

# PS121

---

*Version* : A.017  
*Issue Date* : 2008/11/04  
*File Name* : SP-PS121-A.017.DOC  
*Total Pages*: 9

## ***Voltage Detecting IC***



**SITI**

新竹市科學園區展業一路9號7樓之1  
SILICON TOUCH TECHNOLOGY INC.

9-7F-1, Prosperity Road I, Science Based Industrial Park,  
Hsin-Chu, Taiwan 300, R.O.C.

Tel : 886-3-5645656 Fax : 886-3-5645626

## PS121

### Voltage Detecting IC

#### General Description

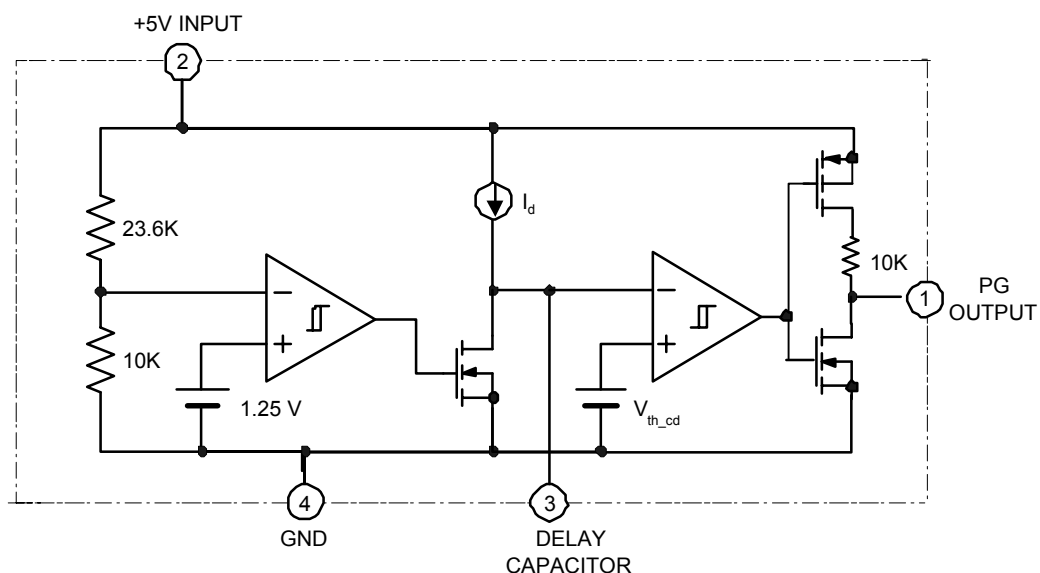
PS121 is specially designed for +5V power good signal generating. Power good signal notifies microprocessor whether the +5V supply voltage is ready, therefore it can provide a stable and reliable power supply and computing environment.

Delay circuit is also built-in to provide delay time by adding an external capacitor.

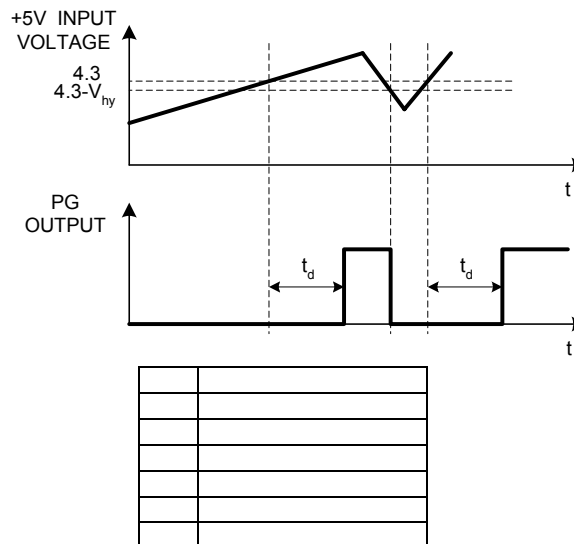
#### Features

1. Power Good Logic to Check +5V
2. Adjustable delay time
3. 4-pin SIP package

#### Block Diagram



## Function Diagram



## Pin Descriptions

### TO-93

Pin No	PIN NAME	Descriptions
1	PG	Power good output signal pin
2	+5V(VDD)	+5V(VDD) input pin
3	$C_d$	External capacitor for PG delay
4	VSS	Ground

### SOT-26

Pin No	PIN NAME	Descriptions
1	NC	NO connect
2	VSS	Ground
3	PG	Power good output signal pin
4	+5V(VDD)	+5V(VDD) input pin
5	$C_d$	External capacitor for PG delay
6	NC	NO connect



## Absolute Maximum Ratings

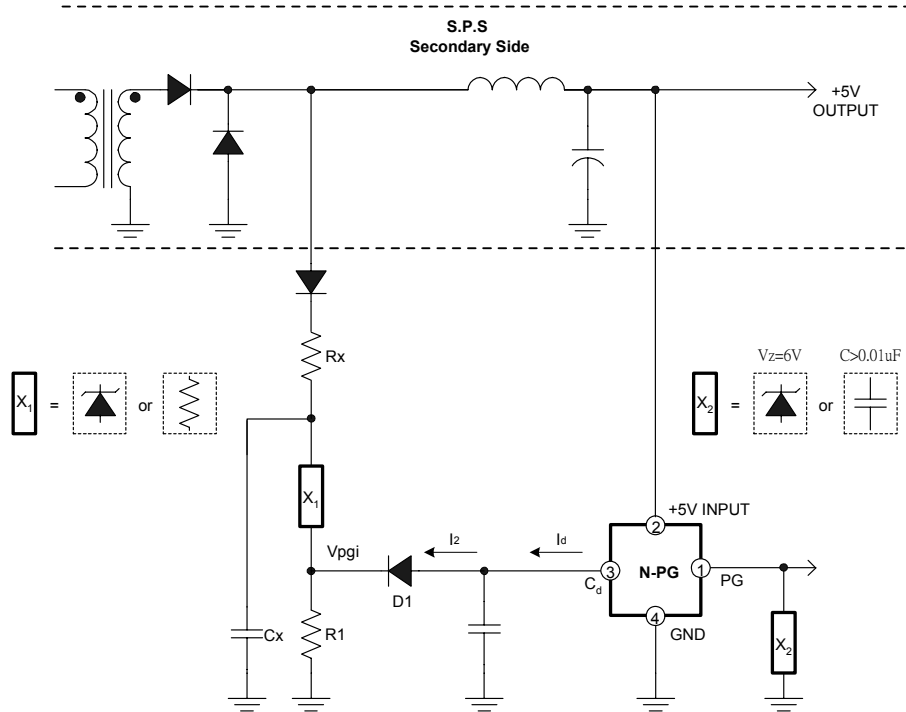
Parameter	Symbol	Rating	Unit
Supply Voltage	VDD	-0.5 ~ +7.5	V
Output Sink Current	I <sub>sink</sub>	30	mA
Output Voltage	V <sub>PG</sub>	-0.5 ~ +7.5	V
Power Dissipation	P <sub>d</sub>	300	mW
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C
Operating Temperature	T <sub>opr</sub>	-30 ~ +90	°C
Junction Temperature	T <sub>j</sub>	150	°C
Package Thermal Resistance	θ <sub>JA</sub>	160	°C/W

## Electrical characteristics, V<sub>CC</sub>=5V, T<sub>a</sub> = 25 °C. (unless otherwise specified)

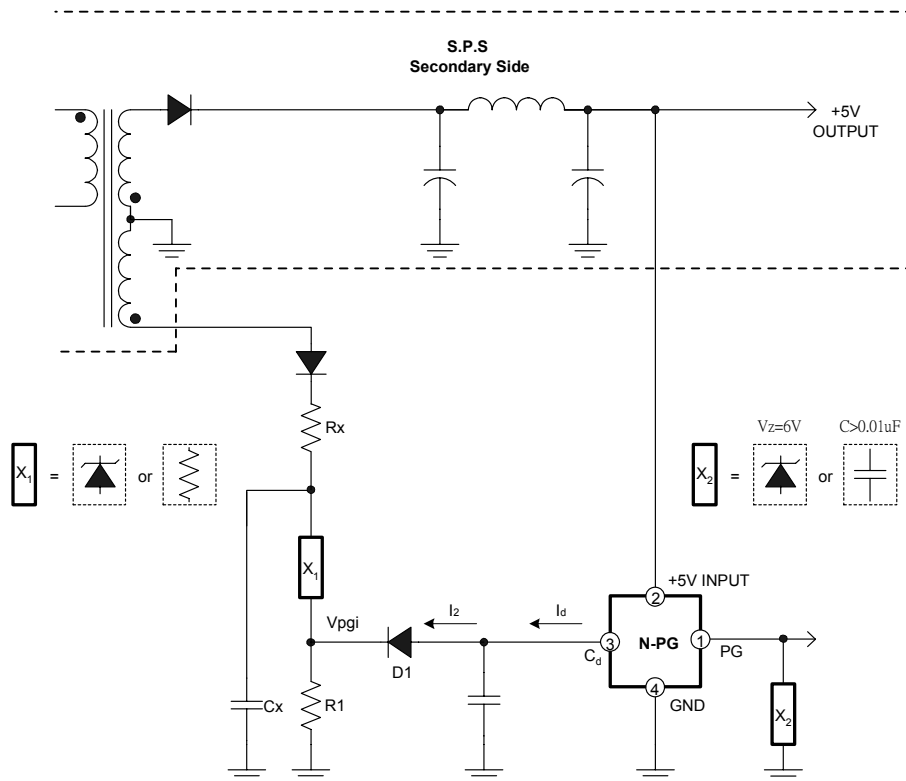
Parameter		Test Condition	MIN	TYP	MAX	Unit
V <sub>th</sub>	Detecting Threshold Voltage		4.05	4.30	4.55	V
V <sub>hy</sub>	V <sub>th</sub> Hysteresis Voltage		0.1	0.2	0.3	V
I <sub>DD</sub>	Circuit Current	VCC=5V		0.97	2.5	mA
T <sub>d</sub>	Delay Time	Cd=0.1μF		21.4		ms
I <sub>d</sub>	Constant Current at C <sub>d</sub> Pin		8.0	8.7	9.4	μA
V <sub>sat</sub>	PG Output Saturation Voltage	V+5=4.0V, I <sub>sink</sub> =10mA		0.128	0.192	V
V <sub>thcd</sub>	Threshold Voltage in Pin C <sub>d</sub>	VDD = 0 → 5	1.79	1.87	1.95	V
		VDD = 5 → 0	1.72	1.77	1.82	
ΔT	Temperature coefficient			+1	+2	mV/°C

## Typical Application

### (1) For Forward Type



### (2) For Flyback Type



Note1: Once AC power is turned on, V<sub>pgi</sub> will be pulled high before +5V input. At this time, diode D1 will be turn off. The PG delay time is dependent on C<sub>d</sub> as follows,

$$T_{d-ON} = 0.216 \times C_d (pF) \mu sec, \left( T = \frac{C_d \times V_{thcd}}{I_{d-ON}} = \frac{C_d \times 1.85}{8.7 \mu} \right)$$

Note2: Diode D1 is connected to V<sub>pgi</sub> to control the PG delay time when AC is off. The AC off delay time can be controlled as follows,

$$T_{d-OFF} \doteq \frac{C_d \times V_{thcd}}{I_2 - I_d} = \frac{C_d \times V_{thcd}}{I_{d-OFF}} = \frac{C_d \times V_{thcd}}{\frac{1}{2} \times (V_{Cd} + V_{thcd})} = \frac{C_d \times 1.85}{\frac{1}{2} \times (V_{Cd} + 1.85)}$$

Among  $T_{d-OFF}$  equation, the  $\frac{1}{2} \times (V_{Cd} + V_{thcd})$  is discharged average current.

Note3: Since the maximum threshold voltage at Pin 3(C<sub>d</sub>) is 1.95V, the voltage across R1 has to be higher than 2V at normal operation.

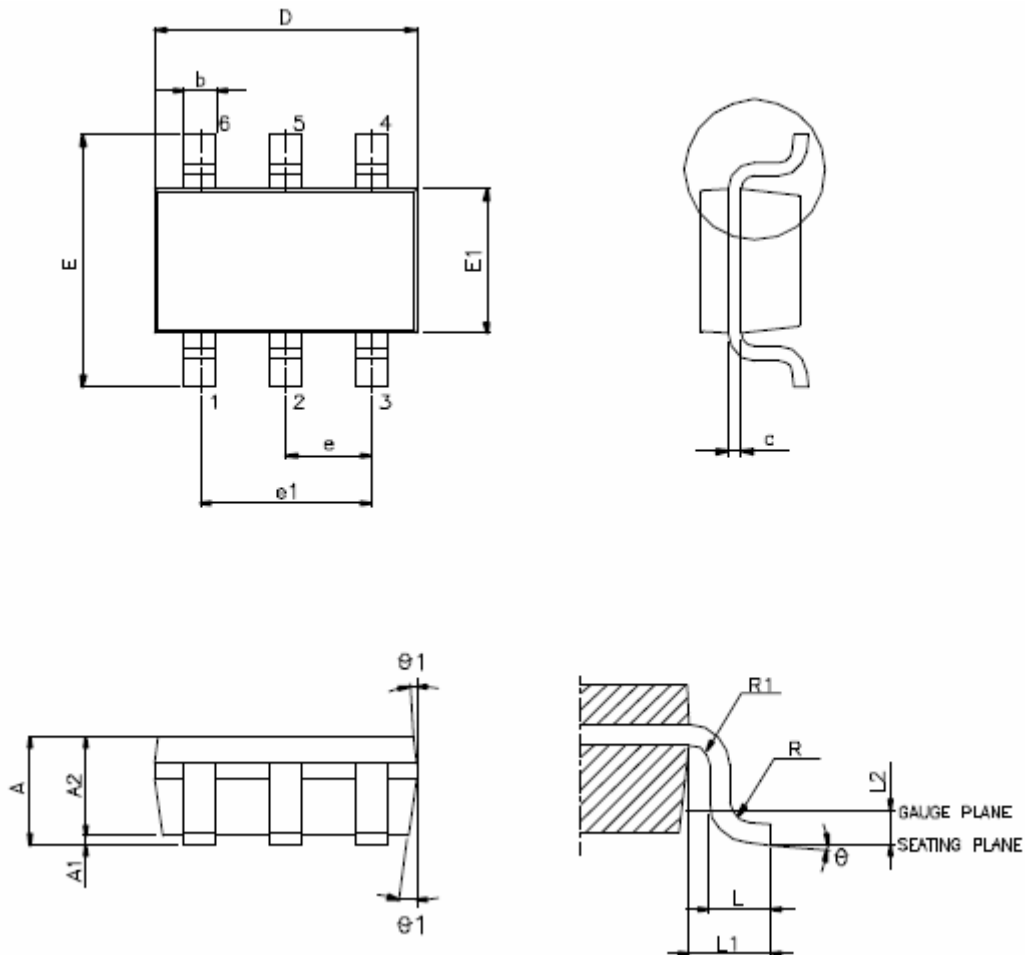
Note4: In PCB layout condition, when the input-pin(VDD) smaller than detecting threshold voltage(V<sub>th</sub>), the power good signal of PS121 will connect to LOW, so the ground-pin(VSS) must connect to the most clean ground of the power supply system to avoid noise appear.

Note5: Suggested using RC filter circuit (R<sub>x</sub> and C<sub>x</sub>) to decrease ripples.

Note6: Suggested using component X<sub>1</sub> and R<sub>1</sub> to cut down V<sub>pgi</sub> voltage.

Note7: Suggested using component X<sub>2</sub> to avoid overshoot voltage damages IC.

### Package Specification (SOT-26)

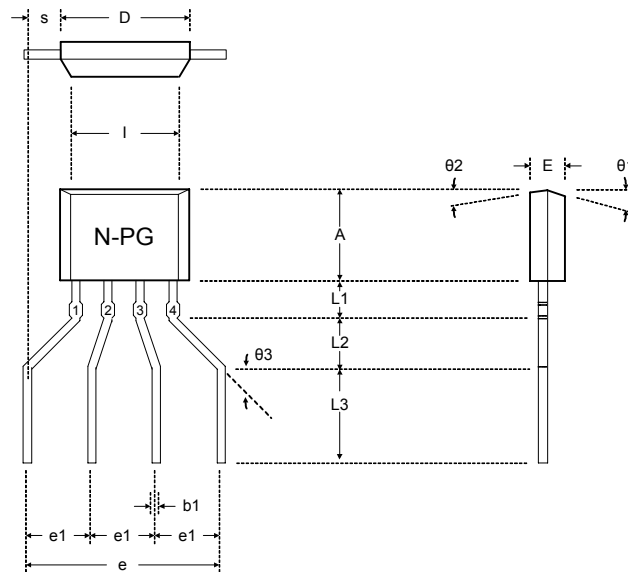


Symbol	Dimension in mm
A	1.225 ± 0.225
A1	0.075 ± 0.075
A2	1.000 ± 0.3
b	0.4 ± 0.1
c	0.165 ± 0.085
D	2.9 ± 0.2
e	0.95 BSC
e1	1.90 BSC
E1	1.600 ± 0.2
L	0.450 ± 0.15
L1	0.6 REF
L2	0.25 BSC
R	0.1 (TYP)
R1	0.1 (TYP)
$\theta$	5° (TYP)
$\theta 1$	10° (TYP)
E	2.8 ± 0.2

NOTE	
Pin No	PIN NAME
1	NC
2	VSS
3	PG
4	+5V(VDD)
5	C <sub>d</sub>
6	NC

## Package Specification (TO-93)

(TO-93 4-pin)



Symbol	Dimension in mm	Dimension in inch
A	3.65 ± 0.1	0.144 ± 0.004
b1	0.38 ± 0.1	0.015 ± 0.004
D	5.22 ± 0.1	0.20 ± 0.004
e	6.9 ± 1.0	0.27 ± 0.02
e1	2.3 ± 0.75	0.09 ± 0.03
E	1.55 ± 0.1	0.06 ± 0.004
I	4.20 ± 0.14	0.16 ± 0.006
L1	1.75 ± 0.5	0.07 ± 0.02
L2	2.10 ± 0.5	0.08 ± 0.02
L3	2.70 ± 0.5	0.11 ± 0.02
s	1.50 ± 0.5	0.06 ± 0.02
θ1	5.0° (TYP)	5.0° (TYP)
θ2	3.0° (TYP)	3.0° (TYP)
θ3	46.0° (TYP)	46.0° (TYP)

NOTE

**PINOUT:**  
Pin1 PG  
Pin2 +5V / Vcc  
Pin3 Cd  
Pin4 Vss



The products listed herein are designed for ordinary electronic applications, such as electrical appliances, audio-visual equipment, communications devices and so on. Hence, it is advisable that the devices should not be used in medical instruments, surgical implants, aerospace machinery, nuclear power control systems, disaster/crime-prevention equipment and the like. Misusing those products may directly or indirectly endanger human life, or cause injury and property loss.

Silicon Touch Technology, Inc. will not take any responsibilities regarding the misuse of the products mentioned above. Anyone who purchases any products described herein with the above-mentioned intention or with such misused applications should accept full responsibility and indemnify. Silicon Touch Technology, Inc. and its distributors and all their officers and employees shall defend jointly and severally against any and all claims and litigation and all damages, cost and expenses associated with such intention and manipulation.