

Report No.:SHCR230700145205

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# TEST REPORT

**Application No.:** SHCR2307001452AT

FCC ID: 2AH25T6810 IC: 22621-T6810

Applicant: Shanghai Sunmi Technology Co., Ltd.

**Address of Applicant:** Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China

Manufacturer: Shanghai Sunmi Technology Co., Ltd.

**Address of Manufacturer:** Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China

**Equipment Under Test (EUT):** 

**EUT Name:** Smart POS system

Model No.: T6810

HVIN: T6810, T6810H, T6810M

Trade Mark: **SUNMI** 

47 CFR Part 15, Subpart C 15.225 Standard(s):

RSS-210 Issue 10 Amendment (April 2020)

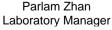
RSS-Gen Issue 5 Amendment 2 (February 2021)

2023-06-07 **Date of Receipt:** 

**Date of Test:** 2023-06-26 to 2023-07-01

Date of Issue: 2023-07-03

Test Result: Pass\*



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record							
Version	Description	Date	Remark					
00	Add new configuration SKU3.	2023-07-03	Based on KSCR221000185705					

Authorized for issue by:			
	Michael Nil		
	Micheal Niu / Project Engineer	-	
	Parlam Zhan		
	Parlam Zhan / Reviewer	-	



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#### 2 **Test Summary**

Radio Spectrum Matter Part								
Item	FCC Requirement	IC Requirement	Method	Result				
Radiated Emissions(9kHz- 30MHz)	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.4&6.5	Pass				
Radiated Emissions(30MHz- 1GHz)	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.4&6.5	Pass				

### Remark:

Compared with the original report, this report added new configuration SKU3. Compared with SKU1, SKU3 removed code scanning probe, also added one alternative screen and battery. Considering the differences, only test Radiated Emissions (30MHz-1GHz), Radiated Emissions (9kHz-30MHz), other test data please refer to original report.

Note: SKU1: T6810H, SKU2: T6810, SKU3: T6810M



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## **General Information**

#### 4.1 Details of E.U.T.

 Dotallo of Eloiti	
Power supply:	DC 5V 1A; DC 5V 2A
Adapter information:	Adapter 1:  Model: TPA-46B050100UU Input: 100-240V~ 50/60Hz 0.2A Output: 5.0V 1.0A Adapter 2: Model: TPA-23A050200UU01 Input: 100-240V~ 50/60Hz 0.3A Output: 5.0V 2.0A Adapter 3: Model No.: UC11US PRI: 100-240V~50/60Hz 0.2A SEC: 5.0V 1.0A 5.0W
Battery information:	Model 1: TMPA 1ICP6/59/63 Nominal Voltage: 3.8V Limited Charge Voltage: 4.35V Rated Capacity: 2900mAh Model 2: TMPC 1ICP6/59/63 Nominal Voltage: 3.8V Limited Charge Voltage: 4.35V Rated Capacity: 2900mAh
Operation Frequency:	13.56MHz
Channel Number:	1
Modulation Type:	ASK
Antenna Type:	Loop Antenna
SN:	PC10E35P10028
Firmware version:	V1.0.0

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.			
	-					
The EUT has been tested as an independent unit.						



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## 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 <sup>-8</sup>
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	DE Dadiated Dawer	5.2dB (Below 1GHz)
5	RF Radiated Power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
6	Radiated Spurious Emission Test	4.5dB (30MHz-1GHz)
0		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
7	Temperature Test	1°C
8	Humidity Test	3%
9	Supply Voltages	1.5%
10	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

- 1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
- 2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

### A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

### • FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

### • ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

## • VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

### 4.6 Deviation from Standards

None

### 4.7 Abnormalities from Standard Conditions

None



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#### **Equipment List** 5

RF Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2022-12-20	2023-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2022-12-20	2023-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2021-09-11	2023-09-10
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2022-05-07	2024-05-06
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022-08-11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2021-09-18	2023-09-17
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2021-09-18	2023-09-17
Pre-Amplifier	HP	8447D	SHEM236-1	2022-08-02	2023-08-01
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2022-12-20	2023-12-19
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2021-05-25	2024-05-24
RE test Cable	/	RE01, RE02, RE06	/	2023-01-07	2024-01-06
Test software	FARAD	EZ_EMC	1.1.4.2	/	/



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## 6 Radio Spectrum Matter Test Results

## 6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in these three bands (9-90kHz,110-490kHz and Above 1GHz) are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

### 6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	07	TX mode_Keep the EUT in transmitting with modulation mode.



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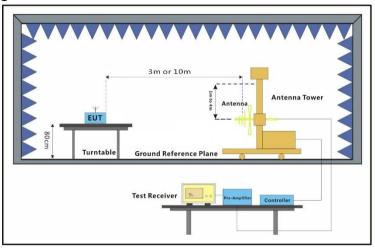
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### 6.1.3 Test Setup Diagram



### 6.1.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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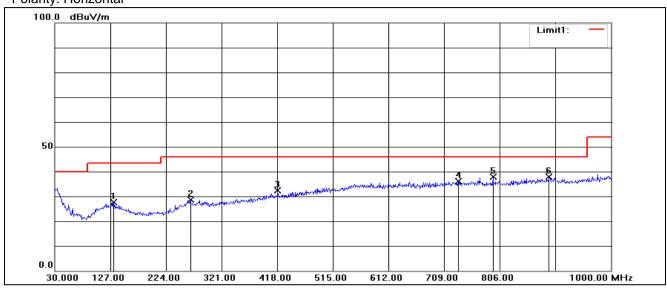
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Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	132.8200	8.24	19.29	27.53	43.50	-15.97	QP
2	266.6800	7.85	20.78	28.63	46.00	-17.37	QP
3	418.9700	8.31	24.04	32.35	46.00	-13.65	QP
4	734.2200	33.62	2.42	36.04	46.00	-9.96	QP
5	794.3600	35.67	2.21	37.88	46.00	-8.12	QP
6	892.3300	35.42	2.44	37.86	46.00	-8.14	QP



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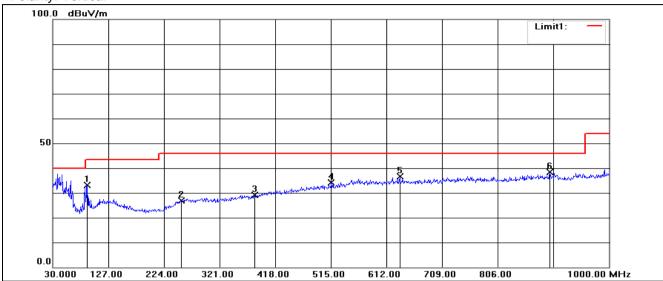
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No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	90.1400	18.19	14.87	33.06	43.50	-10.44	QP
2	254.0700	6.79	20.07	26.86	46.00	-19.14	QP
3	382.1100	6.56	22.52	29.08	46.00	-16.92	QP
4	515.9700	8.15	25.92	34.07	46.00	-11.93	QP
5	635.2800	9.00	27.73	36.73	46.00	-9.27	QP
6	897.1800	35.87	2.48	38.35	46.00	-7.65	QP



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### 6.2 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30

#### **Below 30MHz**

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40log\{d_{(near field)}/d_{(10m)}\} + 20log\{d_{(30/300m)}/d_{(near field)}\}$$
(2)

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20log\{d_{(30/300m)}/d_{(10m)}\}$$
(3)

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40log\{d_{(30/300m)}/d_{(10m)}\}$$
(4)

Remark:

 $d_{near field} = 47.77 / f_{MHz}$ 

where f<sub>MHz</sub> is the frequency of the emission being measured in MHz.

#### Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor



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$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left( \frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

 $FS_{limit}$  is the calculation of field strength at the limit distance, expressed in dB $\mu$ V/m

FS<sub>max</sub> is the measured field strength, expressed in dBμV/m  $d_{\text{measure}}$  is the distance of the measurement point from the EUT is the reference distance or the distance of the  $\lambda/2\pi$  point

### 6.2.1 E.U.T. Operation

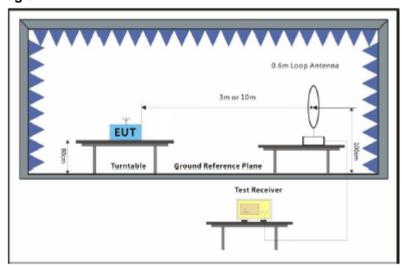
Operating Environment:

Temperature: 23.5 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

### 6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	07	TX mode_Keep the EUT in transmitting with modulation mode.

### 6.2.3 Test Setup Diagram



### 6.2.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



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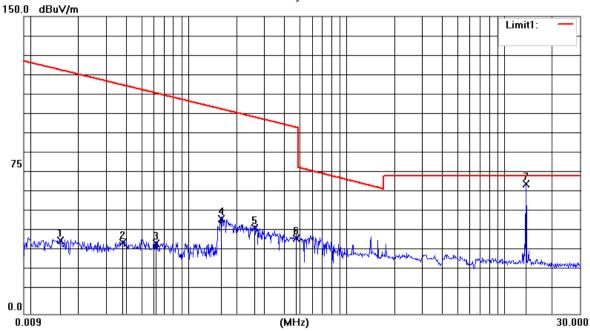
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Item	Freq.	Read Level	Correct Factor	Result Level@3m	Result Level@SPEC	Limit Line@SPEC	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0154	21.08	15.94	37.02	-42.98	42.98	-85.96	QP
2	0.0381	20.31	15.69	36.00	-44.00	35.34	-79.34	QP
3	0.0616	20.03	15.43	35.46	-44.54	31.29	-75.83	QP
4	0.1597	33.54	14.45	47.99	-32.01	23.25	-55.26	QP
5	0.2590	28.99	14.44	43.43	-36.57	19.18	-55.75	QP
6	0.4786	23.66	14.42	38.08	-41.92	14.00	-55.92	QP
7	13.5600	52.25	13.13	65.38	25.38	84.00	-58.62	Peak



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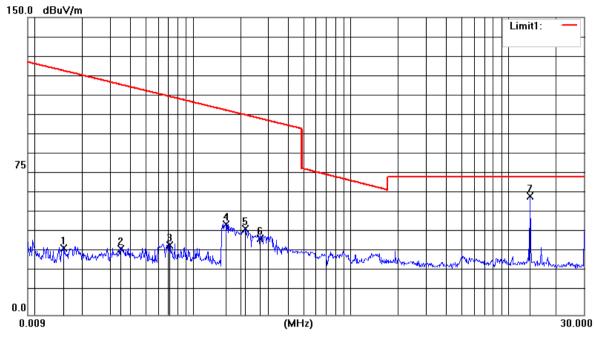
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## Polarity:Coplanar



Item	Freq.	Read Level	Correct Factor	Result Level@3m	Result Level@SPEC	Limit Line@SPEC	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0151	17.54	15.94	33.48	-46.52	43.14	-89.66	QP
2	0.0347	17.47	15.73	33.20	-46.80	36.13	-82.93	QP
3	0.0710	19.78	15.32	35.10	-44.90	30.09	-74.99	QP
4	0.1615	30.98	14.45	45.43	-34.57	23.16	-57.73	QP
5	0.2140	28.77	14.44	43.21	-36.79	20.79	-57.58	QP
6	0.2655	24.15	14.44	38.59	-41.41	18.97	-60.38	QP
7	13.5600	46.78	13.13	59.91	19.91	84.00	-64.09	Peak



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#### **Test Setup Photo** 7

Refer to Appendix - Test Setup Photo for SHCR2307001452AT

#### **EUT Constructional Details (EUT Photos)** 8

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2307001452AT

End of the Report -



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