

# TEST REPORT

**Applicant:** Jiangsu Niu Electric Technology Co., Ltd.  
**Address:** No. 387. ChangtingRd, WEZ, Wujin, Changzhou, Jiangsu Province. China  
**Equipment Type:** ECU  
**Model Name:** V50A  
**Brand Name:** NIU  
**FCC ID:** 2AZ6G-V50A  
**Test Standard:** 47 CFR Part 2.1091  
KDB 447498 D04 v01  
**Sample Arrival Date:** Feb. 05, 2024  
**Test Date:** Feb. 18, 2024 - Feb. 26, 2024  
**Date of Issue:** Apr. 09, 2024

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Xu Rui

**Checked by:** Zong Liyao

**Approved by:** Tolan Tu  
(Testing Director)

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<b>Revision History</b>		
Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Apr. 09, 2024</u>	<u>Initial Issue</u>

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# 1 GENERAL INFORMATION

## 1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

## 1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	Jiangsu Niu Electric Technology Co., Ltd.
Address	No. 387. ChangtingRd, WEZ, Wujin, Changzhou, Jiangsu Province. China

### 2.2 Manufacturer Information

Manufacturer	Jiangsu Niu Electric Technology Co., Ltd.
Address	No. 387. ChangtingRd, WEZ, Wujin, Changzhou, Jiangsu Province. China

### 2.3 General Description for Equipment under Test (EUT)

EUT Name	ECU
Model Name Under Test	V50A
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V5A01V45
Software Version	V5A01A18+V5Q54V01
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

### 2.4 Technical Information

Network and Wireless connectivity	3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network LTE FDD Band 2/4/12
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	WCDMA; LTE		
Frequency Range	WCDMA B2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA B4	TX: 1710 ~ 1755 MHz	RX: 1930 ~ 1990 MHz
	WCDMA B5	TX: 824 ~ 849 MHz	RX: 1930 ~ 1990 MHz
	LTE B2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE B4	TX: 1710 ~ 1755 MHz	RX: 1930 ~ 1990 MHz
	LTE B12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
Antenna Type	WWAN	PIFA	
Exposure Category	General Population/Uncontrolled Exposure		
Product Type	Mobile Device		

### 3 SUMMARY OF TEST RESULT

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

## 4 DEVICE CATEGORY AND LEVELS LIMITS

### Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

### FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP<sub>20cm</sub> in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold  $P_{th}$  (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad \text{(B. 2)}$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and  $f$  is in GHz,  $d$  is the separation distance (cm), and  $ERP_{20\text{cm}}$  is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

## 5 ASSESSMENT RESULT

### 5.1 Output Power

WCDMA			
Mode	Band 2	Band 4	Band 5
Conducted Power (dBm)	24.44	23.89	21.34
Antenna Gain (dBi)	0.98	0.55	0.28
ERP/EIRP (dBm)	25.42	24.44	19.47

Note: This report listed the maximal case power value, please refer to BL-SZ2420228-501 report for more details.

LTE			
Mode	Band 2	Band 4	Band 12
Conducted Power (dBm)	24.22	23.79	19.42
Antenna Gain (dBi)	0.98	0.55	-1.74
ERP/EIRP (dBm)	25.20	24.34	15.53

Note: This report listed the maximal case power value, please refer to BL-SZ2420228-501 report for more details.

### 5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
WCDMA	Band 2	[23.00,25.00]	[24.00,26.00]	[21.85, 23.85]
	Band 4	[22.00,24.00]	[23.00,26.00]	[20.85, 22.85]
	Band 5	[18.00,20.00]	/	[17.85,19.85]
LTE	Band 2	[23.00,25.00]	[24.00,26.00]	[21.85, 23.85]
	Band 4	[22.00,24.00]	[23.00,26.00]	[20.85, 22.85]
	Band 12	[18.00,20.00]	/	[13.85,15.85]

Note1: ERP= EIRP -2.15dB.  
 Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.



### 5.3 RF Exposure Evaluation Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Verdict
WCDMA Band 2	25.00	316.23	200	3060.00	Pass
WCDMA Band 4	24.00	251.19	200	3060.00	Pass
WCDMA Band 5	20.00	100.00	200	1680.96	Pass
LTE Band 2	25.00	316.23	200	3060.00	Pass
LTE Band 4	24.00	251.19	200	3060.00	Pass
LTE Band 12	20.00	100.00	200	1460.64	Pass

### 5.4 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

## Statement

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--END OF REPORT--