RF Exposure Evaluation

1 Measuring Standard

According to KDB 680106 D01 v04.

2 Limits

The criteria listed in the following tableshall 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 Procedure

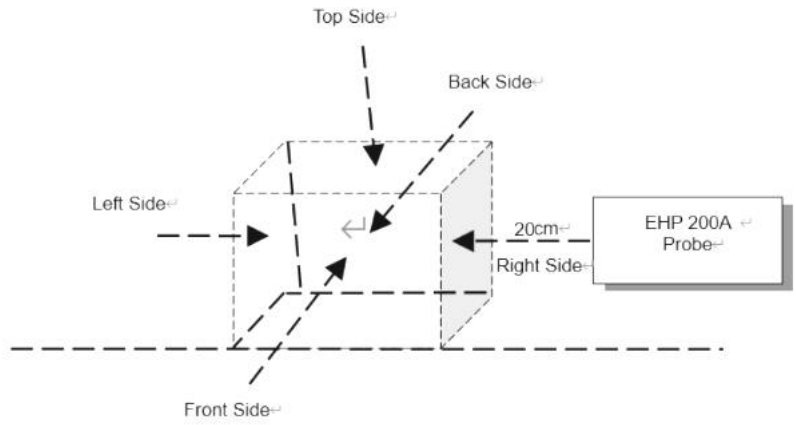
1) The RF exposure test was performed in anechoic chamber.

2) E and H-field measurements should be made with the center of the probe at a distance of 20cm.

3) The highest emission level was recorded and compared with limit as soon as measurement of each points were completed.

4) The EUT was measured according to the dictates of KDB 680106 D01 v04.

4 Test Setup



5 Requirements

According to the item 5 of KDB 680106 D01 Wireless Power Transfer v04r01:

1. The power transfer frequency is below 1 MHz.

Yes. The power transfer frequency is 110-205KHz.

2. The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.

Yes. The maximum output power is:

Wireless Charging Output (Phone): 5W/7.5W/10W/15W (Max)

Wireless Charging Output (TWS): 5W

Wireless Charging Output (Watch): 5W

3. A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)

Yes. The EUT has three source primary coils.

4. Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).

Yes, This device is a mobile device.

5. The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.

Yes, The EUT field strength levels are less 50% x MPE limit.

6. For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.

This device has three wireless charging coil. See 8 Test Results for test modes.

6 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Exposure Level Tester	Narda	EHP-200A	180ZX00634	2023.06.21	2024.06.20

7 Description of Support Units

Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
Wireless Charger	N/A	TB-001	N/A	EUT
Adapter	OPPO	VCB7CACH	N/A	Auxiliary
Mobile Phone	Apple	iPhone 14	N/A	Auxiliary
Watch	Apple	Iwatch Ultra	N/A	Auxiliary
TWS headphones	Apple	AirPods Pro	N/A	Auxiliary

8 Test Result

Mode 1	Charging+Wireless (Phone 15W)
Mode 2	Charging+Wireless (Phone 10W)
Mode 3	Charging+Wireless (Phone 7.5W)
Mode 4	Charging+Wireless (Phone 5W)
Mode 5	Charging+Wireless (Watch 5W)
Mode 6	Charging+Wireless (TWS 5W)
Mode 7	Charging+Wireless (Phone 5W+TWS 5W+ Watch 5W)
Mode 8	Charging+Wireless (Phone 7.5W+TWS 5W)
Mode 9	Charging+Wireless (Phone 7.5W+Watch 5W)
Mode 10	Charging+Wireless (Phone 10W+ TWS 5W)
Mode 11	Charging+Wireless (Phone 10W+ Watch 5W)
Mode 12	Charging+Wireless (Watch 5W+TWS 5W)
Mode 13	Charging+Wireless (Phone 15W+TWS 5W+ Watch 5W)
Mode 14	Charging+Wireless (Phone 10W+TWS 5W+ Watch 5W)
Mode 15	Charging+Wireless (Phone 7.5W+TWS 5W+ Watch 5W)
Mode 16	Charging+Wireless (Phone 5W+TWS 5W+ Watch 5W)
Note:All test modes were pre-tested, but we only recorded the worst Mode 13 case in this report.	

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit(V/m)
Top	1.45	614	307
Left	1.35	614	307
Right	1.45	614	307
Rear	1.37	614	307
Front	1.20	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit(A/m)
Top	0.74	1.63	0.815
Left	0.67	1.63	0.815
Right	0.64	1.63	0.815
Rear	0.76	1.63	0.815
Front	0.61	1.63	0.815

9 Test Set-up Photo