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CP2681 Datasheet

1 Channel Capacitive Touch Detection Device

1 GENERAL DESCRIPTION

The CP2681 is a one channel capacitive sensor device, which enables streamlining of human-machine interface with implementation of touch-base input. Employing a high power and RF noise immunity architecture, the device can reliably detect small changes in capacitance, allowing touch-based input to replace mechanical implantations. On-chip automatic calibration and tracking mechanism simplify the system design process. Touch input can be access directly as in conventional mechanical buttons. An advanced touch detection algorithm has been equipped inside the chip for water proof purpose and noise immunity.

Features

- Support 1 touch sensor
- Support open-drain I/O to outputs touch status
- High power and RF noise immunity
- Water Proof
- Automatic drifting tracking and self calibration to optimize the system performance
- Simple sensitivity adjustment via a single capacitor
- 2.8 - 5.5V power supply
- SOT23-6L package

Contents

CP2681 Datasheet	1
1 General Description	2
Contents	3
List of Figures	4
List of Tables	5
2 Package and PIN Assignment	6
2.1 Pin Assignment	6
2.2 Pin Descriptions	7
3 Typical Applications	9
4 Function Descriptions	10
4.1 Sensor Status Acquisition	10
5 Electrical Specification	11
6 Package Information	12
6.1 SOT23-6L	12
7 Ordering information	13

List of Figures

Figure 1	CP2681-A1 SOT23-6L Pin Assignment	6
Figure 2	CP2681-B1 SOT23-6L Pin Assignment	6
Figure 3	CP2681-A2 SOT23-6L Pin Assignment	7
Figure 4	CP2681-B2 SOT23-6L Pin Assignment	7
Figure 5	Typical application.....	9
Figure 6	SOT23-6L Package.....	12

List of Tables

Table 1	CP2681 Pin function descriptions	7
Table 2	Sensor status indicator of ST_D pin.....	10
Table 3	Sensor status indicator of ST_TOG pin.....	10
Table 4	Electrical Specifications	11

2 PACKAGE AND PIN ASSIGNMENT

2.1 Pin Assignment

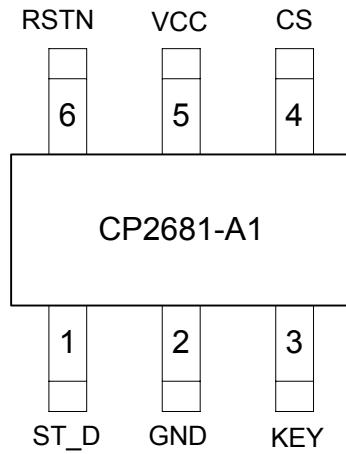


Figure 1 CP2681-A1 SOT23-6L Pin Assignment

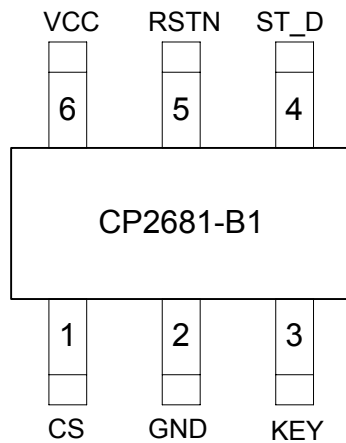


Figure 2 CP2681-B1 SOT23-6L Pin Assignment

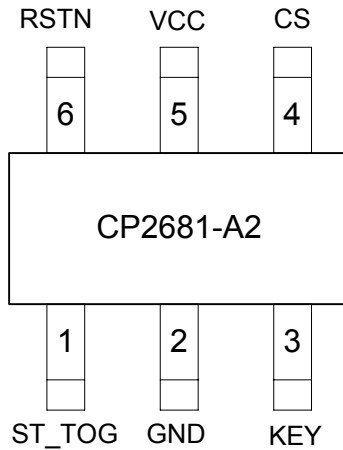


Figure 3 CP2681-A2 SOT23-6L Pin Assignment

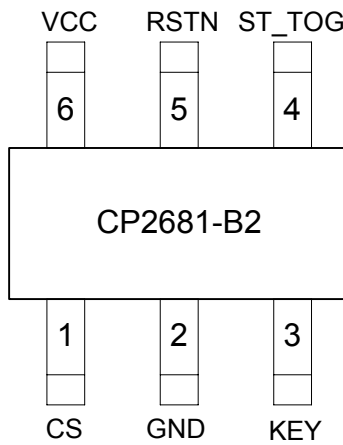


Figure 4 CP2681-B2 SOT23-6L Pin Assignment

2.2 Pin Descriptions

Table 1 CP2681 Pin function descriptions

Pin Name.	CP2680 -A1 Pin No.	CP2680 -B1 Pin No.	CP2680 -A2 Pin No.	CP2680 -B2 Pin No.	I/O Type	Description
ST_D	1	-	1	-	O	Touch status direct output. Open drain.
ST_TOG	-	4	-	4	O	Touch status toggle output. Open drain.
RSTN	6	5	6	5	I	Chip reset, low active
KEY	3	3	3	3	A	Capacitive sensor
CS	4	1	4	1	A	Connect capacitor.

						(4.7F typically)
GND	2	2	2	2	G	Ground
VCC	5	6	5	6	P	Power supply

Notes:

- I:** digital input pin
- O:** digital output pin
- IO:** digital bidirectional pin
- A:** analog pin
- P:** power
- G:** ground

3 TYPICAL APPLICATIONS

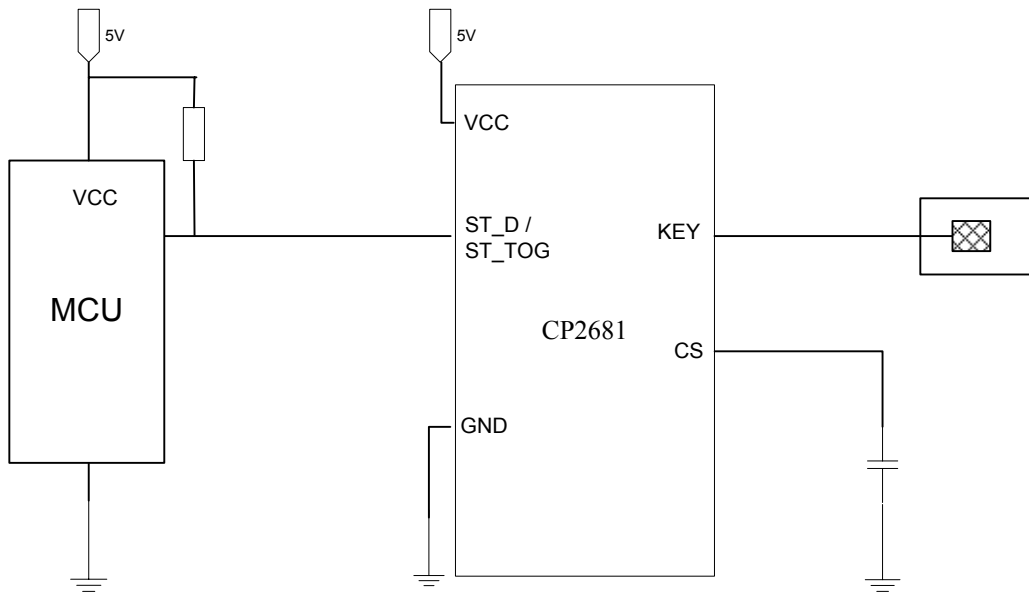


Figure 5 Typical application

4 FUNCTION DESCRIPTIONS

4.1 Sensor Status Acquisition

In the CP2681-A1 and CP2681-B1, the sensor status is acquired from ST_D pin. The ST_D pin is open drain output, active low.

Table 2 Sensor status indicator of ST_D pin

ST_D	Sensor
z	touch OFF
0	touch ON

In the CP2681-A2 and CP2681-B2, the sensor status is acquired from ST_TOG pin. The ST_TOG pin is open drain output, active low.

Table 3 Sensor status indicator of ST_TOG pin

ST_TOG	Sensor
z	Initial status
0	First touch ON
z	Second touch ON
0	third touch ON
z	Fourth touch ON
...	...

5 ELECTRICAL SPECIFICATION

VCC=5V, T_A=-40°C~85°C, all typical value below is tested on T_A=25°C

Table 4 Electrical Specifications

Parameter	symbol	unit	Min.	Typ.	Max
Absolute Maximum Ratings					
Storage Temperature	Tstg	°C	-40	25	95
Operating Temperature	Topr	°C	-35	25	90
Operating Humidity	Hopr	%	5	-	95
Power Supply Voltage	Vcc	V	2.8	5	5.5
Input Voltage	Vin	V	Vss-0.3	-	Vcc+0.3
ESD	HBM	V	8000	-	-
Recommended Operating Condition					
Operating Temperature	Top	°C	-30	25	85
Power supply Voltage	Vcc	V	2.8	5	5.5
Digital Input Rising Time	Tri	Ns	-	-	5
Digital Input Falling Time	Tfi	Ns	-	-	5
AC Electrical Specification (Typically values at Ta = 25°C and Vcc=3.3V)					
Internal OSC frequency	Fosc	MHz	2.8	4.0	5.2
Touch Sensitivity	Stch	pF	-	0.02	-
Initial Time	Trn	ms	-	260	-
Output Rising time	Tro	ns	-	20	-
Output Falling Time	Tfo	ns	-	20	-
DC Electrical Specifications (Typically values at Ta = 25°C and Vcc=3.3V)					
Supply Current	Idd	uA	-	190	-
Digital Input Low Voltage	Vil	V	-	0.8	-
Digital Input High Voltage	Vih	V	2.0	-	-
Digital Output Current	Io	mA	-	16	-

6 PACKAGE INFORMATION

6.1 SOT23-6L

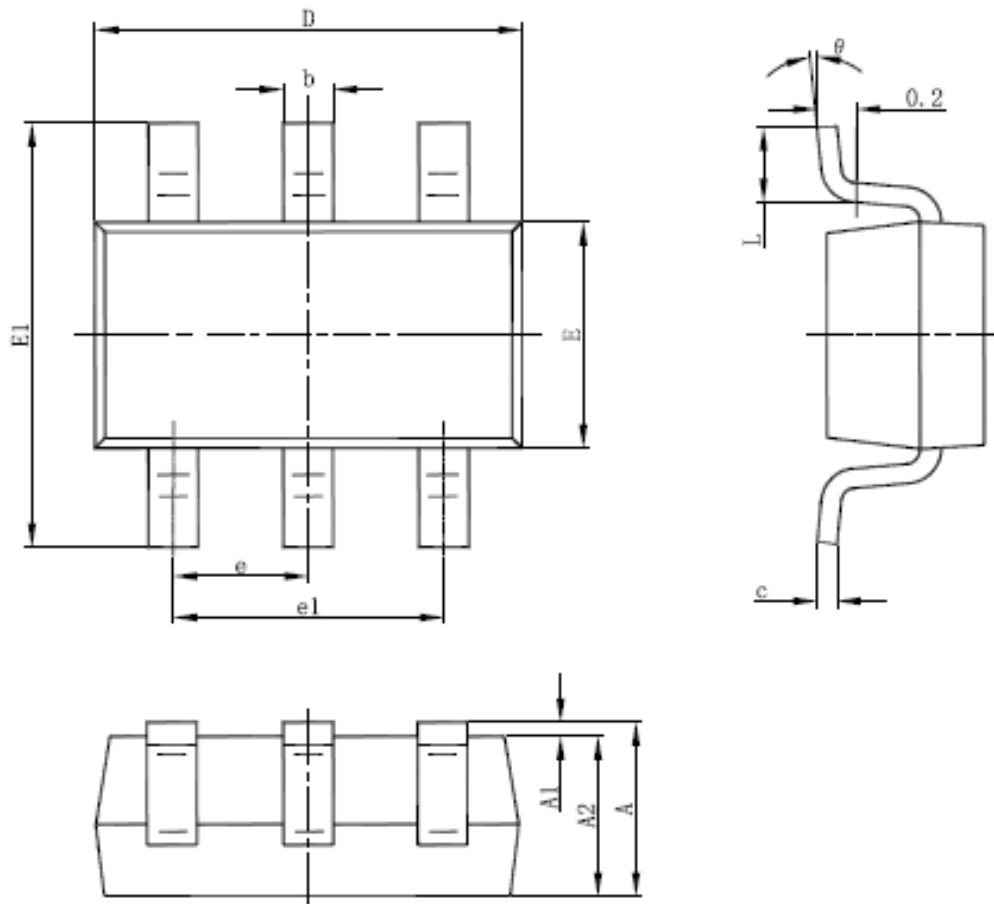


Figure 6 SOT23-6L Package

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

7 ORDERING INFORMATION

Order Number	Temperature Range	Package	RoHS	Marking	Packing Type
CP2681ST-A1	-40℃～85℃	SOT23-6L	Yes	T81LL ^{*1}	3000units/Tape and Reel
CP2681ST-B1	-40℃～85℃	SOT23-6L	Yes	T81BLL ^{*1}	3000units/Tape and Reel
CP2681ST-A2	-40℃～85℃	SOT23-6L	Yes	T81CLL ^{*1}	3000units/Tape and Reel
CP2681ST-B2	-40℃～85℃	SOT23-6L	Yes	T81DLL ^{*1}	3000units/Tape and Reel

*1: "LL" represents Lot Number

