

RF Exposure Requirement

According to KDB680106 D01 RF Exposure Wireless Charging Apps v03 (04/09/2018), the requirement of RF exposure for the Wireless Charging device shall be met.

The RF exposure requirements must be determined in conjunction with the device operating characteristics, according to the mobile and portable exposure requirements in Sections 2.1091 and 2.1093 of the rules. SAR and MPE limits do not cover the frequency range for wireless power transfer applications which operate below 100 kHz and 300 kHz respectively; therefore, RF exposure compliance needs to be determined with respect to Sections 1.1307 (c) and (d) of the FCC rules.

For devices designed for typical desktop applications, such as 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.

Table 1 – Limits for Maximum Permissible Exposure (MPE)

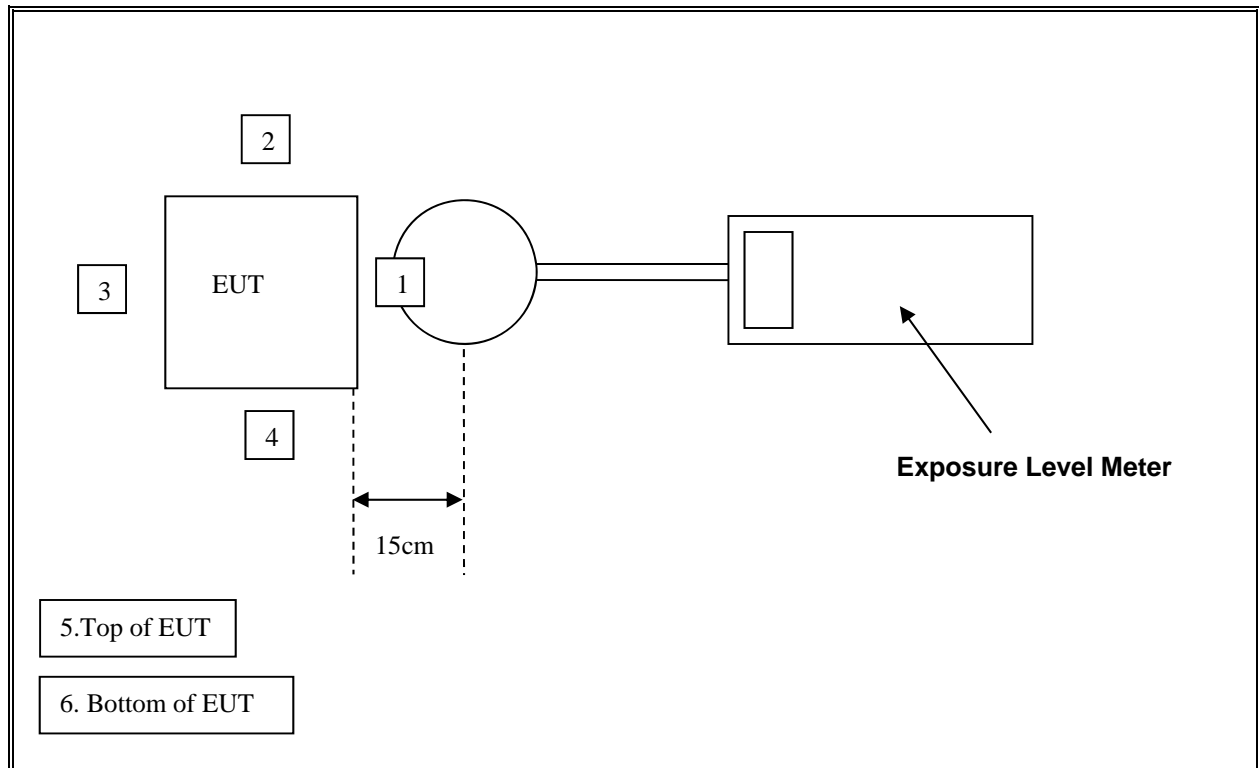
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			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

Note: f denotes for frequency in MHz

Test Method for H-field:

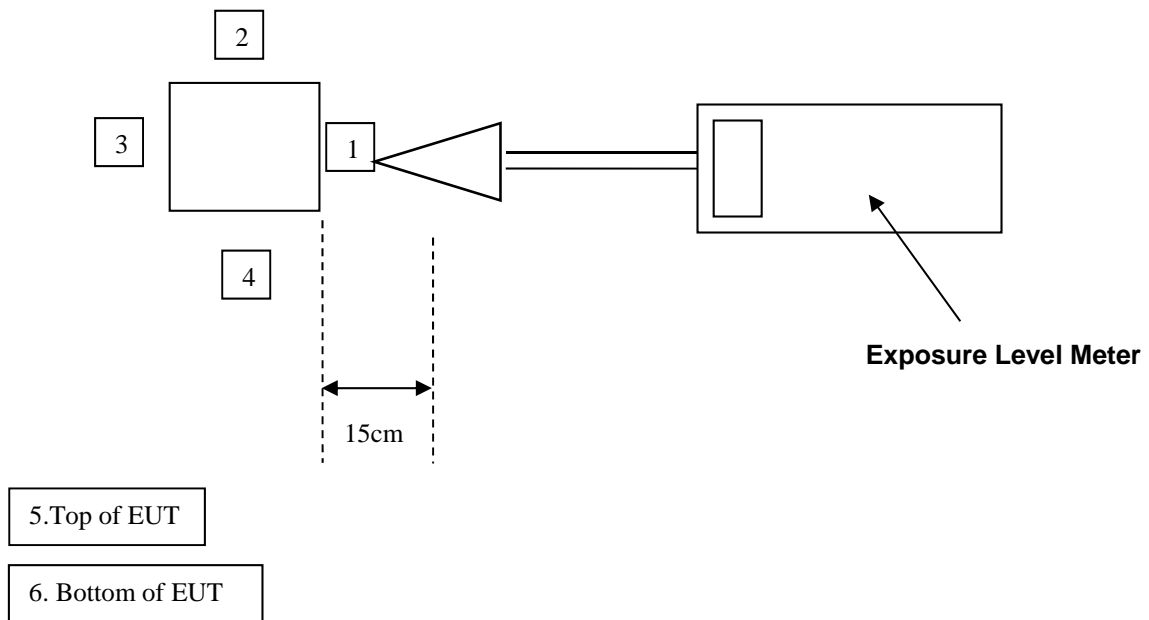
Measurements are conducted with a magnetic field probe located 15cm surrounding away from the EUT and its associated attachments, including 20 cm above the top surface from the EUT for scanning the emissions.

Test Setup:



Test Method for E-field:

Measurements are conducted with a electric field probe located 15cm surrounding away from the EUT and its associated attachments, including 20 cm above the top surface from the EUT for scanning the emissions.



Test Result

Charging Status: 1%

All measurement at defined as $f = 115\text{kHz}$

Magnetic Field (H-Field) strength at 15cm from the boundaries of the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin
Front (1)	0.32	1.63	0.815	-0.495
Left (2)	0.30	1.63	0.815	-0.515
Right (4)	0.35	1.63	0.815	-0.465
Back (3)	0.34	1.63	0.815	-0.475
Bottom	0.42	1.63	0.815	-0.395

Magnetic Field (H-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin (A/m)
Top	0.45	1.63	0.815	-0.365

Electric Field (E-Field) strength at 15cm from the boundaries of the EUT

EUT location	Calculated E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Front (1)	0.26	614.0	307.0	-306.74
Left (2)	0.25	614.0	307.0	-306.75
Right (4)	0.28	614.0	307.0	-306.72
Back (3)	0.24	614.0	307.0	-306.76
Bottom	0.40	614.0	307.0	-306.60

Electric Field (E-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Top	0.43	614.0	307.0	-306.57

Test Result

Charging Status: 50%

All measurement at defined as $f= 115\text{kHz}$

Magnetic Field (H-Field) strength at 15cm from the boundaries of the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin
Front (1)	0.35	1.63	0.815	-0.465
Left (2)	0.36	1.63	0.815	-0.455
Right (4)	0.35	1.63	0.815	-0.465
Back (3)	0.38	1.63	0.815	-0.435
Bottom	0.41	1.63	0.815	-0.405

Magnetic Field (H-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin (A/m)
Top	0.42	1.63	0.815	-0.395

Electric Field (E-Field) strength at 15cm from the boundaries of the EUT

EUT location	Calculated E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Front (1)	0.25	614.0	307.0	-306.75
Left (2)	0.25	614.0	307.0	-306.75
Right (4)	0.23	614.0	307.0	-306.77
Back (3)	0.26	614.0	307.0	-306.74
Bottom	0.38	614.0	307.0	-306.62

Electric Field (E-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Top	0.39	614.0	307.0	-306.61

Test Result

Charging Status: 99%

All measurement at defined as $f = 115\text{kHz}$

Magnetic Field (H-Field) strength at 15cm from the boundaries of the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin
Front (1)	0.33	1.63	0.815	-0.485
Left (2)	0.32	1.63	0.815	-0.495
Right (4)	0.32	1.63	0.815	-0.495
Back (3)	0.35	1.63	0.815	-0.465
Bottom	0.34	1.63	0.815	-0.475

Magnetic Field (H-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured H-field (A/m)	Limit (A/m)	50%of Limit	Margin (A/m)
Top	0.39	1.63	0.815	-0.425

Electric Field (E-Field) strength at 15cm from the boundaries of the EUT

EUT location	Calculated E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Front (1)	0.30	614.0	307.0	-306.70
Left (2)	0.32	614.0	307.0	-306.68
Right (4)	0.25	614.0	307.0	-306.75
Back (3)	0.22	614.0	307.0	-306.78
Bottom	0.32	614.0	307.0	-306.68

Electric Field (E-Field) strength at 20cm above the top surface from the EUT

EUT location	Measured E-field (V/m)	Limit (V/m)	50%of Limit	Margin (V/m)
Top	0.37	614.0	307.0	-306.63

Equipment List

Equipment	Magnetic Field meter
Registration No.	EW-2140
Manufacturer	NARDASAFETY
Model No.	ELT400
Calibration Date	Mar 28, 2018
Calibration Due Date	Mar 28, 2019

Equipment	Electric Field Sensor
Registration No.	EW-1387
Manufacturer	SCHAFFNER
Model No.	EMC20
Calibration Date	Nov 6, 2017
Calibration Due Date	May 6, 2019