Chemtronics

ADA03

1-CH Capacitive Touch Sensor with Self-Calibration Mode

General Description

The ADA03 touch sensor is designed specifically for detecting of capacitance variation in sense node, and it is detecting 0.1pF capacitance difference as compared with average capacitance. It will project a sense field through almost any dielectric material and detect the capacitance variation in sense node. Its sense module can be sealed from water or dust perfectly.

Also the device works in the very low power condition, supply voltage, 2.5V and 30uA.

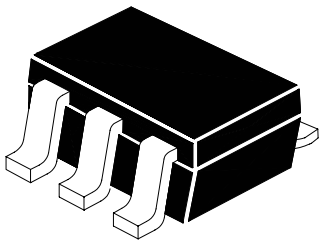
General Feature

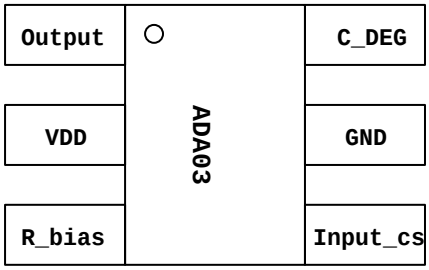
- 1-Channel Capacitive Sensor with self calibration.
- Projects a 'touch button' through any dielectric,
- Sensitivity selection with a external capacitor.
- Open-Drain Digital Output.

Application

- Fluid level sensing
- Switch replacement
- Human presence detection
- Human interface for Toys & interactive games
- Switch for light controls.
- Membrane switch replacement
- Sealed control panels, keypads

Package (SOT26)





PIN Description

Pin name	Function	Protection
Output	Output of Open Drain	Vdd
Vdd	Supply Voltage(2.5V – 5.5V)	
R_bias	Set a Bias Current	Vdd
Input_Cs	Sensor Capacitance input	Vdd
Gnd	Ground	
C_deg	Sensitivity level selection(5 level)	Vdd

Absolute Maximum Rating

Battery supply voltage	6.5V
Maximum voltage on any pin	VDD+0.3
Maximum current on any PAD to avoid latch-up	100mA
Power Dissipation	100mW
Storage Temperature	-50 ~ 150℃
Operating Temperature	-20 ~ 75℃
Junction Temperature	150℃
ESD protection	2000V

Characteristics	Symbol	Test Condition	Min	Typ	Max	Units
Supply Voltage	Vdd		2.2	-	6.5	V
Current consumption	Idmax	-20℃ < Ta < +75℃, Vdd = 5V	-	120		uA
Power dissipation	Pd	-20 ~ 75℃, Vdd = 5V	-	-	200	mW

Electrical Characteristics

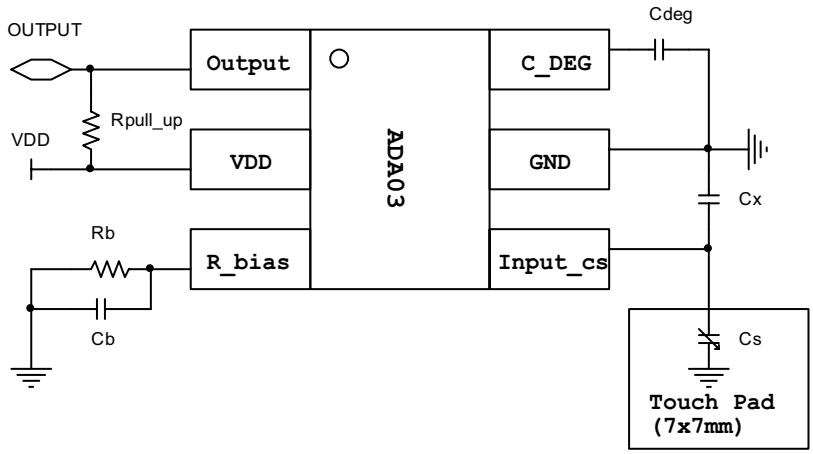
T_A = 25℃

Characteristics	Symbol	Condition	Min	Typ	Max	Units
Operating Voltage	Vdd		2.5		5.5	V
Current consumption	Idd	VDD=5.0V, Rb=500K VDD=2.5V, Rb=500K		100 40		uA uA
Output Impedance (open drain)	Zo	delta Cs > 0.1pF delta Cs < 0.1pF		10 100M		Ohm
Output Sink Current	Isk	VDD=5V, Rb=500K			4.0	mA
Input capacitance range	Cs		1.0	4.0		pF
Minimum detective capacitance	delta_Cs	Cs = 4pF		0.1		pF
Output hold time	T_hold	delta Cs > 0.1pF, Rb=500K		60		sec
Self calibration time	T_cal	power on reset, VDD=5.0V, Rb=300K			0.25	sec
Bias resistance	Rb *Note1*	VDD=5.0V VDD=2.5V	300 200	500 300	650 450	Kohm Kohm
Sensitivity Selection	Cdeg *Note2*		Vdd=2.5V	Vdd=3.3V	Vdd=5.0V	
		Very High Sensitivity	0	0	0	pF
		High Sensitivity	220	200	180	pF
		Medium Sensitivity	440	400	360	pF
		Low Sensitivity	880	800	750	pF

Note1 : Lower Rb is recommended in noisy condition.

Note2 : Cdeg should be in +/- 5% tolerance.

Application Circuit

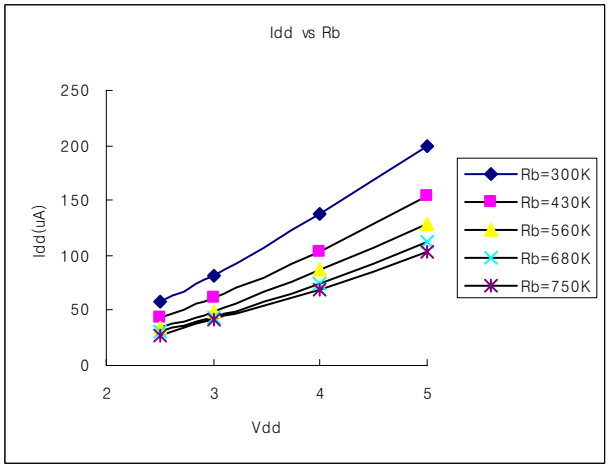


Note1 : For stable operation, Cb should be selected 1.2nF.

Note2 : Cx will help to set a grade of sensitivity for fine tuned level if Cdeg level selected is not enough.

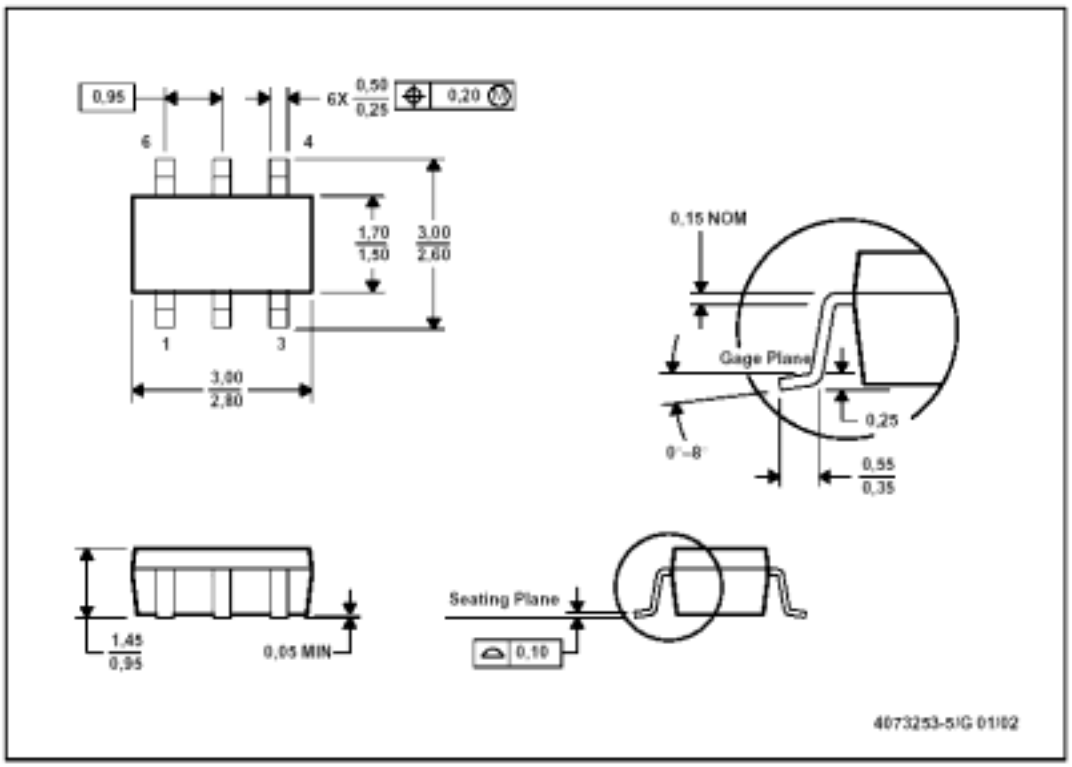
Note3 : If Supply Voltage is not stable, the chip will not operate properly.

Supply Current vs Bias Resistance



Package Physical Dimensions millimeters unless otherwise noted

SOT-26(2.9 x 1.6 x 1.1mm)



NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion.
D. Leads 1, 2, 3 may be wider than leads 4, 5, 6 for package orientation.

Recommended Soldering Profiles

Wave Soldering

		Wave Solder
Ramp Up (C/sec)	Recommended	4 C/sec
Solder Temperature	Maximum	255 C
Dwell Time	Maximum	3 seconds
Ramp Down	Recommended	4 C/sec

IR Convection / Vapor Phase Reflow – Surface Mount

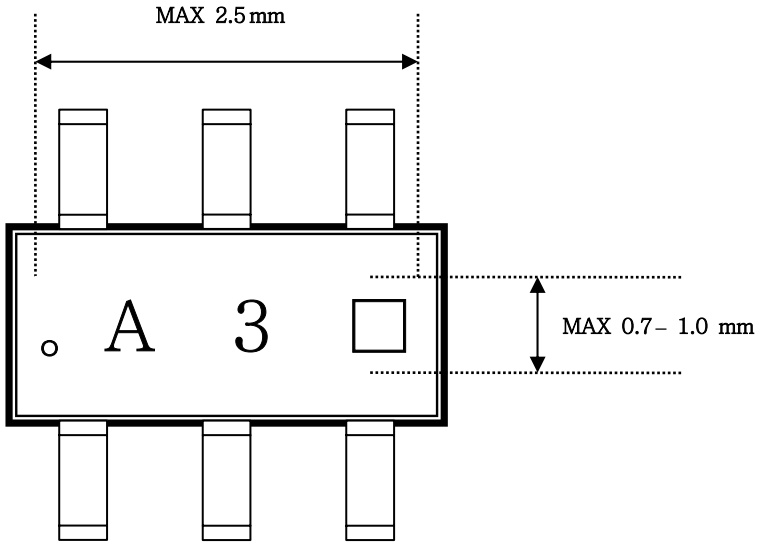
		Convection / IR	Vapor Phase
Ramp Up (C/sec)	Recommended	2 C/sec	2 C/sec
Solder Temperature	Maximum	235 C	230 C
Dwell Time	Maximum	15 seconds	60 seconds
Ramp Down	Recommended	2 C/sec	2 C/sec

MARKING SPECIFICATION

A. CHARACTER TYPE : ARIAL

B. MARKING METHOD : LASER

C. MARKING LAYOUT & AREA



D. MARKING INSTRUCTION

CODE	MARKING INSTRUCTION											
◦	DOT MARKING. PIN No. 1											
A3	DEVICE CODE											
□	ASSEMBLY DATE CODE											
	MONTH	1	2	3	4	5	6	7	8	9	10 11	12
	CODE	1	2	3	4	5	6	7	8	9	O N	D

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