RF Exposure evaluation

FCC ID	2BMHD-CYJ-10
Product Name	3 in 1 Wireless Charger
Model/Type reference	CYJ-10
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Device

1. Reference

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 680106 D01 RF Exposure Wireless Charging Apps v04: RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

FCC CFR 47 part 18.107:Indusial, Scientific, and Medical Equipment

2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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
300-1,500	/	/	f/300	6
1,500-100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
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
300-1,500	/	/	f/1500	30
1,500-100,000	/	/	1.0	30

F=frequency in MHz

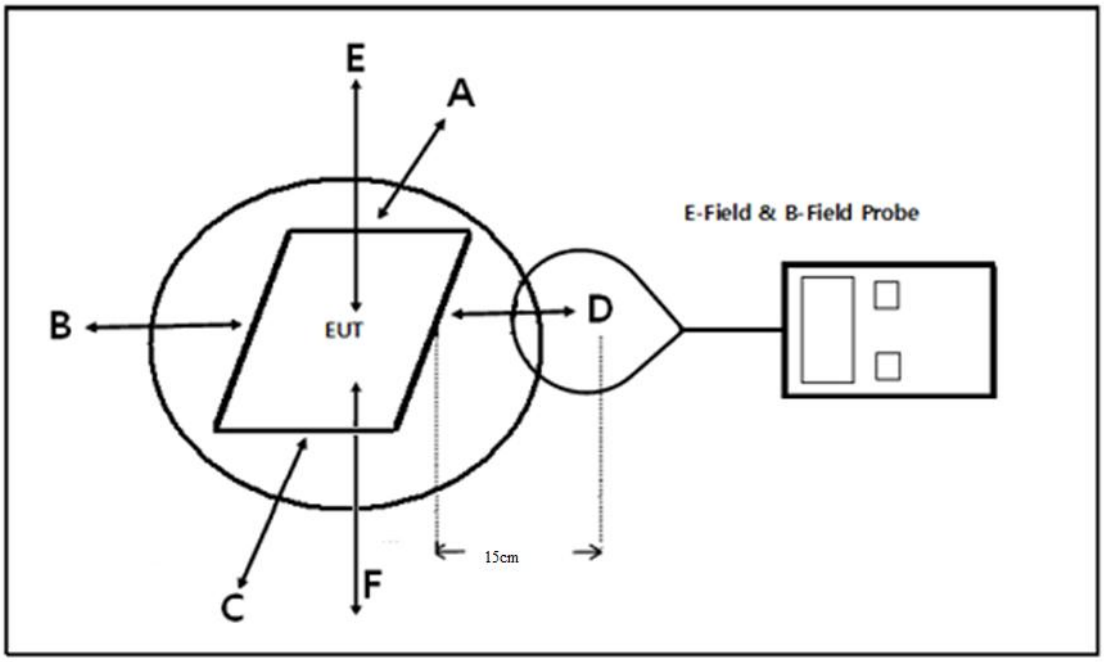
*=Plane-wave equivalent power density

According to FCC KDB 680106 D01 Section 3. RF Exposure Requirements clause 3 the Emission-Limits in the frequency range from 100 KHz to 300 KHz should be assessed versus the limits at 300 KHz in Table 1 of CFR 47 – Section1.310 as following (measured distance shall be 15cm from the center of the probe to the edge of the device):

	E-Field	*/*	B-Field
Frequency	V/m	A/m	uT
0.3 MHz – 3.0 MHz	614	1.613	2.0
3.0 MHz – 30 MHz	$824/f$ ($=27.5_{30MHz}$)	$2.19/f$ ($=0.073_{30MHz}$)	--

A KDB inquire was required to determine/confirm the applicable limits below 100 kHz.

3. Test Setup Diagram



4. Test Equipment

Equipment	Manufacturer	Model	Serial no.	Calibrated date	Calibrated Due
Exposure Level Tester	Narda	ELT-400	N-0713	2024-1-07	2025-1-06
B-Field Probe	Narda	ELT-400	M-1154	2024-1-07	2025-1-06

5. Support equipment List

Manufacturer	Description	Model	Serial Number
Adapter	Guangdong Sangu Technology Co. ltd	SG-0501000AU	--
Phone	Huawei	Mate 60	--
TWS Earphone	iPhone	airPodspro2	--
Watch	Huawei	WatchGT4	--

6. Measurement Procedure

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

b) The measurement probe was placed at test distance (15cm and 20cm) which is between the edges of the charger and the geometric center of probe.

c) The turn table was rotated 360d degree to search of highest strength.

d) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.

e) The EUT were measured according to the dictates of KDB 680106D01v04.

7. Equipment Approval Considerations

The EUT does comply with item 5.2 of KDB 680106 D01v04 as follows table;

Requirements of KDB 680106 D01	Yes / No	Description
Power transfer frequency is less than 1 MHz	Yes	The device operate in the frequency range 110.1kHz - 205kHz
The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.	Yes	The maximum output power of the primary coil is 15W.
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	Client device is placed directly in contact with the transmitter.
Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).	Yes	EUT is a mobile device
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	Fulfil requirements
For systems with more than one radiating structure, the conditions specified in (5) must be met when the	Yes	EUT has only one coil

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.		

8. E and H field Strength

Test Modes	
Mode 1	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch + TWS Earphone(Battery Status: <1%)
Mode 2	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch + TWS Earphone(Battery Status: <50%)
Mode 3	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch + TWS Earphone(Battery Status: <100%)
Mode 4	AC/DC Adapter (12V/2.5A) + EUT + iPhone (Battery Status: <1%)
Mode 5	AC/DC Adapter (12V/2.5A) + EUT + iPhone (Battery Status: <50%)
Mode 6	AC/DC Adapter (12V/2.5A) + EUT + iPhone (Battery Status: <100%)
Mode 7	AC/DC Adapter (12V/2.5A) + EUT + Watch (Battery Status: <1%)
Mode 8	AC/DC Adapter (12V/2.5A) + EUT + Watch (Battery Status: <50%)
Mode 9	AC/DC Adapter (12V/2.5A) + EUT + Watch (Battery Status: <100%)
Mode 10	AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: <1%)
Mode 11	AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: <50%)
Mode 12	AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: <100%)
Mode 13	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch(Battery Status: <1%)
Mode 14	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch(Battery Status: <50%)
Mode 15	AC/DC Adapter (12V/2.5A) + EUT + iPhone + Watch(Battery Status: <100%)
Mode 16	AC/DC Adapter (12V/2.5A) + EUT + iPhone + TWS Earphone (Battery Status: <1%)
Mode 17	AC/DC Adapter (12V/2.5A) + EUT + iPhone + TWS Earphone (Battery Status: <50%)
Mode 18	AC/DC Adapter (12V/2.5A) + EUT + iPhone + TWS Earphone (Battery Status: <100%)
Mode 19	AC/DC Adapter (12V/2.5A) + EUT + Watch + TWS Earphone (Battery Status: <1%)
Mode	AC/DC Adapter (12V/2.5A) + EUT + Watch + TWS Earphone (Battery Status:

20	<50%)
Mode 21	AC/DC Adapter (12V/2.5A) + EUT + Watch + TWS Earphone (Battery Status: <100%)
Note: All test modes were pre-tested, but we only recorded the worst case in this report.	

H-Field Strength at 20cm from the top surface of the EUT

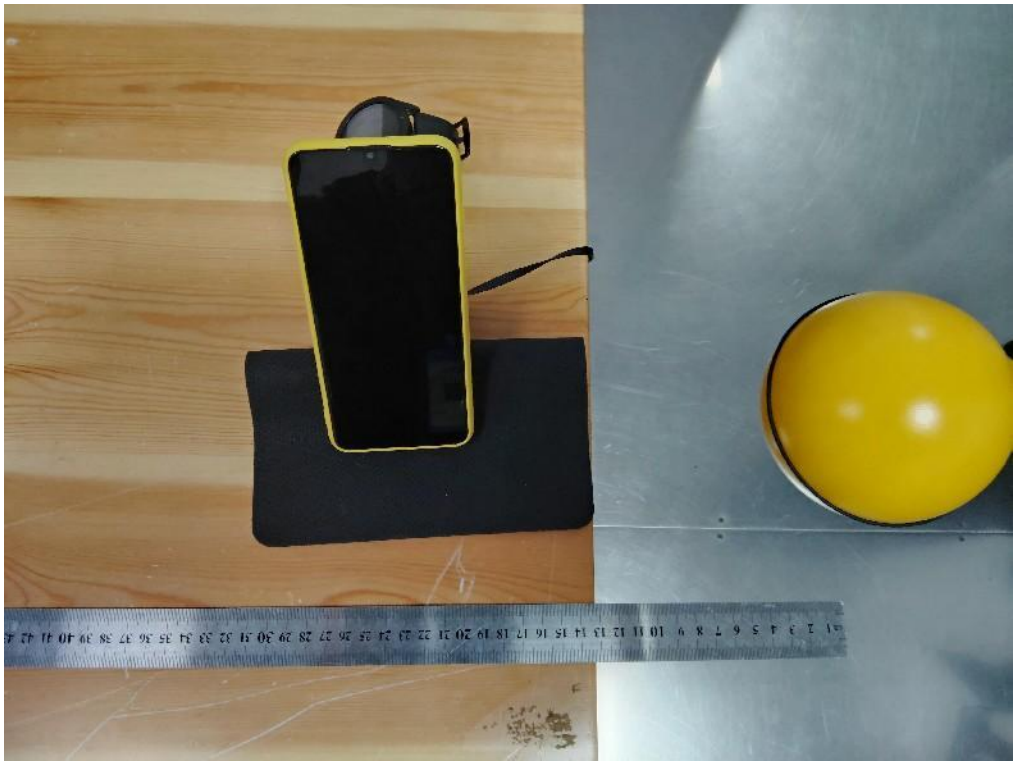
TM1~TM3

Charging Battery Level	Unit	Measured H-Field Strength Values (A/m)	FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
		Test Position E		
1%	uT	0.110	--	--
1%	A/m	0.096	0.815	1.63
50%	uT	0.091	--	--
50%	A/m	0.084	0.815	1.63
99%	uT	0.076	--	--
99%	A/m	0.067	0.815	1.63

Note:1A/m=1.25uT

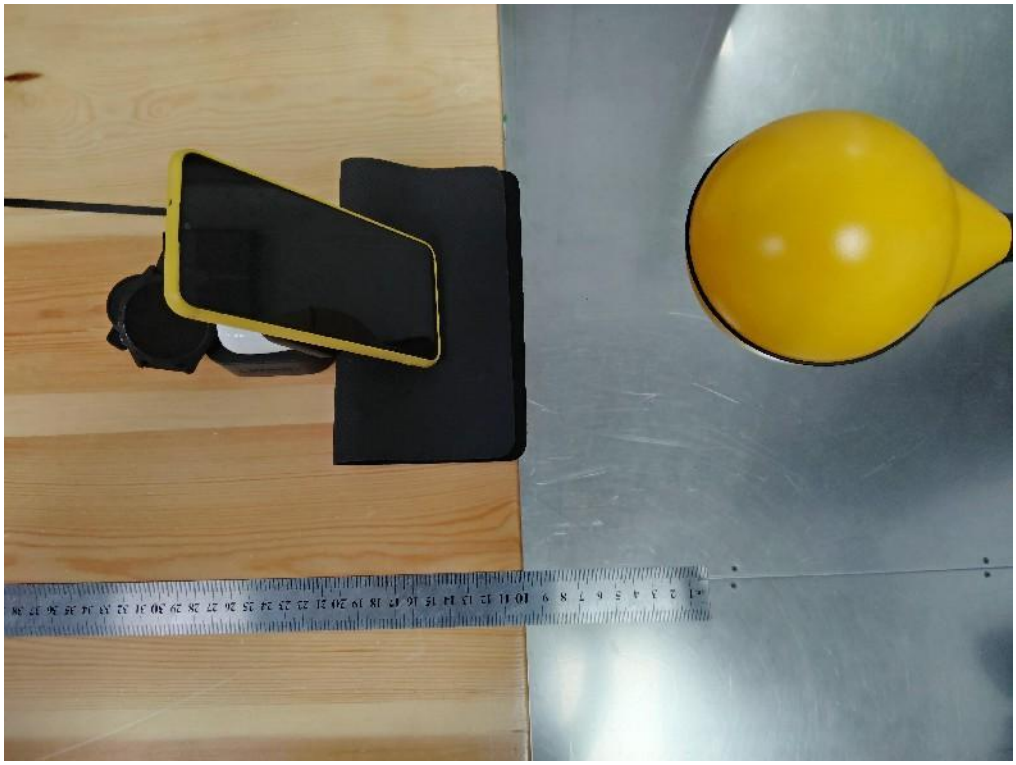
9. Test Setup Photos

Test Position A - Exposure photo from side edge surface-Rear



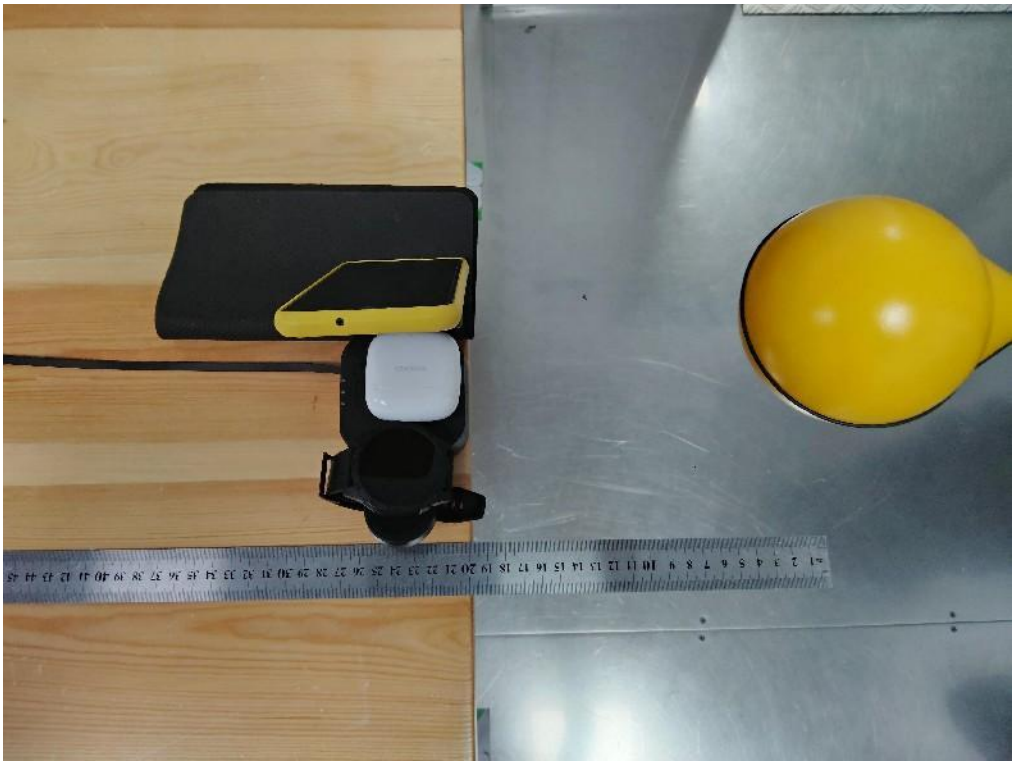
(TM1)

Test Position B - Exposure photo from side edge surface-Left



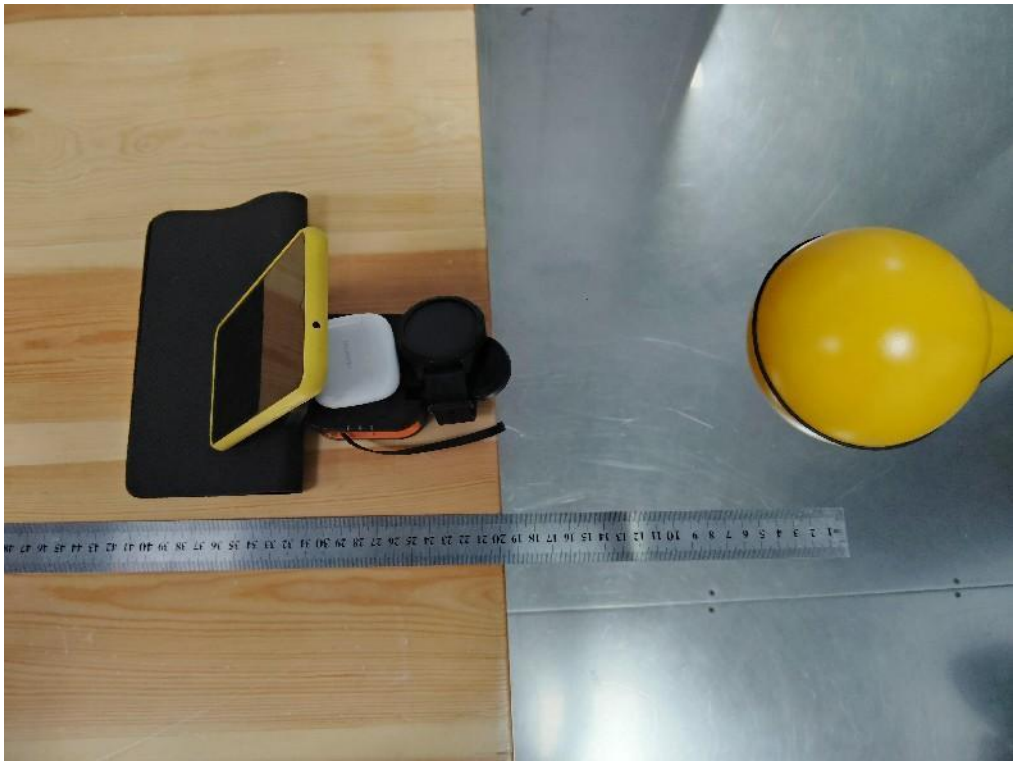
(TM1)

Test Position C - Exposure photo from side edge surface-Front



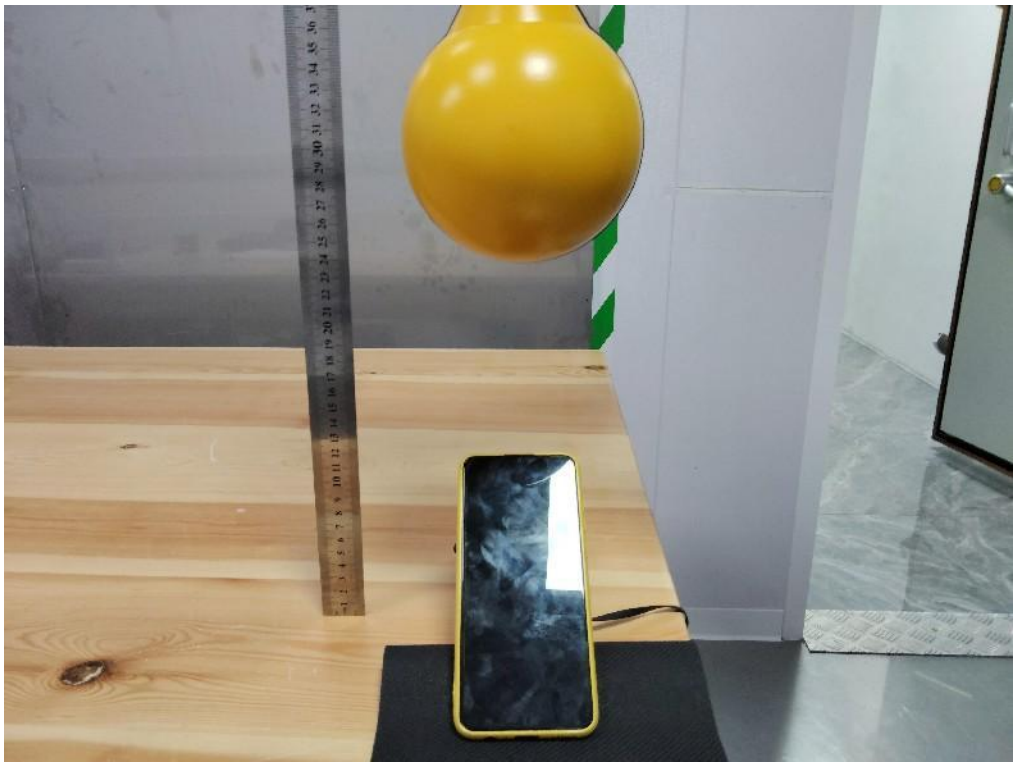
(TM1)

Test Position D - Exposure photo from side edge surface-Right



(TM1)

Test Position E- Exposure photo from top surface (20cm)



(TM1)

------End of the report------