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 Part 22(H), 24(E), 27, 90**

The product was received on Jan. 17, 2023, and testing was started from Feb. 16, 2023 and completed on Feb. 23, 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/TIA-603-E-2016 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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Photographs of EUT v01

History of this test report

Report No.	Version	Description	Issued Date
FG152404-04	01	Initial issue of report	Oct. 30, 2024
FG152404-04	02	1. Revised typo 2. Add Testing Location Information (This report is the latest version replacing for the report issued on Oct. 30, 2024)	Nov. 01, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	2.1046	Conducted Output Power	Not Required	-
	22.913(a)(5) 27.50(c)(1)(9) 27.50(b)(4)(9)	Effective Radiated Power	Not Required	-
	24.232(a) 27.50(d)(2) 27.50(d)(4) 27.50(h)(2)	Equivalent Isotropic Radiated Power		
-	22.913(d) 24.232(d) 27.50(d)(5)	Peak-to-Average Ratio	Not Required	-
-	2.1049	Occupied Bandwidth	Not Required	-
-	2.1051 22.917(a) 24.238(a) 27.53(h) 27.53(g) 27.53(c) 27.53(m)(4)	Conducted Band Edge	Not Required	-
-	2.1051 22.917(a) 24.238(a) 27.53(h) 27.53(g) 27.53(c) 27.53(m)(4)	Conducted Spurious Emission	Not Required	-
-	2.1053 22.917(a) 24.238(a) 27.53(h) 27.53(g) 27.53(c)(f) 27.53(m)(4)	Radiated Spurious Emission	Not Required	-
-	2.1055 22.355 24.235 27.54	Frequency Stability for Temperature & Voltage	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:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Ryan Hsiao

Report Producer: Ann Hou

1 General Description

1.1 Information

1.1.1 RF General Information

Items	Description				
Operating Frequency	Band		Bandwidth (MHz)	TX Frequency (MHz)	RX Frequency (MHz)
	☒	GSM 850	0.2	824.2 – 849.2	869.2 – 894.2
	☒	PCS 1900	0.2	1850.2 - 1909.8	1930.2 - 1989.8
	☒	WCDMA Band V	5	826.4 - 846.6	871.4 - 891.6
	☒	WCDMA Band II	5	1852.4 - 1907.6	1932.4 - 1987.6
	☒	WCDMA Band IV	5	1712.4 - 1752.6	2112.4 - 2152.6
	☒	LTE Band 5	1.4	824.7 - 848.3	869.7 - 893.3
			3	825.5 - 847.5	870.5 - 892.5
			5	826.5 - 846.5	871.5 - 891.5
			10	829.0 - 844.0	874.0 - 889.0
	☒	LTE Band 2	1.4	1850.7 - 1909.3	1930.7 - 1989.3
			3	1851.5 - 1908.5	1931.5 - 1988.5
			5	1852.5 - 1907.5	1932.5 - 1987.5
			10	1855.0 - 1905.0	1935.0 - 1985.0
			15	1857.5 - 1902.5	1937.5 -1982.5
			20	1860.0 - 1900.0	1940.0 - 1980.0
	☒	LTE Band 4	1.4	1710.7 - 1754.3	2110.7 - 2154.3
			3	1711.5 - 1753.5	2111.5 - 2153.5
			5	1712.5 - 1752.5	2112.5 - 2152.5
			10	1715.0 - 1750.0	2115.0 - 2150.0
			15	1717.5 - 1747.5	2117.5 - 2147.5
			20	1720.0 - 1745.0	2120.0 - 2145.0
	☒	LTE Band 7	5	2502.5 – 2567.5	2622.5 – 2687.5
			10	2505 – 2565	2625 – 2685
			15	2507.5 – 2562.5	2627.5 – 2682.5
			20	2510 - 2560	2630 - 2680
	☒	LTE Band 12	1.4	699.7 - 715.3	729.7 - 745.3
			3	700.5 - 714.5	730.5 - 744.5
			5	701.5 - 713.5	731.5 - 743.5
			10	704.0 - 711.0	734.0 - 741.0
	☒	LTE Band 13	5	779.5 - 784.5	748.5 - 753.5
			10	782.0	751.0
	☒	LTE Band 29	3	-	718-5-726.5
			5	-	719.5-725.5
			10	-	722-723
	☒	LTE Band 66	1.4	1710.7 - 1779.3	2110.7 - 2179.3
			3	1711.5 - 1778.5	2111.5 - 2178.5
			5	1712.5 - 1777.5	2112.5 - 2177.5
			10	1715 - 1775	2115 - 2175
			15	1717.5 - 1772.5	2117.5 - 2172.5
			20	1720 - 1770	2120 - 2170

Type of Modulation	GSM/GPRS: GMSK EDGE: 8PSK WCDMA: BPSK / QPSK HSDPA: BPSK / QPSK HSUPA: BPSK / QPSK LTE: QPSK / 16QAM

Note: The above information was declared by manufacturer.

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)						
		2400	2420	2440	2460	2480	2500	Remark (Note. 1)
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)				
		5150	5250	5750	5850	Remark (Note. 2)
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)					
		GSM 850	PCS 1900	WCDMA Band 2	WCDMA Band 4	WCDMA Band 5	Remark (Note. 3)
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)						
		LTE Band 2	LTE Band 4/66	LTE Band 5	LTE Band 7	LTE Band 12	LTE Band 13	Remark (Note. 3)
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

<SKU 1>

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				
EUT Power Type	From DC Power Supply			
EUT Function	☐	Base Station	☒	Mobile Station

Type of EUT		
☒	Stand-alone	
☐	Combined (EUT where the radio part is fully integrated within another device)	
	Combined Equipment - Brand Name / Model No.:	…
☐	Plug-in radio (EUT intended for a variety of host systems)	
	Host System - Brand Name / Model No.:	…
☐	Other:	

1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FG152404-03
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. 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. 1. The gain of new antennas for Wi-Fi 2.4G and WWAN is lower than original antenna. 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,FBGA 78,8Gbit,1024M*8bit,3200MT/S,2.5V,MICRON,RoHS,AEC-Q100	DDR4,SMD,MT40A1G8AG-062EAAT:R,FBGA 78,8Gbit,1024M*8bit,3200MT/S,2.5V,(fck=1600MHz),MICRON,RoHS,AEC-Q100	5
eMMC	eMMC NAND Flash (TLC),SMD,MTFC64GAZAQHD-AAT,VFBGA153,64GB,200MHz,1.8/3.3V,MICRON,RoHS,AEC-Q100	eMMC NAND Flash (TLC),SMD,MTFC64GBCAQTC-AAT,LFBGA153,64GB,200MHz,1.8/3.3V,MICRON,RoHS,AEC-Q100	1
Reset IC	IC_RESET,SMD,SGM803-RXN3L/TR,SOT23-3,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,SOD|128-2,Vrrm/Vz=600V,If=2A,ROHM,RoHS,AEC-Q101	Diode(standard),SMD,GS2JAFC-AU_R1_000A1,SMAF-C2,Vrrm/Vz=600V,If=2A,PANJIT,HF;RoHS,AEC-Q101	3
Clock IC	IC_Clock Gen.,SMD,5P49V60A503NLG28,VFQFPN24,1.71~3.465V,IDT,RoHS,AEC-Q100	IC_Clock Gen.,SMD,5P49V60B503NLG28,VFQFPN24,1.71~3.465V,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 Applicable Standards

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

- 47 CFR Part 22(H), 24(E), 27, 90
- ANSI/TIA-603-E-2016
- KDB 971168 D01 v03r01

1.3 Testing Location Information

Test Lab.：Sporton International Inc. Hsinhua Laboratory			
☒	Hsinhua	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
	(TAF: 3785**)**	**TEL:** 886-3-327-3456	**FAX:** 886-3-327-0973
		Test site Designation No. TW3785 with FCC.	
☐	Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
	(TAF: 3785**)**	**TEL:** 886-3-318-0787	**FAX:** 886-3-318-0287
		Test site Designation No. TW0008 with FCC.	

2 Test Configuration of Equipment Under Test

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————