System Reset
Monolithic IC PST575

Outline

This IC functions in a variety of CPU systems and other logic systems, to detect power supply voltage and reset the system accurately when power is turned on or interrupted. This ultra-low current consumption low reset type system reset IC has a built-in delay time generating circuit that can set the time by an external capacitor and resistor. It is ideal for use in multi-CPU systems because a fast-rising output waveform can be obtained.

Features

1. Ultra-low current consumption
2. Low operating limit voltage
3. Output current high for ON
4. Hysteresis voltage provided in detection voltage
5. Delay time can set over a wide range using external capacitor and resistor.
6. 10 ranks of detection voltage

I_{CCH}=7.5µA typ. I_{CCL}=400µA typ.
0.65V typ.
30mA typ.
50mV typ.

10µS~10S

| PST575 | C : 4.5V typ. | H : 3.1V typ. |
	D : 4.2V typ.	I : 2.9V typ.
	E : 3.9V typ.	J : 2.7V typ.
	F : 3.6V typ.	K : 2.5V typ.
	G : 3.3V typ.	L : 2.3V typ.

Package

MMP-4A (PST575☐M)
DIP-8A (PST575☐)
* ☐contains detection voltage rank

Applications

1. Reset circuits in microcomputers, CPUs and MPUs (especially multi-CPU sets)
2. Logic circuit reset circuits.
3. Battery voltage check circuits.
4. Back-up power supply switching circuits.
5. Level detection circuits.

Pin Assignment
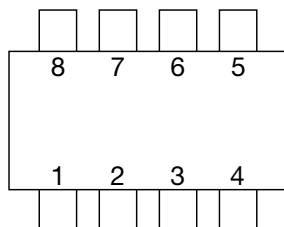
| 3	GND
4	Cd
5	V_{OUT}
7	V_{CC}
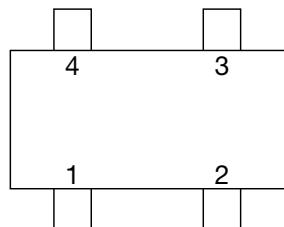
DIP-8A

1	V_{CC}
2	V_{OUT}
3	Cd
4	GND

MMP-4A

Equivalent Circuit Diagram
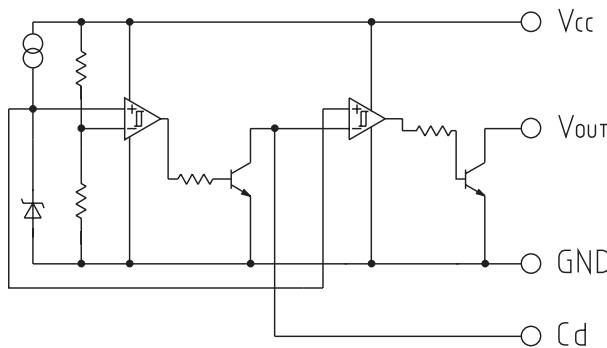
Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Rating	Units
Storage temperature	T_{STG}	−40~+125	℃
Operating temperature	T_{OPR}	−20~+75	℃
Power supply voltage	V_{CC} max.	−0.3~10	V
Allowable loss	Pd	200 (MMP-3A) 300 (TO-92A)	mW

Electrical Characteristics (Ta=25℃) (Except where noted otherwise, resistance unit is Ω)

Item	Symbol	Measuring circuit	Measurement conditions		Min.	Typ.	Max.	Units
Detection voltage	V_S	1	R_L=470 V_{OL}≤ 0.4V V_{CC}=H→L	PST575C	4.3	4.5	4.7	V
				PST575D	4.0	4.2	4.4	
				PST575E	3.7	3.9	4.1	
				PST575F	3.4	3.6	3.8	
				PST575G	3.1	3.3	3.5	
				PST575H	2.9	3.1	3.3	
				PST575I	2.75	2.90	3.05	
				PST575J	2.55	2.70	2.85	
				PST575K	2.35	2.50	2.65	
				PST575L	2.15	2.30	2.45	
Hysteresis voltage	$\triangle V_S$	1	R_L=470, V_{CC}=L→H→L		25	50	100	mV
Detection voltage temperature coefficient	$V_S/\triangle T$	1	R_L=470, Ta=−20℃~+75℃			±0.01		%/℃
Low-level output voltage	V_{OL}	1	V_{CC}=V_S min.−0.05V, R_L=470			0.1	0.4	V
Output leakage current	I_{OH}	1	V_{CC}=7.5V				±0.1	μA
Circuit current while on	I_{CCL}	1	V_{CC}=V_S min.−0.05V, R_L=∞			400	650	μA
Circuit current while off	I_{CCH}	1	V_{CC}=V_S typ./0.85V, R_L=∞			7.5	12.0	μA
"H" transport delay time	tpLH	2	Rd=100k, Cd=0.01μF ＊1		0.75	1.25	1.75	mS
"L" transport delay time	tpHL	2	Rd=100k, Cd=0.01μF ＊1			6	20	μS
Operating power supply voltage	VopL	1	R_L=4.7kΩ, V_{OL}≤ 0.4V			0.65	0.85	V
Output current while on I	I_{OL} I	1	V_{CC}=V_S min.−0.05V, R_L=0		8	30		mA
Output current while on II	I_{OL} II	1	Ta=−20℃~+75℃, R_L=0 ＊2		5			mA
Threshold voltage for delay time setting comparator (CO2)	Vtsh	1	V_{CC}=5.0V, Rd=100k, Cd=0.01μF R_L=4.7k, C_L=100pF		3.5	3.7	3.9	V

＊1 : tpLH : V_{CC}= (V_S typ.−0.4V) → (V_S typ.+0.4V), tpHL : V_{CC}= (V_S typ.+0.4V) → (V_S typ.−0.4V), C_L=100pF

＊2: V_{CC}=V_S min.−0.15V

Measuring Circuit (Example: PST575C)

[1]

A : DC ammeter
V : DC voltmeter
CRT: Oscilloscope

[2]

Input pulse
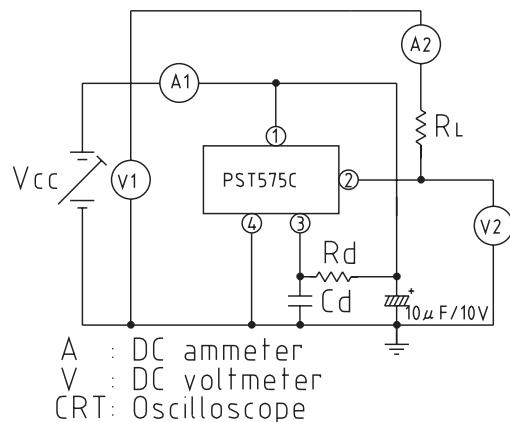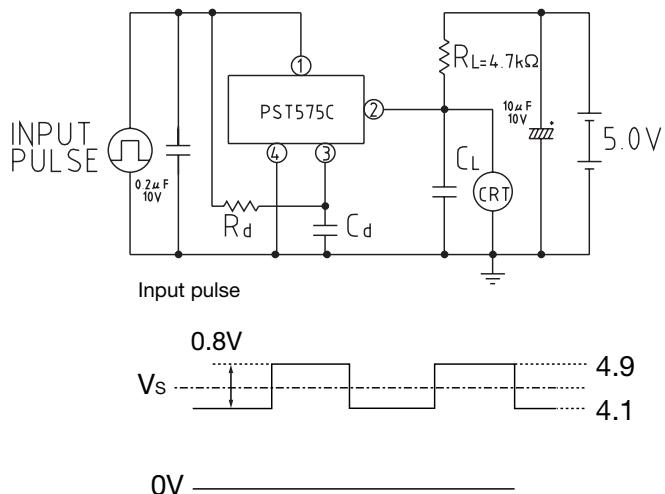
Note: Input model is an example for PST575C (MMP-4P).

Characteristics (Example: PST575C)

■ V$_{CC}$ vs. V$_{OUT}$
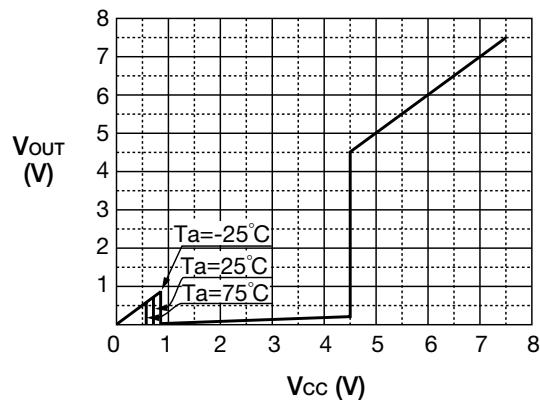
■ V$_{CC}$ vs. I$_{CC}$
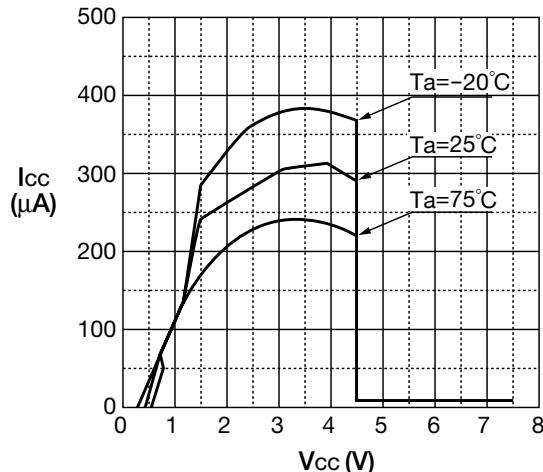
■ V$_S$ vs. Ta
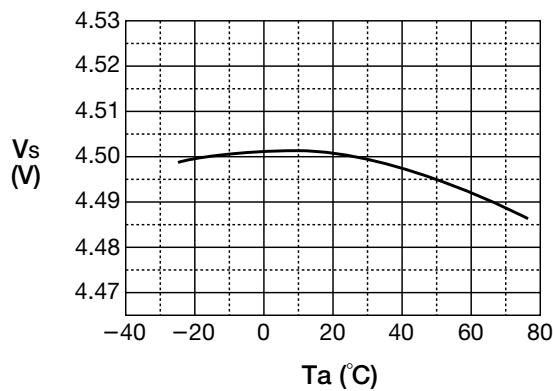
■ ⊿V$_S$ vs. Ta
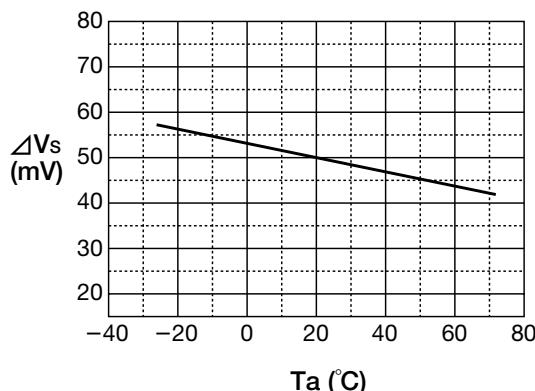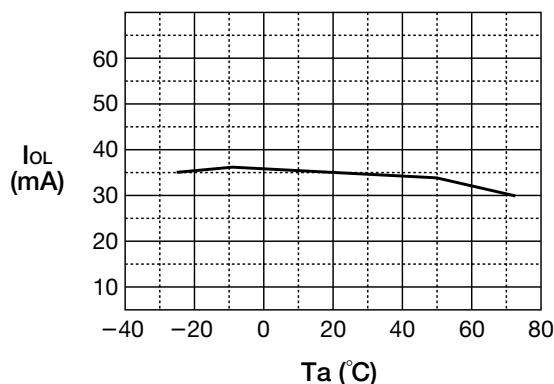
■ IOL vs. Ta

■ VOL vs. Ta
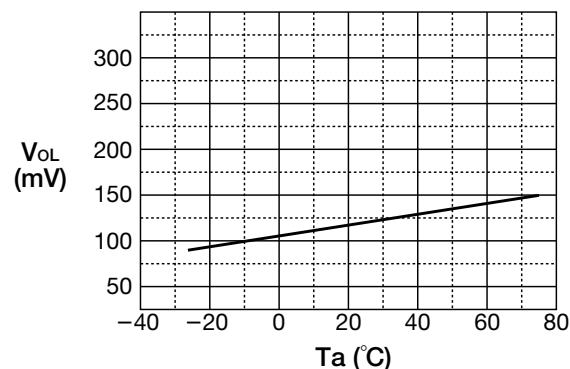
■ ICCH vs. Ta
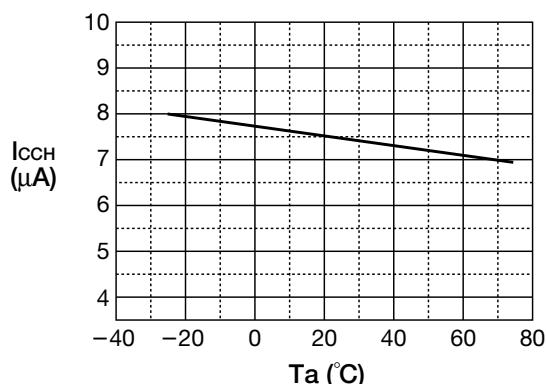
■ ICCL vs. Ta
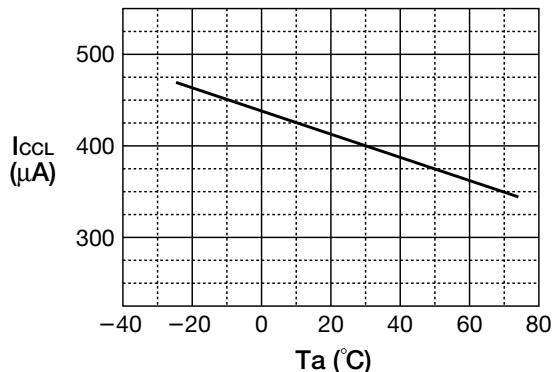
■ Cd (Rd) vs. tpLH

■ tpLH vs. Ta

Rd=100k Cd=0.01μF (Mylar)
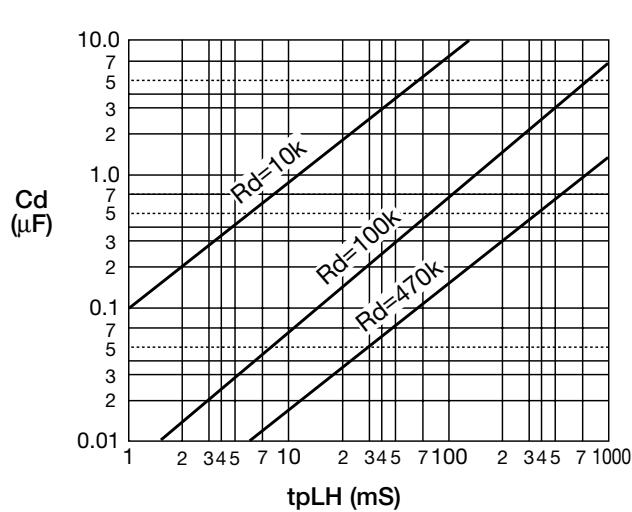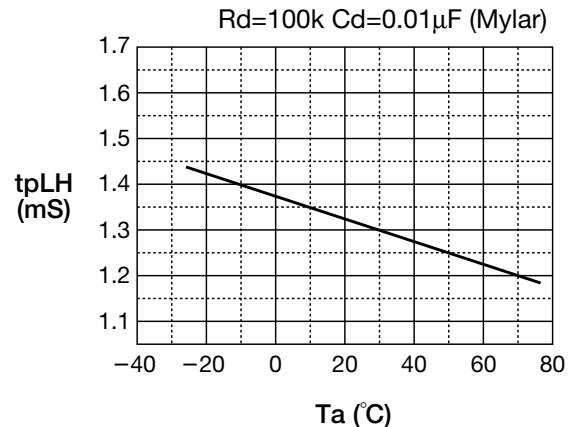
### ■ Pd vs. Ta
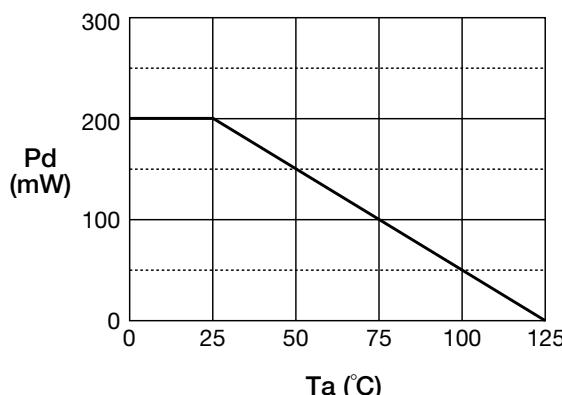
Timing Chart
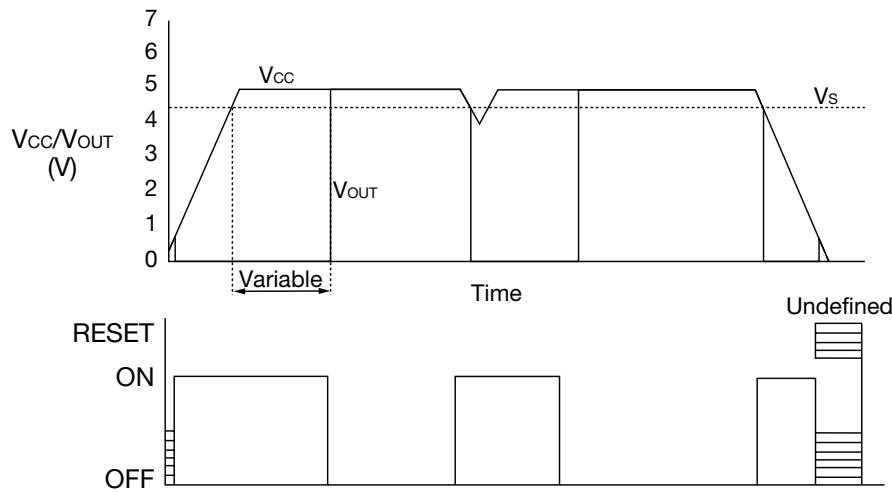
Application Circuits (Pin numbers are for an example of MMP-4P.)

1. Normal hard reset
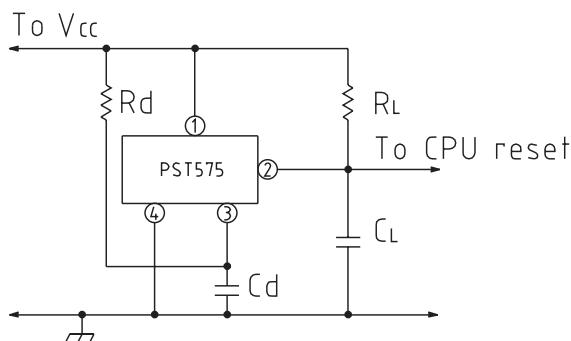

Delay time (tPLH)
$\fallingdotseq 1.3Cd \times Rd + 0.007$ (mS)
 Cd : μF   Rd : kΩ
Note: Connect a capacitor between IC pins 1 and 2 if
      V_{CC} line impedance is high.

2. Manual reset added
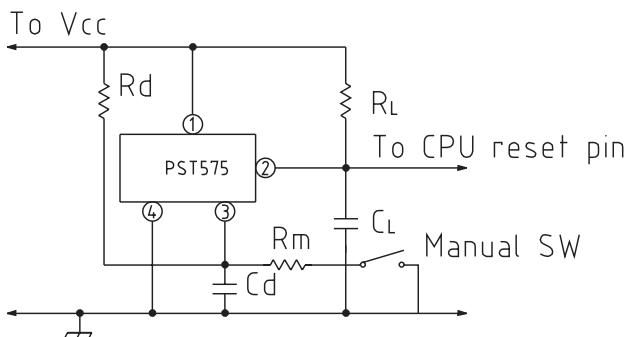
Note: Use R_L, C_L and Rm to prevent manual switch
      chattering. Connect a capacitor between IC
      pins 1 and 2 if V_{CC} line impedance is high.

### 3. Battery checker (LED ON for high voltage)
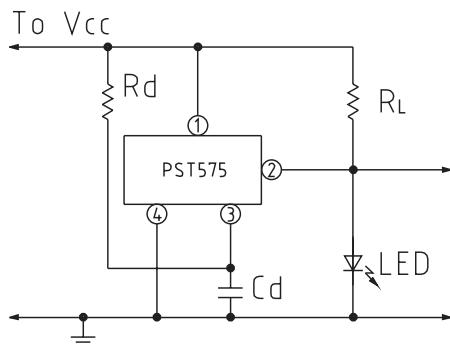
Note: Connect a capacitor between IC pins 1 and 2 if Vcc line impedance is high.

4. Battery checker (LED ON for low voltage)
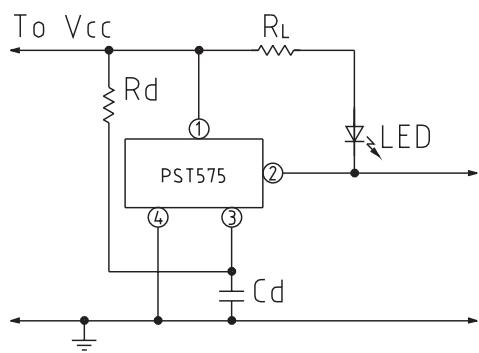
Note: Connect a capacitor between IC pins 1 and 2 if Vcc line impedance is high.

5. Hysteresis voltage UP method
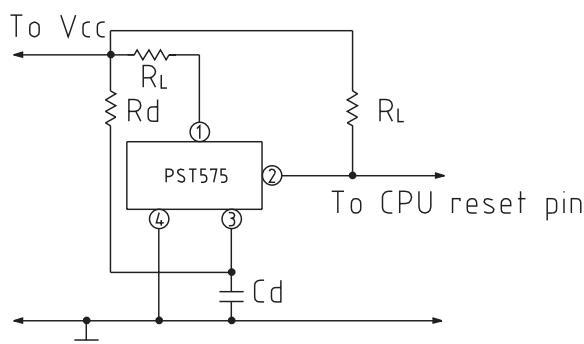
When increasing hysteresis voltage for stable system operation, determine RH as follows and connect externally.

However, I_{CCH} is −5000PPM/℃, so perform temperature compensation at RH when using over a wide temperature range.

Hysteresis voltage UP amount ($\triangle$Vsup) is

$\triangle$Vsup $\fallingdotseq$ RH × I_{CCL}

Total hysteresis voltage ($\triangle$Vstotal) is

$\triangle$Vstotal $\fallingdotseq$ Vs+$\triangle$Vsup

(Operation will be destabilized is RH is raised too much.)

Note: Connect a capacitor between IC pins 1 and 2 if Vcc line impedance is high.