



VHV15003

10W SINGLE DC/DC CONVERTER

100-325 V_{IN} (PEAK 450V) 5 V_{OUT}@2A
with labels on side & gold pins

Key Features

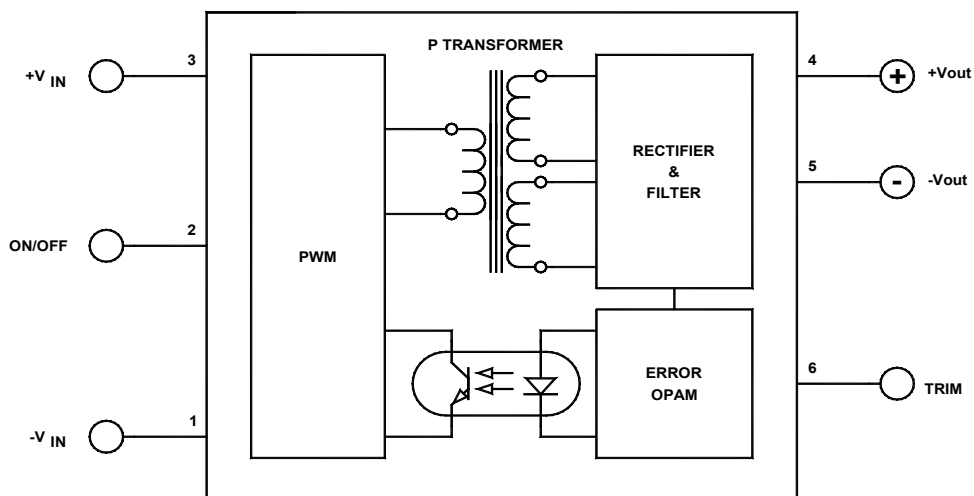
- Input-to-output isolation
- Soft start
- Short circuit and thermal protection
- EMI six-sided shielding
- Frequency Jitter Modulation
- 83% Efficiency
- Labels on the side
- Gold input & output pins
- .16 inch length(min) of pin height



Label shown for illustration purpose only

Functional Description

The VHV15003 is a 10W single DC/DC converter in a 1×2×0.45-inch package that provides 5V_{OUT}@2A 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	325	Vdc
Input Voltage Slew Rate				10	V/μS
No Load Input Current	@270Vin		4.5		mA
Full Load Input Current	@270Vin		60		mA
Input Filter	C				
Reflected Ripple Current	Measured with 10μF input capacitor		100		mA _{pp}
Reverse Voltage Protection	Parallel Diode		5		A
On/Off	Reference to -V _{IN}				
Converter ON	Open		5.6		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 3		25	35	mS
Startup Input Voltage			25		Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			5		Vdc
Output Voltage Accuracy			1	2	%
Output Current			2		A
Output Adjust Range			10		% of V _{OUT}
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 V _{OUT})	50% FL to 100% FL to 50% FL ,See Fig.3		500		μs

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			83		%
Isolation Voltage (1 min.)			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

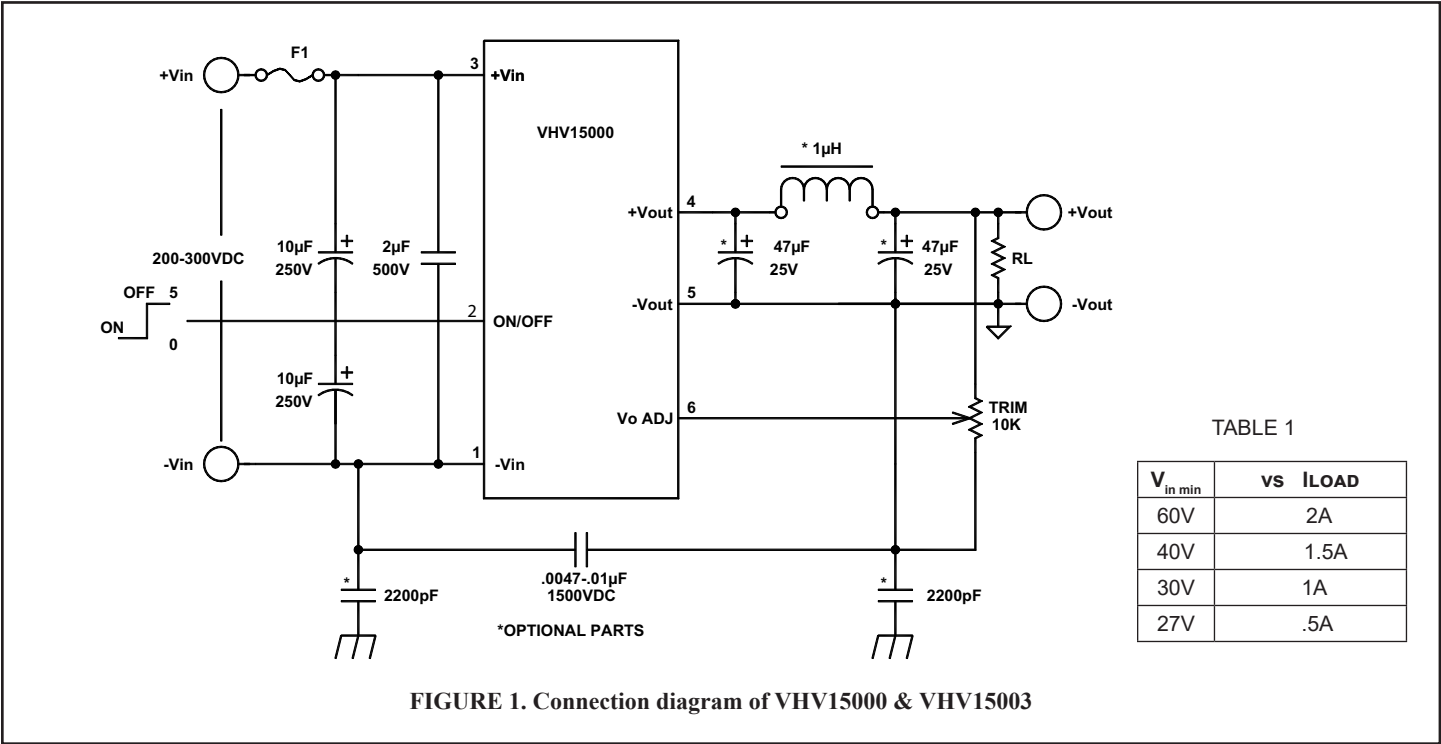
ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature (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 ⁶		hours

PHYSICAL CHARACTERISTICS

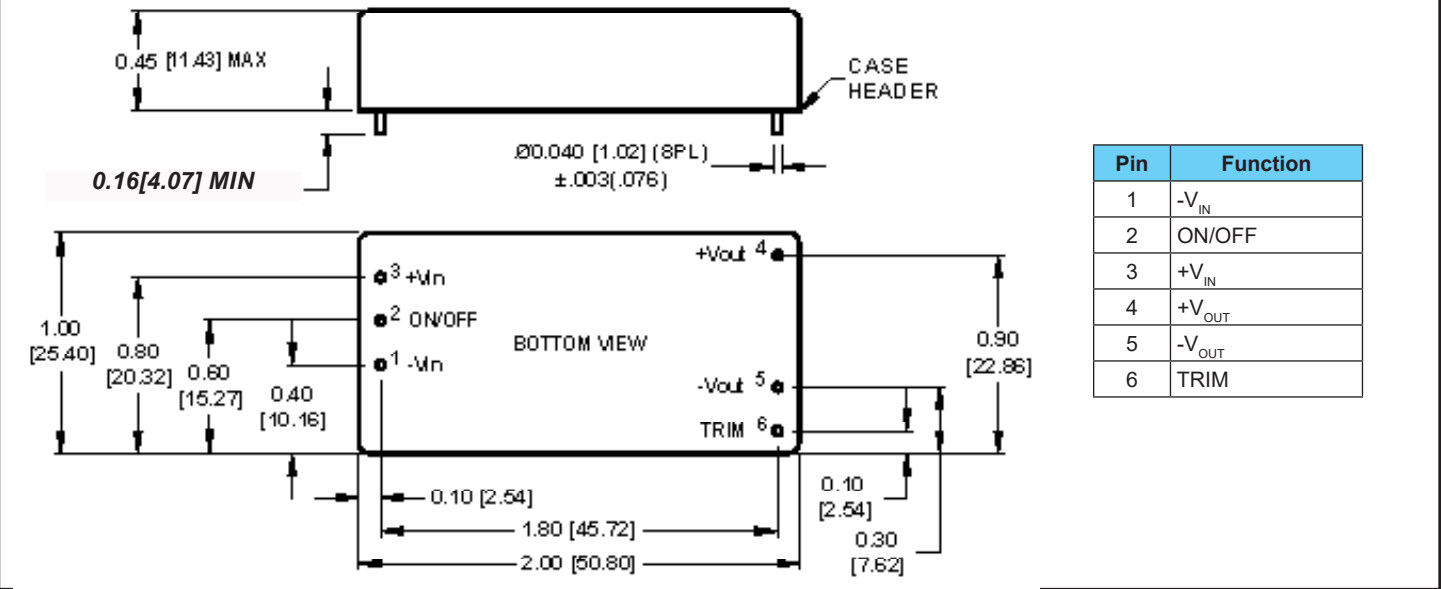
PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (LxWxH)	2.00x1.00x0.450 IN. (50.80x25.40x11.43mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection	Case and Header Floating				

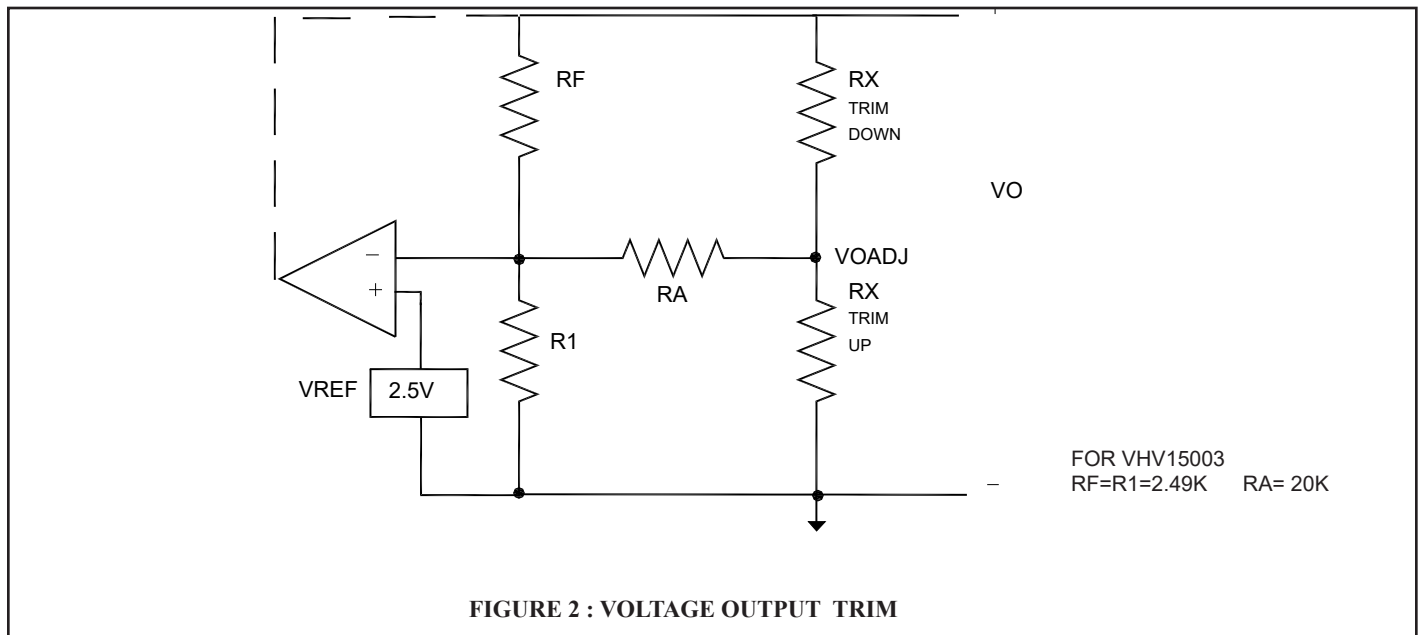
Note 1: The converter will operate at Vin Peak of 450 VDC .



MECHANICAL SPECIFICATIONS

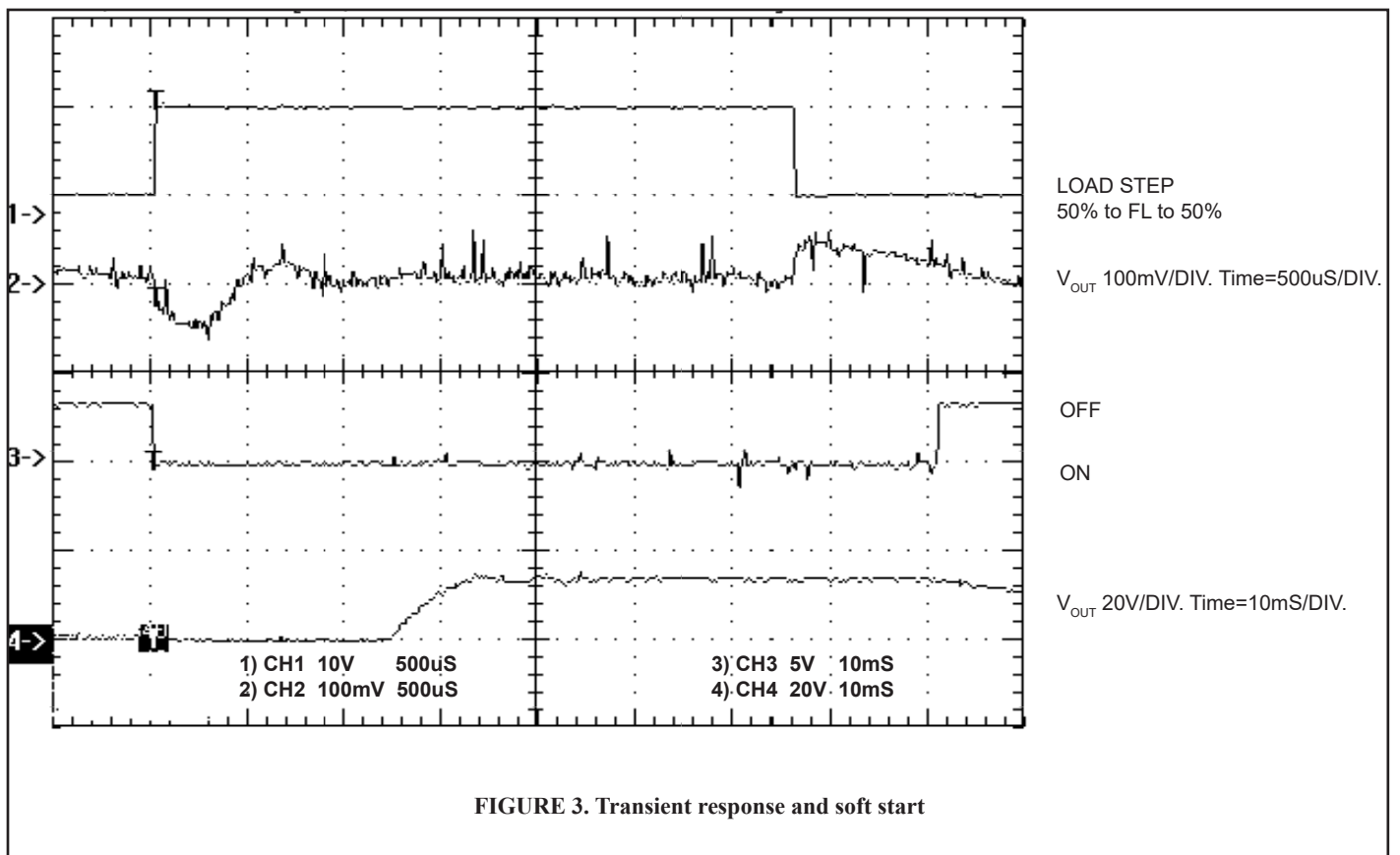
DIMENSIONS ARE IN INCH(mm)
TOLERANCES: .XX ±.01(.254)
.XXX ±.005(.127)





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

$$\text{TRIM-DN } RX = \frac{RF}{VF (VREF) - 1} - \frac{RA}{(VO-VREF) R1}$$



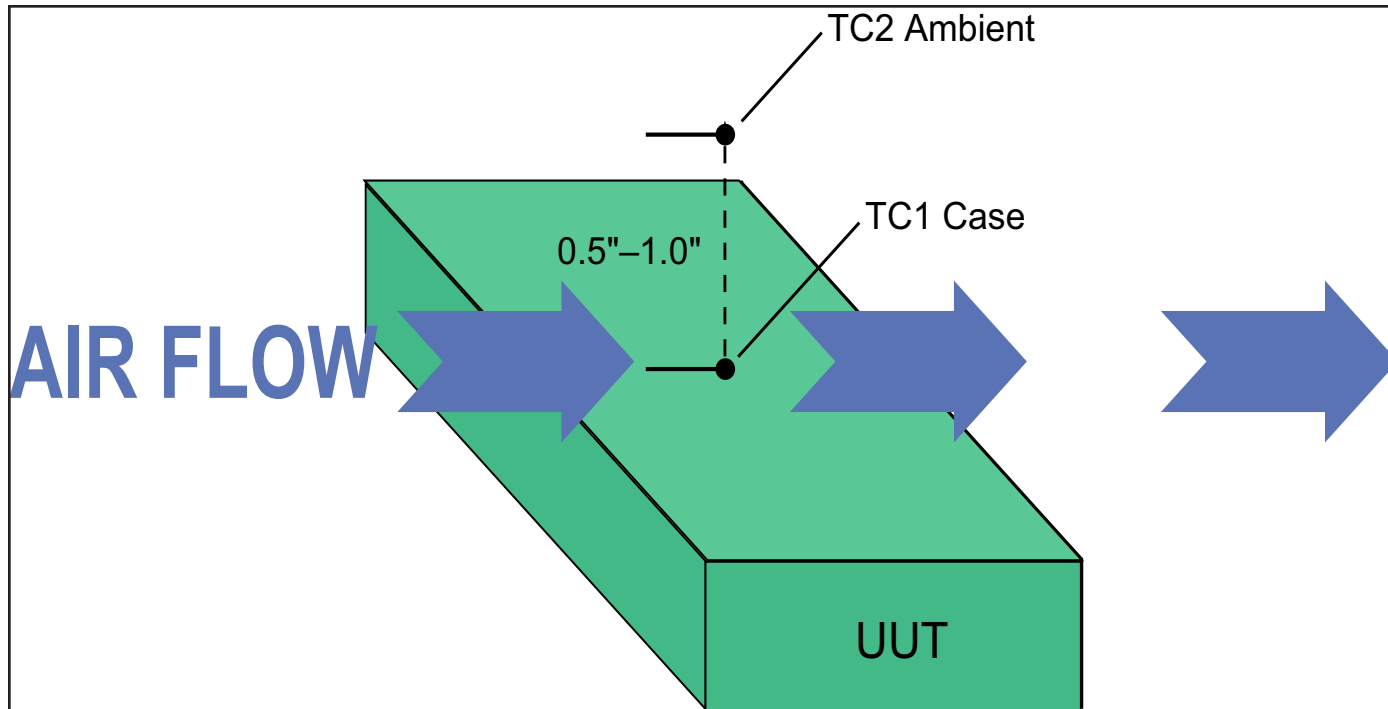


FIGURE 4. Setup for measuring case and ambient temperatures

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.

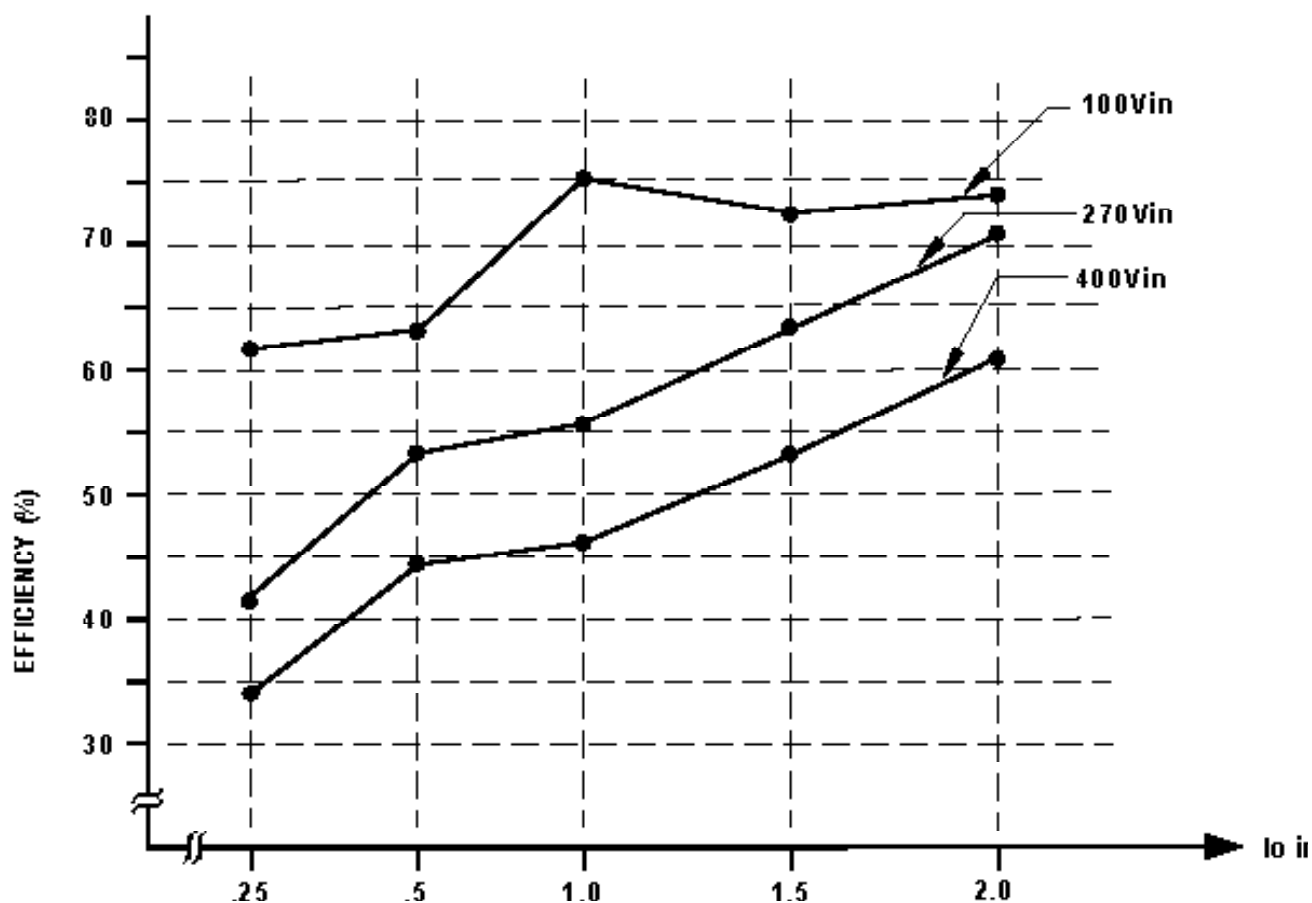


FIGURE 5. Efficiency vs. Output Load for VHV15003.