System Reset
Monolithic IC PST993, 994

Outline

The function of this IC is to accurately reset systems after detecting the supply voltage at the time of switching power on and instantaneous power off in various CPU and other logic systems. Further, this IC can be offered at low cost because it is designed to be simplified allowing for the replacement from reset circuit of discrete configuration.

Features

1. Voltage detect precision	V_S±5% max.
2. Low consumption current	I_{CCH}=300μA typ. I_{CCL}=250μA typ.
3. Low operating threshold voltage	0.65V typ.
4. Hysteresis voltage is provided as detect voltage	50mV typ.
5. Large output current at the time ON	15mA typ.
6. Detect voltage rank	PST993 C : 4.5V H : 3.1V D : 4.2V I : 2.9V E : 3.9V J : 2.7V F : 3.6V K : 2.5V G : 3.3V L : 2.3V (Same ranks for PST994 too)

7. Output form
   PST993 : Constant current load built-in
   PST994 : Open collector

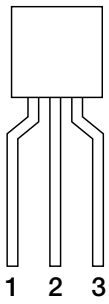
Packages

TO-92A (PST993□, PST994□)
*□contains detection voltage rank.

Applications

1. Reset circuits for microcomputers, CPU and MPU.
2. Reset circuit for logic circuitry.
3. Level detecting circuit.

Pin Assignment

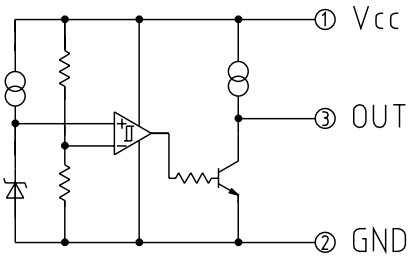


TO-92A

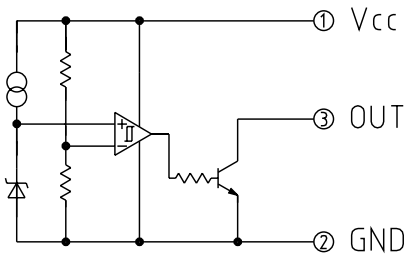
1	V_{CC}
2	GND
3	V_{OUT}

Equivalent Circuit Diagram

PST993



PST994



Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Ratings	Units
Storage temperature	T_{STG}	−40~+125	℃
Operating temperature	T_{OPR}	−20~+75	℃
Supply voltage	V_{CC}	−0.3~+10	V
Allowable loss	Pd	300	mW

Electrical Characteristics (Ta=25℃) (The unit of resistance is Ω unless otherwise indicated.)

Item	Symbol	Measurement Circuit	Measurement conditions		Min.	Typ.	Max.	Units
Detection Voltage	Vs	1	R_L=∞ V_{CC}=H→L	PST993C	4.27	4.50	4.73	V
				PST993D	4.00	4.20	4.40	
				PST993E	3.70	3.90	4.10	
				PST993F	3.42	3.60	3.78	
				PST993G	3.13	3.30	3.47	
				PST993H	2.94	3.10	3.26	
				PST993I	2.75	2.90	3.05	
				PST993J	2.56	2.70	2.84	
				PST993K	2.37	2.50	2.63	
				PST993L	2.18	2.30	2.42	
Hysteresis Voltage	⊿Vs	1	R_L=∞, V_{CC}=L→H→L		30	50	100	mV
Detection Voltage Temperature Coefficient	Vs/⊿T	1	R_L=∞, Ta=−20~+75℃			±0.01		%/℃
Low Level Output Voltage	V_{OL}	1	V_{CC}=Vs min. −0.05V, R_L=1k			0.1	0.4	V
Output Constant Current	IoC	1	V_O=2.5V, V_{CC}=5V, R_L=∞		−40	−25	−17	μA
Circuit Current at ON Time	I_{CCL}	1	V_{CC}=Vs min. −0.05V, R_L=∞			250	400	μA
Circuit Current at OFF Time	I_{CCH}	1	V_{CC}=Vs typ. /0.85V, R_L=∞			300	500	μA
"H" Transmission Delay Time	tpLH	2	C_L=100pF			20 *1		μs
"L" Transmission Delay Time	tpHL	2	C_L=100pF			1		μs
Operating Threshold Voltage	V_{OPL}	1	R_L=4.7k, V_{OL} ≦ 0.4V			0.65	0.85	V
Output Current at ON Time 1	I_{OL1}	1	R_L=∞, V_O=0.4V V_{CC}=Vs min. −0.05V		6	15		mA
Output Current at ON Time 2	I_{OL2}	1	Ta=−20~+75℃, R_L=∞ V_O=0.4V, V_{CC}=Vs min. −0.05V		4			mA

*Do not apply onto the OUT terminal any voltage higher than that at the V_{CC} terminal.

(*1) The tpLH is a function of the charging time of C_L by output constant current.
The delay time of this IC is about 1 μs.

Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Ratings	Units
Storage temperature	T_{STG}	−40~+125	℃
Operating temperature	T_{OPR}	−20~+75	℃
Supply voltage	V_{CC}	−0.3~+10	V
Allowable loss	Pd	300	mW

Electrical Characteristics (Ta=25℃) (The unit of resistance is Ω unless otherwise indicated.)

Item	Symbol	Measurement Circuit	Measurement conditions		Min.	Typ.	Max.	Units
Detection Voltage	Vs	1	R_L=1k V_{CC}=H→L	PST994C	4.27	4.5	4.73	V
				PST994D	4.00	4.2	4.40	
				PST994E	3.70	3.9	4.10	
				PST994F	3.42	3.6	3.78	
				PST994G	3.13	3.3	3.47	
				PST994H	2.94	3.1	3.26	
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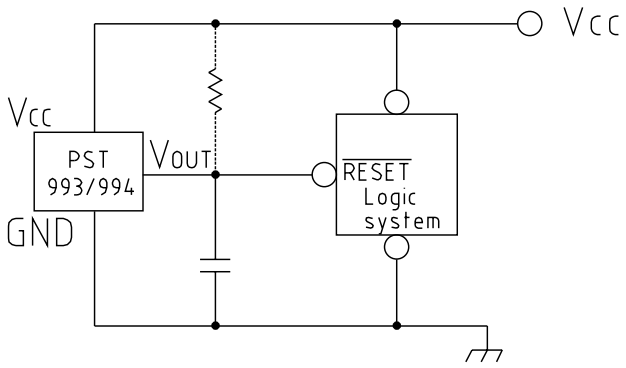
				PST994L	2.18	2.3	2.42	
Hysteresis Voltage	⊿Vs	1	R_L=1k, V_{CC}=L→H→L		30	50	100	mV
Detection Voltage Temperature Coefficient	Vs/⊿T	1	R_L=1k, Ta=−20~+75℃			±0.01		%/℃
Low Level Output Voltage	V_{OL}	1	V_{CC}=Vs min. −0.05V, R_L=1k			0.1	0.4	V
Output Leakage Current	I_{OH}	1	V_{CC}=10V				0.1	μA
Circuit Current at ON Time	I_{CCL}	1	V_{CC}=Vs min. −0.05V, R_L=∞			250	400	μA
Circuit Current at OFF Time	I_{CCH}	1	V_{CC}=Vs typ./0.85V, R_L=∞			300	500	μA
"H" Transmission Delay Time	tpLH	2	C_L=100pF, R_L=4.7k			1		μs
"L" Transmission Delay Time	tpHL	2	C_L=100pF, R_L=4.7k			1		μs
Operating Threshold Voltage	V_{OPL}	1	R_L=4.7k, V_{OL} ≦ 0.4V			0.65	0.85	V
Output Current at ON Time 1	I_{OL1}	1	V_O=0.4V R=∞ V_{CC}=Vs min. −0.05V		6	15		mA
Output Current at ON Time 2	I_{OL2}	1	Ta=−20~+75℃ R=∞ V_O=0.4V, V_{CC}=Vs min.−0.05V		4			mA

*Do not apply onto the OUT terminal any voltage higher than that at the V_{CC} terminal.

(*1) The tpLH is a function of the charging time of C_L by output constant current.
The delay time of this IC is about 1 μs.

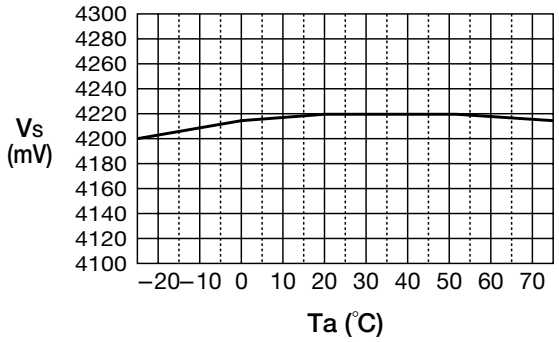
Equivalent Circuit Diagram



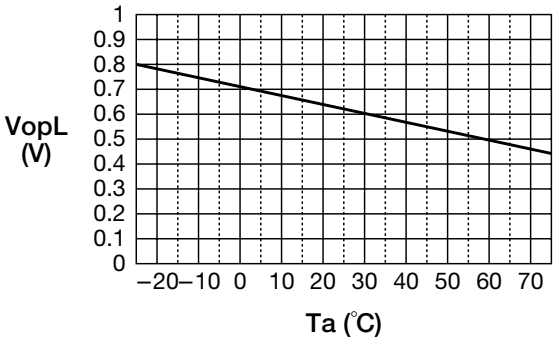
* Since PST993 incorporates a constant current load, the pull-up resistance is not necessary.

Characteristics

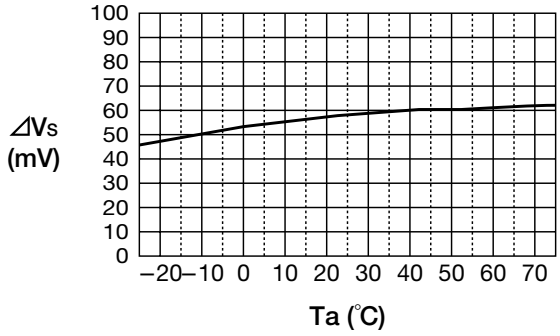
Vs vs. Ta



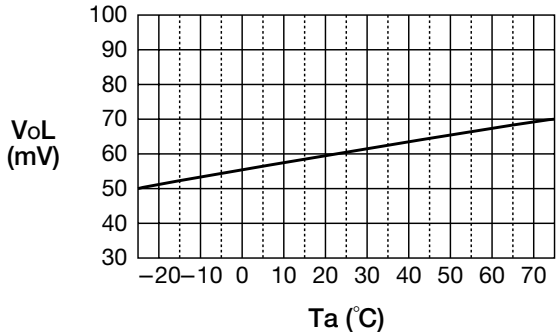
VopL vs. Ta



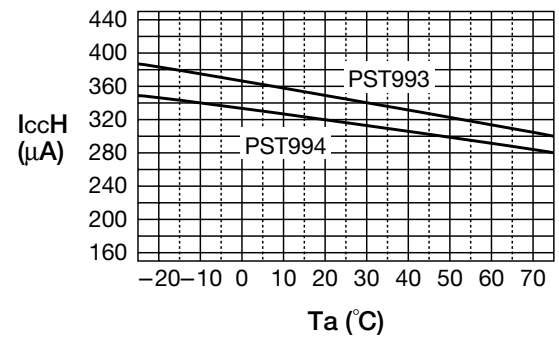
⊿Vs vs. Ta



VoL vs. Ta



IccH vs. Ta



IoC vs. Ta (PST993)