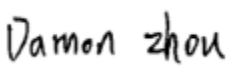
1 Cover Page

RF Exposure Evaluation Report

Application No.:	KSCR2309001745AT
FCC ID:	2AH25T1721
IC:	22621-T1721
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:	POS System
Model No.:	T1721
Standard(s) :	FCC Rules 47 CFR §2.1091 KDB 447498 D04 interim General RF Exposure Guidance v01 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt:	2023-09-26
Date of Test:	2023-11-01 to 2023-11-15
Date of Issue:	2023-11-16
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Revision Record			
Version	**Description**	***Date***	***Remark***
00	Original	2023-11-16	/

Authorized for issue by:				
Tested By		 **Damon_Zhou/Project Engineer**		
Approved By		 **Terry Hou /Reviewer**		

2 Contents

3 General Information

3.1 General Description of E.U.T.

Power supply:	Adapter Model: CYZS36-240150 Input: 100-240V~50/60Hz 1.5A Output: 24V 1.5A 36W Battery Model: LKPA Nominal Voltage: 7.2Vdc Limited Charge Voltage: 8.4V Rated Capacity: 2500mAh,18.0Wh Nominal Capacity: 2600mAh,18.72Wh
Serial Number:	DE06D38140087
Firmware Version:	D3mini_IO_V2.0

3.2 Details of E.U.T.

2.4G WLAN

Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	1.01 dBi(Provided by the manufacturer)

BT

Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	PIFA Antenna
Antenna Gain:	1.01 dBi(Provided by the manufacturer)

BLE

Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	1.01 dBi(Provided by the manufacturer)

5G WLAN

Operation Frequency/Number of channels (20MHz):	U-NII-1: 5180-5240MHz (4 Channels); U-NII-2A: 5260-5320MHz (4 Channels); U-NII-2C: 5500-5700MHz (11 Channels); U-NII-3: 5745-5825MHz (5 Channels)
Operation Frequency/Number of channels/(40MHz):	U-NII-1: 5190-5230MHz (2 Channels); U-NII-2A: 5270-5310MHz (2 Channels); U-NII-2C: 5510-5670MHz (5 Channels); U-NII-3: 5755-5795MHz (2 Channels)
Operation Frequency/Number of channels (80MHz):	U-NII-1: 5210MHz (1 Channel); U-NII-2A: 5290MHz (1 Channels); U-NII-2C: 5530-5610MHz (2 Channels); U-NII-3: 5775MHz (1 Channel)
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n/ac20: 20MHz; 802.11n/ac40: 40MHz; 802.11ac80: 80MHz
DFS Function:	Slave without Radar detection
Antenna Type:	PIFA Antenna
Antenna Gain:	U-NII-1:1.98dBi, U-NII-2A:2.07dBi, U-NII-2C:2.08dBi, U-NII-3:2.12dBi (Provided by the manufacturer)

13.56MHz

Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Loop Antenna

2G

Support Network:	GSM, GPRS, EGPRS
Operation Frequency Band:	GSM850/GSM1900
Modulation Type:	GMSK for GSM/GPRS/EGPRS 8PSK for EGPRS
GPRS Class:	8/10/12
EGPRS Class:	8/10/12
Antenna Type:	PIFA Antenna
Antenna Gain:	GSM850: -0.36dBi (Provided by the manufacturer) GSM1900: 3.62dBi (Provided by the manufacturer)

3G

Operation Frequency Band:	UMTS B2, B4, B5
Modulation Type:	UL QPSK, BPSK DL QPSK, BPSK
Antenna Type:	PIFA Antenna
Antenna Gain:	UMTS B2: 3.62dBi (Provided by the manufacturer) UMTS B4: 3.09dBi (Provided by the manufacturer) UMTS B5: -0.36dBi (Provided by the manufacturer)

4G

LTE Operation Frequency Band:	LTE Band 2,4,5,7,12,13,17,25,26,30,38,40,41,66,71
Modulation Type:	QPSK, 16QAM, 64QAM
Antenna Type:	PIFA Antenna
Antenna Gain:	Band 2:3.62dBi(Provided by the manufacturer) Band 4: 3.09dBi(Provided by the manufacturer) Band 5: -0.36dBi(Provided by the manufacturer) Band 7: 3.56dBi(Provided by the manufacturer) Band 12: -0.22dBi(Provided by the manufacturer) Band 13: 0.33dBi(Provided by the manufacturer) Band 17: -0.22dBi(Provided by the manufacturer) Band 25: 3.62dBi(Provided by the manufacturer) Band 26: -0.36dBi(Provided by the manufacturer) Band 30: 3.47dBi(Provided by the manufacturer) Band 38: 4.38dBi(Provided by the manufacturer) Band 40: 3.47dBi(Provided by the manufacturer) Band 41: 4.38dBi(Provided by the manufacturer) Band 66: 3.09dBi(Provided by the manufacturer) Band 71: -1.11dBi(Provided by the manufacturer)

3.3 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal 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).

3. Sample source: sent by customer.

3.4 Test Facility

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

- **A2LA**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

- **VCCI**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4 FCC Radiofrequency radiation exposure limits

According to§1.1310, The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842/f	4.89/f	*($900/f^2$)	<6
30–300	61.4	0.163	1.0	<6
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824/f	2.19/f	*($180/f^2$)	<30
30–300	27.5	0.073	0.2	<30
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

5 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W,For 5G device,the limit of worse case is 4.53W

For GSM850,the limit of worse case is 1.29W,For GSM1900,the limit of worse case is 2.24W,

For UMTS B2,the limit of worse case is 2.24W, For UMTS B4,the limit of worse case is 2.12W,

For UMTS B5,the limit of worse case is 1.29W, For LTE B2,the limit of worse case is 2.14W,

For LTE B4,the limit of worse case is 2.12W, For LTE B5,the limit of worse case is 1.29W,

For LTE B7,the limit of worse case is 2.75W, For LTE B12,the limit of worse case is 1.15W,

For LTE B13,the limit of worse case is 1.24W, For LTE B17,the limit of worse case is 1.16W,

For LTE B25,the limit of worse case is 2.24W, For LTE B26,the limit of worse case is 1.29W,

For LTE B30,the limit of worse case is 2.60W, For LTE B38,the limit of worse case is 2.80W,

For LTE B40,the limit of worse case is 2.60W, For LTE B41,the limit of worse case is 2.75W,

For LTE B66,the limit of worse case is 2.12W, For LTE B71,the limit of worse case is 1.11W,

6 Measurement and Calculation

6.1 Maximum transmit power

The Power Data is based on the RF Test Report KSCR230900174501, KSCR230900174502, KSCR230900174503, KSCR230900174504, KSCR230900174505, KSCR230900174506, KSCR230900174507, KSCR230900174508, KSCR230900174601, KSCR230900174602, KSCR230900174603.

6.2 MPE Calculation

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

1) P (mW)
2) R = distance to the center of radiation of antenna (in centimeter)

Test Mode	Max Tune up (dBm)	Max Tune up (W)	Antenna Gain (dBi)	Operation Distance R(cm)	Power Density (mW/cm2)	Limit of Power Density S(mW/cm2) for FCC	Result
LTE B2	24.50	0.282	3.62	20	0.129	1	Pass
LTE B4	24.50	0.282	3.09	20	0.114	1	Pass
LTE B5	24.50	0.282	-0.36	20	0.052	0.549	Pass
LTE B7	24.50	0.282	3.56	20	0.127	1	Pass
LTE B12	24.50	0.282	-0.22	20	0.053	0.466	Pass
LTE B13	24.50	0.282	0.33	20	0.060	0.518	Pass
LTE B17	24.00	0.251	-0.22	20	0.048	0.469	Pass
LTE B25	24.00	0.251	3.62	20	0.115	1	Pass
LTE B26	24.50	0.282	-0.36	20	0.052	0.543	Pass
LTE B30	20.00	0.100	3.47	20	0.044	1	Pass
LTE B38	24.00	0.251	4.38	20	0.137	1	Pass
LTE B40	20.00	0.100	3.47	20	0.044	1	Pass
LTE B41	20.00	0.100	4.38	20	0.055	1	Pass
LTE B66	25.50	0.355	3.09	20	0.144	1	Pass
LTE B71	24.50	0.282	-1.11	20	0.043	0.442	Pass
UMTS B2	25.00	0.316	3.62	20	0.145	1	Pass
UMTS B4	25.00	0.316	3.09	20	0.128	1	Pass
UMTS B5	25.00	0.316	-0.36	20	0.058	0.55	Pass
GSM850	24.50	0.282	-0.36	20	0.052	0.55	Pass
GSM1900	20.00	0.100	3.62	20	0.046	1	Pass

Test Mode	Max Tune up (dBm)	Max Tune up (W)	Antenna Gain (dBi)	Operation Distance R(cm)	Power Density (mW/cm2)	Limit of Power Density S(mW/cm2) for FCC	Result
Bluetooth	10.00	0.010	1.01	20	0.003	1	Pass
2.4G WLAN	17.50	0.056	1.01	20	0.014	1	Pass
5G WLAN	15.50	0.035	2.12	20	0.012	1	Pass

13.56MHz: 63.66dBuV/m@3m=0.0007mW

For FCC:
The 2.4GHz WLAN,BT,5GHz WLAN ,WWAN and 13.56MHz can transmit simultaneously, but the maximum rate of MPE is 0.014/1+0.003/1+0.012/1+0.145/1+0.0007/1=0.174≤1. So the device is exclusion from SAR test.

For IC:
The 2.4GHz WLAN,BT,5GHz WLAN ,WWAN and 13.56MHz can transmit simultaneously, but the maximum rate of MPE is 0.056/2.68+0.010/2.68+0.035/4.53+0.282/1.11+0.0007/1000=0.286≤1. So the device is exclusion from SAR test.

--End of the Report--