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PCMCIA / Flash memory power supply

BP5310A

The BP5310A is a DC / DC converter for supplying power to PCMCIA flash memory. From a power supply (+5V) for PCMCIA operations, the module supplies a voltage for programming operations (+12V).

● Applications

Personal computers, CD-ROM players, personal digital assistants, and other PCMCIA-slot equipped devices

● Features

- 1) Designed to provide power for PCMCIA/flash memory programming operations (output voltage=12V±5%; output current=120mA)
- 2) The 5V operating voltage is same as the IC memory card operating voltage.
- 3) Built-in protection circuit for shorted-circuit.
- 4) Compact 9-pin SIP package.
- 5) Surface mounting is possible because parts are concentrated on one side.

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Input voltage	V _{IN}	7	V
Operating temperature range	T _{opr}	0 ~ 60	°C
Storage temperature range	T _{stg}	-30 ~ +85	°C

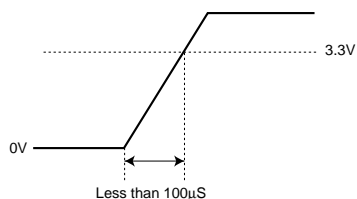
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● Electrical characteristics (unless otherwise noted, $T_a=25^\circ\text{C}$, $V_{\text{CTL}}=5\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V_{IN}	4.75	5.00	5.25	V	
Output current	I_{OUT}	–	–	120	mA	
Output voltage	V_{OUT}	11.4	12.0	12.6	V	$V_{\text{IN}}=4.75\text{--}5.25\text{V}$ $I_{\text{OUT}}=0\text{--}120\text{mA}$
Ripple noise voltage	v_1	–	100	200	mV _{PP}	$V_{\text{IN}}=5\text{V}$, $I_{\text{OUT}}=60\text{mA}$ *1
Efficiency	η	65	73	–	%	$V_{\text{IN}}=5\text{V}$, $I_{\text{OUT}}=60\text{mA}$
ON/OFF CTL voltage when ON	V_{CTL}	3.3	–	–	V	$V_{\text{IN}}=5\text{V}$, $V_{\text{OUT}}\geq 11.4\text{V}$ *2
ON/OFF CTL voltage when OFF	V_{CTL}	–	–	0.4	V	$V_{\text{IN}}=4.75\text{--}5.25\text{V}$
ON/OFF CTL sink current when ON	I_{SINK}	–	0.8	1.3	mA	$V_{\text{IN}}=5\text{V}$ $V_{\text{CTL}}=3.3\text{V}$ *3
ON/OFF CTL source current when OFF	I_{SOURCE}	–	1.0	1.5	mA	$V_{\text{IN}}=5\text{V}$ $V_{\text{CTL}}=0.4\text{V}$ *4

*1 Measured with a band width of 20 MHz.

*2 Ensure that the HIGH signal of the CTL pin(pin 8)rises in less than 100 μs to the level at which the output turns on.



*3 When the HIGH signal is applied to the CTL pin , a current flows into the CTL pin for a short period until the output rises. Little current flows thereafter.

*4 When the LOW signal is applied to the CTL pin to turn OFF the output, a current flows from the CTL pin for a short period until the output drops to 0V. Ensure that the control circuit can sink this current.

● Pin descriptions

Pin No.	Pin name	Function
1	C_o	Output smoothing capacitor connection pin; connect a low-impedance capacitor with a recommended capacitance of 47 μF between this pin and GND
2	V_{OUT}	Output pin; connect an output capacitor with a recommended capacitance of 2.2 μF between this pin and GND
3	TP	Test pin; use this internally connected pin in OPEN mode
4, 7	GND	Ground pin
8	V_{CTL}	Output ON/OFF control pin; output starts when the pin is HIGH level, and stops at LOW level
9	V_{IN}	Input pin; connect a low-impedance capacitor with a recommended capacitance of 100 μF between this pin and GND

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● **Measurement circuit**

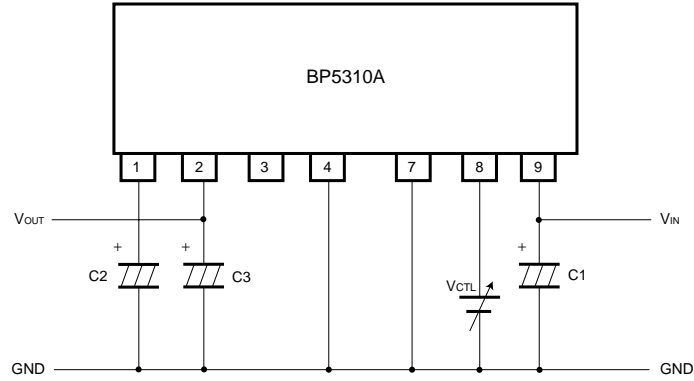


Fig.1

- C1 : 100 μ F / 16V (Low impedance)
- C2 : 47 μ F / 35V (Low impedance)
- C3 : 2.2 μ F (Al electrolytic capacitor)

● **Application example**

(1) Flash memory that applies 5V for reading

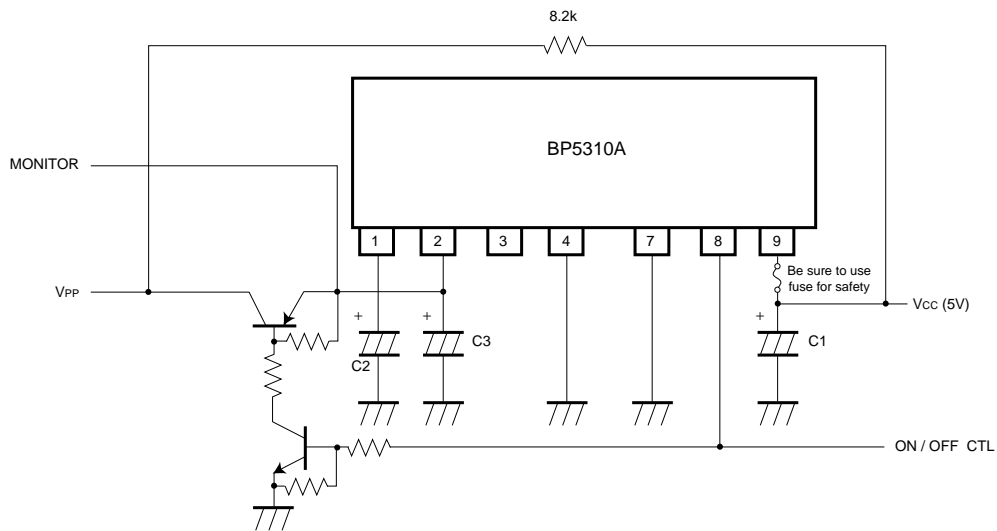


Fig.2

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(2) Pull-down of VPP

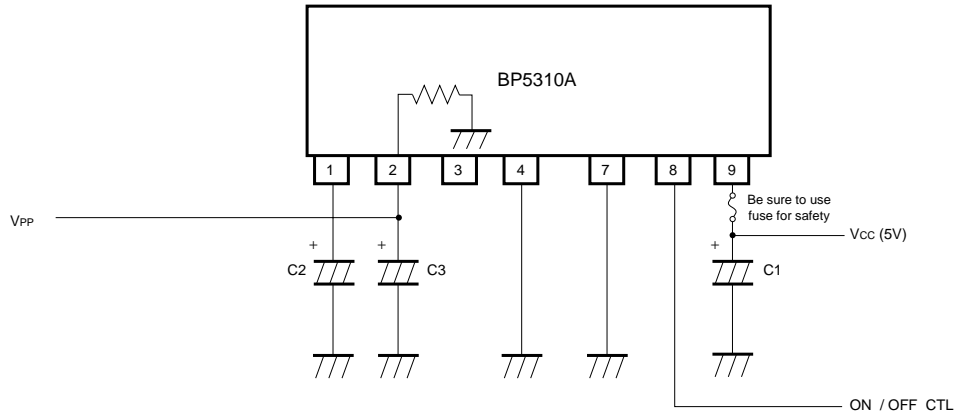


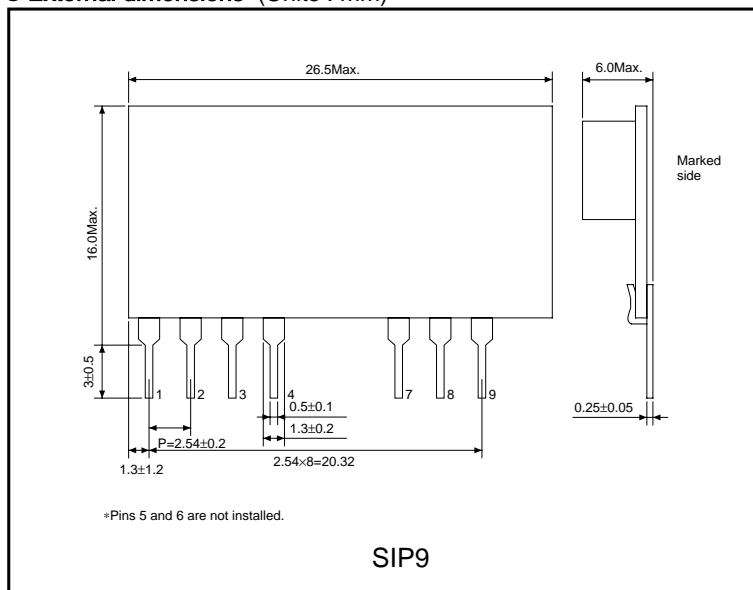
Fig.3

The OFF output is pulled down through an effective resistance of 30k Ω

● **Operation notes**

- (1) Place I / O external capacitors as near as possible to the connection pins. In particular, make sure to minimize the impedance between the input-side capacitor (C1) and pin 9. (Reference Value : A length less than 50mm for a copperfoil of 1.0mm wide and 35 μ m thickness.)
- (2) Avoid frequent switching using the ON / OFF CTL pin (five times per second at the maximum).
- (3) The module has a built-in shorted-circuit protection circuit. Shorted-circuiting is assumed if the output voltage does not reach 4.2V (typical) in 40ms (typical), and the protection circuit starts to operate. When setting the output capacitor, we recommend considering the flash memory capacitance within the IC card and making the output voltage to reach 8V or more in less than 20ms.

● **External dimensions (Units : mm)**



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 - [b] Installation of redundant circuits in the case of single-circuit failure
- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
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 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation
- 3) The products are not radiation resistant.
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