Power supply unit for LCDs BP5302 / BP5302F

The BP5302 and BP5302F are DC / DC converter units for supplying power to liquid crystal display (LCD) panels. The ICs supply a negative voltage from a positive power supply. They are available in a single in-line package as an upright (BP5302) or L-shaped lead (BP5302F) type.

Applications

LCD panels in personal computers, word processors, copiers and facsimiles

Features

- 1) Wide input voltage range. (+5 to + 14V)
- 2) Accurate output voltage. $(-24 \pm 0.75V)$
- 3) High conversion efficiency. (typically 80%)
- 4) Built-in protection circuit.

- 5) Built-in ON / OFF switch.
- 6) Compact and light.
- 7) Available as an upright or L-shaped lead type.

Absolute maximum ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vin	15	V
Operating temperature	Topr	0~+60	°C
Storage temperature	Tstg	-30 ∼+85	°C

●Electrical characteristics (unless otherwise noted, Ta = 25°C and R1 and R2 resistors in the measurement circuit of Fig. 1 are disconnected)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Input voltage	Vin	5	_	14	٧	
Output current	Іоит	_	_	30	mA	
Output voltage	Vоит	-23.25	-24.00	-24.75	٧	V _{IN} =12V, I _{OUT} =20mA
Line regulation	ΔV1	_	_	0.75	٧	V _{IN} =5~14V, Iоит=20mA
Load regulation	ΔV2	_	_	0.5	٧	V _{IN} =12V, Ιουτ=0~20mA
Ripple noise voltage	υ 1	_	_	200	mV _{P-P}	V _{IN} =12V, I _{OUT} =20mA*
Efficiency	η	70	80	_	%	V _{IN} =12V, I _{OUT} =20mA
ON/OFF CTL voltage when ON	Vctl	1.5	_	6.0	٧	V _{IN} =5~14V
ON/OFF CTL voltage when OFF	VcTL	_	_	0.5		V _5 40V
		(Alternatively, when OPEN)		V	V _{IN} =5~14V	
ON/OFF CTL CTL current	ICTL	_	_	150	μΑ	V _{IN} =5~14V, V _{CTL} =5V
Current consumption when OFF	loff	_	_	10	μΑ	V _{IN} =5~14V, V _{CTL} =0V
R1 resistance	R1	50	_	∞	kΩ	V _{IN} =5~14V, V _{CTL} =5V
R2 resistance	R2	20	_	∞	kΩ	V _{IN} =5~14V, V _{CTL} =5V

^{*} Measured with a band width of 20 MHz.

Pin descriptions

Pin No.	Pin name	Functions
1	Со	Output smoothing capacitor connection; connect a low-impedance capacitor with a recommended capacitance of 47 $\mu\rm F$ between this pin and GND
2	Vout	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 μ F between this pin and GND

Measurement circuit and application example

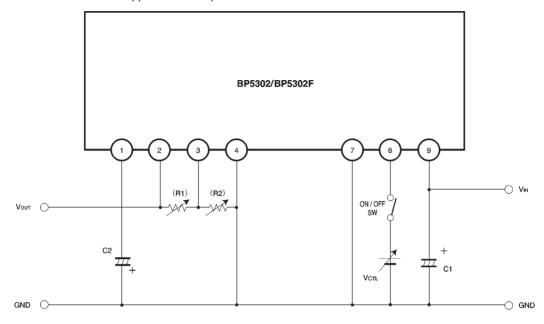


Fig. 1

C1: 100 µF / 16V (NICHICON PL-series or equivalent)

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

R1, R2: Resistors for adjusting output voltage (disconnected during test measurement)

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 valve: A length less than 50mm is recommended for a copper foil of 1.0mm wide and $35\mu m$ thick.)

- (2) Avoid frequent switching using the ON / OFF CTL pin (5 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

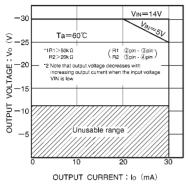


Fig. 2 Derating curve

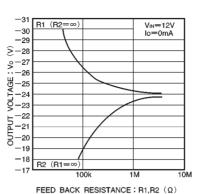
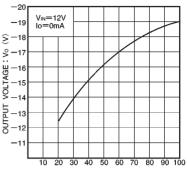


Fig. 3 Output voltage vs. feedback resistance

(R1, R2)



FEED BACK RESISTANCE : R2 (kΩ)

Fig. 4 Output voltage feedback resistance (R2 < 100 kΩ)

External dimensions (Units: mm)

