RF Exposure Evaluation

1 Measuring Standard

KDB 680106 RF Exposure Wireless Charging Apps v03r01

2 Requirements

According to the item 5 of KDB 680106 v03r01:

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

(1) Power transfer frequency is less than 1MHz.

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

(3) The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.

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

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

(6) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

Remark: Meet all the above requirements.

Limits

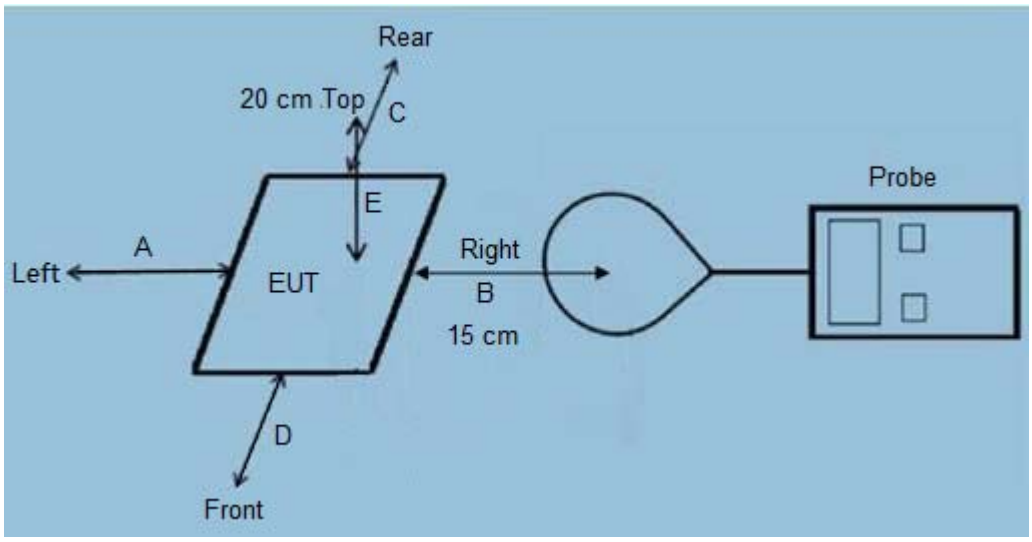
The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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



4 Test Procedure

1) The RF exposure test was performed in anechoic chamber.

2) The measurement probe was placed at test distance (15 cm from all sides and 20 cm from the top) 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 D01v03.

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

5 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

Test Mode	Description	
Mode 1	AC Adapter + EUT + Mobile phone+ Watch	Record
Mode 2	AC Adapter + EUT + Earphone + Watch	Pre-tested
Mode 3	AC Adapter + EUT + Mobile phone	Pre-tested
Mode 4	AC Adapter + EUT + Earphone	Pre-tested
Mode 5	AC Adapter + EUT + Watch	Pre-tested
Mode 6	Test the EUT in idle mode.	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

6 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Electric and Magnetic Field Analyzer	Narda	EHP-200A	180ZX10505	22.06.2022	21.06.2024

7 Test Result

E-Filed Strength at 15 cm from the edges surrounding the EUT (V/m)

Unit	Test mode	Frequency Range (MHz)	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits (V/m)	Limits (V/m)
V/m	TM1	0.112-0.205	90.46	101.58	94.41	94.52	89.46	307	614

H-Filed Strength at 15 cm from the edges surrounding the EUT (A/m)

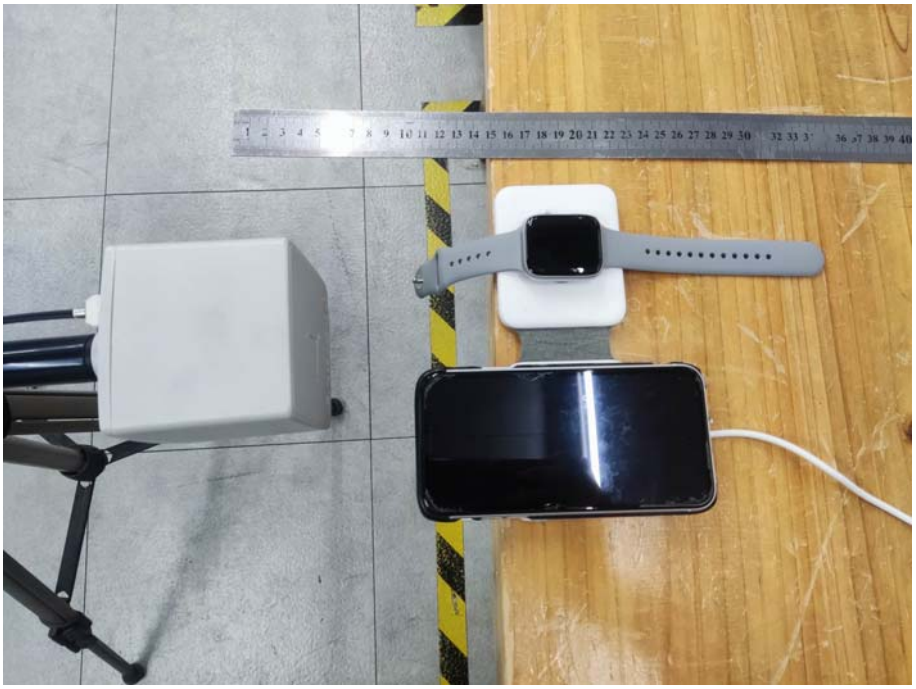
Unit	Test mode	Frequency Range (MHz)	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits (A/m)	Limits (A/m)
A/m	TM1	0.112-0.205	0.116	0.164	0.263	0.111	0.248	0.815	1.63

H-Filed Strength at 20 cm from the top of the EUT (A/m)

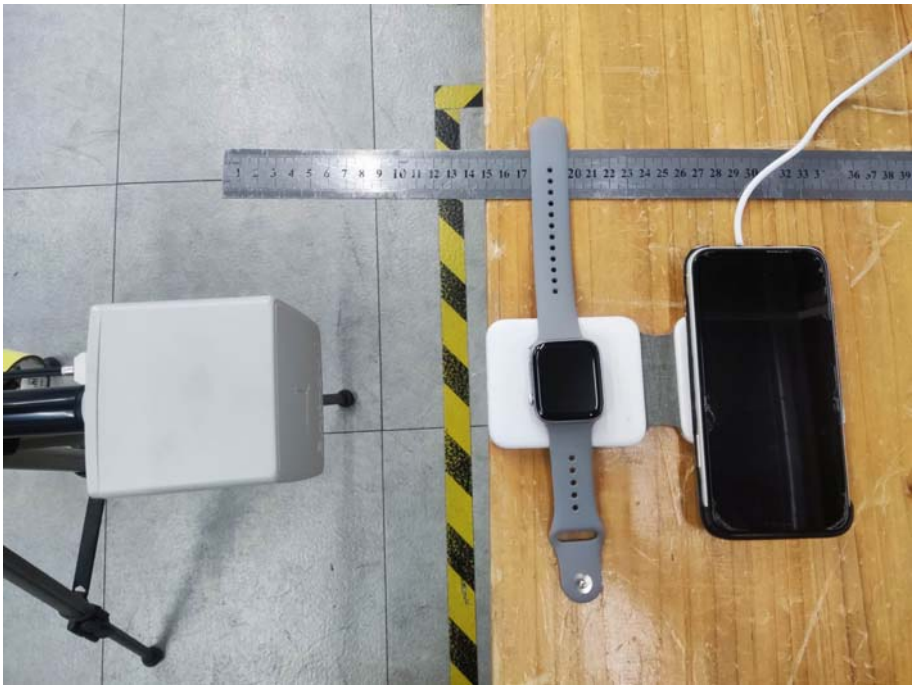
Unit	Test mode	Frequency Range (MHz)	Test Position E	50% Limits (A/m)	Limits (A/m)
A/m	TM1	0.112-0.205	0.211	0.815	1.63

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

8 Test Setup photo



Test Position A-15cm from the edge of EUT to the geometric center of the probe



Test Position B-15cm from the edge of EUT to the geometric center of the probe

Test Position C-15cm from the edge of EUT to the geometric center of the probe

Test Position D-15cm from the edge of EUT to the geometric center of the probe

Test Position E-15cm from the edge of EUT to the geometric center of the probe

Test Position F-20cm from the edge of EUT to the geometric center of the probe

Test Position A-15cm from the edge of EUT to the geometric center of the probe

Test Position B-15cm from the edge of EUT to the geometric center of the probe

Test Position C-15cm from the edge of EUT to the geometric center of the probe

Test Position D-15cm from the edge of EUT to the geometric center of the probe

Test Position E-15cm from the edge of EUT to the geometric center of the probe

Test Position F-20cm from the edge of EUT to the geometric center of the probe

Test Position A-15cm from the edge of EUT to the geometric center of the probe

Test Position B-15cm from the edge of EUT to the geometric center of the probe

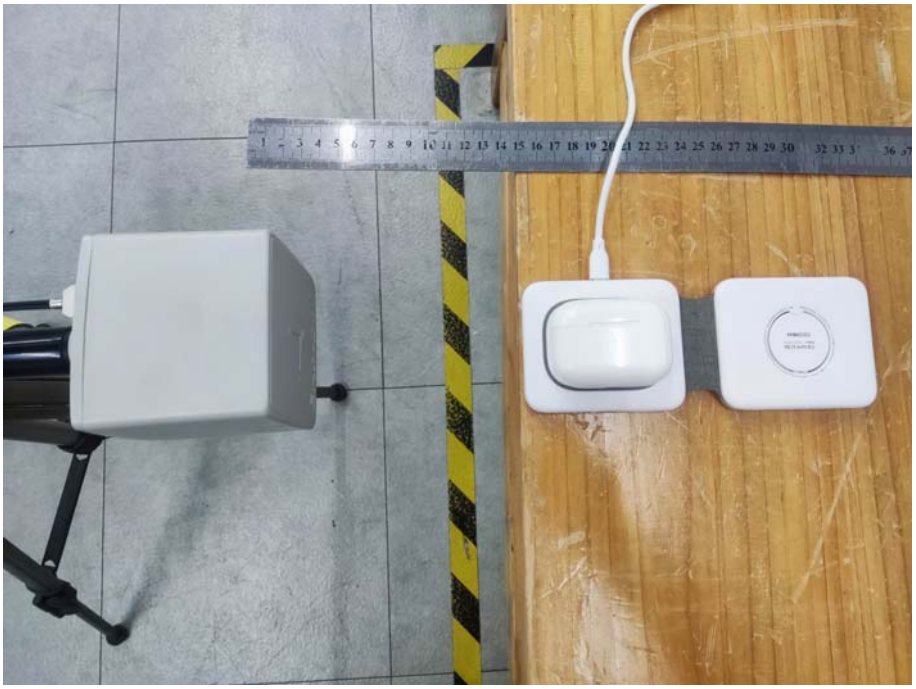
Test Position C-15cm from the edge of EUT to the geometric center of the probe

Test Position D-15cm from the edge of EUT to the geometric center of the probe

Test Position E-15cm from the edge of EUT to the geometric center of the probe

Test Position F-20cm from the edge of EUT to the geometric center of the probe

Test Position A-15cm from the edge of EUT to the geometric center of the probe



Test Position B-15cm from the edge of EUT to the geometric center of the probe

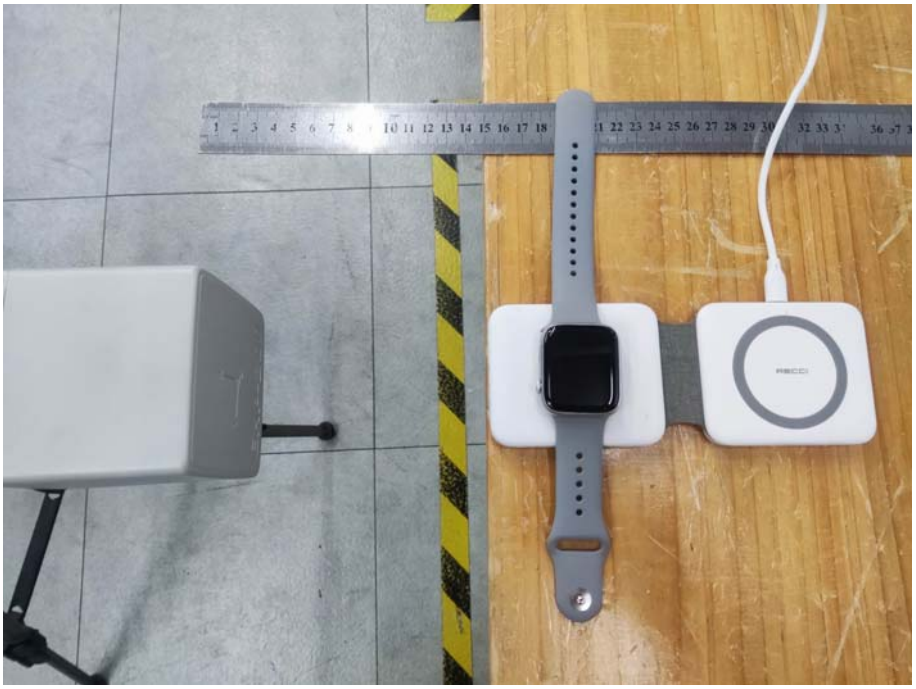
Test Position C-15cm from the edge of EUT to the geometric center of the probe

Test Position D-15cm from the edge of EUT to the geometric center of the probe

Test Position E-15cm from the edge of EUT to the geometric center of the probe

Test Position F-20cm from the edge of EUT to the geometric center of the probe

Test Position A-15cm from the edge of EUT to the geometric center of the probe

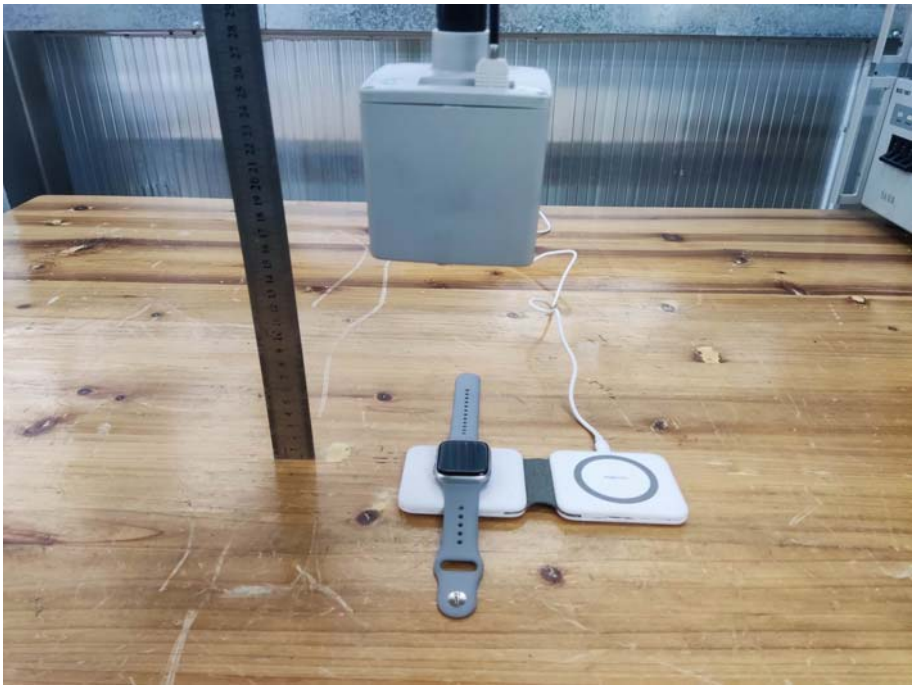


Test Position B-15cm from the edge of EUT to the geometric center of the probe

Test Position C-15cm from the edge of EUT to the geometric center of the probe

Test Position D-15cm from the edge of EUT to the geometric center of the probe

Test Position E-15cm from the edge of EUT to the geometric center of the probe



Test Position F-20cm from the edge of EUT to the geometric center of the probe

End of report