# Power supply unit for LCD drives 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

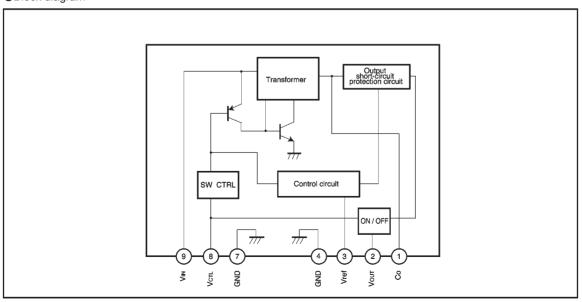
- 1) High conversion efficiency.
- 2) Built-in protection circuit.
- 3) Built-in ON / OFF switch.

- 4) Compact and light.
- Surface mounting is possible because parts are concentrated on one side.

# ● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vin	7	V
Operating temperature	Topr	0~+60	°C
Storage temperature	Tstg	<del>-30~+85</del>	°C

## Block diagram



# Pin descriptions

Pin No.	Pin name	Function
1	Co	Output smoothing capacitor connectionn; connect a low-impedance capacitor with a recommended capacitance of 47 $\mu$ F between this pin and GND
2	<b>V</b> out	Output
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
8	VctL	Output ON/OFF control; output starts when the pin is HIGH level, and stops when the pin is LOW or OPEN
9	Vin	Input ; connect a low-impedance capacitor with a recommended capacitance of 100 $\mu$ F between this pin and GND

# Electrical characteristics

(unless otherwise noted, Ta = 25°C, VcTL = 5V, and R1 and R2 resistors are disconnected)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Input voltage	VIN	4.5	5.0	5.5	٧	_
Output current	Іоит	_	_	25	mA	_
Output voltage	Vout1	28.0	29.5	31.0	٧	V <sub>IN</sub> =4.5~5.5V, lout=0~25mA
Output voltage when OFF	V <sub>OUT2</sub>	_	_	0.3	٧	V <sub>IN</sub> =4.5~5.5V, V <sub>CTL</sub> =0V
Ripple noise voltage	υ1	_	100	200	mV <sub>P-P</sub>	V <sub>IN</sub> =5V, I <sub>OUT</sub> =20mA *
Efficiency	η	67	77	_	%	V <sub>IN</sub> =5V, Iout=20mA
ON/OFF CTL voltage when ON	Vctl	1.5	_	_	٧	V <sub>IN</sub> =5V, Vo>28V
ON/OFF CTL voltage when OFF	VcTL	– (Alternati	– vely, wher	0.5 OPEN)	٧	V <sub>IN</sub> =5V, Vo<0.3V
ON/OFF CTL CTL current	ICTL	_	_	500	μΑ	V <sub>IN</sub> =5V, V <sub>CTL</sub> =1.5V
Current dissipation when OFF	loff	_	_	50	μΑ	VIN=5V, VCTL=0V

<sup>\*</sup> Measured with a band width of 20 MHz.

Regulator ICs BP5311

### Measurement circuit and application example

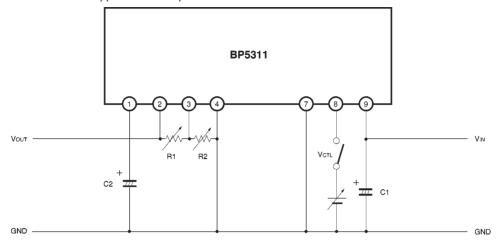


Fig. 1

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

C2: 47 µ F / 35 V (NICHICON PL-series or equivalent)

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

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

### Electrical characteristic curves

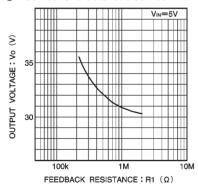
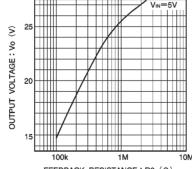


Fig. 2 Output voltage vs. feedback resistance (R1)



FEEDBACK RESISTANCE: R2  $(\Omega)$ 

Fig. 3 Ooutput voltage and feedback resistance (R2)

# ●External dimensions (Units: mm)

