

Report No.:SHCR230700145206

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TEST REPORT

Application No.: SHCR2307001452AT

FCC ID: 2AH25T6810

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 2

Standard(s): 47 CFR Part 22 subpart H

47 CFR Part 24 subpart E

Date of Receipt: 2023-06-07

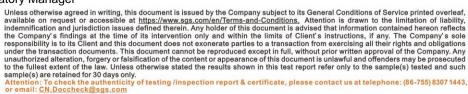
Date of Test: 2023-06-26 to 2023-07-01

Date of Issue: 2023-07-03

Test Result: Pass*

parlan 2han

Parlam Zhan Laboratory Manager



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^{*} 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 KSCR221000185706				

Authorized for issue by:		
	hichael Mil	
	Micheal Niu / Project Engineer	
	Parlam Zhan	
	Parlam Zhan / Reviewer	



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Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Radiated spurious emissions	§2.1051, §22.917, §24.238	≤ -13dBm	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 difference, only test Radiated spurious emissions in this report, 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.

	Details of L.O.1.				
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				
Test voltage:	DC 3.8V				
Serial Number:	PC10E35P10028				
Firmware version:	V1.0.0				
Sample Type:	Portable production				
Support Network:	GSM, GPRS, EGPRS				
Operation Frequency Band:	GSM850/GSM1900				
Modulation Type:	GMSK for GSM/GPRS/EGPRS 8PSK for EGPRS				
GPRS Class:	12				
EGPRS Class:	12				
Antenna Type:	FPC Antenna				
Antenna Gain:	GSM850: -1.60dBi (Provided by the manufacturer) GSM1900: -0.20dBi (Provided by the manufacturer)				
Extreme temp. Tolerance:	-10°C to +50°C				
Extreme vol. Limits:	3.46V DC to 4.35V DC (nominal: 3.8V DC)				
IMEI:	863407060071936				



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4.2 Test Frequency

Test mode:	TX / RX	RF Channel				
rest mode.	IA/KA	Low (L)	Middle (M)	High (H)		
	TX	Channel 128	Channel 190	Channel 251		
GSM850	1.4	824.2MHz	836.6 MHz	848.8 MHz		
GSIVIOSU	RX	Channel 128	Channel 190	Channel 251		
		869.2 MHz	881.6 MHz	893.8 MHz		
Test mode:	TX / RX	RF Channel				
rest mode:		Low (L)	Middle (M)	High (H)		
	TX	Channel 512	Channel 661	Channel 810		
CCM4000		1850.2MHz	1880.0 MHz	1909.8 MHz		
GSM1900	DV	Channel 512	Channel 661	Channel 810		
	RX	1930.2 MHz	1960.0 MHz	1989.8 MHz		

4.3 Test Environment

Environment Parameter	Selected Values During Tests		
Relative Humidity		48%	
Atmospheric Pressure:	101kPa		
Temperature:	TN	25 °C	
	VL	3.46V	
Voltage:	VN	3.80V	
	VH	4.35V	

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

TN= normal temperature

4.4 Description of Support Units

The EUT has been tested as an independent unit.



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4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
0	DC Dedicted Dower	5.2dB (Below 1GHz)
8	RF Radiated Power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
9	Padiated Spurious Emission Test	4.5dB (30MHz-1GHz)
9	Radiated Spurious Emission Test	5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	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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4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xingiao, Songjiang, 201612 Shanghai, China

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

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).

4.7 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.

4.8 Deviation from Standards

4.9 Abnormalities from Standard Conditions

None



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Equipment List 5

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test	ivianulacturer	Wodel No	inventory NO	Cai Date	Cai Due Date
Spectrum Analyzer	R&S	FSP-30	CHEMOOD 4	2022 42 20	2022 42 40
			SHEM002-1	2022-12-20	2023-12-19
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2022-12-20	2023-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2022-08-02	2023-08-01
Signal Generator	R&S	SMR20	SHEM006-1	2022-08-02	2023-08-01
Signal Generator	Agilent	N5182A	SHEM182-1	2022-08-02	2023-08-01
Communication Tester	R&S	CMW270	SHEM183-1	2023-06-01	2024-05-31
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2022-08-02	2023-08-01
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2022-11-08	2024-11-07
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2022-12-20	2023-12-19
DC Power Supply	MCH	MCH-303A	SHEM210-1	2022-12-20	2023-12-19
Conducted test Cable	/	RF01~RF04	/	2022-12-20	2023-12-19
Switcher	Tonscend	JS0806	SHEM184-1	2022-08-02	2023-08-01
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	/
Coaxial Cable	TST		SHEM263-1	2022-08-02	2023-08-01
Test software	TST	TST PASS	Version: 2.0	/	/
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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Radio Spectrum Matter Test Results 6

Field strength of spurious radiation

Test Requirement: §2.1051, §22.917, §24.238,

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm

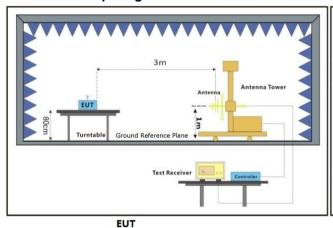
6.1.1 E.U.T. Operation

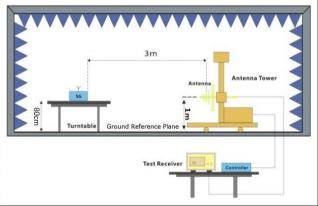
Operating Environment:

Temperature: 22.7 °C Humidity: 68.2 % RH Atmospheric Pressure: 1030 mbar

Tx mode, Keep the EUT in transmitting mode. Test mode:

6.1.2 Test Setup Diagram





Substiute Antenna+Signal Generator



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6.1.3 Measurement Procedure and Data

Test Procedure:

- (1)On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- (2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3) The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6) The transmitter shall than be rotated through 360 in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8) The maximum signal level detected by the measuring receiver shall be noted.
- (9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11) The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12) The substitution antenna shall be connected to a calibrated signal generator.
- (13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15) The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16) The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

Remark: We have evaluated different adapters and battery modes. The battery mode is the worst, and only the battery mode is tested finally.



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	GSM850-Low channel						
Frequency	Level	Limit	Over Limit	Polarization			
(MHz)	(dBm)	(dBm)	(dB)				
1648.400	-53.17	-13	-40.17	Horizontal			
2472.600	-56.49	-13	-43.49	Horizontal			
3296.800	-52.88	-13	-39.88	Horizontal			
1648.400	-56.61	-13	-43.61	Vertical			
2472.600	-58.54	-13	-45.54	Vertical			
3296.800	-57.39	-13	-44.39	Vertical			

GSM850-Middle channe					
Frequency	Level	Limit	Over Limit	Polarization	
(MHz)	(dBm)	(dBm)	(dB)		
1672.800	-58.78	-13	-45.78	Horizontal	
2509.200	-61.88	-13	-48.88	Horizontal	
3345.600	-58.56	-13	-45.56	Horizontal	
1672.800	-53.78	-13	-40.78	Vertical	
2509.200	-62.14	-13	-49.14	Vertical	
3345.600	-56.96	-13	-43.96	Vertical	

GSM850- High channel					
Frequency	Level	Limit	Over Limit	Polarization	
(MHz)	(dBm)	(dBm)	(dB)		
1697.600	-58.45	-13	-45.45	Horizontal	
2546.400	-62.38	-13	-49.38	Horizontal	
3395.200	-52.52	-13	-39.52	Horizontal	
1697.600	-59.67	-13	-46.67	Vertical	
2546.400	-61.13	-13	-48.13	Vertical	
3395.200	-56.38	-13	-43.38	Vertical	



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GSM1900-Low channel						
Frequency	Level	Limit	Over Limit	Polarization		
(MHz)	(dBm)	(dBm)	(dB)			
3700.400	-46.69	-13	-33.69	Horizontal		
5550.600	-49.34	-13	-36.34	Horizontal		
7400.800	-46.35	-13	-33.35	Horizontal		
3700.400	-46.27	-13	-33.27	Vertical		
5550.600	-47.56	-13	-34.56	Vertical		
7400.800	-48.87	-13	-35.87	Vertical		

GSM1900-Middle channel						
Frequency	Level	Limit	Over Limit	Polarization		
(MHz)	(dBm)	(dBm)	(dB)			
3760.000	-45.60	-13	-32.60	Horizontal		
5640.000	-50.00	-13	-37.00	Horizontal		
7520.000	-46.84	-13	-33.84	Horizontal		
3760.000	-49.15	-13	-36.15	Vertical		
5640.000	-52.52	-13	-39.52	Vertical		
7520.000	-48.04	-13	-35.04	Vertical		

GSM1900-High channel							
GOWI 900-MIGH CHAINTEI							
Frequency	Level	Limit	Over Limit	Polarization			
(MHz)	(dBm)	(dBm)	(dB)				
3819.600	-47.37	-13	-34.37	Horizontal			
5729.400	-52.89	-13	-39.89	Horizontal			
7639.200	-42.80	-13	-29.80	Horizontal			
3819.600	-46.26	-13	-33.26	Vertical			
5729.400	-52.51	-13	-39.51	Vertical			
7639.200	-44.63	-13	-31.63	Vertical			

Remark:

We have tested all modulation and all Bandwidth, but only the worst case data presented in this report.



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Test Setup Photo

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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