



# VHV15001

## 15W SINGLE DC/DC CONVERTER

100-400  $V_{IN}$  (PEAK 450V) 26 $V_{OUT}$ @577mA

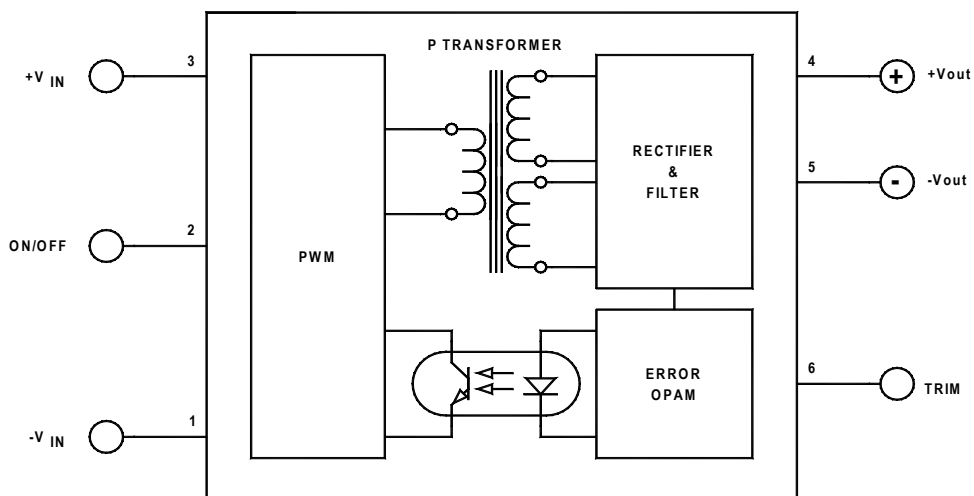
### Key Features

- Input-to-output isolation
- Soft start
- Short circuit and thermal protection
- EMI six-sided shielding
- Frequency Jitter Modulation
- 85% Efficiency



### Functional Description

The VHV15001 is a 15W single DC/DC converter in a 1×2×0.45-inch package that provides 26 $V_{OUT}$ @577mA with an operating temperature range from -55°C to +85°C. The 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	See Note 1	100	200	400	Vdc
Input Voltage Slew Rate				10	V/μS
No Load Input Current	@200Vin		2		mA
Full Load Input Current	@200Vin		88		mA
Input Filter	C				
Reflected Ripple Current	Measured with 10μF input capacitor		100		mA <sub>pp</sub>
Reverse Voltage Protection	Parallel Diode		5		A
On/Off	Reference to -V <sub>IN</sub>				
Converter ON	Open		5.6		Vdc
Converter OFF	0V, Pin 2 (On/Off) shorted to Pin 1 (-V <sub>IN</sub> )		0	0.8	Vdc
Turn On Delay	Including soft start, See Figure 3		25	35	mS
Startup Input Voltage			25		Vdc

### OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			26		Vdc
Output Voltage Accuracy			1	2	%
Output Current			.577		A
Output Adjust Range			10		% of V <sub>OUT</sub>
Ripple & Noise (20MHz BW)	see Figure 1.		1	2	% of V <sub>OUTPP</sub>
Line Regulation	Output 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 V <sub>out</sub> )	50% FL to 100% FL to 50% FL ,See Fig.3		500		μs

### GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			85		%
Isolation Voltage (1 min.)			1000		Vdc
Isolation Resistance			10 <sup>9</sup>		Ω
Isolation Capacitance			300		pF
Switching Frequency		115	130	140	kHz
Frequency Jitter			±4		kHz
Frequency Jitter Modulation			250		Hz

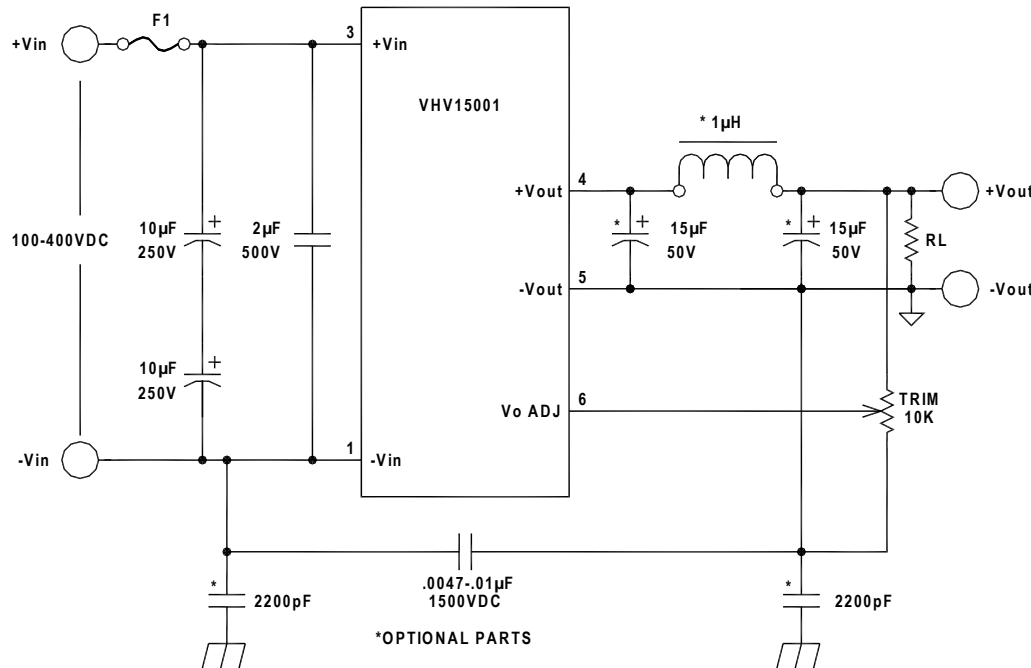
### ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature (Ambient)		-55		+85	°C
Storage Temperature Range		-60		+125	°C
Thermal Protection, Turn Off	Junction Temperature		145		
Thermal Hysteresis			30		°C
Humidity	Up to 95% non-condensing				°C
Cooling	Free-air convection				
MTBF	per MIL-HNBK-217F (Ground benign, +25 °C)		2.048x10 <sup>6</sup>		hours

**PHYSICAL CHARACTERISTICS**

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (WxLxH)	1.00x2.00x0.450 IN. (25.40x50.80x11.43mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection	Case and Header Floating				

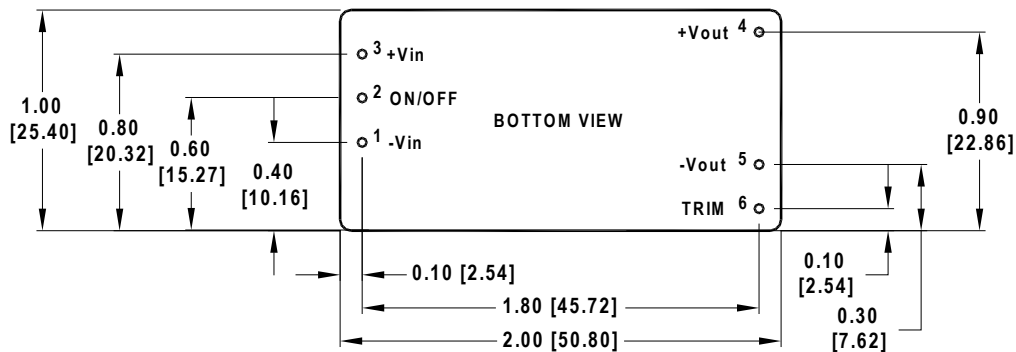
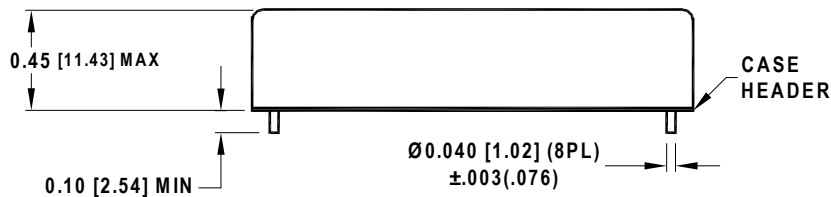
**Note 1:** The converter will operate at Vin Peak of 450 VDC .



**FIGURE 1. Connection diagram**

**MECHANICAL SPECIFICATIONS**

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



Pin	Function
1	-V <sub>IN</sub>
2	ON/OFF
3	+V <sub>IN</sub>
4	+V <sub>OUT</sub>
5	-V <sub>OUT</sub>
6	TRIM

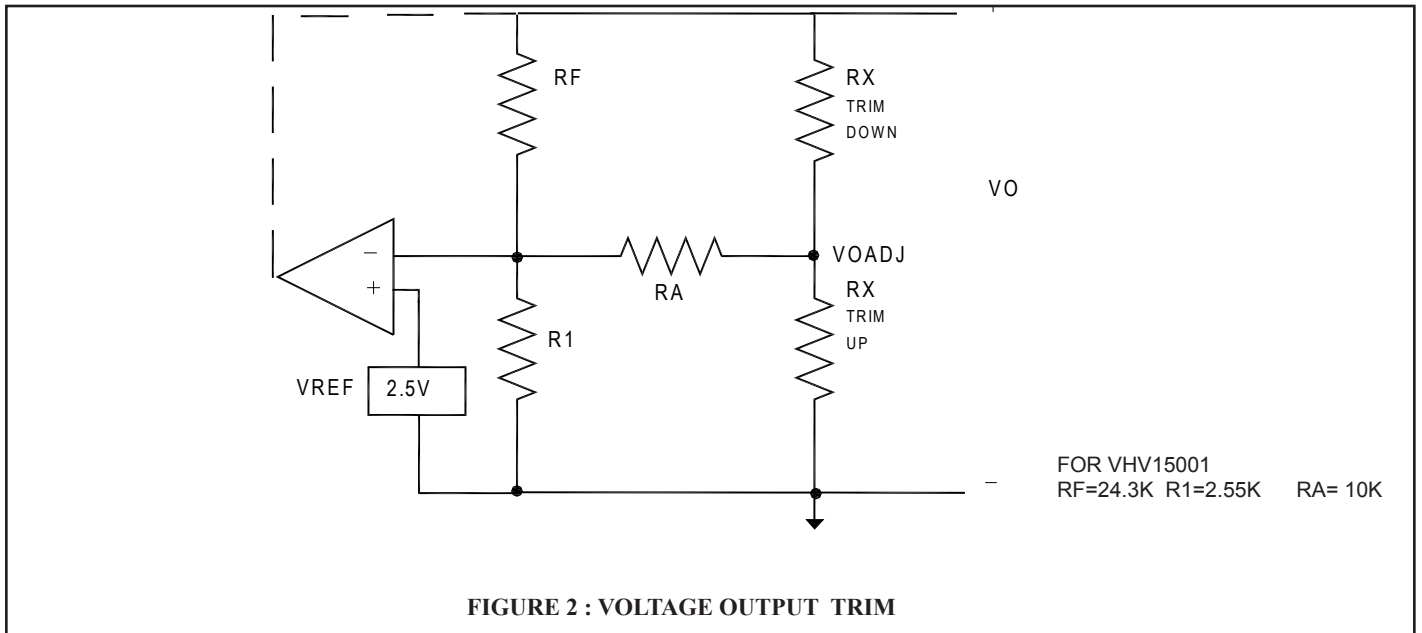


FIGURE 2 : VOLTAGE OUTPUT TRIM

$$\text{TRIM-UP RX} = \frac{R1(RF)}{VO(R1) - (R1+RF)VREF} - RA$$

$$\text{TRIM-DN RX} = \frac{RF}{(VO-VREF)R1} - RA$$

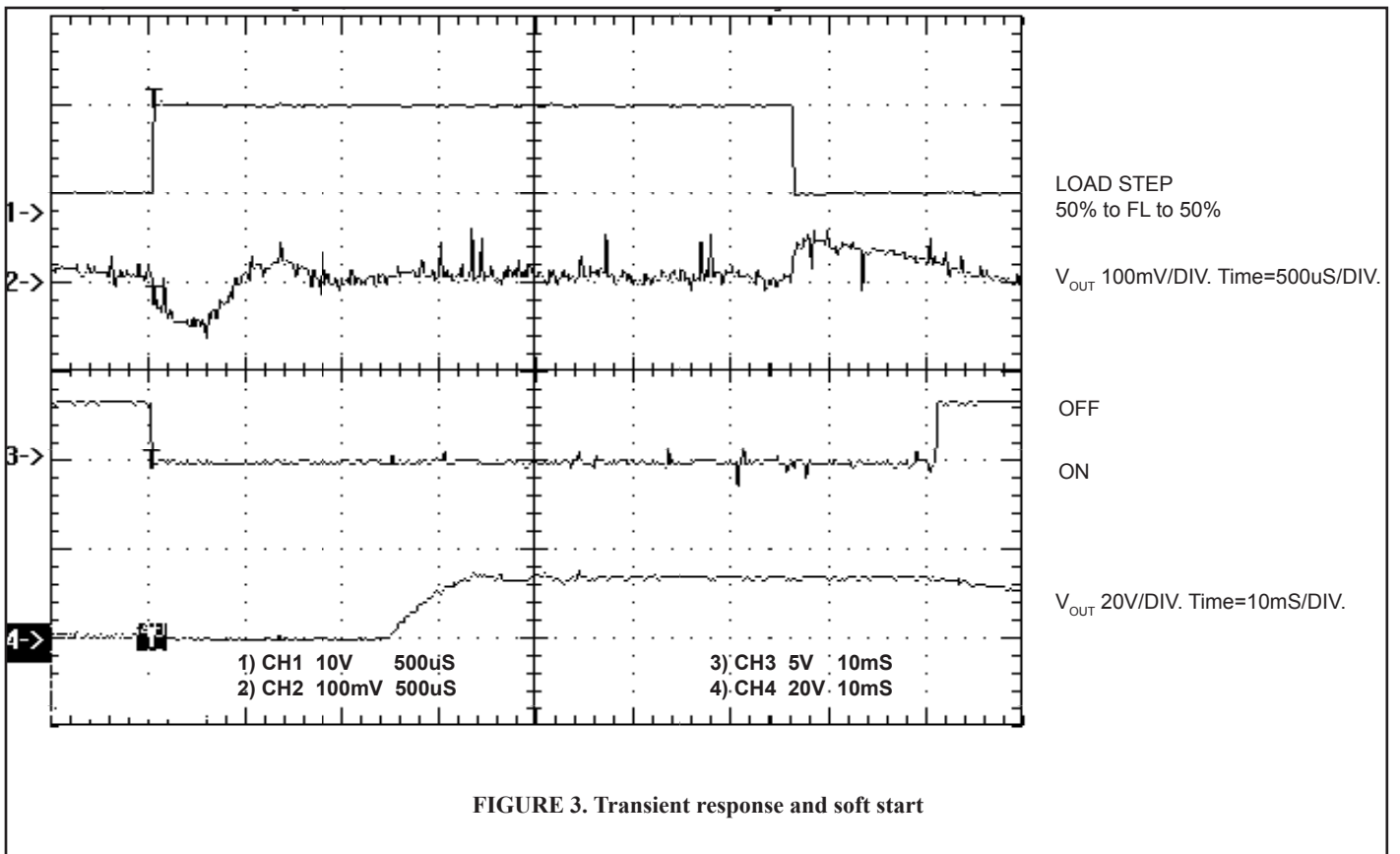


FIGURE 3. Transient response and soft start

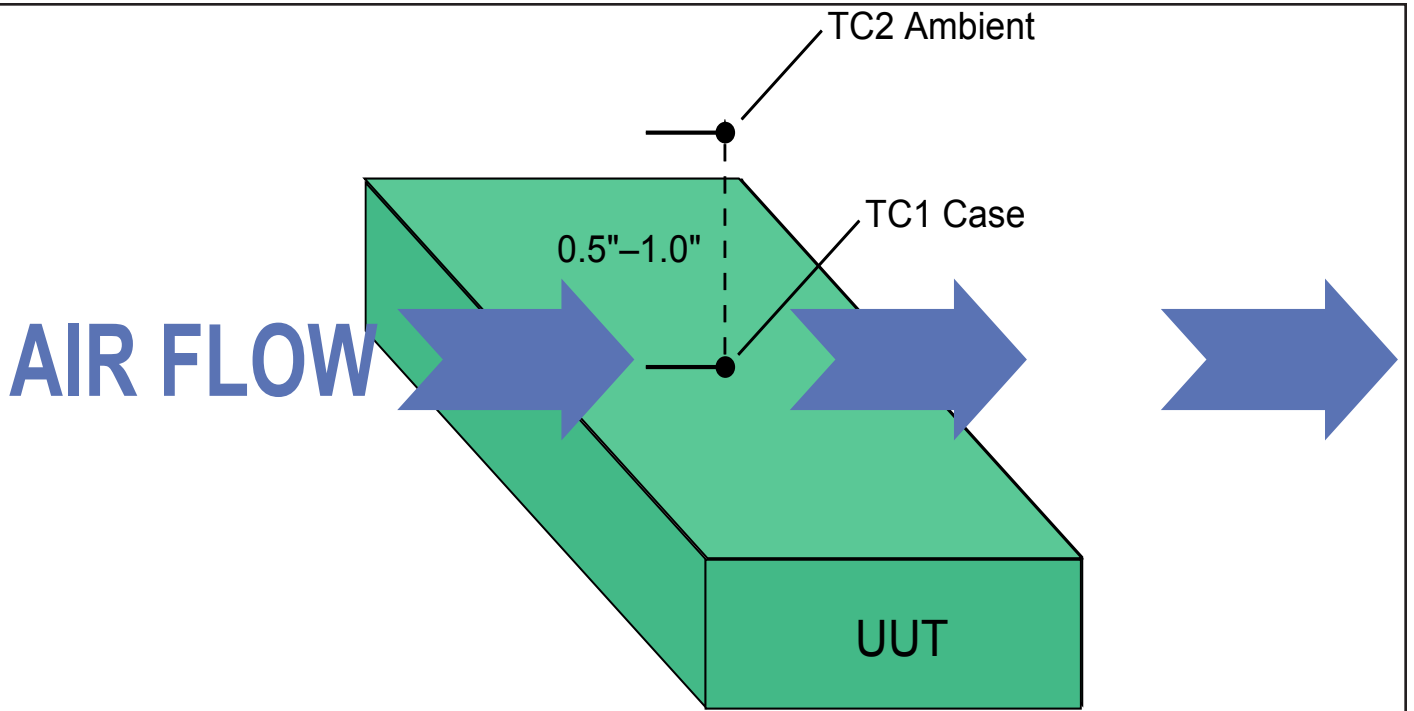


FIGURE 4. Setup for measuring case and ambient temperatures

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.

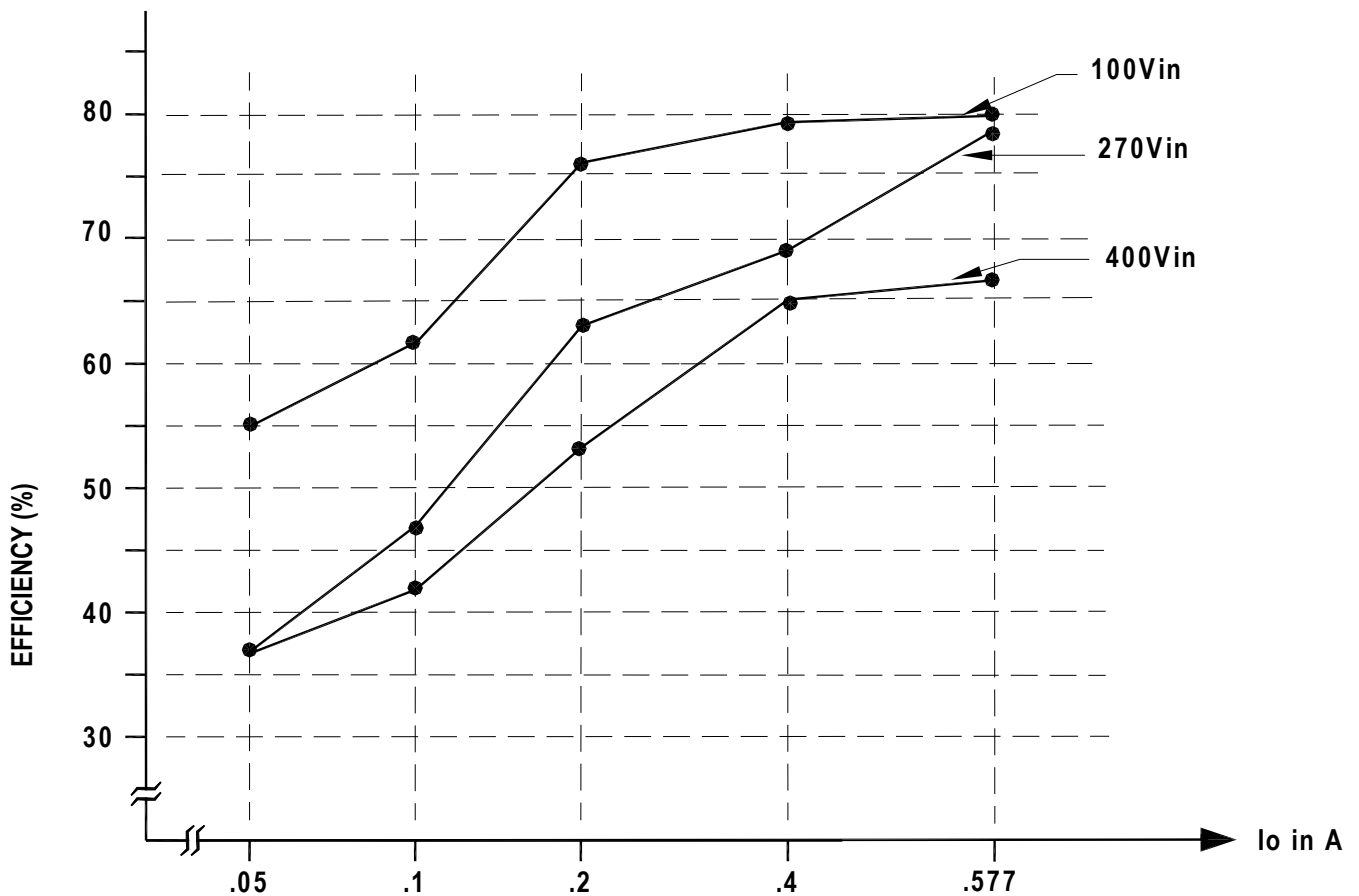


FIGURE 5. Efficiency vs. Output Load for VHV15001