

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

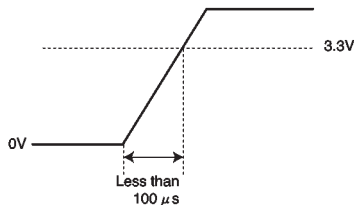
Parameter	Symbol	Limits	Unit
Input voltage	V_{IN}	7	V
Operating temperature	T_{opr}	0~+60	°C
Storage temperature	T_{stg}	-30~+85	°C

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

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	$V_{\text{IN}}=4.75\sim 5.25\text{V}$ $I_{\text{OUT}}=0\sim 120\text{mA}$
Ripple noise voltage	ν_1	—	100	200	mV _{P-P}	$V_{\text{IN}}=5\text{V}$, $I_{\text{OUT}}=60\text{mA}$ *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	$V_{\text{IN}}=4.75\sim 5.25\text{V}$
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 $100\ \mu\text{s}$ 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 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

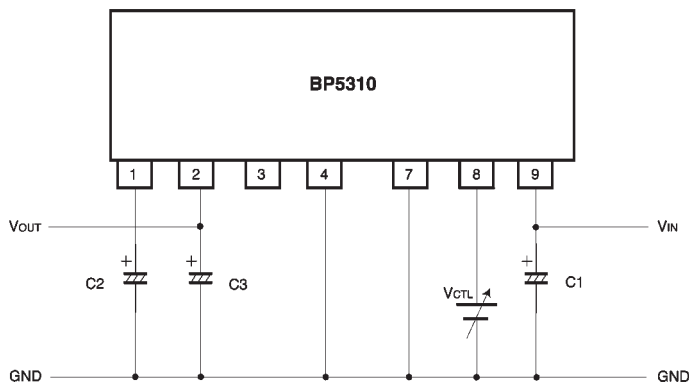


Fig. 1

C1 : $100\ \mu\text{F} / 16\text{V}$ (NICHICON PL-series or equivalent)

C2 : $47\ \mu\text{F} / 35\text{V}$ (NICHICON PL-series or equivalent)

C3 : $2.2\ \mu\text{F} / 35\text{V}$ (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

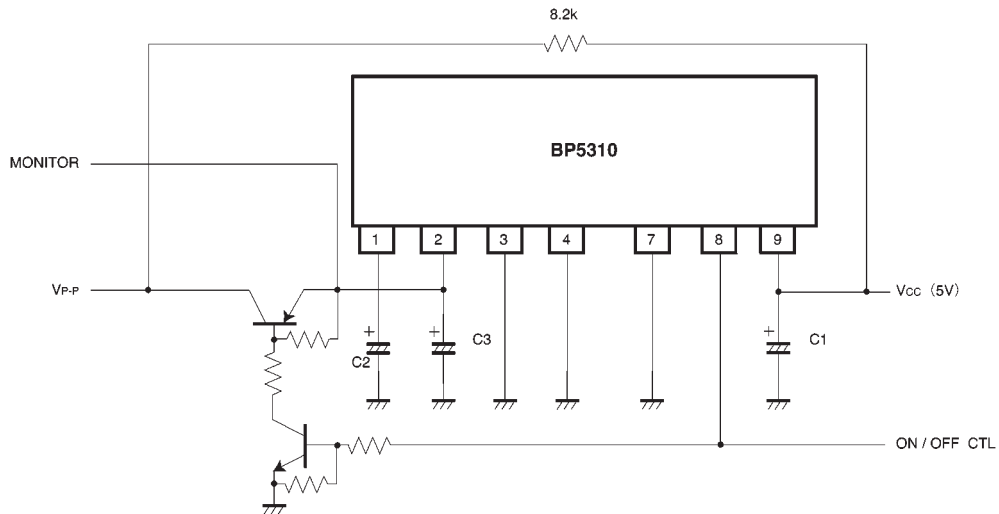


Fig. 2

● 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 $35\mu\text{m}$ 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}

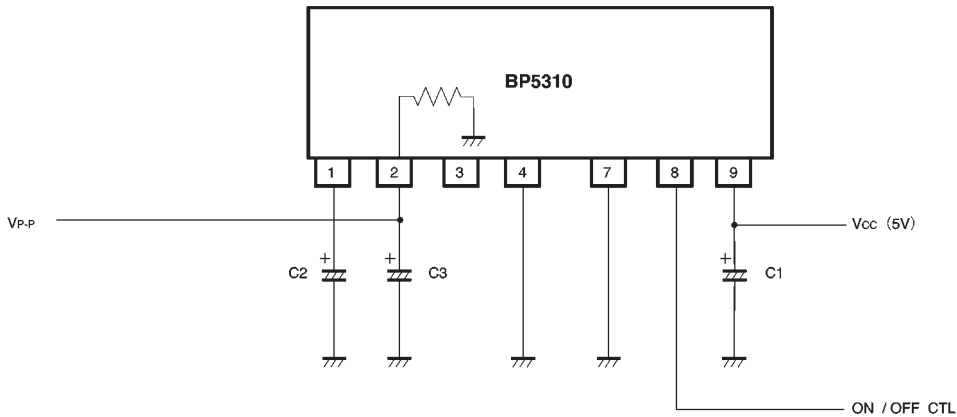


Fig. 3

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)

