



RF Exposure Evaluation

1 Measuring Standard

680106 D01 RF Exposure Wireless Charging App v03r01

And KDB Tracking Number 671578 ; TCB Workshop, October 2018, 5.2 RF Exposure Procedures

2 Requirements

According to the item 5 of 680106 D01 RF Exposure Wireless Charging App v03r01:

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

Yes

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

Yes

(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.

Yes

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

Yes

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

No

(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.

Yes

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)

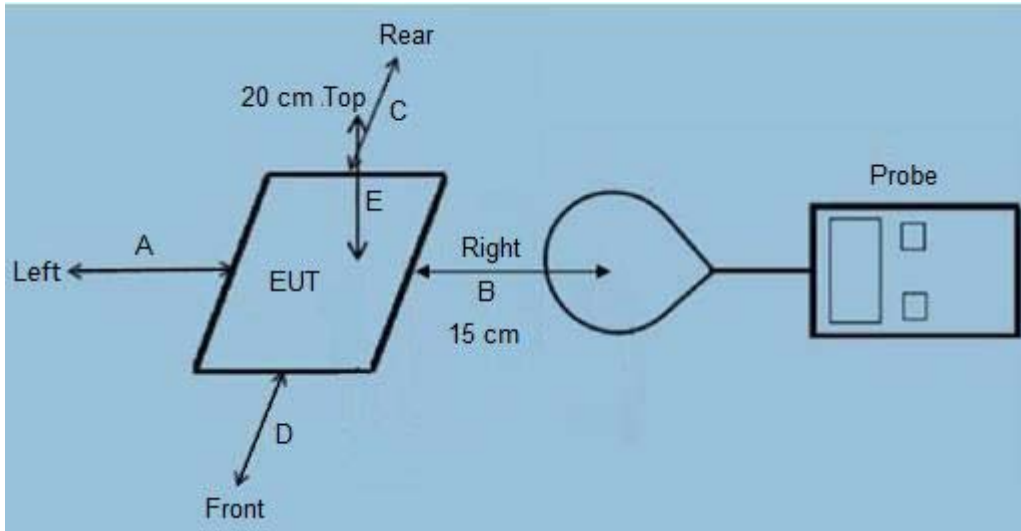
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000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

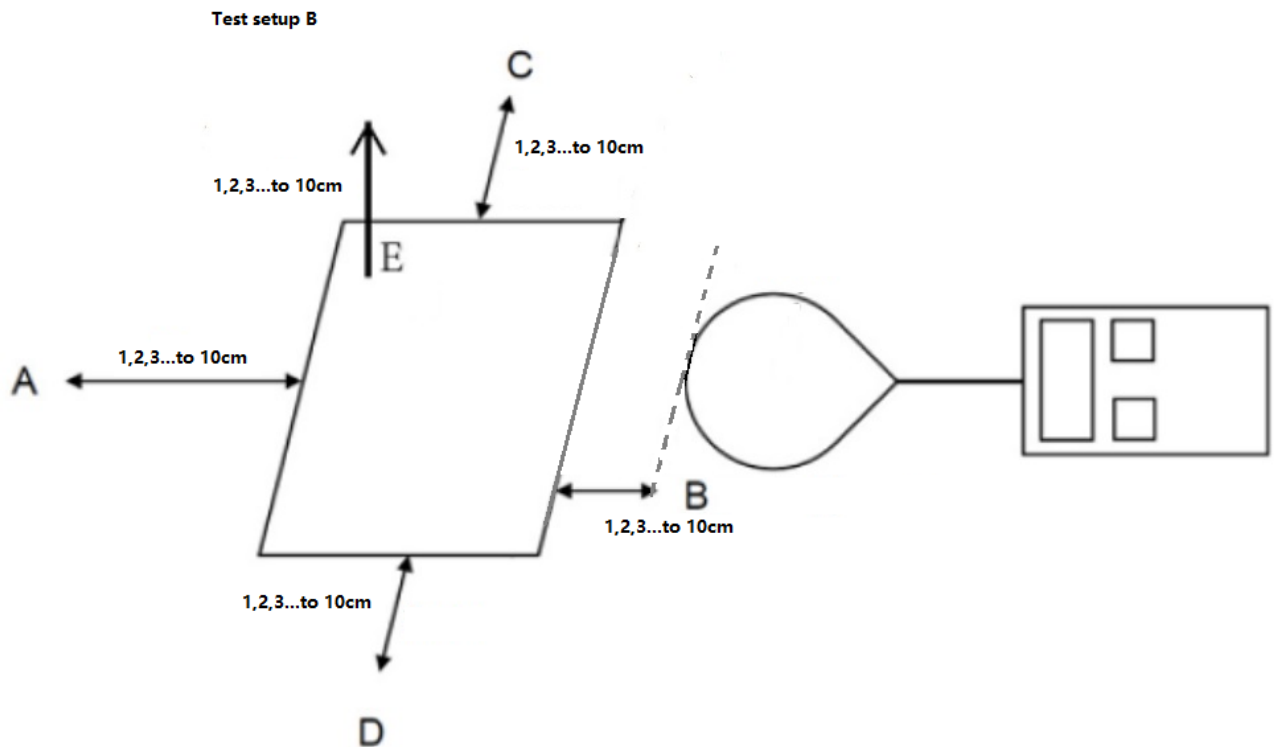


3 Test Setup

A:



B:



The report refers only to the sample tested and does not apply to the bulk.
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4 Test Procedure

- 1) The RF exposure test was performed in an echoic chamber;
- 2) The measurement probe was placed at test distance(15 cm from edges, 20 cm from top) Which is between the edge of the charger and the geometric center of probe, for test setup A;
- 3) In addition to what is described in KDB 680106 D01, please measure and provide magnetic and electrical field strength at a distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm. Which is between the edge of the charger and the edge of probe, for test setup B;
- 4) The highest emission level was recorded and compared with limit as soon as measurement of each points (A,B, C,D, E)were completed;
- 5) The EUT was measured according to the dictates of 680106 D01 RF Exposure Wireless Charging App v03r01; And KDB Tracking Number 671578 ; TCB Workshop, October 2018, 5.2 RF Exposure Procedures

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

5 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
EMF Meter	NARDA	ELT-400	N-0356	Oct 11, 2020	Oct 10, 2021
EMF probe	NARDA	B-Field Probe	M-0812	Oct 11, 2020	Oct 10, 2021

6 Test Result

Battery working mode and AC in working mode all have been tested , only worse case battery working mode is reported.

Test Result for Test setup A:

Note: Frequency Range 0.1115-0.205 (MHz); <5%, 50 %, > 90% load all have been tested, Only worse case Max load (>90%) is reported.

E-Filed Strength at (15 cm from edges A, B, C, D, 20 cm from top E) surrounding the EUT (V/m)

Charging Load Worse case	Test Position A(V/m)	Test Position B(V/m)	Test Position C(V/m)	Test Position D(V/m)	Test Position E(V/m)	Limits (V/m)
Max load	1.58	1.51	1.36	1.29	1.42	83

H-Filed Strength at (15 cm from edges A, B, C, D, 20 cm from top E) surrounding the EUT (A/m)

Charging Load Worse case	Test Position A(A/m)	Test Position B(A/m)	Test Position C(A/m)	Test Position D(A/m)	Test Position E(A/m)	Limits (A/m)
Max load	0.65	0.57	0.44	0.40	0.35	90

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Test Result for Test setup B:

Note: Frequency Range 0.1115-0.205 (MHz); <5%, 50%, >90% load all have been tested, Only worse case Max load (>90%) is reported.

E-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of probe,) surrounding the EUT (V/m)

Test distance (cm)	Test Position A(V/m)	Test Position B(V/m)	Test Position C(V/m)	Test Position D(V/m)	Test Position E(V/m)	Limits (V/m)
1	3.44	3.37	3.32	3.25	3.21	83
2	3.30	3.24	3.17	3.13	3.05	83
3	3.26	3.20	3.15	3.07	3.01	83
4	2.98	2.94	2.89	2.84	2.78	83
5	2.83	2.80	2.74	2.71	2.69	83
6	2.70	2.68	2.65	2.60	2.57	83
7	2.62	2.54	2.50	2.47	2.43	83
8	2.52	2.46	2.41	2.38	2.32	83
9	2.48	2.43	2.39	2.34	2.28	83
10	2.31	2.25	2.20	2.16	2.12	83

H-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of probe,) surrounding the EUT (A/m)

Test distance (cm)	Test Position A(A/m)	Test Position B(A/m)	Test Position C(A/m)	Test Position D(A/m)	Test Position E(A/m)	Limits (A/m)
1	1.18	1.13	1.10	1.05	0.98	90
2	0.94	0.90	0.87	0.82	0.79	90
3	0.84	0.81	0.75	0.71	0.67	90
4	0.70	0.66	0.62	0.59	0.55	90
5	0.64	0.59	0.57	0.53	0.49	90
6	0.58	0.55	0.51	0.47	0.43	90
7	0.50	0.46	0.42	0.35	0.31	90
8	0.41	0.35	0.30	0.24	0.22	90
9	0.32	0.26	0.23	0.18	0.15	90
10	0.19	0.16	0.14	0.09	0.04	90

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7.0 Test Setup Photo



Test Engineer: Alan geng

Reviewer: Perry Tang

Dated: January 28, 2021

Dated: January 28, 2021

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