



RF exposure evaluation

1. Introduction

Model : MW-02

Product Type : TURBOPOWER 50W WIRELESS CHARGING STAND

Brand name : MOTO

Applicant : Motorola Mobility LLC

Address : 222 W. Merchandise Mart Plaza, Chicago Illinois 60654 USA

Manufacturer : Motorola Mobility LLC

Address : 222 W. Merchandise Mart Plaza, Chicago Illinois 60654 USA

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 and KDB 680106 D01 v03r01 of the FCC Rules and Regulations.



2. Product information

Product:	TURBOPOWER 50W WIRELESS CHARGING STAND
Model no.:	MW-02
FCC ID:	IHDT6AA2
Rating:	5-20Vdc 3.5A Max supplied by an external adapter
RF Transmission Frequency:	111-145KHz
Max magnetic field strength distance 3m:	102.06dBuV/m
Antenna Type:	Litz Wire Coil
Antenna gain:	0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a wireless charger which operated at 111-145KHz.

3. Limit and Guidelines on RF Exposure

(1) According to KDB 680106 D01 v03r01 3(c) For devices designed for typical desktop applications, such as wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. Below 100 kHz, applicable reference levels for maximum instantaneous exposure field strengths are defined in clause 3.a).

(2) According to §1.1310 system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

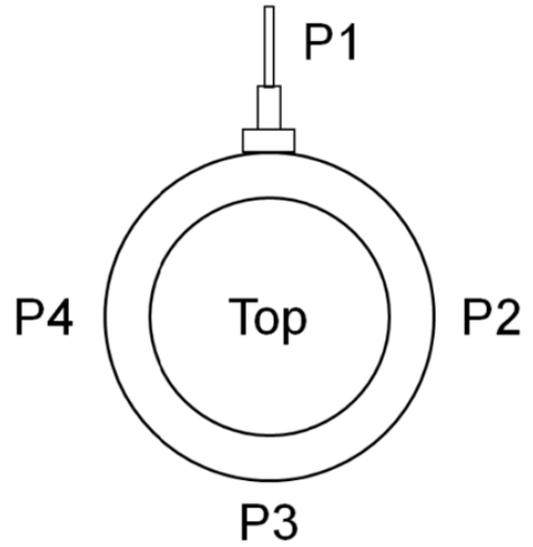
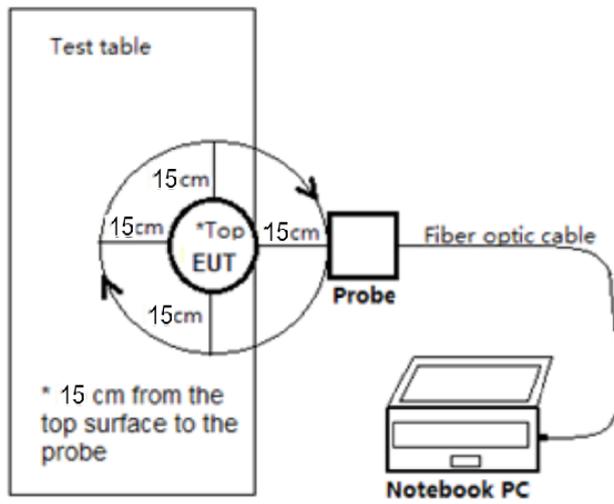
TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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 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
(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
300-1,500			f/1500	<30
1,500-100,000			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.

4. Test setup



5. Measurement procedure

- a) The RF exposure test was performed on the table in anechoic chamber.
 - b) The measurement was investigated between the edge of the charger and center of the field probe in the closest state.
 - c) Maximum E-field and H-field measurements were made on each of five sides of the EUT that could come in contact with a user. Five sides are defined as follows: Right (P2), Top, Left (P4), Rear (P1) and Front (P3). Refer to the test position diagram above.
 - d) According to the guidance of KDB 680106 D01 v03r01 test distance was 15 cm on the surrounding sides from the EUT.
 - e) Equipment approval considerations item 5.b) of KDB 680106 D01 v03r01
 - (1) Power transfer frequency is less than 1 MHz
 - Yes, The device operates at a frequency of 111 KHz to 145 KHz.
 - (2) Output power from each primary coil is less than or equal to 15 watts.
 - No; the maximum output power of the primary coil is 50 W. so we have Submitted an Inquiry to FCC official (KDB Inquiry Number 476529).
 - (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.
 - Yes, only one source primary coils is working when charging.
 - (4) Client device is placed directly in contact with the transmitter.
 - Yes
 - (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
 - Yes, Mobile exposure conditions only
 - (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.
 - Refer to following worst test result (For more detail, please refer to section 7)
- 1) The worst E-Field Strength levels at 15 cm < 50 % of the MPE E-Field Strength limit 614 V/m
Quickly charging test mode: 1.6931V/m < 307 V/m
 - 2) The worst H-Field Strength levels at 15 cm < 50 % of the MPE H-Field Strength limit 1.63 A/m
Quickly charging test mode 0.3649A/m < 0.815 A/m
 - 3) The top surface E-Field Strength levels at 20 cm < 50 % of the MPE E-Field Strength limit 614 V/m
Quickly charging test mode: 0.6871 V/m < 307 V/m
 - 4) The top surface H-Field Strength levels at 20 cm < 50 % of the MPE H-Field Strength limit 1.63 A/m
Quickly charging test mode 0.1120 A/m < 0.815 A/m



6. Test Laboratory and test Equipment List

Details about the Test Laboratory:

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2,
Nanshan District, Shenzhen City, 518052, P. R. China

FCC Registration No.: 514049

Telephone: 86 755 8828 6998
Fax: 86 755 828 5299

Equipment list

Description	Manufacturer	Model no.	Serial no.	Cal. due date
Electric and magnetic field probe Analyzer	Narda	EHP-200A	180ZX10218	2023-4-19

Measurement Uncertainty

Test Item	Uncertainty
Electric and magnetic field	7.8%

7. Test Result

15cm

Quickly Charging test mode Down Coil:

Electric Field Emissions					
Test Position	Test Distance (cm)	Measure Value (V/m)	Limit (V/m)	50% Limit (V/m)	Result
P1	15	0.9056	614	307	Pass
P2	15	0.8636	614	307	Pass
P3	15	0.9694	614	307	Pass
P4	15	0.8462	614	307	Pass
Top	15	0.9279	614	307	Pass
Magnetic Field Emissions					
Test Position	Test Distance (cm)	Measure Value (A/m)	Limit (A/m)	50% Limit (A/m)	Result
P1	15	0.1907	1.63	0.815	Pass
P2	15	0.1786	1.63	0.815	Pass
P3	15	0.3649	1.63	0.815	Pass
P4	15	0.1879	1.63	0.815	Pass
Top	15	0.1938	1.63	0.815	Pass

Quickly Charging test mode Top Coil:

Electric Field Emissions					
Test Position	Test Distance (cm)	Measure Value (V/m)	Limit (V/m)	50% Limit (V/m)	Result
P1	15	1.2882	614	307	Pass
P2	15	1.6931	614	307	Pass
P3	15	1.2700	614	307	Pass
P4	15	1.3147	614	307	Pass
Top	15	1.5513	614	307	Pass
Magnetic Field Emissions					
Test Position	Test Distance (cm)	Measure Value (A/m)	Limit (A/m)	50% Limit (A/m)	Result
P1	15	0.1421	1.63	0.815	Pass
P2	15	0.1506	1.63	0.815	Pass
P3	15	0.1908	1.63	0.815	Pass
P4	15	0.1832	1.63	0.815	Pass
Top	15	0.1593	1.63	0.815	Pass



20cm

Quickly Charging test mode Down Coil:

Electric Field Emissions					
Test Position	Test Distance (cm)	Measure Value (V/m)	Limit (V/m)	50% Limit (V/m)	Result
Top	20	0.6871	614	307	Pass
Magnetic Field Emissions					
Test Position	Test Distance (cm)	Measure Value (A/m)	Limit (A/m)	50% Limit (A/m)	Result
Top	20	0.1120	1.63	0.815	Pass

Quickly Charging test mode Top Coil:

Electric Field Emissions					
Test Position	Test Distance (cm)	Measure Value (V/m)	Limit (V/m)	50% Limit (V/m)	Result
Top	20	0.6490	614	307	Pass
Magnetic Field Emissions					
Test Position	Test Distance (cm)	Measure Value (A/m)	Limit (A/m)	50% Limit (A/m)	Result
Top	20	0.1064	1.63	0.815	Pass

The test result compliance with §1.1310 requirement.

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