

PCMCIA / flash memory power supply

BP5310

The BP5310 is a DC / DC converter for supplying power to PCMCIA flash memory. From a power supply (+5V) for PCMCIA operations, the IC supplies a voltage for programming operations (+12V).

●Applications

Personal computers, CD-ROM players, portable information devices, and other PCMCIA-slot equipped devices

●Features

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

●Absolute maximum ratings

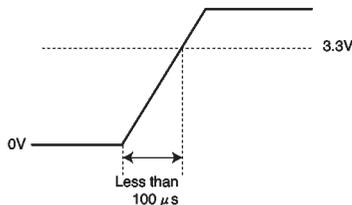
| Parameter | Symbol | Limits | Unit |
|-----------------------|-----------|---------|------|
| Input voltage | V_{IN} | 7 | V |
| Operating temperature | T_{opr} | 0~+60 | °C |
| Storage temperature | T_{stg} | -30~+85 | °C |

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CTL} = 5V)

| 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 _{IN} =4.75~5.25V I _{OUT} =0~120mA |
| Ripple noise voltage | ν ₁ | — | 100 | 200 | mV _{P-P} | V _{IN} =5V, I _{OUT} =60mA *1 |
| Efficiency | η | 65 | 73 | — | % | V _{IN} =5V, I _{OUT} =60mA |
| ON/OFF CTL voltage when ON | V _{CTL} | 3.3 | — | — | V | V _{IN} =5V, V _{OUT} ≥11.4V *2 |
| ON/OFF CTL voltage when OFF | V _{CTL} | — | — | 0.4 | V | V _{IN} =4.75~5.25V |
| ON/OFF CTL sink current when ON | I _{SINK} | — | 0.8 | 1.3 | mA | V _{IN} =5V V _{CTL} =3.3V *3 |
| ON/OFF CTL source current when OFF | I _{SOURCE} | — | 1.0 | 1.5 | mA | V _{IN} =5V V _{CTL} =0.4V *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 into the CTL pin for a short period until the output drops to 0 V. Ensure that the control circuit can sink this current.

●Measurement circuit

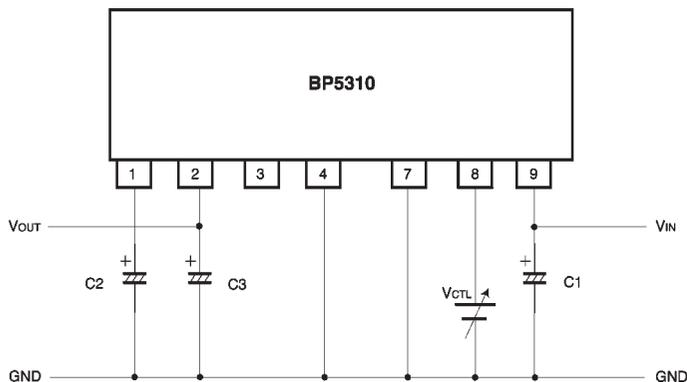


Fig. 1

C1 : 100 μF / 16V (NICHICON PL-series or equivalent)

C2 : 47 μF / 35V (NICHICON PL-series or equivalent)

C3 : 2.2 μF / 35V (Al electrolytic capacitor)

● Pin descriptions

| Pin No. | Pin name | Function |
|---------|------------------|---|
| 1 | Co | Output smoothing capacitor connection; connect a low-impedance capacitor with a recommended capacitance of $47\ \mu\text{F}$ between this pin and GND |
| 2 | V _{OUT} | Output; 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 |
| 8 | V _{CTL} | Output ON/OFF control; output starts when the pin is HIGH level, and stops at LOW level |
| 9 | V _{IN} | Input; connect a low-impedance capacitor with a recommended capacitance of $100\ \mu\text{F}$ between this pin and GND |

● Application examples

(1) Flash memory that requires 5V for reading

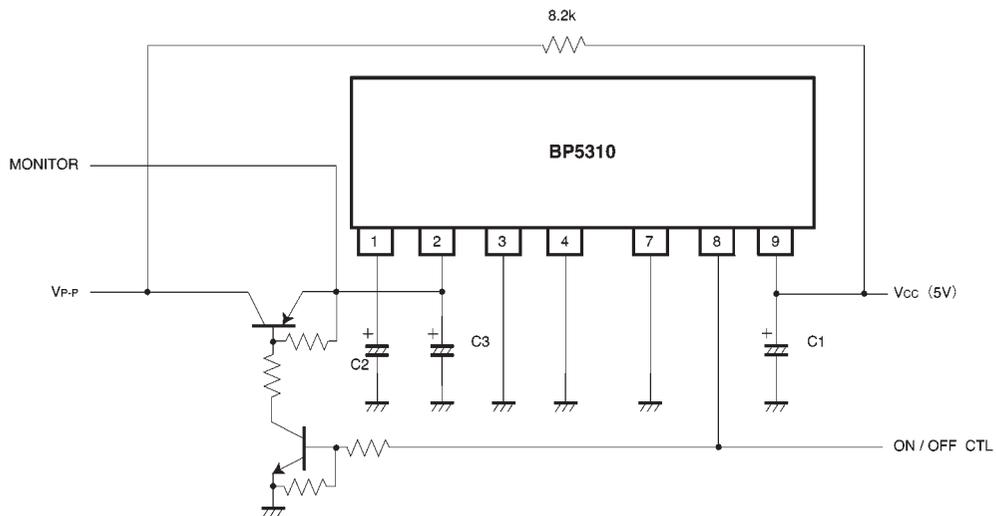


Fig. 2

● 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 copper foil of 1.0mm wide and 35 μm thickness.)

(2) Avoid frequent switching using the ON / OFF CTL pin (five times per second at the maximum).

(2) Pull-down of V_{P-P}

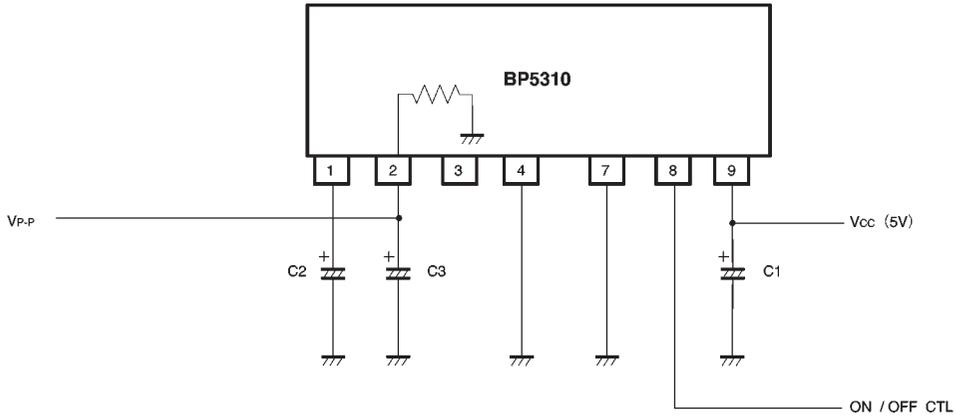


Fig. 3

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

(3) The module has a built-in short-circuit protection circuit. Short-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 out-

put capacitor, we recommend considering the capacitance within the IC card and making the output voltage to reach 8V or more in less than 20ms.

● External dimensions (Units: mm)

