IC for System Reset
Monolithic IC PST600

September 6, 2001

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. There are other system reset ICs available such as PST572(conventional). In PST600, the circuit current increases or decreases during power-on tracking a load current. This is a low-reset type system reset IC with low-current consumption during power-on and power-off.

Features

1. Low current consumption during power-on and power-off as the circuit current increases or decreases during power-on tracking a load current — No load : I_{CCL}=7μA typ.; I_{CCH}=5μA typ.
2. Low operating limit voltage — 0.65V typ.
3. Hysteresis voltage provided for detection voltage — 50mV typ.
4. 10 ranks of detection voltages are available.

PST600 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.

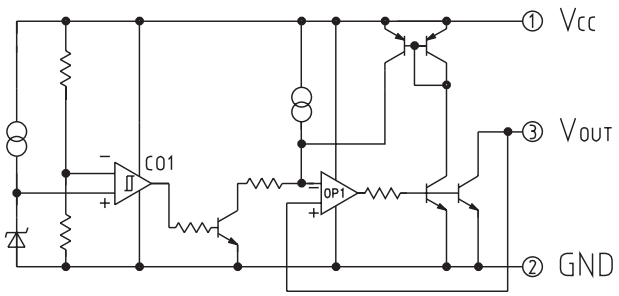
Packages

MMP-3A (PST600□M)
TO-92A (PST600□)
*The box represents a rank of detection voltage.

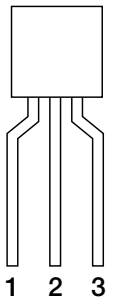
Applications

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

Equivalent Circuit

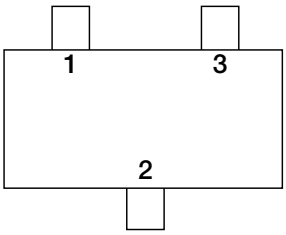


Pin Assignment



TO-92A

1	VCC
2	GND
3	VOUT



MMP-3A
(TOP VIEW)

1	VCC
2	GND
3	VOUT

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	TSTG	−40~+125	°C
Operating temperature	TOPR	−20~+75	°C
Power supply voltage	VCC max.	−0.3~10	V
Allowable loss	Pd	200 (MMP-3A) 300 (TO-92A)	mW

Electrical Characteristics (Ta=25°C) (unless otherwise indicated resistance unit is Ω)

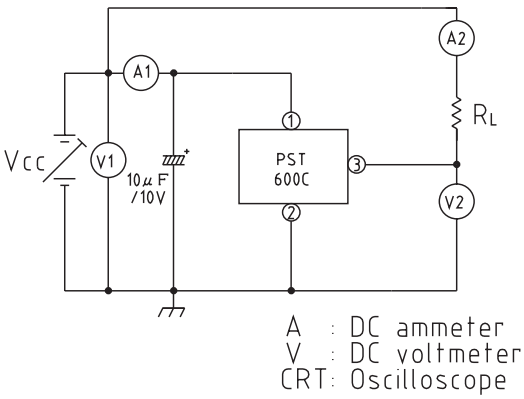
Item	Symbol	Measurement circuit	Measurement conditions		Min.	Typ.	Max.	Units
Detection voltage	Vs	1	RL=470 VOL ≦ 0.4V VCC=H→L	PST600C	4.3	4.5	4.7	V
				PST600D	4.0	4.2	4.4	
				PST600E	3.7	3.9	4.1	
				PST600F	3.4	3.6	3.8	
				PST600G	3.1	3.3	3.5	
				PST600H	2.9	3.1	3.3	
				PST600I	2.75	2.90	3.05	
				PST600J	2.55	2.70	2.85	
				PST600K	2.35	2.50	2.65	
				PST600L	2.15	2.30	2.45	
Hysteresis voltage	⊿Vs	1	RL=470, VCC=L→H→L		30	50	100	mV
Detection voltage temperature coefficient	Vs/⊿T	1	RL=470, Ta=−20°C~+75°C			±0.01		%/°C
Low level output voltage	VOL	1	VCC=Vs min. −0.05V, RL=470			0.3	0.4	V
Output leak current	IOH	1	VCC=10V				±0.1	μA
Circuit current for ON	ICCL	1	VCC=Vs min. −0.05V	IOL=0mA		7	14	μA
				IOL=8mA		50	130	
Circuit current for OFF	ICCH	1	VCC=Vs typ./0.85V, RL=∞			5	10	μA
H transmission delay time	tPLH	2	RL=4.7k, CL=100pF ✶1		20	40	80	μs
L transmission delay time	tPHL	2	RL=4.7k, CL=100pF ✶1		10	20	40	μs
Operating limit voltage	VopL	1	RL=4.7k, VoL ≦ 0.4V			0.65	0.85	V
Output current 1 for ON	IOL 1	1	VCC=Vs min. −0.05V, RL=0		8			mA
Output current 2 for ON	IOL 2	1	Ta=−20°C~+75°C, RL=0 ✶2		6			mA

*1 tPLH : VCC= (Vs typ. −0.4V) → (Vs typ.+0.4V), tPLH : VCC= (Vs typ.+0.4V) → (Vs typ.−0.4V)

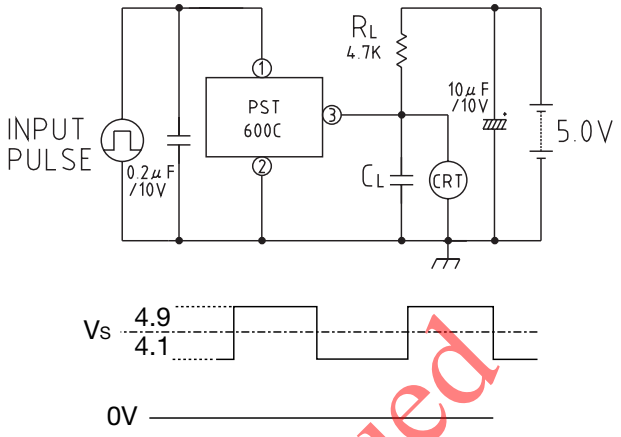
*2 VCC=Vs min. −0.15V

Measurement Circuit

[1]



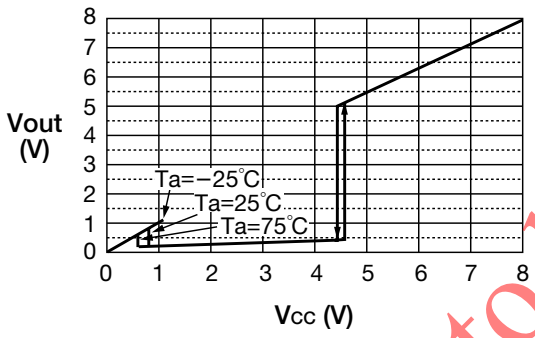
[2]



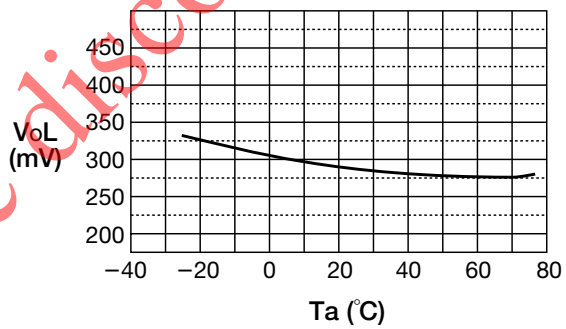
* The input model is an example of PST600C (MMP-3P).

Characteristics (PST600C is used as the representative model for characteristics examples.)

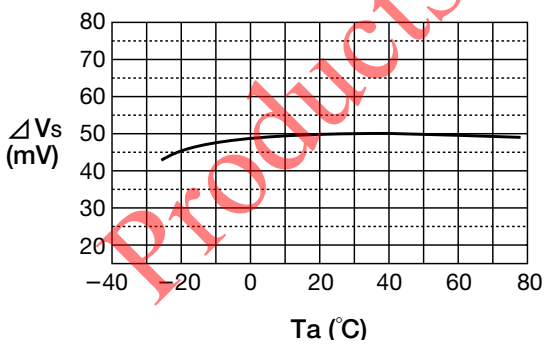
Vcc vs. Vout



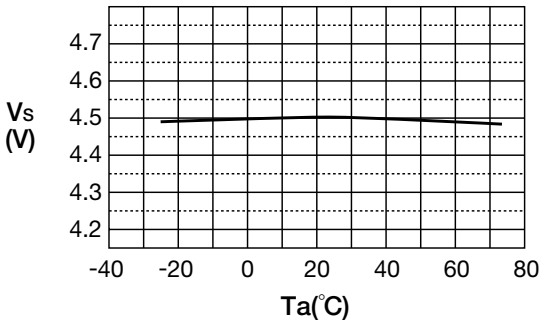
VoL vs. Ta



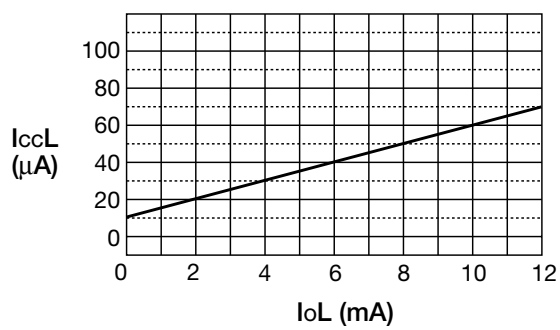
⊿Vs vs. Ta



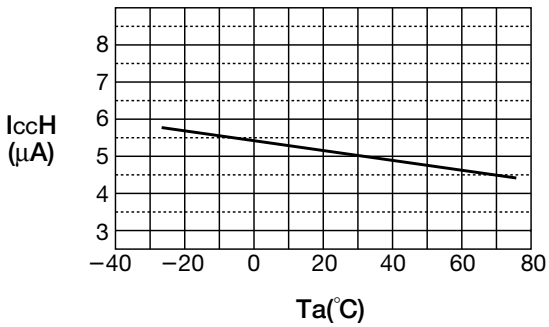
Vs vs. Ta



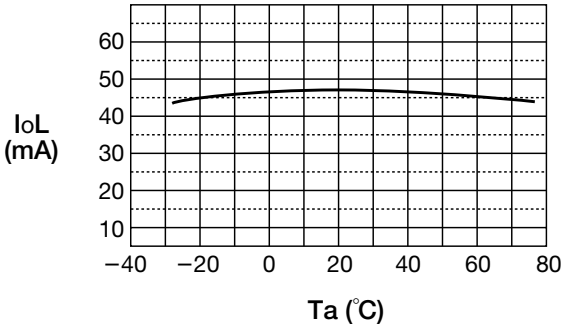
IccL vs. IoL



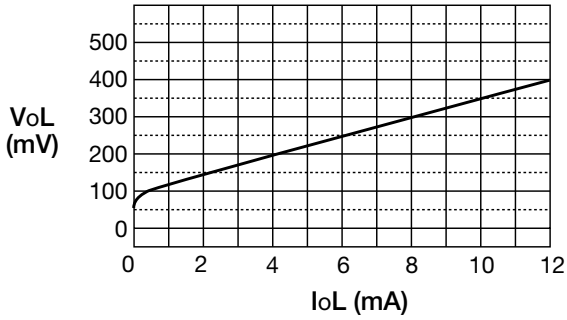
IccH vs. Ta



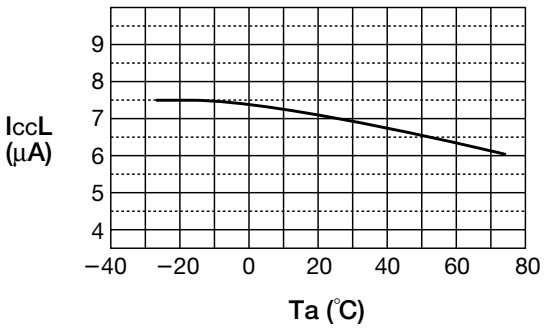
IoL vs. Ta



VoL vs. IoL

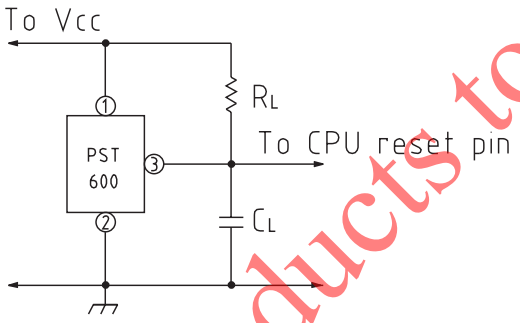


IccL (IoL=0mA) vs. Ta



Application Circuits

1. Normal hard reset



Delay Time (tPLH)

$$\fallingdotseq C_L \times R_L \times \left[\ln \frac{V_{CC}}{V_{CC} - (V_{S\,CPU} + 0.2)}\right] + 0.040 \text{ (ms)}$$

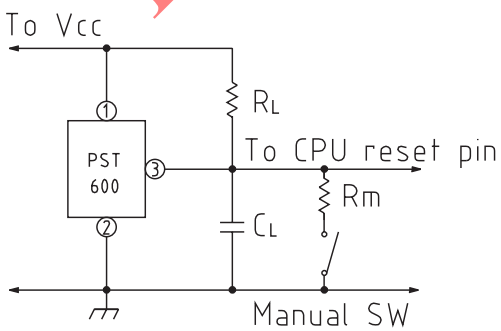
C_L : µF $V_{S\,CPU}$: CPU, MPU reset threshold voltage

R_L : kΩ

Voltage : V

Note : When V_{CC} line impedance is high, connect a capacitor between IC Pins 1 and 2.

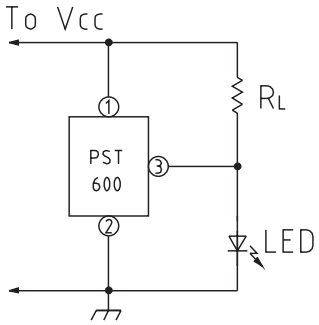
2. Manual Reset



Note : Prevent Manual SW chattering by using R_L, C_L and Rm. Rm setting conditions are as follows : Rm ≦ 1/20 R_L

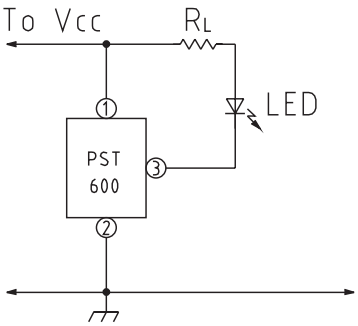
Note : When V_{CC} line impedance is high,connect a capacitor between IC Pins 1 and 2.

3. Battery Checker (LED ON for High voltage)



Note : When V_{CC} line impedance is high, connect a capacitor between IC Pins 1 and 2.

4. Battery Checker (LED ON for Low voltage)



Note : When V_{CC} line impedance is high, connect a capacitor between IC Pins 1 and 2.