

# 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)

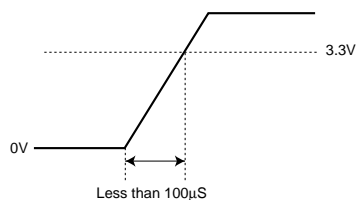
| Parameter                   | Symbol           | Limits    | Unit |
|-----------------------------|------------------|-----------|------|
| Input voltage               | V <sub>IN</sub>  | 7         | V    |
| Operating temperature range | T <sub>opr</sub> | 0 ~ 60    | °C   |
| Storage temperature range   | T <sub>stg</sub> | -30 ~ +85 | °C   |

**● 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                      | $V_{\text{IN}}$     | 4.75 | 5.00 | 5.25 | V                |  |
| Output current                     | $I_{\text{OUT}}$    | –    | –    | 120  | mA               |  |
| Output voltage                     | $V_{\text{OUT}}$    | 11.4 | 12.0 | 12.6 | V                | $V_{\text{IN}}=4.75\text{--}5.25\text{V}$<br>$I_{\text{OUT}}=0\text{--}120\text{mA}$ |
| Ripple noise voltage               | $v_1$               | –    | 100  | 200  | mV <sub>PP</sub> | $V_{\text{IN}}=5\text{V}$ , $I_{\text{OUT}}=60\text{mA}$ *1                          |
| Efficiency                         | $\eta$              | 65   | 73   | –    | %                | $V_{\text{IN}}=5\text{V}$ , $I_{\text{OUT}}=60\text{mA}$                             |
| ON/OFF CTL voltage when ON         | $V_{\text{CTL}}$    | 3.3  | –    | –    | V                | $V_{\text{IN}}=5\text{V}$ , $V_{\text{OUT}}\geq 11.4\text{V}$ *2                     |
| ON/OFF CTL voltage when OFF        | $V_{\text{CTL}}$    | –    | –    | 0.4  | V                | $V_{\text{IN}}=4.75\text{--}5.25\text{V}$  |
| ON/OFF CTL sink current when ON    | $I_{\text{SINK}}$   | –    | 0.8  | 1.3  | mA               | $V_{\text{IN}}=5\text{V}$<br>$V_{\text{CTL}}=3.3\text{V}$ *3                         |
| ON/OFF CTL source current when OFF | $I_{\text{SOURCE}}$ | –    | 1.0  | 1.5  | mA               | $V_{\text{IN}}=5\text{V}$<br>$V_{\text{CTL}}=0.4\text{V}$ *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 $\mu\text{s}$  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 $\mu\text{F}$ between this pin and GND |
| 2       | $V_{\text{OUT}}$ | Output pin; connect an output capacitor with a recommended capacitance of 2.2 $\mu\text{F}$ between this pin and GND                                     |
| 3       | TP               | Test pin; use this internally connected pin in OPEN mode   |
| 4, 7    | GND              | Ground pin   |
| 8       | $V_{\text{CTL}}$ | Output ON/OFF control pin; output starts when the pin is HIGH level, and stops at LOW level  |
| 9       | $V_{\text{IN}}$  | Input pin; connect a low-impedance capacitor with a recommended capacitance of 100 $\mu\text{F}$ between this pin and GND                                |

● Measurement circuit

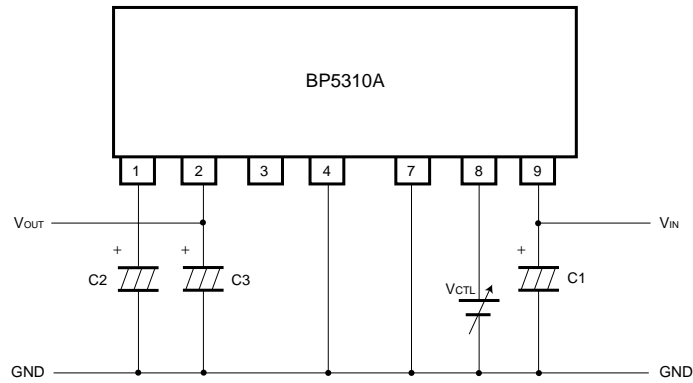


Fig.1

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

● Application example

(1) Flash memory that applies 5V for reading

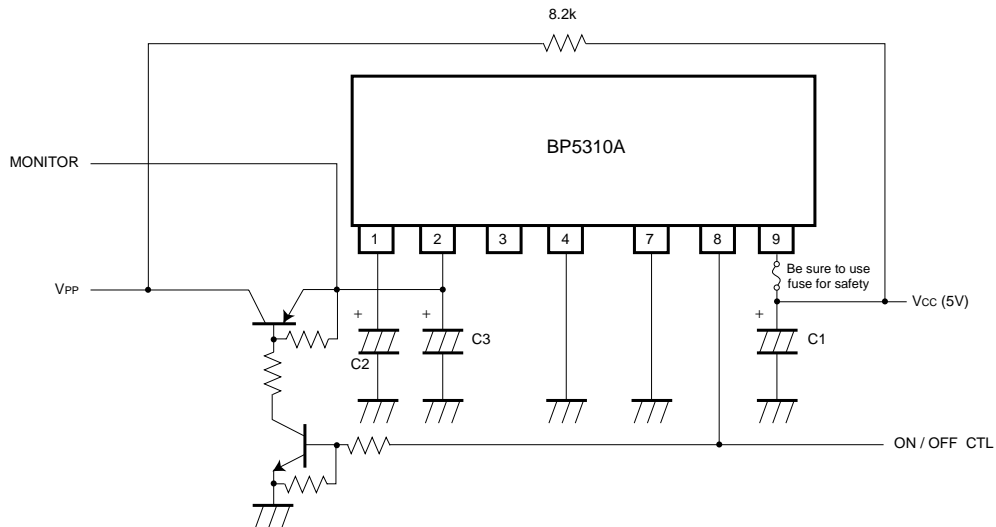


Fig.2

(2) Pull-down of VPP

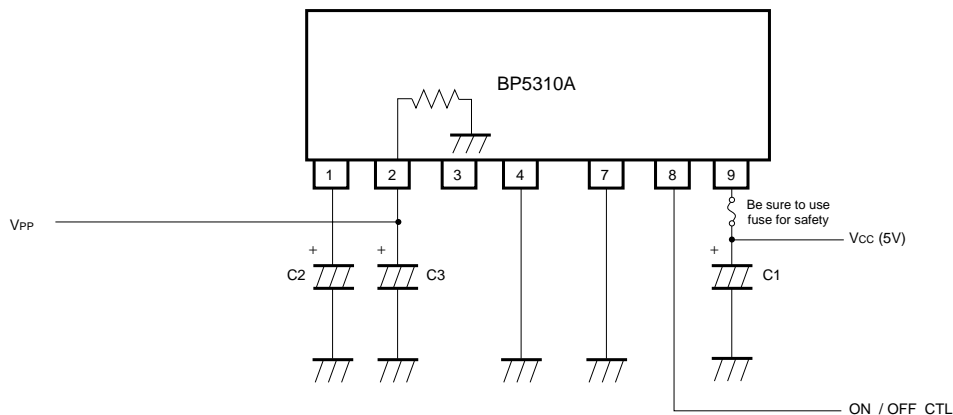


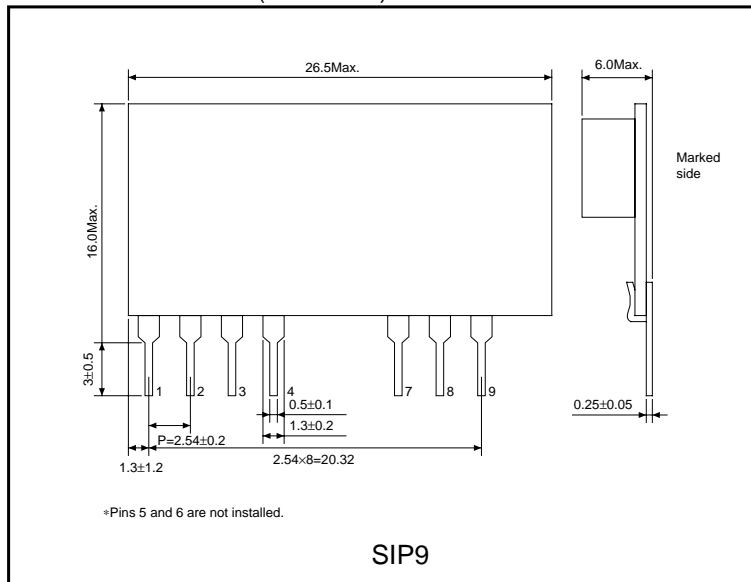
Fig.3

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

● 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 35μm 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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