

EUT Specification

FCC ID: 2BEMX-0001

Characteristics	Description
Product Name	3-IN-1 MAGNETIC WIRELESS CHARGER
Model number	2IHQI1006-BLK-BL
Power Supply	AC120V/60Hz for adapter
Operating Frequency Range	110-205KHz for iphone 327.84KHz for Apple Watch 116.39KHz for Earbuds
Modulation Technique	FSK for iphone charging ASK for Apple Watch charging ASK for Earbuds charging
Antenna Type	Induction coil
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Applicable Standard:

FCC Part 1(1.1310) ,Part 2(2.1093) and KDB 680106 D01 RF Exposure
Wireless Charging Apps v04

Applicable Requirement:

Three different categories of transmitters are defined by the FCC in OET Bulletin 65.

These categories are fixed installation, mobile, and portable and are defined as follows:

Fixed Installations: fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.

Mobile Devices: a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR §2.1091.

Portable Devices: a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR§2.1093).

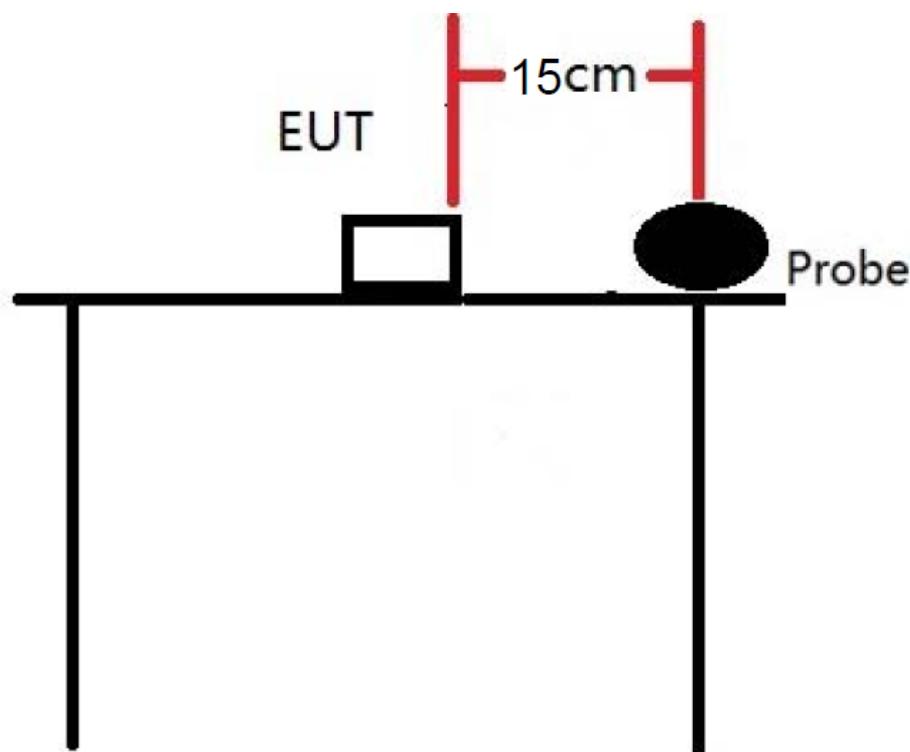
The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/ Controlled Exposure and General Population/Uncontrolled Exposure.

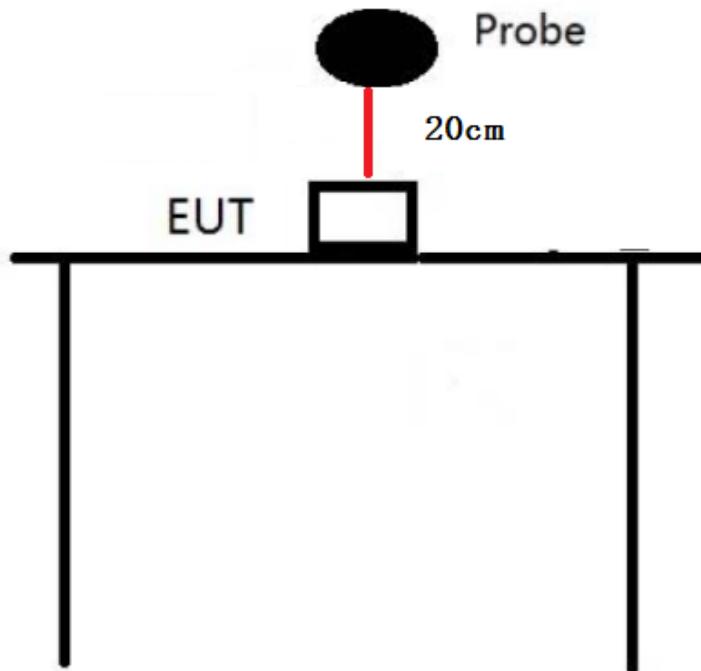
These two categories are defined as follows:

Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. The phrase **fully aware** in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of transient persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. Such training is not required for transient persons, but they must receive written and/or verbal information and notification (for example, using signs) concerning their exposure potential and appropriate means available to mitigate their exposure. The phrase **exercise control** means that an exposed

person is allowed to and knows how to reduce or avoid exposure by administrative or engineering controls and work practices, such as use of personal protective equipment or time averaging of exposure. General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. Licensees and applicants are responsible for compliance with both the occupational/controlled exposure limits and the general population/uncontrolled exposure limits as they apply to transmitters under their jurisdiction. Licensees and applicants should be aware that the occupational/controlled exposure limits apply especially in situations where workers may have access to areas in very close proximity to antennas and access to the general public may be restricted. In lieu of evaluation with the general population/uncontrolled exposure limits, amateur licensees authorized under part 97 of this chapter and members of his or her immediate household may be evaluated with respect to the occupational/controlled exposure limits in this section, provided appropriate training and information has been provided to the amateur licensee and members of his/her household. Other nearby persons who are not members of the amateur licensee's household must be evaluated with respect to the general population/uncontrolled exposure limits.

Test Setup Block





Test Procedure

1. Connect the EUT and equipment as above diagram of test configuration.
2. EUT was placed on a table, and the measure probe was placed at a measurement distance of 20cm from the EUT to the center of the probe.
3. Power on the measuring probe, the EUT was set at the maximum field strength emission state.
4. The EUT was put in different directions (Left, Right, Front, Rear, Top and Bottom) toward to the measure probe, the distance 20cm, 22cm and 24cm need to be tested. Measure the value of field strength.
5. Record the worst data of the different directions.

Measuring Device And Test Equipment

Used	Equipment	Manufacturer	Model No.	Serial No.	Next Cal.	Cal. Interval
<input checked="" type="checkbox"/>	E&H-Field Probe(9kHz-30MHz)	Narda	EHP-200A	180ZX11012	Sep. 21, 2024	1 Year

Description of Support Device

iPhone	: Manufacturer: Apple Inc. M/N: A2404 S/N: N/A
Adapter	: Model number:CD217 Input: AC 100-240V, 50/60Hz Output: DC 5V/3A,DC 9/3A,DC 12V/2.5A
Airpods	: Manufacturer: Apple Inc. M/N: A2190 S/N: N/A
Apple Watch	: Manufacturer: Apple Inc. M/N: A1859 S/N: N/A

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	F/1500	30
1500-100000	--	--	1	30

Note: f denotes for frequency in MHz.

* denotes for plane-wave equivalent power density.

Measurement Result

(1) The power transfer frequency is below 1 MHz.

Yes, the working frequency is: 110-205KHz for iPhone, 327.84KHz for Apple Watch, 116.39KHz for Earbuds.

(2) The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.

Yes, the maximum output power is 15 watts.

(3) 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, the maximum permitted load is placed in physical contact with the transmitter.

(4) Only § 2.1091-*Mobile* exposure conditions apply (i.e., this provision does not cover § 2.1093-*Portable* exposure conditions).

Yes, this provision does not cover § 2.1093-*Portable* exposure conditions.

(5) 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, 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; coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.

(6) For systems with more than one radiating structure, the conditions specified in (5) must be met when the 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.

Yes, For systems with more than one radiating structure, the conditions specified in (5) must be met when the 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.

We pretested four modes (max load, mid load, Standby) for EUT. The worst mode (max load) and worst test frequency(frequency: 128.19KHz for iphone, 327.84KHz for Apple Watch, 116.39KHz for Earbuds) test data see the following.

The EUT was put in different directions (Left, Right, Front, Rear, Top and Bottom) toward to the measure probe, the distance 20cm, 22cm and 24cm were tested, only the worst case results (20cm) were recorded in this report.

Test mode: Wireless Charging for iphone:

Test Mode: Wireless Charging 15w for 100% battery					
		Measuring Distance(cm)	H- Field(A/m)	Limit(A/m)	50% Limit(A/m)
Measurement Point 1	Front	15	0.395	1.63	0.815
Measurement Point 2	Back	15	0.379		
Measurement Point 3	Left	15	0.374		
Measurement Point 4	Right	15	0.372		
Measurement Point 5	Bottom	15	0.356		
Measurement Point 6	Top	20	0.391		

Test Mode: Wireless Charging 15w for 100% battery					
		Measuring Distance(cm)	E- Field(V/m)	Limit(V/m)	50% Limit(V/m)
Measurement Point 1	Front	15	3.426	614	307
Measurement Point 2	Back	15	3.325		
Measurement Point 3	Left	15	3.238		
Measurement Point 4	Right	15	3.371		
Measurement Point 5	Bottom	15	3.208		
Measurement Point 6	Top	20	3.416		

Test mode: Wireless Charging for Apple Watch :

Test Mode: Wireless Charging 2.5w for 100% battery					
		Measuring Distance(cm)	H- Field(A/m)	Limit(A/m)	50% Limit(A/m)
Measurement Point 1	Front	20	0.347	1.63	0.815
Measurement Point 2	Back	20	0.349		
Measurement Point 3	Left	20	0.342		
Measurement Point 4	Right	20	0.365		
Measurement Point 5	Bottom	20	0.340		
Measurement Point 6	Top	20	0.364		

Test Mode: Wireless Charging 2.5w for 100% battery					
		Measuring Distance(cm)	E- Field(V/m)	Limit(V/m)	50% Limit(V/m)
Measurement Point 1	Front	20	3.464	614	307
Measurement Point 2	Back	20	3.437		
Measurement Point 3	Left	20	3.369		
Measurement Point 4	Right	20	3.373		
Measurement Point 5	Bottom	20	3.236		
Measurement Point 6	Top	20	3.402		

Test mode: Wireless Charging for Airpods

Test Mode: Wireless Charging 5w for 100% battery					
		Measuring Distance(cm)	H- Field(A/m)	Limit(A/m)	50% Limit(A/m)
Measurement Point 1	Front	20	0.344	1.63	0.815
Measurement Point 2	Back	20	0.341		
Measurement Point 3	Left	20	0.348		
Measurement Point 4	Right	20	0.337		
Measurement Point 5	Bottom	20	0.325		
Measurement Point 6	Top	20	0.349		

Test Mode: Wireless Charging 5w for 100% battery					
		Measuring Distance(cm)	E- Field(V/m)	Limit(V/m)	50% Limit(V/m)
Measurement Point 1	Front	20	3.469	614	307
Measurement Point 2	Back	20	3.471		
Measurement Point 3	Left	20	3.337		
Measurement Point 4	Right	20	3.261		
Measurement Point 5	Bottom	20	3.149		
Measurement Point 6	Top	20	3.445		

Test mode : Wireless Charging for iphone+Apple Watch+Airpods

Test Mode: iphone 15W+ Apple Watch 2.5W+Airpods 5W for 100% battery					
		Measuring Distance(cm)	H- Field(A/m)	Limit(A/m)	50% Limit(A/m)
Measurement Point 1	Front	20	0.391	1.63	0.815
Measurement Point 2	Back	20	0.387		
Measurement Point 3	Left	20	0.382		
Measurement Point 4	Right	20	0.387		
Measurement Point 5	Bottom	20	0.358		
Measurement Point 6	Top	20	0.395		

Test Mode: iphone 15W+ Apple Watch 2.5W+Airpods 5W for 100% battery					
		Measuring Distance(cm)	E- Field(V/m)	Limit(V/m)	50% Limit(V/m)
Measurement Point 1	Front	20	3.547	614	307
Measurement Point 2	Back	20	3.551		
Measurement Point 3	Left	20	3.549		
Measurement Point 4	Right	20	3.548		
Measurement Point 5	Bottom	20	3.256		
Measurement Point 6	Top	20	3.654		

PHOTOGRAPHS OF TEST SETUP



Signature

Tiger Xu
EMC Director
Date: 2024-03-24