

RF Exposure Evaluation

1 Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v04

2 Requirements

According to the item 5 of KDB 680106 D01v04:

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 1MHz.
- (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.

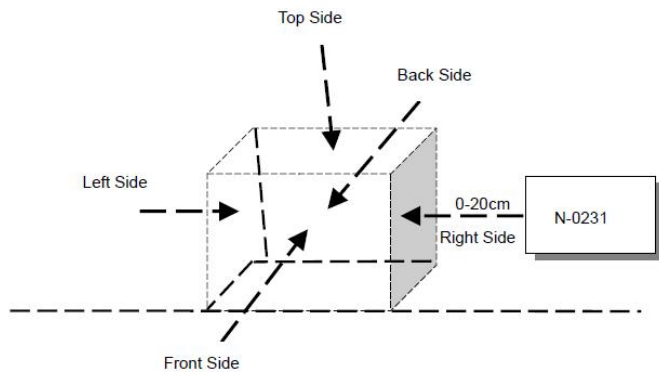
Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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



4 Test Procedure

- 1) The RF exposure test was performed in anechoic chamber.
- 2) Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm.
- 3) The highest emission level was recorded and compared with limit.
- 4) The EUT was measured according to the dictates of TCB Workshop
 “41-Part-18-&-Wireless-Power-Transfer - April 27, 2022”

5 Equipment Approval Considerations

The EUT does comply with KDB 680106 D01 as follow 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 110KHz~205KHz
Output power from each primary coil is less than 15 watts	Yes	The maximum output power for each primary coil is 15W.
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	The transfer system includes only one primary coils.
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).	No	portable exposure
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.	Yes	Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm

6 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

Test Modes:	
Mode 1	Wireless Output+phone 5W
Mode 2	Wireless Output+phone 7.5W
Mode 3	Wireless Output+phone 10W
Mode 4	Wireless Output+phone 15W
Note: All test modes were pre-tested, but we only recorded the worst case in this report.	

7 Description of Support Units

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
Adapter	/	GS-555	Input: 100-240V~, 50/60Hz, 0.6A Output:DC 5V 2A/9V 1.67A/12V 1.5A/2A	CE/FCC	EUT
Mobile phone	XIAOMI	Mi11	15W	CE/FCC	Auxiliary

8 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Exposure Level Tester	Narda	ELT-400	N-0231	2023/11/02	2024/11/01
Magnetic field probe 100cm ²	Narda	ELT probe 100cm ²	M0675	2023/11/02	2024/11/01

9 Test Result**For portable exposure condition:**

Note: operating modes with client device (1 %, 50%, 99% battery status of client device) have been test, only show the data of worst case of 1% battery status of client device.

H-field measurements taken every 2 cm (starting as close to 20 cm as possible) on each edge/top surface of the host/client pair were also evaluated for portable use conditions. The report reflects data for the worst 5 cm test distance mode only.

Test condition 1: Mode 4 operating mode with client device (1 % battery status of client device)

-test distance: 5cm

Maximum permissible Exposure						
Battery levels	Test sides	Test distance(cm)	field (V/m)	H-Field (A/m)	FCC E-Field Strength Limits (V/m)	FCC H-Field Strength Limits (A/m)
1%	Top	5	82.940	0.220	614	1.63
1%	Left	5	82.186	0.218	614	1.63
1%	Right	5	80.678	0.214	614	1.63
1%	Front	5	81.809	0.217	614	1.63
1%	Back	5	81.055	0.215	614	1.63
1%	Bottom	5	80.301	0.213	614	1.63

Note: V/m= A/m *377

10 Test Set-up Photo

See setup photo

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