RF Exposure Evaluation Requirements

Per Section 5.2 of KDB Publication 680106 D01 Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF exposure evaluation:

a) Power transfer frequency is less that 1 MHz

Device operates at 110 kHz.

b) Output power from each primary coil is less than 5 watts

The EUT is a Power Class 0 device following the Wireless Power Consortium design specifications for a device operating at less than 5 watts.

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

This device is designed to comply with this requirement.

d) Client device is inserted in or placed directly in contact with the transmitter

This device is designed for direct contact charging only.

e) The maximum coupling surface area of the transmit (charging) device is between 60 cm2 and 400 cm2

The maximum coupling surface area of this device is 15 x 8 cm = 120 square centimeters.

f) Aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.

Aggregate leakage fields at 10 cm distance surrounding the EUT were measured with each integral coil loaded by both an iPhone 8 and a Samsung Galaxy 6X Active cellular phone and in both cases remain below 30% of the MPE limit. A summary of this data is included as follows.

Frequency Range	Det	IF Bandwidth	Video Bandwidth	Measurement Distance
9 kHz ≤ f ≤ 150 kHz	Pk/QPk	100 kHz	300 kHz	10 cm
150 kHz ≤ f ≤ 30 MHz	Pk/QPk	100 kHz	300 kHz	

Loop Antenna Classification: Small

Application: Vehicular Cellular Phone Charging Pad Mounted in Console

					H-field Sensor					E-field Sensor					
#	Mode	EUT Side	Sensor Orientation	Freq.** kHz	Pr (Pk) dBm	Ka dB/m	dBA/m	A/m	Limit A/m	Pr (Pk) dBm	Ka dB/m	dBV/m	V/m	Limit V/m	Worst Case MPE Level (%)
1	Coil 1, Samsung 6X Active < 25% Charging	Front	max all	109.8	-77.2	54.0	-36.2	0.015	1.63	-73.2	119.0	32.8	43.7	614.0	7.1
2		Right	max all	109.8	-75.3	54.0	-34.3	0.019	1.63	-77.9	119.0	28.1	25.4	614.0	4.1
3		Bottom*	max all	109.8	-63.2	54.0	-22.2	0.078	1.63	-65.9	119.0	40.1	101.2	614.0	16.5
4		Back*	max all	109.8	-77.2	54.0	-36.2	0.015	1.63	-73.2	119.0	32.8	43.7	614.0	7.1
5		Left*	max all	109.8	-75.3	54.0	-34.3	0.019	1.63	-77.9	119.0	28.1	25.4	614.0	4.1
6		Top	max all	109.8	-63.2	54.0	-22.2	0.078	1.63	-65.9	119.0	40.1	101.2	614.0	**16.5**
7	Coil 2, Samsung 6X Active < 25% Charging	Front	max all	109.8	-67.2	54.0	-26.2	0.049	1.63	-69.9	119.0	36.1	63.8	614.0	10.4
8		Right	max all	109.8	-75.1	54.0	-34.1	0.020	1.63	-73.9	119.0	32.1	40.3	614.0	6.6
9		Bottom*	max all	109.8	-80.4	54.0	-39.4	0.011	1.63	-70.2	119.0	35.8	61.7	614.0	10.0
10		Back*	max all	109.8	-67.2	54.0	-26.2	0.049	1.63	-69.9	119.0	36.1	63.8	614.0	10.4
11		Left*	max all	109.8	-75.1	54.0	-34.1	0.020	1.63	-73.9	119.0	32.1	40.3	614.0	6.6
12		Top	max all	109.8	-80.4	54.0	-39.4	0.011	1.63	-70.2	119.0	35.8	61.7	614.0	10.0
13	Coil 3, Samsung 6X Active < 25% Charging	Front	max all	109.8	-77.2	54.0	-36.2	0.015	1.63	-73.2	119.0	32.8	43.7	614.0	7.1
14		Right	max all	109.8	-75.3	54.0	-34.3	0.019	1.63	-77.9	119.0	28.1	25.4	614.0	4.1
15		Bottom*	max all	109.8	-63.2	54.0	-22.2	0.078	1.63	-65.9	119.0	40.1	101.2	614.0	16.5
16		Back*	max all	109.8	-77.2	54.0	-36.2	0.015	1.63	-73.2	119.0	32.8	43.7	614.0	7.1
17		Left*	max all	109.8	-75.3	54.0	-34.3	0.019	1.63	-77.9	119.0	28.1	25.4	614.0	4.1
18		Top	max all	109.8	-63.2	54.0	-22.2	0.078	1.63	-65.9	119.0	40.1	101.2	614.0	16.5

* Due to the symmetry of coils, measurements are made only on three sides (front, right, top) of the device at the distances reported. Bottom, Back, and Left data is mirrored. Coil 3 data is also the same as Coil 1 data.

*Only the fundamental frequency data is reported, as all harmonics measured were more than 20 dBc.

Frequency Range	Det	IF Bandwidth	Video Bandwidth	Measurement Distance
9 kHz ≤ f ≤ 150 kHz	Pk/QPk	100 kHz	300 kHz	10 cm
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#	Mode	EUT Side	Sensor Orientation	Freq.** kHz	Pr (Pk) dBm	Ka dB/m	dBA/m	A/m	Limit A/m	Pr (Pk) dBm	Ka dB/m	dBV/m	V/m	Limit V/m	Worst Case MPE Level (%)
1	Coil 1, iPhone 8 < 25% Charging	Front	max all	109.8	-79.2	54.0	-38.2	0.012	1.63	-75.7	119.0	30.3	32.7	614.0	5.3
2		Right	max all	109.8	-73.2	54.0	-32.2	0.025	1.63	-76.8	119.0	29.2	28.8	614.0	4.7
3		Bottom*	max all	109.8	-58.0	54.0	-17.0	0.141	1.63	-64.7	119.0	41.3	116.1	614.0	18.9
4		Back*	max all	109.8	-79.2	54.0	-38.2	0.012	1.63	-75.7	119.0	30.3	32.7	614.0	5.3
5		Left*	max all	109.8	-73.2	54.0	-32.2	0.025	1.63	-76.8	119.0	29.2	28.8	614.0	4.7
6		Top	max all	109.8	-58.0	54.0	-17.0	0.141	1.63	-64.7	119.0	41.3	116.1	614.0	**18.9**
7	Coil 2, iPhone 8 < 25% Charging	Front	max all	109.8	-65.2	54.0	-24.2	0.062	1.63	-70.2	119.0	35.8	61.7	614.0	10.0
8		Right	max all	109.8	-72.9	54.0	-31.9	0.025	1.63	-79.9	119.0	26.1	20.2	614.0	3.3
9		Bottom*	max all	109.8	-80.7	54.0	-39.7	0.010	1.63	-69.0	119.0	37.0	70.8	614.0	11.5
10		Back*	max all	109.8	-65.2	54.0	-24.2	0.062	1.63	-70.2	119.0	35.8	61.7	614.0	10.0
11		Left*	max all	109.8	-72.9	54.0	-31.9	0.025	1.63	-79.9	119.0	26.1	20.2	614.0	3.3
12		Top	max all	109.8	-80.7	54.0	-39.7	0.010	1.63	-69.0	119.0	37.0	70.8	614.0	11.5
13	Coil 3, iPhone 8 < 25% Charging	Front	max all	109.8	-79.2	54.0	-38.2	0.012	1.63	-75.7	119.0	30.3	32.7	614.0	5.3
14		Right	max all	109.8	-73.2	54.0	-32.2	0.025	1.63	-76.8	119.0	29.2	28.8	614.0	4.7
15		Bottom*	max all	109.8	-58.0	54.0	-17.0	0.141	1.63	-64.7	119.0	41.3	116.1	614.0	18.9
16		Back*	max all	109.8	-79.2	54.0	-38.2	0.012	1.63	-75.7	119.0	30.3	32.7	614.0	5.3
17		Left*	max all	109.8	-73.2	54.0	-32.2	0.025	1.63	-76.8	119.0	29.2	28.8	614.0	4.7
18		Top	max all	109.8	-58.0	54.0	-17.0	0.141	1.63	-64.7	119.0	41.3	116.1	614.0	**18.9**

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