

# **RF Exposure Report** Report No.: FCC IC RF SL21021001-RIVIAN-005 MPE FCC ID: 2AW3A-1NAG20VAS Test Models: VAS BLE 1.0 PT00039251-E (Fir Tree – internal antenna), PT00039252-E (Screw Mount Series Model: - internal antenna) & PT00039253-E (Screw Mount - External antenna) Received Date: 03/01/2021 Test Date: 03/01/2021-03/04/2021 Issued Date: March 15, 2021 Applicant: Rivian Address: 2708 Orchard Pkwy Ste 10 San Jose, CA 95134 Manufacturer: Rivian Address: 2708 Orchard Pkwy Ste 10 San Jose, CA 95134 Issued By: Bureau Veritas Consumer Products Services, Inc. Lab Address: 775 Montague Expressway, Milpitas, CA 95035 Test Location (1): 775 Montague Expressway, Milpitas, CA 95035 FCC Registration / 540430 **Designation Number:**



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specification, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any government agencies.



# **Table of Contents**

Relea	ase Control Record	3
1	Certificate of Conformity	4
2	RF Exposure	5
2.1 2.2	Limits for Maximum Permissible Exposure (MPE) MPE Calculation Formula	5 5 5
2.3 2.4 2.5	Antenna Gain Calculation Result of Maximum Conducted Power	5 5 6
3	Conclusion	6



# Release Control Record

Issue No.	Description	Date Issued
FCC_RF_SL21021001-RIVIAN-005_MPE	Orignal Release	03/22/2021



Certificate of Conformity				
Product:	roduct: BLE VAS 1.0 (Vehicle Access System BLE)			
Brand:	Rivian			
<b>Test Models:</b> PT00039251-E (Fir Tree – internal antenna), PT00039252-E (Screw Mointernal antenna) & PT00039253-E (Screw Mount – External antenna)				
Sample Status:	Final Product			
Applicant:	Hamid Movahedi			
Test Date:	03/01/2021-03/04/2021			
Standards:	FCC Part 2 (Section 2.1093)			
	KDB 447498 D01 General RF Exposure Guidance v06			
	IEEE C95.1-1992			

1

The above equipment has been tested by **Bureau Veritas Consumer Products Services, Inc., Milpitas Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Just Umamas			
	, Date:	03/22/2021	
Jude Semana / Test Engineer			
Gary Chou			
	, Date:	03/22/2021	
Gary Chou / Engineer Reviewer			
	Jude Semana / Test Engineer Gary Chou Gary Chou / Engineer Reviewer	, Date:	, Date: 03/22/2021 Jude Semana / Test Engineer Grang Chou , Date: 03/22/2021 Gary Chou / Engineer Reviewer



# 2 RF Exposure

# 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)		
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 <sup>2</sup> )*	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

# 2.2 MPE Calculation 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 = 3.1416

R = distance between observation point and center of the radiator in cm

# 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

#### 2.4 Antenna Gain

The internal antenna type is Chip antenna with 1.5 dBi gain. The external antenna type is Patch antenna with -1.5 dBi gain.



Frequency Band (MHz)	Max Power (dBm)	Max Power (mW)	Turn-Up Tolerance	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402-2480	5.04	3.19	±1dB	1.5	20	0.00113	1

# 2.5 Calculation Result of Maximum Conducted Power

Note:

- 1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2. Calculate SAR test exclusion thresholds from condition "1" formulas.

# 3 Conclusion

# **Conclusion:**

The formula of calculated the MPE is: CPD1 / LPD1 + CPD2 / LPD2 + .....etc. < 1 CPD = Calculation power density LPD = Limit of power density

BT\_LE = 0.00113 <1 Therefore the maximum calculations of above situations are less than the "1" limit.

---- END ----