RF Exposure Considerations

1. Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v02

2. TEST MODE

Test Mode	Description	Remark
TM1	DC 5V output	With mobile phone
TM2	DC 9V output	With mobile phone

3. Requirements

According to the item 5.2 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.

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

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

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

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

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.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

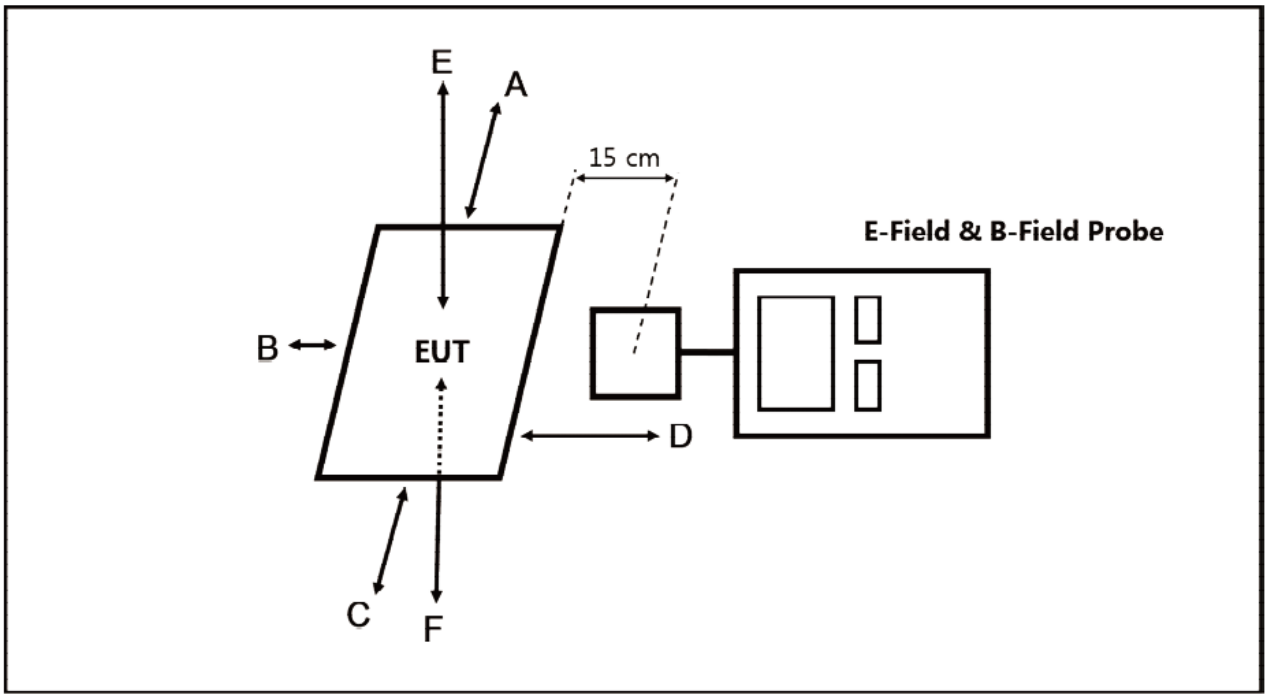
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			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

4. 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	2017/10/25	2018/10/24

5. Test Setup



Note: Measurements should be made from all sides and the top of the primary/client pair, with the 10cm measured from the center of the probe(s) to the edge of the device.

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, F) were completed.

4) The EUT was measured according to the dictates of KDB 680106 D01 v02.

Remark:

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

7. Test Result

Test Mode: TM1 (DC 5V output):

Electric Field Emissions		
Test Position	**Measure Value (V/m)**	**Limit(V/m)**
Top	19.54	614
Bottom	20.14	614
Front	16.84	614
Rear	16.84	614
Left	18.94	614
Right	16.84	614

Test condition: TM2 (DC 9V output):

Electric Field Emissions		
Test Position	**Measure Value (V/m)**	**Limit(V/m)**
Top	20.45	614
Bottom	21.35	614
Front	17.44	614
Rear	18.64	614
Left	21.05	614
Right	17.14	614

Test condition: TM1 (DC 5V output):

Magnetic Field Emissions			
Test Position	**B-field (μT)**	**Measure Value (A/m)**	**Limit(A/m)**
Top	0.065	0.0520	1.63
Bottom	0.067	0.0536	1.63
Front	0.056	0.0448	1.63
Rear	0.056	0.0448	1.63
Left	0.063	0.0504	1.63
Right	0.056	0.0448	1.63

Test condition: TM2 (DC 9V output):

Magnetic Field Emissions			
Test Position	**B-field (μT)**	**Measure Value (A/m)**	**Limit(A/m)**
Top	0.068	0.0544	1.63
Bottom	0.071	0.0568	1.63
Front	0.058	0.0464	1.63
Rear	0.062	0.0496	1.63
Left	0.070	0.0560	1.63
Right	0.057	0.0456	1.63

Remark:

1. H-field strength(A/m)=B-field(μT)/1.25
2. dBuV/m=dBuA/m+51.5
3. $V/m=10^{(((dBuV/m)-120)/20)}$
4. The EUT only has one coil, not applicable for 50% of the MPE limit.

8. Test Set-up Photo