

# RF Exposure evaluation

FCC ID	2BR7N-QH-AKD111
Product Name	car mount, wireless car charger
Model No.	QH-AKD111, Magnus, Magnus-QI
Listed Model(s)	N/A
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 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radio frequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radio frequency radiation exposure evaluation: mobile devices

[FCC KDB publication 680106 D01 RF Exposure Wireless Charging Apps v04](#): RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

## 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 <sup>2</sup> )	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 <sup>2</sup> )*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500–100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

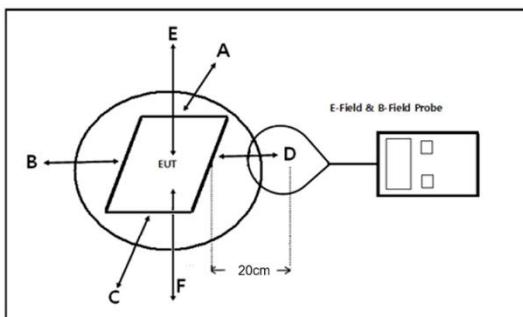
Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz, \*=Plane-wave equivalent power density

Per the guidance of KDB 680106, the E-field and H-field limits shown in the table above are extended down to 100kHz

### 3. RF Exposure evaluation for WPT

#### 3.1. Test Setup Diagram



#### 3.2. Test Equipment

Equipment	Manufacturer	Model	Serial no.	Calibrated date	Calibrated Due
Exposure Level Tester	Narda	ELT-400	N-0713	2025-1-07	2026-1-06
B-Field Probe	Narda	ELT-400	M-1154	2025-1-07	2026-1-06

#### 3.3. Support equipment List

Manufacturer	Description	Model	Serial Number
Guangdong Sangu Technology Co. Ltd	Adpater	SG-0501000AU	--
Shenzhen EESON Electronics Co., Ltd.	RX Full - function Test Module 3rd Generation	EESON-RX-3	--

#### 3.4. Measurement Procedure

- 1) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- 2) The measurement probe was placed at test distance (20cm) which is between the edges of the charger and the geometric center of probe.
- 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 (A, B, C, D, E) were completed.
- 5) The EUT were measured according to the dictates of KDB 680106D01v04.

### 3.5. Equipment Approval Considerations

Requirements of KDB 680106 D01	Yes / No	Description
Power transfer frequency is less than 1 MHz	Yes	The device operate in the frequency range 111kHz - 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 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	EUT has only one coil

### 3.6. Result

Test Modes	
Mode 1	AC/DC Adapter + EUT(5W) + phone(Battery Status: <1%)
Mode 2	AC/DC Adapter + EUT(5W) + phone(Battery Status: <50%)
Mode 3	AC/DC Adapter + EUT(5W) + phone(Battery Status: <99%)
Mode 4	AC/DC Adapter + EUT(7.5W) + phone(Battery Status: <1%)
Mode 5	AC/DC Adapter + EUT(7.5W) + phone(Battery Status: <50%)
Mode 6	AC/DC Adapter + EUT(7.5W) + phone(Battery Status: <99%)
Mode 7	AC/DC Adapter + EUT(10W) + phone(Battery Status: <1%)
Mode 8	AC/DC Adapter + EUT(10W) + phone(Battery Status: <50%)
Mode 9	AC/DC Adapter + EUT(10W) + phone(Battery Status: <99%)
Mode 10	AC/DC Adapter + EUT(15W) + phone(Battery Status: <1%)
Mode 11	AC/DC Adapter + EUT(15W) + phone(Battery Status: <50%)
Mode 12	AC/DC Adapter + EUT(15W) + phone(Battery Status: <99%)
Note: All test modes were pre-tested, but we only recorded the worst case in this report.	

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

Test mode	Field Strength	Measurement data / Test Position					50% Limits	Result
		A	B	C	D	E		
10	uT	0.125	0.134	0.145	0.133	0.132	-	-
	H Field Strength (A/m)	0.103	0.112	0.113	0.110	0.107	0.815	Pass
	E Field Strength (V/m)	38.253	41.358	41.826	40.426	40.489	307.0	Pass
11	uT	0.124	0.135	0.143	0.131	0.132	-	-
	H Field Strength (A/m)	0.100	0.110	0.112	0.105	0.106	0.815	Pass
	E Field Strength (V/m)	37.238	40.516	41.325	37.238	40.516	307.0	Pass
12	uT	0.124	0.135	0.143	0.131	0.132	-	-
	H Field Strength (A/m)	0.100	0.110	0.112	0.105	0.106	0.815	Pass
	E Field Strength (V/m)	37.238	40.516	41.289	37.238	40.516	307.0	Pass

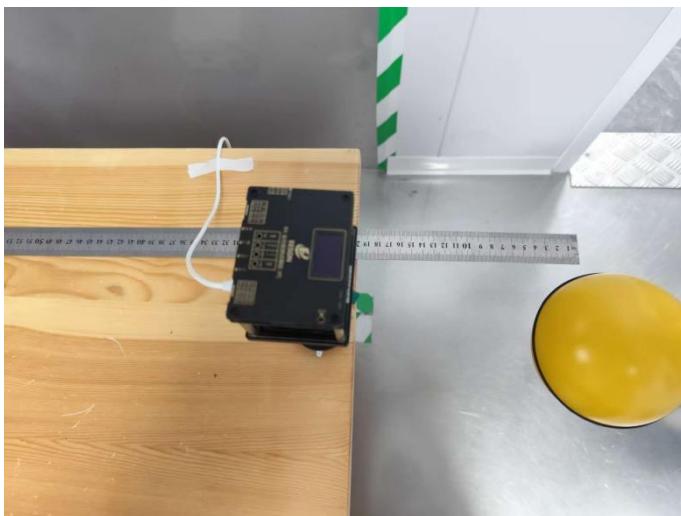
Note:

1A/m=1.25uT, 1V/m=0.00334uT

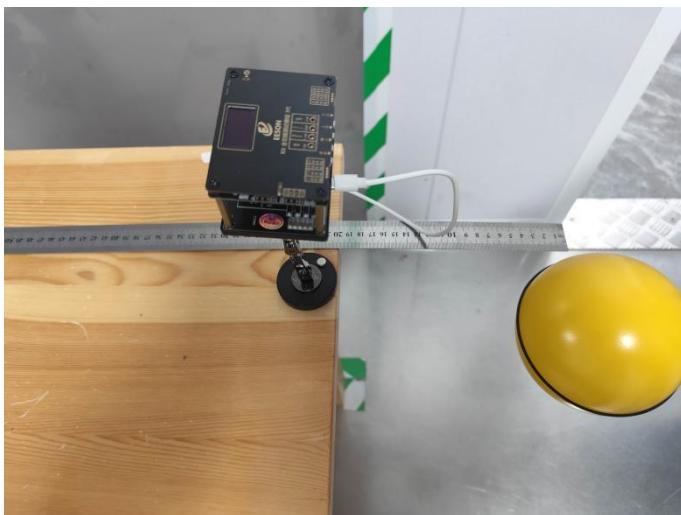
H-Field Strength at 20 cm from the edges surrounding the EUT and 20cm from the top surface of the EUT

### 3.7. Test Setup Photos

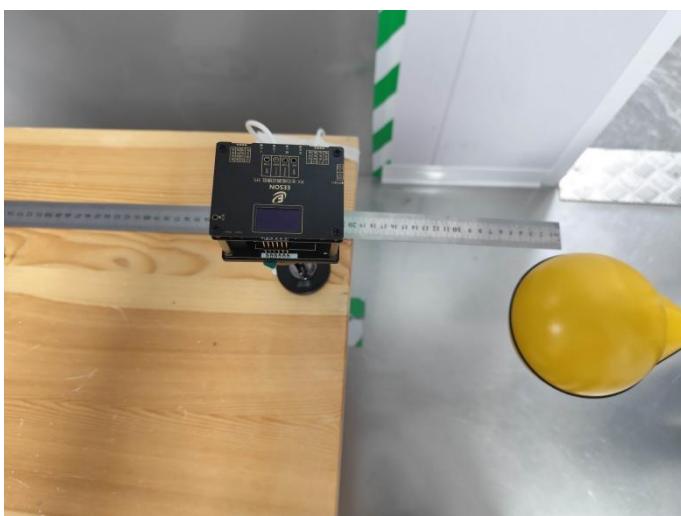
**Test Position A - Exposure photo from side edge surface-Rear (20cm)**



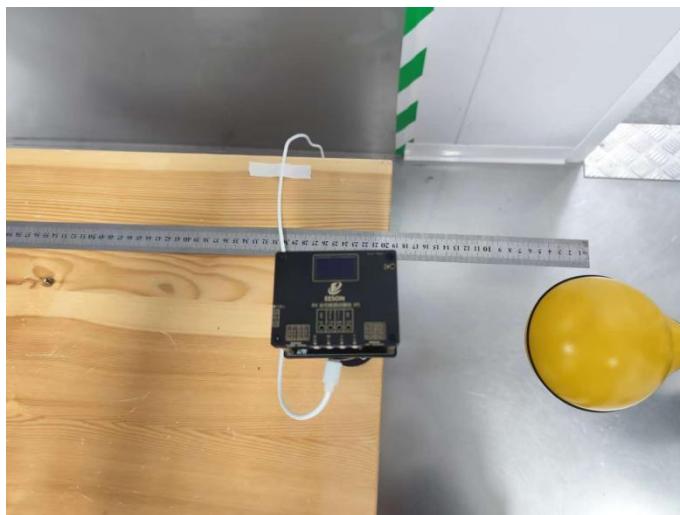
**Test Position B - Exposure photo from side edge surface-Left (20cm)**



**Test Position C - Exposure photo from side edge surface-Front (20cm)**



**Test Position D - Exposure photo from side edge surface-Right (20cm)**



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



#### 4. RF Exposure evaluation for simultaneous transmission

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated<sub>k</sub> term) should be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from §1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^a \frac{P_i}{P_{\text{th},i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{\text{th},j}} + \sum_{k=1}^c \frac{\text{Evaluated}_k}{\text{Exposure Limit}_k} \leq 1$$

Type	E Field Strength (V/m)	Limit (V/m)	E Field Strength / Limit	Limit	Result
WPT	41.826	307	0.136	1.0	Pass

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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