



HVA35001

20W HIGH-VOLTAGE ADJUSTABLE
DC/DC CONVERTER
36-72Vin 5-320 Vout @60mA

Key Features

- Efficiency up to 87%
- Wide input voltage range (2:1)
- Six-sided shielding
- Soft start
- Short circuit and thermal protection
- Adjustable output
- Output O.V.P



Beta Dyne is protected under various patents, including but not limited to U.S. Patent numbers: 5,777,519; 6,188,276; 6,262,901; 6,452,818; 6,473,3171.

Applications

High Voltage Adjustable

Voltage Source

Instrumentation

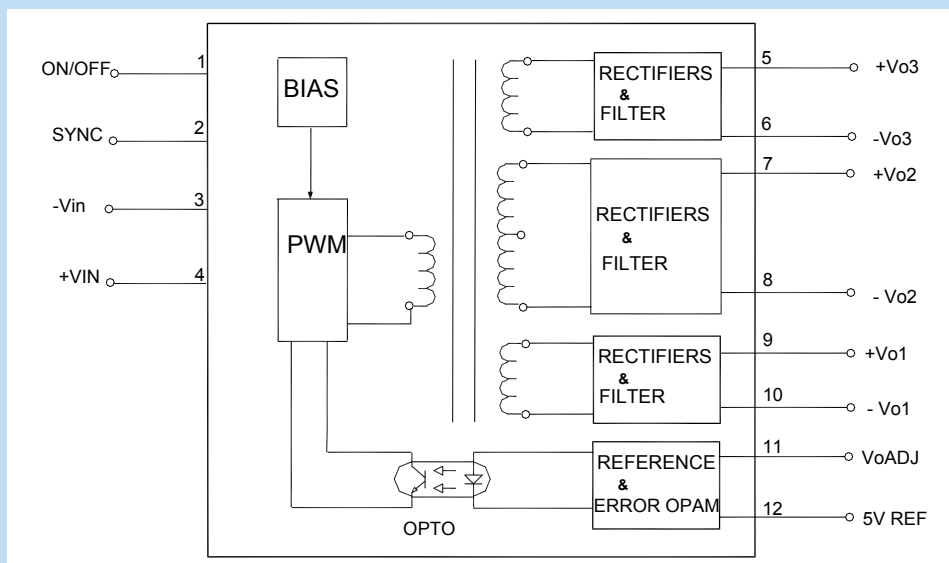
Test & Measurement

Telecom

DSL Power Supply

Functional Description

The HVA35001 is a high voltage output isolated DC/DC converter .It accepts 36 to 72 VDC at its input and provides 5-320 VDC @60 mA at its output .The converter is packaged in a 2x2x.5” metal case and offers six-sided shielding. Other standard features include input to output isolation, under and over voltage protection, soft start and external synchronization .



Typical Block Diagram

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

Electrical Specifications

INPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range		36	48	72	
Startup Voltage for Bias Converter		4.7	5		Vdc
Input Startup Voltage, 48V _{IN}		35	36		Vdc
Input Overvoltage Protection, 48V _{IN}		74	76		Vdc
Input Filter	LC				
Reverse Polarity	Internal parasitic shunt diodes				
Input Surge Current (20µS Spike)				10	A
Short Circuit Current Limit	See Short Circuit Protection		150		% I _{IN}
Turn on delay	Including soft start See Fig : 3				
Off State Current			750		µA
Remote ON/OFF Control					
Supply ON	Pin 1 Open (Open circuit voltage: 13V max.)				
Supply OFF		-0.6	0	0.8	Vdc
Logic Input Reference	To -V _{IN} for ON/OFF and SYNC				
Logic Compatibility for Reference	TTL Open Collector or CMOS Open Drain				
Sync, High N.A.	See External Synchronization, see Fig 4	2		6	Vdc
Sync, Low N.A.	See External Synchronization, see Fig 4	0		0.8	Vdc

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage		5		320	V
Output Voltage Accuracy			±0.5	±1	%
Ripple & Noise			1	2	%
Control Voltage Range Vc		0		5	V
Vc Current	Sink / Source			1	mA
Output Current			60		mA
Line Regulation			±1.0	±2.0	%
Temperature Coefficient @ FL			0.02		%/°C
Transient Response Time	50% FL to FL to 50% FL		200	250	µS
Short Circuit Protection	By input current limiting hick up mode				

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			87		%
Isolation Voltage (1 min.), Input to Output			1500		Vdc
Isolation Voltage (1 min.), Output to Output			500		Vdc
Isolation Resistance			10 ⁹		Ω
Isolation Capacitance			2700		pF
Switching Frequency, Power Stage			170		kHz
Switching Frequency, BIAS Stage			200		kHz

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature, Industrial (Ambient) ¹	See note in Figures 1,2	-40		+71	°C
Operating Temperature, Extended (X)	See Ordering Guide (Please contact factory)	-55		+85	°C
Storage Temperature Range		-55		+125	°C
Thermal Resistance			1.6		°C/W _{DISS}
Maximum Operating Case Temperature				95	°C
Thermal Turn Off, Case Temperature		75	85	95	°C
Thermal Hysteresis			20		°C
Derating					
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
EMI/RFI	Six-sided continuous shielded metal case				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		485,000		hours

* See footnotes 3, 4 and 5

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×2.00×0.5 in. (50.8×50.8×12.7mm)				
Weight	3.00 oz. (85g)				
Case Material	Coated metal				
Shielding Connection, 48V _{IN}	+Input (Pin 4)				

¹ ⚠ WARNING - Usage of input fuse with adequate ratings is essential to avoid possible hazard and damage of the unit. A suppressor diode with adequate ratings is intended to be connected in series to the supply for reverse polarity protection.

² Pins 6 and 7 are connected internally. Pins 8 and 9 are also connected internally.

³ Contact factory for -55° to +85°C operating temperature range.

⁴ Adequate insulation is to be provided to the converters at the end usage as per applicable requirements.

⁵ Temperature rise on the case of the converters is to be considered during the end usage as per applicable requirements.

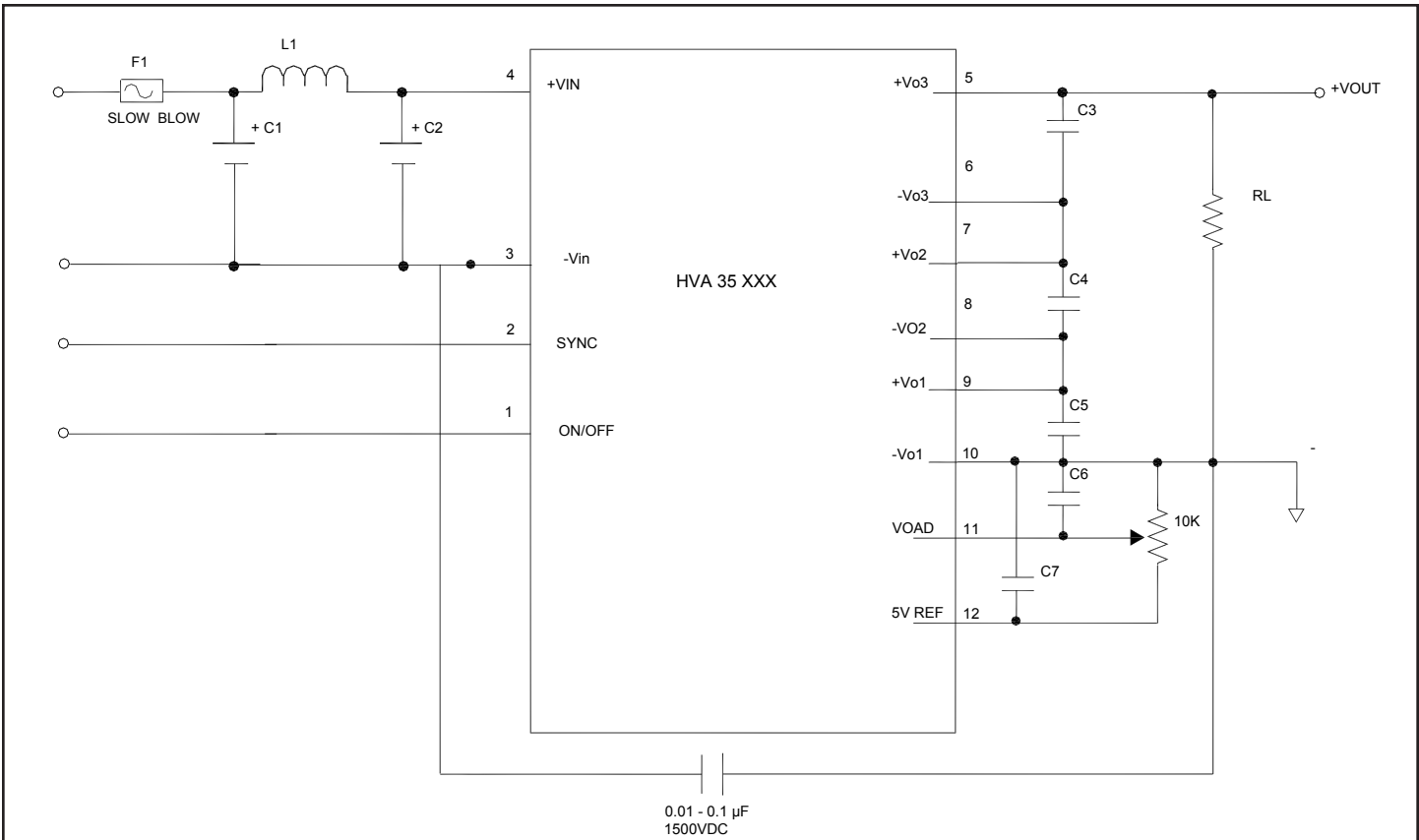


FIGURE 1. Typical Connection Diagram of HVA35 Series Single Output

V _{IN}	F1	C1	C2	L1
12	5A	100μF@25V	220μF@25V	.68μH
24	3A	50μF@50V	100μF@50V	1μH
48	2A	22μF@100V	50μF@100V	2.2μH

C3=C4=C5 ≥ 6.8μF @ 250V
 C6 , C7 = .01 to .1μF @ 50V

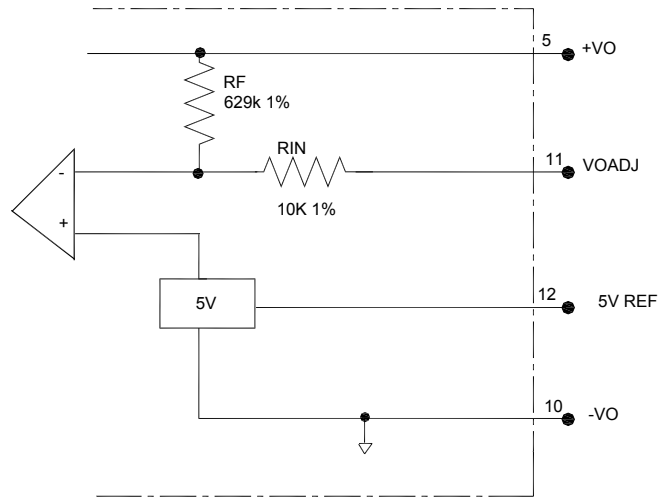


FIGURE 2. Typical Control circuit of HVA35001

$$VO = (1 + RF/RIN) * VOADJ$$

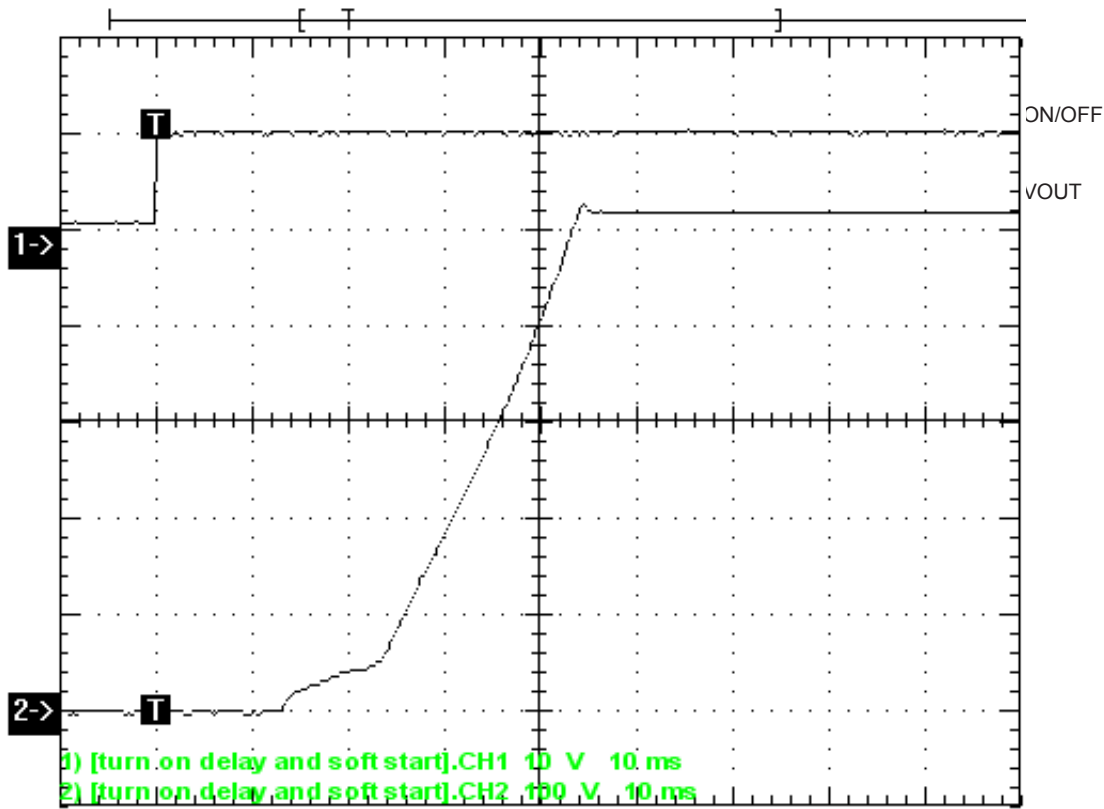


FIGURE 3 . Turn On Delay And Soft Start

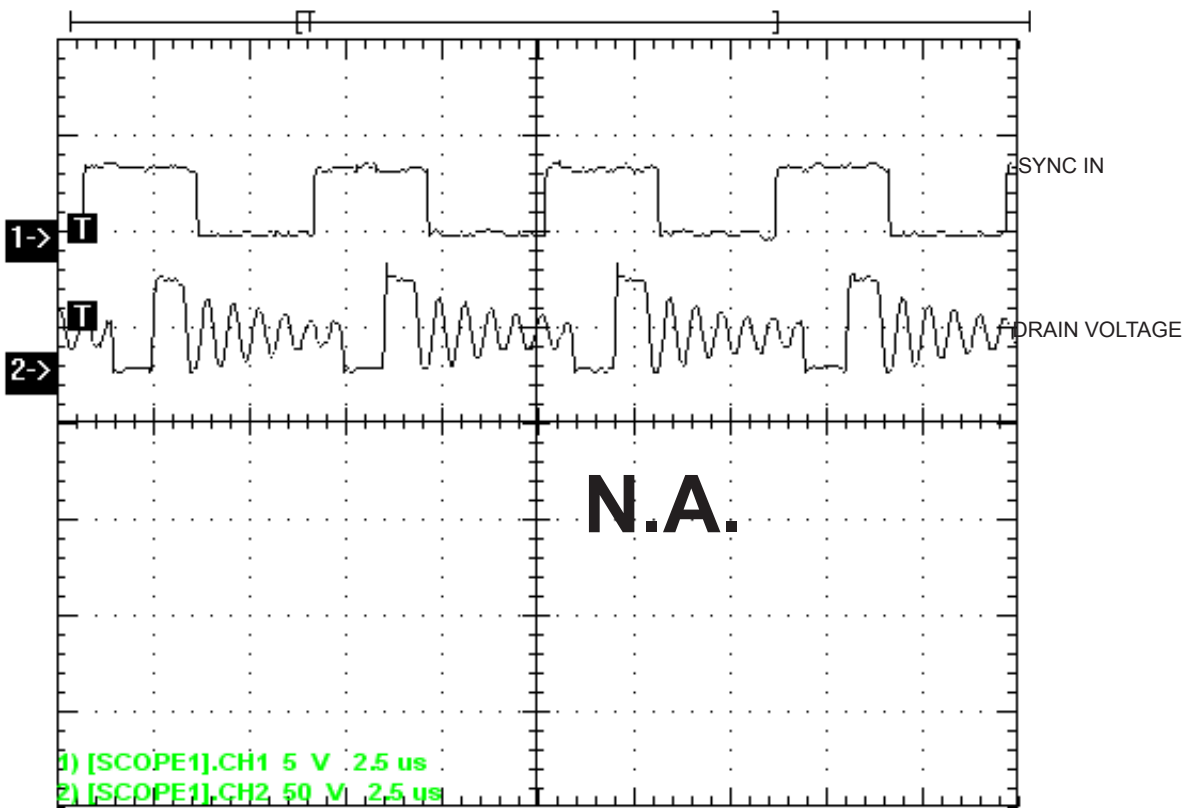


FIGURE 4 . External Synchronization

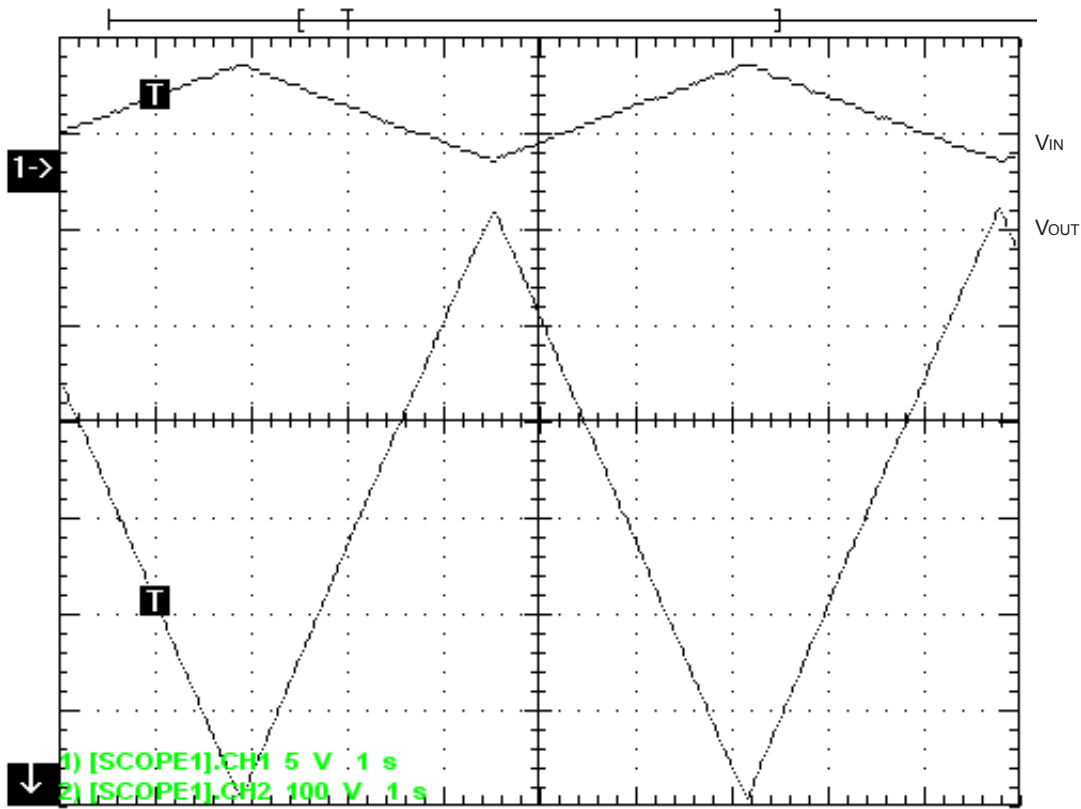


FIGURE 5 . V_{IN} Versus V_{OUT}

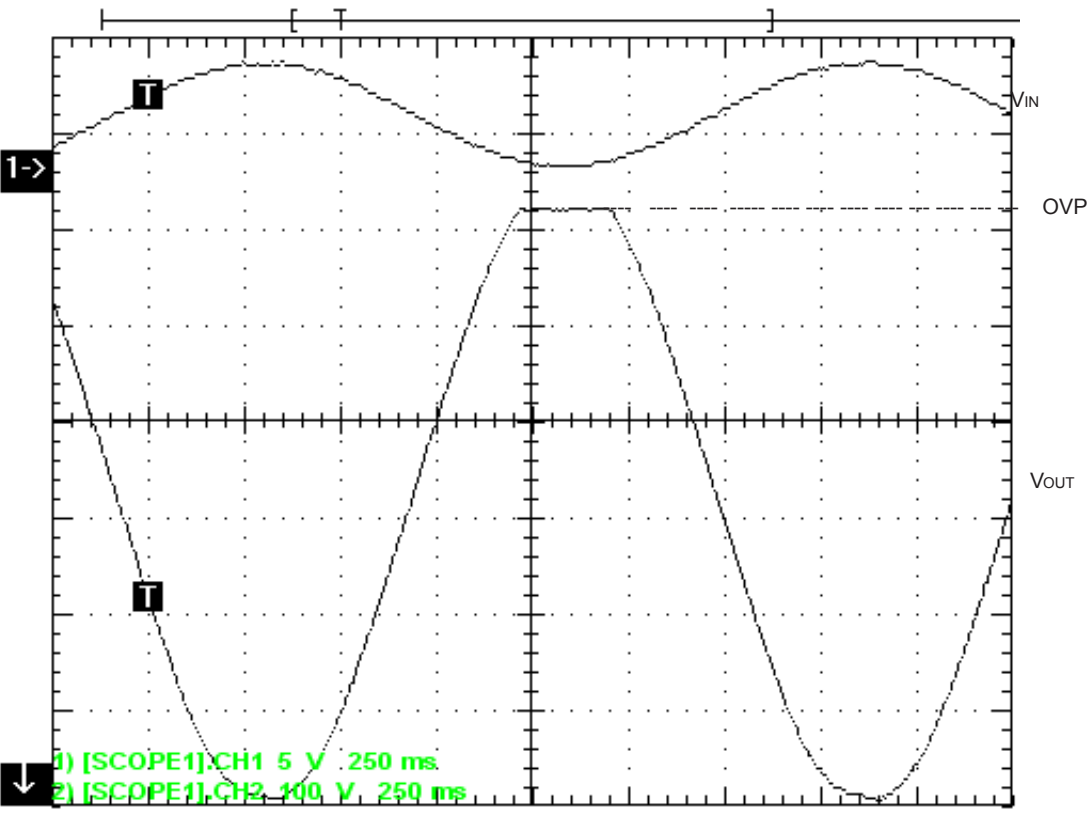
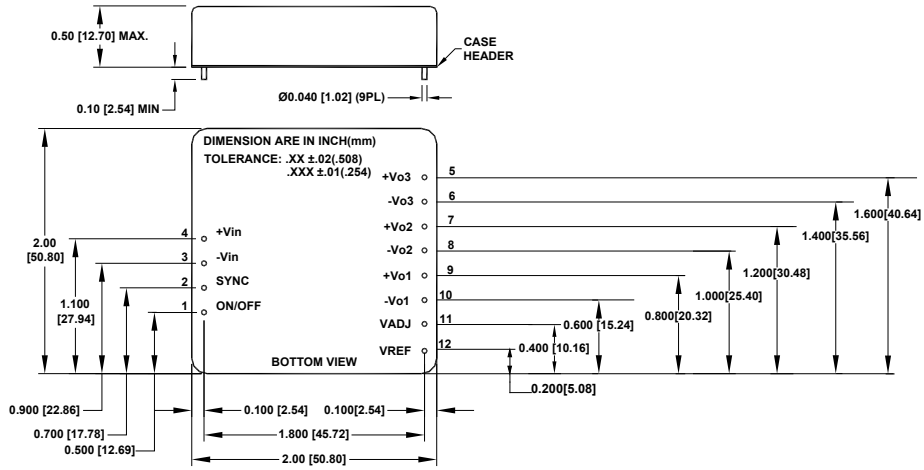


FIGURE 6 . V_{IN} Versus V_{OUT} With OVP

MECHANICAL SPECIFICATIONS



Pin	Function
1	ON/OFF
2	SYNC N.A.
3	-V _{IN}
4	+V _{IN}
5	+V _{O3}
6	-V _{O3}
7	+V _{O2}
8	-V _{O2}
9	+V _{O1}
10	-V _{O1}
11	V _{OUT} ADJ
12	V _{OUT} REF