

PS121

Version : A.017

Issue Date : 2008/11/04

File Name : SP-PS121-A.017.DOC

Total Pages: 9

Voltage Detecting IC



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PS121

Voltage Detecting IC

General Description

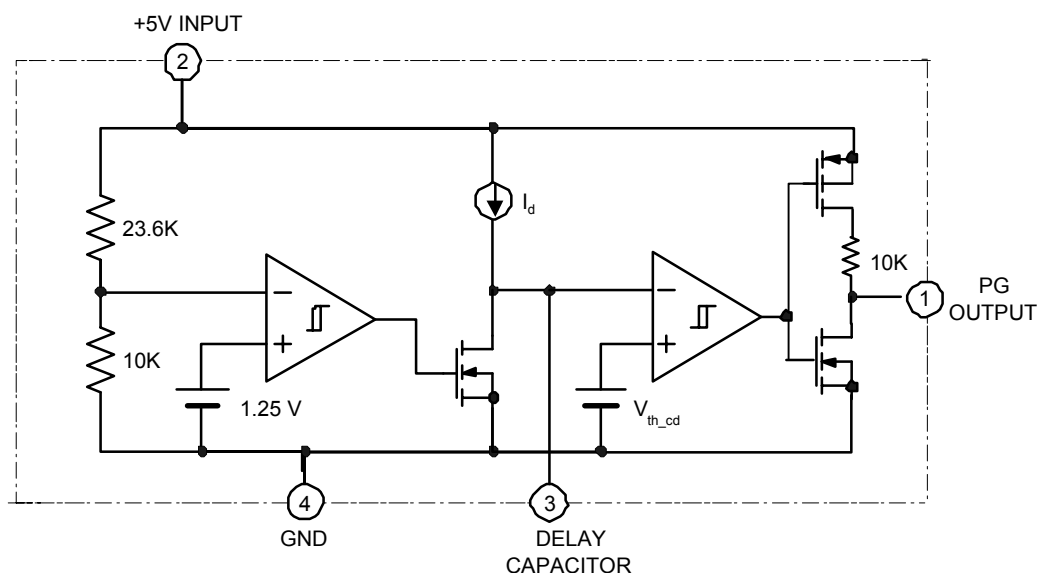
PS121 is specially designed for +5V power good signal generating. Power good signal notifies microprocessor whether the +5V supply voltage is ready, therefore it can provide a stable and reliable power supply and computing environment.

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

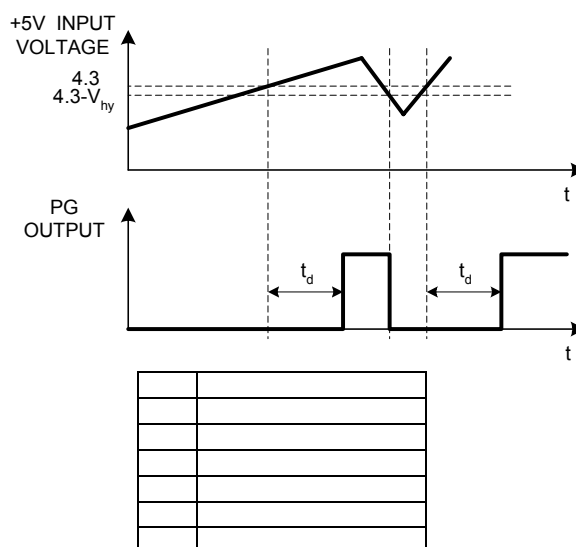
Features

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

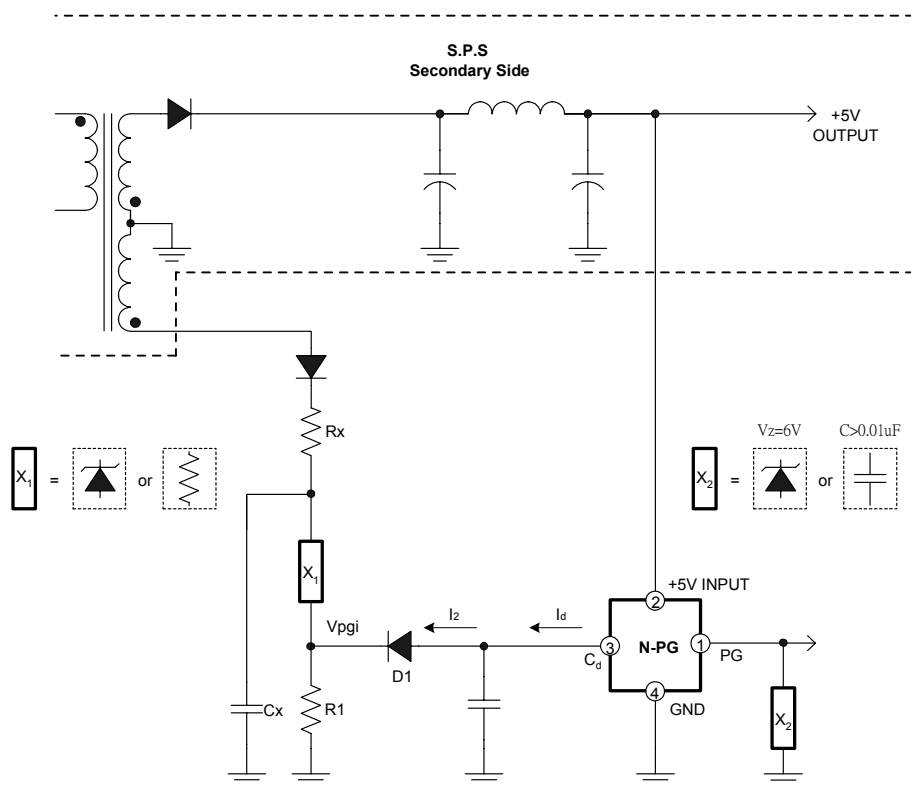
Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply Voltage	VDD	-0.5 ~ +7.5	V
Output Sink Current	I _{sink}	30	mA
Output Voltage	V _{PG}	-0.5 ~ +7.5	V
Power Dissipation	P _d	300	mW
Storage Temperature	T _{stg}	-40 ~ +125	°C
Operating Temperature	T _{opr}	-30 ~ +90	°C
Junction Temperature	T _j	150	°C
Package Thermal Resistance	θ_{JA}	160	°C/W

Electrical characteristics, V_{CC}=5V, T_a = 25 °C. (unless otherwise specified)

Parameter		Test Condition	MIN	TYP	MAX	Unit
V _{th}	Detecting Threshold Voltage		4.05	4.30	4.55	V
V _{hy}	V _{th} Hysteresis Voltage		0.1	0.2	0.3	V
I _{DD}	Circuit Current	VCC=5V		0.97	2.5	mA
T _d	Delay Time	Cd=0.1μF		21.4		ms
I _d	Constant Current at C _d Pin		8.0	8.7	9.4	μA
V _{sat}	PG Output Saturation Voltage	V+5=4.0V, I _{sink} =10mA		0.128	0.192	V
V _{thcd}	Threshold Voltage in Pin C _d	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

(1) For Forward Type



Note1: Once AC power is turned on, Vpgi will be pulled high before +5V input. At this time, diode D1 will be turn off. The PG delay time is dependent on C_d 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 Vpgi to control the PG delay time when AC is off. The AC off delay time can be controlled as follows,

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

$R_1 \qquad R_1$

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_d) is 1.95V, the voltage across R1 has to be higher than 2V at normal operation.

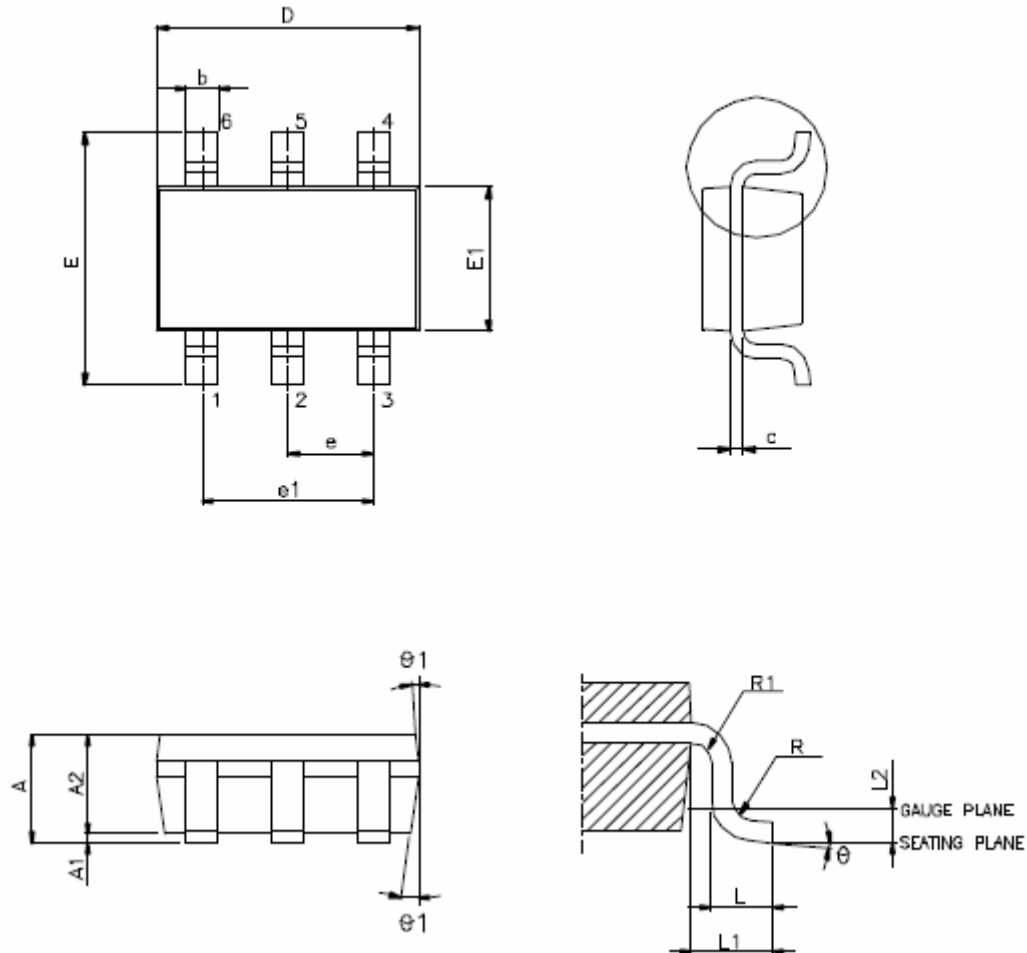
Note4: In PCB layout condition, when the input-pin(VDD) smaller than detecting threshold voltage(V_{th}), the power good signal of PS121 will connect to LOW, so the ground-pin(VSS) must connect to the most clean ground of the power supply system to avoid noise appear.

Note5: Suggested using RC filter circuit (Rx and Cx) to decrease ripples.

Note6: Suggested using component X₁ and R₁ to cut down Vpgi voltage.

Note7: Suggested using component X₂ to avoid overshoot voltage damages IC.

Package Specification (SOT-26)



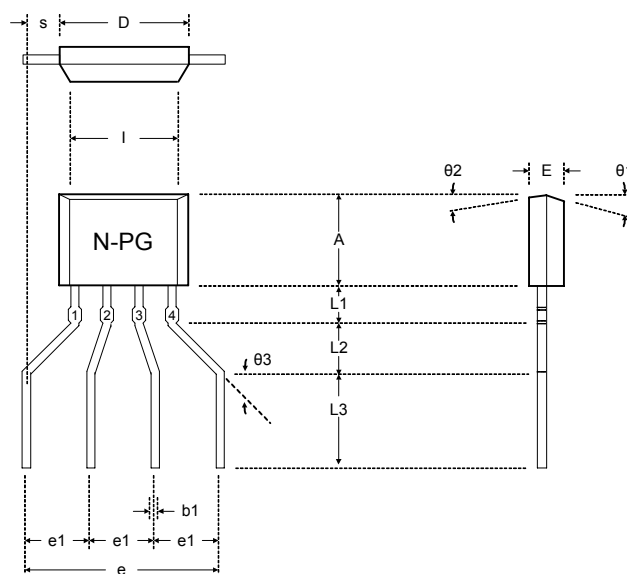
Symbol	Dimension in mm
A	1.225 ± 0.225
A1	0.075 ± 0.075
A2	1.000 ± 0.3
b	0.4 ± 0.1
c	0.165 ± 0.085
D	2.9 ± 0.2
e	0.95 BSC
e1	1.90 BSC
E1	1.600 ± 0.2
L	0.450 ± 0.15
L1	0.6 REF
L2	0.25 BSC
R	0.1 (TYP)
R1	0.1 (TYP)
θ	5° (TYP)
θ1	10° (TYP)
E	2.8 ± 0.2

NOTE

Pin No	PIN NAME
1	NC
2	VSS
3	PG
4	+5V(VDD)
5	C _d
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
$\theta1$	5.0° (TYP)	5.0° (TYP)
$\theta2$	3.0° (TYP)	3.0° (TYP)
$\theta3$	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.

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