



Radio Frequency Exposure Evaluation Report

For:
Lucid USA, Inc.

Host Model: P11-K2B100
Module Model: JODY-W354-00A

Product Description:
(Center Console Controller) CCCv2

FCC ID: 2AXZJ-K2B100
IC: 27970-K2B100

Applied Rules and Standards:
CFR Part Part1 (1.1307 & 1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISED RSS-102 Issue 5

Report number: EMC_Lucid_001_22001_MPE_Rev1

DATE: 2023-05-30



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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091) and ISED standard RSS-102 issue 5 under worst case 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.

The device meets the limits as stipulated by the above given FCC and ISED rule parts based on available specifications for worst-case conditions at 20 cm distance to the body.

Company	Description	Host Model #	Module Model #
Lucid USA, Inc.	(Center Console Controller) CCCv2	P11-K2B100	JODY-W354-00A

Responsible for Testing Laboratory:

Arndt Stoecker

2023-05-30 Compliance (Director of Regulatory Services)

Date	Section	Name	Signature
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Responsible for the Report:

Art Thammanavarat

2023-05-30 Compliance (Senior EMC Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Section 3.

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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 Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Arndt Stoecker
Responsible Project Leader:	Akanksha Baskaran

2.2 Identification of the Client

Client Firm/Name:	Lucid USA, Inc.
Street Address:	7373 Gateway Blvd
City/Zip Code	Newark, California, 94560
Country	USA

2.3 Identification of the Manufacturer

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

3 Equipment under Assessment

3.1 EUT Specifications

Host Model No	P11-K2B100
HW Version	02
SW Version	23W4
Contains FCC ID :	2AXZJ-K2B100
Contains IC:	27970-K2B100
Product Description	(Center Console Controller) CCCv2
Radio Module	Wi-Fi & Bluetooth Modules Model Name : Ublox Model Number : JODY-W354-00A Wireless Technologies Wi-Fi 5GHz : 802.11a/ac Bluetooth : BDR/DER, BLE
Co-located Transmitters/ Antennas?	Bluetooth with WiFi can transmit simultaneously
Rated Operating Voltage Range	9V to 16V DCs
Operating Temperature Range	-40 °C to 85 °C
Sample Revision	<input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production
Device Category	<input type="checkbox"/> Fixed Installation <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable
Exposure Category	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled

3.2 Antenna Information

Radio Technology	Conducted RF Power (dBm)	Peak Antenna Gain (dBi)
Bluetooth 2.4 GHz	Bluetooth: +8.12dBm BLE: +6.68dBm	2.8
WLAN 5GHz	5GHz WLAN UNII-1 : +18.12dBm 5GHz WLAN UNII-3 : +18.33dBm	5

4 RF Exposure Evaluation Methods

4.1 RF Exposure Test Exemptions for Single Source

4.1.1 FCC § 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.

Single RF sources as defined in paragraph (b)(2) of FCC § 2.1091 is exempt if the ERP (watts) is no more than the calculated value prescribed for that frequency. General frequency and separation-distance dependent MPE-based effective radiated power ERP thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES
SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R ²
1.34	–	30	35.6 m	–	1.6 m	3,450 R ² /f ²
30	–	300	1.6 m	–	159 mm	3.83 R ²
300	–	1,500	159 mm	–	31.8 mm	0.0128 R ² f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R ²
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

4.1.2 Exemption Limits for Routine Evaluation to RSS-102 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

4.2 RF Exposure Test Exemptions for Simultaneous Transmission Sources

Multiple RF sources are exempt if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th} , including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i .

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from § 1.1310 of this chapter.

4.3 RF Exposure evaluation flow chart

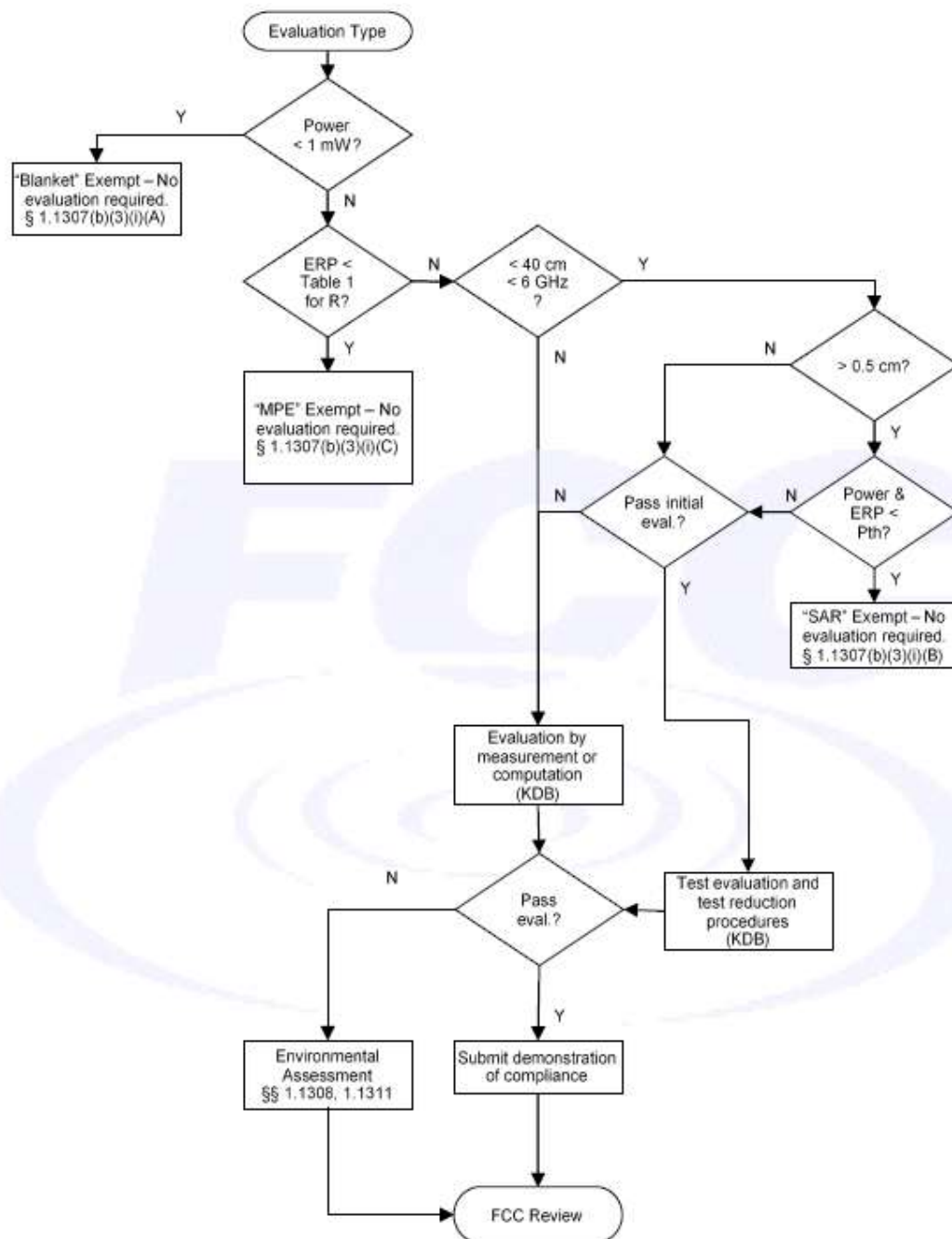


Figure A.1 – General Sequence for Determination of Procedure (exemption or evaluation) to Establish Compliance with Exposure Limits for a Single RF Source³⁹

5 Evaluations

5.1 RF Exposure Test Exemptions for Single Source

Compliance with FCC Table 1 of § 1.1307(b)(3)(i)(C) and RSS-102 2.5.2 exemption limits												
Band	Frequency (MHz)	Output Power		Antenna Gain (dBi)	E.I.R.P		Separation Distances (mm)	FCC Pth Threshold (mW)	ISED Threshold EIRP (mW)	FCC ERP/PTH Ratio	ISED EIRP / Limit Ratio	MPE Exempt No evaluation required Ratios < 1
		dBm	mW		dBm	mW						
Bluetooth BDR	2402.0	8.12	6.49	2.8	10.92	12.359	20	4900.08	2678.51	0.001	0.005	Exempt
Bluetooth LE	2402.0	6.68	4.66	2.8	9.48	8.872	20	4900.08	2678.51	0.001	0.003	Exempt
WLAN 5GHz (UNII-1)	5180.0	18.12	64.86	5	23.12	205.116	20	10567.20	4529.14	0.006	0.045	Exempt
WLAN 5GHz (UNII-3)	5745.0	18.33	68.08	5	23.33	215.278	20	11719.80	4861.23	0.006	0.044	Exempt

Note: All calculations are with the manufacturer declared distance R = 20 cm minimum separation between the antenna and the human body.

Conclusion:

- The maximum RF emissions from this equipment fulfills the MPE exclusion threshold limits for separation distance between the antenna and the human body greater than 20 cm. No MPE evaluation is required.

5.2 RF Exposure Test Exemptions for Simultaneous Transmission Sources

- Theoretically, the worst case of simultaneous transmission is with the Wi-Fi 5GHz and BLE transmitters operating at the highest output power mode, within the nearest frequency bands.

Regulation Authority	Applicable Simultaneous Transmission Sources	Sum of the ratios of the applicable terms	Limit	MPE Exempt No evaluation required
FCC	UNII-1 + BDR	$0.006 + 0.001 = 0.007$	< 1	Yes
ISED	UNII-1 + BLE	$0.045 + 0.003 = 0.048$	< 1	Yes

Conclusion:

- The equipment is excluded from simultaneous transmission MPE test.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2023-04-18	EMC_LUCID_011_22001_MPE	Initial Version	Art Thammanavarat
2023-05-30	EMC_LUCID_011_22001_MPE_Rev1	Section 5.1: Updated Table. Section 5.2: Updated Table.	Art Thammanavarat

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