

TEST REPORT

Applicant: Shenzhen Unique Scales Co., Ltd
Address: 301&601, no.22, Huanping Road, Gaoqiao
Community Pingdi Street, Longgang District,
Shenzhen City, China.
Equipment Type: Electronic scale
Model Name: CF577BLE+WIFI
Brand Name: unique
FCC ID: 2AVEN-CF577
Test Standard: 47 CFR Part 2.1093
KDB 447498 D04 v01
Sample Arrival Data: Aug. 17, 2023
Test Date: Sep. 12, 2023 - Sep. 18, 2023
Date of Issue: Nov. 23, 2023

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining

Checked by: Xu Rui

Approved by: Tolan Tu
(Testing Director)

Xiong Li Ning

Xu Rui

Tolan Tu

Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Jan. 25, 2022</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Nov. 14, 2023</u>	<u>Add section 5.4 Collocated Power Calculation</u>
<u>Rev. 03</u>	<u>Nov. 20, 2023</u>	<u>Modify the calculation results in sections 5.3 and 5.4</u>
<u>Rev. 04</u>	<u>Nov. 22, 2023</u>	<u>Modify the calculation results and remarks in section 5 and update antenna location map in section 2.5</u>
<u>Rev. 04</u>	<u>Nov. 23, 2023</u>	<u>Update product type in section 2.4</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	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 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	Shenzhen Unique Scales Co., Ltd
Address	301&601, no.22, Huanping Road, Gaoqiao Community Pingdi Street, Longgang District, Shenzhen City, China.

2.2 Manufacturer Information

Manufacturer	Shenzhen Unique Scales Co., Ltd
Address	301&601, no.22, Huanping Road, Gaoqiao Community Pingdi Street, Longgang District, Shenzhen City, China.

2.3 General Description for Equipment under Test (EUT)

EUT Name	Electronic scale
Model Name Under Test	CF577BLE+WIFI
Series Model Name	CF366BLE, CF367BLE, CF368BLE, CF369BLE, CF370BLE, CF371BLE, CF372BLE, CF373BLE, CF375BLE, CF376BLE, CF377BLE, CF378BLE, CF379BLE, CF380BLE, CF381BLE, CF382BLE, CF383BLE, CF385BLE, CF386BLE, CF387BLE, CF388BLE, CF389BLE, CF390BLE, CF391BLE, CF392BLE, CF393BLE, CF395BLE, CF396BLE, CF397BLE, CF398BLE, CF399BLE, CF500BLE, CF501BLE, CF502BLE, CF503BLE, CF505BLE, CF506BLE, CF507BLE, CF508BLE, CF509BLE, CF510BLE, CF511BLE, CF512BLE, CF513BLE, CF515BLE, CF516BLE, CF517BLE, CF518BLE, CF519BLE, CF520BLE, CF521BLE, CF522BLE, CF523BLE, CF525BLE, CF526BLE, CF527BLE, CF528BLE, CF529BLE, CF530BLE, CF531BLE, CF532BLE, CF533BLE, CF535BLE, CF536BLE, CF537BLE, CF538BLE, CF539BLE, CF550BLE, CF551BLE, CF552BLE, CF553BLE, CF555BLE, CF556BLE, CF557BLE, CF558BLE, CF559BLE, CF560BLE, CF561BLE, CF562BLE, CF563BLE, CF565BLE, CF566BLE, CF567BLE, CF568BLE, CF569BLE, CF570BLE, CF571BLE, CF572BLE, CF573BLE, CF575BLE, CF576BLE, CF577BLE, CF578BLE,, CF579BLE, CF580BLE, CF581BLE, CF582BLE, CF583BLE, CF585BLE, CF586BLE, CF587BLE, CF588BLE, CF589BLE, CF590BLE, CF591BLE, CF592BLE, CF593BLE, CF595BLE, CF596BLE, CF597BLE, CF598BLE, CF599BLE, CF600BLE, CF601BLE, CF602BLE, CF603BLE, CF605BLE, CF606BLE, CF607BLE, CF608BLE, CF609BLE, CF610BLE, CF611BLE, CF612BLE, CF613BLE, CF615BLE, CF616BLE, CF617BLE, CF618BLE, CF619BLE,

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Description of Model name differentiation	The model changed for different market and customer, the others are the same. (this information provided by the applicant)
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

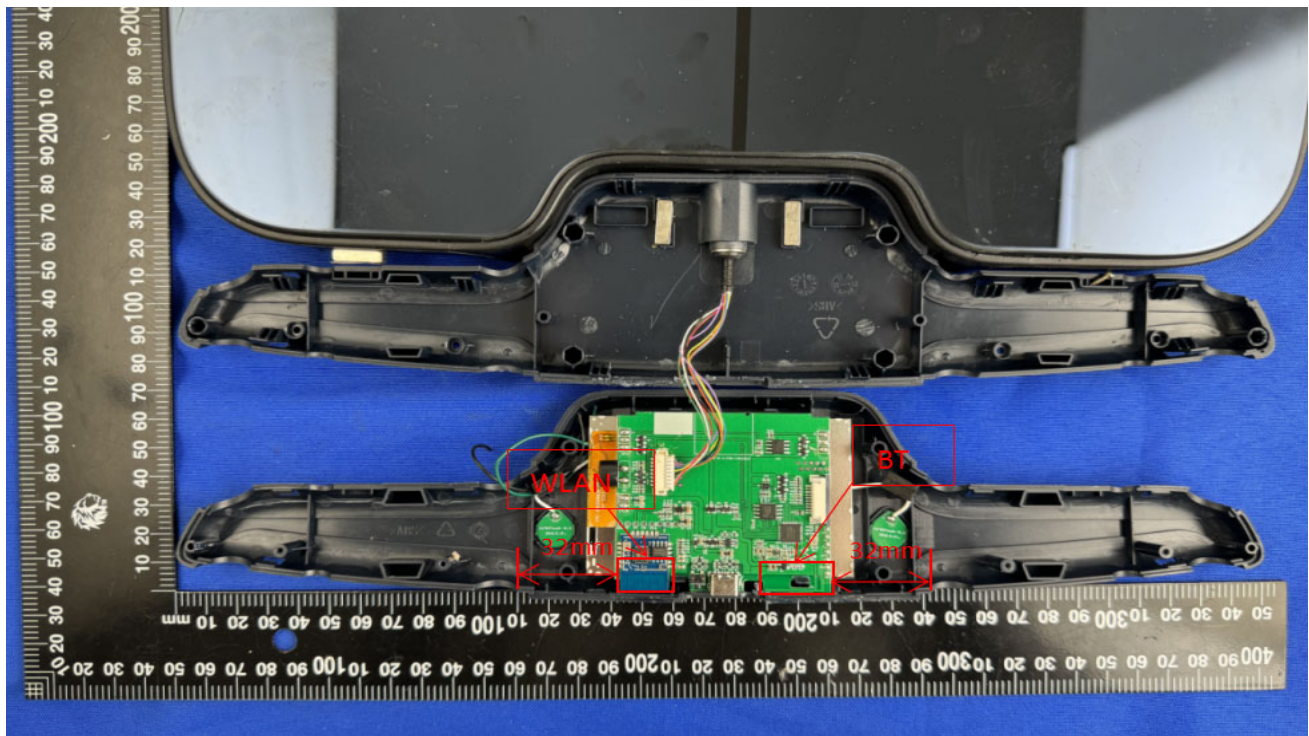
2.4 Technical Information

Network and Wireless connectivity	Bluetooth (BLE) 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20)
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth	
Frequency Range	Bluetooth, WIFI	2400 ~ 2483.5 MHz
Antenna Type	Bluetooth, WIFI	PCB
Exposure Category	General Population/Uncontrolled Exposure	
Product Type	Portable Device	

2.5 Antenna Information



3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices
2	KDB 447498 D04 v01	KDB 447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Portable Derives:

CFR Title 47 §2.1093(b)

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

FCC KDB 447498 Derives:

According with FCC KDB 447498 D04, Appendix B, The SAR-based exemption formula 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). The following table shows the power threshold from 5mm to 50mm.

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

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power including tune-up tolerance among production units
2. Per KDB 447498 D04, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D04, standalone SAR test exclusion threshold is applied; If the distance of the antenna to the user is < 5mm, 5mm is used to determine SAR exclusion threshold
4. Per KDB 447498 D04, for separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive), the threshold Pth (mW) is given by Following:

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

where

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

- a. f (GHz) is the RF channel transmit frequency in GHz
- b. d is the separation distance (cm), The result is rounded to one decimal place for comparison
- c. ERP_{20cm} are determined by:

$$ERP_{20cm}(mW) = f(x) = \begin{cases} 2040f & 0.3GHz \leq f < 1.5GHz \\ 3060 & 1.5GHz \leq f \leq 6GHz \end{cases}$$

5 ASSESSMENT RESULT

5.1 Output Power

Bluetooth and WIFI		
Mode	Bluetooth	2.4G WIFI
Peak Power (dBm)	-0.61	14.50
Antenna Gain (dBi)	2.87	1.96
EIRP (dBm)	2.26	16.46
Note: This report listed the worst case power value, please refer to BL-SZ2380902-601~602 test report for more details.		

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	[-2.00, 0.00]	[0.87, 2.87]	[-1.28, 0.72]
2.4G WIFI	[13.00, 15.00]	[14.96, 16.96]	[12.81, 14.81]
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

Mode	Distance (mm)	Calculation Frequency (GHz)	Tune-up limit power (dBm)	Tune-up limit power (mW)	Threshold Value(mW)	Power / Limit	Verdict
Bluetooth	13	2.480	0.72	1.18	41.93	0.028	Compliance
2.4G WIFI	13	2.462	15	31.63	42.11	0.751	Compliance
Note1: According to the antenna position diagram, the device antenna is located in the middle of the handle, the height of the handle shell is 26mm, and the nearest distance between the device antenna and the human body is 13mm.							
Note2: Because the antenna position is only touched by human limbs, the Limb limit is 2.5 times the Body limit, and the Limb power limit (mW) should also be multiplied by 2.5 times before being judged.							

5.4 Collocated Power Calculation

Evolution mode	Frequency(MHz)	Power /Limit	$\Sigma(\text{Power} / \text{Limit})$ of Bluetooth + WLAN	Verdict
Bluetooth	2480	0.0280	0.779	Pass
2.4G WIFI	2462	0.7510		

Note:

1. $\Sigma(\text{Power} / \text{Limit})$: This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for Bluetooth + 2.4G WIFI.
2. Both of the Bluetooth/2.4G WIFI can transmit simultaneously, the formula of calculated the Power is $CP1 / LP1 + CP2 / LP2 + \dots \text{etc.} < 1$
 CP = Calculation power
 LP = Limit of power
3. Both of the Bluetooth and 2.4G WIFI can't transmit simultaneously at same time.
4. The worst-case situation is 0.779, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
5. The DUT work frequency range used is 2400 MHz ~ 2483.5 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
6. More power list please refer to BL-SZ2380902-601~602 test report.

5.5 Conclusion

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

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--