Power supply unit for LCDs

BP5311

The BP5311 is a DC-DC converter unit for supplying power to liquid crystal display (LCD) panels. The unit supplies a positive voltage for LCDs from a logic circuit power supply (+5V)

●Applications

LCD panels in personal computers and word processors

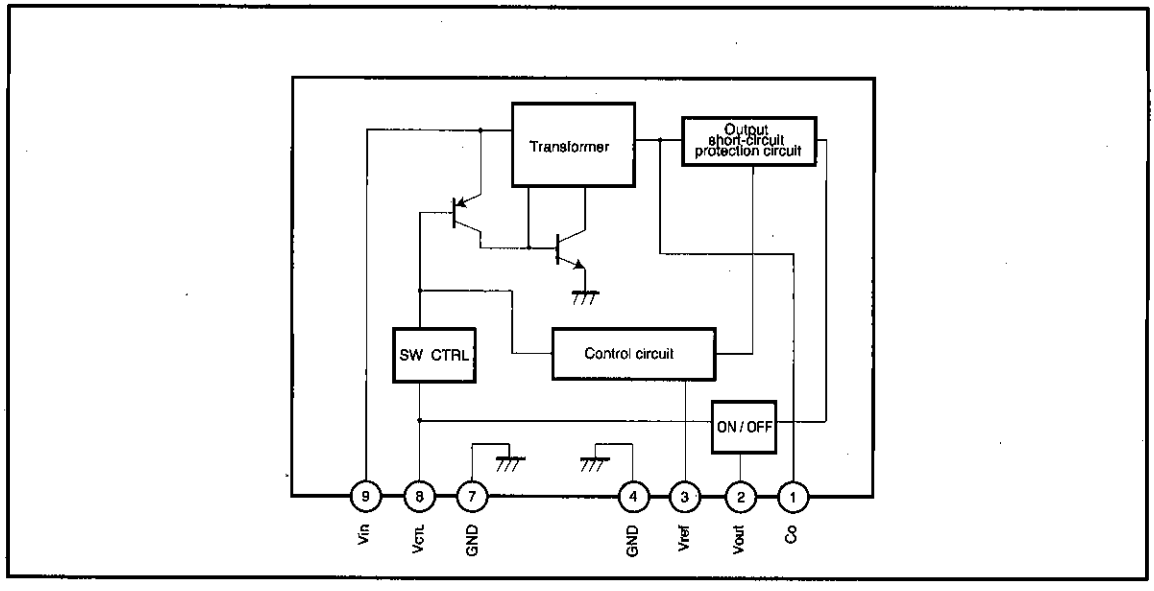
●Features

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.

●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vin	7	V
Operating temperature	Topr	0~60	℃
Storage temperature	Tstg	−30~85	℃

●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 μF between this pin and GND
2	Vout	Output pin
3	Vref	Output voltage pin for contrast adjustment; 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	Vin	Input pin; connect a low-impedance capacitor with a recommended capacitance of 100 μF between this pin and GND

●Electrical characteristics

(unless otherwise noted, Ta=25℃, V_{CTL}=5V, and R1 and R2 resistors are disconnected)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Input voltage	Vin	4.5	5.0	5.5	V		Fig.1
Output current	Iout	—	—	25	mA		Fig.1
Output voltage	Vout1	28.0	29.5	31.0	V	Vin=4.5~5.5V, Iout=0~25mA	Fig.1
Output voltage when OFF	Vout2	—	—	0.3	V	Vin=4.5~5.5V, V_{CTL}=0V	Fig.1
Ripple noise voltage	ν 1	—	100	200	mV_{P-P}	Vin=5V, Iout=20mA *	Fig.1
Efficiency	η	67	77	—	%	Vin=5V, Iout=20mA	Fig.1
ON/OFF CTL voltage when ON	V_{CTL}	1.5	—	—	V	Vin=5V, Vo>28V	Fig.1
ON/OFF CTL voltage when OFF	V_{CTL}	— (Alternatively, when OPEN)	—	0.5	V	Vin=5V, Vo<0.3V	Fig.1
ON/OFF CTL CTL current	I_{CTL}	—	—	500	μA	Vin=5V, V_{CTL}=1.5V	Fig.1
Current consumption when OFF	I_{OFF}	—	—	50	μA	Vin=5V, V_{CTL}=0V	Fig.1

* Measured with a band width of 20 MHz.

●Measurement circuit/application example

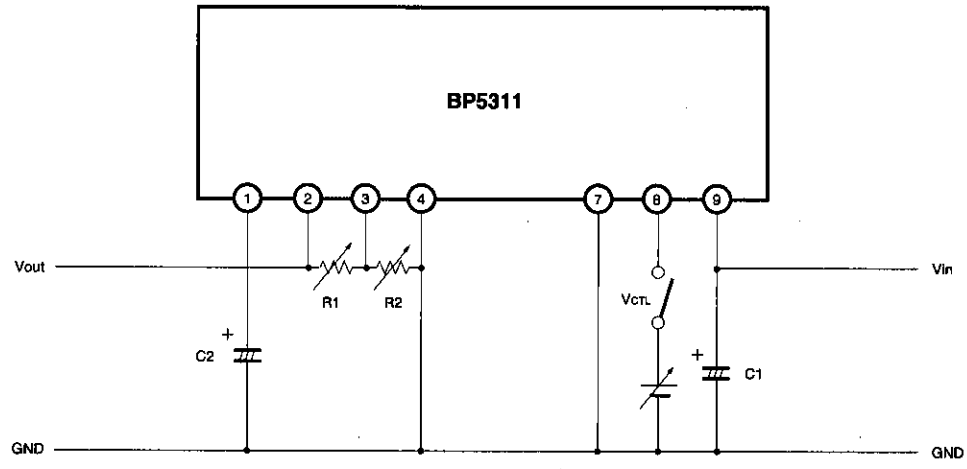


Fig. 1

C1: 100 μF, 16 V (NICHICON PL-series or equivalent)
C2: 47 μF, 35 V (NICHICON PL-series or equivalent)
R1, 2: Resistors for adjusting output voltage (contrast adjustment)

*) · 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 μm thick.

· Avoid frequent switching using the ON/OFF CTL pin (four times per second at the maximum).
R1 and R2 resistors, which are used for changing the output voltage, are usually not required.

●Electrical characteristic curves

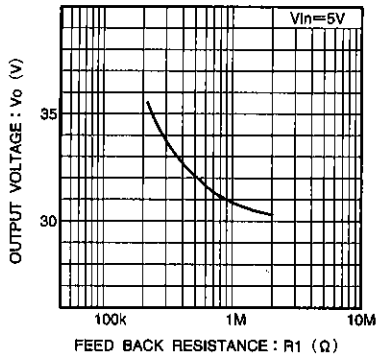


Fig. 2 Output voltage vs. feedback resistance (R1)

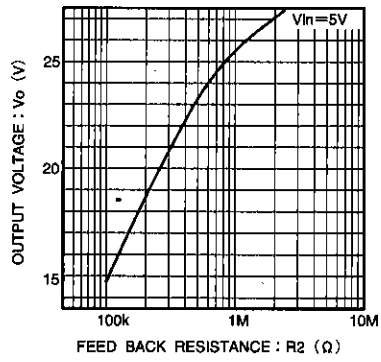
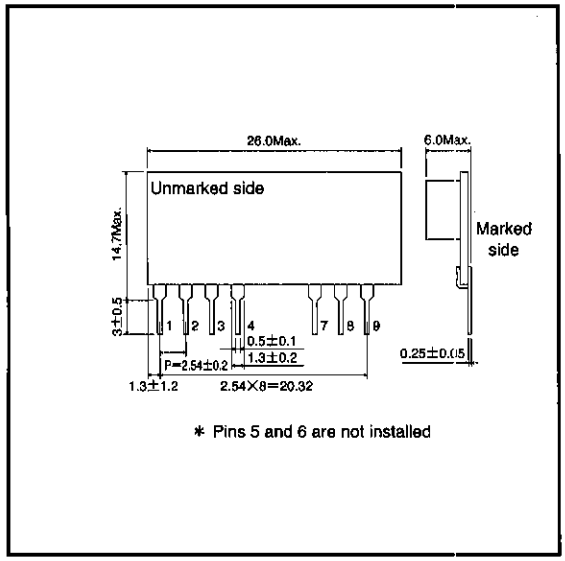


Fig. 3 Ooutput voltage and feedback resistance (R2)

●External dimensions (Units: mm)



* Pins 5 and 6 are not installed

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