RF Exposure Evaluation

1 Measuring Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. According to §1.1310 and §2.1091 RF exposure is calculated. According KDB680106 D01: KDB 680106 D01 Wireless Power Transfer v04.

2 Requirements

According to the item 3 of KDB 680106 D01v04:

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

(1) Mobile Device and Portable Device Configurations

(2) Equipment Authorization Procedures for Devices Operating at Frequencies Below 4 MHz

(3) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the top surface.

Limits

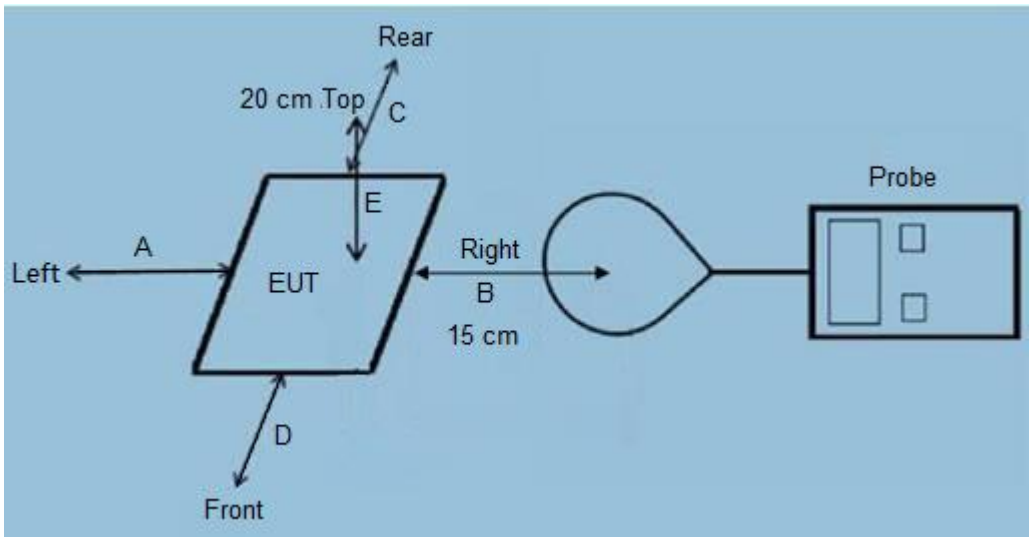
The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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 D01 Wireless Power Transfer v04.
Remark：The EUT's test position A, B, C, D and E is valid for the E and H field measurements.

5 Equipment Approval Considerations

The EUT does comply with KDB 680106 D01 as follow table.

Requirements of KDB 680106 D01	Yes / No	Description
Mobile Device and Portable Device Configurations	Yes	Mobile Device
Equipment Authorization Procedures for Devices Operating at Frequencies Below 4 MHz	Yes	The device operate in the frequency range 113kHz-205kHz, 300kHz-350kHz
RF Exposure compliance may be ensured only for a minimum separation distance that is greater than 20 cm, while use conditions at smaller distances can still be considered unlikely.	Yes	The EUT H-field strengths at 15 cm surrounding the device and 20 cm above the top surface.

6 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 + Wireless charger receiver+ Earphone+ Watch	Record
Mode 2	AC Adapter + EUT + Wireless charger receiver+ Earphone	Pre-tested
Mode 3	AC Adapter + EUT + Wireless charger receiver+Watch	Pre-tested
Mode 4	AC Adapter + EUT + Earphone +Watch	Pre-tested
Mode 5	AC Adapter + EUT + Wireless charger receiver	Pre-tested
Mode 6	AC Adapter + EUT + Earphone	Pre-tested
Mode 7	AC Adapter + EUT + Watch	Pre-tested
Mode 8	Test the EUT in idle mode.	Pre-tested
Note: 1. All test modes were pre-tested, but we only recorded the worst case in this report. 2. Unfolded and folded mode were tested, but we only recorded the worst case.		

7 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	Adapter	HNT	HNT-QC530	N/A	N/A	N/A
2	Wireless charger receiver	SLY	15W	N/A	N/A	N/A
3	Earphone	PocBuds	K6	N/A	N/A	N/A
4	Watch	Apple	S6	N/A	N/A	N/A

8 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	21.06.2022	20.06.2024

9 Test Result

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

Unit	Test mode TM1	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits (V/m)	Limits (V/m)
V/m	Phone port	107.533	128.390	128.461	122.182	111.353	307	614
V/m	Earphone port	111.233	104.856	110.553	114.166	106.586	307	614
V/m	Watch port	79.001	103.106	99.971	97.526	81.221	307	614

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

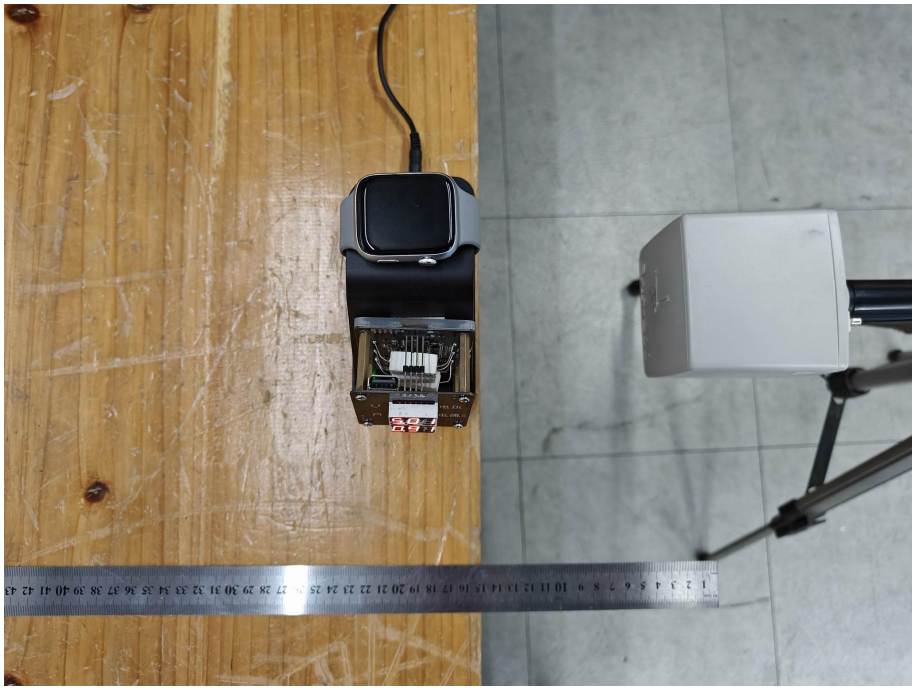
Unit	Test mode TM1	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	50% Limits (A/m)	Limits (A/m)
A/m	Phone port	0.376	0.431	0.414	0.388	0.359	0.815	1.63
A/m	Earphone port	0.404	0.389	0.352	0.374	0.376	0.815	1.63
A/m	Watch port	0.386	0.363	0.493	0.423	0.325	0.815	1.63

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

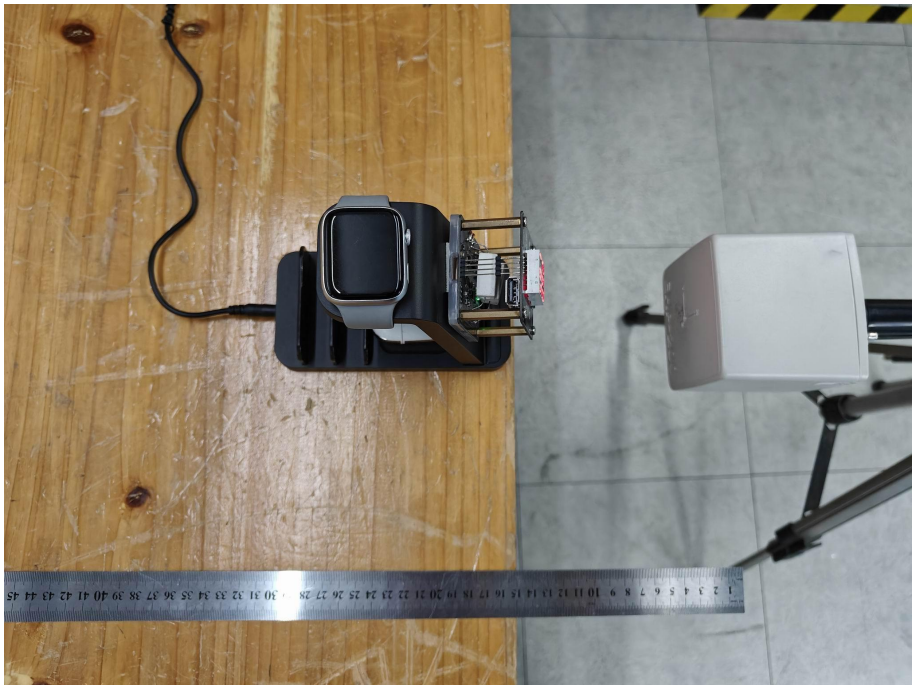
Unit	Test mode TM1	Test Position E	50% Limits (A/m)	Limits (A/m)
A/m	Phone port	0.361	0.815	1.63
A/m	Earphone port	0.382	0.815	1.63
A/m	Watch port	0.361	0.815	1.63

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

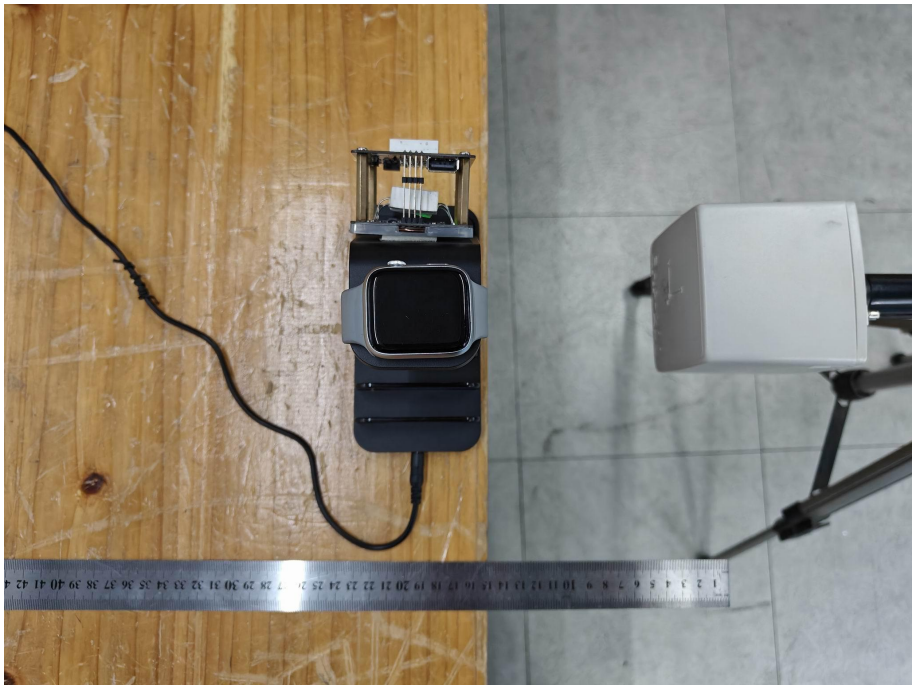
10 Test Setup photo



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

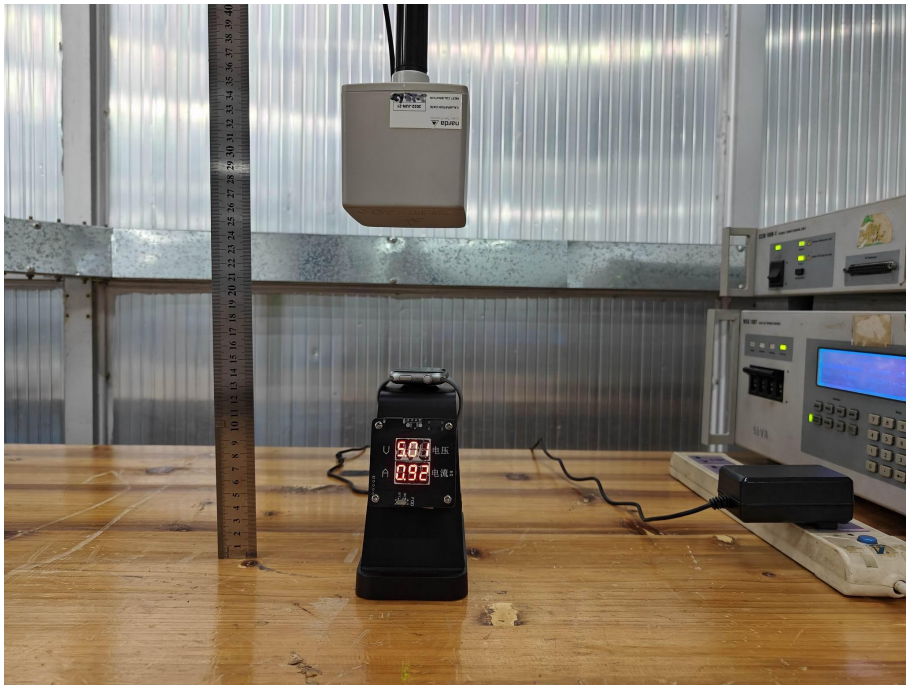


Test Position B-15cm from the edge of EUT to the geometric center of the probe

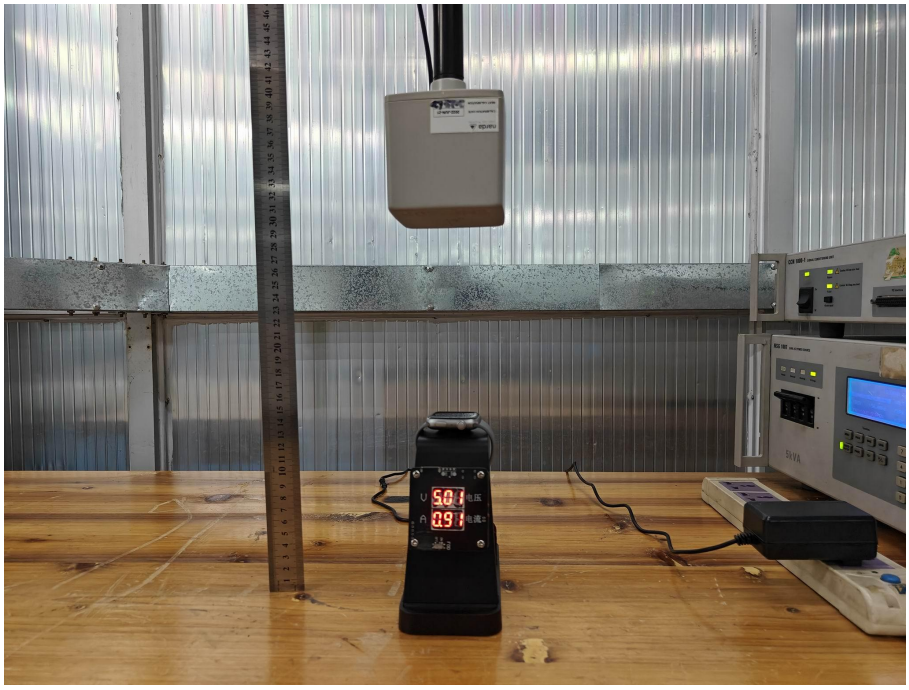


Test Position C-15cm from the edge of EUT to the geometric center of the probe

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 E-20cm from the edge of EUT to the geometric center of the probe

End of report