

## FCC §1.1307& §1.1310 – RF EXPOSURE

### Applicable Standard

FCC §1.1307 & 1.1310

According to the item 5.2 of KDB 680106 D01 RF Exposure Wireless Charging Apps v03: Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF evaluation.

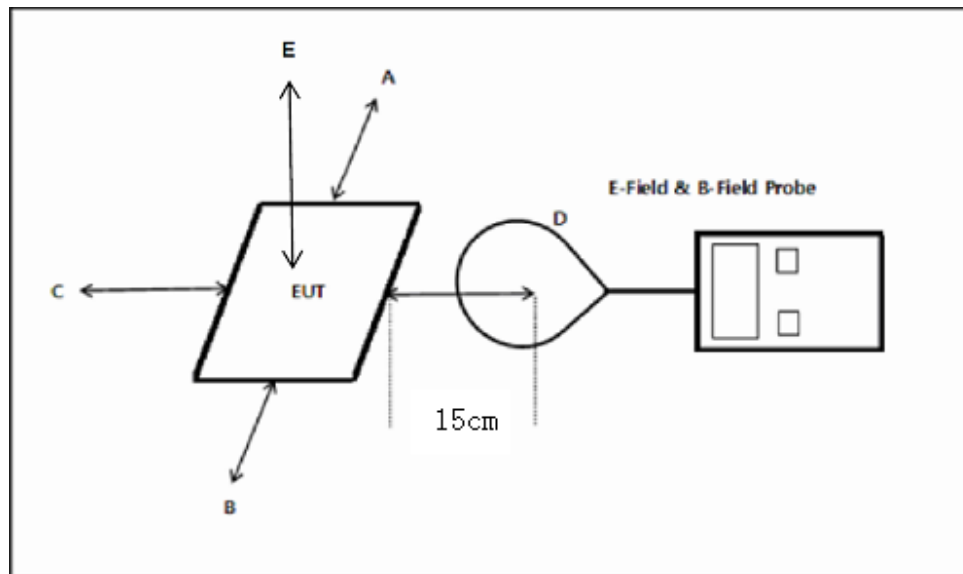
- Power transfer frequency is less than 1 MHz.
- Output power from each primary coil is less than or equal to 15 watts.
- The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
- Client device is placed directly in contact with the transmitter.
- Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
- 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.

### Limits for Maximum Permissible Exposure (MPE)

| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz)                                   | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | 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 <sup>2</sup>                 | 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 <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;

## EUT Setup



## Result

- a) Power transfer frequency is less than 1 MHz.  
Yes, the device operates in the frequency 110 kHz-200 kHz.
- b) Output power from each primary coil is less than or equal to 15 watts.  
Yes, the maximum output power of the primary coil is  $5W < 15W$ .
- c) 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 including a charging system with only single primary coils is to detect and allow only between individual of coils.
- d) Client device is inserted in or placed directly in contact with the transmitter.  
Yes, client device is placed directly in contact with the transmitter.
- e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).  
Yes, this is a mobile device.
- f) 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.  
The EUT H-field Strength levels at 15cm and 20 cm above the top surface are less than 50% the MPE limit.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.2℃     |
| <b>Relative Humidity:</b> | 51 %      |
| <b>ATM Pressure:</b>      | 101.2 kPa |

*The testing was performed by Hope Zhang on 2018-11-12.*

**H-Filed Strength**

| <b>Frequency Range (kHz)</b> | <b>Position A (A/m)</b> | <b>Position B (A/m)</b> | <b>Position C (A/m)</b> | <b>Position D (A/m)</b> | <b>Position E (A/m)</b> | <b>Limit Test (A/m)</b> | <b>Maximum ration of MPE limit</b> |
|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------------------|
| 110-200                      | 0.172                   | 0.193                   | 0.212                   | 0.153                   | 0.429                   | 1.63                    | 26.32%                             |

**E-Filed Strength**

| <b>Frequency Range (kHz)</b> | <b>Position A (V/m)</b> | <b>Position B (V/m)</b> | <b>Position C (V/m)</b> | <b>Position D (V/m)</b> | <b>Position E (V/m)</b> | <b>Limit Test (V/m)</b> | <b>Maximum ration of MPE limit</b> |
|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------------------|
| 110-200                      | 2.88                    | 2.86                    | 2.11                    | 3.78                    | 6.32                    | 614                     | 1.03%                              |

**Note:**

1: According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03, Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614V/m and 1.63 A/m. Aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

2: The distance for position A, B, C, D are 15cm, the distance for position E is 20cm.