



Product Name:	2 in 1 Wireless charger
Product Model No.:	581007
Test Auxiliary:	Notebook, iWatch, Airpod
Test Auxiliary Model No.:	NP-RC510,S4,AirPods Pro 2
Transmitting mode	Keep the EUT in continuously wireless charging mode
Power supply:	Input: 5V===1A, 5V===2A Airpod Wireless Output: 5W(Max) Apple Watch Magnetic Wireless Output: 2.5W(Max)
Battery Capacity:	N/A

Test Modes:		Description:	
Mode 1	Airpod+Coil-1	Full Load Battery \geq 98%	Record
		Half Load Battery=50%	
		No Load Battery \leq 1%	
Note: All modes have been tested, and the report only reflects the worst case data.			

Test Modes:		Description:	
Mode 2	iWatch+Coil-2	Full Load Battery \geq 98%	Record
		Half Load Battery=50%	
		No Load Battery \leq 1%	
Note: All modes have been tested, and the report only reflects the worst case data.			



RF Exposure Evaluation

1 Measuring Standard

1.1 KDB 680106 RF Exposure Wireless Charging Apps v03r01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainly
1	H-filed	$\pm 0.93\text{dB}$
2	E-filed	$\pm 0.51\text{dB}$

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.

a) Power transfer frequency is less than 1 MHz

Yes. The device operates in the frequency Airpod Wireless: 115KHz-205KHz, Apple Watch Magnetic Wireless: 115KHz-333KHz.

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

Yes, The maximum output power of Airpod Wireless Output: 5W(Max), Apple Watch Magnetic Wireless Output: 2.5W(Max)

c) 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 transfer system including a charging system with only single primary coils is to detect and allow only between individual of coils

d) Client device is placed directly in contact with the transmitter

Yes. Client device is placed directly in contact with the transmitter

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

No. The EUT has portable exposure condition.

f) 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. Meet the requirement.

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)

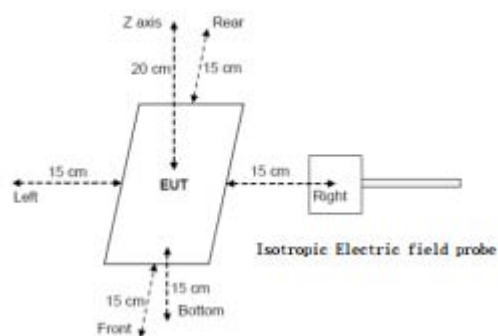


Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000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

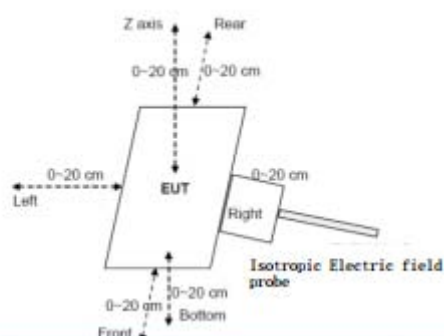
F=frequency in MHz
 * =Plane-wave equivalent power density
 RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

3 Test Setup

For mobile exposure conditions:



For portable exposure conditions:



Note: Measurements should be made from all sides and the top of the primary/client pair, with the 20 cm-0cm measured from the center of the top, and 20cm-0cm measured from the center of the rest

For mobile exposure conditions:

- The RF exposure test was performed in anechoic chamber
- E and H-field measurements should be made with the center of the probe at a distance of 15 cm surrounding the EUT and 20 cm above the top surface of the primary/client pair
- The highest emission level was recorded and compared with limit
- The EUT was measured according to the dictates of KDB680106 v03r01

For portable exposure conditions:

- The RF exposure test was performed in anechoic chamber
- E and H-field measurements should be made with the probe at 0 cm for all side of the EUT.
- The highest emission level was recorded and compared with limit.

For portable exposure conditions:

Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm starting from as close as possible out to 10cm



4 Test Procedure

- 1) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- 2) 20 cm-0cm measured from the center of the top, and 20cm-0cm measured from the center of the rest sides.
- 3) The turn table was rotated 360d degree to search of highest strength.
- 4) The highest emission level was recorded and compared with limit as soon as measurement of each points were completed.
- 5) The EUT were measured according to the dictates of KDB 680106-v03

5 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Electric and Magnetic field Probe-Analyzer	Narda	EHP 200A	19SN0980	2023.03.08	2024.03.07



6 Test Result

Apple Watch Magnetic Wireless

H-Filed Strength at 20 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.18	0.17	0.16	0.19	0.20	0.19	1.63

H-Filed Strength at 18 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.22	0.23	0.21	0.24	0.22	0.25	1.63

H-Filed Strength at 16 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.24	0.26	0.25	0.28	0.27	0.26	1.63

H-Filed Strength at 14 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.29	0.31	0.33	0.32	0.34	0.32	1.63

H-Filed Strength at 12 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.36	0.38	0.35	0.34	0.39	0.37	1.63

H-Filed Strength at 10 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.42	0.41	0.43	0.45	0.46	0.44	1.63



H-Filed Strength at 8 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.47	0.49	0.50	0.52	0.51	0.48	1.63

H-Filed Strength at 6 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.54	0.53	0.56	0.58	0.55	0.57	1.63

H-Filed Strength at 4 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.62	0.59	0.64	0.60	0.63	0.62	1.63

H-Filed Strength at 2 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.67	0.65	0.66	0.69	0.68	0.67	1.63

H-Filed Strength at 0 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.333	0.72	0.74	0.76	0.77	0.73	0.75	1.63



Airpod Wireless

H-Filed Strength at 20 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.23	0.22	0.24	0.23	0.20	0.19	1.63

H-Filed Strength at 18 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.25	0.27	0.25	0.26	0.28	0.25	1.63

H-Filed Strength at 16 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.27	0.25	0.28	0.29	0.27	0.29	1.63

H-Filed Strength at 14 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.30	0.29	0.31	0.33	0.32	0.31	1.63

H-Filed Strength at 12 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.37	0.36	0.39	0.38	0.37	0.36	1.63

H-Filed Strength at 10 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.45	0.44	0.45	0.46	0.47	0.43	1.63



H-Filed Strength at 8 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.49	0.48	0.51	0.50	0.53	0.50	1.63

H-Filed Strength at 6 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.56	0.55	0.54	0.57	0.56	0.58	1.63

H-Filed Strength at 4 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.60	0.58	0.63	0.61	0.66	0.64	1.63

H-Filed Strength at 2 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.70	0.69	0.71	0.73	0.72	0.71	1.63

H-Filed Strength at 0 cm from the edges surrounding the EUT (A/m)

Frequency Range (MHz)	Test Position Left	Test Position Right	Test Position Bottom	Test Position Rear	Test Position Front	Test Position Top	Limits (A/m)
0.115-0.205	0.77	0.76	0.75	0.79	0.78	0.79	1.63



6 Test Set-up Photo

















