Product Name:	Magnetic Wireless Power Bank
Product Model No.:	W05 CYD-W05,UNICHG22518,IST-09991,CL72104
Test Auxiliary:	Phone
Auxiliary Model No.:	DL01
Transmitting mode	Keep the EUT in continuously wireless charging mode
Power supply:	Input: DC 5V 3A DC 9V 2A Wireless Output: 10W Max Battery Capacity: 3.85V, 5000mAh, 19.25Wh
Test Description:	Phone Battery>98%, =50%and <1% are tested, and the worst is <1%.

Test Modes:		
Mode 1	AC/DC Adapter (5V/3A) + EUT + iPhone (10W)	
Mode 2	AC/DC Adapter (5V/3A) + EUT + iPhone (5W)	
Mode 3	AC/DC Adapter (9V/2A) + EUT + iPhone (10W)	
Mode 4	AC/DC Adapter (9V/2A) + EUT + iPhone (5W)	
Mode 5	Battery (3.85V) + EUT + iPhone (10W)	Record
Mode 6	Battery (3.85V) + EUT + iPhone (5W)	
Note: 1) All test modes were pre-tested, but we only recorded the worst case in this report. 2) Device transmit under 100% duty cycle condition.		

Me**asurement Uncertainty**	
Test Item	Uncertainty
Magentic fieid meansurements(9kHz~30MHz)	±2.3%
Electrice fieid meansurements(9kHz~30MHz)	±2.1%

RF Exposure Evaluation

1 Measuring Standard

KDB 680106 RF Exposure Wireless Charging Apps v03r01

2022 April TCBC WORKSHOP 4.1 Part 18 & Wireless Power Transfer.

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 that 1 MHz

Yes.The device operates in the frequency115KHz-205KHz

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

Yes,The maximum output power of the primary coil is Max 5W≤15W.

c) The transfer system includes onle 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 form all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit

No. The EUT ggregate H-Field more than 50% of the MPE limit.

Limits

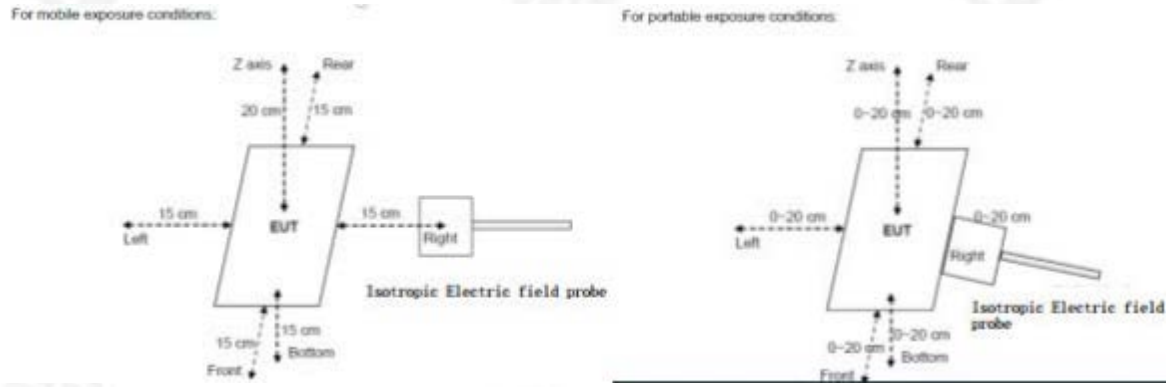
The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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



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:

a. The RF exposure test was performed in anechoic chamber

b. 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 primarv/client pair

c. The highest emission level was recorded and compared with limit

d. The EUT was measured according to the dictates of KDB680106 v03r01

For portable exposure conditions:

a. The RF exposure test was performed in anechoic chamber

b. E and H-field measurements should be made with the probe at O cmfor all side of the EUT.

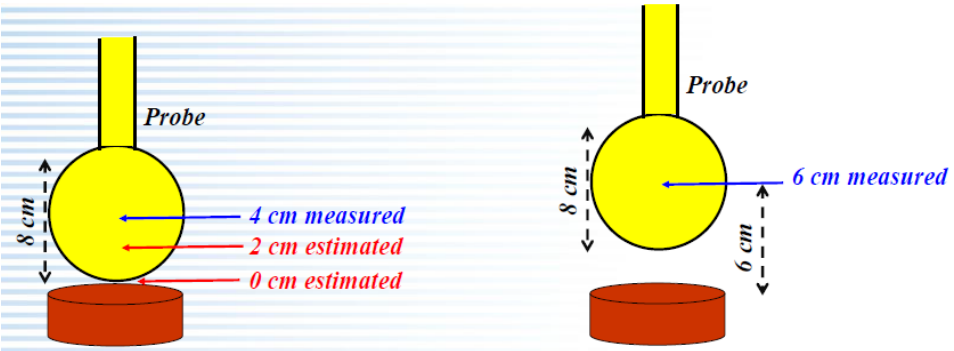
c. The highest emission level was recorded and compared with limit. For portable exposure conditions:

Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cmstartino from as close as possible out to 20cm

4 Test Procedure

1) The RF exposure test was performed on 360 degree turn table in anechoic chamber.

2) Perform H-field/E-field measurements are taken along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable.



Example of probe measurements in points close to the device surface: estimates compared with measurements at 4 and 6 cm provide validation

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。

6) According to Calibration information and specification about WP400-3, The Probe WP400-3's sensitive elements center is located in the probe's center, and the dimensions is 25x25mm. so the actral 0cm field strengths need to be estimated for the positions that are not reachable. The Extrapolated Value Calculation Method please

Refer item 7) . And the result of test distance 2cm~20cm was measured value.

Probe	Length	Width	Radius
	2.5cm	2.5cm	1.25cm

7) Estimated method for portable RF Exposure condition:

We use Biot-Savart formula theory to estimate the strength of the magnetic field that the measuring instrument cannot measure. According to Biot-Savart formula:

$$B = \frac{\mu_0 * I * N * R^2}{2 * (R^2 + x^2)^{3/2}}$$

B: means H-field value;
μ_0 is space permeability; μ0=4π*10-7;
I: A current element passing through a coil;
R: means the Radius of coil(According to provided Antenna specification: We can get the minimum R=20/2=10mm=0.1m);
x: means the distance.
N: Number of turns, According to provided "Antenna specification" files: N=10.

For validation purposes: If the value to show a **30% agreement** between the mode and the (E- and/or H-field) probe measurements for the two closest points to the device surface, and with 2cm increments. Then this extrapolation method is reasonable.

Note: The percent ratio of agreement is the difference between the estimated and measured values divided by the average of the estimated and measured values.

8) EUT is a loop/coil emitting structure, so E-field not required. Just recorded the H-field value.

5 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Electric field Meter	Wavecontrol	SMP-160	20WP120082	Oct. 17 2022	Oct. 16 2023
Isotropic Electric field probe	Wavecontrol	WP400-3	19SN0980	Oct. 17 2022	Oct. 16 2023

6 Test Result

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	0.16	0.15	0.15	0.16	0.15	0.16	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	0.21	0.22	0.21	0.21	0.20	0.22	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	0.26	0.27	0.26	0.27	0.26	0.27	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	0.33	0.35	0.34	0.35	0.34	0.34	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	0.36	0.37	0.36	0.37	0.36	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)
0.115-0.205	0.44	0.45	0.46	0.46	0.47	0.46	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	0.56	0.55	0.56	0.55	0.55	0.55	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	0.63	0.62	0.62	0.62	0.63	0.63	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	0.67	0.68	0.67	0.68	0.68	0.68	1.63

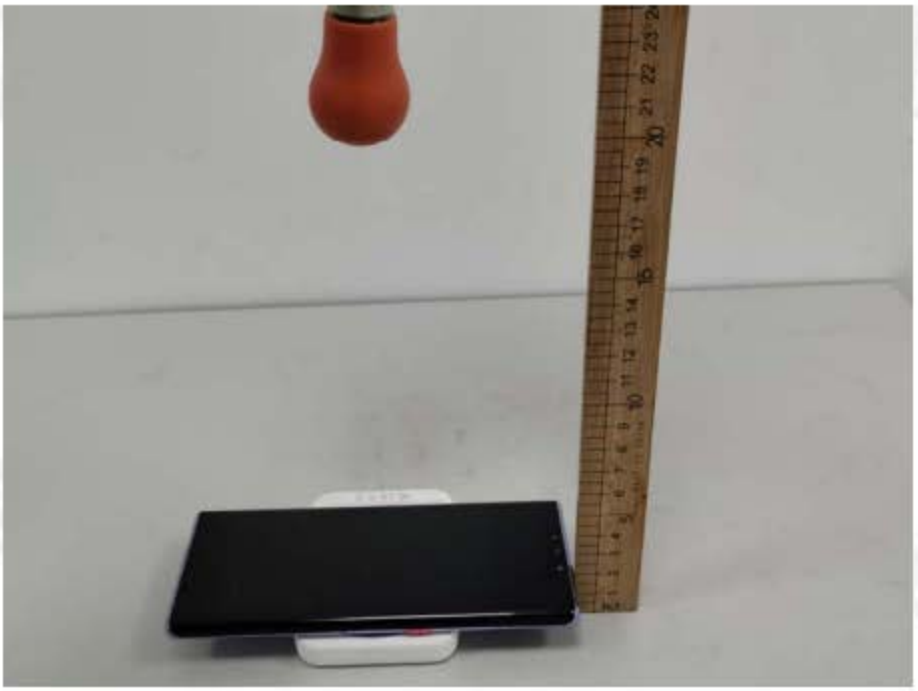
H-Filed Strength at 2 cm from the edges surrounding the EUT (A/m)

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	0.76	0.77	0.77	0.76	0.77	0.77	1.63

Estimated value for 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	0.81	0.82	0.82	0.81	0.82	0.82	1.63

Validation:

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -2cm	3.87	3.82	2.56	5.13	3.82	3.82	Compliance (Within 30%)
2cm(estimated)	0.79	0.80	0.79	0.80	0.80	0.80	
2cm(measured)	0.76	0.77	0.77	0.76	0.77	0.77	
Agreement -4cm	17.69	14.97	16.44	14.97	16.22	16.22	
4cm(estimated)	0.80	0.79	0.79	0.79	0.80	0.80	
4cm(measured)	0.67	0.68	0.67	0.68	0.68	0.68	

6 Test Set-up Photo