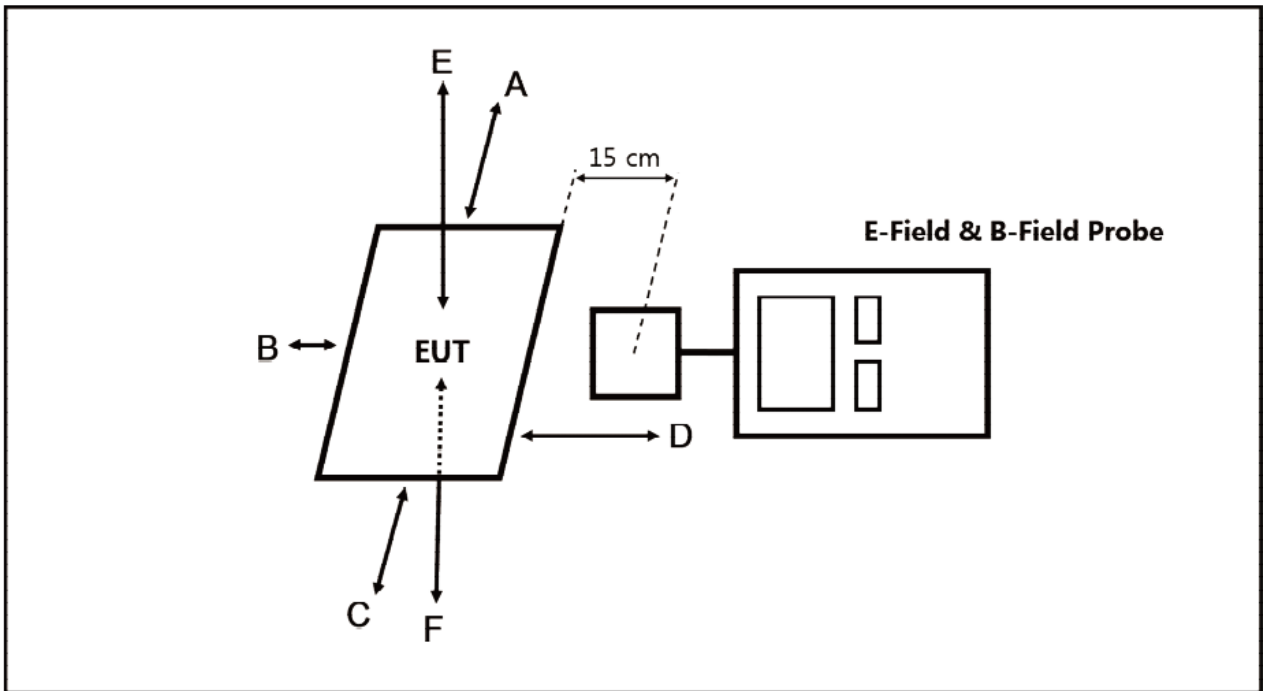
4. EUT configuration

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?					
✓					
Item	Equipement	Trade Name	Model No.	FCC ID	Power cord
1	Adapter	Apple	A1443	-	-
2	Oclean Smart Sonic Electric Toothbrush	Oclean	Y2087	-	-

5. Test Setup



Note: Measurements should be made from all sides and the top of the primary/client pair, with the top is 20cm, other sides are 15cm from the edge of EUT to center of the probe.

6. Test Procedure

- 1) The RF exposure test was performed in anechoic chamber.
- 2) The measurement probe was placed at test distance (15cm) which is between the edge of the charger and the geometric center of probe.
- 3) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.
- 4) The EUT was measured according to the dictates of KDB 680106 D01 v03.

Remark:

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

7. Test Result

Half load test data

Magnetic Field Emissions					
Test Channel	H-field (μT)	Measure Value (A/m)	50% of the MPE limit (A/m)	Limit(A/m)	Result
Top	0.083	0.0664	0.815	1.63	Pass
Front	0.061	0.0488	0.815	1.63	Pass
Rear	0.082	0.0656	0.815	1.63	Pass
Left	0.074	0.0592	0.815	1.63	Pass
Right	0.093	0.0744	0.815	1.63	Pass

Null load test data

Magnetic Field Emissions					
Test Channel	H-field (μT)	Measure Value (A/m)	50% of the MPE limit (A/m)	Limit(A/m)	Result
Top	0.124	0.0992	0.815	1.63	Pass
Front	0.134	0.1072	0.815	1.63	Pass
Rear	0.128	0.1024	0.815	1.63	Pass
Left	0.137	0.1096	0.815	1.63	Pass
Right	0.146	0.1168	0.815	1.63	Pass

Full load test data

Magnetic Field Emissions					
Test Channel	H-field (μT)	Measure Value (A/m)	50% of the MPE limit (A/m)	Limit(A/m)	Result
Top	0.036	0.0288	0.815	1.63	Pass
Front	0.045	0.036	0.815	1.63	Pass
Rear	0.069	0.0552	0.815	1.63	Pass
Left	0.066	0.0528	0.815	1.63	Pass
Right	0.064	0.0512	0.815	1.63	Pass

Remark:

1. H-field strength(A/m)=H-field(μT)/1.25
2. According to October 2018 TCB workshop. Only H-field required.

8. Test Set-up Photo

