



BDH10018

15W SINGLE DC/DC CONVERTER
200-300 V_{IN} ($V_{IN PEAK}$ 400V) 15 $V_{OUT}@1A$

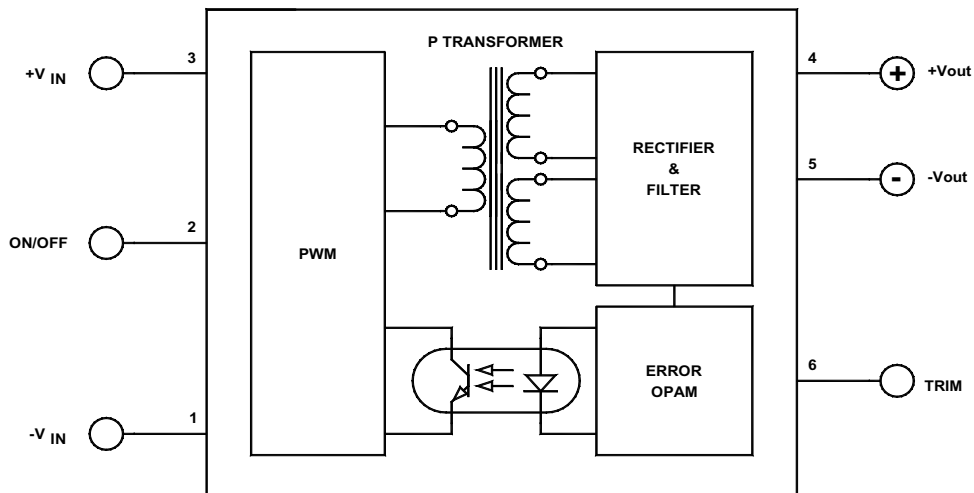
Key Features

- Input-to-output isolation
- Soft start
- Short circuit and thermal protection
- EMI six-sided shielding
- Frequency Jitter Modulation



Functional Description

The BDH10018 is a 15W single DC/DC converter in a 2x1x0.395-inch package that provides 15 $V_{OUT}@1A$ with an operating temperature range from -40°C to +85°C. Switching frequency jitter modulation reduces EMI while its six-sided shielding eliminates RFI.



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		200	270	300	Vdc
Input Voltage Slew Rate				10	V/ μ S
No Load Input Current	@270Vin		4.5		mA
Full Load Input Current	@270Vin		76		mA
Input Filter	NONE				
Reflected Ripple Current	Measured with 10 μ F input capacitor		100		mA _{pp}
Reverse Voltage Protection	Parallel Diode		5		A
On/Off	Reference to -V _{IN}				
Converter ON	Open		10		Vdc
Converter OFF	0V, Pin 2 (On/Off) shorted to Pin 1 (-V _{IN})		0	0.8	Vdc
Turn On Delay	Including soft start, See Figure 2		25	35	mS
Startup Input Voltage		150			Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			15.00		Vdc
Output Voltage Accuracy			1	2	%
Output Adjust Range			10		% of V _{out}
Output Current			1		A
Ripple & Noise (20MHz BW)			.5	1	% of V _{OUTPP}
Line Regulation	Outputs fully loaded		1		%
Load Regulation	10% FL to FL		1		%
Temperature Coefficient @ FL			±0.02		%/°C
Short Circuit Protection	Continuous, Current Limit				
Short Circuit Restart	Automatic				
Transient Response (to within 1% of Vout)	50% to 100% FL to 50% FL, see Figure 3		500		μ S

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			75		%
Isolation Voltage (1 min.)		500	1000		Vdc
Isolation Resistance			10 ⁹		Ω
Isolation Capacitance			300		pF
Switching Frequency		115	130	140	kHz
Frequency Jitter			±4		kHz
Frequency Jitter Modulation			250		Hz

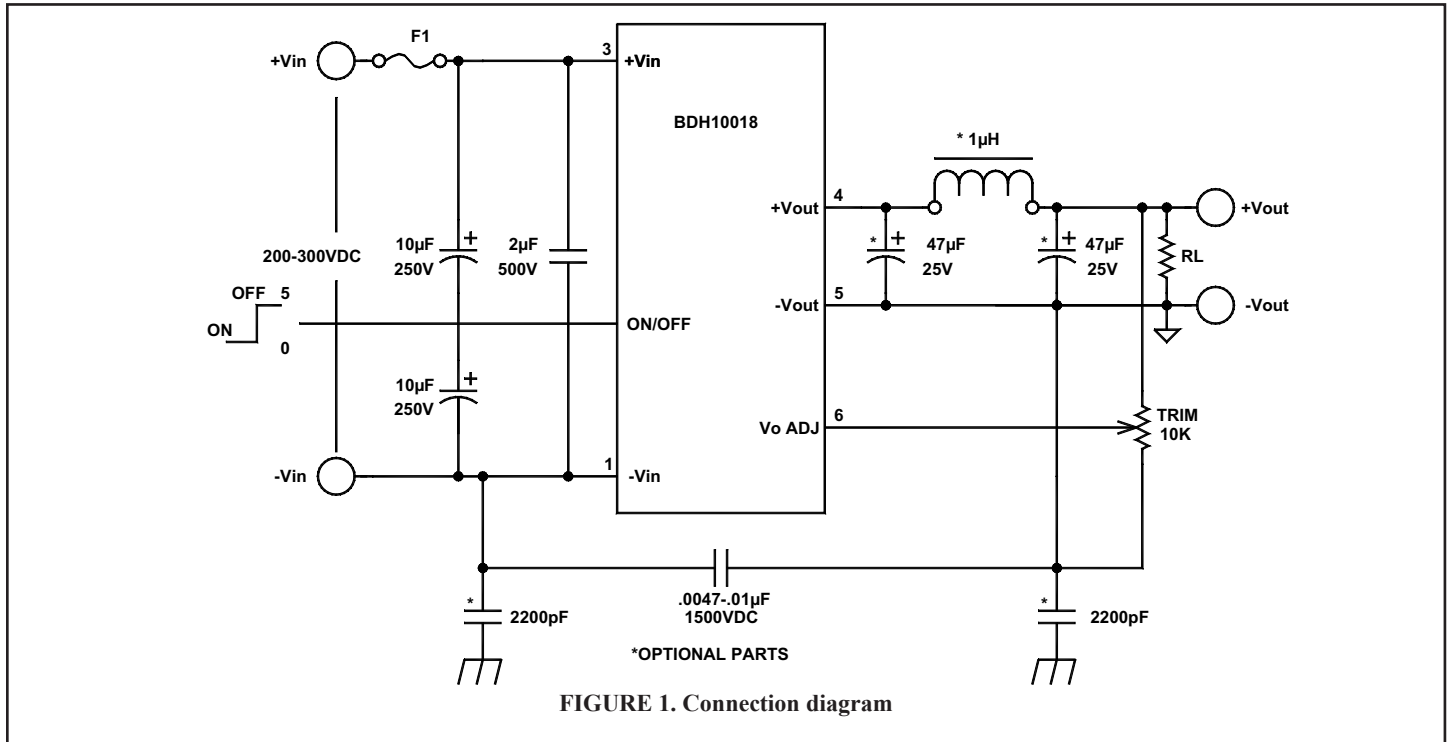
ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range (Ambient)		-40		+85	°C
Storage Temperature Range		-60		+125	°C
Derating	See Figure 4				
Thermal Protection, Turn Off ¹	Junction Temperature		145		°C
Thermal Hysteresis			30		°C
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
MTBF	per MIL-HNBK-217F (Ground benign, +25°)		2.045x10 ⁶		hours

¹ Input power may have to be recycled after thermal turn off.

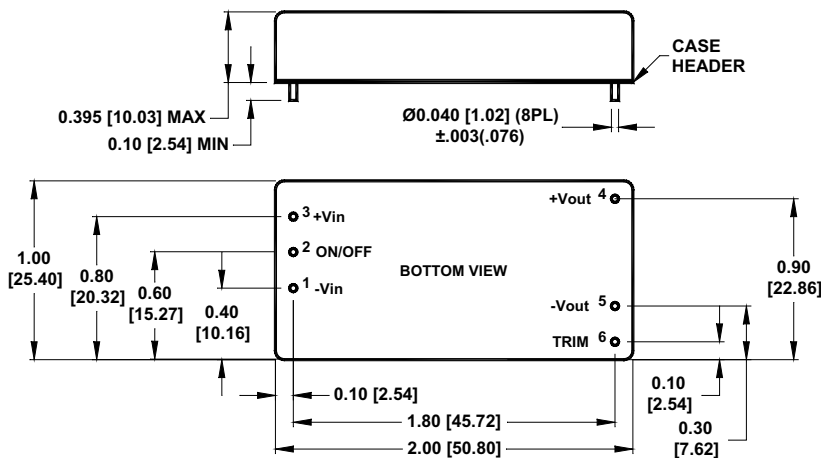
PHYSICAL CHARACTERISTICS

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	-V _{IN} (Pin 1)				



MECHANICAL SPECIFICATIONS

DIMENSIONS ARE IN INCH(mm)
 TOLERANCES: .XX ±.01(.254)
 .XXX ±.005(.127)



Pin	Function
1	-V _{IN}
2	ON/OFF
3	+V _{IN}
4	+V _{OUT}
5	-V _{OUT}
6	TRIM

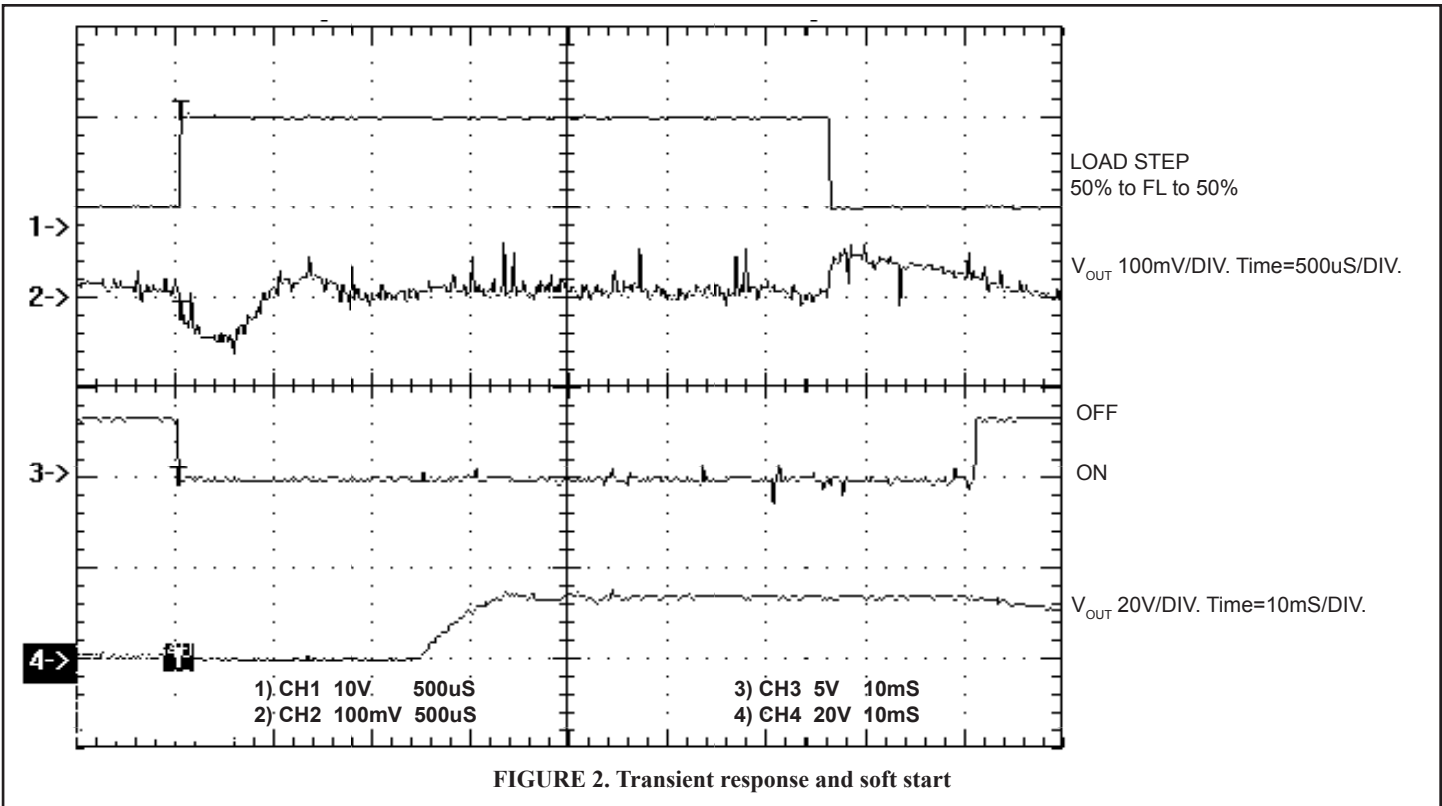


FIGURE 2. Transient response and soft start

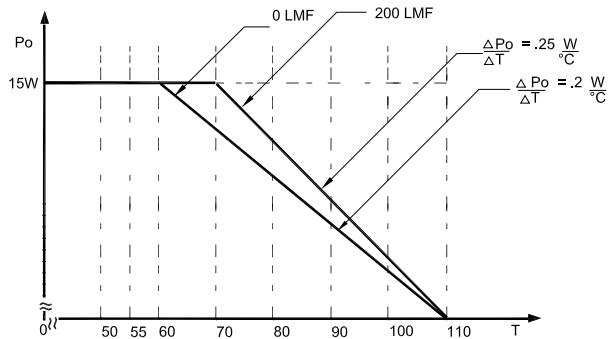
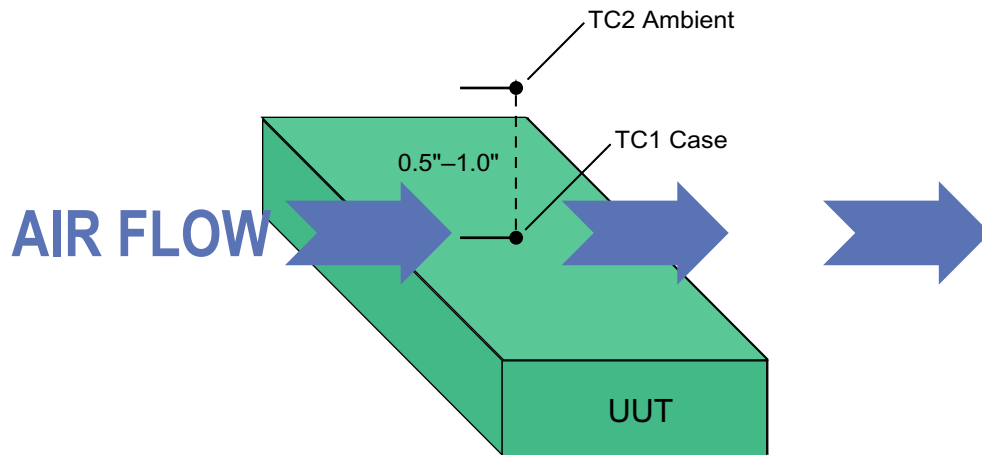


FIGURE 3. Derating of BDH10018



The ambient temperature is measured with thermo-coupler #2, which is positioned 0.5"-1.0" above the center of the unit. When airflow is used, position the converter such that the 2" length of the converter is perpendicular to the airflow.

FIGURE 4. Setup for measuring case and ambient temperatures

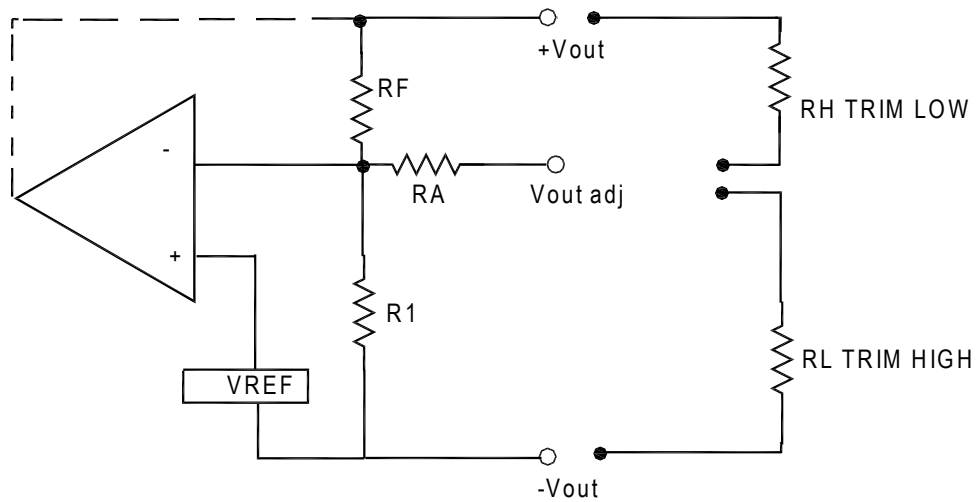


FIGURE 5. Output voltage trim schematic

To calculate R adjust for higher Vout use

$$RT = [R1 * RF * Vref] / [(R1 * Vout) - Vref(R1 + RF)] - RA$$

where Vout is the new higher value of Vout.

See Figure 5 and table 1.

*Vref is taken from the tables on page 5.

To calculate RT for lower Vout use

$$RT = [R1 * RF (Vout - Vref)] / [Vref(RF + R1) - R1 Vout] - RA$$

where Vout is the new lower value of Vout.

Vout	R1	RF	RA	VREF
15	2.49K	12.59K	22.1K	2.50V

Table 1. Resistor values for output voltage trim.