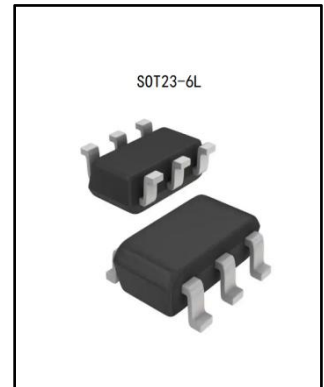


## Single-Key Touch Sensor IC

### SSP8011AM

#### General Description

The SSP8011AM is a low-cost and low-power single-key capacitive touch sensor IC, which provides single-channel touch sensing channels. Built-in voltage regulator circuit, few peripheral components, simple design, only a few components can complete the hardware design. Provides 2 output modes, high/low level output optional. It also provides a Reset function after a maximum button press time of 9 second . The sensitivity of the touch-sensitive keys can be adjusted as needed by adjusting the capacity of the external capacitance (CS), which increases the operability of the product and makes the design more flexible and versatile.



#### Features

- Single-Key Capacitive Touch sensor IC
- Operation Voltage: 2.3V~5.5V
- Power consumption: VDD=3V No load, typical value 2.5 $\mu$ A, maximum value 5.0 $\mu$ A
- Max Response time :160ms at low power mode@VDD=3V; 70ms at fast mode @VDD=3V;
- Sensitivity can adjust by the cap:acitance(0~50pF) outside
- Output mode selection: synchronous output or toggle output; CMOS output effective level selection: Active High/Low.
- Maximum output time of key: 9 seconds
- Automatic adaptation of ambient temperature and humidity changes
- Strong anti-EMC interference capability

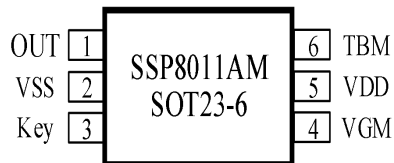
#### Applications

- Household appliance
- Consumer electronics
- Security and building products
- Healthcare products
- Handheld device
- Industrial control, lighting products
- Toys and computer peripherals

## Order specification

Part No	Package	Manner of Packing	Devices per bag/reel
SSP8011AM	SOT23-6L	Reel	3000PCS

## Pin Arrangement Diagram



No.	Name	In/Out	Pin Description
1	OUT	O	CMOS output pin
2	VSS	P	Ground
3	Key	I/O	Input sensor port
4	VGM	I-PL	VGM connect to VDD, OUT is active low output VGM connect to VSS, OUT is active high output
5	VDD	P	Power input pin
6	TBM	I-PL	OUT pin mode selection TBM connect to VDD, OUT is Toggle mode TBM connect to VSS, OUT is Synchronous mode

## Absolute Maximum Ratings

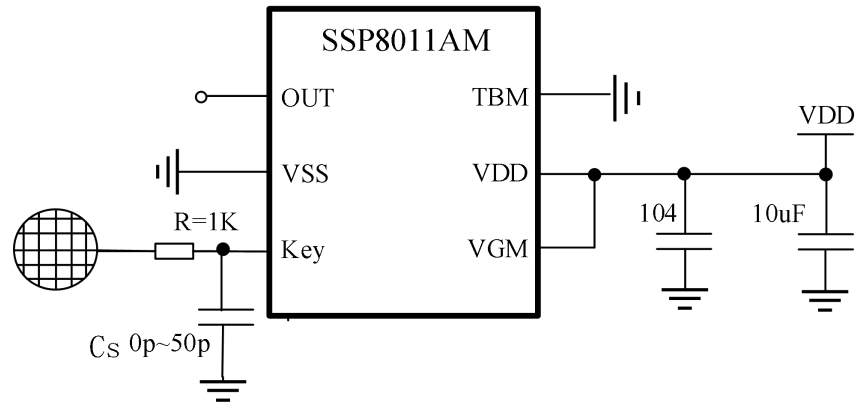
Parameter	Symbol	Value	Unit
Supply voltage	$V_{DD}$	$V_{SS}-0.3 \sim V_{SS}+5.5$	V
Input voltage	$V_{IN}$	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
CS Induced capacitance range	$C_s$	0~50	pF
Operating temperature	$T_{amb}$	-20 ~ +85	°C
Storage temperature	$T_{stg}$	-40 ~ +125	°C

## Electrical Characteristics

Ta=25°C

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		VDD	Conditions				
Operating Voltage	V <sub>DD</sub>	-	-	2.3	3.0	5.5	V
Power Supply Current	I <sub>DD</sub>	3V, Low power mode		-	2.5	5.0	μA
		3V, Fast mode		-	5.0	10.0	μA
Enter Low Power mode after no activity time	T <sub>r</sub>	V <sub>DD</sub> =3.0V		-	12	-	S
Initialization Time of Power On	T <sub>ini</sub>	V <sub>DD</sub> =3.0V		-	400	-	ms
Output Response Time	T <sub>re</sub>	3V, Low power mode		-	160	-	ms
		3V, Fast mode		-	70	-	ms
Input Low Voltage Threshold	V <sub>IL</sub>	-		0	-	0.2	V
Input High Voltage Threshold	V <sub>IH</sub>	-		0.8	-	1.0	V
Output Current of Source	I <sub>OH</sub>	3V	V <sub>OH</sub> =2.7V	-	0.4	-	mA
		5V	V <sub>OH</sub> =4.5V	-	1.1	-	mA
Output Current of Sink	I <sub>OL</sub>	3V	V <sub>OL</sub> =0.3V	-	-19	-	mA
		5V	V <sub>OL</sub> =0.5V	-	-42	-	mA
LVR Voltage	V <sub>rst</sub>			-	1.5	-	V

## Application Circuits



## FUNCTIONAL DESCRIPTION

The total loading of electrode size and capacitance of connecting line on PCB can affect the sensitivity. So the sensitivity adjustment must according to the practical application on PCB.

1. The dynamic balance relationship between the size of the touch button and the material and thickness of the touch medium. The larger the size of the touch button, the higher the sensitivity.

Touch the same medium, the thicker the medium thickness, the lower the sensitivity. The same key size, the same thickness, the sensitivity between different media materials will be different, please adjust according to the actual application of the media.

2. Adjust the CS capacitance value and the R resistance value

Under other conditions, the value of CS capacitance is inversely proportional to the sensitivity. The smaller the CS capacitance value, the higher the sensitivity, and the recommended CS capacitance value (0~50pF) - can be floating in most applications. The smaller the R1 resistance value, the higher the sensitivity, the recommended R1 resistance value (0~5k) - typical application value 1K.

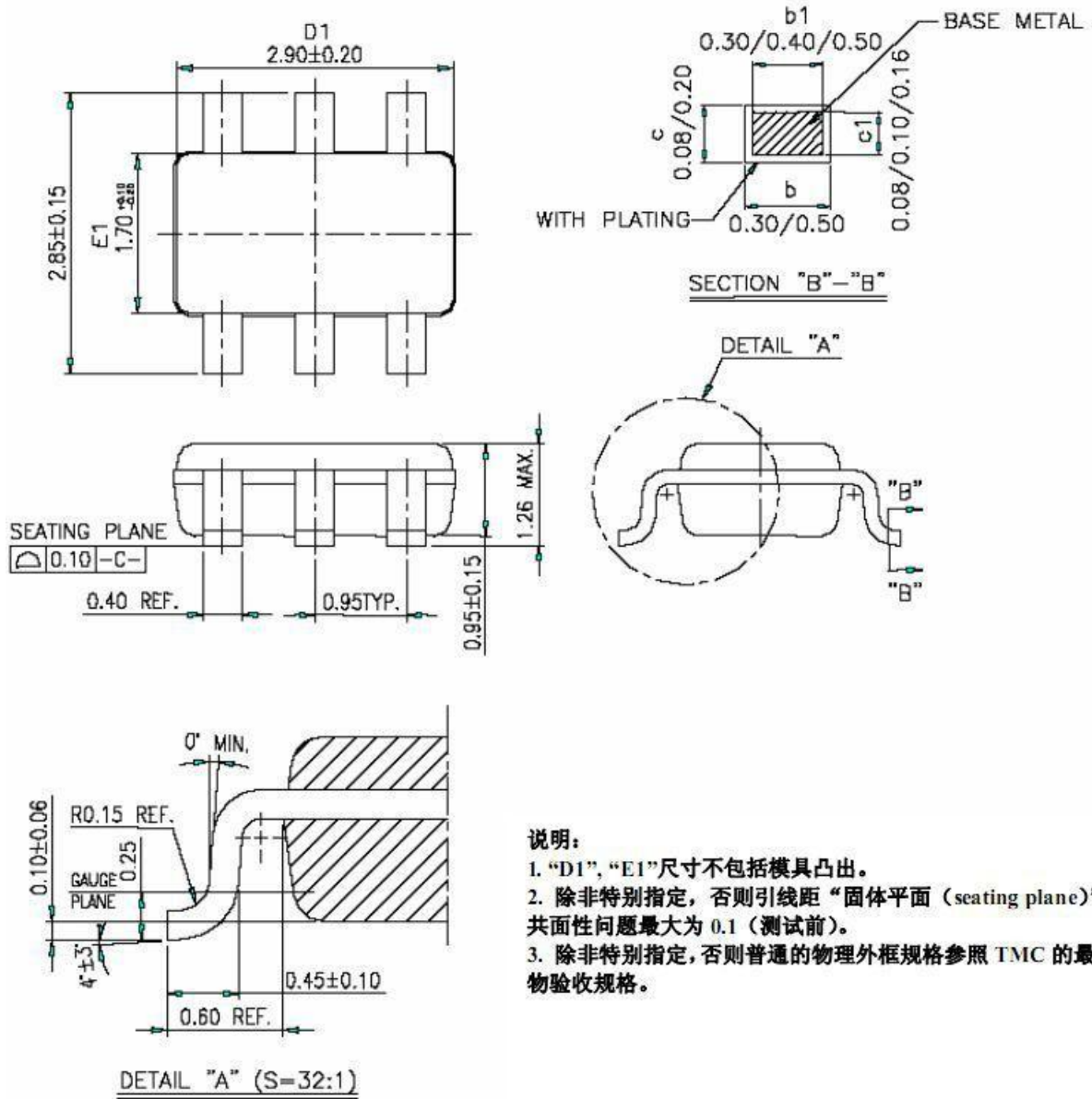
3. Maximum output time of a key

When the TBM=0 chip is in synchronous mode, the internal timer will monitor the key detection, and the maximum output duration set by the timer is 9 seconds. When the timer time is exceeded, the system will automatically return to the initial state of power-up, and the output becomes invalid until the key is detected again.

## Design considerations

1. The induction connection and the induction pad are preferably arranged on the PCB. The shorter the induction pad is from the IC pin (induction line), the better. The induction line should be more than 1mm away from the copper coating or other wires, and the wire diameter should be 0.15mm~0.2mm. Cover the touch pad with copper as much as possible.
2. Proper grounding area can improve anti-interference.
3. The material of panel covering on the PCB can not include the metal or the electric element. The paints on the surfaces are the same. The entire metal shell cannot be used as an induction electrode.
4. The 104 capacitor must be used between VDD and VSS; and should be routed with very short tracks to the device's VDD and VSS pins
5. The capacitance  $C_s$  can be used to adjust the sensitivity. The range of  $C_s$  value is 0~50pF. The value of  $C_s$  use smaller, then the sensitivity will be better. The sensitivity adjustment must according to the practical application on PCB. The R resistors in series on the induction line should be placed close to the chip.
6. The sensitivity adjustment capacitors ( $C_s$ ) must use smaller temperature coefficient and more stable capacitors. Such are X7R, NPO for example. So for touch application, recommend to use NPO capacitor, for reducing that the temperature varies to affect sensitivity. In the wiring, the sensitivity adjustment capacitor must be far away from the power components, heating elements, etc.
7. Precautions for copper coating: If there will be radio signals or high-voltage devices or magnetic fields near the touch pad, please use 20% mesh ground copper foil coating, but avoid copper coating under the induction pad and near the chip. The copper coating should be 2mm away from the induction pad and 1mm away from the induction line.
8. Induction pad can be irregular shape, such as: oval, triangle and other irregular shape. Induction pad allows perforation in the middle, decorative LED indicator light and other purposes. If the induction pad cannot be close to the panel, the induction line can be pulled to the surface shell by a spring, and a metal sheet should be added above the spring as the induction electrode. Do not use ordinary wires to connect the induction wire and the induction electrode.

Package Information (SOT23-6L)



说明:

1. "D1", "E1"尺寸不包括模具凸出。
2. 除非特别指定, 否则引线距"固体平面 (seating plane)"的共面性问题最大为 0.1 (测试前)。
3. 除非特别指定, 否则普通的物理外框规格参照 TMC 的最终实物验收规格。

## Special Instructions

The company reserves the right of final interpretation of this specification.

## Version Change Description

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Version: V1.0

Author: Yang

Time: 2022.7.27

Modify the record:

1. Editio princeps

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## Statement

The information in the usage specification is correct at the time of publication, Shanghai Siproin Microelectronics Co. has the right to change and interpret the specification, and reserves the right to modify the product without prior notice. Users can obtain the latest version information from our official website or other effective channels before confirmation, and verify whether the relevant information is complete and up to date.

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