Maximum Permissible Exposure

FCC ID	:	**2AEIM-WC4**
Equipment	:	**Wireless Phone Charger**
Brand Name	:	**Tesla**
Model Name	:	**WC4**
Applicant	:	**Tesla Motors, Inc. 3500 Deer Creek Road Palo Alto, California US 94304 United States Of America**
Manufacturer	:	**Tesla Motors, Inc. 3500 Deer Creek Road Palo Alto, California US 94304 United States Of America**
Standard	:	**47 CFR Part 2.1091**

The product was received on Sep. 25, 2020, and testing was started from Dec. 25, 2020 and completed on Feb. 05, 2021. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA092529	01	Initial issue of report	Jan. 11, 2021
FA092529	02	The distance 15 and 20 cm separation was evaluated. (This report is the latest version replacing for the report issued on Jan. 11, 2021)	Feb. 05, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.5	-	Maximum Permissible Exposure	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
None.

Reviewed by: Sam Tsai

Report Producer: Ann Hou

1 Human Exposure Assessment

1.1 Maximum Permissible Exposure

1.1.1 Limit of Maximum Permissible Exposure

Wireless Power Transfer General Information			
Frequency Range	**Modulation Mode**	**Charging Freq. (kHz)**	**Field Strength (dBuV/m)**
120-130 kHz	FSK	123.94	-
Power Transfer Method	**Output power from each primary coil**	**That may have multiple primary coils**	**Charging Method**
Multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.	<15W	Yes (2 primary coils)	Client directly contact
Note 1: Field strength performed peak level at 3m.			

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
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
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
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
Note 1: f = frequency in MHz ; *Plane-wave equivalent power density Note 2: For the applicable limit, see FCC 1.1310				

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2.1091

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB680106 D01 RF Exposure Wireless Charging Apps v03

1.3 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)			
		TEL : 886-3-327-3456 FAX : 886-3-327-0973			
Test site Designation No. TW1190 with FCC.					
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted (Mode 1~4)		TH06-HY	Alan	20.1~26.9°C / 50~60%	25/Dec/2020
RF Conducted (Mode 5)		TH06-HY	Alan	21.4~26.7°C / 52~59%	05/Feb/2021

1.4 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Battery	Panasonic	46B24R(NS60)	-
2	Charging Phone*2	Apple	X max	-

1.5 The Worst Condition

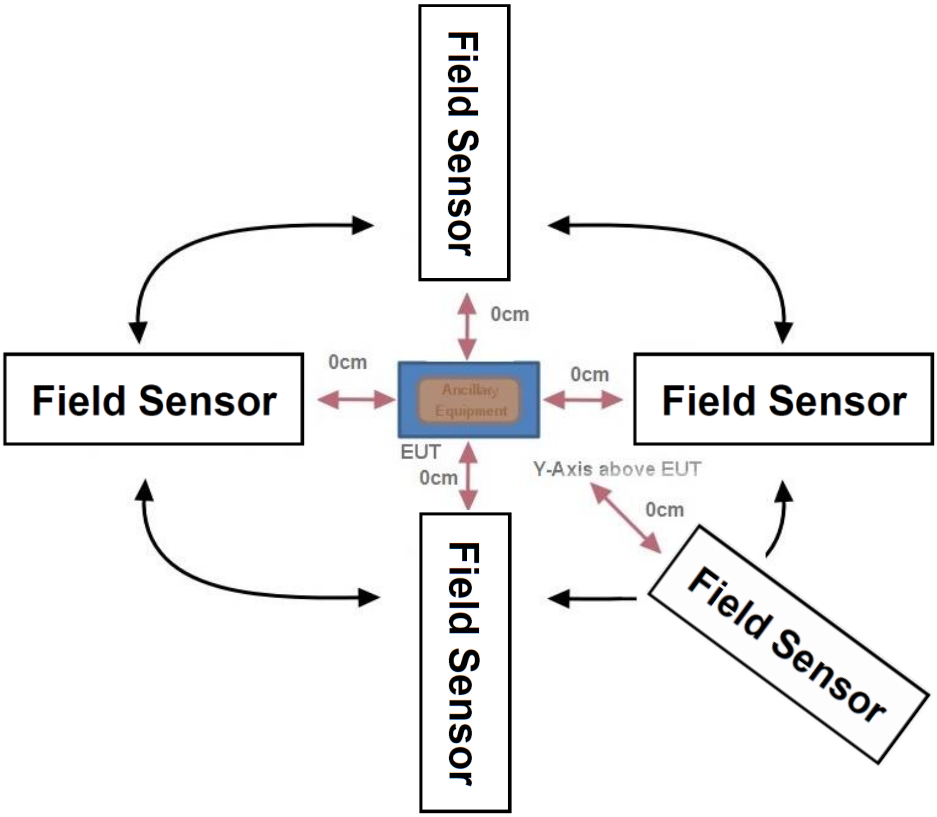
Mode	Ancillary Equipment	Charging Condition	Remark
1	Charging Phone*2	Battery power <10% 0 cm	-
2	Charging Phone*2	Battery power <10% Y-axis distance 2~15cm	-
3	Charging Phone*2	Battery power <50%	-
4	Charging Phone*2	Battery power <90%	-
5	Charging Phone*2	Battery power <10% 15 cm and 20cm	-

1.5.1 Test Method

Test Method	
☒	Performed aggregate both leakage E-field and H-field at surrounding the device from all simultaneous transmitting coils.
☒	During testing, the EUT was placed on a non-conductive table top and the ancillary equipment (e.g., mobile phone) was placed on the EUT for charging. Maximum E-field and H-field measurements were tested 0 cm from each side of the EUT. Along the side of the EUT to center of E-field probe and H-field probe were positioned at the location to search maximum field strength.
☒	E-field transfer to H-field
-	E-field = Z_0 × H-field H-field = E-field ÷ Z_0 Where Z_0 = Free Space Impedance = 377Ω

1.5.2 Test Setup

E-field and H-field Measurement



Note 1: find worst position for each axis.

1.5.3 Result of Maximum Permissible Exposure

Maximum Permissible Exposure (Mode 1)				
Charging Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
battery power<10%	0cm	Left	0.3531	0.9563
	0cm	Right	0.1438	0.3206
	0cm	Top	0.275	1.0931
	0cm	Bottom	0.1719	0.9506
	0cm	Y-axis above EUT	0.4344	0.7575
Limit			614	1.63
Margin Limit (%)			0.07%	67.06%

Maximum Permissible Exposure (Mode 2)				
Charging Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
battery power<10%	0cm	Y-axis above EUT	0.9844	1.0930
	2cm	Y-axis above EUT	0.1906	1.0800
	4cm	Y-axis above EUT	0.2063	0.3694
	6cm	Y-axis above EUT	0.1969	0.3150
	8cm	Y-axis above EUT	0.2563	0.1650
	10cm	Y-axis above EUT	0.3125	0.1125
	12cm	Y-axis above EUT	0.3531	0.0769
	14cm	Y-axis above EUT	0.2313	0.0450
	15cm	Y-axis above EUT	0.15	0.0469
Limit			614	1.63
Margin Limit (%)			0.16%	67.06%

Maximum Permissible Exposure (Mode 3)				
Charging Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
battery power<50%	0cm	Y-axis above EUT	1.2344	0.6844
Limit			614	1.63
Margin Limit (%)			0.20%	41.99%

Maximum Permissible Exposure (Mode 4)				
Charging Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
battery power<90%	0cm	Y-axis above EUT	0.344	0.3281
Limit			614	1.63
Margin Limit (%)			0.06%	20.13%

Maximum Permissible Exposure (Mode 5)				
Charging Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
battery power<10%	15cm	Left	0.49	0.2363
battery power<10%	15cm	Right	0.81	0.1930
battery power<10%	15cm	Top	0.72	0.2267
battery power<10%	15cm	Bottom	0.49	0.2156
battery power<10%	20cm	Y-axis above EUT	0.4344	0.2283
Limit			614	1.63
Margin Limit (%)			0.13%	14.50%

2 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Electric and Magnetic field Probe - Analyzer	Narda S.T.S. / PMM	EHP 200AC	170WX80309	3kHz~30MHz	08/May/2019	07/May/2021