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Dual Touch Dual ouput Touch IC

1. Overview

PT8042 is a capacitive touch control ASIC, which supports dual channel touch input and dual channel synchronous switch output. Two sync output can config the valid electrical level via pin configuration.PT8042 realizes touch synchronization switch control. Suitable for nebulizer, car products, electronic toys, consumer electronic products and other fields, with prominent advantages of low power consumption, high anti-jamming, wide operating voltage range, high penetration.

2. Main features

- Power supply range：2.4~5.5V
- Standby current: 5uA@V_{DD}=5V&CMOD=10nF
- Two channel touch input
- Two sync output can config the valid electrical level via pin configuration.
- Touch with Charge sharing method.
- Maximum key output time：16S（±30%）
- Built in voltage regulator、POR reset and LVR reset
- Built in real-time environment adaptive, efficient digital filtering and other software algorithms.
- HBM ESD better than 5KV

3. Package and pin description
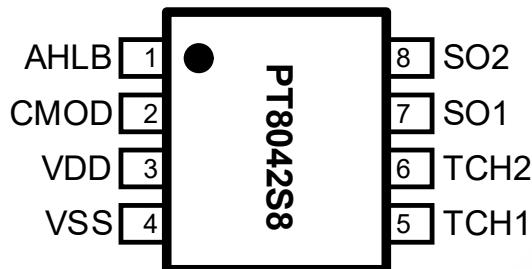
Figure1 SOP8 package

Table1 pin description

NO.	Pin name	I/O	Description
1	AHLB	I/O	Initial state setting of output pin, hanging high
2	CMOD	I/O	Sampling capacitance input pin
3	VDD	P	Positive power supply
4	VSS	P	Negative power supply
5	TCH1	I/O	Touch input pad 1
6	TCH2	I/O	Touch input pad 2
7	SO1	I/O	Touch output pad 1
8	SO2	I/O	Touch output pad 2

4. Function introduction

● SO1 and SO2 initial output state after Power on via AHLB input value:

> If ALHB connected to VDD (high level) power on: SO1 and SO2 output high level

> If ALHB connected to GND (low level) power on: SO1 and SO2 output low level

● Touch input of TCH1 corresponds to SO1 logic output

● Touch input of TCH2 corresponds to SO2 logic output

● Press and hold TCH1 or TCH2, turn over the output state of SO1 or SO2, release and return to the initial state to realize the synchronous switch.

● Touch detection may continue to be effective due to objects covering the touch disc or sudden changes in the environment. When the IC internal touch algorithm detects that the effective duration of the output reaches the set value of 16S (+30%), the system returns to the initial power-on state and the output becomes invalid.

5. Application circuit
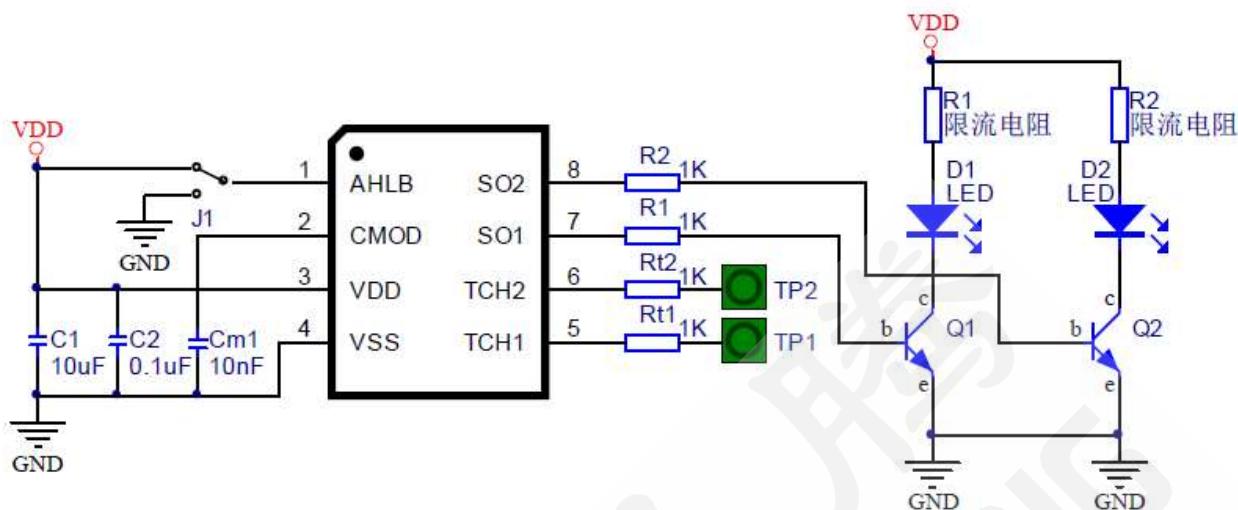
Table 2 Standard application circuit

Special note：

When the difference of dielectric material and thickness is large, the touch sensitivity can be adjusted by adjusting the Cm capacitance between CMOD and GND. The higher the capacitance value, the higher the sensitivity; the smaller the capacitance value, the lower the sensitivity. The following data are for reference only, and the details shall be subject to the actual situation.

Table 2 CMOD Sampling capacitance

Medium type	CMOD Sampling capacitance	
	Device type	Device parameters
touch metal case directly	333 NPO capacitance	33nF/25V
acrylic glass within 3mm	103 NPO capacitance	10nF/25V
3-6mm acrylic glass	203 NPO capacitance	20nF/25V
6-10mm acrylic glass	473 NPO capacitance	47nF/25V

6. Electrical parameters

6.1 limit parameters of electrical characteristics

Table 3 limit parameters

Parameters	Lable	Condition	Range	Unit
Power supply voltage	V_{DD}	-	-0 to +6.0	V
Input voltage	V_I	all I/O□	-0.3 to V_{DD} + 0.3	V
working temperature	T_A	-	-20 to + 70	℃
Storage temperature	T_{STG}	-	-40 to + 125	℃

6.2 DC characteristics

Table 4 DC characteristics（Unless otherwise specified V_{DD} = 2.4V~5.5V，Temp = 25ºC）

Parameter	Lable	Condition	Min	Typ	Max	Unit
working voltage	V_{DD}		2.4		5.5	V
Input high voltage threshold	V_{IH}		$0.75V_{DD}$			V
Input low voltage threshold	V_{IL}				0.25 V_{DD}	V
Output current of Source	I_{OH}	V_{DD}=5V, VOH=0.9V_{DD}		6		mA
Output current of Sink	I_{OL}	V_{DD}=5V, VOL=0.1V_{DD}		18		mA
Standby current	I_{SB}	V_{DD}=5V,Cmod=10nF		5		uA
		V_{DD}=3V,Cmod=10nF		4		

7. Package dimension drawing
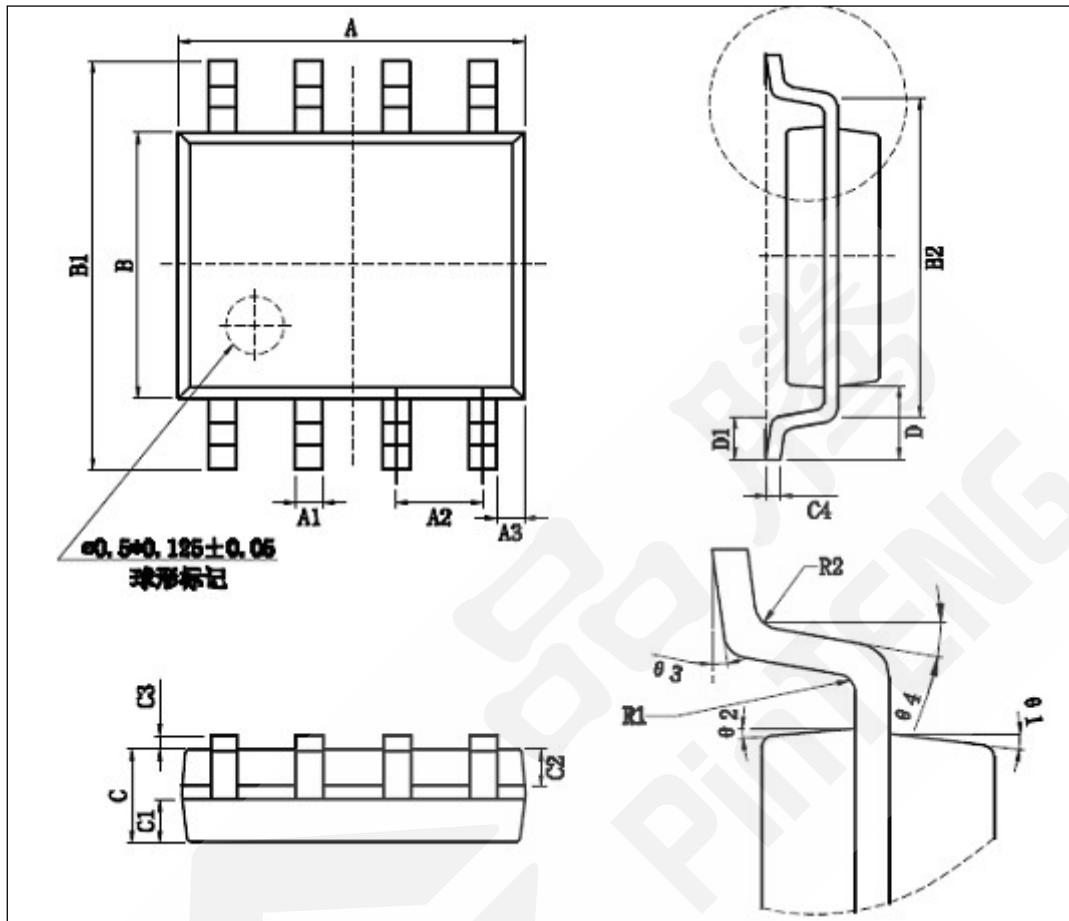
Figure 3 SOP8 Package

Table 5 SOP8 Package size

Unit	size（mm）		
	Min	Typ	Min
A	4.80	-	5.00
A1	0.35	-	0.45
A2	-	1.27	-
A3	-	0.345	-
B	3.80	-	4.00
B1	5.80	-	6.20
B2	-	5.00	-
C	1.30	-	1.50
C1	0.55	-	0.65
C2	0.55	-	0.65

8. History

Version	Modification record	Release Time
V1.0	Initial version	2022-08-10
V1.1	Increase Long Time Touch Description	2022-11-03