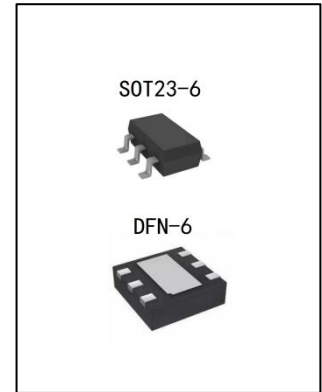


Single-key Touch Sensor IC

SSP8011

General Description

The SSP8011 is a low-power single-key touch sensor IC. The operating mode is divided into Normal mode and Low Power mode. Button mode or Switching mode output can be chosen, and the output level mode is optional.



Features

- Single-key Touch Sensor IC
- Operation Voltage: 2.2V~5.5V
- Operation Current: Normal mode =2.0μA/Low Power mode=1.3μA @VDD=3V
- Operating mode divided into Normal mode and Low Power mode. Enter Low Power mode after no activity for 12 second
- Response Time: Normal mode < 70mS; Low Power mode < 140mS
- Sensitivity adjusted by Key pin capacitor(0pF~30pF)
- Selectable output level: Active High or Active Low or Open Drain Output
- Selectable output mode: Button mode or switching mode
- Key press timeout reset:9 second or No Limit. Different IC models are available
- SOT23-6,DFN-6 package

Applications

- Household appliance
- Intelligent instrument

Order specification

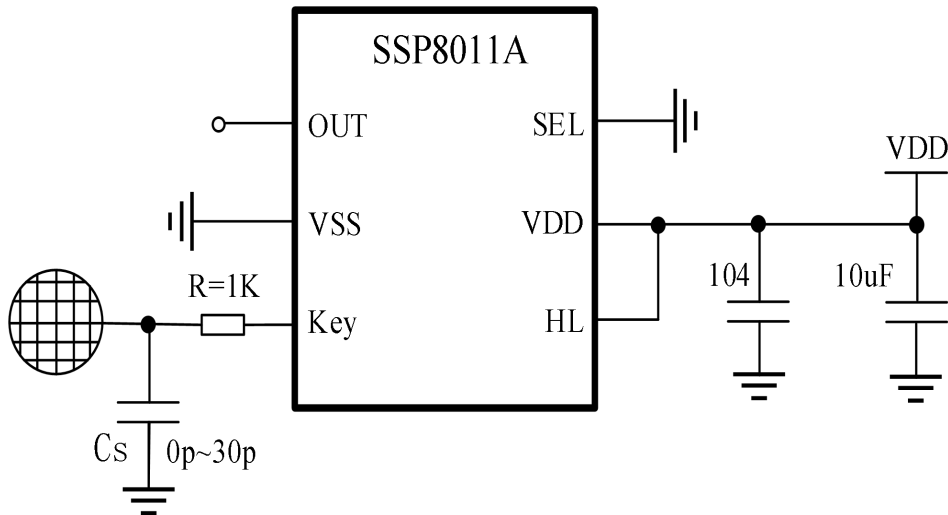
Part No	Package	Manner of Packing	Devices per bag/reel
SSP8011A-A	SOT23-6	Reel	3000PCS
SSP8011D-A	SOT23-6	Reel	3000PCS
SSP8011A-C	DFN-6	Reel	3000PCS
SSP8011D-C	DFN-6	Reel	3000PCS

Selection Table

Part No	Key press timeout reset	OUT level
SSP8011A	9 second	CMOS output Active High or Active Low
SSP8011D	9 second or No Limit, Defined by MOT	Default Open Drain Output/ Active Low

Note: Recommended use SSP8011A.

Application Circuits



Pin Arrangement Diagram: SOT23-6

SSP8011A-A(SOT23-6) Pin Assignment

No.	Name	In/Out	Pin Description
1	OUT	O	Output state
2	VSS	G	Ground
3	Key	I	Capacitive Touch Sensor Input.Key pin capacitor adjust sensitivity(0pF~30pF)
4	HL	I	OUT output level selection (SSP8011A) HL connect to VDD: OUT is CMOS active low output HL connect to VSS: OUT is CMOS active high output
5	VDD	P	Power input pin
6	SEL	I	OUT pin mode selection SEL connect to VDD: OUT is Switching mode output SEL connect to VSS: OUT is Button mode output

SSP8011D-A(SOT23-6) Pin Assignment

No.	Name	In/Out	Pin Description
1	OUT	O	Output state , Open Drain Output/Active Low
2	VSS	G	Ground
3	Key	I	Capacitive Touch Sensor Input.Key pin capacitor adjust sensitivity(0pF~30pF)
4	MOT	I	Key press timeout reset (SSP8011D) MOT connect to VDD: No Limit MOT connect to VSS: 9 second
5	VDD	P	Power input pin
6	SEL	I	OUT pin mode selection SEL connect to VDD: OUT is Switch mode output SEL connect to VSS: OUT is Button mode output

Pin Arrangement Diagram: DFN-6



SSP8011A-C(DFN-6) Pin Assignment

No.	Name	In/Out	Pin Description
1	Key	I	Capacitive Touch Sensor Input.Key pin capacitor adjust sensitivity(0pF~30pF)
2	VSS	G	Ground
3	OUT	O	Output state
4	SEL	I	OUT pin mode selection SEL connect to VDD: OUT is Switching mode output SEL connect to VSS: OUT is Button mode output
5	VDD	P	Power input pin
6	HL	I	OUT output level selection (SSP8011A) HL connect to VDD: OUT is CMOS active low output HL connect to VSS: OUT is CMOS active high output

SSP8011D-C(DFN-6) Pin Assignment

No.	Name	In/Out	Pin Description
1	Key	I	Capacitive Touch Sensor Input.Key pin capacitor adjust sensitivity(0pF~30pF)
2	VSS	G	Ground
3	OUT	O	Output state
4	SEL	I	OUT pin mode selection SEL connect to VDD: OUT is Switching mode output SEL connect to VSS: OUT is Button mode output
5	VDD	P	Power input pin
6	MOT	I	Key press timeout reset (SSP8011D) MOT connect to VDD: No Limit MOT connect to VSS: 9 second

FUNCTIONAL DESCRIPTION

1. Output Pin Mode Selection

The OUT pin mode is defined by SEL, HL

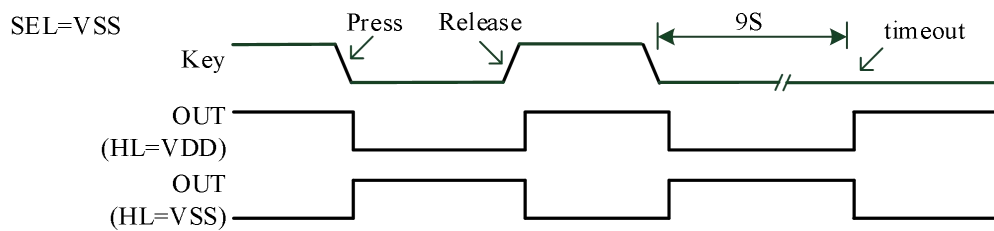
SEL	OUT output mode	HL	OUT output level
VDD	Switching mode	VDD	CMOS active Low
VSS	Button mode	VSS	CMOS active High

1.1 SEL Button output mode

This mode needs to connect SEL to VSS. When the touch key is pressed, the OUT output signal is flipped, and when the key is lifted, the output signal is restored. Suitable as an alternative to normal buttons. The Button mode waveform is as shown below.

HL connect to VDD: During power-on, the OUT is CMOS high level. The key is active low level. The long press timeout restores the high level.

HL connect to VSS: During power-on, the OUT is CMOS low level. The key is active high level. The long press timeout restores the low level.

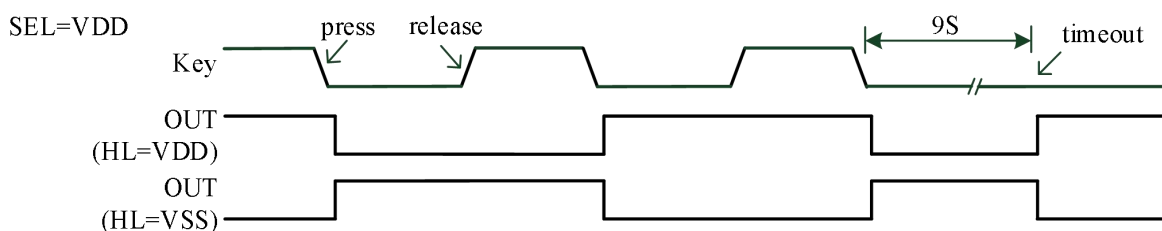


1.2 SEL Switching output mode

This mode needs to connect SEL to VDD. When the touch key is pressed each time, the OUT output signal is flipped once. This mode is suitable for replacing common switches. HL selects the level at power-on in the Switch output mode. The Switch mode waveform is as shown below.

HL connect to VDD: During power-on, the OUT is CMOS high level. The signal is flipped every time you press, and the long press timeout restores the high level.

HL connect to VSS: During power-on, the OUT is CMOS low level. The signal is turned over every time you press, and the long press timeout restores the low level.



2.Touch Sensitivity Adjustment

The sensitivity of touch key can be adjusted by the capacitance of Key pin. The adjustment range is from 0pF to 30pF. Smaller capacitance can make higher sensitivity.

3.Key Press Timeout Reset

Long press on the touch key will produce a timeout reset. The maximum time is 9 seconds or No Limit.

4.Normal mode and Low Power mode

The chip starts at Normal mode after reset. If no event occurred for 12 second, it switches to Low Power mode. It switches to Normal mode after sampling Key pin's capacitance variation event.

Absolute Maximum Ratings

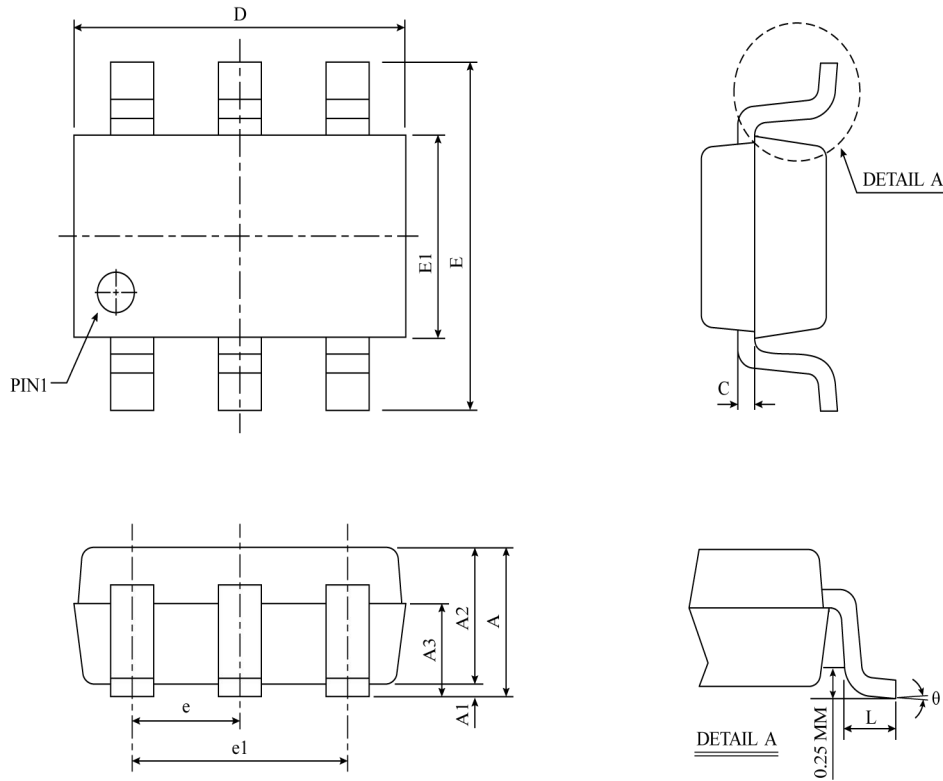
Parameter	Symbol	Value	Unit
Supply voltage	V_{DD}	$V_{SS}-0.3 \sim V_{SS}+5.5$	V
Input voltage	V_{IN}	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
Operating temperature	T_{amb}	-20 ~ +70	°C
Storage temperature	T_{stg}	-65 ~ +150	°C

Electrical Characteristics

Ta=25°C

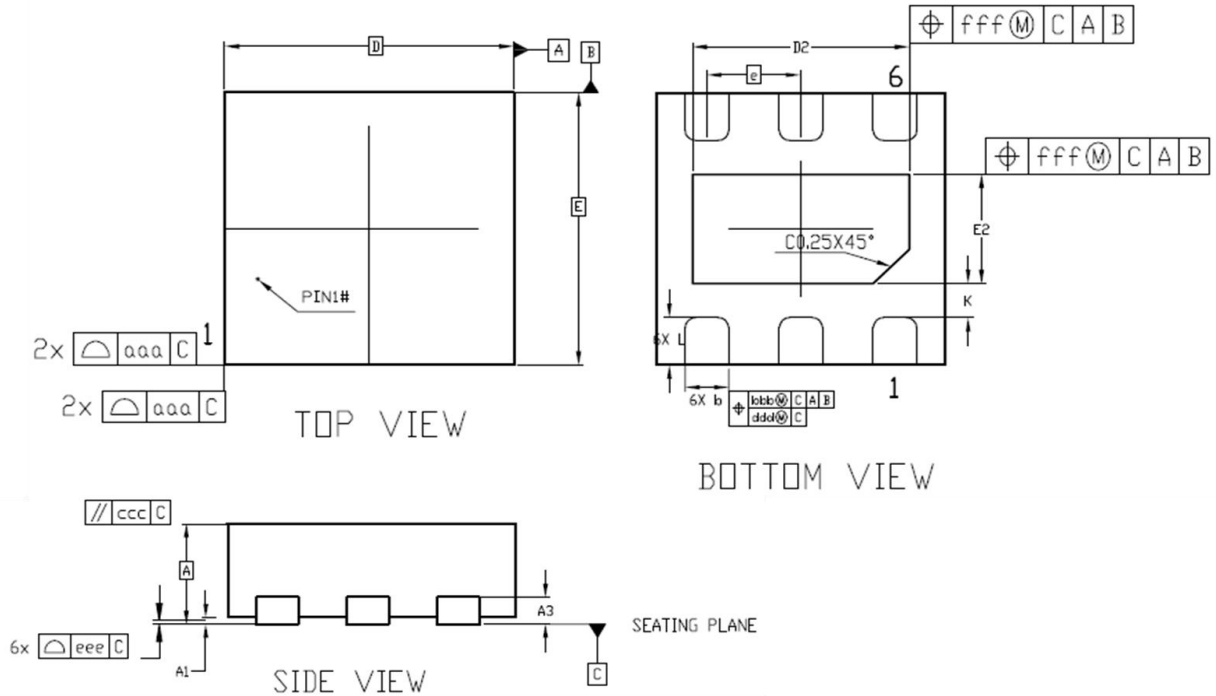
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Operating voltage	V _{DD}	-	2.2	-	5.5	V	
Key Input High Voltage	V _{IH}	Signal input	0.8V _{DD}	-	V _{DD}	V	
Key Input Low Voltage	V _{IL}	V _{IN} - V _{OUT} =1V	-	-	0.2V _{DD}	V	
I/O Port Source Current	I _{OH}	all Output	V _{DD} =3.0V V _{OH} =2.7V	-	7	-	mA
			V _{DD} =5.0V V _{OH} =4.5V	-	16	-	mA
I/O Port Sink Current	I _{OL}	all Output	V _{DD} =3.0V V _{OL} =0.3V	-	22	-	mA
			V _{DD} =5.0V V _{OL} =0.5V	-	47	-	mA
Power Supply Current	I _{DD}	Normal mode	V _{DD} =4.2V	-	2.4	-	μA
			V _{DD} =3.6V	-	2.2	-	μA
			V _{DD} =3.0V	-	2.0	-	μA
		Low Power mode	V _{DD} =4.2V	-	1.5	-	μA
			V _{DD} =3.6V	-	1.4	-	μA
			V _{DD} =3.0V	-	1.3	-	μA
Timeout Lead Time	T _{LT}	V _{DD} =3.0V	-	9	-	S	
Enter Low Power mode after no activity time	T _r	V _{DD} =3.0V	-	12	-	S	
Normal mode Response Time	t	V _{DD} =3.0V	50	60	70	ms	
Low Power mode Response Time	t	V _{DD} =3.0V	50	100	140	ms	
LVR Voltage	V _{LVR}	TA=25°C	1.8	1.9	2.2	V	

Package Information (SOT23-6)



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	-	1.45	-	-	0.057
A1	0	0.08	0.15	0	0.003	0.006
A2	0.90	1.10	1.30	0.035	0.043	0.051
A3	0.60	0.65	0.70	0.024	0.026	0.028
c	0.12	0.16	0.19	0.005	0.006	0.007
D	2.82	2.92	3.02	0.111	0.115	0.119
E	2.70	2.90	3.10	0.106	0.114	0.122
E1	1.52	1.62	1.72	0.060	0.064	0.068
e	0.85	0.95	1.05	0.033	0.037	0.041
e1	1.80	1.90	2.00	0.071	0.075	0.079
L	0.35	0.48	0.60	0.014	0.019	0.024
θ	0°	4°	8°	0°	4°	8°
JEDEC	MO-178(AB)					

Package Information (DFN-6)



DIM SYMBOL	MIN.	NOM.	MAX.
A	0,70	0,75	0,80
	0,80	0,85	0,90
A1	0	0,02	0,05
A3	-	0,20 REF	-
b	0,25	0,30	0,35
D	2,00BSC		
E	2,00BSC		
D2	1,40	1,50	1,60
E2	0,70	0,80	0,90
e	0,65BSC		
L	0,30	0,35	0,40
K	0,25	-	-
aaa	0,15		
bbb	0,10		
ccc	0,10		
ddd	0,05		
eee	0,08		
fff	0,10		

Special Instructions

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

Version Change Description

Version: V1.0

Author: Yang

Time: 2020.11.24

Modify the record:

1. Editio princeps

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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