RF Exposure Evaluation

FCC ID: 2AT2E-KT-IW

1. Client Information

Applicant	:	Dongguan Kington Electronic Technology Co.,Ltd.
Address	:	3/F, Building B, Abao Industrial Park No.160 LuYuan Road TangXia Town, DongGuan China
Manufacturer	:	Dongguan Kington Electronic Technology Co.,Ltd.
Address	:	3/F, Building B, Abao Industrial Park No.160 LuYuan Road TangXia Town, DongGuan China

2. General Description of EUT

EUT Name	:	3 in 1 wireless charger	
Model(s)	:	KT-IW	
Sample ID	:	202203-0228_01-01	
Product Description	:	Operation Frequency:	Watch:300-350KHz Phone:110-205KHz
		Modulation Type:	ASK
		Antenna:	Coil Antenna 1(Phone/Earphone) Coil Antenna 2 (Phone) Coil Antenna 3 (Watch)
Power Supply	:	TYPE-C Input: DC 5V/3.1A 9V/2A USB Output: DC 5V 1.5A (Max) Phone: Wireless Charging: 10W(Max) Watch: Wireless Charging: 2.5W(Max)	
Software Version	:	-----	
Hardware Version	:	KT-10W2TX-APPLETX_V1.2	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Accessories	:	HUAWEI Mate 40Pro and Apple Watch	

Note: More test information about the EUT please refer the RF Test Report.

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RF Exposure Considerations

1. Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging App v03.

2. Requirements

According to the item 5.2 of KDB 680106 D01v03:
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 1 MHz.

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

(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.

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

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

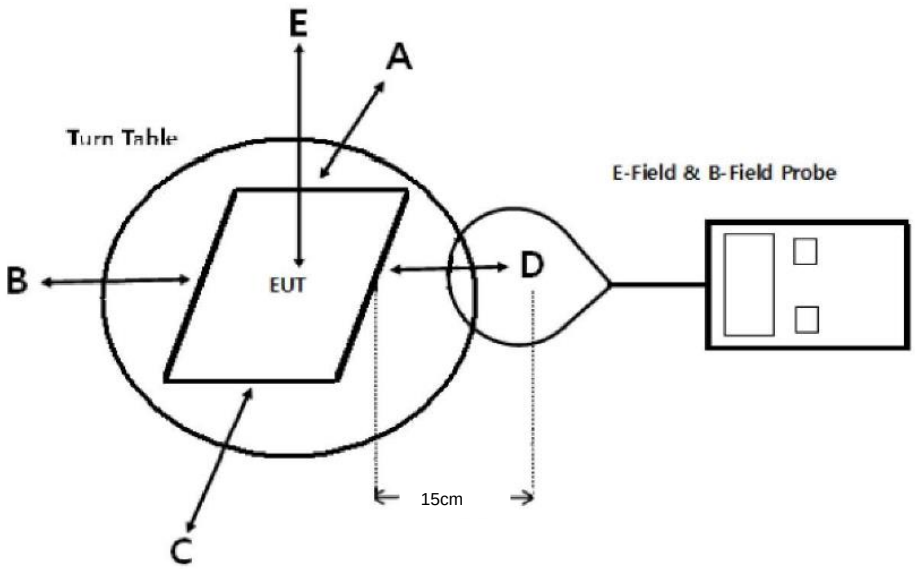
(6) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

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: The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface.

4.Test Procedure

1) The RF exposure test was performed in anechoic chamber.
2) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface.
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 v03.

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 item 5.2 of KDB 680106 D01v03 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 110.0 KHz - 205 KHz and 300KHz -350KHz
Output power from each primary coil is less than 15 watts	Yes	The maximum output power of the primary coil is 10W.
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 includes only single primary and secondary coils. Charging systems have three primary coils and clients that are able to detect and allow coupling only between individual pairs of coilsand the coil pairs powered on at the same time.
Client device is placed directly in contact with the transmitter.	Yes	Client device is placed directly in contact with the transmitter.
Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes	Mobile exposure conditions and mobile exposure conditions
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	The EUT 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.

In all other cases, unless excluded above, an RF exposure evaluation report must be reviewed and accepted through a KDB or PBA inquiry to enable authorization of the equipment. When evaluation is required to show compliance; for example, using field strength, power density, SAR measurements or computational modeling etc., the specific authorization requirements will be determined based on the results of the RF exposure evaluation

6. Test Equipment List

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Magnetic field meter	NARDA	ELT-400	EE030	Sep. 10, 2021	Sep. 09, 2022

7. Deviation From Test Standard

No deviation

8. Mode of operation during the test / Test peripherals used

Test Modes:		
TM1	AC/DC Adapter + EUT + Phone+ Earphone + Watch (Battery Status: <1%)	record
TM2	AC/DC Adapter + EUT + Phone+ Earphone + Watch (Battery Status: <50%)	record
TM3	AC/DC Adapter + EUT + Phone + Earphone + Watch (Battery Status: <99%)	record

9. Test Result

Phone& Watch：

H-Filed Strength at 15 cm from the edges surrounding the EUT and 15 cm above the top surface

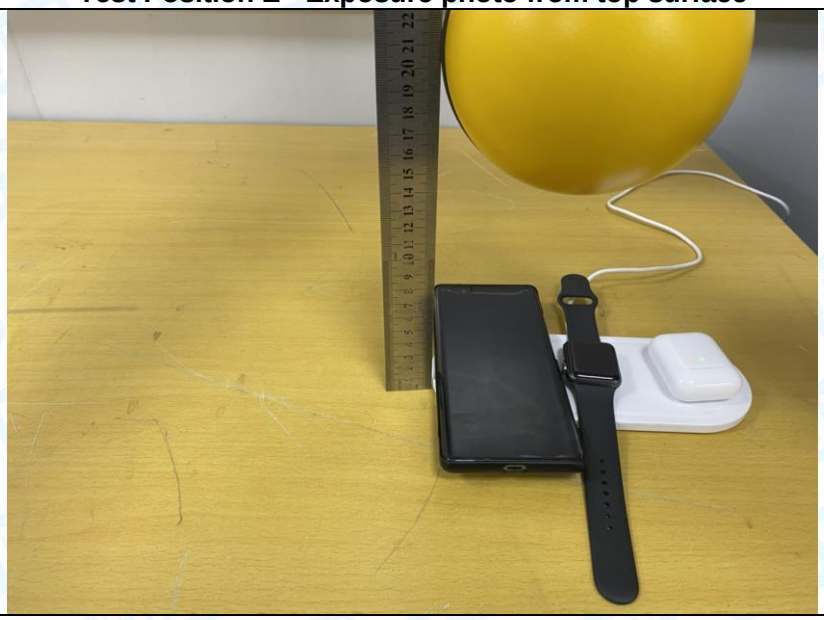
Note	Charging Battery Level	unit	Measured H-Field Strength Values (A/m)					H-Field Strength 50% Limits (A/m)	H-Field Strength Limits (A/m)
			Test Position						
			A	B	C	D	E		
Earphone (ANT1)	1%	uT	0.141	0.164	0.189	0.143	0.164	0.815	1.63
Phone (ANT2)	1%	uT	0.143	0.165	0.189	0.139	0.156	0.815	1.63
Watch (ANT3)	1%	uT	0.134	0.139	0.178	0.128	0.153	0.815	1.63
Earphone (ANT1)	1%	A/m	0.113	0.131	0.151	0.114	0.131	0.815	1.63
Phone (ANT2)	1%	A/m	0.114	0.132	0.151	0.111	0.125	0.815	1.63
Watch (ANT3)	1%	A/m	0.107	0.111	0.142	0.102	0.122	0.815	1.63
SUM	1%	A/m	/	/	/	/	0.378	0.815	1.63
Earphone (ANT1)	50%	uT	0.128	0.131	0.176	0.126	0.151	0.815	1.63
Phone (ANT2)	50%	uT	0.132	0.114	0.131	0.122	0.115	0.815	1.63
Watch (ANT3)	50%	uT	0.126	0.128	0.178	0.128	0.164	0.815	1.63
Earphone (ANT1)	50%	A/m	0.102	0.105	0.141	0.101	0.121	0.815	1.63
Phone (ANT2)	50%	A/m	0.201	0.166	0.145	0.120	0.145	0.815	1.63
Watch (ANT3)	50%	A/m	0.101	0.102	0.142	0.102	0.131	0.815	1.63
SUM	50%	A/m	/	/	/	/	0.397	0.815	1.63
Earphone (ANT1)	99%	uT	0.128	0.129	0.176	0.129	0.165	0.815	1.63
Phone (ANT2)	99%	uT	0.131	0.130	0.178	0.130	0.159	0.815	1.63
Watch (ANT3)	99%	uT	0.130	0.128	0.165	0.128	0.156	0.815	1.63
Earphone (ANT1)	99%	A/m	0.102	0.103	0.141	0.103	0.132	0.815	1.63
Phone (ANT2)	99%	A/m	0.105	0.104	0.142	0.104	0.127	0.815	1.63
Watch (ANT3)	99%	A/m	0.104	0.102	0.132	0.102	0.125	0.815	1.63
SUM	99%	A/m	/	/	/	/	0.384	0.815	1.63

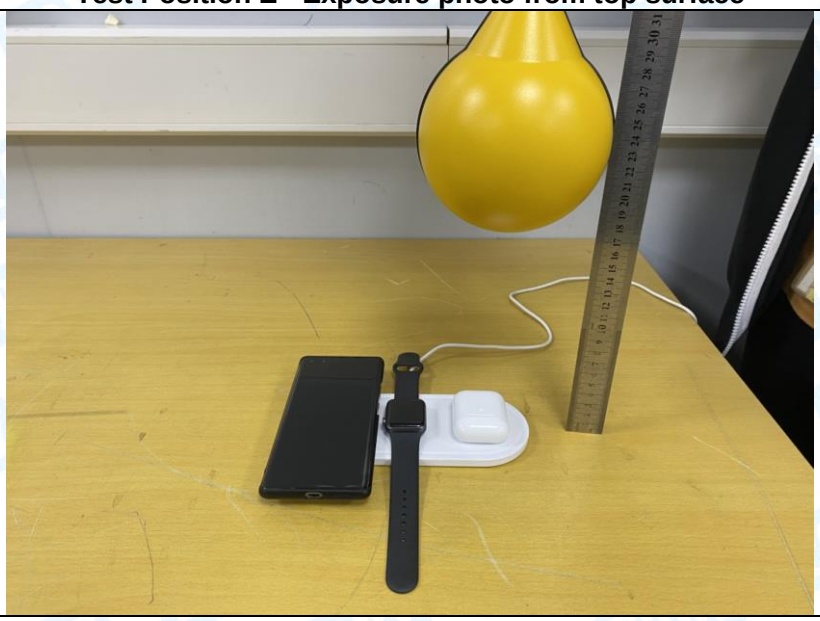
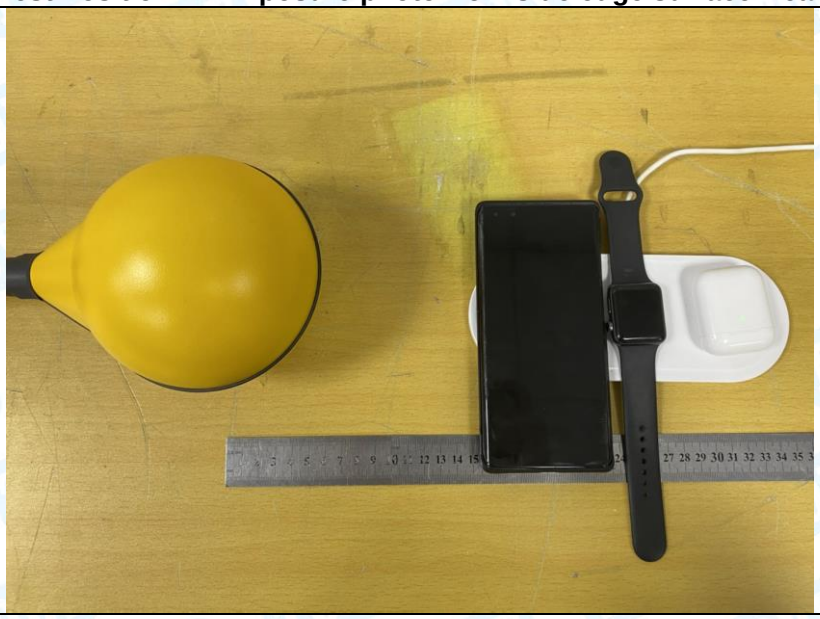
H-Field Strength at 20cm from the top surface of the EUT

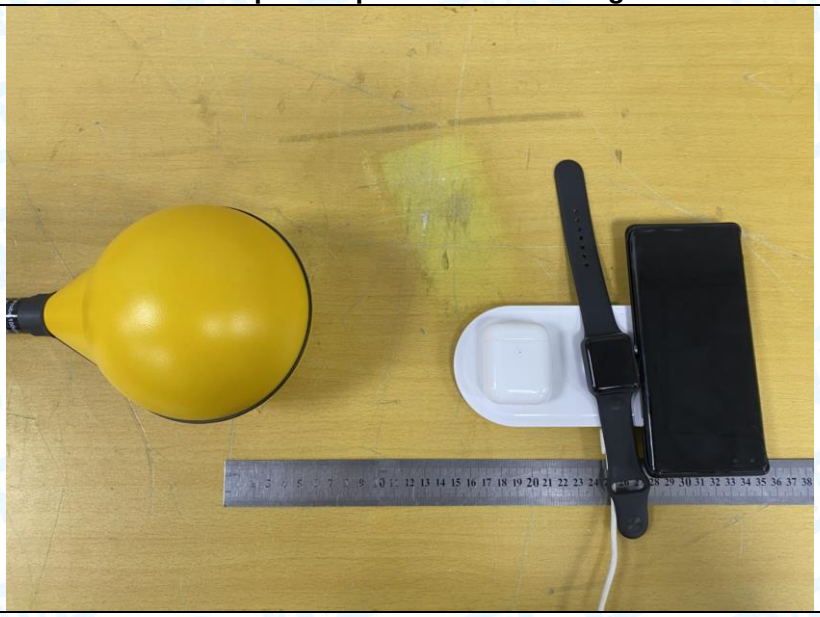
Note	Charging Battery Level	Unit	Measured H-Field Strength Values (A/m)	FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
			Test Position E		
Earphone (ANT1)	1%	uT	0.178	0.815	1.63
Phone (ANT2)	1%	uT	0.179	0.815	1.63
Watch (ANT3)	1%	uT	0.135	0.815	1.63
Earphone (ANT1)	1%	A/m	0.142	0.815	1.63
Phone (ANT2)	1%	A/m	0.134	0.815	1.63
Watch (ANT3)	1%	A/m	0.108	0.815	1.63
SUM	1%	A/m	0.394	0.815	1.63
Earphone (ANT1)	50%	uT	0.176	0.815	1.63
Phone (ANT2)	50%	uT	0.133	0.815	1.63
Watch (ANT3)	50%	uT	0.095	0.815	1.63
Earphone (ANT1)	50%	A/m	0.141	0.815	1.63
Phone (ANT2)	50%	A/m	0.106	0.815	1.63
Watch (ANT3)	50%	A/m	0.076	0.815	1.63
SUM	50%	A/m	0.323	0.815	1.63
Earphone (ANT1)	99%	uT	0.165	0.815	1.63
Phone (ANT2)	99%	uT	0.128	0.815	1.63
Watch (ANT3)	99%	uT	0.093	0.815	1.63
Earphone (ANT1)	99%	A/m	0.132	0.815	1.63
Phone (ANT2)	99%	A/m	0.102	0.815	1.63
Watch (ANT3)	99%	A/m	0.074	0.815	1.63
SUM	99%	A/m	0.308	0.815	1.63

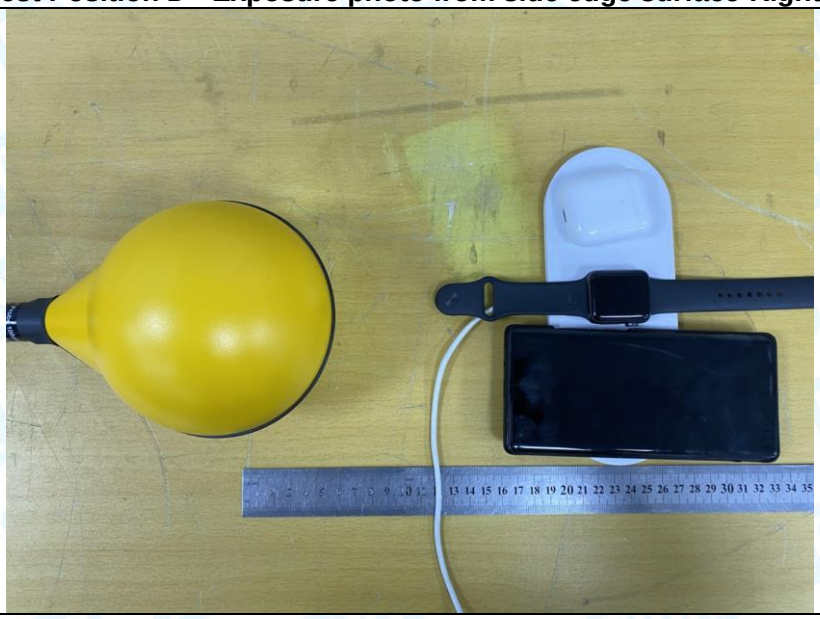
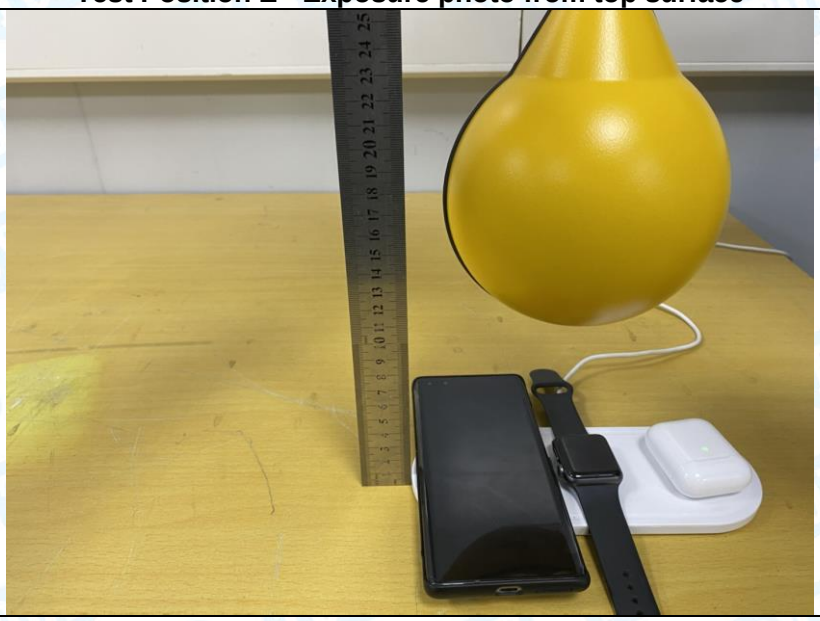
Note: A/m=uT/1.25

10. Test Set-up Photo

H-Field Strength-20cm (Watch Ant3)
Test Position E - Exposure photo from top surface
H-Field Strength-20cm (Phone Ant2)
Test Position E - Exposure photo from top surface


H-Field Strength-20cm (Earphone Ant1)
Test Position E - Exposure photo from top surface

H-Field Strength-15cm
Test Position A - Exposure photo from side edge surface-Rear


H-Field Strength-15cm
Test Position B - Exposure photo from side edge surface-Left
H-Field Strength-15cm
Test Position C - Exposure photo from side edge surface-Front


H-Field Strength-15cm
Test Position D - Exposure photo from side edge surface-Right

H-Field Strength- 15 cm (Watch Ant3)
Test Position E - Exposure photo from top surface


H-Field Strength- 15 cm (Phone Ant2)
Test Position E - Exposure photo from top surface
H-Field Strength- 15 cm (Earphone Ant1)
Test Position E - Exposure photo from top surface

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