



VHV10S450/300

10W SINGLE DC/DC CONVERTER

V_{IN} 100-400 V_{IN} (PEAK 450V) , $V_{OUT}=450V_{OUT}@22mA$

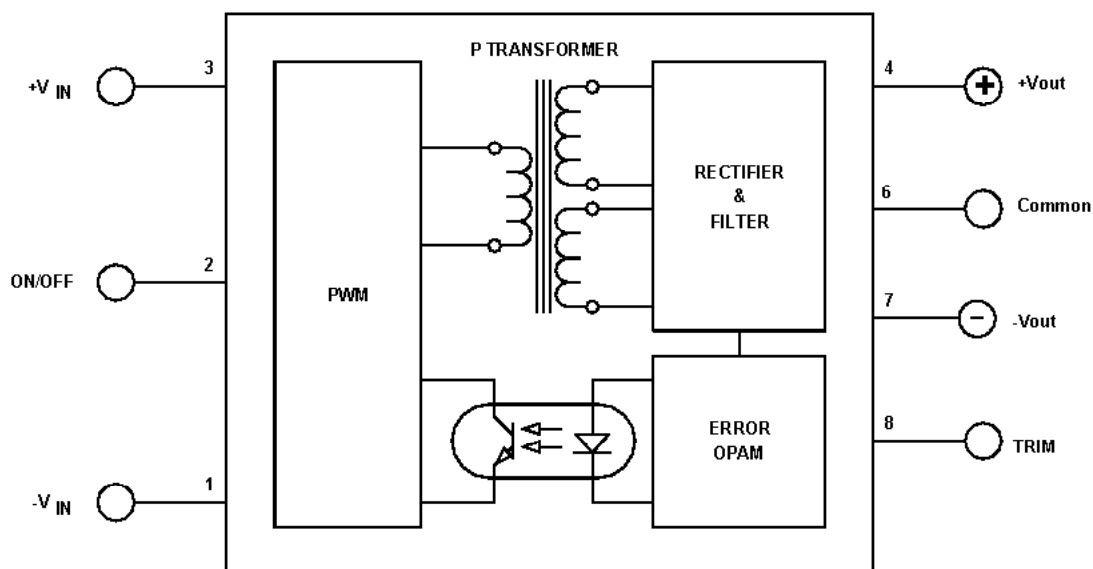
Key Features

- Input-to-output isolation
- Soft start
- Short circuit and thermal protection
- six-sided shielding for EMI reduction
- Frequency Jitter Modulation
- 86% Efficiency
- 10% Adjustable output



Functional Description

The VHV10S450/300 is a 10W single DC/DC Converter in a 1x2x0.395 inch package that provides a $450V_{OUT}@22mA$ with an operating temperature range of -55°C to +85°C. The frequency jitter modulation reduces EMI. The unit has six-sided shielding which 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	300	400	Vdc
Input Voltage Slew Rate				10	V/μS
No Load Input Current	@300Vin		3		mA
Full Load Input Current	@300Vin		38		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		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 3		25	35	mS
Startup Input Voltage			25		Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			450		Vdc
Output Voltage Accuracy			+/-1	+/-2	%
Output Current			22		mA
Output Adjust Range			+/-5	+/-10	% of V _{OUT}
Ripple & Noise (20MHz BW)			1	2	% of V _{OUTPP}
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 _{OUT})	50% FL to 100% FL to 50% FL ,See Fig.3		2		ms

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			86		%
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)	1.00x2.00x0.395 IN. (25.40x50.80x10.03mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection	Case and Header Floating				

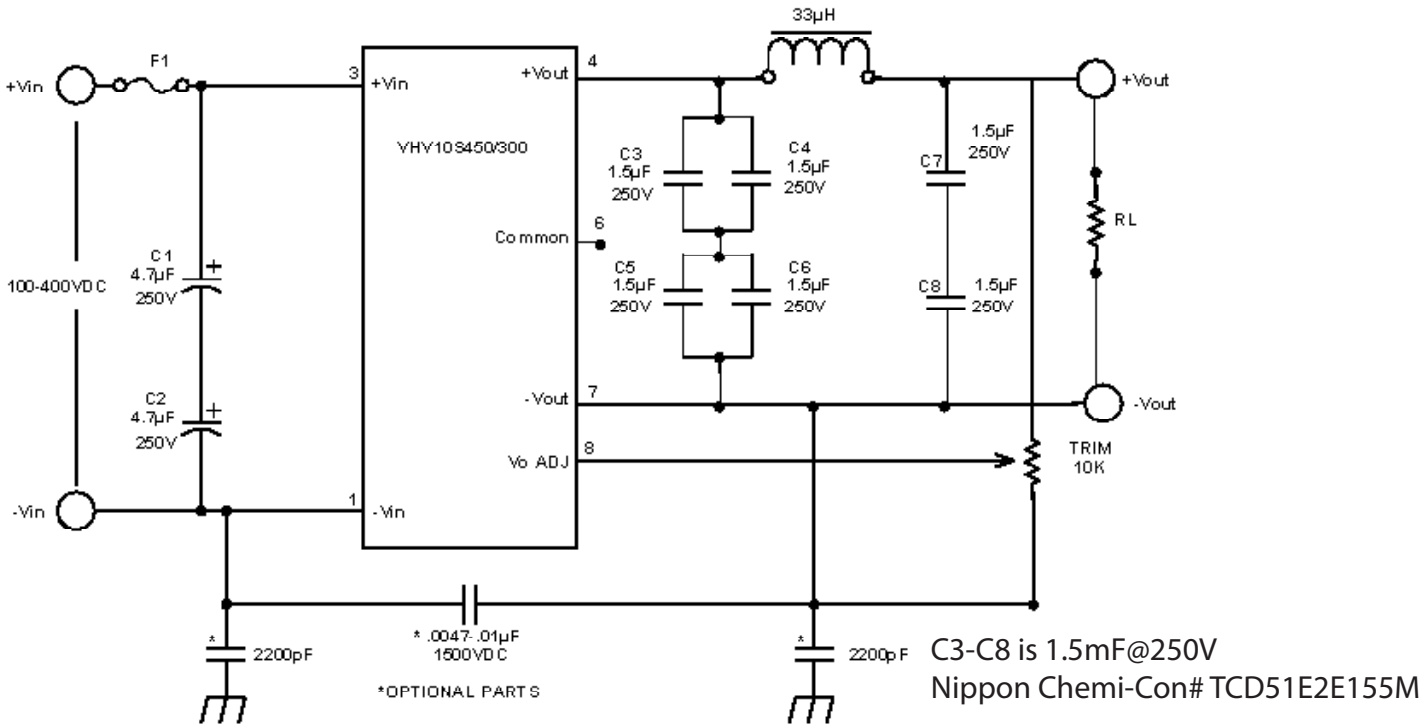
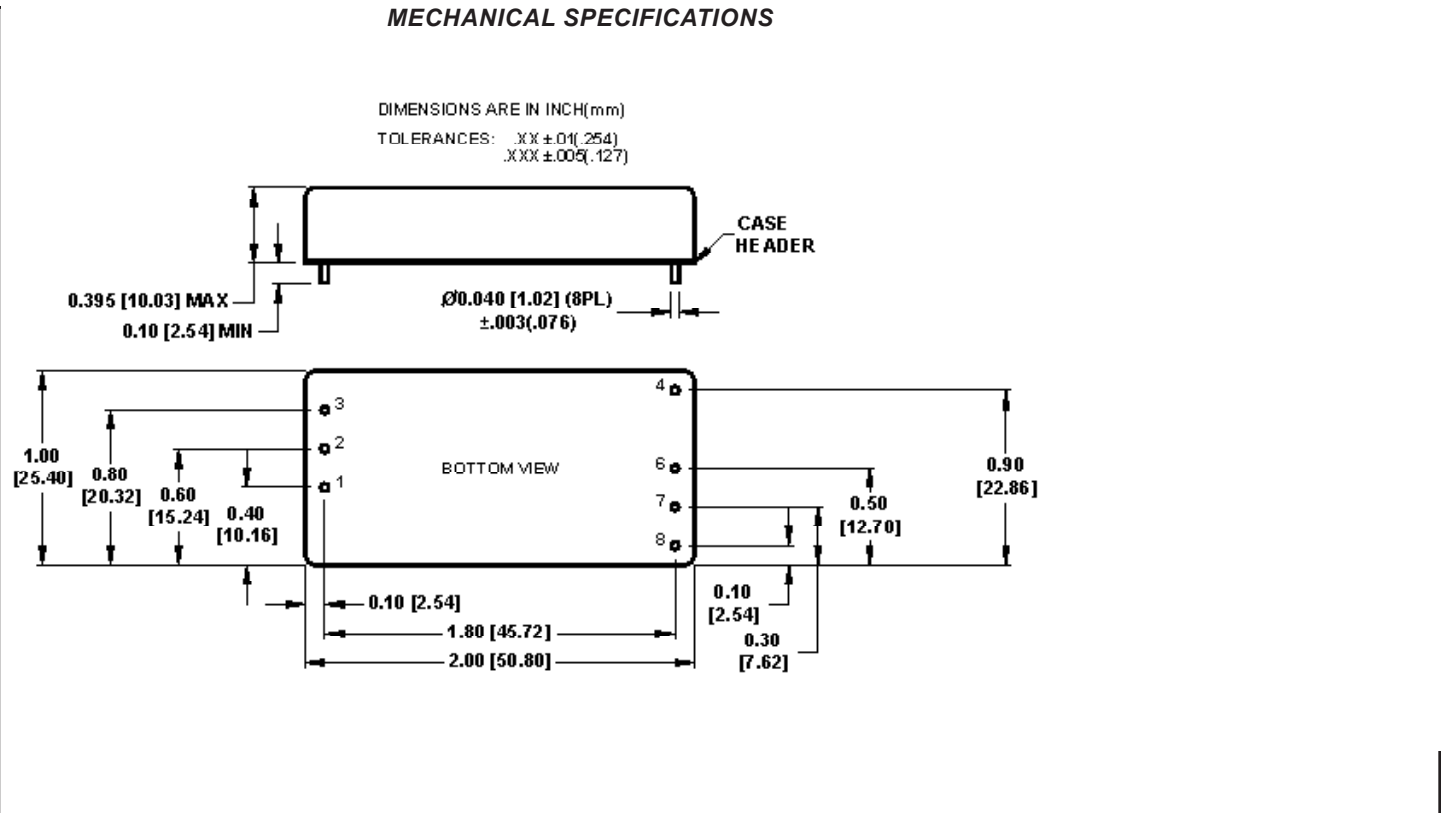
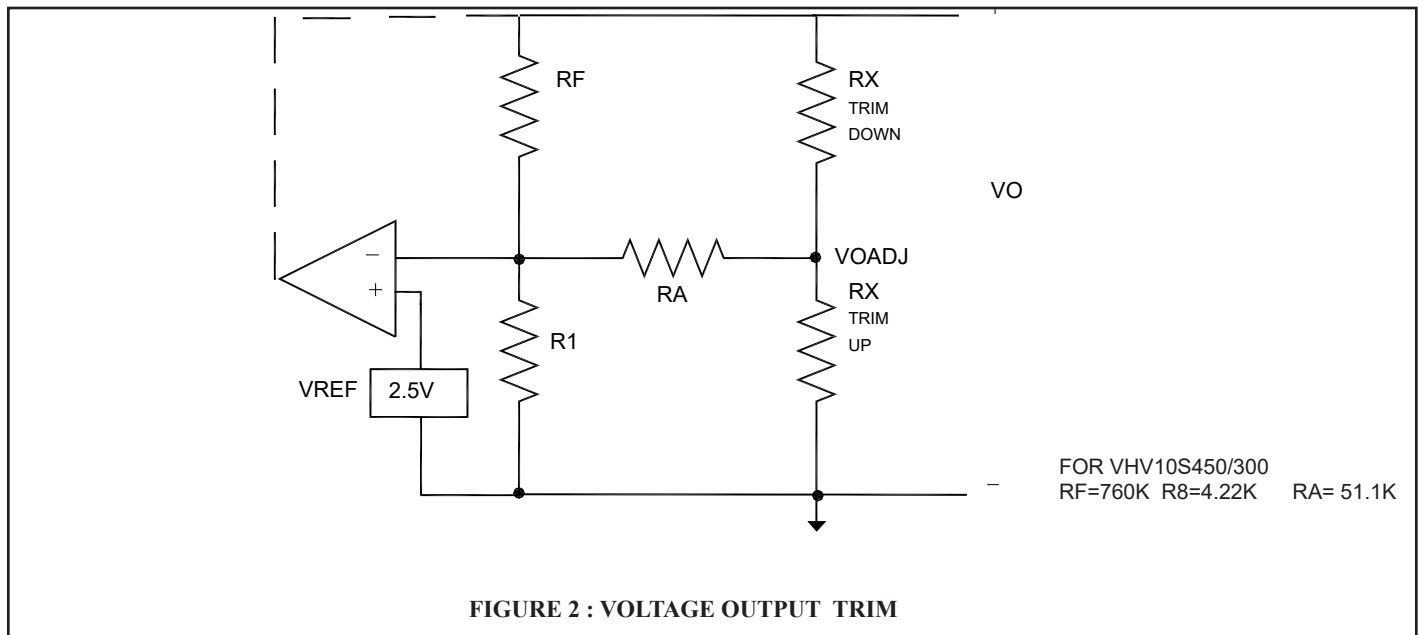


FIGURE 1. Connection diagram

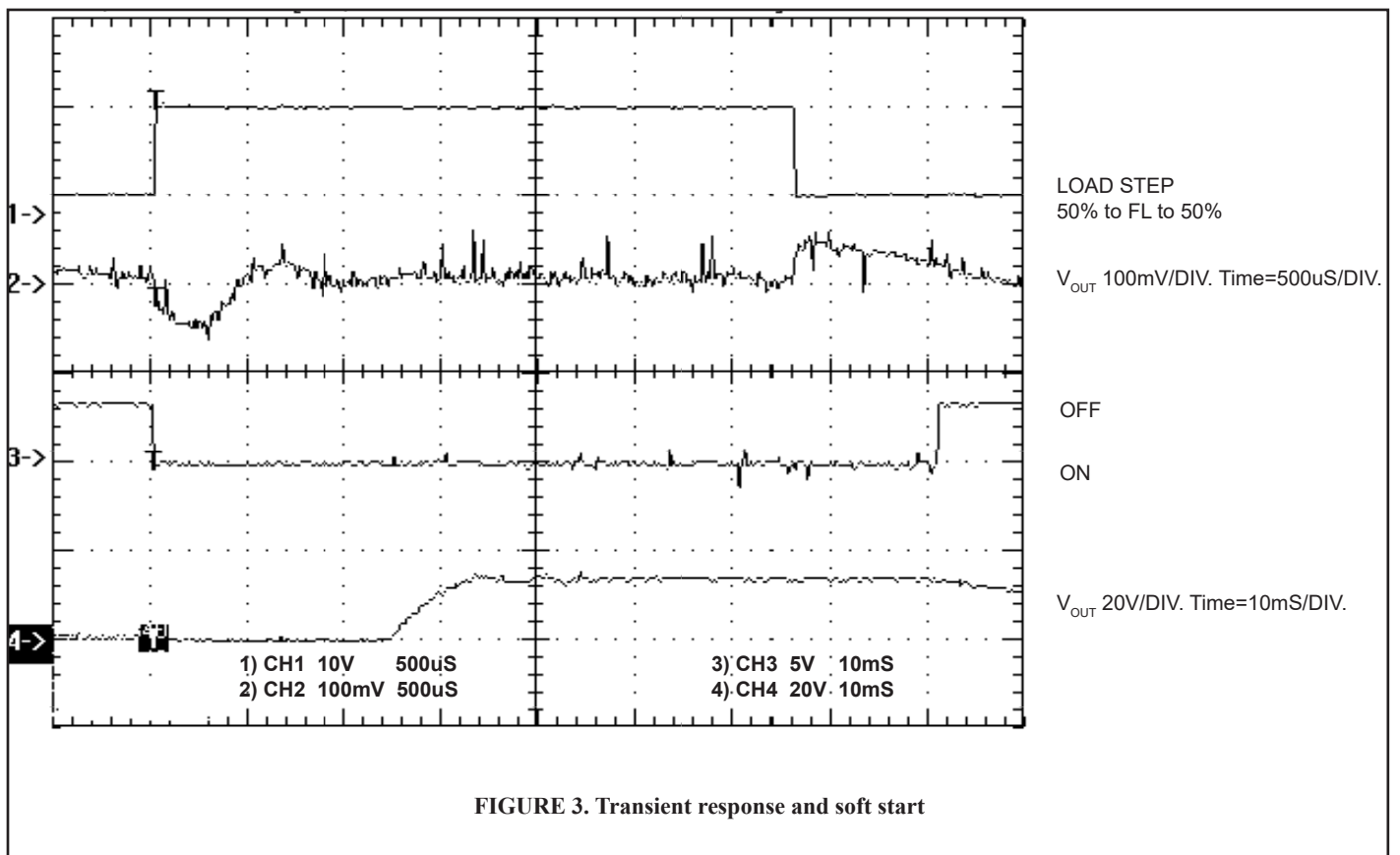
MECHANICAL SPECIFICATIONS





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

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



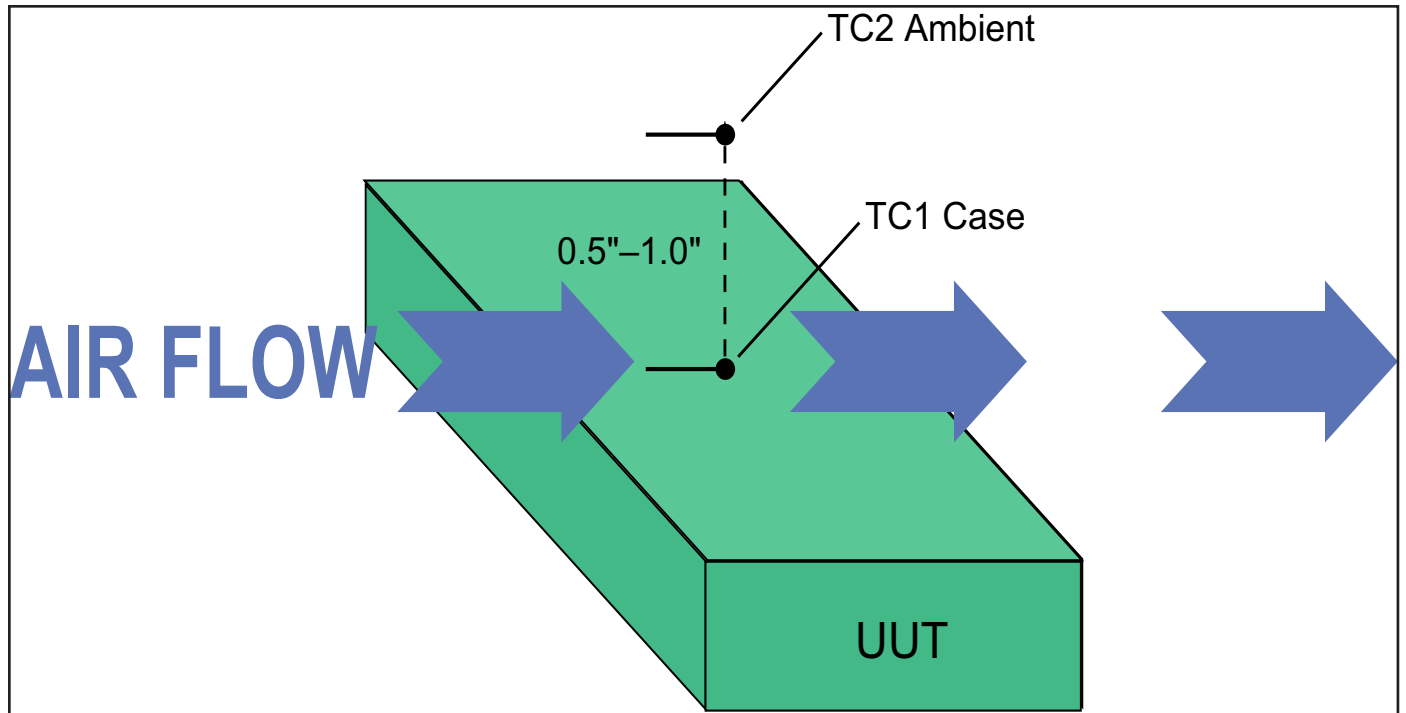


FIGURE 4. Setup for measuring case and ambient temperatures

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.