

SECTION RF Exposure

1. TEST CONFIGURATION

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC Rules and Regulations.

The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1. According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

Table 1-Limits for Maximum Permissible Exposure(MPE)

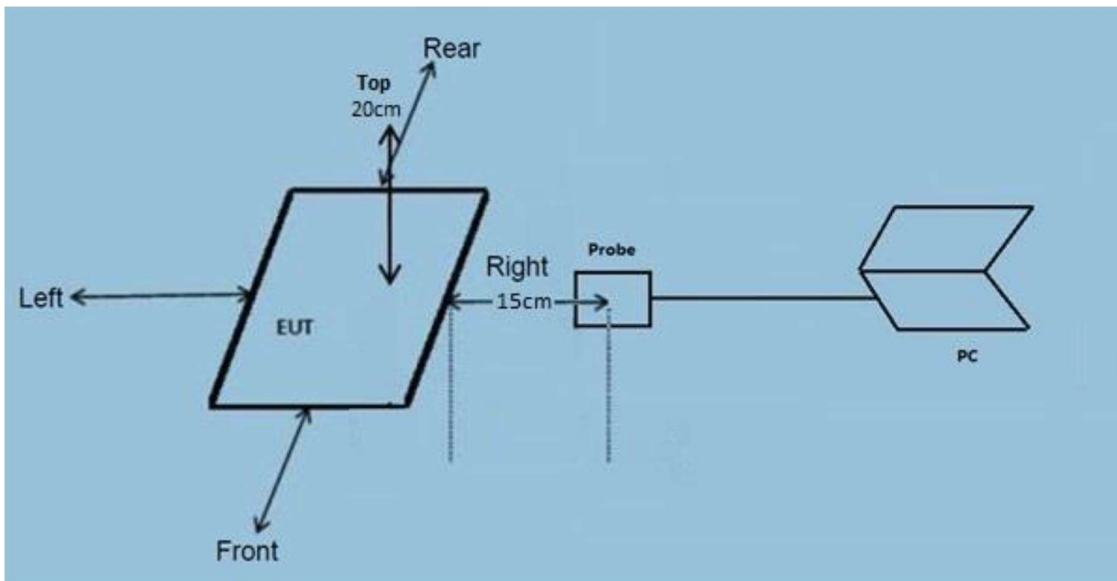
Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3 ~ 3.0	614	1.63	*100	6
3.0 ~ 30	1842/f	4.89/f	*900/f ²	6
30 ~ 300	61.4	0.163	1.0	6
300 ~ 1500			f/300	6
1500 ~ 100,000			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 ~ 1,500			f/1500	30
1,500 ~ 100,000			1	30

Note f = frequency in MHz

* = Plane-wave equivalent power density

Per the guidance of KDB 680106, the E-field and H-field limits shown in the table above are extended down to 100kHz.

2. TEST SETUP CONFIGURATION



Note

- The RF exposure test is performed in the shield room.
- The test distance is between the edge of the charger and the geometric centre of probe.

2.1 Test Equipment List

Name of instrument	Model	Manufacturer	Cal. Date	Due Date
Electric and Magnetic Field Analyzer	EHP-50F	Narda	2021-01-29	2022-01-29

2.2 Support equipment

Client device	Model	Note
Samsung Mobile Phone	SM-N970U	N/A
Apple Mobile Phone	iPhone 11	N/A
Smart Watch	MTF02KH/A	N/A

Note1) : The manufacturer customized and provided receiver load as worst one of max. capacity of EUT.

3. Equipment Approval Considerations

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

- Mobile phone wireless charging: 110 kHz to 205 kHz.
- Apple watch: 325 kHz

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

- Yes, the maximum output power of the primary coil is 10W
(DC 5V/2A, DC9V/2A)

(3) 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 DUT(Device Under Test) includes two primary coils and Clients will be able to detect and allow coupling between individual pairs of coils.

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

- Yes, When the client device is placed directly in contact with transmitter, then charging is able to start.

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

- Yes, the EUT is a Mobile Wireless Charger

(6) 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% MPE limit.

4. Test Methods

4.1 Measurement procedure

1. The RF exposure test was performed at the turn table of anechoic chamber.
2. The edge of the charger(EUT) and center of the filed probe should be located at specified distance(15 cm, 20 cm).
3. Maximum value of E-field and H-field were measured for the six side each at the specified distance and recorded them on the following Test Result table. Six sides are Front, Left, Rear, Right, and Top. (Please see 2Page)
4. The EUT was implemented by the dictates of KDB 680106 D01 v03 accordingly.

4.2 Test Mode

EUT Mode	Description
2 W Charging Mode (Smart Watch)	Mode 1
5 W Charging Mode (Samsung Mobile)	Mode 2
7.5 W Charging Mode (Apple Mobile)	Mode 3
10 W Charging Mode (Samsung Mobile)	Mode 4

Simultaneous Charging Mode (Mode 1+2)	Mode 5
Simultaneous Charging Mode (Mode 1+3)	Mode 6
Simultaneous Charging Mode (Mode 1+4)	Mode 7
Note: All test modes were pre-testd, but we only recorded the worst case Mode 7 in this report.	

4.3 Test Result

- Complied

- Date of Test: 2020.07.20 ~ 2021.07.23

*** Simultaneous Transmission**

- 2 W(Smart Watch) + 10 W(Samsung Mobile) Charging Mode (< 1% charged)

E-field Measurements

Distance(cm)	Front(V/m)	Left(V/m)	Rear(V/m)	Right(V/m)	Top(V/m)	Limit(V/m)
15	3.6145	4.6281	3.8201	1.0958	3.8427	614.00
20					2.7916	

H-field Measurements

Distance(cm)	Front(A/m)	Left(A/m)	Rear(A/m)	Right(A/m)	Top(A/m)	Limit(A/m)
15	0.0202	0.0562	0.0237	0.0147	0.0172	1.63
20					0.0135	0.82

- 2 W(Smart Watch) + 10 W(Samsung Mobile) Charging Mode (< 50% charged)

E-field Measurements

Distance(cm)	Front(V/m)	Left(V/m)	Rear(V/m)	Right(V/m)	Top(V/m)	Limit(V/m)
15	3.5959	5.0674	4.8396	0.9375	3.9466	614.00
20					2.4879	307.00

H-field Measurements

Distance(cm)	Front(A/m)	Left(A/m)	Rear(A/m)	Right(A/m)	Top(A/m)	Limit(A/m)
15	0.0248	0.0584	0.0202	0.0143	0.0189	1.63
20					0.011	0.82

- 2 W(Smart Watch) + 10 W(Samsung Mobile) Charging Mode (< 99% charged)

E-field Measurements

Distance(cm)	Front(V/m)	Left(V/m)	Rear(V/m)	Right(V/m)	Top(V/m)	Limit(V/m)
15	5.0462	5.1135	4.9991	1.0519	4.2294	614.00
20					2.7245	307.00

H-field Measurements

Distance(cm)	Front(A/m)	Left(A/m)	Rear(A/m)	Right(A/m)	Top(A/m)	Limit(A/m)
15	0.0256	0.0597	0.0294	0.0129	0.0178	1.63
20					0.0105	0.82