Radio Frequency Exposure Evaluation Report

For:

Lucid USA, Inc.

Model Name:

P11-K2B000

Product Description:

Center Console Controller (CCC)

FCC ID: 2AXZJ-K2B000

Applied Rules and Standards:
CFR 47 Part 1 (1.1307 & 1.1310), Part 2 (2.1091)

Report number: EMC_LUCID-004-21001_MPE_Rev1
DATE: 2021-09-01

A2LA Accredited

IC recognized # 3462B-1

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Contents

1. Assessment

This RF Exposure evaluation report provides information about compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR 47 Part 1 (1.1307 &1.1310), Part 2 (2.1091), under given conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant). In addition, maximum antenna gain or minimum distance towards the human body is calculated, respectively, where relevant.

Company Name	Product Description	Model #
Lucid USA, Inc.	Center Console Controller (CCC)	P11-K2B000

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2021-09-01	Compliance	Kevin Wang (EMC Lab Manager)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2021.09.01 11:41:45 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2021-09-01	Compliance	Yuchan Lu (EMC Engineer)	Yuchan Lu Digitally signed by: Yuchan Lu DN: CN = Yuchan Lu email = Yuchan.Lu@cetecom.com C = US O = CETECOM Inc. OU = EMC Date: 2021.09.01 11:44:07 -07'00'

2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Compliance Manager:	Kevin Wang
Responsible Project Leader:	Akanksha Baskaran

2.2. Identification of the Client

Applicant's Name:	Lucid USA, Inc.
Street Address:	7373 Gateway Blvd
City/Zip Code	Newark, CA 94560
Country	United States

2.3. Identification of the Manufacturer

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

3. Equipment under Assessment

Model No	P11-K2B000
HW Version	01
SW Version	01
Radio Module	Ublox Model: JODY-W164-03A-01; FCC ID: XPYJODYW164
Product Description	Center Console Controller (CCC)
Transceiver Technology	- BDR/EDR; BLE - 802.11 a/ac UNII-1; UNII-2; UNII-3
Co-located Transmitters/ Antennas?	Bluetooth with WiFi can transmit simultaneously
Power Supply/ Rated Operating Voltage Range	10V to 15V DC
Operating Temperature Range	-40 ºC to 85 ºC
Sample Revision	☐Prototype ■Production ☐ Pre-Production
Device Category	☐Fixed Installation ■Mobile ☐Portable
Exposure Category	☐ Occupational/ Controlled ■ General Population/ Uncontrolled

3.1. Antenna Information

Radio Technology	Conducted RF Power (dBm)	Peak Antenna Gain (dBi)
Bluetooth 2.4 GHz	BDR: +12 dBm ± 2 dB EDR: +10 dBm ± 2 dB BLE: +8 dBm ± 2 dB	2.8
WLAN 5GHz, 5.15 – 5.85GHz	OFDM, BPSK +16 dBm ± 2 dB	5

4. RF Exposure Limits

For the specific described radio apparatus the following basic limits and rules apply

4.1. Power Density Limits acc. to FCC 1.1310(e)

Frequency Range (MHz)	Power density (mW/cm²)	Averaging time (minutes)
300-1500	f/1500	30
1500 – 100.000	1.0	30

4.2. Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c)

- Operating frequency < 1.5GHz: excluded if ERP < 1.5W / 31.8dBm
- Operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm

Per KDB 447498 D01 FCC allows calculative estimation of RF exposure for mobile applications when routine environmental evaluation categorical exclusion applies and also for fixed applications.

4.3. RF Exposure Estimation (MPE Estimation)

Having available the source based average output power and peak antenna gain or the ERP/EIRP of the specified device and for a known minimum distance of its radiating structures from the body of persons according to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (mW/cm² or W/m²)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

5. Evaluations

5.1. Compliance with MPE (Power Density) limits

Power Density Calculation						
Band of Operation MHz	**EIRP** dBm	**Maximum Duty Cycle** %	**Distance** cm	**Power Density** mW/cm^2	**FCC Limit** mW/cm^2	**Verdict**
2400 - 2480	16.8	1:1	25	0.006	1.000	Pass
5120 - 5850	23	1:1	25	0.025	1.000	Pass

Conclusion:

- The equipment fulfills the MPE limits for the minimum 25cm distance between the antenna and the human body

5.2. Routine Environmental Evaluation Applicability Simultaneous Transmission

- Possible simultaneous transmissions: According to the manufacturer the Wi-Fi can operate simultaneously with the Bluetooth. Theoretically the worst case of simultaneous transmission is with the two transmitters operating at the highest output power mode.

Transmission Mode	Sum of the ratios for the highest Power Densities	Limits for the Highest Combined Ratio	Exempt from Routine evaluation
Wi-Fi + BDR	0.006 + 0.025 = 0.031	< 1	Yes

Note: Power Density to Applicable limit for Stand Alone Operation are derived from table in section 5.1

Conclusion:

- The equipment is excluded from simultaneous transmission MPE test.

6. Revision History

Date	Report Name	Changes to report	Report prepared by
2021-07-21	EMC_LUCID-004-21001_MPE	Initial Version	Kris Lazarov
2021-09-01	EMC_LUCID-004-21001_MPE_Rev1	Updated the WLAN 5GHz Power in Section 3.1 and 5	Yuchan Lu

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