



# FCC Radio Test Report

**FCC ID** : 2AXZJ-CTX0710W3  
**Equipment** : Telematics Control Unit  
**Brand Name** : Lucid USA, Inc  
**Model Name** : P11-K290G0-02  
**Applicant** : Lucid USA, Inc  
Lucid Motors, Inc 7373 Gateway Blvd,  
Newark, California, United States, 94560  
**Manufacturer** : Lucid USA, Inc  
Lucid Motors, Inc 7373 Gateway Blvd,  
Newark, California, United States, 94560  
**Standard** : 47 CFR FCC Part 15.247

The product was received on Jan. 17, 2023, and testing was started from Feb. 08, 2023 and completed on Mar. 10, 2023. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Jackson Tsai

**SPORTON INTERNATIONAL INC. Hsinhua Laboratory**

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History of this test report

| Report No.    | Version | Description                                                                                                                                    | Issued Date   |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| FR152404-04AC | 01      | Initial issue of report                                                                                                                        | Oct. 30, 2024 |
| FR152404-04AC | 02      | 1. Revised typo<br>2. Add Testing Location Information<br>(This report is the latest version replacing for the report issued on Oct. 30, 2024) | Nov. 01, 2024 |
|               |         |                                                                                                                                                |               |
|               |         |                                                                                                                                                |               |
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|               |         |                                                                                                                                                |               |

## Summary of Test Result

| Report Clause | Ref. Std. Clause | Test Items                                  | Result (PASS/FAIL) | Remark |
|---------------|------------------|---------------------------------------------|--------------------|--------|
| 1.1.2         | 15.203           | Antenna Requirement                         | PASS               | -      |
| -             | 15.207           | AC Power-line Conducted Emissions           | Not Required       | -      |
| -             | 15.247(a)        | DTS Bandwidth                               | Not Required       | -      |
| -             | 15.247(b)        | Maximum Conducted Output Power              | Not Required       | -      |
| -             | 15.247(e)        | Power Spectral Density                      | Not Required       | -      |
| -             | 15.247(d)        | Emissions in Non-restricted Frequency Bands | Not Required       | -      |
| -             | 15.247(d)        | Emissions in Restricted Frequency Bands     | Not Required       | -      |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and explanations:**

None

**Reviewed by: Ryan Hsiao**

**Report Producer: Ann Hou**

# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| Frequency Range (MHz) | IEEE Std. 802.11                 | Ch. Frequency (MHz) | Channel Number |
|-----------------------|----------------------------------|---------------------|----------------|
| 2400-2483.5           | b, g, n (HT20), VHT20, ax(HEW20) | 2412-2462           | 1-11 [11]      |
| 2400-2483.5           | n (HT40), VHT40, ax(HEW40)       | 2422-2452           | 3-9 [7]        |

| Band          | Mode           | BWch (MHz) | Nant |
|---------------|----------------|------------|------|
| 2.4-2.4835GHz | 802.11b        | 20         | 1TX  |
| 2.4-2.4835GHz | 802.11g        | 20         | 1TX  |
| 2.4-2.4835GHz | 802.11ax HEW20 | 20         | 1TX  |
| 2.4-2.4835GHz | 802.11ax HEW40 | 40         | 1TX  |

Note:

- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.
- Evaluated HEW20/HEW40 mode only due to the similar modulation. The power setting of HT20/HT40/ VHT20/VHT40 mode are the same or lower than HEW20/HEW40.

### 1.1.2 Antenna Information

| SKU | Ant. | Brand    | Model Name    | Antenna Type | Connector | Support       |
|-----|------|----------|---------------|--------------|-----------|---------------|
| 1   | 1    | Amphenol | P11-J67E00-02 | FPC          | FARKA     | 2.4G+5G       |
|     | 2    | Amphenol | P11-J67200-02 | FPC          | FARKA     | 2.4G+5G       |
|     | 3    | nextium  | P11-J44000-00 | FPC          | FARKA     | WWAN 2G/3G/4G |
|     | 4    | nextium  | P11-J44100-00 | FPC          | FARKA     | WWAN 2G/3G/4G |
| 2   | 5    | NMBTC    | P21-J29200-01 | FPC          | FARKA     | 2.4G+5G       |
|     | 6    | NMBTC    | P21-J29300-01 | FPC          | FARKA     | 2.4G+5G       |
|     | 7    | NMBTC    | P21-J40000-01 | FPC          | FARKA     | WWAN 2G/3G/4G |
|     | 8    | NMBTC    | P21-J40100-01 | FPC          | FARKA     | WWAN 2G/3G/4G |



| Ant. | Port | 2.4G Gain (dBi) |      |      |      |      |      | Remark<br>(Note. 1) |
|------|------|-----------------|------|------|------|------|------|---------------------|
|      |      | 2400            | 2420 | 2440 | 2460 | 2480 | 2500 |                     |
| 1    | 1    | 3.1             | 3.0  | 2.8  | 2.9  | 3.0  | 3.5  | w/o cable           |
|      |      | 0.6             | 0.5  | 0.3  | 0.4  | 0.5  | 1.0  | with cable          |
| 5    | 1    | 2.16            | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 | w/o cable           |
|      |      | 0.36            | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | with cable          |

| Ant. | Port | 5G Gain (dBi) |      |      |      | Remark<br>(Note. 2) |
|------|------|---------------|------|------|------|---------------------|
|      |      | 5150          | 5250 | 5750 | 5850 |                     |
| 1    | 1    | 1.5           | 2.2  | 4.1  | 4.3  | w/o cable           |
|      |      | -1.8          | -1.1 | 0.7  | 0.9  | with cable          |
| 2    | 2    | 1.7           | 2.3  | 3.9  | 4.1  | w/o cable           |
|      |      | -1.6          | -1.0 | 0.5  | 0.7  | with cable          |
| 5    | 1    | 2.87          | 2.87 | 2.64 | 2.64 | w/o cable           |
|      |      | 0.67          | 0.67 | 0.34 | 0.34 | with cable          |
| 6    | 2    | 2.87          | 2.87 | 2.64 | 2.64 | w/o cable           |
|      |      | 0.67          | 0.67 | 0.34 | 0.34 | with cable          |

| Ant. | Port | WWAN 2G/3G Gain (dBi) |          |                 |                 |                 | Remark<br>(Note. 3) |
|------|------|-----------------------|----------|-----------------|-----------------|-----------------|---------------------|
|      |      | GSM 850               | PCS 1900 | WCDMA<br>Band 2 | WCDMA<br>Band 4 | WCDMA<br>Band 5 |                     |
| 3~4  | 1~2  | 1.0                   | 4.5      | 4.5             | 4.5             | 1.0             | w/o cable           |
|      |      | -0.2                  | 2.7      | 2.7             | 2.7             | -0.2            | with cable          |
| 7~8  | 1~2  | 0.62                  | 3.85     | 3.85            | 3.85            | 0.62            | w/o cable           |
|      |      | -0.88                 | 2.15     | 2.15            | 2.15            | -0.88           | with cable          |

| Ant. | Port | WWAN 4G Gain (dBi) |                  |               |               |                |                | Remark<br>(Note. 3) |
|------|------|--------------------|------------------|---------------|---------------|----------------|----------------|---------------------|
|      |      | LTE<br>Band 2      | LTE<br>Band 4/66 | LTE<br>Band 5 | LTE<br>Band 7 | LTE<br>Band 12 | LTE<br>Band 13 |                     |
| 3~4  | 1~2  | 4.5                | 4.5              | 1.0           | 5.7           | 1.0            | 1.0            | w/o cable           |
|      |      | 2.7                | 2.7              | -0.2          | 2.7           | -0.2           | -0.2           | with cable          |
| 7~8  | 1~2  | 3.85               | 3.85             | 0.62          | 3.85          | 0.62           | 0.62           | w/o cable           |
|      |      | 2.15               | 2.15             | -0.88         | 2.05          | -0.78          | -0.78          | with cable          |

&lt;SKU 1&gt;

Note 1: WLAN 2.4G cable loss = 2.5 dB.

Note 2: WLAN 5GHz Band 1 cable loss = 3.3 dB, and 5GHz Band 4 cable loss = 3.4 dB.

Note 3: WWAN cable loss = 1.2 dB (GSM 850, FDD V, LTE Band 5, 12, 13)

WWAN cable loss = 1.8 dB (PCS 1900, FDD II, FDD IV, LTE Band 2, 4/66)

WWAN cable loss = 3.0 dB (LTE Band 7).



<SKU 2>

Note 4: WLAN 2.4G cable loss = 1.8 dB.

Note 5: WLAN 5GHz Band 1 cable loss = 2.2 dB, and 5GHz Band 4 cable loss = 2.3 dB.

Note 6: WWAN cable loss = 1.4 dB (LTE Band 12, LTE Band 13)

WWAN cable loss = 1.5 dB (GSM 850, FDD V, LTE Band 5)

WWAN cable loss = 1.7 dB (PCS 1900, FDD II, FDD IV, LTE Band 2, LTE Band 4/66)

WWAN cable loss = 1.8 dB (LTE Band 7).

Note 7: The EUT has four TX antenna (2 sets).

**For 2.4GHz function:**

For IEEE 802.11 b/g/n/VHT/ax mode (1TX/1RX)

Ant. 1 (port 1) or Ant. 5 (port 1) could transmit/receive.

**For 5GHz function:**

For IEEE 802.11 a mode (1TX/1RX)

Support diversity function and pre-tested on each single chain, the worst case was Ant. 2(port 2), Ant. 6(port 2) and it was recored in this test report.

For IEEE 802.11 n/ac/ax mode (2TX/2RX)

Ant. 1 (port 1), Ant. 2 (port 2) or Ant. 5 (port 1), Ant. 6 (port 2) could transmit/receive simultaneously.

**For WWAN 2G function (1TX/1RX):**

Ant. 3 (port 1) or Ant. 7 (port 1) could transmit/receive.

**For WWAN 3G/4G function (1TX/2RX):**

Ant. 3 (port 1) or Ant. 7 (port 1) could transmit, and Ant. 3 (port 1), Ant. 4 (port 2) or Ant. 7 (port 1), Ant. 8 (port 2) could receive simultaneously.

### 1.1.3 EUT Information

| Operational Condition               |                                                                               |                                                         |     |
|-------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------|-----|
| <b>EUT Power Type</b>               | From DC Power supply                                                          |                                                         |     |
| <b>EUT Function</b>                 | <input checked="" type="checkbox"/> Point-to-multipoint                       | <input type="checkbox"/> Point-to-point                 |     |
| <b>Beamforming Function</b>         | <input type="checkbox"/> With beamforming                                     | <input checked="" type="checkbox"/> Without beamforming |     |
| <b>Resource Unit(802.11ax)</b>      | <input checked="" type="checkbox"/> Full RU                                   | <input type="checkbox"/> Partial RU                     |     |
| Type of EUT                         |                                                                               |                                                         |     |
| <input checked="" type="checkbox"/> | Stand-alone                                                                   |                                                         |     |
| <input type="checkbox"/>            | Combined (EUT where the radio part is fully integrated within another device) |                                                         |     |
|                                     | Combined Equipment - Brand Name / Model No.:                                  |                                                         | ... |
| <input type="checkbox"/>            | Plug-in radio (EUT intended for a variety of host systems)                    |                                                         |     |
|                                     | Host System - Brand Name / Model No.:                                         |                                                         | ... |
| <input type="checkbox"/>            | Other:                                                                        |                                                         |     |

### 1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR152404-03AC  
 Below is the table for the change of the product with respect to the original one.

| Modifications                                                                                                                                                                               | Performance Checking                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Adding new second source for WiFi and WWAN and GNSS antenna.<br>2. Adding below EMI components for second source: DDR4, eMMC, Reset IC, Common choke, diode, clock IC(Non-RF), and PMIC. | After evaluation, no RF test validations are required.<br>1. The gain of new antennas for Wi-Fi 2.4G and WWAN is lower than original antenna.<br>2. The implemented components are non RF component, EMI test was performed and recorded in FCC 15B test report. |



### 1.1.5 Table for Multiple Listing

| Component    | Original component                                                                              | 2nd source component                                                                                        | BOM. Qty |
|--------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|
| WiFi antenna | Amphenol,P11-J67E00-02, WiFi LH                                                                 | NMBTC,P21-J29200-01, WiFi LH                                                                                | 1        |
| WiFi antenna | Amphenol,P11-J67200-02, WiFi RH                                                                 | NMBTC,P21-J29300-01,WiFi RH                                                                                 | 1        |
| LTE antenna  | nextium, P11-J44000-00, LTE LH                                                                  | NMBTC,P21-J40000-01, LTE LH                                                                                 | 1        |
| LTE antenna  | nextium, P11-J44100-00, LTE RH                                                                  | NMBTC,P21-J40100-01, LTE RH                                                                                 | 1        |
| GNSS antenna | Amphenol, P11-J67B00-01                                                                         | Amphenol, P21-J8500-00                                                                                      | 1        |
| DDR4         | DDR4,SMD,MT40A1G8SA-062EAAT:E,F BGA<br>78,8Gbit,1024M*8bit,3200MT/S,2.5V,MICRON,RoHS,AEC-Q100   | DDR4,SMD,MT40A1G8AG-062EAAT:R,F BGA<br>78,8Gbit,1024M*8bit,3200MT/S,2.5V,(fck=1600MHz),MICRON,RoHS,AEC-Q100 | 5        |
| eMMC         | eMMC NAND Flash (TLC),SMD,MTFC64GAZAQHD-AAT,VFB GA153,64GB,200MHz,1.8/3.3V,MICRON,RoHS,AEC-Q100 | eMMC NAND Flash (TLC),SMD,MTFC64GBCAQTC-AAT,LFB GA153,64GB,200MHz,1.8/3.3V,MICRON,RoHS,AEC-Q100             | 1        |
| Reset IC     | IC_RESET,SMD,SGM803-RXN3L/TR,SO T23-3,Vreset=2.63V,SGMICRO,RoHS                                 | IC_RESET,SMD,SGM803B-RXN3LG/TR, SOT23-3,Vreset=2.63V,SGMICRO,RoHS                                           | 1        |
| Common Choke | Common Choke,SMD,ACT1210G-800-2P-TL05,-,80uH,+50%-30%,70mA,2.4Ω,TDK,RoHS,AEC-Q200               | Common Choke,SMD,ACT1210G-800-2P-TL10,-,80uH,+50%-30%,70mA,2.6Ω,TDK,HF;RoHS,AEC-Q200                        | 1        |
| Diode        | Diode(standard),SMD,RR2LAM6STFTR, SODJ128-2,Vrrm/Vz=600V,If=2A,ROHM,RoHS,AEC-Q101               | Diode(standard),SMD,GS2JAF-C-AU_R1_000A1,SMAF-C2,Vrrm/Vz=600V,If=2A,P ANJIT,HF;RoHS,AEC-Q101                | 3        |
| Clock IC     | IC_Clock Gen.,SMD,5P49V60A503NLG28,VFQFP N24,1.71~3.465V,IDT,RoHS,AEC-Q100                      | IC_Clock Gen.,SMD,5P49V60B503NLG28,VFQFP N24,1.71~3.465V,RENESAS,RoHS,AEC-Q100                              | 1        |
| PMIC         | IC Power Manage,SMD,MC33PF8200CXES,HVQFN56,DC,2.7~5.5V,2.5A,NXP(PHILIPS),RoHS,AEC-Q100          | IC Power Manage,SMD,MC33PF8200A0ES,HVQFN56,DC,2.7~5.5V,2.5A,NXP(PHILIPS),RoHS,AEC-Q100                      | 1        |

## 1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- ♦ KDB 558074 D01 v05r02
- ♦ KDB 662911 D01 v02r01
- ♦ KDB 414788 D01 v01r01



### 1.3 Testing Location Information

|                                                                  |                                                                                                |                            |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------|
| <b>Test Lab. : Sporton International Inc. Hsinhua Laboratory</b> |                                                                                                |                            |
| <input checked="" type="checkbox"/> Hsinhua<br>(TAF: 3785)       | <b>ADD:</b> No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)          |                            |
|                                                                  | <b>TEL:</b> 886-3-327-3456                                                                     | <b>FAX:</b> 886-3-327-0973 |
| Test site Designation No. TW3785 with FCC.                       |                                                                                                |                            |
| <input type="checkbox"/> Wen 33rd.St.<br>(TAF: 3785)             | <b>ADD:</b> No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) |                            |
|                                                                  | <b>TEL:</b> 886-3-318-0787                                                                     | <b>FAX:</b> 886-3-318-0287 |
| Test site Designation No. TW0008 with FCC.                       |                                                                                                |                            |

## 2 Test Configuration of EUT

### 2.1 Accessories

| Accessories                 |             |                                                 |
|-----------------------------|-------------|-------------------------------------------------|
| DC Power Cable              | Signal Line | 2.0 meter, non-shielded cable, w/o ferrite core |
| APTIV Cable                 | Signal Line | 2.0 meter, shielded cable, w/o ferrite core     |
| Antenna Cable 1 (WiFi*2)    | Signal Line | 2.5 meter, shielded cable, w/o ferrite core     |
| Antenna Cable 2 (WiFi*2)    | Signal Line | 1.0 meter, shielded cable, w/o ferrite core     |
| Antenna Cable 1 (LTE L & R) | Signal Line | 2.5 meter, shielded cable, w/o ferrite core     |
| Antenna Cable 2 (LTE*2)     | Signal Line | 1.0 meter, shielded cable, w/o ferrite core     |
| GPS Cable 1                 | Signal Line | 2.0 meter, shielded cable, w/o ferrite core     |
| GPS Cable 2                 | Signal Line | 3.0 meter, shielded cable, w/o ferrite core     |

Reminder: Regarding to more detail and other information, please refer to user manual.

————THE END————