FCC ID:2BQRZ-F15B

Product Name:	Magnetic wireless power bank
Product Model No.:	F15B, F20S, F22, F22S, F21, F21S, F20S, F20A.F20, F19S, F19A, F19, F18S, F18A, F18, F16S, F16, F155, F15, F13, F13S, F12, F12S, F11, F11S, F10, F10S, YE101A
Model Difference:	F15B is tested model, other models are derivative models .The models are identical in circuit, only different on the model names . So the test data of F15B can represent the remaining models.
Test Auxiliary:	Mobile phone and AC Adapter and Wireless charging load
Transmitting mode:	Keep the EUT in continuously wireless charging mode
Power supply:	Type-C Input: 5V⎓ 3A, 9V⎓ 2.22A, 12V⎓ 1.67A or Battery capacity:10000mAh/3.85V/38.5Wh Wireless Output: 5W/7.5W/10W/15W

Test Modes:	
Mode 1	AC Adapter + Wireless charging load (Qi Protocol: 15W)
Mode 2	AC Adapter + Wireless charging load (Qi Protocol: 10W)
Mode 3	AC Adapter + Wireless charging load (Qi Protocol: 7.5W)
Mode 4	AC Adapter + Wireless charging load (Qi Protocol: 5W)
Mode 5	AC Adapter + Phone charging (MPP Protocol: Battery Status:≤1%)
Mode 6	AC Adapter + Phone charging (MPP Protocol: Battery Status:50%)
Mode 7	AC Adapter + Phone charging (MPP Protocol: Battery Status:≥98%)
Mode 8	AC Adapter + Earbuds charging (Battery Status:≤1%)
Mode 9	AC Adapter + Earbuds charging (Battery Status:50%)
Mode 10	AC Adapter + Earbuds charging (Battery Status:≥98%)
Mode 11	AC Adapter + Watch charging (Battery Status:≤1%)
Mode 12	AC Adapter + Watch charging (Battery Status:50%)
Mode 13	AC Adapter + Watch charging (Battery Status:≥98%)
Mode 14	Standby
Note: All full load, half load, and no-load tests have been conducted in each mode, only the worst-case was recorded in the report. Mode 5 full load is the worst mode.	

Auxiliary equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	AC Adapter	/	G301CU	/	AE
E-2	Wireless charging load	/	EESON	/	AE
E-3	Mobile phone	Apple Inc.	iPhone 15 Pro	/	AE

1 Measuring Standard

KDB 680106 RF Exposure Wireless Charging Apps v03r01

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.

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

The EUT frequency range is:

Phone: 115-205kHz&360kHz (10W)

Earbuds: 115-205kHz

Watch: 300-350kHz

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

The output power is less than 15W.

(3) The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.

EUT has only one coil.

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

EUT can be directly charged.

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

EUT is a mobile device

(6) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

Fulfil requirements.

Remark: Meet all the above requirements.

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)

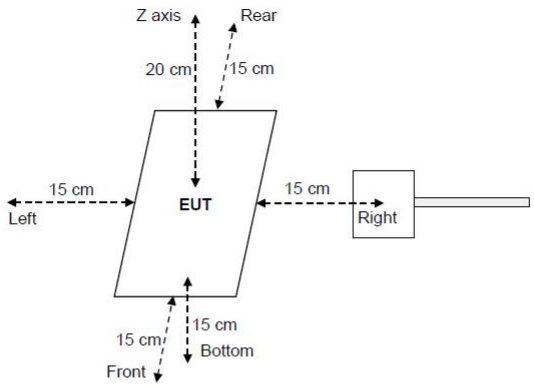
Limits for Maximum Permissible Exposure (MPE)

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

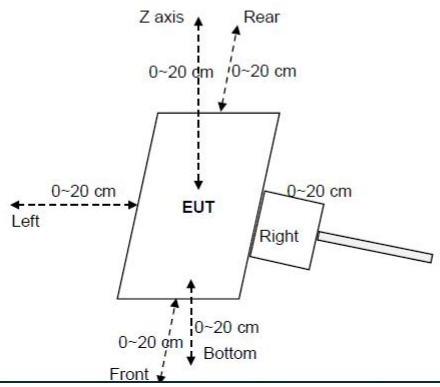
F=frequency in MHz
*=Plane-wave equivalent power density
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

3 Test Setup

For mobile exposure conditions:



For portable exposure conditions:



4 Test Procedure

1) 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 primary/client pair.

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

d. The EUT was measured according to the dictates of KDB 680106 v03r01.

2) 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 0 cm for all side of the EUT.

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

3) 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 10 cm

5 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended 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	Uncertainty
1	H-field	±0.7dB
2	E-field	±1.06dB

Decision Rule

☒ Uncertainty is not included

☐ Uncertainty is included

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	ELT-400	N-0231	Sep. 29, 2024	Sep. 28, 2025
Magnetic field probe 100cm2	Narda	ELT probe 100cm2	M0675	Sep. 29, 2024	Sep. 28, 2025
Isotropic Electric field probe	Narda	EP-601	611WX70332	Sep. 29, 2024	Sep. 28, 2025

7 Test Result

H-Filed Strength from the edges surrounding the EUT (A/m)										
The measurement probe was placed at test distance which is between the edge of the charger and the geometric of probe(cm)	Frequency Range (MHz)	Unit	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	Limits (A/m)	test result
6	0.111-0.205	A (uT)	0.530	0.520	0.540	0.580	0.550	0.560	1.63	PASS
		(A/m)	0.424	0.416	0.432	0.464	0.440	0.448		
8	0.111-0.205	A (uT)	0.480	0.470	0.420	0.450	0.450	0.430	1.63	PASS
		(A/m)	0.384	0.376	0.336	0.360	0.360	0.344		
10	0.111-0.205	A (uT)	0.380	0.380	0.410	0.390	0.390	0.390	1.63	PASS
		(A/m)	0.304	0.304	0.328	0.312	0.312	0.312		
12	0.111-0.205	A (uT)	0.360	0.350	0.350	0.350	0.380	0.360	1.63	PASS
		(A/m)	0.288	0.280	0.280	0.280	0.304	0.288		
14	0.111-0.205	A (uT)	0.350	0.340	0.350	0.350	0.350	0.340	1.63	PASS
		(A/m)	0.280	0.272	0.280	0.280	0.280	0.272		
16	0.111-0.205	A (uT)	0.330	0.300	0.330	0.290	0.290	0.290	1.63	PASS
		(A/m)	0.264	0.240	0.264	0.232	0.232	0.232		
18	0.111-0.205	A (uT)	0.290	0.260	0.270	0.290	0.280	0.270	1.63	PASS
		(A/m)	0.232	0.208	0.216	0.232	0.224	0.216		
20	0.111-0.205	A (uT)	0.260	0.250	0.230	0.250	0.260	0.230	1.63	PASS
		(A/m)	0.208	0.200	0.184	0.200	0.208	0.184		

Note: Calculation: A/m=uT/1.25

Note: Biot-Savar law:

1. Magnetic field on the axis of a current-carrying circle coil:

$$B = \frac{u_0 I R^2}{2(R^2+X^2)^{\frac{3}{2}}}$$

R is the coil outside diameter radius.

X is the distance from the test point to the center of the coil circle.

B is the magnetic magnetic field.

2. According to the KDB 680106, the model needs to be validated by probe measurements at the two points closest to the surface of the device, in 2cm increments, and if there is a 30% agreement between the model and the (E-field and/or h-field) probe measurements, the validation is considered sufficient.

3. We derived the field strengths at 10cm to 8cm and 8cm to 6cm, respectively, which are close to the actual test values, based on the field strength at 6 cm, the field strength at 4cm and 2cm and O cm can be deduced.

4. A table of error data between the assessed and measured values:

distance (cm)	Measurements (A/m)	distance (cm)	Assessed (A/m)	Error (%)	Limit (%)
10	0.328	/	/	/	/
8	0.384	10 to 8	0.453	-15.23	＜30
6	0.464	8 to 6	0.644	-27.95	＜30

5. Calculation process:

distance (cm)	Position Left (A/m)
8	0.453
6	0.644
4	0.922
2	1.245
0	1.410

8cm: $u_0IR^2 = B * 2(R^2 + X^2)^{\frac{2}{3}} = 0.328 * 2(0.055^2 + 0.08^2)^{\frac{3}{2}} = 0.01280858$

To 6cm: $B = \frac{u_0IR^2}{2(R^2+X^2)^{\frac{2}{3}}} = \frac{0.00412187}{2(0.055^2+0.06^2)^{\frac{3}{2}}} = 0.644$

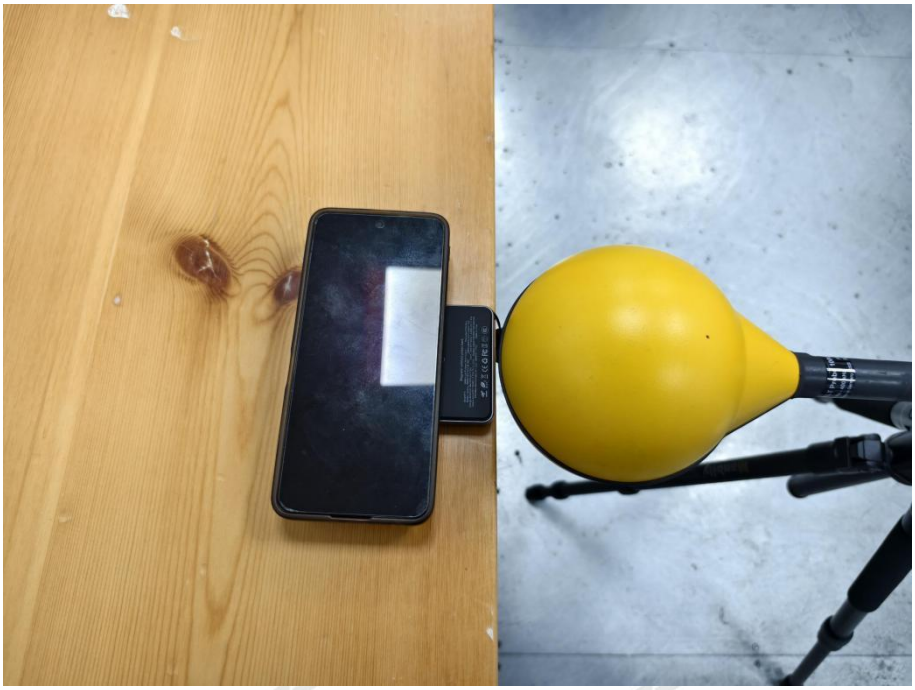
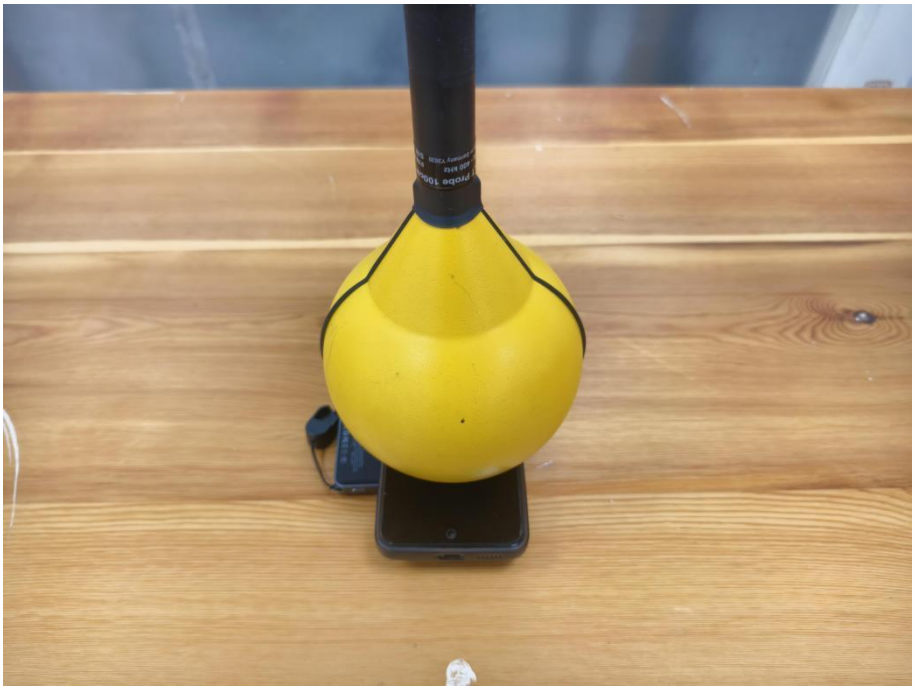
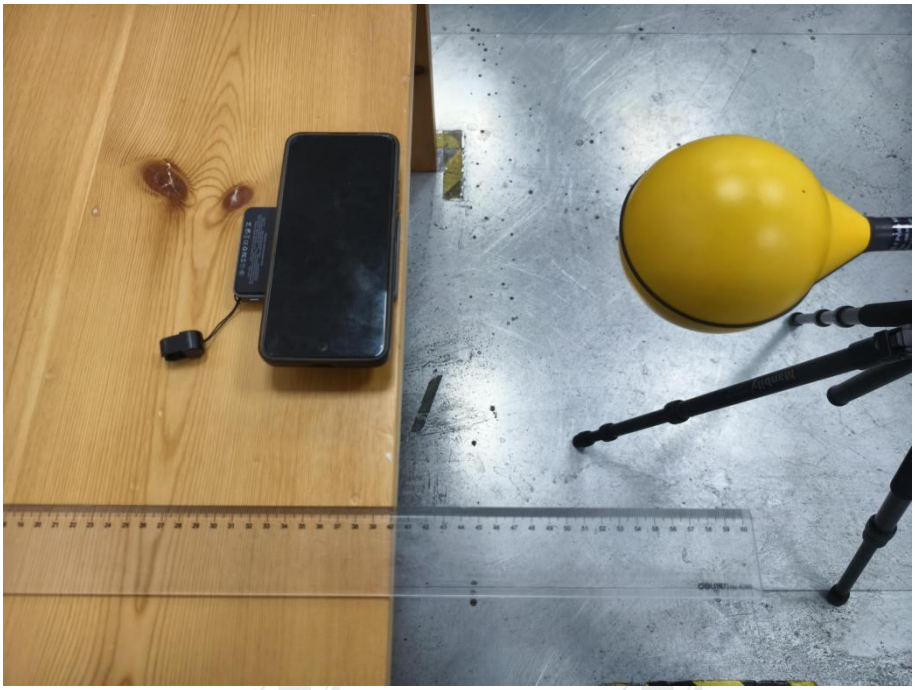
6cm: $u_0IR^2 = B * 2(R^2 + X^2)^{\frac{2}{3}} = 0.2234 * 2(0.055^2 + 0.06^2)^{\frac{3}{2}} = 0.01279950$

To 4cm: $B = \frac{u_0IR^2}{2(R^2+X^2)^{\frac{2}{3}}} = \frac{0.00024096}{2(0.055^2+0.04^2)^{\frac{3}{2}}} = 0.922$

4cm: $u_0IR^2 = B * 2(R^2 + X^2)^{\frac{2}{3}} = 0.3830 * 2(0.055^2 + 0.04^2)^{\frac{3}{2}} = 0.01279275$

To 2cm: $B = \frac{u_0IR^2}{2(R^2+X^2)^{\frac{2}{3}}} = \frac{0.00024096}{2(0.055^2+0.02^2)^{\frac{3}{2}}} = 1.245$

2cm: $u_0IR^2 = B * 2(R^2 + X^2)^{\frac{2}{3}} = 0.6011 * 2(0.055^2 + 0.02^2)^{\frac{3}{2}} = 0.01279238$

To 0cm: $B = \frac{u_0IR^2}{2(R^2+X^2)^{\frac{2}{3}}} = \frac{0.00024096}{2(0.055^2+0^2)^{\frac{3}{2}}} = 1.410$

8. Test Photo