



# BD10016

## 14W SINGLE DC/DC CONVERTER

110V<sub>OUT</sub>

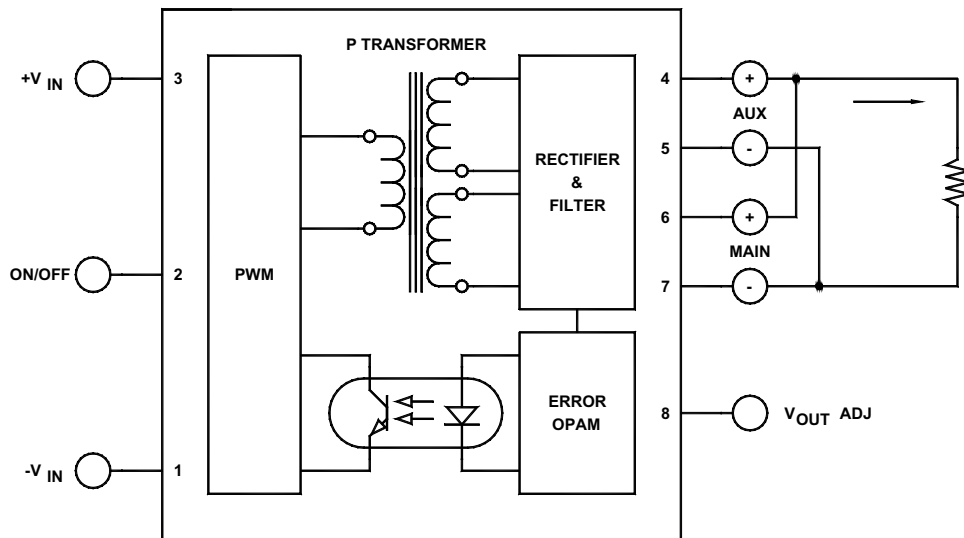
### Key Features

- Input-to-output isolation
- Soft start
- Hot pluggable
- Short circuit and thermal protection
- Adjustable output
- 50µA off state current
- Wide input voltage range (40–60Vdc)



### Functional Description

The BD10016 is a 14W single DC/DC converter with an input voltage range from 40V<sub>IN</sub> to 60V<sub>IN</sub> and offers an adjustable output from 90V<sub>OUT</sub> to 130V<sub>OUT</sub> with a nominal 110V<sub>OUT</sub>.



Typical Block Diagram

## Electrical Specifications

### INPUT SPECIFICATIONS

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 Range (2:1)		36	48	75	Vdc
Input Filter <sup>1</sup>	RC				
Reflected Ripple Current <sup>2</sup>			90		mA <sub>PP</sub>
Reverse Voltage Protection	Parallel Diode		5		A
On/Off	Reference to -V <sub>IN</sub>				
Voltage	Open		10		Vdc
Unit On	Open				
Unit Off	Short to -V <sub>IN</sub>				
Off State Current	Pin 2 short to Pin 3		50	120	μA
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 and Current Ratings		108	110	120	Vdc
Output Voltage Accuracy			±1	±2	%
Output Current			127		mA
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 <sub>OUT</sub> )	50% FL to 100% FL to 50% FL			200	μS

### GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			80		%
Isolation Voltage (1 min.)		500	1000		Vdc
Isolation Resistance			10 <sup>9</sup>		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		+75	°C
Storage Temperature Range		-60		+105	°C
Derating	See Figure 2				
Thermal Protection	Shutdown ( )		145		°C
Thermal Hysteresis			30		°C
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		1.1×10 <sup>6</sup>		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					

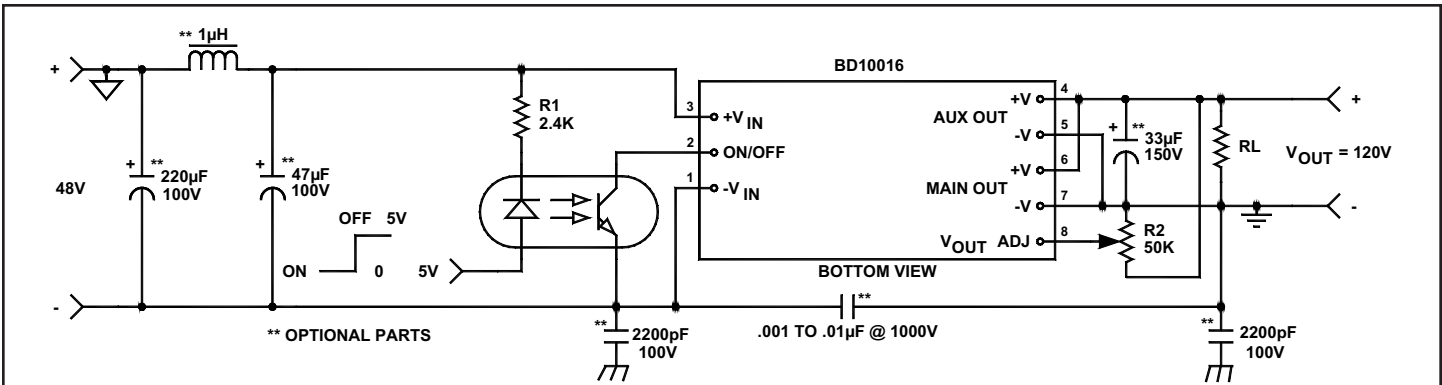


FIGURE 1. Single connection diagram

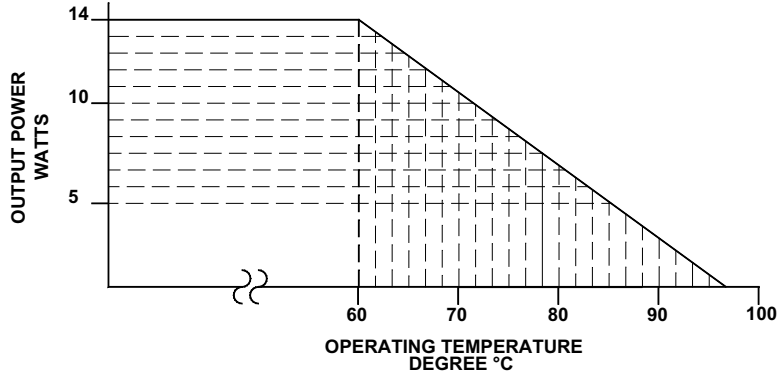
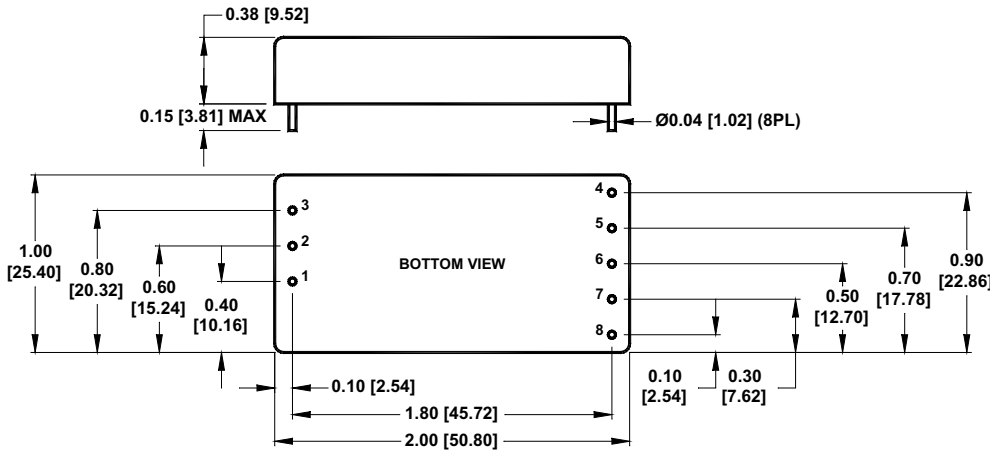


FIGURE 2. Derating curve of BD10016 at  $V_{IN}$  minimum

**MECHANICAL SPECIFICATIONS**

in inches [mm]



Pin	Function
1	$-V_{IN}$
2	ON/OFF
3	$+V_{IN}$
4	$+V_{OUT}$ (CONNECT PIN 4 TO 6)
5	$-V_{OUT}$ (CONNECT PIN 5 TO 7)
6	$+V_{OUT}$ (CONNECT PIN 4 TO 6)
7	$-V_{OUT}$ (CONNECT PIN 5 TO 7)
8	$V_{OUT}$ ADJ

<sup>1</sup> The RC input filter utilizes the  $R_{ON}$  of the series MOSFET transistor which is part of the hot pluggable circuit. The benefits of this RC filters are the reduction of inrush current by approximately 27dB and reflected ripple attenuation by 8dB. The penalty for the hot pluggability and the RC filter is 1% to 2% reduction of the converter's efficiency.

<sup>2</sup> The maximum input current at any given input range measured at minimum input voltage is given as  $1.6 \cdot I_{NOMINAL}$ . Nominal input current is the typical value measured at the input of the converter under full-load room temperature and nominal input voltage (24, 48 and 120Vdc).

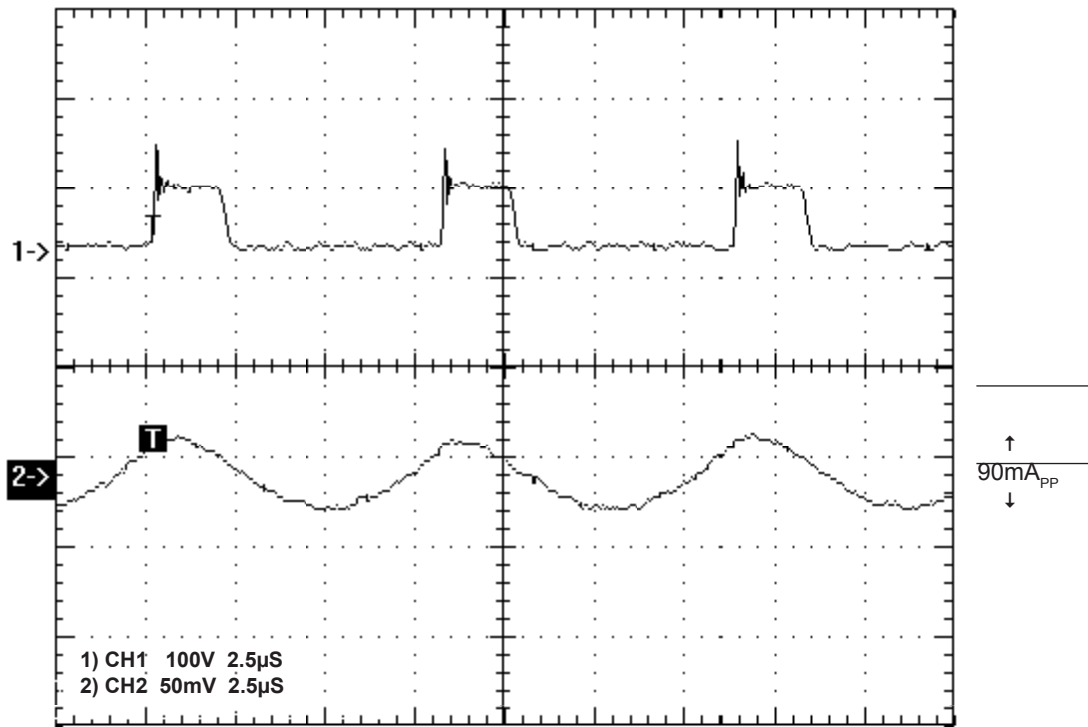


FIGURE 3A. (CH2) 14W reflected ripple *with* hot pluggable circuit,  $V_{IN}$  36V

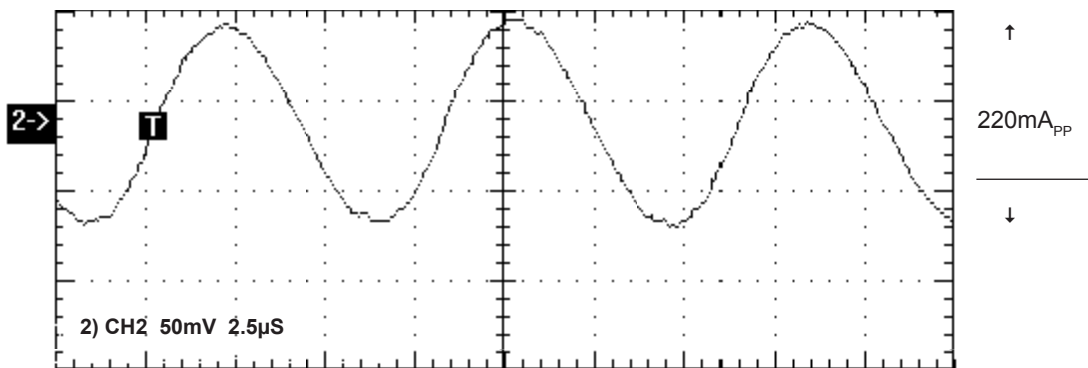


FIGURE 3B. (CH2) 14W reflected ripple *without* hot pluggable circuit

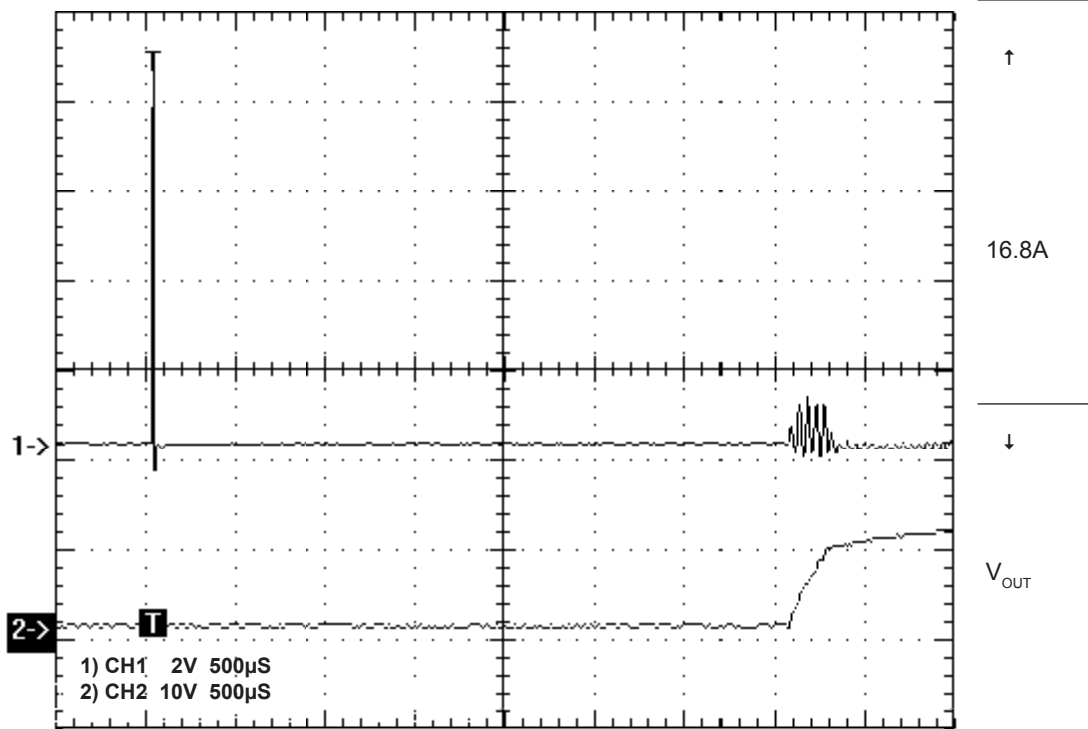


FIGURE 4A. (CH1) Inrush current *without* hot pluggable circuit ON  
 $V_{IN}$  48V, Current spike duration 5 $\mu$ S

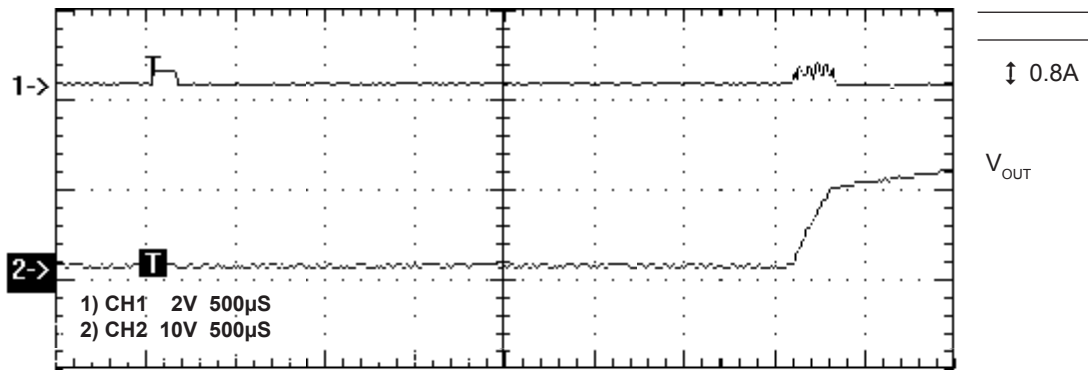


FIGURE 4B. (CH1) Inrush current *with* hot pluggable circuit ON