Radio Frequency Exposure Evaluation Report

For:
Rivian Automotive, LLC

Brand:
-

Marketing Name:
Keyfob 2.0

Model Name:
Keyfob 2.0

Product Description:
Hand Held Automotive Vehicle Acess Keyfob

FCC ID: 2AW3A-2WWG24R1TKFB
2A3WA-2WWG24R1SKFB *
IC: 26958-2WWG24R1TKF
26958-2WWG24R1SKF *
* Cosmetic difference, see 7 Annex

Applied Rules and Standards:
FCC CFR 47 Part 1 (1.1307 &1.1310), Part 2 (2.1093),
ISED RSS-102 Issue 6

REPORT #: RIVIA_069_24001_RF_Exposure_Rev1

DATE: 2024-10-15

A2LA Accredited

IC recognized #
3462B
CABID: US0187

***CETECOM* Inc.**
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1 Assessment

The following device was evaluated against the applicable criteria specified in

- FCC rule part 1 (1.1307 & 1.1310) of Title 47 of the Code of Federal Regulations
- FCC rule part 2 (2.1093) of Title 47 of the Code of Federal Regulations
- RSS-102, Issue 6

No deviations were ascertained.

Company	Description	Model #
Rivian Automotive, LLC	Hand Held Automotive Vehicle Acess Keyfob	Keyfob 2.0

Responsible for the Report:

Date	Section	Name	Signature
2024-10-15	Compliance	Guangcheng Huang (Senior EMC Test Engineer)	

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing
City/Zip Code	Milpitas, 95035 CA
Country	USA
Telephone:	+ 1 (408) 586 6200
Fax:	+ 1 (408) 586 6299
EMC Lab Manager:	Alvin Ilarina
Project Manager:	Akanksha Baskaran

2.2 Identification of the Client

Client's Name:	Rivian Automotive, LLC
Street Address:	14600 Myford Road
City/Zip Code	Irvine, CA 92606
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	same as client
Manufacturers Address:	same as client
City/Zip Code	same as client
Country	same as client

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	Keyfob 2.0
Marketing Name:	Keyfob 2.0
HW Version:	Rev.B.
SW Version:	-
FCC ID:	2AW3A-2WWG24R1TKFB 2A3WA-2WWG24R1SKFB *
IC:	26958-2WWG24R1TKF 26958-2WWG24R1SKF *
FWIN:	N/A
HVIN:	R1TKFB R1SKFB *
PMN:	Keyfob 2.0
Product Description:	Hand Held Automotive Vehicle Acess Keyfob
Power Supply / Rated operating Voltage Range:	Range: 2 - 3.3 V Normial: 3 V
Operating Temperature Range	Range: -30 °C to +45 °C Norminal: 20 °C
Sample Revision	pre-production
EUT Dimensions	85mmx44mmx16mm
Note: All information provided by the client. * Cosmetic difference, see 7 Annex	

3.2 Radio Specifications

Embedded Radio Technologies	BLE, UWB
Frequency Range / number of channels:	BLE: CH1-39 (2402 - 2480 MHz) UWB: CH5 (6.5 GHz) (not supported), CH9 (8 GHz)
Note: All information provided by the client.	

4 RF Exposure Limits and FCC and ISED Rules

4.1 FCC

§ 1.1307(b)(3)(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

§ 2.1093(c)(1) portable devices having single RF sources

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for portable devices having single RF sources with more than an available maximum time-averaged power of 1 mW, more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), or more than the Pth in the following formula, whichever is greater. The following formula shall only be used in conjunction with portable devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 0.5 centimeters to 20 centimeters and frequencies from 0.3 GHz to 6 GHz.

§ 2.1093(c)(2) portable devices having multiple RF sources

For multiple mobile or portable RF sources within a device operating in the same time averaging period, routine environmental evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

4.2 ISED RSS 102

4.2.1 Clause 6.3 SAR Exemption Limit

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.

Frequency [MHz]	< 5 mm [mW]
2450	3

4.2.2 Clause 6.5 IPD Exemption Limit

A transmitter producing emissions in the 6 GHz -30 GHz frequency range (i.e. where the occupied bandwidth (99% emission bandwidth) is fully contained within this range) is exempt from routine IPD evaluation if the output power (adjusted for tune-up tolerance) is less than or equal to 1 mW (0 dBm).

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5 Evaluations

The device utilizes 2 radios, is portable, could be held in the hand or put into pocket, hence the minimal distance to human body is 0 cm.

5.1 FCC

Radio	Frequency [GHz]	Power [dBm]	Power [mW]	Less than 1 mW
BLE	2.4	-2.4	0.57	Yes
UWB	7.9	-23.25	0.0047	Yes
Sum of the radios	-	-	0.5747	Yes

Note 1: The max. duty cycle of the BLE transmission is 6.6%, according to the operational description provided by the client. It leads to a time-averaged correction factor of -11.8 dB. The conducted peak power measurement shows a max. value of 9.4 dBm over low, middle and high channels, referring test report RIVIA_069_24001_FCC15247_RSS247. Thus, the time/averaged power of BLE is -2.4 dBm.

Note 2: The conducted measurement one UWB at 7.9 GHz shows a -23.25 dBm/1 MHz power density, referring test report RIVIA_069_24001_FCC15519_RSS220, 10 dB bandwidth.

Conclusion:

- The sum of the radios is less than 1 mW. According to rule part 1.1307(b)(3)(ii)(A), the device could be treated as a device with single radio. Hence the device is exempt from the routine evaluation.

5.2 ISED RSS-102

Radio	Frequency [GHz]	Output Power [dBm]	Output Power [mW]	Exemption limit [mW]	Exemption
BLE	2.4	-2.4	0.57	3 mW (SAR exemption limit)	Yes
UWB	7.9	-23.25	0.0047	1 mW (IPD exemption limit)	Yes

Note 1: The max. duty cycle of the BLE transmission is 6.6%, according to the operational description provided by the client. It leads to a time-averaged correction factor of -11.8 dB.. The conducted peak power measurement shows a max. value of 9.4 dBm over low, middle and high channels, referring test report RIVIA_069_24001_FCC15247_RSS247. Thus, the time/averaged power of BLE is -2.4 dBm.

Note 2: The conducted measurement one UWB at 7.9 GHz shows a -23.25 dBm/1 MHz power density, referring test report RIVIA_069_24001_FCC15519_RSS220, 10 dB bandwidth.

Conclusion:

- The output power of the radios embedded in the device meet the exemption limit. Thus, the device is exempt from the routine evaluation.

6 Revision History

Date	Report name	Changes to report	Prepared by
2024-10-11	RIVIA_069_24001_RF_Exposure	Initial version	Guangcheng Huang
2024-10-15	RIVIA_069_24001_RF_Exposure_Rev1	Adding declaration of similarity	Guangcheng Huang

7 Annex: Declaration of Similarity

RIVIAN

14600 Myford Rd
Irvine CA, 92606

Declaration of Similarity

TO WHOM IT MAY CONCERN

We, Rivian Automotive LLC., hereby declare that the following Models of Keyfob 2.0 are electrically identical and have the same electromagnetic emissions and electromagnetic compatibility characteristics. The models only difference is cosmetic on the cover.

Model	FCC ID	IC	Description
R1TKFB	2AW3A-2WWG24R1TKFB	26958-2WWG24R1TKF	Automotive Vehicle Access Keyfob (R1T)
R1SKFB	2AW3A-2WWG24R1SKFB	26958-2WWG24R1SKF	Automotive Vehicle Access Keyfob (R1S)

Sincerely,

Sep Zaker
Director, Homologation
E: sepzaker@rivian.com

RIVIAN

Rivian Internal

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