

TEST REPORT

Applicant: Shanghai Xiangcheng Communication Technology Co., Ltd
Address: 6th Floor, Building 10, No.3000, Longdong Avenue, Pudong New District, Shanghai
Equipment Type: Smart Electronic Cash Register
Model Name: D8C
Brand Name: KOZEN
FCC ID: 2A2UU-D8CA
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: N/A
Test Date: N/A
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ISSUED BY:

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Revision History

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<u>Rev. 01</u>	<u>Jul. 30, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Address	1-2/F., Building 1, No.222, Xuanlan Road, Xuanqiao, Pudong New District, Shanghai, China

1.2 Test Location

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Location	1-2/F., Building 1, No.222, Xuanlan Road, Xuanqiao, Pudong New District, Shanghai, China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1352. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 29671.

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 General Description for Equipment under Test (EUT)

EUT Name	Smart Electronic Cash Register
Model Name Under Test	D8C
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	D08C1_MAIN_PCB V1.0
Software Version	D08C1_kozen_combo
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	Bluetooth(BR+EDR+BLE) 2.4G WIFI 802.11b,802.11g,802.11n(HT20/40) 5G WIFI 802.11a,802.11n(HT20/40),802.11ac(VHT20/40/80)
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth, WIFI	
Frequency Range	Bluetooth	2402 ~ 2480 MHz
	2.4G WIFI	2412 ~ 2462 MHz
	5G WIFI	U-NII-1: 5150 ~ 5250MHz U-NII-2A: 5250 ~ 5350MHz U-NII-2C: 5470 ~ 5725MHz U-NII-3: 5725 ~ 5850MHz
Antenna Type	Bluetooth	PIFA
	WIFI	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	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

3.2 Limit Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices

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_{20cm} 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

Bluetooth					
Mode	GFSK	$\pi/4$ DQPSK	8-DPSK	BLE 1Mbps	BLE 2Mbps
Conducted Power (dBm)	13.06	13.12	13.12	-1.14	-0.74
Antenna Gain (dBi)	1.87	1.87	1.87	1.87	1.87
EIRP (dBm)	14.93	14.99	14.99	0.73	1.13
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH2530291-601 and BL-SH2530291-602 for more details.					

WLAN					
Mode	2.4G WIFI Max	5G WIFI(U-NII-1) Max	5G WIFI(U-NII-2A) Max	5G WIFI(U-NII-2C) Max	5G WIFI(U-NII-3) Max
Conducted Power (dBm)	24.19	15.23	15.23	15.22	15.34
Antenna Gain (dBi)	1.87	2.32	1.84	2.64	2.60
EIRP (dBm)	26.06	17.55	17.07	17.86	17.94
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH2530291-603 and BL-SH2530291-604 for more details.					

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	【12.00,14.00】	【13.87,15.87】	【11.72,13.72】
2.4G WIFI	【23.00,25.00】	【24.87,26.87】	【22.72,24.72】
5G WIFI (U-NII-1: 5150-5250MHz)	【14.00,16.00】	【16.32,18.32】	【14.17,16.17】
5G WIFI (U-NII-2A: 5250-5350MHz)	【14.00,16.00】	【15.84,17.84】	【13.69,15.69】
5G WIFI (U-NII-2C: 5470-5725MHz)	【14.00,16.00】	【16.64,18.64】	【14.49,16.49】
5G WIFI (U-NII-3: 5725-5850MHz)	【14.00,16.00】	【16.60,18.60】	【14.45,16.45】
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	Frequency (MHz)	Distance (cm)	Maximum power (dBm)	Maximum power (mW)	Threshold Power (mW)	P/P _{limit}	Verdict
Bluetooth	2412	20	14.00	25.12	3060.00	0.0082	Pass
2.4G WIFI	2402	20	25.00	316.23	3060.00	0.1033	Pass
5G WIFI(U-NII-1: 5150-5250MHz)	5150	20	16.17	41.40	3060.00	0.0135	Pass
5G WIFI(U-NII-2A: 5250-5350MHz)	5250	20	16.00	39.81	3060.00	0.0130	Pass
5G WIFI(U-NII-2C: 5470-5725MHz)	5470	20	16.49	44.57	3060.00	0.0146	Pass
5G WIFI(U-NII-3: 5725-5850MHz)	5725	20	16.45	44.16	3060.00	0.0144	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency(MHz)	Power /Limit	$\Sigma(\text{Power} / \text{Limit})$ of Bluetooth + WLAN	Verdict
Bluetooth	2402 MHz ~ 2480 MHz	0.0082	0.1115	Pass
2.4G WIFI	2412 MHz ~ 2462 MHz	0.1033		

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.
2. Both of the Bluetooth+ WLAN 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 2.4GHz WIFI and 5GHz WIFI can't transmit simultaneously at same time.
4. The worst-case situation is 0.1115, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
5. 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 Testing Center 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.
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