

System Reset Monolithic IC PST574

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 fixed delay time generating circuit. It is ideal for use in multi-CPU systems because a fast-rising output waveform can be obtained.

Features

- | | |
|---|--|
| 1. Ultra-low current consumption | $I_{CCCH}=7.5\mu A$ typ. $I_{CCCL}=400\mu A$ typ. |
| 2. Low operating limit voltage | 0.65V typ. |
| 3. Output current high for ON | 30mA typ. |
| 4. Hysteresis voltage provided in detection voltage | 50mV typ. |
| 5. Built-in delay circuit with excellent delay time temperature characteristics | 50mV typ. |
| 6. 10 ranks of detection voltage | PST574 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-3A (PST574 □M)

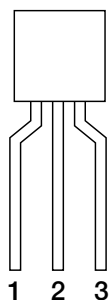
TO-92A (PST574 □)

*□ contains detection voltage rank .

Applications

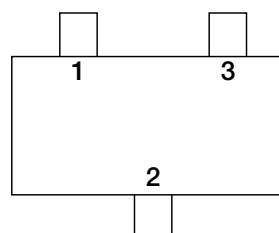
1. Reset circuits in microcomputers, CPUs and MPUs (especially multi-CPU sets)
2. Logic circuit reset circuits.
3. Battery voltage check circuits.
4. Back-up power supply switching circuits.
5. Level detection circuits.

Pin Assignment



TO-92A

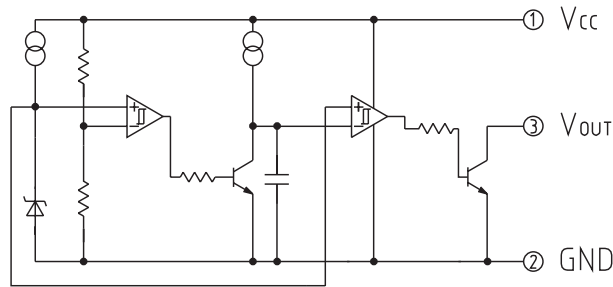
| | |
|---|------------------|
| 1 | V _{CC} |
| 2 | GND |
| 3 | V _{OUT} |



MMP-3A

| | |
|---|------------------|
| 1 | V _{CC} |
| 2 | GND |
| 3 | V _{OUT} |

Equivalent Circuit Diagram



Absolute Maximum Ratings (Ta=25°C)

| Item | Symbol | Rating | Units |
|-----------------------|----------------------|------------------------------|-------|
| Storage temperature | T _{STG} | -40~+125 | °C |
| Operating temperature | T _{OPR} | -20~+75 | °C |
| Power supply voltage | V _{CC} max. | -0.3~10 | V |
| Allowable loss | P _d | 200 (MMP-3A) 300 (TO-92A) | mW |

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

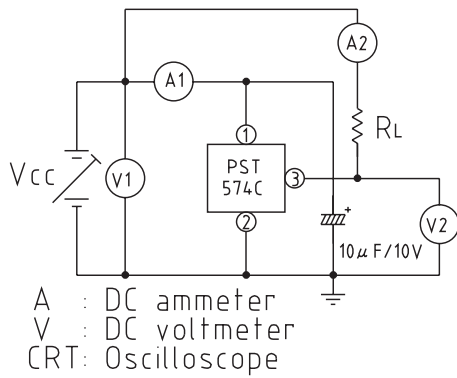
| Item | Symbol | Measurement circuit | Measurement conditions | Min. | Typ. | Max. | Units | |
|---|--------------------|---------------------|---|---------|-------|------|-------|---|
| Detection voltage | V _s | 1 | R _L =470 V _{OL} ≤ 0.4V V _{CC} =H→L | PST574C | 4.3 | 4.5 | 4.7 | V |
| | | | | PST574D | 4.0 | 4.2 | 4.4 | |
| | | | | PST574E | 3.7 | 3.9 | 4.1 | |
| | | | | PST574F | 3.4 | 3.6 | 3.8 | |
| | | | | PST574G | 3.1 | 3.3 | 3.5 | |
| | | | | PST574H | 2.9 | 3.1 | 3.3 | |
| | | | | PST574I | 2.75 | 2.90 | 3.05 | |
| | | | | PST574J | 2.55 | 2.70 | 2.85 | |
| | | | | PST574K | 2.35 | 2.50 | 2.65 | |
| PST574L | 2.15 | 2.30 | 2.45 | | | | | |
| Hysteresis voltage | ΔV _s | 1 | R _L =470, V _{CC} =L→H→L | 25 | 50 | 100 | mV | |
| Detection voltage temperature coefficient | V _s /ΔT | 1 | R _L =470, Ta=-20°C~+75°C | | ±0.01 | | %/°C | |
| 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 | *1 R _L =4.7kΩ, C _L =100pF | 250 | 400 | 600 | μS | |
| "L"transport delay time | tpHL | 2 | *1 R _L =4.7kΩ, C _L =100pF | | 6 | 20 | μS | |
| Operation limit voltage | V _{opL} | 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 | *2 Ta=-20°C~+75°C, R _L =0 | 5 | | | mA | |

*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)

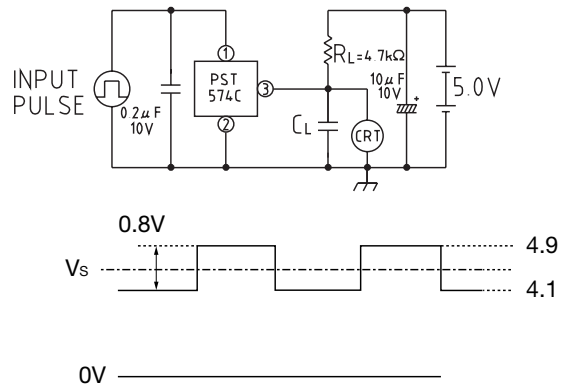
*2 : V_{CC}=V_s min.-0.15V

Measuring Circuit

[1]



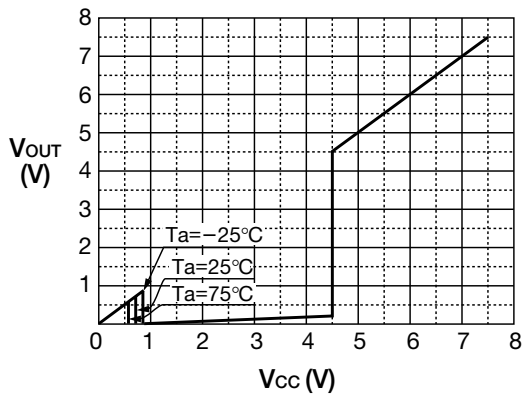
[2]



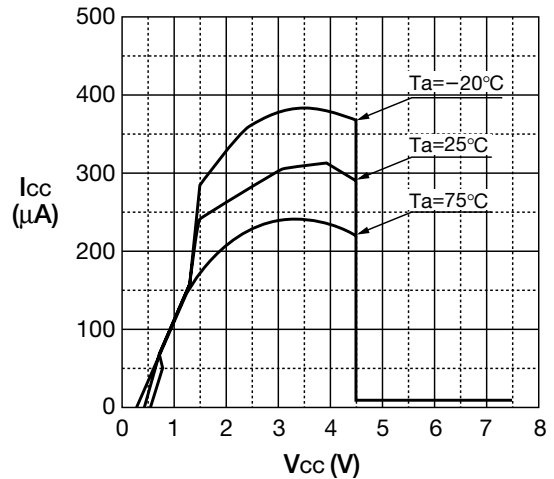
Note: Input model is an example for PST574C.

Characteristics (Example: PST574C)

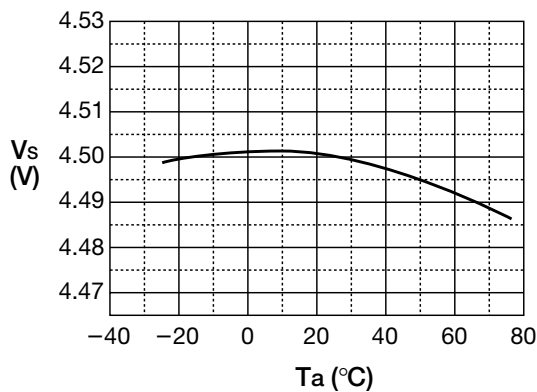
Vcc vs. Vout



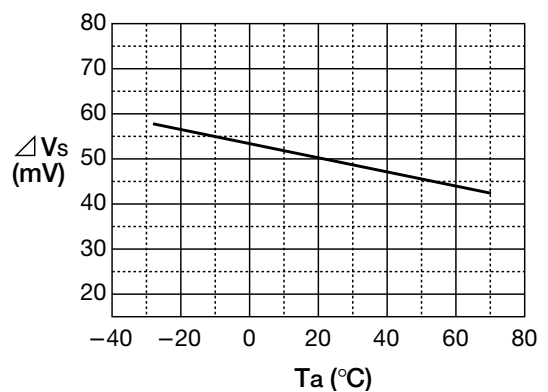
Vcc vs. Icc



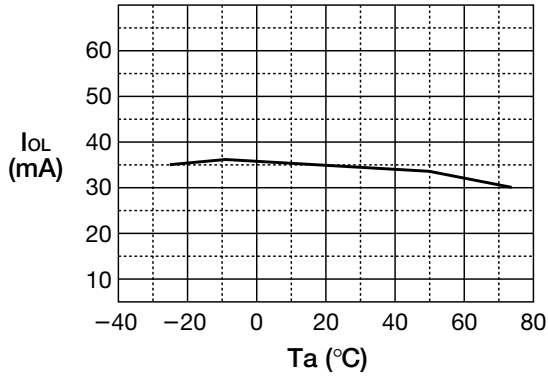
Vs vs. Ta



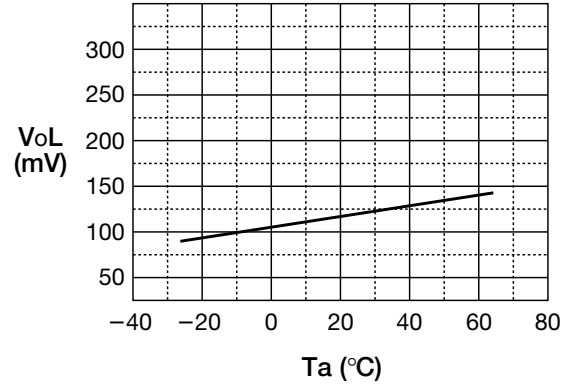
ΔVs vs. Ta



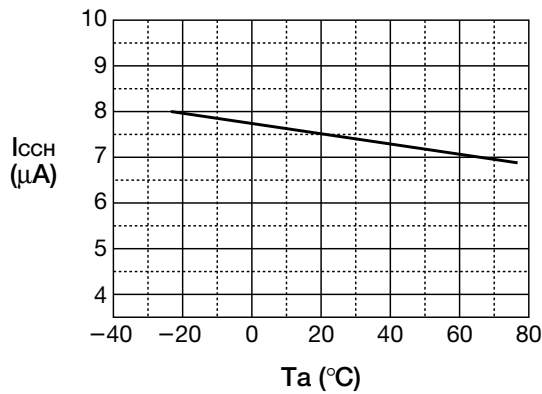
IoL vs. Ta



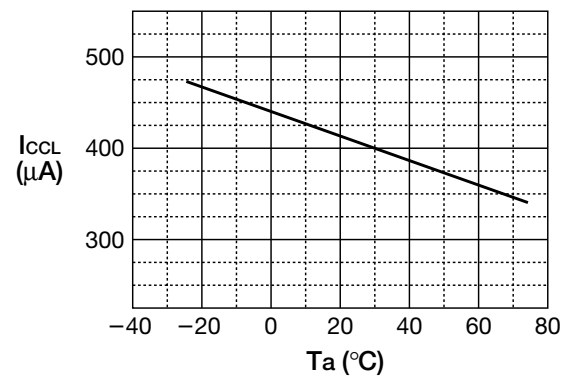
VoL vs. Ta



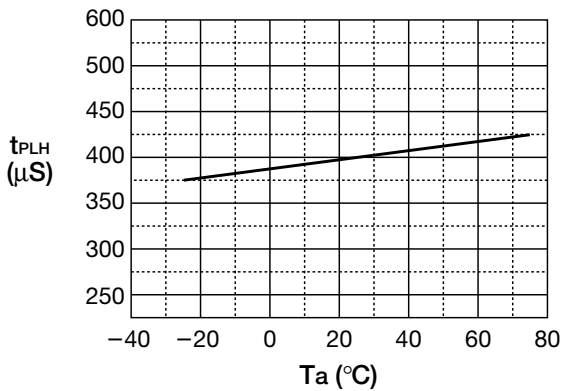
IcCH vs. Ta



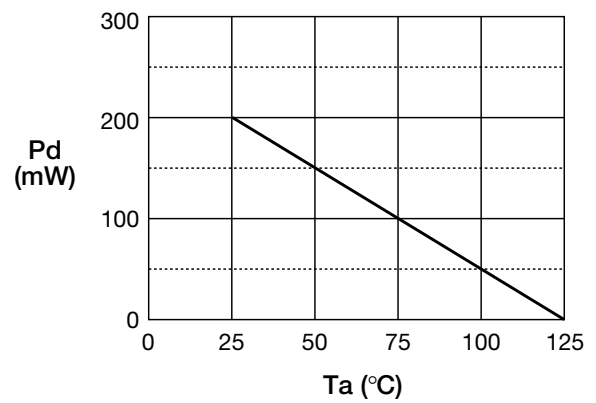
IcCL vs. Ta



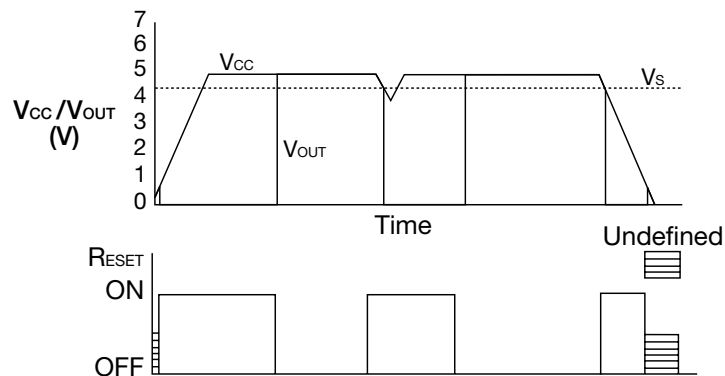
tPLH vs. Ta



Pd vs. Ta

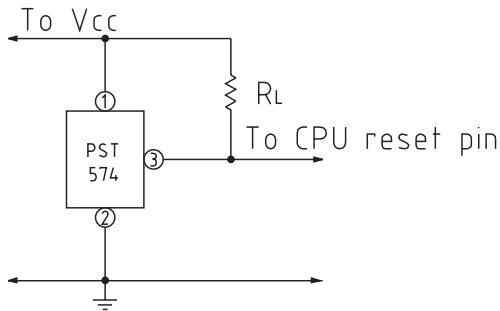


Timing Chart



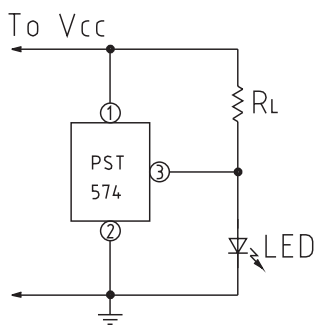
Application circuits

1. Normal hard reset



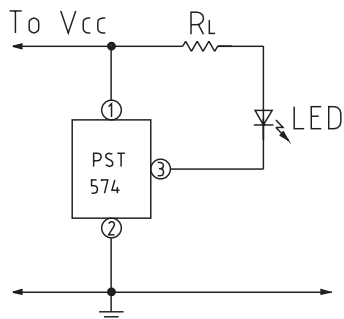
Note: Connect a capacitor between IC pins 1 and 2 if V_{CC} line impedance is high.

2. Battery checker (LED ON for high voltage)



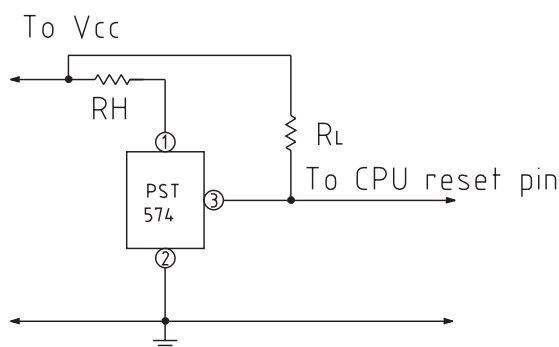
Note: Connect a capacitor between IC pins 1 and 2 if V_{CC} line impedance is high.

3. Battery checker (LED ON for low voltage)



Note: Connect a capacitor between IC pins 1 and 2 if V_{CC} line impedance is high.

4. Hysteresis voltage UP method



When increasing hysteresis voltage for stable system operation, determine R_H as follows and connect externally.

However, I_{CC1} is -5000PPM/°C, so perform temperature compensation at R_H when using over a wide temperature range.

Hysteresis voltage UP amount (ΔV_{sup}) is

$$\Delta V_{sup} \cong R_H \times I_{CC1}$$

Total hysteresis voltage (ΔV_{total}) is

$$\Delta V_{total} \cong V_s + \Delta V_{sup}$$

(Operation will be destabilized if R_H is raised too much.)

Note: Connect a capacitor between IC pins 1 and 2 if V_{CC} line impedance is high.