

Power supply for PCMCIA flash memory

BP5315

The BP5315 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). Compact and thin surface-mounted package with embossing tape for automatic mounting.

●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 and thin SMD package.
- 5) Supplied with embossing tape for automatic mounting by the mounter.

●Absolute maximum ratings

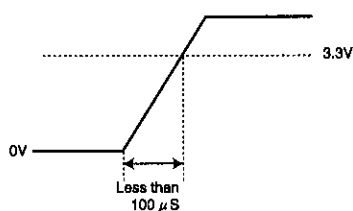
Parameter	Symbol	Limits	Unit
Input voltage	V _{in}	7	V
Operating temperature	T _{opr}	0~60	°C
Storage temperature	T _{stg}	-30~85	°C

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

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	v_1	—	100	200	mV _{P-P}	$V_{\text{in}}=5\text{V}$, $I_{\text{out}}=60\text{mA}$ *1
Efficiency	η	65	77	—	%	$V_{\text{in}}=5\text{V}$, $I_{\text{out}}=60\text{mA}$
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 6) 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

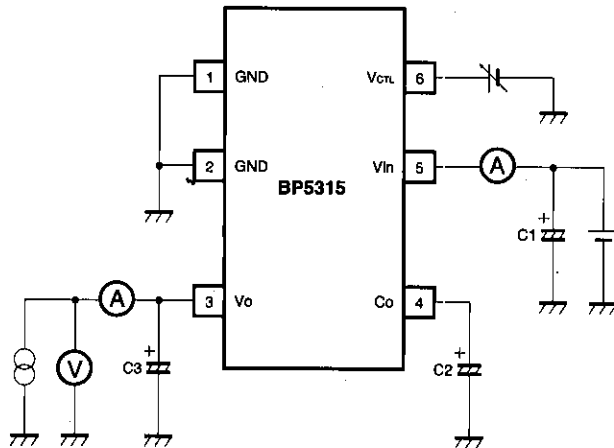


Fig. 1

- C3 : 2.2 μ F (Al electrolytic capacitor)
 C2 : 47 μ F / 35V (NICHICON PL-series or equivalent)
 C1 : 100 μ F / 16V (NICHICON PL-series or equivalent)

● Pin description

Pin No.	Pin name	Function
1, 2	GND	Ground pin
3	Vout	Output pin; connect an output capacitor with a recommended capacitance of 2.2 μ F between this pin and GND
4	Co	Output smoothing capacitor connection pin; connect a low-impedance capacitor with a recommended capacitance of 47 μ F between this pin and GND
5	Vin	Input pin; connect a low-impedance capacitor with a recommended capacitance of 100 μ F between this pin and GND
6	V _{CTL}	Output ON/OFF control pin; output starts when the pin is HIGH level, and stops at LOW level

● Operation notes

- 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. A length less than 50mm is recommended for a copper foil of 1.0mm wide and 35 μ m thick.
- Avoid frequent switching using the ON/OFF CTL pin (four times per second at the maximum).

●Application example

(1) Flash memory that requires 5V for reading

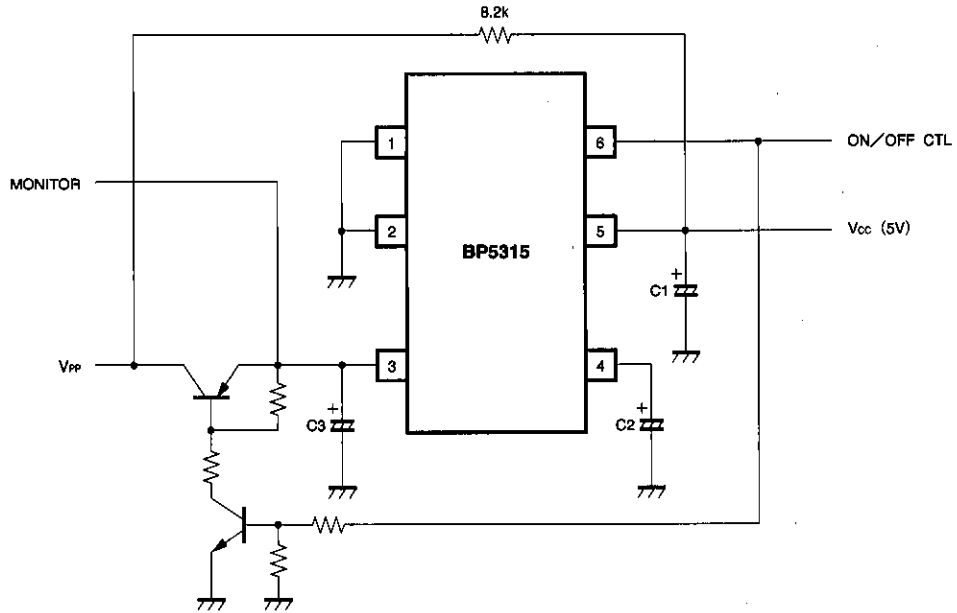


Fig.2

●Application example

(2) Pull-down of VPP

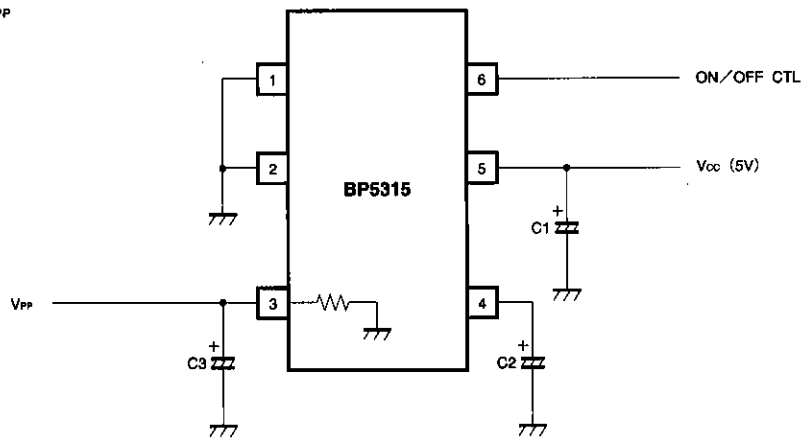


Fig.3

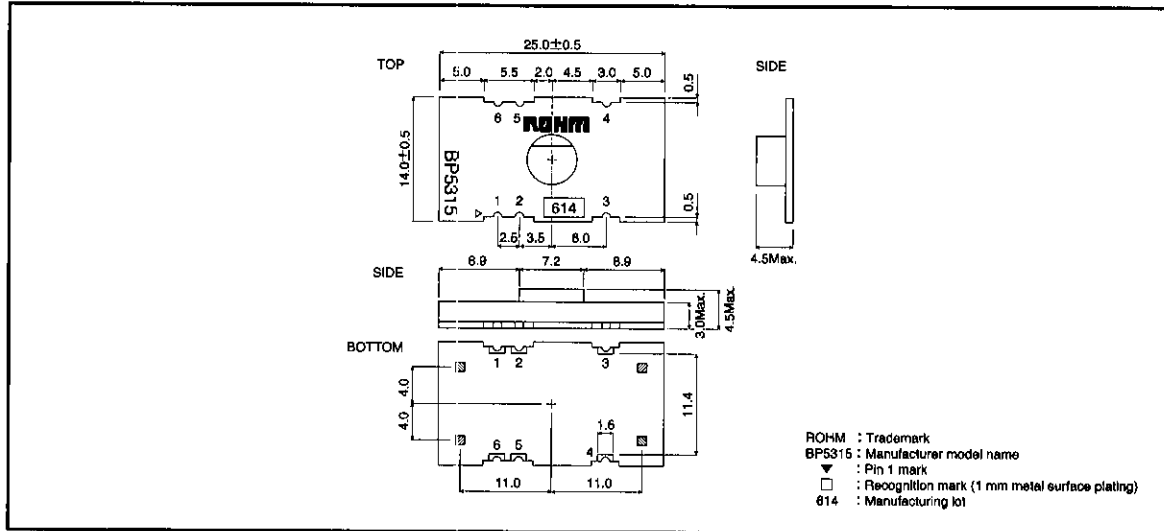
The OFF output is pulled down through an effective resistance of 30kΩ.

● Operation notes

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

output 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 (Unit: mm)



- The soldering used inside the unit is equivalent to H63 solder, so it will refuse during reflow. Be sure not to subject the unit to any vibrations when passing through the reflow furnace.

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