

# 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

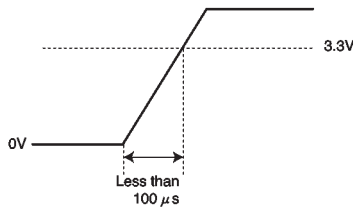
Parameter	Symbol	Limits	Unit
Input voltage	$V_{IN}$	7	V
Operating temperature	$T_{opr}$	0~+60	°C
Storage temperature	$T_{stg}$	-30~+85	°C

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V<sub>CTL</sub> = 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V <sub>IN</sub>	4.75	5.00	5.25	V	
Output current	I <sub>OUT</sub>	—	—	120	mA	
Output voltage	V <sub>OUT</sub>	11.4	12.0	12.6	V	V <sub>IN</sub> =4.75~5.25V I <sub>OUT</sub> =0~120mA
Ripple noise voltage	ν <sub>1</sub>	—	100	200	mV <sub>P-P</sub>	V <sub>IN</sub> =5V, I <sub>OUT</sub> =60mA *1
Efficiency	η	65	73	—	%	V <sub>IN</sub> =5V, I <sub>OUT</sub> =60mA
ON/OFF CTL voltage when ON	V <sub>CTL</sub>	3.3	—	—	V	V <sub>IN</sub> =5V, V <sub>OUT</sub> ≥11.4V *2
ON/OFF CTL voltage when OFF	V <sub>CTL</sub>	—	—	0.4	V	V <sub>IN</sub> =4.75~5.25V
ON/OFF CTL sink current when ON	I <sub>SINK</sub>	—	0.8	1.3	mA	V <sub>IN</sub> =5V V <sub>CTL</sub> =3.3V *3
ON/OFF CTL source current when OFF	I <sub>SOURCE</sub>	—	1.0	1.5	mA	V <sub>IN</sub> =5V V <sub>CTL</sub> =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

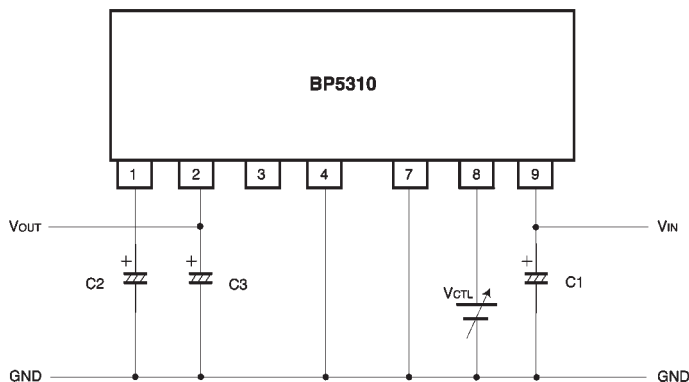


Fig. 1

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 $\mu$ F between this pin and GND
2	V <sub>OUT</sub>	Output; connect an output capacitor with a recommended capacitance of 2.2 $\mu$ F between this pin and GND
3	TP	Test pin; use this internally connected pin in OPEN mode
4, 7	GND	Ground
8	V <sub>CTL</sub>	Output ON/OFF control; output starts when the pin is HIGH level, and stops at LOW level
9	V <sub>IN</sub>	Input; connect a low-impedance capacitor with a recommended capacitance of 100 $\mu$ F between this pin and GND

● Application examples

(1) Flash memory that requires 5V for reading

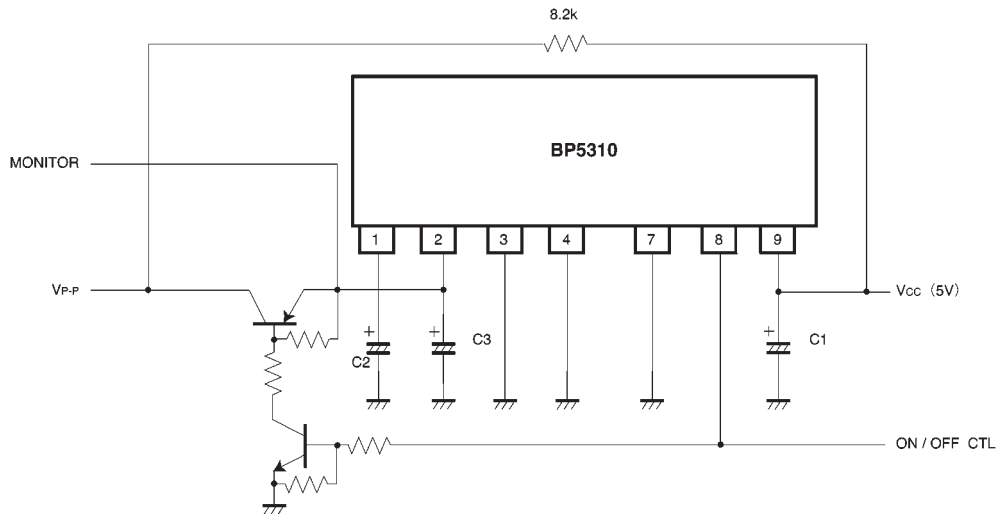


Fig. 2

● 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 $\mu$ m thickness.)

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

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

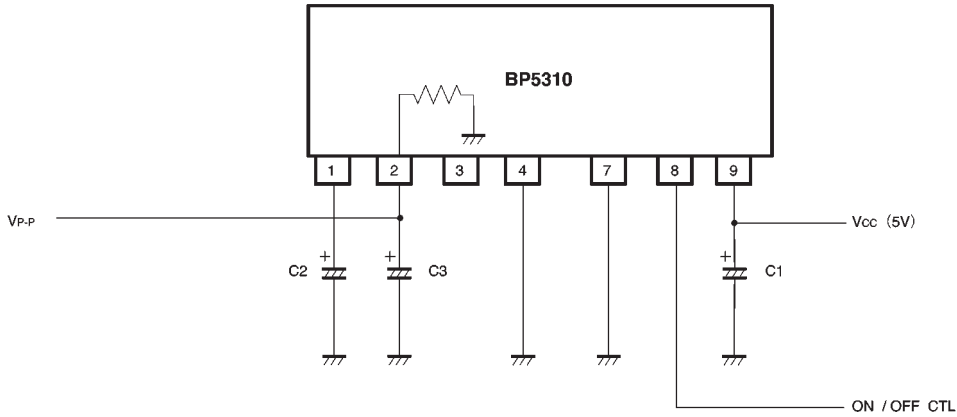


Fig. 3

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)

