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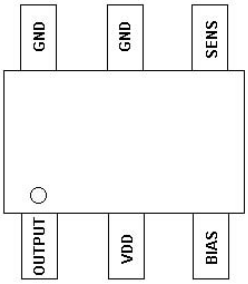
Eastern System and Semiconductor Design

SS02
1-CH Digital Capacitive Sensor

General Description

The SS02 digital capacitive sensor designed specifically for touch controls. It is provide stable sensing under a wide variety of changing conditions. It will project a sense field through almost any dielectric. It is designed specifically for human interfaces, like control panels, application lighting controls or anywhere a mechanical switch or button may be found.



SOT-26 Small Package

General Feature

- 1-Channel Digital Capacitive Sensor
- Projects a 'touch button' through any dielectric
- Open drain digital output
- Auto calibration for environment

Application

- Switch replacement
- Human presence detection
- Appliance control Switch (TV/Monitor/Telephone etc)
- Toys & interactive games
- Lighting controls (on/off)
- Membrane switch replacement
- Sealed control panels, keypads
- Security key-panel
- Mobile application(Cell phone, Mp3/PMP player etc)

Pin Description

PIN NO	PIN NAME	TYPE	Description	PIN NO	PIN NAME	TYPE	Description
1	Output	DOI	Output of Open-Drain	4	Sens	AI	Sensor input
2	VDD	-	Supply	5	GND	-	Ground
3	Bias	AI	Resistor of Bias	6	GND	-	Ground

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Absolute Maximum Rating (Note 2)

Battery supply voltage	6.0V
Maximum voltage on any pin	VDD+0.3
Maximum current on any PAD to avoid latch-up	100mA
Power Dissipation	3mW
Storage Temperature	-50 ~ 150℃
Operating Temperature	-20 ~ 75℃
Junction Temperature	150℃
ESD protection	2000V

Operation conditions (Note 1, 2)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Units
Supply Voltage	V_{DD}	-	3.0	-	5.5	V
Current consumption in disable mode	I_disa	All blocks disable	-	-	120	uA
Power dissipation	Pd	-20 ~ 75℃	-	-	20	mW
Operating Temperature	Topr		-20	-	75	℃

Electrical Characteristics (Note 1,2)

T_A = 25℃, Vdd=5V, Bias=75kΩ

Characteristics	Symbol	Test Condition	Min	Typ	Max	Units
Current consumption	I_{DD_On}	Osc_bias_adj=75kΩ	-	3.5	5	mA
Output drive current	Io	Sensor (Sin) touched	-	-	12	mA
Output impedance	Zo	Cs > 0.1 Cs < 0.1		10 100M		Ohm
R_bias range	R_bias		10	-	300	kΩ
Auto calibration time	T_cal		-	-	250	ms
Sensible capacitance	ΔCs	Touch through any dielectric	0.1	0.4	-	pF

Note 1: All voltages are measured with respect to the ground pin, unless otherwise specified.

Note 2: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. Electrical Characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Ratings. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance

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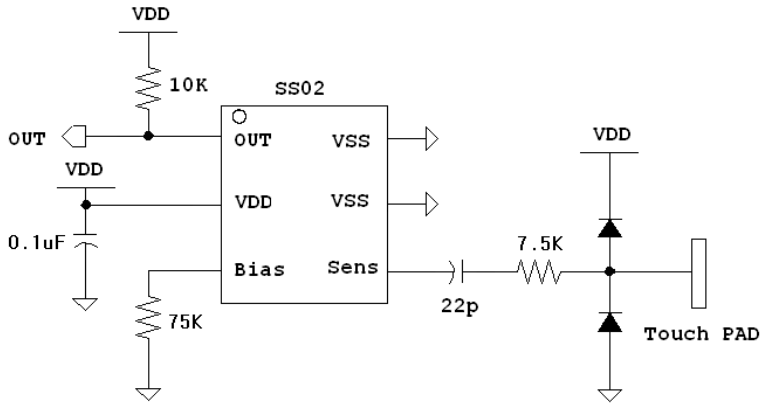
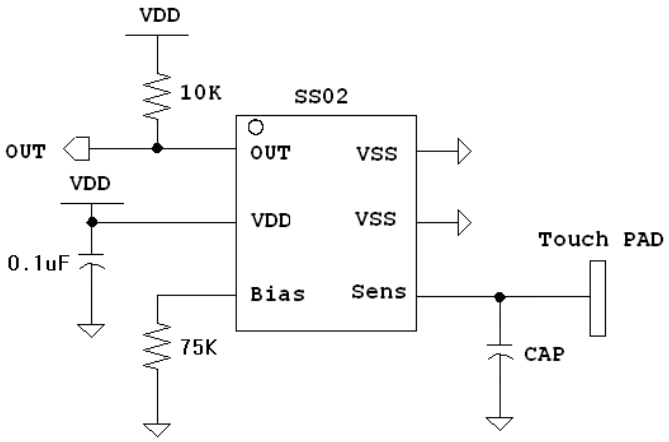
Application Note

- **Direct touch circuit**



- **In-direct touch circuit**



PCB Layout recommendation

Common drawing rule

1. The touch PAD have to make use conduct material.

2. Each signal line (Sense Pin line) have to separate as possible as far to avoid interference.

3. From touch PAD pattern to other patterns have to have distance around 2mm.

4. You have to connect touch panel GND to chassis GND.

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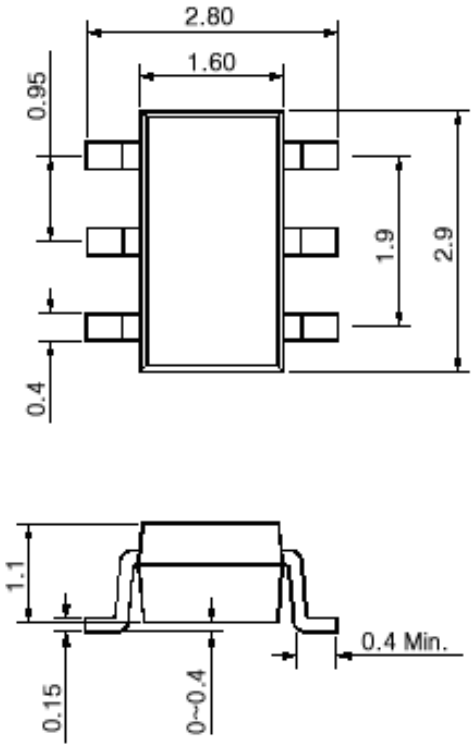
Physical Dimensions

millimeters unless otherwise noted



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