

DC / DC converter for LCDs

BP5311A / BP5311XA

The BP5311A and BP5311XA are DC / DC converters for supplying power to liquid crystal display (LCD) panels. The modules supply a positive voltage for LCDs from a logic circuit power supply (+5). They are available in a single in-line package as an upright (BP5311A) or L-shaped lead (BP5311XA) type.

● Applications

LCD panels in personal computers and word processors.

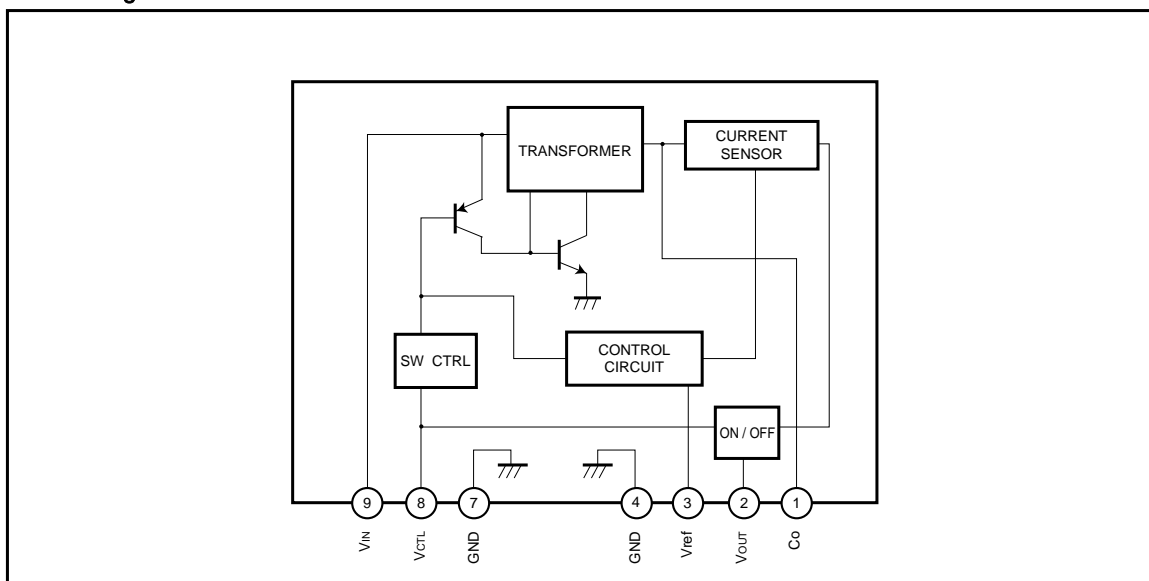
● Features

- 1) High conversion efficiency
- 2) Built-in protection circuit
- 3) Built-in ON/OFF switch.
- 4) Compact and light.
- 5) Surface mounting is possible because parts are concentrated on one side.
- 6) Available as an upright or L-shaped lead type.

● Absolute maximum ratings (Ta=25°C)

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

● Block diagram



● Pin descriptions

Pin No.	Pin name	Function
1	Co	Output smoothing capacitor connection pin ; connect a low-impedance capacitor with a recommended capacitance of 47 μ F between this and GND.
2	V _{OUT}	Output pin.
3	V _{ref}	Output voltage adjustment pin for contrast ; output voltage is adjusted by connecting a resistor between pins 2 and 3 or pins 3 and 4.
4, 7	GND	Ground pin.
8	V _{CTL}	Output ON/OFF control pin ; output starts when the pin is HIGH level, and stops when the pin is LOW or OPEN.
9	V _{IN}	Input pin ; connect a low-impedance capacitor with a recommended capacitance of 100 μ F between this pin and GND.

● Electrical characteristics (unless otherwise noted, T_a=25°C, V_{CTL}=5V, R1~R2 resistors are disconnected)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V _{IN}	4.5	5.0	5.5	V	–
Output current	I _{OUT}	–	–	25	mA	–
Output voltage	V _{OUT1}	28.0	29.5	31.0	V	V _{IN} =4.5~5.5V, I _{OUT} =0~25mA
Output voltage when OFF	V _{OUT2}	–	–	0.3	V	V _{IN} =4.5~5.5V, V _{CTL} =0V
Ripple noise voltage	v ₁	–	100	200	mV _{P-P}	V _{IN} =5V, I _{OUT} =20mA *
Efficiency	η	67	77	–	%	V _{IN} =5V, I _{OUT} =20mA
ON / OFF CTL voltage when ON	V _{CTL}	1.5	–	–	V	V _{IN} =5V, V _O >28V
ON / OFF CTL voltage when OFF	V _{CTL}	–	–	0.5	V	V _{IN} =5V, V _O <0.3V (Alternatively, when OPEN)
ON / OFF CTL current	I _{CTL}	–	–	500	μ A	V _{IN} =5V, V _{CTL} =1.5V
Current consumption when OFF	I _{OFF}	–	–	50	μ A	V _{IN} =5V, V _{CTL} =0V

* Measured with a band width of 20 MHz.

● Measurement circuit / Application example

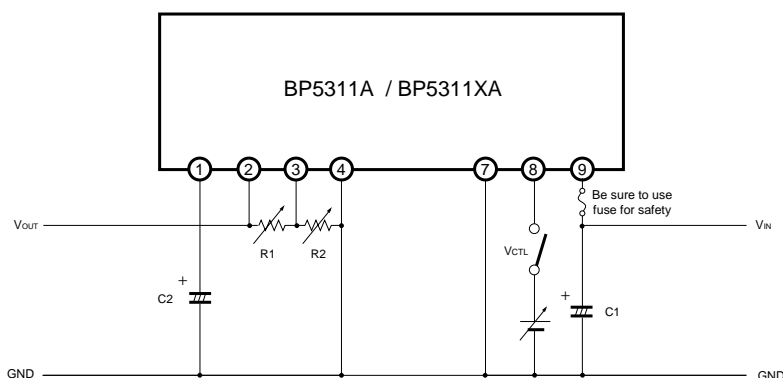


Fig.1

C1 : 100 μ F / 16V (Low impedance)C2 : 47 μ F / 35V (Low impedance)

R1, 2 : Resistors for adjusting output voltage (Contrast adjustment)

● Electrical characteristic curves

- (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. A length less than 50 mm is recommended for a copper foil of 1.0 mm wide and 35 μ m thick.
- (2) Avoid frequent switching using the ON/OFF CTL pin (five times per second at the maximum).
- (3) R1 and R2 resistors, which are used for changing the output voltage, are usually not required.

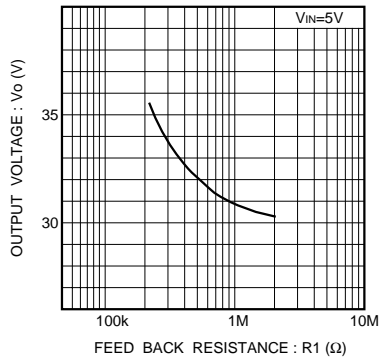


Fig.2 Output voltage vs. feedback resistance (R1)

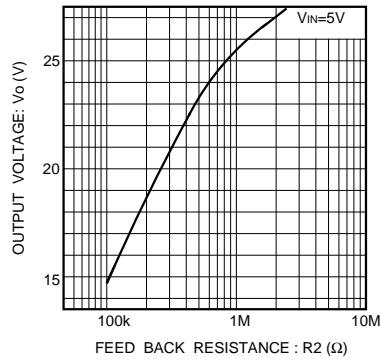
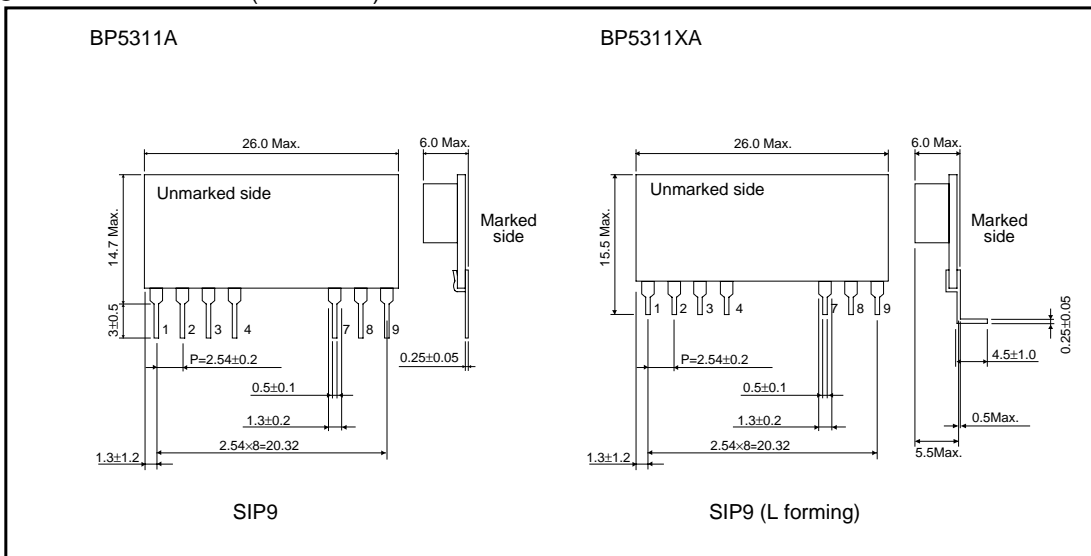


Fig.3 Output voltage and feedback resistance (R2)

● External dimensions (Units : mm)



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