BD80000

88W STEP-UP SWITCHING REGULATOR

11–22Vdc Input Voltage Range

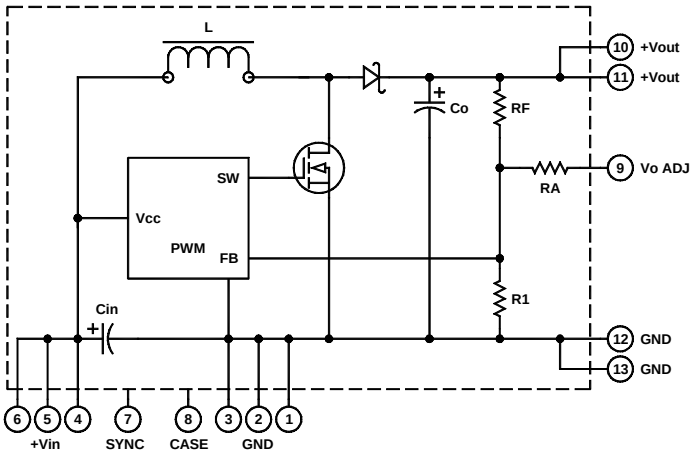
Key Features

- 95% maximum efficiency
- Wide input range (11–22V)
  30V Absolute Maximum
- Input undervoltage protection
- Output overvoltage protection
- 300kHz constant frequency
- 44W/in^3 power density
- Six-sided shielding

Functional Description

The BD80000 is a constant frequency, current mode step-up converter with excellent line and load regulation that accepts $11V_{IN}$ to $22V_{IN}$ and provides $22V_{OUT}$@4A maximum. High switching frequency and SMD technology makes achieving high power density, low cost and high reliability possible. The BD80000 requires a low impedance power source or minimum 1000µF input and output capacitors for proper operation.

NOTE: This converter does *NOT* feature short circuit protection, you must use an external fuse to provide short circuit protection.



Typical Block Diagram

Electrical Specifications

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

INPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range[1]		11	12	22	Vdc
Input Current	NL		50		mA
Input Reflected Ripple	With 2000µF, See Figure 1		20		mA_{PP}
Turn On Delay	Including Soft Start, See Figure 2		5	8	mS
Undervoltage Lockout		8	10		Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			22		Vdc
Output Voltage Accuracy			0.5	1	%
Line Regulation			2	5	% of V_{OUT}
Load Regulation			2	5	% of V_{OUT}
Ripple and Noise	With C_O=1000µF minimum, See Figure 1		1	2	% of V_{OUTPP}
Temperature Coefficient			0.01	0.02	%
Transient Response	See Figure 3		100		µS
Output Overvoltage Protection	Provided by the end user			30	Vdc
Short Circuit Current	Input Fuse				
V_{OUT} Adjust Range			5	10	%

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency	See Figure 4		94		%
Switching Frequency	Fixed	300	330	360	kHz
Isolation	None				
Thermal Resistance	Internally dissipated		5		°C/W
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		1.3×10^6		hours

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Humidity	Non-condensing			95	%
Storage Temperature		-55		+125	°C
Operating Temperature, Commercial		0		+50	°C

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×2.00×0.50 in. (50.80×50.80×12.70mm)				
Weight	2.43 oz. (69g)				
Case Material	Coated metal				

[1] The converter will stop switching when $V_{IN} \geq 22V$. For $V_{IN} \geq 22V$, $V_{OUT} = V_{IN}$ - 0.5V. The absolute maximum allowed input voltage is 30Vdc.

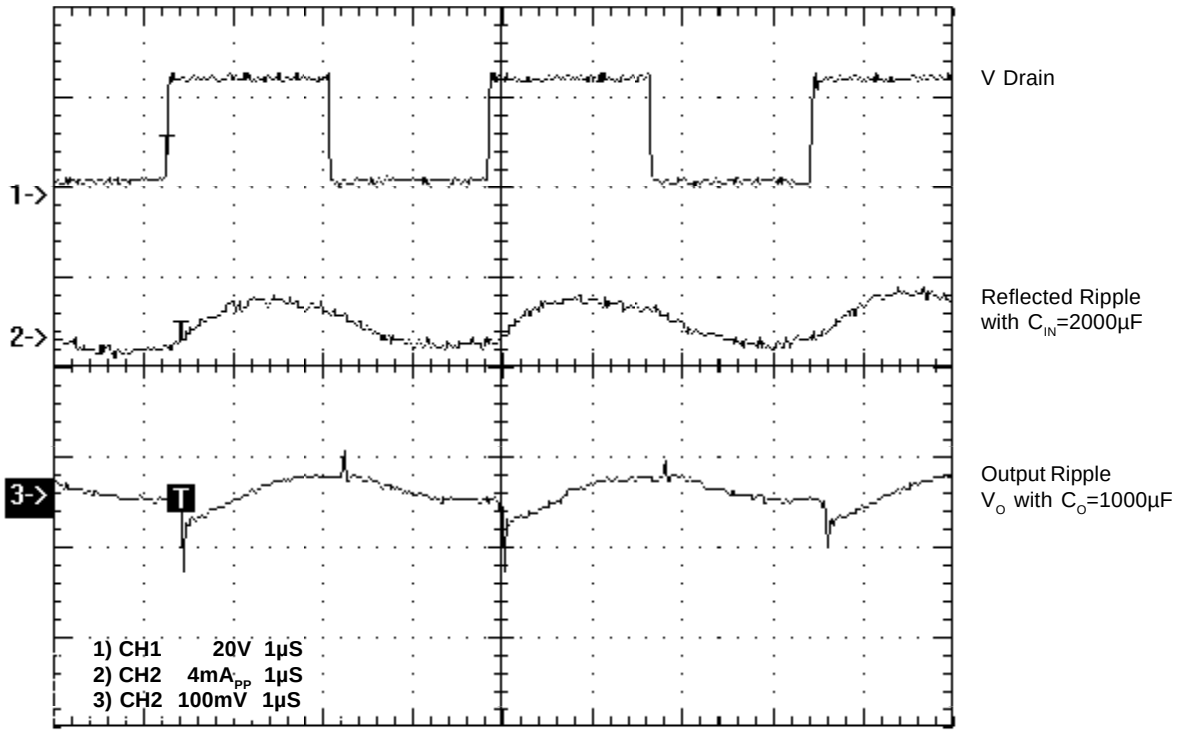


FIGURE 1. Reflected ripple and output ripple

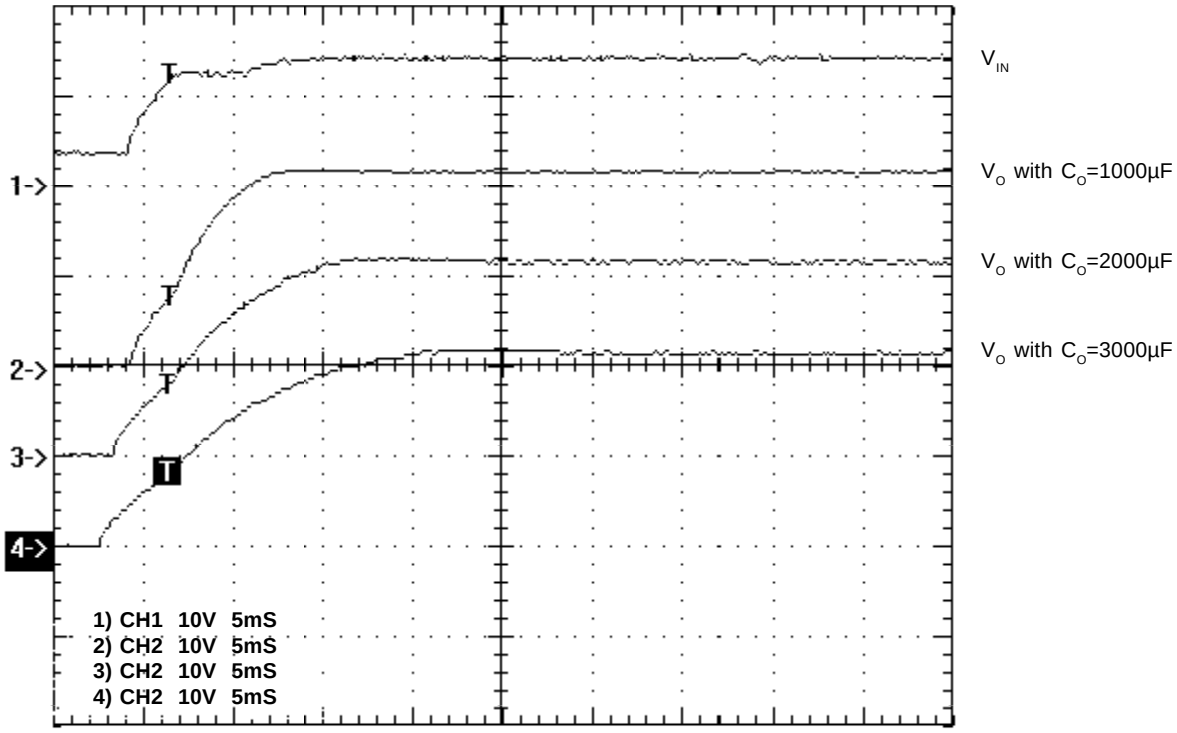


FIGURE 2. Soft start

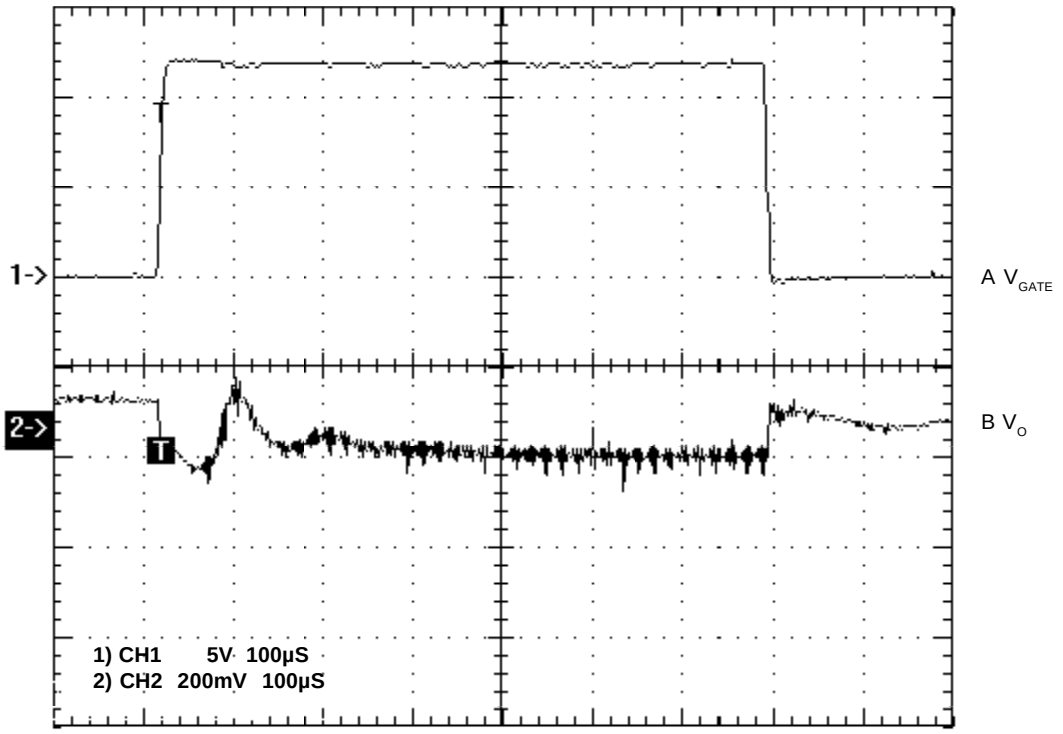


FIGURE 3. Transient response, V_{IN}=12V, 40%FL to 80% FL to 40%FL, C_{IN}=1000µF

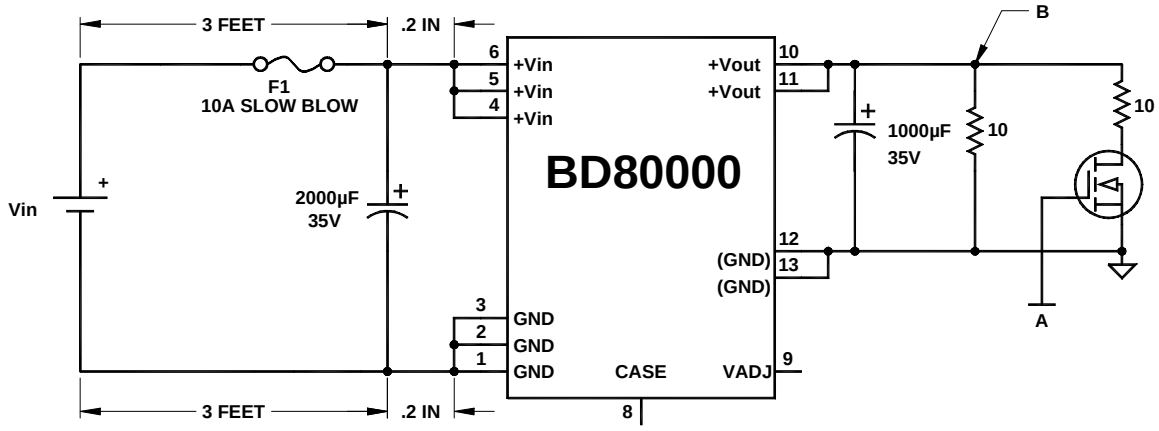


FIGURE 4. Transient response setup

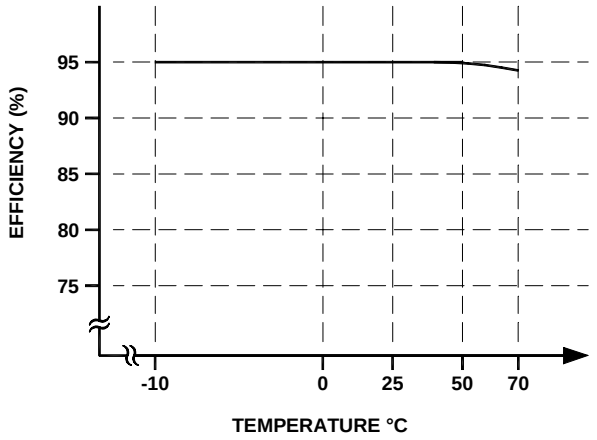


FIGURE 5. Efficiency vs. Temperature

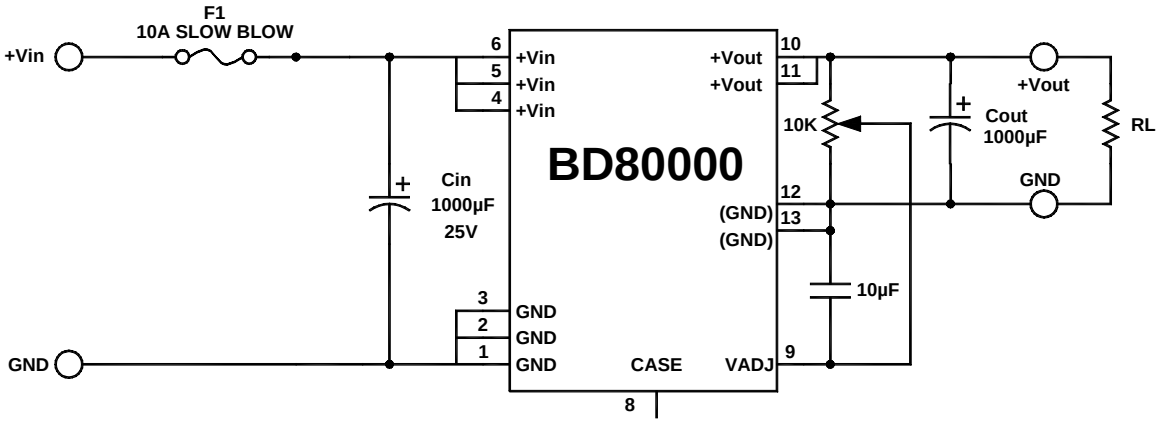
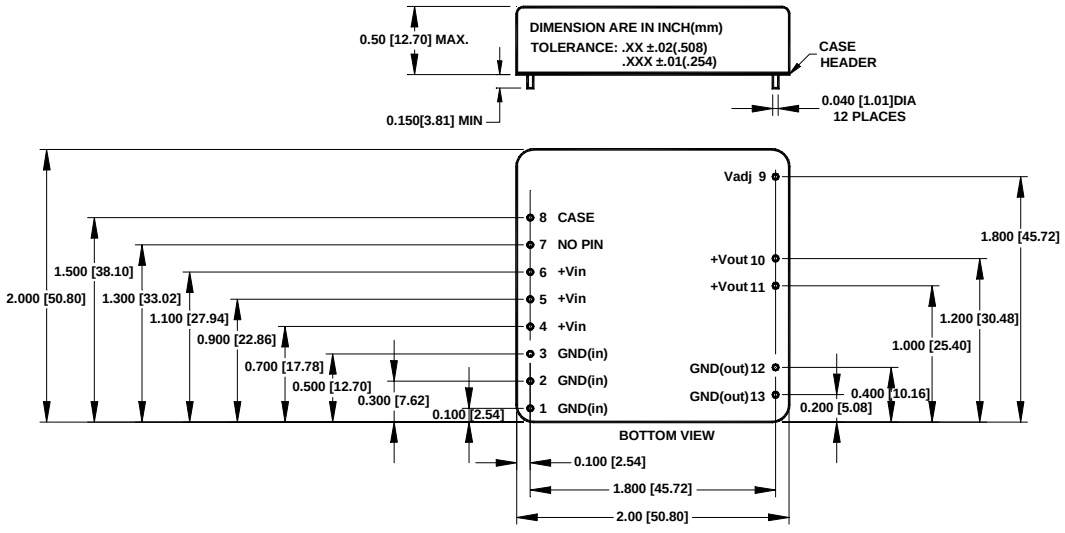


FIGURE 6. Typical connection diagram

MECHANICAL SPECIFICATIONS



Pin	Function
1	GND (INPUT)
2	GND (INPUT)
3	GND (INPUT)
4	$+V_{IN}$
5	$+V_{IN}$
6	$+V_{IN}$
7	No Pin
8	CASE
9	V_O ADJ
10	$+V_{OUT}$
11	$+V_{OUT}$
12	GND (OUTPUT)
13	GND (OUTPUT)