IC for CMOS System Reset
Monolithic IC PST81XX, 82XX Series

Outline

This IC functions in a variety of CPU systems and other logic systems, to detect supply voltage and reset the system accurately when the power is turned on or interrupted.
To ±1.5% of detection voltage accuracy of the conventional models, a maximum of ±0.5% of super-high precision is realized, and it is more suitable for battery detection etc. Moreover, the mounting area significantly contributes to space saving using the SSON package.

Features

1. High Accuracy	±0.5% typ. / 2.0~6.0V
	±0.8% typ. / 0.8~1.9V
2. Ultra-low current consumption	0.25μA typ.
3. Ultra-small package	1.10×1.40mm (SSON-4)
4. Operating temperature range	-40~+105°C
5. Detecting voltage rank	0.8~6.0V (0.1V step)
6. Output configuration	PST81XX series ····· CMOS output
	PST82XX series ····· Open drain output

Packages

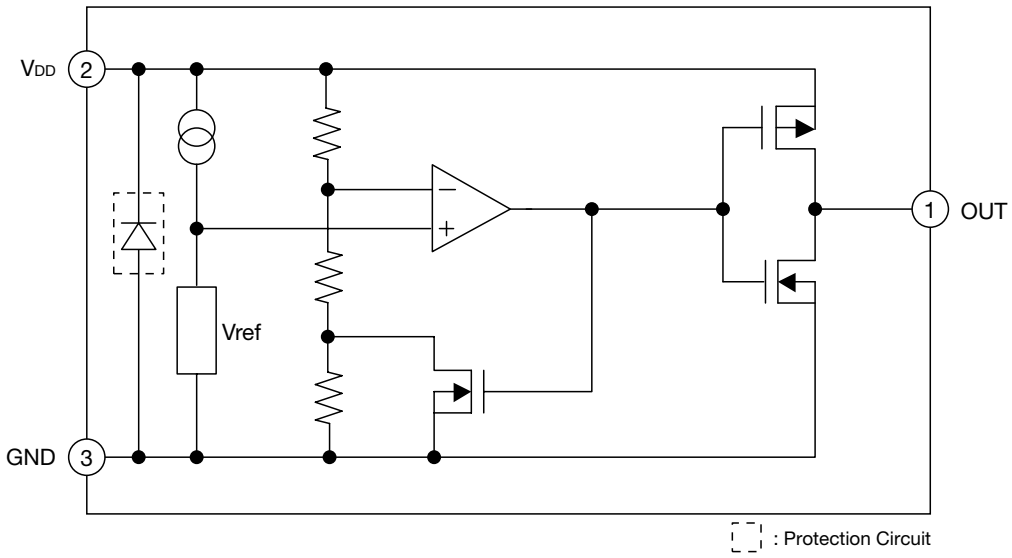
SOT-25A
SC-82ABA
SC-82ABB
SSON-4

Applications

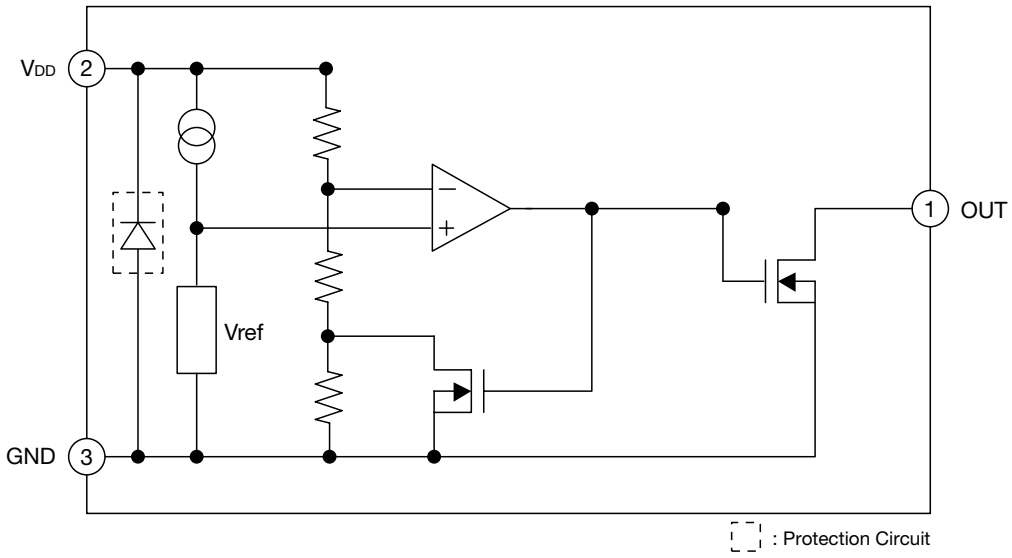
1. Reset circuits for microcomputers, CPUs and MPUs
2. Reset circuits for logic circuits
3. Battery voltage check circuits
4. Back-up power supply switching circuits
5. Level detection circuits

Block Diagram

PST81XX *①-③ in the circuit diagram is pin number for the SOT-25A package.

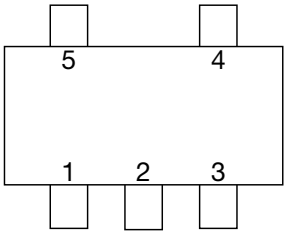


PST82XX *①-③ in the circuit diagram is pin number for the SOT-25A package.



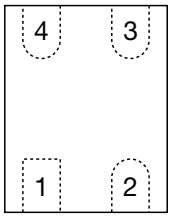
Pin Assignment

PST81XX, PST82XX



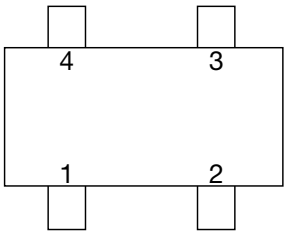
SOT-25A
(TOP VIEW)

1	OUT
2	V_{DD}
3	GND
4	NC
5	NC



SSON-4
(TOP VIEW)

1	OUT
2	GND
3	NC
4	V_{DD}



SC-82ABA
SC-82ABB
(TOP VIEW)

1	OUT
2	V_{DD}
3	NC
4	GND

Pin Description

PST81XXNX, PST82XXNX (SOT-25A)

Pin No.	Pin name	Functions
1	OUT	Reset Signal Output Pin
2	V_{DD}	V_{DD} Pin / Voltage Detect Pin
3	GND	GND Pin
4	NC	No Connection
5	NC	No Connection

PST81XXRX, PST82XXRX (SSON-4)

Pin No.	Pin name	Functions
1	OUT	Reset Signal Output Pin
2	GND	GND Pin
3	NC	No Connection
4	V_{DD}	V_{DD} Pin / Voltage Detect Pin

PST81XXUX, PST82XXUX (SC-82ABA/-82ABB)

Pin No.	Pin name	Functions
1	OUT	Reset Signal Output Pin
2	V_{DD}	V_{DD} Pin / Voltage Detect Pin
3	NC	No Connection
4	GND	GND Pin

Absolute Maximum Ratings

PST81XX

Item	Symbol	Ratings	Units
Supply voltage	V_{DD} max.	−0.3~+12.0	V
Output voltage	OUT	−0.3~(V_{DD}+0.3)	V
Input current (V_{DD})	I_{DD}	20	mA
Output current (RESET, $\overline{\text{RESET}}$)	I_{OUT}	20	mA
Power Dissipation	P_D	150 (SOT−25A, SC−82AB) 330 (SSON−4) (note)	mW
Operating temperature	T_{OPR}	−40~+105	°C
Storage temperature	T_{STG}	−65~+150	°C

PST82XX

Item	Symbol	Ratings	Units
Supply voltage	V_{DD} max.	−0.3~+12.0	V
Output voltage	OUT	−0.3~+12.0	V
Input current (V_{DD})	I_{DD}	20	mA
Output current (RESET, $\overline{\text{RESET}}$)	I_{OUT}	20	mA
Power Dissipation	P_D	150 (SOT−25A, SC−82AB) 330 (SSON−4) (note)	mW
Operating temperature	T_{OPR}	−40~+105	°C
Storage temperature	T_{STG}	−65~+150	°C

note : With PC board of glass epoxy. (The tab pin is not connected with PC board.)
PC board size of 110×40×0.8mm

Recommended Operating Conditions

Item	Symbol	Ratings	Units
Operating temperature	T_{OPR}	−40~+105	°C
Supply voltage	V_{DD}	0.70~10.0	V

Electrical Characteristics (Except where noted otherwise Ta=25°C)

PST81XX

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units	Circuit
Supply current	I_{DD}	$V_{DD}=V_{TH}+1V$		0.25	1.0	µA	(1)
Reset threshold	V_{TH}	Ta=+25°C $V_{TH}\leqq 1.9V$	$V_{TH}-0.8\%$	V_{TH} 0.8~ 6.0V (0.1Vstep)	$V_{TH}+0.8\%$	V	(2)
		Ta=−40~+85°C (note1)	$V_{TH}-2.5\%$		$V_{TH}+2.5\%$		
		Ta=+25°C $V_{TH}\geqq 2.0V$	$V_{TH}-0.5\%$		$V_{TH}+0.5\%$		
		Ta=−40~+85°C (note1)	$V_{TH}-2.5\%$		$V_{TH}+2.5\%$		
Reset threshold hysteresis	ΔV_{TH}	$V_{DD}=0V\rightarrow V_{TH}+1V\rightarrow 0V$	$V_{TH}\times 0.03$		$V_{TH}\times 0.08$	V	(2)
Reset threshold temp. coefficient	$\Delta V_{TH}/°C$	Ta=−40~+85°C (note1)		±100		ppm/°C	(2)
L transfer delay time	t_{PHL}	$V_{DD}=V_{TH}+0.4V\rightarrow V_{TH}-0.4V$(note2)			100	µs	(5)
H transfer delay time	t_{PLH}	$V_{DD}=V_{TH}-0.4V\rightarrow V_{TH}+0.4V$(note2)			100	µs	(5)
"L" output current	I_{OL1}	$V_{DD}=0.7V$, $V_{DS}=0.05V$	0.01	0.10		mA	(3)
	I_{OL2}	$V_{DD}=1.2V$, $V_{DS}=0.5V$ $V_{TH}>1.3V$	0.23	2.00			
	I_{OL3}	$V_{DD}=2.4V$, $V_{DS}=0.5V$ $V_{TH}>2.5V$	1.60	8.00			
	I_{OL4}	$V_{DD}=3.6V$, $V_{DS}=0.5V$ $V_{TH}>3.7V$	3.20	12.0			
"H" output current	I_{OH1}	$V_{DD}=4.8V$, $V_{DS}=0.5V$, $V_{TH}<4.7V$	0.36	0.62		mA	(4)
	I_{OH2}	$V_{DD}=6.1V$, $V_{DS}=0.5V$, $V_{TH}<5.9V$	0.46	0.75			

note1 : This device is tested at Ta=25°C, over temperature limits guaranteed by design only.
note2 : The parameter is guaranteed by design.

PST82XX

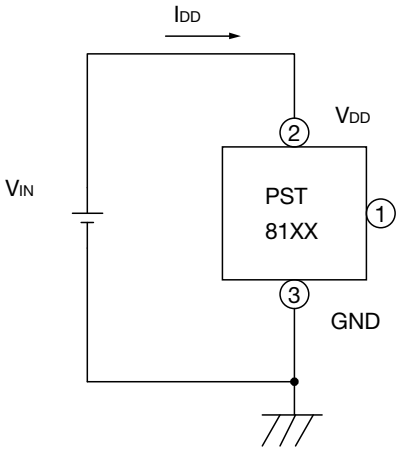
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units	Circuit
Supply current	I_{DD}	$V_{DD}=V_{TH}+1V$		0.25	1.0	µA	(1)
Reset threshold	V_{TH}	Ta=+25°C $V_{TH}\leqq 1.9V$	$V_{TH}-0.8\%$	V_{TH} 0.8~ 6.0V (0.1Vstep)	$V_{TH}+0.8\%$	V	(2)
		Ta=−40~+85°C (note1)	$V_{TH}-2.5\%$		$V_{TH}+2.5\%$		
		Ta=+25°C $V_{TH}\geqq 2.0V$	$V_{TH}-0.5\%$		$V_{TH}+0.5\%$		
		Ta=−40~+85°C (note1)	$V_{TH}-2.5\%$		$V_{TH}+2.5\%$		
Reset threshold hysteresis	ΔV_{TH}	$V_{DD}=0V\rightarrow V_{TH}+1V\rightarrow 0V$	$V_{TH}\times 0.03$		$V_{TH}\times 0.08$	V	(2)
Reset threshold temp. coefficient	$\Delta V_{TH}/°C$	Ta=−40~+85°C (note1)		±100		ppm/°C	(2)
L transfer delay time	t_{PHL}	$V_{DD}=V_{TH}+0.4V\rightarrow V_{TH}-0.4V$(note2)			100	µs	(4)
H transfer delay time	t_{PLH}	$V_{DD}=V_{TH}-0.4V\rightarrow V_{TH}+0.4V$(note2)			100	µs	(4)
"L" output current	I_{OL1}	$V_{DD}=0.7V$, $V_{DS}=0.05V$	0.01	0.10		mA	(3)
	I_{OL2}	$V_{DD}=1.2V$, $V_{DS}=0.5V$ $V_{TH}>1.3V$	0.23	2.00			
	I_{OL3}	$V_{DD}=2.4V$, $V_{DS}=0.5V$ $V_{TH}>2.5V$	1.60	8.00			
	I_{OL4}	$V_{DD}=3.6V$, $V_{DS}=0.5V$ $V_{TH}>3.7V$	3.20	12.0			
Output leakage current	Ileak	$V_{DD}=10V$, OUT=10V			0.1	µA	(3)

note1 : This device is tested at Ta=25°C, over temperature limits guaranteed by design only.
note2 : The parameter is guaranteed by design.

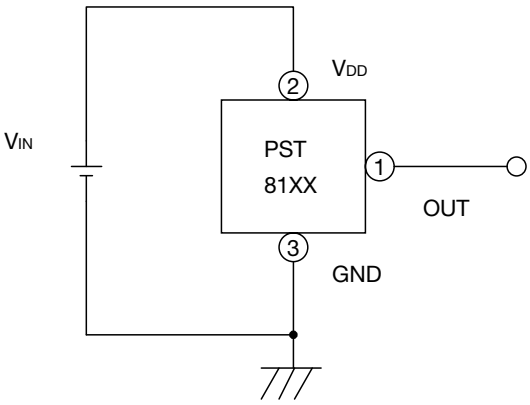
Measuring Circuit

PST81XX *①-③ in the circuit diagram is pin number for the SOT-25A package.

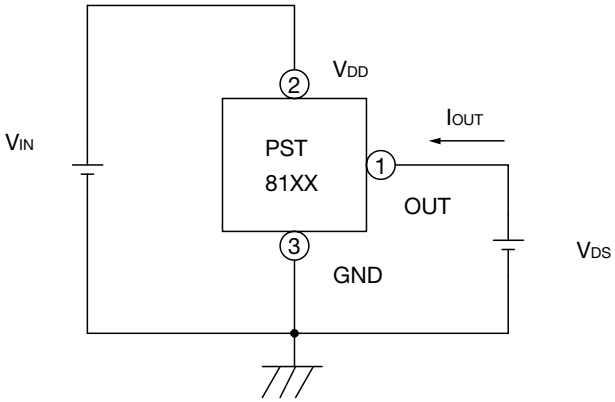
(1) I_{DD}



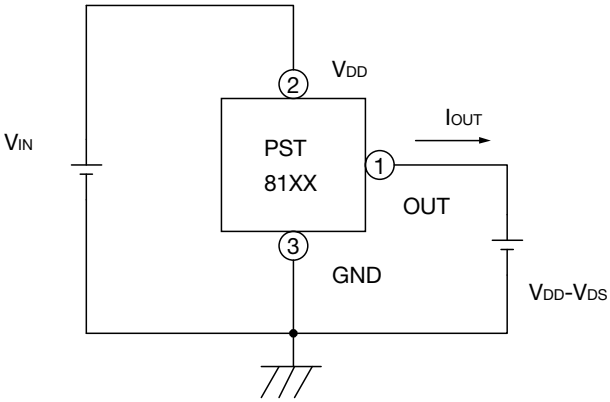
(2) V_{TH}, ΔV_{TH}, $\Delta V_{TH}/°C$



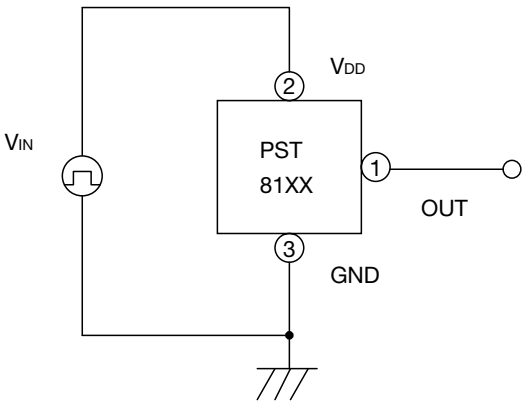
(3) I_{OL1}, I_{OL2}, I_{OL3}, I_{OL4}

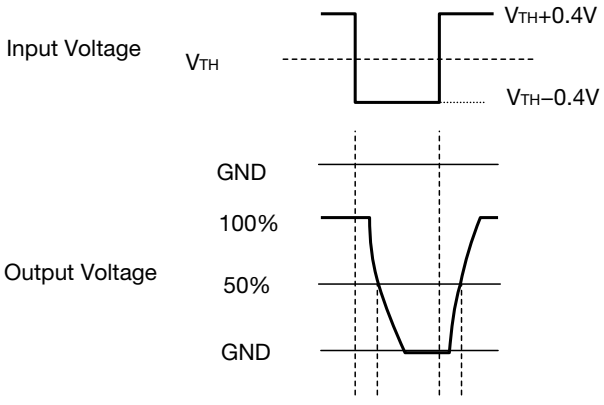


(4) I_{OH1}, I_{OH2}



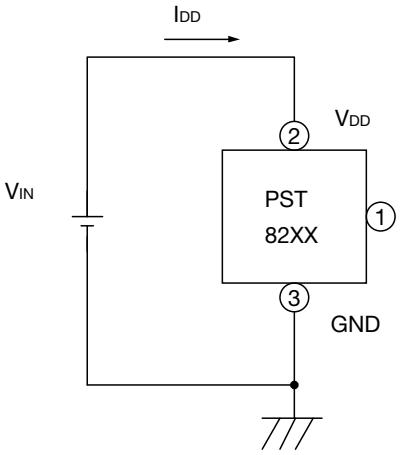
(5) t_{PLH}, t_{PHL}



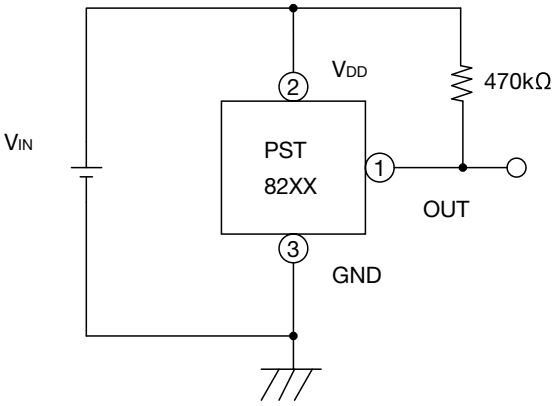


PST82XX *①-③ in the circuit diagram is pin number for the SOT-25A package.

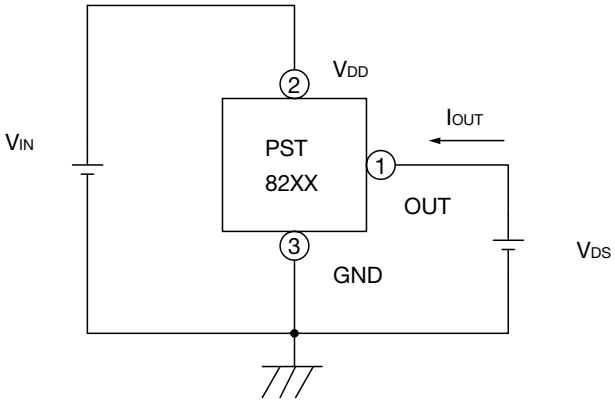
(1) I_{DD}



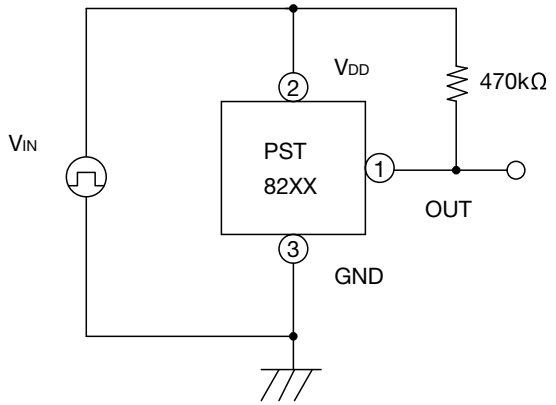
(2) V_{TH}, ΔV_{TH}, $\Delta V_{TH}/°C$

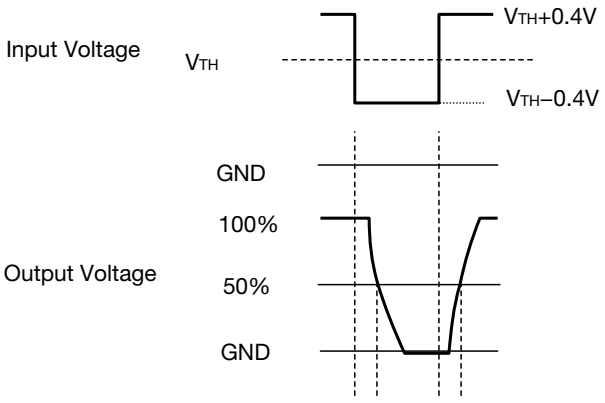


(3) I_{OL1}, I_{OL2}, I_{OL3}, I_{OL4}, Ileak

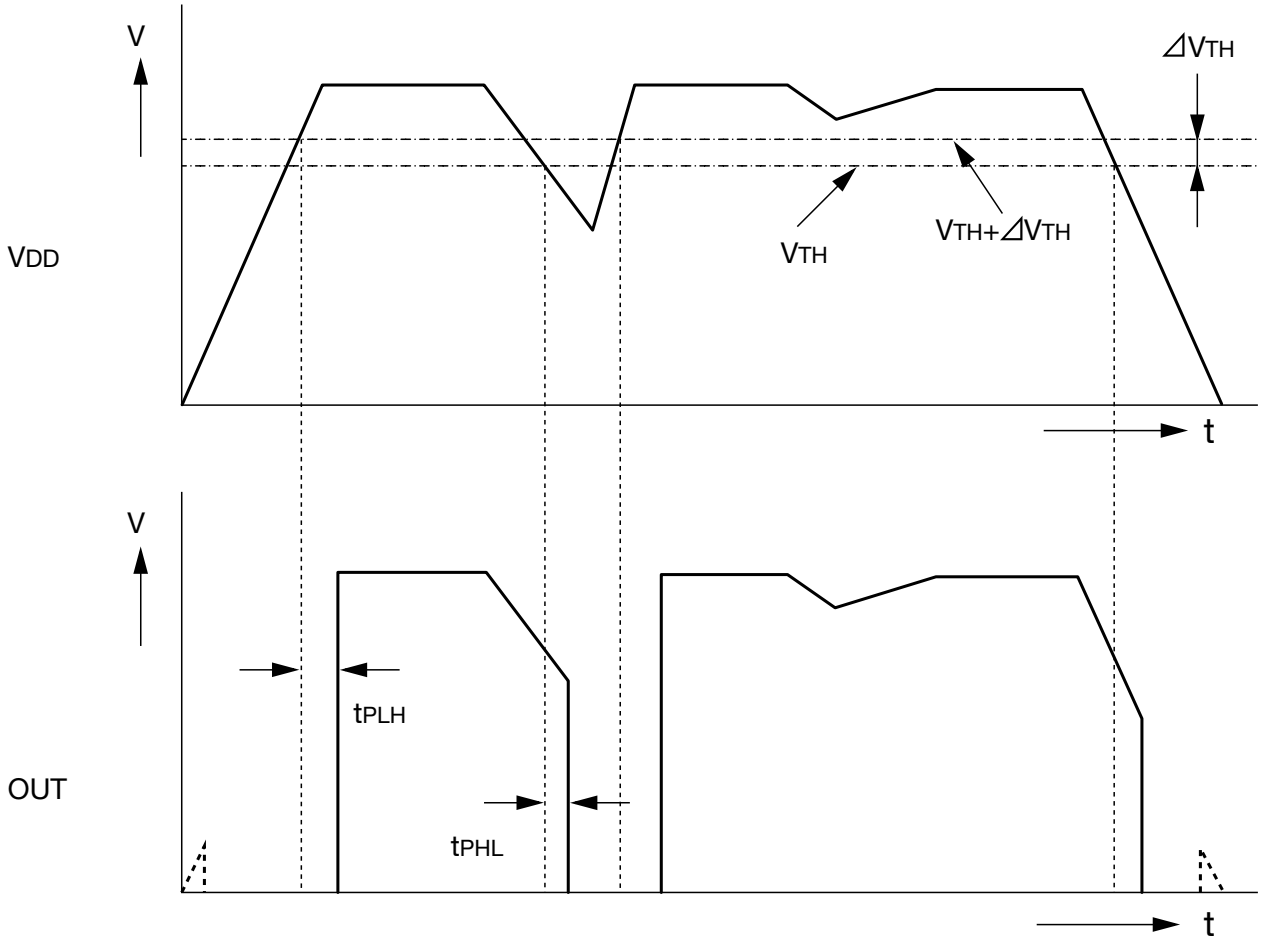


(4) t_{PLH}, t_{PHL}



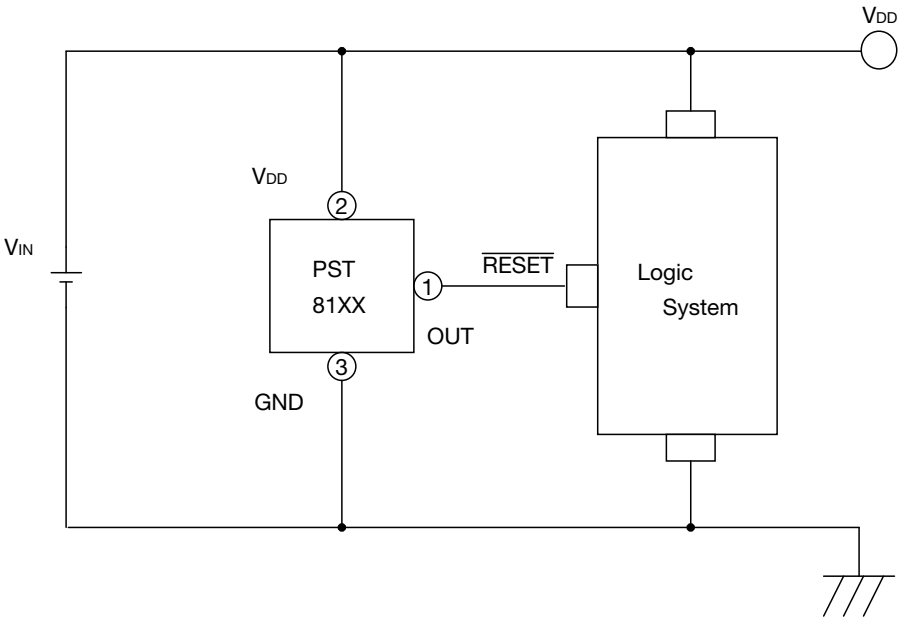


Timing Chart

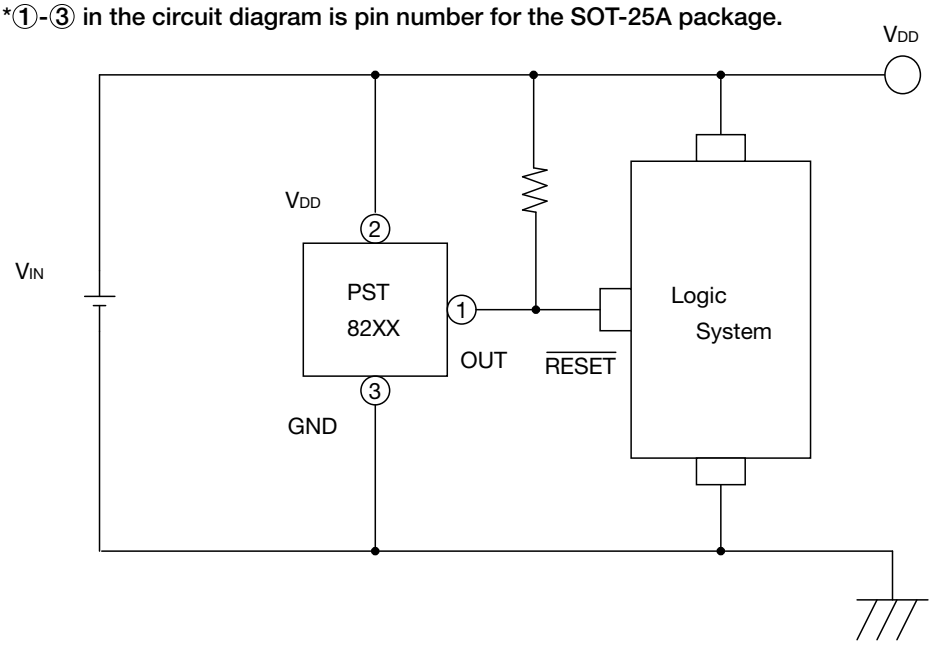


Application Circuits

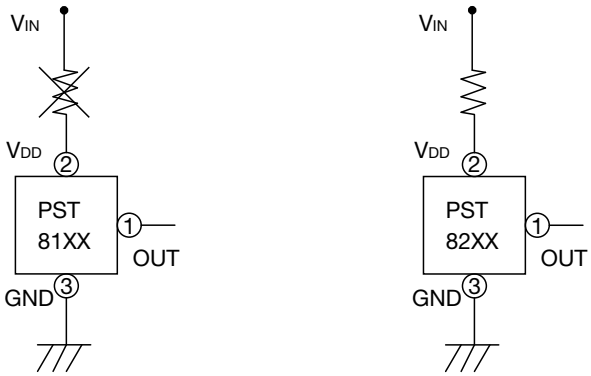
PST81XX *①-③ in the circuit diagram is pin number for the SOT-25A package.



PST82XX *①-③ in the circuit diagram is pin number for the SOT-25A package.



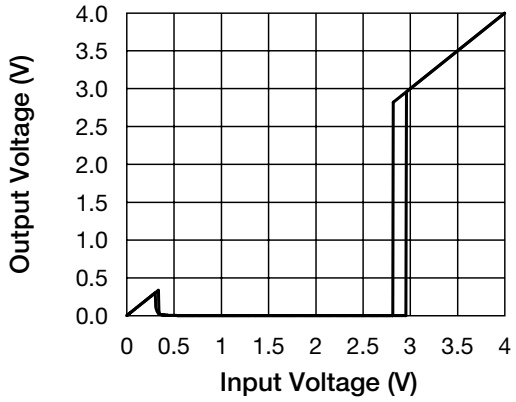
・We shall not be liable for any trouble or damage caused by using this circuit.
・In the event a problem which may affect industrial property or any other rights of us or a third party is encountered during the use of information described in these circuit, Mitsumi Electric Co., Ltd. shall not be liable for any such problem, nor grant a license therefore.



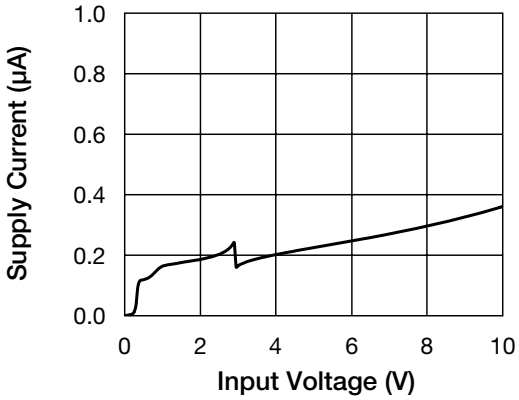
・Please note that there is any possibility of circuit oscillation when resistance put in the line V_{IN}.
・Please do not put resistance for PST81XX.
・Recommend 15kΩ or less for PST82XX.

Characteristics (Typical Performance Characteristics 2.8V)

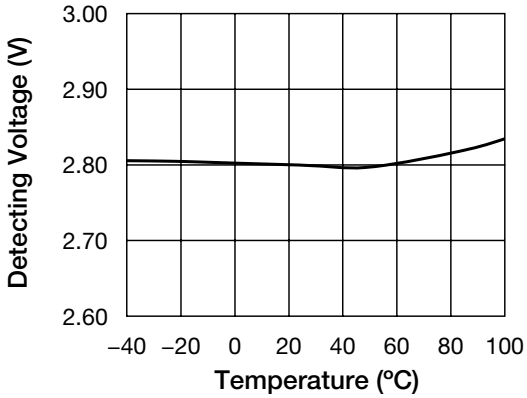
Detecting Voltage



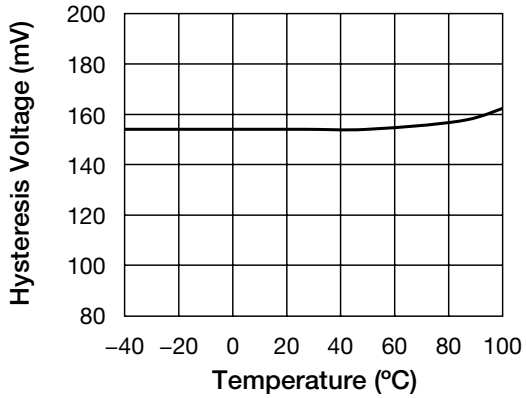
Supply Current



Detecting Voltage - Temperature

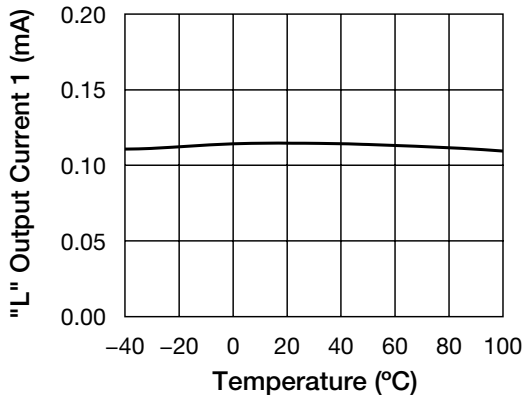


Hysteresis Voltage - Temperature

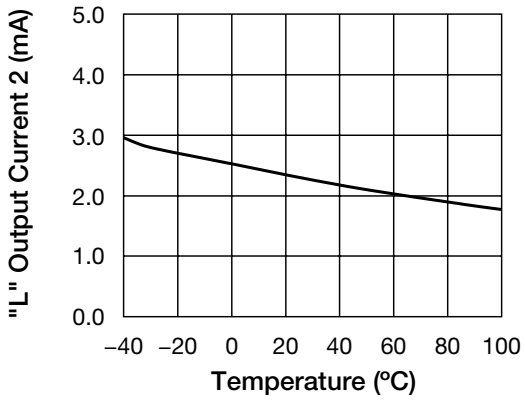


note : these are typical characteristics

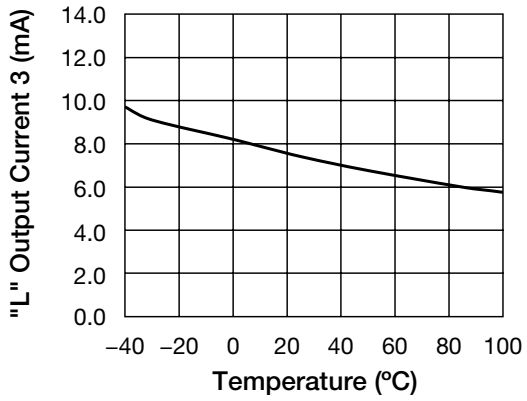
"L" Output Current 1 - Temperature



"L" Output Current 2 - Temperature



"L" Output Current 3 - Temperature



note : these are typical characteristics