

Surface-mount type power supply unit for LCDs

BP5307

The BP5307 is a DC-DC converter unit designed for driving liquid crystal displays (LCDs). The unit supplies a positive voltage for LCDs from a logic circuit power supply (+5V). Being in a compact and light surface-mount package, the IC can be built into a LCD panel.

●Applications

LCD panels of personal computers, word processors, and copiers

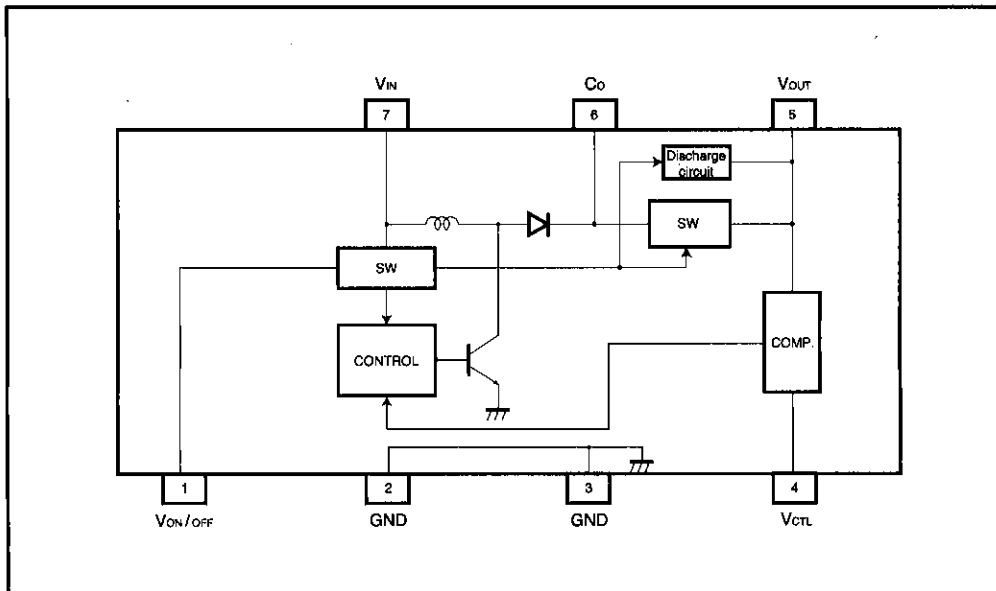
●Features

- 1) Automatic mounting and reflow soldering are possible.
- 2) With a maximum thickness of 4.1 mm, the IC can be built into a LCD panel.
- 3) Output voltage can be regulated by a microcontroller.
- 4) Discharge circuit is built in for output. (Fall time : 1ms Typ.)

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{IN}	7.0	V
Operating temperature	T _{opr}	0~60	°C
Storage temperature	T _{stg}	-20~85	°C

●Block diagram



DC/DC converter units for LCDs

● Pin description

Pin No.	Pin name	Function
1	V _{ON/OFF}	Output ON/OFF control pin; output starts when the pin is HIGH level, and stops when the pin is LOW or OPEN
2	GND	Internally connected ground pins
3	GND	
4	V _{CTL}	Output voltage can be adjusted by the input voltage of 0.8-2.8 V, which is available even when the pin is OPEN; typically V _{OUT} = 34 V when OPEN
5	V _{OUT}	Output pin; connect a low-impedance capacitor with a recommended capacitance of 47 μF between this pin and GND
6	C _O	External capacitor connection pin; connect a low-impedance capacitor with a recommended capacitance of 10 μF between this pin and GND
7	V _{IN}	Input pin; connect a low-impedance capacitor with a recommended capacitance of 10 μF between this pin and GND

● Electrical characteristics (unless otherwise noted, T_a = 25°C and V_{CTL} = 0.8V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Input voltage	V _{IN}	4.5	5.0	5.5	V		Fig.1
Output current	I _{OUT}	0	—	40	mA	V _{CTL} = 0.8~2.8V	Fig.1
Output voltage 1	V _{OUT1}	+30.00	+32.00	+33.60	V	V _{IN} = 4.5~5.5V V _{CTL} = 0.8V, I _{OUT} = 0~40mA	Fig.1
Output voltage 2	V _{OUT2}	+16.00	+19.00	+20.00	V	V _{IN} = 4.5~5.5V V _{CTL} = 2.8V, I _{OUT} = 0~40mA	Fig.1
Ripple noise voltage	V _r	—	200	300	mV _{P-P}	V _{IN} = 5V, I _{OUT} = 40mA *	Fig.1
Efficiency	η	60	70	—	%	V _{IN} = 5V, I _{OUT} = 40mA	Fig.1
ON/OFF CTL voltage when ON	V _{ON}	2.5	—	5.5	V	V _{IN} = 4.5~5.5V Output ON	Fig.1
ON/OFF CTL voltage when OFF	V _{OFF}	—	—	0.7	V	V _{IN} = 4.5~5.5V Output OFF (Alternatively, when OPEN)	Fig.1
V _{ctl} applied voltage	V _{CTL}	0	—	4.0	V		Fig.1
Oscillation frequency	f _{sw}	—	100	—	kHz		Fig.1

* Measured with a band width of 20 MHz

● Measurement circuit

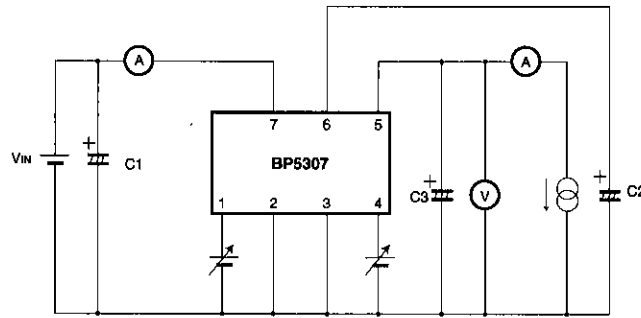


Fig. 1

- C1 : 10 μ F / 50V (NICHICON PL-series or equivalent)
- C2 : 10 μ F / 50V (NICHICON PL-series or equivalent)
- C3 : 47 μ F / 50V (NICHICON PL-series or equivalent)

● Electrical characteristic curves

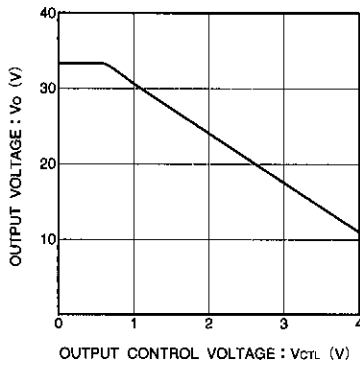


Fig. 2 Output voltage vs. output control voltage

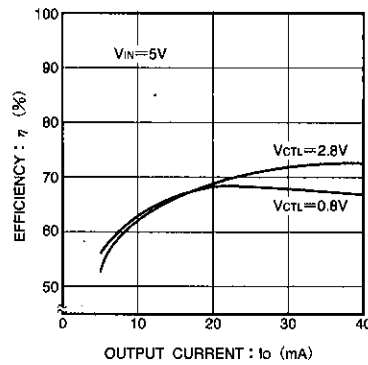


Fig. 3 Efficiency

DC/DC converter units for LCDs

● Recommended pad dimensions

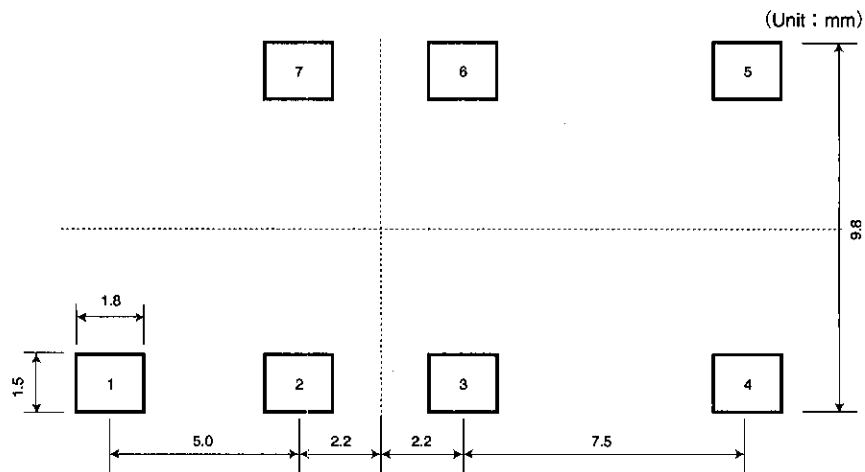
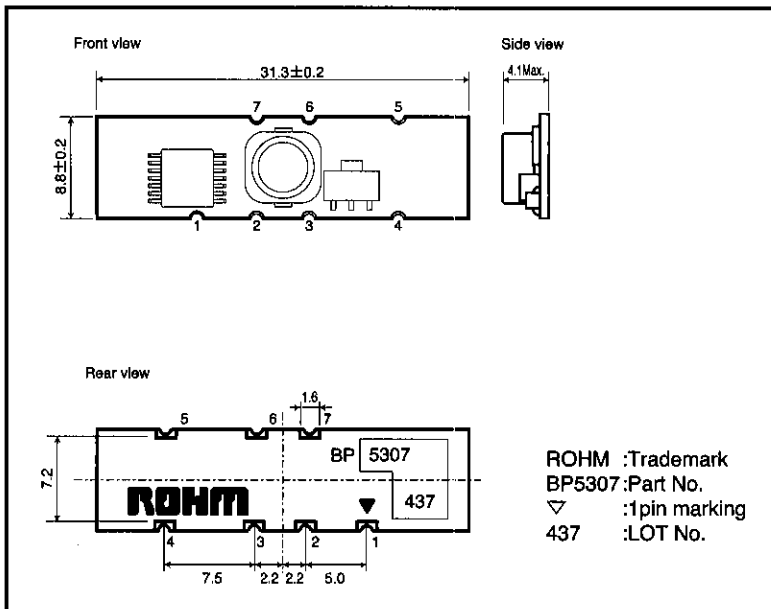


Fig. 4

● Operation notes

The H63 or equivalent is used for soldering within the unit. Note that the solder remelts during reflow soldering.

● External dimensions (Units: mm)



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