

FCC

MPE

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Wireless Phone Charger

ISSUED TO
Tesla Motors, Inc.

3500 Deer Creek Rd, Palo Alto, CA 94304, USA



Tested by: Zong Liyao
Zong Liyao

Date: Mar. 04, 2021

Approved by: Wei Yanquan
Wei Yanquan
(Chief Engineer)

Date: Mar. 04, 2021

Report No.: BL-EC2120070-701
EUT Name: Wireless Phone Charger
Model Name: WC3
Brand Name: TESLA
Test Standard: 47 CFR Part 1.1307
47 CFR Part 1.1310
FCC ID: 2AEIM-WC3

Test Conclusion: Pass
Test Date: Feb. 08, 2021
Date of Issue: Mar. 04, 2021

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Mar. 04, 2021</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	21 to 23 °C
Ambient Relative Humidity	40 to 50%
Ambient Pressure	100 to 102 KPa

1.4 Announce

- (1) The test report reference to the report template version v1.2.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Tesla Motors, Inc.
Address	3500 Deer Creek Rd, Palo Alto, CA 94304, USA

2.2 Manufacturer Information

Manufacturer	Tesla Motors, Inc.
Address	3500 Deer Creek Rd, Palo Alto, CA 94304, USA

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Wireless Phone Charger
Model Name Under Test	WC3
Series Model Name	N/A
Description of Model name differentiation	WC3
Serial Number	N/A
Hardware Version	A1
Software Version	A1
Dimensions (Approx.)	N/A

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Network and Wireless connectivity	QI
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The requirement for the following technical information of the EUT was tested in this report:

Operating Frequency	122.72kHz~132.72kHz
Antenna Type	Coil Antenna
About Product	The EUT only support the QI technology.
Exposure Category	General Population/Uncontrolled exposure
EUT Stage	Mobile Device
Product	Type
	<input checked="" type="checkbox"/> Production unit <input type="checkbox"/> Identical prototype

3 STANDARD INFORMATION

3.1 Test Standard

No.	Identity	Document Title
1	47 CFR Part 1	Practice and Procedure
2	KDB 680106 D01	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

3.2 Radiofrequency Radiation Exposure Limit

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 Exposure				
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
300-1,500			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 ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30
<i>f = frequency in MHz * = Plane-wave equivalent power density</i>				

NOTE:

Limits: According KDB 680106 D01, emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m.

General Population/Uncontrolled Exposure: Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Occupational/Controlled Exposure: Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure. In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

3.3 Measurement Uncertainty

Measurement uncertainty evaluation for electric filed strength and magnetic filed strength test

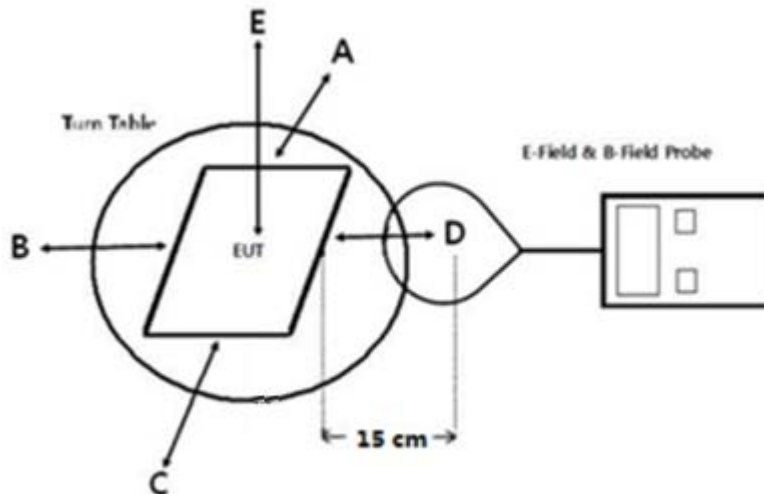
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement	Value
Electric Filed Strength	1.13 dB
Magnetic Filed Strength	1.18 dB

4 TEST SETUP

4.1 Test Setup Photo

Maximum H-field and E-field measurements were made on each of five sides of the EUT that could come in contact with a user. The five sides are defined as follows: Top (A), Left (B), Bottom (C), Right (D) and Front (E). Refer to the test position diagram below.



4.2 Measurement procedure

1. The RF exposure test was performed in anechoic chamber.
2. The measurement probe was placed at test distance (15 cm) 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 the dictates of KDB 680106 D01v03r01.

4.3 Mobile Condition

Probe	Condition	Test Distance (cm) A/B/C/D	Test Distance (cm) E
H-field	Mobile	15	20
E-field	Mobile	15	20

4.4 Equipment Approval Considerations item 5.2 of KDB 680106 D01 v03r01.

1. Power transfer frequency is less than 1 MHz.
 - The device operates at a frequency 122.72kHz~132.72kHz.
2. Output power from each primary coil is less than or equal to 15 watts.
 - Output power from primary coil 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.
 - The transfer system including a charging system with one primary and secondary coils is to detect and allow only between individual pairs of coils.
4. Client device is placed directly in contact with the transmitter.
 - Client device is placed directly in contact with the transmitter.
5. Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
 - On the normal use this EUT only support mobile exposure condition.
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.
 - Refer to following test results.
The EUT E-Field Strength levels at 20 cm < 50 % of the MPE E-Field Strength limit 307.0 V/m
3.502 V/m (Max. at 20 cm) < 307 V/m
The EUT H-Field Strength levels at 20 cm < 50 % of the MPE H-Field Strength limit 0.815 A/m
0.032 A/m (Max. at 20 cm) < 0.815 A/m

4.5 Test Equipment

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
H-field Probe	SCHWARZBECK	FESP 5134-40	5134-40-242	2020.10.10	2021.10.09
E-field Probe	Narda	EP-602	611WX80276	2020.06.08	2021.06.08
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2020.06.08	2021.06.08
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2020.02.18	2021.02.17

4.6 Test Configuration

To check all kinds of possible modes, the EUT was evaluated with appropriate client and under each charging condition as the below table:

Test Mode NO.	Description	
1	Charging Mode	AC/DC Adapter + EUT+ Artificial Load 1
2	Charging Mode	AC/DC Adapter + EUT+ Artificial Load 1+ Artificial Load 2

5 TEST RESULT

5.1 H-field

Distance (cm)	Test Mode	EUT Edges				Limit (A/m)
		A (A/m)	B (A/m)	C (A/m)	D (A/m)	
15	1	0.021	0.016	0.013	0.015	1.63
	2	0.022	0.017	0.014	0.017	

Distance (cm)	Test Mode	EUT Edge	Limit (A/m)
		E (A/m)	
20	1	0.030	1.63
	2	0.032	

5.2 E-field

Distance (cm)	Test Mode	EUT Edges				Limit (V/m)
		A (V/m)	B (V/m)	C (V/m)	D (V/m)	
15	1	3.132	3.064	2.955	3.000	614
	2	3.211	3.165	2.775	3.057	

Distance (cm)	Test Mode	EUT Edge	Limit (V/m)
		E (V/m)	
20	1	3.223	614
	2	3.502	

6 Test Conclusion

6.1 H-field

Distance (cm)	Worst-case Test Mode	EUT Edge E	Limit (A/m)	50% Limit (A/m)	Verdict
		(A/m)			
20	2	0.032	1.63	0.815	Pass

6.2 E-field

Distance (cm)	Worst-case Test Mode	EUT Edge E	Limit (V/m)	50% Limit (V/m)	Verdict
		(V/m)			
20	2	3.502	614	307	Pass

According KDB 680106 D01v03r01, the EUT is compliant with the 50% of the MPE limits.

--END OF REPORT--