



BD10012

5W (25W PEAK) 96V_{OUT}
DC/DC CONVERTER

Key Features

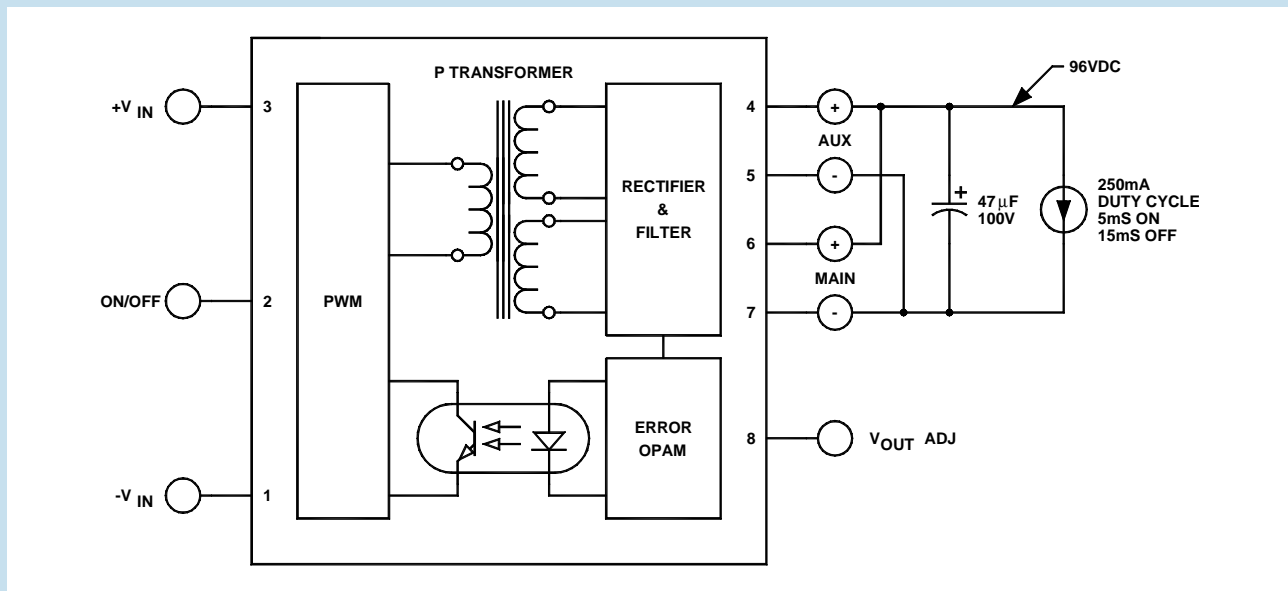
- Input-to-output isolation
- Soft start
- Hot pluggable
- Short circuit and thermal protection
- Adjustable output
- 50µA off state current
- Wide input voltage range (36–72Vdc)



Functional Description

The BD10012 is an application-specific DC/DC converter designed to charge 47µF 100V capacitor(s) at turn on and support current pulses with the following characteristics:

Output Current	ON Time	Duty Cycle (ON)
250mA	5mS ON, 15mS OFF	25% Max.



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 (2:1)		36	48	72	Vdc
Input Filter	RC				
Reflected Ripple Current	$I_o = 800\text{mA}$ @ a duty cycle of 0.1%		150		mA
Reverse Voltage Protection	Parallel diode		5		A
On/Off	Reference to $-V_{IN}$				
Voltage	Open		10		Vdc
Unit On	Open				
Unit Off	Short to $-V_{IN}$				
Off State Current	Pin 2 short to Pin 3		50	120	μA
Turn On Delay	Including soft start			4	S
Startup Input Voltage		11	16		Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Voltage and Current Ratings		95	96	97	%
Output Voltage Accuracy			± 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			200	μS

GENERAL SPECIFICATIONS

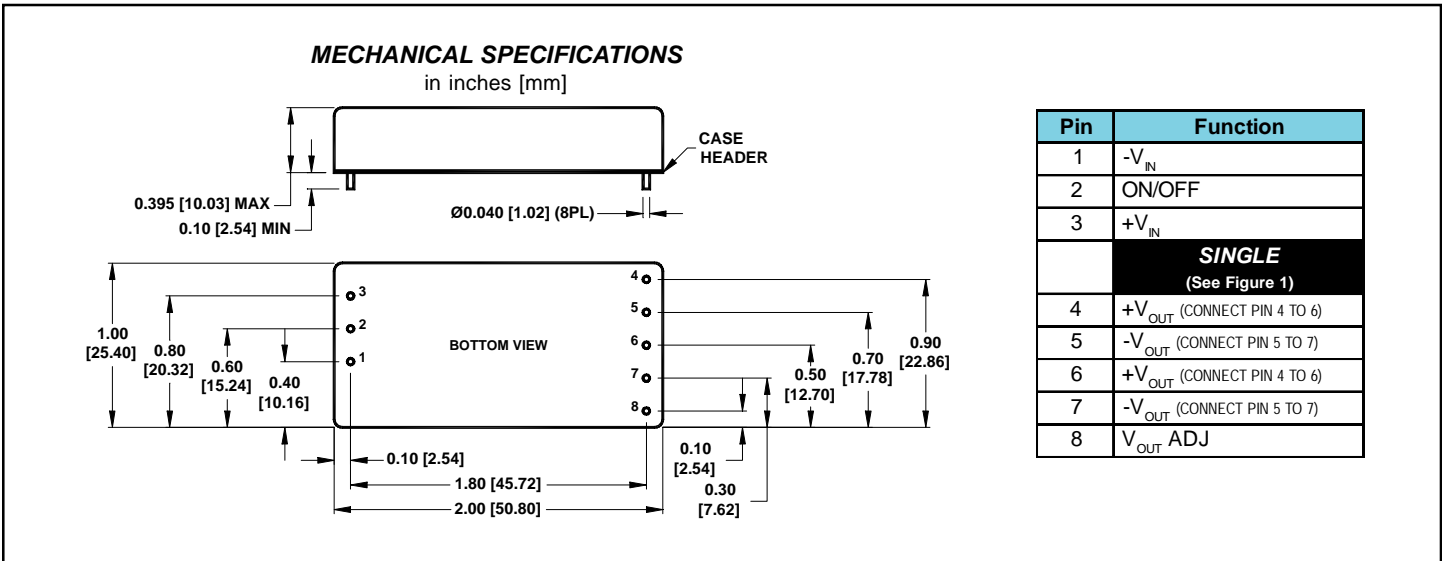
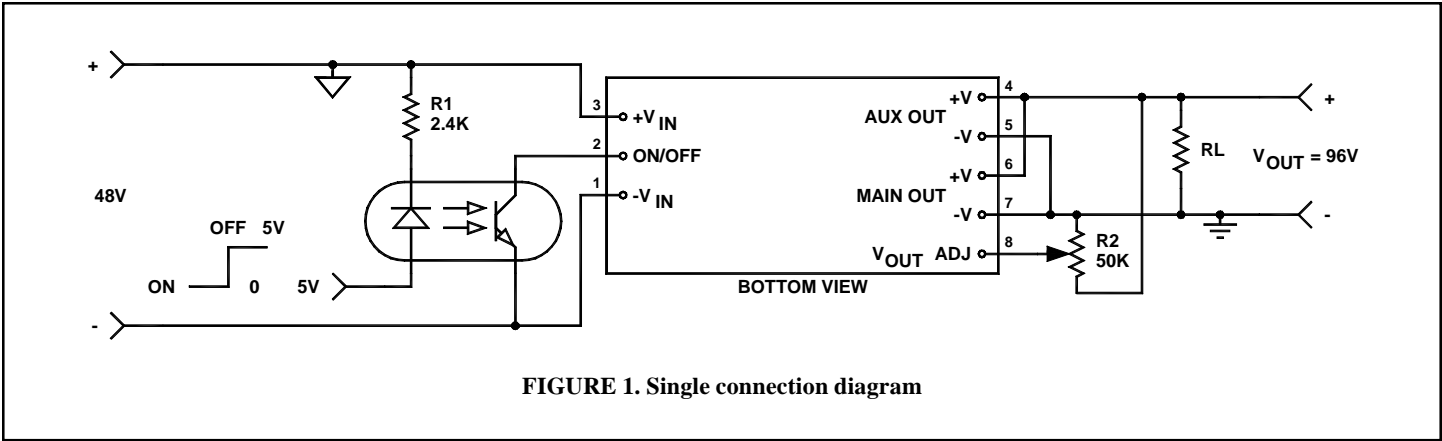
PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			TBD		
Isolation Voltage (1 min.)		500	1000		Vdc
Isolation Resistance			10^9		Ω
Isolation Capacitance			300		pF
Switching Frequency		108	125	130	kHz

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range (Ambient)	(For -55°C to +85°C, please contact factory)	-40		+75	°C
Storage Temperature Range		-60		+105	°C
Derating	None required				
Thermal Protection			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)		850,000		hours

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (LxWxH)	2.00x1.00x0.395 in. (50.80x25.40x10.03mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection	24V to $-V_{IN}$				



NOTE

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. See Figures 2 and 3.

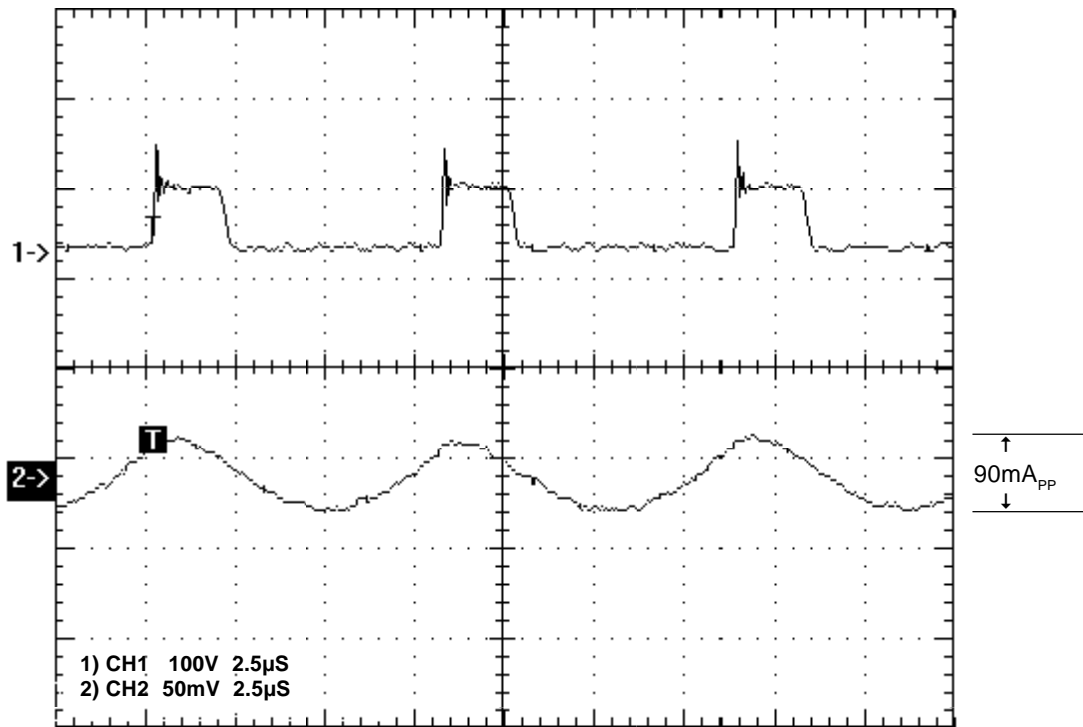


FIGURE 2A. (CH2) 10W reflected ripple *with* hot pluggable circuit, V_{IN} 36V

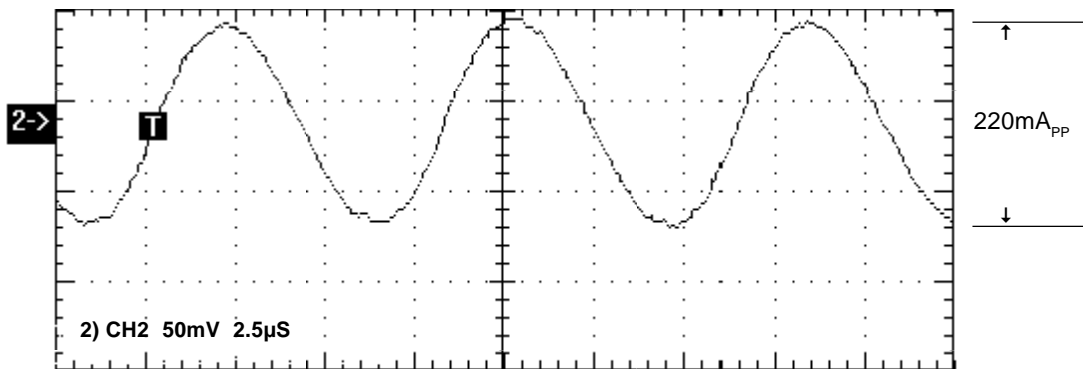


FIGURE 2B. (CH2) 10W reflected ripple *without* hot pluggable circuit

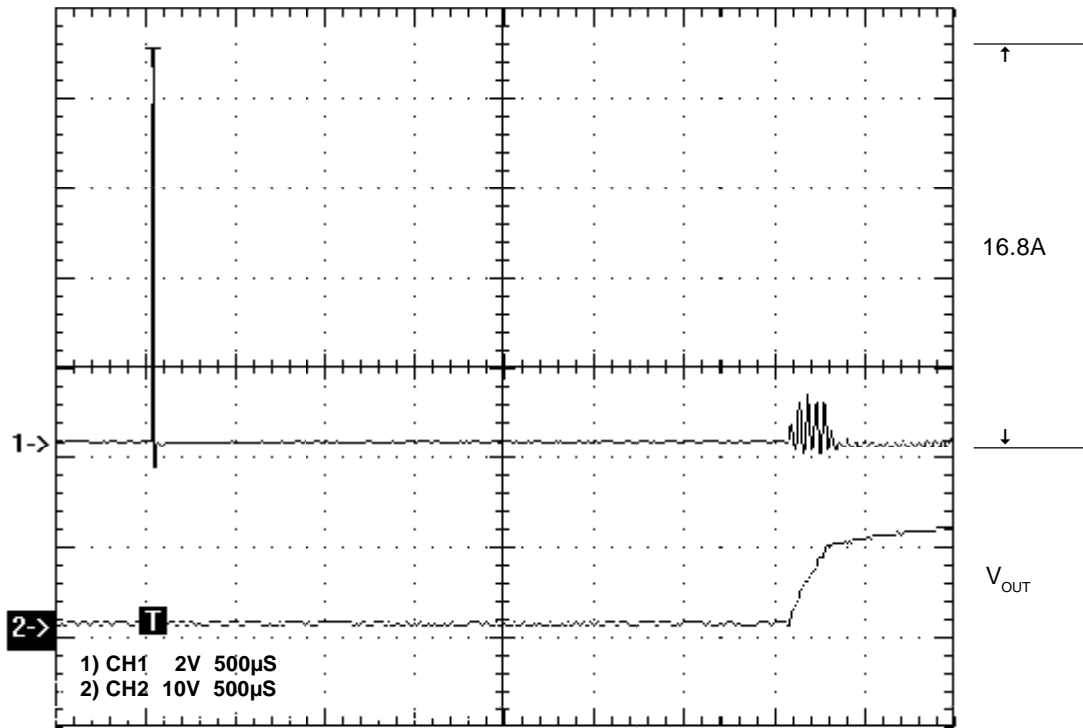


FIGURE 3A. (CH1) Inrush current *without* hot pluggable circuit ON
V_{IN} 48V, Current spike duration 5µS

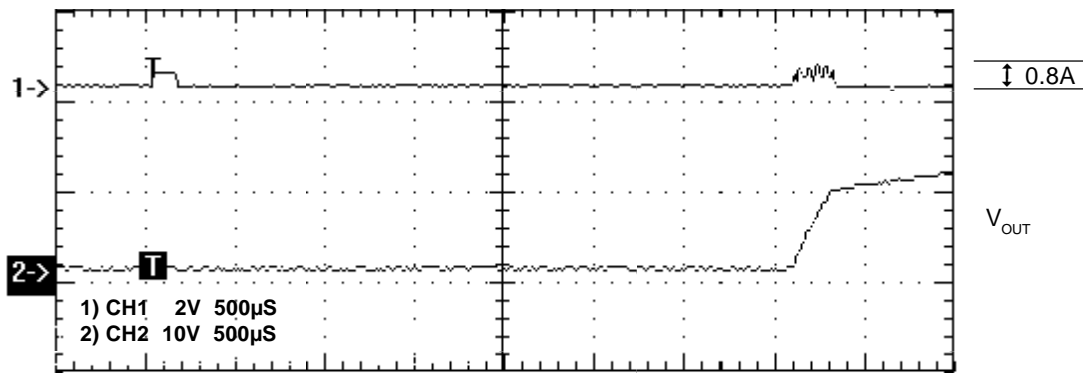


FIGURE 3B. (CH1) Inrush current *with* hot pluggable circuit ON