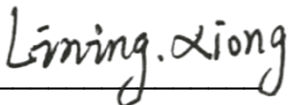


TEST REPORT

Applicant: Shanghai Xiangcheng Communication Technology Co.,Ltd
Address: 6th Floor, Building 10, No.3000 Longdong Avenue, Pudong New District, Shanghai
Equipment Type: POS
Model Name: N4
Brand Name: KOZEN
FCC ID: 2A2UU-N4
Test Standard: 47 CFR Part 2.1091
KDB 447498 D01 v06
Test Date: Nov. 20, 2024 - Dec. 05, 2024
Date of Issue: Jan. 02, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining**Checked by:** Xu Rui**Approved by:** Tolan Tu
(Testing Director)

Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Jan. 02, 2025</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	☐ 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	Shanghai Xiangcheng Communication Technology Co.,Ltd
Address	6th Floor, Building 10, No.3000 Longdong Avenue, Pudong New District, Shanghai

2.2 Manufacturer Information

Manufacturer	Shanghai Xiangcheng Communication Technology Co.,Ltd
Address	6th Floor, Building 10, No.3000 Longdong Avenue, Pudong New District, Shanghai

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	POS
Model Name Under Test	N4
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N40005152511000
Software Version	6101.30.001.241.00
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	2G Network GPRS/EDGE 850/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network LTE FDD Band 2/4/5/7/12/17/25/26 LTE TDD Band 38/41 Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g and 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/HT40), 802.11ac(VHT20/HT40) 5.8G SRD, NFC, GPS, BDS, GLONASS, Galileo
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	GSM, WCDMA, LTE, Bluetooth, WIFI		
Frequency Range	Bluetooth	2400 ~ 2483.5 MHz	
	2.4G WIFI	2400 ~ 2483.5 MHz	
	5G WIFI	U-NII-1: 5150 ~ 5250MHz U-NII-2A: 5250 ~ 5350MHz U-NII-2C: 5470 ~ 5725MHz U-NII-3: 5725 ~ 5850MHz	
	GSM850	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	GSM1900	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA B2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA B4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	WCDMA B5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE B2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE B4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE B5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE B7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
	LTE B12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE B17	TX: 704 ~ 716 MHz	RX: 734 ~ 746 MHz
	LTE B25	TX: 1850 ~ 1915 MHz	RX: 1930 ~ 1995 MHz
	LTE B26	TX: 814 ~ 849 MHz	RX: 859 ~ 894 MHz
	LTE B38	TX: 2570 ~ 2620 MHz	RX: 2570 ~ 2620 MHz
	LTE B41	TX: 2535 ~ 2655 MHz	TX: 2535 ~ 2655 MHz
Antenna Type	Bluetooth	PIFA Antenna	
	WIFI	PIFA Antenna	
	WWAN	PIFA Antenna	
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 D01 v06	447498 D01 General RF Exposure Guidance D01 v06

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 D01 General RF Exposure Guidance v06 Limit

Devices operating in standalone mobile exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When the categorical exclusion provision of § 2.1091(e) applies, the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

Limits for General Population/ Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (H)(A/m)	Power Density (S)(mW/cm ²)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f ²)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0

MPE calculation formula

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density

P = output power (Mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Separation distance between radiator and human body (cm)

5 ASSESSMENT RESULT

5.1 Output Power

Bluetooth					
Mode	GFSK	$\pi/4$ -DQPSK	8-DPSK	BLE 1Mbps	BLE 1Mbps
Conducted Power (dBm)	9.25	8.38	8.35	-1.05	-0.89
Antenna Gain (dBi)	2.59	2.59	2.59	2.59	2.59
EIRP (dBm)	11.84	10.97	10.94	1.54	1.70
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH24B0858-601 and BL-SH24B0858-602 for more details.					

WIFI					
Mode	2.4GWIFI	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
Conducted Power (dBm)	24.01	14.42	14.26	14.41	14.33
Antenna Gain (dBi)	2.59	1.45	1.41	2.74	2.80
EIRP (dBm)	26.60	15.87	15.67	17.15	17.13
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH24B0858-603 and BL-SH24B0858-604 for more details.					

GSM					
Mode	Burst Average Power(dBm)		Division	Frame-Averaged power (dBm)	
	GSM 850	GSM 1900	Factors	GSM 850	GSM 1900
GSM (GMSK, 1-Slot)	N/A	N/A	9.19	N/A	N/A
GPRS (GMSK, 1-Slot)	31.70	20.09	9.19	22.51	10.90
GPRS (GMSK, 2-Slots)	31.31	20.08	6.13	25.18	13.95
GPRS (GMSK, 3-Slots)	29.94	20.07	4.42	25.52	15.65
GPRS (GMSK, 4-Slots)	28.86	20.06	3.18	25.68	16.88
EGPRS (8PSK, 1-Slot)	28.26	20.37	9.19	19.07	11.18
EGPRS (8PSK, 2-Slots)	26.16	20.20	6.13	20.03	14.07
EGPRS (8PSK, 3-Slots)	23.78	19.79	4.42	19.36	15.37
EGPRS (8PSK, 4-Slots)	22.18	19.95	3.18	19.00	16.77
Antenna Gain (dBi)	0.13	0.76	N/A	0.13	0.76
MAX ERP/EIRP (dBm)	29.68	21.13	N/A	23.66	17.64
Note: This report listed the worst Transmitter output power value, please refer to BL-SH24B0858-501 report for more details.					

WCDMA			
Mode	Band 2	Band 4	Band 5
Conducted Power (dBm)	21.81	22.02	21.99
Antenna Gain (dBi)	0.76	-0.13	0.13
ERP/EIRP (dBm)	22.57	21.89	19.97
Note: This report listed the worst case conducted power value, please refer to RF test report No.BL-SH24B0858-501 for more details.			

LTE										
Mode	Band 2	Band 4	Band 5	Band 7	Band 12	Band 17	Band 25	Band 26	Band 38	Band 41
Conducted Power (dBm)	23.20	23.37	23.10	23.28	22.87	22.87	23.31	22.86	23.44	23.62
Antenna Gain (dBi)	0.76	-0.13	0.13	1.19	-1.74	-1.54	0.76	0.49	1.04	1.04
ERP/EIRP (dBm)	23.96	23.24	21.08	24.47	18.98	19.18	24.07	21.2	24.48	24.66
Note: This report listed the worst case conducted power value, please refer to RF test report No.BL-SH24B0858-501 for more details.										

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
GSM	GSM 850	【24.50,26.50】	/	【22.48,24.48】
	GSM 1900	【16.00,18.00】	【16.76,18.76】	【14.61,16.61】
WCDMA	Band 2	【21.00,23.00】	【21.76,23.76】	【19.61,21.61】
	Band 4	【21.00,23.00】	【20.87,22.87】	【18.72,20.72】
	Band 5	【21.00,23.00】	/	【18.98,20.98】
LTE	Band 2	【22.00,24.00】	【22.76,24.76】	【20.61,22.61】
	Band 4	【22.50,24.50】	【22.37,24.37】	【20.22,22.22】
	Band 5	【22.00,24.00】	/	【19.98,21.98】
	Band 7	【22.50,24.50】	【23.69,25.69】	【21.54,23.54】
	Band 12	【22.00,24.00】	/	【18.11,20.11】
	Band 17	【22.00,24.00】	/	【18.31,20.31】
	Band 25	【22.50,24.50】	【23.26,25.26】	【21.11,23.11】
	Band 26	【22.00,24.00】	/	【20.34,22.34】
	Band 38	【22.50,24.50】	【23.54,25.54】	【21.39,23.39】
	Band 41	【22.50,24.50】	【23.54,25.54】	【21.39,23.39】
Bluetooth		【8.00,10.00】	【10.59,12.59】	【8.44,10.44】
2.4GWIFI		【22.50,24.50】	【25.09,27.09】	【22.94,24.94】
5GWIFI (U-NII-1: 5150-5250MHz)		【13.00,15.00】	【14.45,16.45】	【12.30,14.30】
5GWIFI (U-NII-2A: 5250-5350MHz)		【13.00,15.00】	【14.41,16.41】	【12.26,14.26】
5GWIFI (U-NII-2C: 5470-5725MHz)		【13.00,15.00】	【15.74,17.74】	【13.59,15.59】
5GWIFI (U-NII-3: 5725-5850MHz)		【13.00,15.00】	【15.80,17.80】	【13.65,15.65】
Note1: ERP= EIRP -2.15dB.				
Note2: According KDB 447498 D01, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.				

5.3 RF Exposure Evaluation Result

Evolution mode		f(MHz)	Distance (cm)	Max Tune up(dBm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	P/Plimit	Verdict
GSM	GSM 850	824	20	26.50	0.0889	0.55	0.1616	Pass
	GSM 1900	1850	20	18.00	0.0126	1.00	0.0126	Pass
WCDMA	Band 2	1850	20	23.00	0.0397	1.00	0.0397	Pass
	Band 4	1710	20	23.00	0.0397	1.00	0.0397	Pass
	Band 5	824	20	23.00	0.0397	0.55	0.0722	Pass
LTE	Band 2	1850	20	24.00	0.0500	1.00	0.0500	Pass
	Band 4	1710	20	24.50	0.0561	1.00	0.0561	Pass
	Band 5	824	20	24.00	0.0500	0.55	0.0909	Pass
	Band 7	2500	20	24.50	0.0561	1.00	0.0561	Pass
	Band 12	699	20	24.00	0.0500	0.47	0.1064	Pass
	Band 17	704	20	24.00	0.0500	0.47	0.1064	Pass
	Band 25	1850	20	24.50	0.0561	1.00	0.0561	Pass
	Band 26	814	20	24.00	0.0500	0.54	0.0926	Pass
	Band 38	2570	20	24.50	0.0561	1.00	0.0561	Pass
	Band 41	2535	20	24.50	0.0561	1.00	0.0561	Pass
Bluetooth	Bluetooth	2400	20	10.44	0.0022	1.00	0.0022	Pass
WLAN	2.4GWIFI	2400	20	24.94	0.0621	1.00	0.0621	Pass
	5GWIFI (U-NII-1: 5150-5250MHz)	5150	20	15.00	0.0063	1.00	0.0063	Pass
	5GWIFI (U-NII-2A: 5250-5350MHz)	5250	20	15.00	0.0063	1.00	0.0063	Pass
	5GWIFI (U-NII-2C: 5470-5725MHz)	5470	20	15.00	0.0063	1.00	0.0063	Pass
	5GWIFI (U-NII-3: 5725-5850MHz)	5725	20	15.00	0.0063	1.00	0.0063	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency (MHz)	Power /Limit	$\Sigma(\text{Power} / \text{Limit})$ of GSM850 + WLAN	Verdict
GSM850	824MHz ~ 849MHz	0.1616	0.2237	Pass
2.4G WIFI	2400MHz ~ 2483.5MHz	0.0621		

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+ WLAN+WWAN.
2. Both of the 850MHz/2.4GHz or 850MHz/5GHz can transmit simultaneously, the formula of calculated the Power is

$$\text{CP1} / \text{LP1} + \text{CP2} / \text{LP2} + \dots \text{etc.} < 1$$

CP = Calculation power
LP = Limit of power
3. Both of the 2.4GHz WIFI and 5GHz WIFI can't transmit simultaneously at same time.
4. The worst-case situation is 0.2237, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D01 Power limit.
5. The DUT work frequency range used is 824 MHz ~ 849 MHz, 1850 MHz ~ 1915 MHz, 1710 MHz ~ 1780 MHz, 2500 MHz ~ 2570 MHz, 699 MHz ~ 716 MHz, 2570 MHz ~ 2620 MHz, 2535 MHz ~ 2655 MHz, 2400MHz ~ 2483.5 MHz, 5150MHz ~ 5250 MHz, 5250MHz ~ 5350 MHz, 5470MHz ~ 5725MHz, 5725MHz ~ 5850 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 RF 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.
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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.
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7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--