FCC RF Exposure

EUT Description:Cell Phone Stand with Bluetooth speaker and wireless charger
ModelNo.:COMSLAND
FCC ID:2A9CC-COMSLAND
Equipment type: Mobile equipment

1. 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
Formula: $Pd = (Pout*G)/(4*\pi*r^2)$
Where :
Pd = power density in mW/cm^2,
Pout = output power to antenna in mW;
G = gain of antenna in linear scale,
$\pi = 3.14$;
R = distance between observation point and center of the radiator in cm
Pd id the limit of MPE, 1 mW/cm2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Test Result of RF Exposure Evaluation

Modulation	Channel Freq. (MHz)	Conducted power (dBm)	Max power (mW)	Antenna Gain (dBi)	Antenna gain numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
GFSK	2402	4.66	2.92	-0.68	0.86	0.00050	1
	2440	4.54	2.84	-0.68	0.86	0.00048	1
	2480	4.52	2.83	-0.68	0.86	0.00048	1

Conclusion: the max result : 0.0005≤ 1.0 compliance with FCC's RF Exposure.

1 Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v03r01

2 Requirements

According to KDB680106 clause 5,b
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 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.
(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 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.
Remark: Meet all the above requirements.

(1) Power transfer frequency is less than 1 MHz.
--Yes, the device operated in the frequency range from 115 KHz to 205KHz

(2) Output power from each primary coil is less than or equal to 15 watts.
--Yes, the maximum output power of the primary coil is 10 W

(3) The system may consist of more than one source primary coils,charging one or more clients.If more than one primary coli is present,the coil pairy may be powered on at the same time.
--Yes, the transfer system includes have multiple primary coils and clients that are able to detect and allow coupling be powered on at the same time.

(4) Client device is placed directly in contact with the transmitter.
--Yes, Client device is placed directly in contact with the transmitter

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
--Yes

(6) 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.
--Yes, the EUT field strength level are 50% x MPE limit.

3 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)
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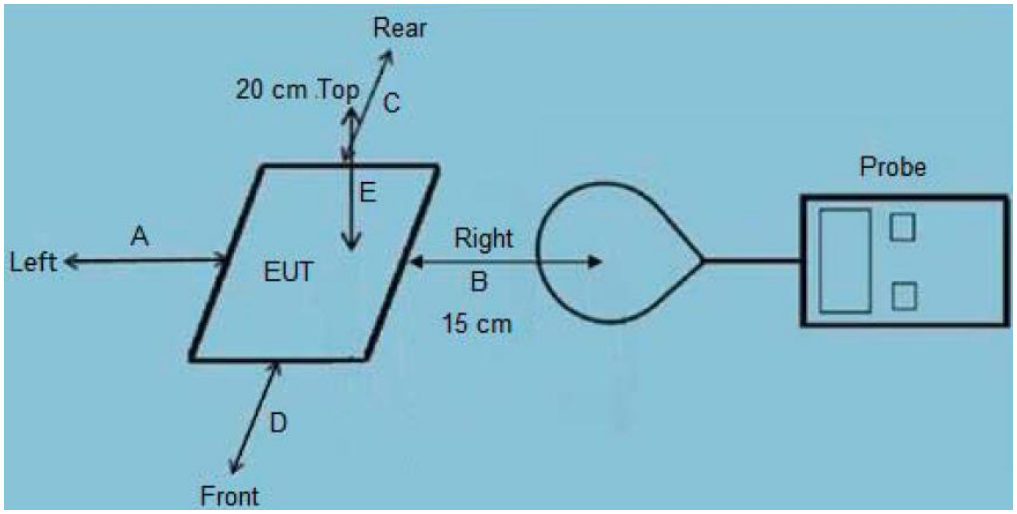
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30
F=frequency in MHz *=Plane-wave equivalent 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).				

4 Test Setup



5 Test Procedure

1) The RF exposure test was performed in anechoic chamber.

2) The measurement probe was placed at test distance (15 cm from all sides and 20 cm from the top) which is between the edge of the charger and the geometric center of probe.

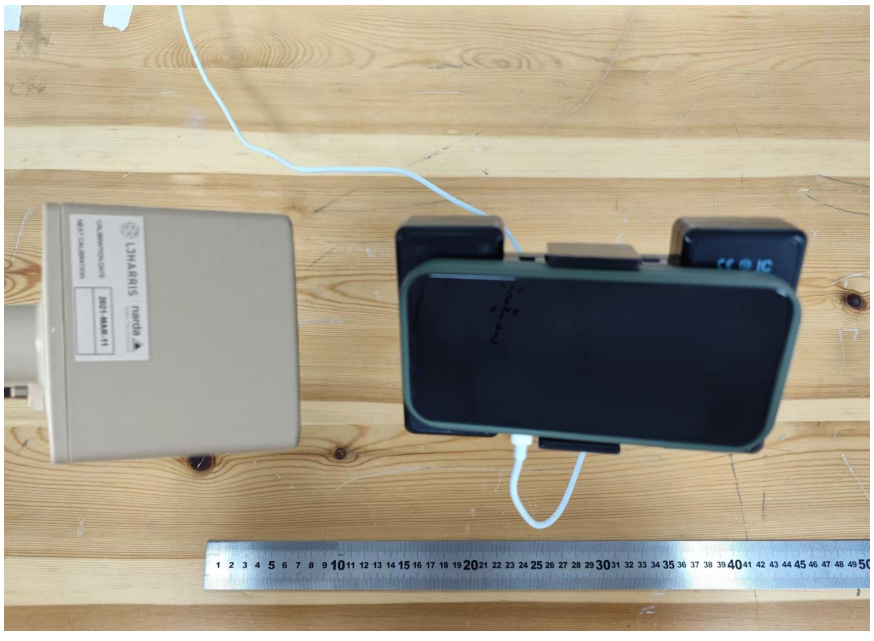
3) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed

4) The EUT was measured according to the dictates of KDB 680106 D01v03r01
Remark：The EUT's test position A, B, C, D and E is valid for the E and H field measurements

6 Equipment list

Test Equipment	**Manufacturer**	**Model No.**	**SN.**	Last calibration	Calibrated until
Electric and Magnetic field probe-Analyzer	Narda	EHP-200A	N03565	Feb 10,2022	Feb 09,2023

7 Placement Mode 1 Photo



8	**Test mode**	
	Mode 1	Mobile phone wireless charging (5W)
	Mode 2	Mobile phone wireless charging (7.5W)
	Mode 3	Mobile phone wireless charging (10W)

9	**Necessary accessories**				
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Adapter	XIAOMI	MDY-11-EB	N/A	This is for testing only in report.
2	Phone	Apple	iPone 12	N/A	This is for testing only in report.

10	**Test Result**
	Mode 3 worst case is recorded
	E-Filed Strength at 15 cm from the edges surrounding the EUT

Battery power	Frequency Range(MHz)	Test Position A	Test Position B	Test Position C	Test Position D	Limits (V/m)
1%	0.115-0.205	1.43	1.47	0.58	0.48	614
50%	0.115-0.205	1.58	1.27	0.46	0.58	614
95%	0.115-0.205	1.27	1.56	0.44	0.56	614
Stand-by	0.115-0.205	1.38	1.27	0.59	0.58	614

E-Filed Strength at 20 cm from the top of the EUT (V/m)

Battery power	Frequency Range(MHz)	Test Position E	Limits (V/m)
1%	0.115-0.205	1.23	614
50%	0.115-0.205	1.29	614
95%	0.115-0.205	1.28	614
Stand-by	0.115-0.205	1.48	614

H-Filed Strength at 15 cm from the edges surrounding the EUT (A/m)

Battery power	Frequency Range(MHz)	Test Position A	Test Position B	Test Position C	Test Position D	Limits (A/m)
1%	0.115-0.205	0.62	0.60	0.70	0.61	1.63
50%	0.115-0.205	0.61	0.62	0.65	0.57	1.63
95%	0.115-0.205	0.60	0.63	0.57	0.55	1.63
Stand-by	0.115-0.205	0.58	0.60	0.64	0.56	1.63

H-Filed Strength at 20 cm from the top of the EUT (A/m)

Battery power	Frequency Range(MHz)	Test Position E	Limits (A/m)
1%	0.115-0.205	0.44	1.63
50%	0.115-0.205	0.38	1.63
95%	0.115-0.205	0.44	1.63
Stand-by	0.115-0.205	0.54	1.63

Bluetooth + wireless charging synchronous transmission:

(0.0005/1)+(0.70/0.815)=0.8594 < 1.0.

Tested by: _____ Reviewed by: