



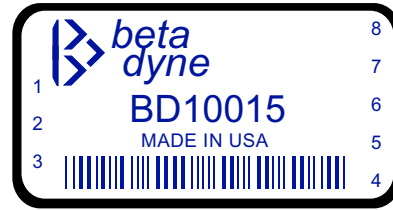
BD10015

10W HIGH-VOLTAGE SINGLE DC/DC CONVERTER

Single 302.5V_{OUT}

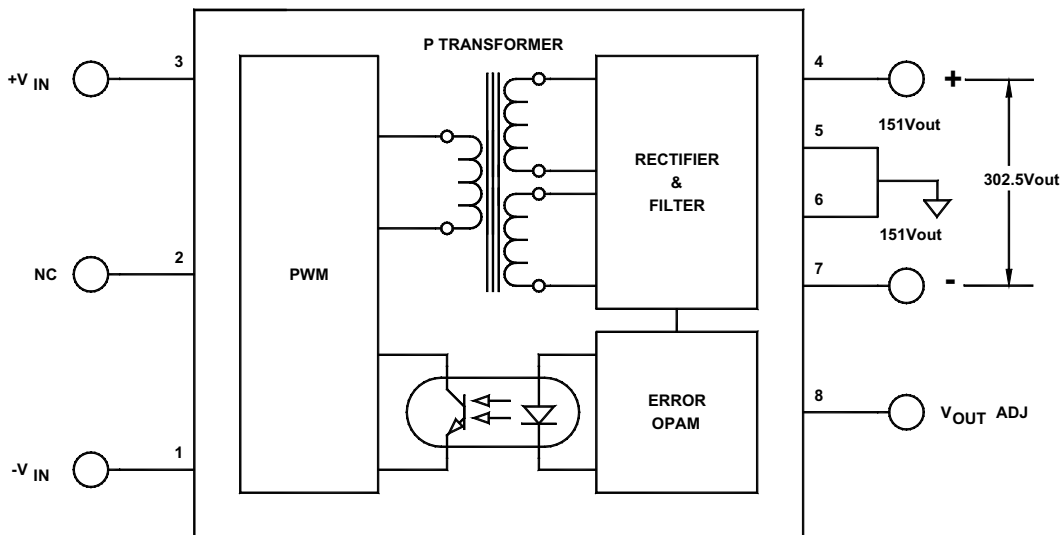
Key Features

- 81% efficiency
- Input-to-output isolation
- Short circuit and thermal protection
- Adjustable outputs
- 50µA off state current
- Wide input voltage range (36–75Vdc)



Functional Description

The BD10015 is a 10W High-Voltage Single DC/DC converter with an input voltage range of 36V_{IN} to 75V_{IN} and an output set for 302.5V_{OUT} across Pin 4 positive and Pin 7 negative.



Typical Block Diagram of BD10015

Electrical Specifications
ABSOLUTE MAXIMUM RATINGS

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

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage	175% of Nominal input line				
Output Short Circuit Duration	Continuous				
Internal Power Dissipation				3.4	W

INPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range (2:1)		36	48	75	Vdc
No Load Input Current			20		mA
Full Load Input Current			270		mA
Input Filter	C				
Reflected Ripple Current ¹			90		mA _{pp}
Reverse Voltage Protection	Parallel Diode		5		A
Turn On Delay	Including soft start	7	10	15	mS
Startup Input Voltage		11	16		Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Voltage			302.5		Vdc
Current			33		mA
Output Voltage Accuracy			±1		%
Output Adjust Range			+1		%
Ripple & Noise (20MHz BW)			±1		%
Line Regulation			±1		%
Load Regulation			±1		%
Temperature Coefficient @ FL				±0.02	%/°C
Short Circuit Protection	Continuous, Current Limit				
Short Circuit Restart	Automatic				
Transient Response (to within 1% of V _{OUT})	50% FL to 100% FL to 50% FL		500		µS

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			81		%
Isolation Voltage (1 min.)		500	1000		Vdc
Isolation Resistance			10 ⁹		Ω
Isolation Capacitance			300		pF
Switching Frequency		108	125	130	kHz

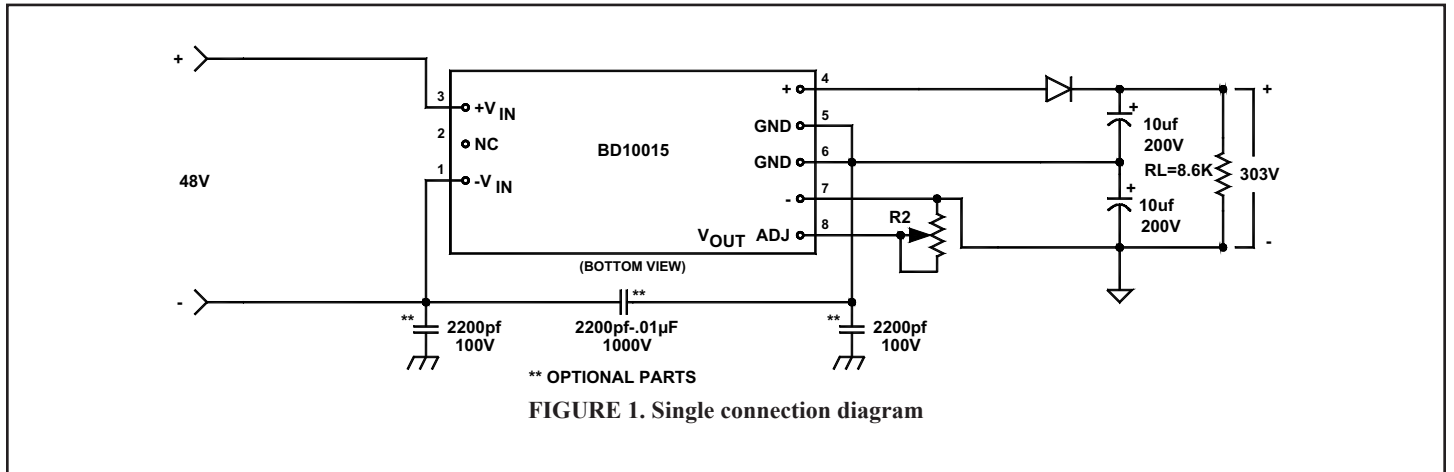
ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range (Ambient)	(For -55°C to +85°C, please contact factory)	-40		+70	°C
Storage Temperature Range		-60		+105	°C
Thermal Shutdown	Case Temperature	96	100	104	°C
Thermal Resistance			6		°C/W
Derating	None required				
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		1.1×10 ⁶		hours

PHYSICAL CHARACTERISTICS

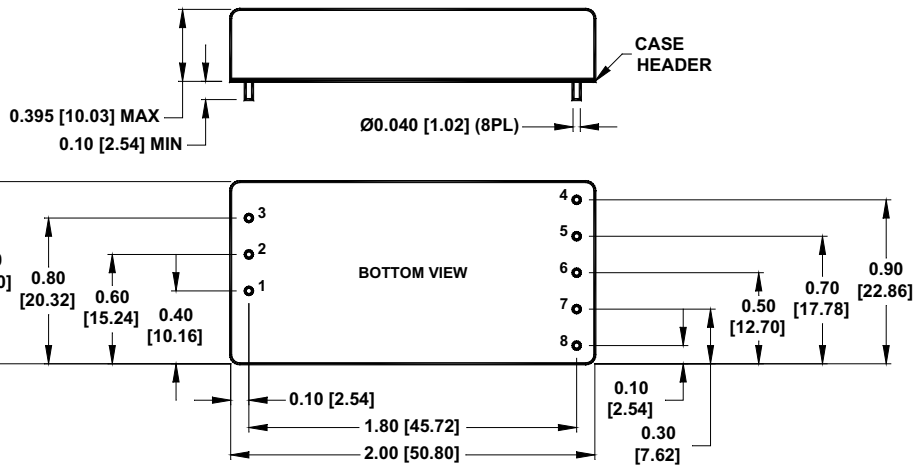
PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×1.00×0.395 in. (50.80×25.40×10.03mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection					

[†] The maximum input current at any given input range measured at minimum input voltage is given as 1.6[†] NOMINAL. Nominal input current is the typical value measured at the input of the converter under full-load room temperature and nominal input voltage (48Vdc).



MECHANICAL SPECIFICATIONS

in inches [mm]



Pin	Function
1	-V _{IN}
2	No Connection
3	+V _{IN}
4	+V _{OUT}
5	GND (CONNECT PIN 5 TO 6)
6	GND (CONNECT PIN 5 TO 6)
7	-V _{OUT}
8	V _{OUT} ADJ

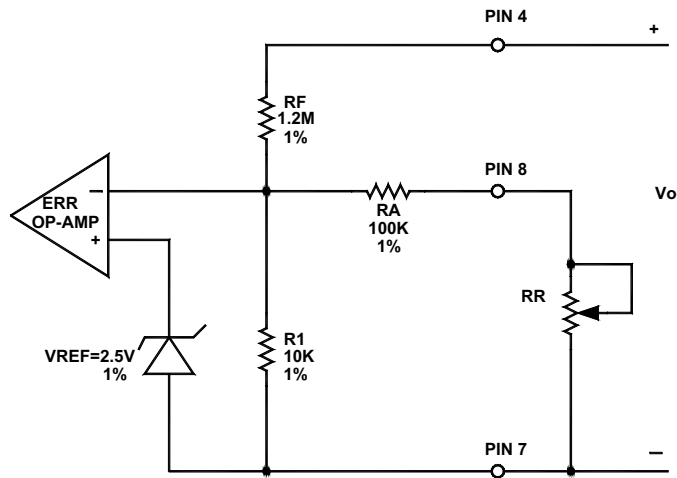


FIGURE 2. Output error amplifier circuit

$$V_o = \left(\frac{R_F}{R_1} + 1 \right) V_{REF} \quad V_o = \left(\frac{1.2 \times 10^6}{1 \times 10^4} + 1 \right) * 2.5 = 302.5 \text{ (Pin 8 open)}$$

$$R_{ADJUST} = R_A + R_R$$

$$R_1' = R_1 // (R_A + R_R) = \frac{R_F}{\frac{V_o}{V_{REF}} - 1}$$

For 310V_{OUT}, R' = 9.75k and RR = 290k

when Pin 8 is OPEN, V_o = 302.5 ±1% Vdc