

Test Report

Prepared for: Rivian Automotive, LLC.

Model: PT00590065-D

FCC ID: 2AW3A-2WWG23CC / IC ID: 26958-2NAT23AXM

Project No: p2410006

Test Results: Compliant

To

FCC 1.1307: 2024

RSS 102: Issue 6 (December 15, 2023)

Date of Issue: March 26, 2024

On the behalf of the applicant:

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Attention of:

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Reviewed / Authorized By:



Jeremiah Darden, Principal Engineer

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Evaluation Results Summary

Specification		Test Name	Pass, Fail, N/A	Comments
FCC	RSS			
1.1307(b)(1) / 1.1310	RSS 102	RF Exposure Evaluation	Pass	SAR exemption based on measured Field Strength values. Exemption FCC 1.1307(b)(3)(i)(A) and RSS 102 Section 6.3

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, *acceptance limit = test limit*.
- Fail - the measured value is above the acceptance limit, *acceptance limit = test limit*.

References/Methods	Description
RSS 102: Issue 6 (December 15, 2023)	RSS-102 — Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
FCC 1.1307:2024	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.
ISO/IEC 17025:2017	General requirements for the Competence of Testing and Calibrations Laboratories



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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	March 26, 2024	Jeremiah Darden	Original Document

EUT Description

Model:	PT00590065-D
Description:	<p>Dock receives commands over the CAN bus, relating to NFC tag detection, and enabling Wireless Power Charging. DUT is powered by LV nominal 13.5VDC from Vehicle Battery. NFC and WPT cannot transmit at the same time.</p> <p>Portable use (0.5cm) in Vehicle.</p>
Additional Information:	<p>Labeling Info: FCC ID: 2AW3A-2WWG23CC IC ID: 26958-2NAT23AXM</p> <p>Dock is designed for horizontal use within a vehicle to facilitate charging while a phone sits on the pad.</p> <p>NFC antenna permanently attached.</p>

RF Exposure Evaluation

Engineer: Jeremiah Darden

Evaluation Procedure

Calculations within this evaluation are based on the final measurements reported in “p2410006 Rivian Freepower PT00590065-D NFC FCC 15C_RSS210 rev1”. Maximum field strength measurements from this report were used to calculate the power density for comparison to SAR exemption limits at 0.5cm for portable in vehicle use.

Limits are calculated for General Population/Uncontrolled Exposure.

FCC 1.1310:

Table 1 to § 1.1310(e)(1)—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)
(i) 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
(ii) 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

f = frequency in MHz. * = Plane-wave equivalent power density.

RSS 102:

5.3.2 Electric field strength levels, magnetic field strength levels and power density levels (10 MHz to 300 GHz)

The electric and magnetic field strength reference levels, power density reference levels, and associated reference period for devices employed by the general public (uncontrolled environment) and controlled-use devices (controlled environment) are specified in table 7 and table 8. Note that the power density limits specified in these tables apply to whole body exposure conditions.

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency range (MHz)	Electric field (V _{RMS} /m)	Magnetic field (A _{RMS} /m)	Power density (W/m ²)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	58.07 / f ^{0.25}	0.1540 / f ^{0.25}	8.944 / f ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f ^{0.3417}	0.008335 f ^{0.3417}	0.02619 f ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000 / f ^{1.2}
150000-300000	0.158 f ^{0.5}	4.21 × 10 ⁻⁴ f ^{0.5}	6.67 × 10 ⁻⁵ f	616000 / f ^{1.2}

Note: f is frequency in MHz.

6.3 SAR exemption limits

Devices operating at or below the applicable output power levels (adjusted for tune-up tolerance) specified in table 11, based on the separation distance, are exempt from SAR evaluation. The separation distance, defined as the distance between the user and/or bystander and the antenna and/or radiating element of the device or the outer surface of the device, shall be less than or equal to 20 cm for these exemption limits to apply.

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

RF Exposure Calculations

Test Frequency, MHz	13.56
Power ERP, Conducted, mW (P)	0.0000006
Power EIRP, Conducted, W (P)	0.00000000093
Antenna Gain Isotropic	dBi
Antenna Gain Numeric (G)	1
Antenna Type	Loop
Distance (R)	0.5 cm

FCC
$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mW/cm ²
RSS
$S = \frac{P * G}{4\pi D^2}$
Power Density (S) W/m ²

Power Density (S) = 0.00000018
Limit =(from above table FCC) = 0.979 mW/ cm ²

Power Density (S) = 0.00000296
Limit =(from above table RSS) = 2 W/m ²

Power Conducted in mW (P) was determined by taking the worse case field strength from the referenced report and converting to dBm ERP or EIRP

Peak dBuV/m@3m – 95.3 – 2.15 = dBm ERP

Peak dBuV/m@3m – 95.3 = dBm EIRP

35.0 – 95.3 – 2.15 = -62.45 dBm ERP

35.0 – 95.3 = -60.3 dBm EIRP

END OF TEST REPORT