



HVA35000

10W HIGH-VOLTAGE ADJUSTABLE DC/DC CONVERTER

18-36VDCin 5-600 Vout @12mA

Key Features

- 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

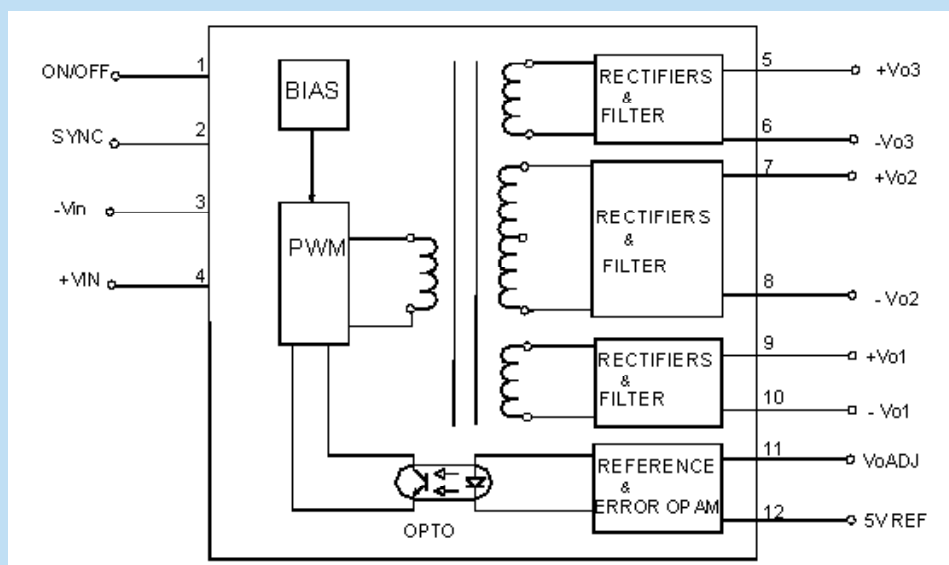
Telecom

DSL Power Supply

Functional Description

The HVA35000 is a high voltage output isolated DC/DC converter .It accepts 18 to 36 VDC at its input and provides 5-600 VDC @12 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		18	24	36	
Startup Voltage for Bias Converter		4.7	5		Vdc
Input Startup Voltage, 24V _{IN}		17	18		Vdc
Input Overvoltage Protection, 24V _{IN}		38	40		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		600	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			12		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			71		%
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, +50°C)		345,000		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, 24V _{IN}	-Input (Pin 3)				

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.

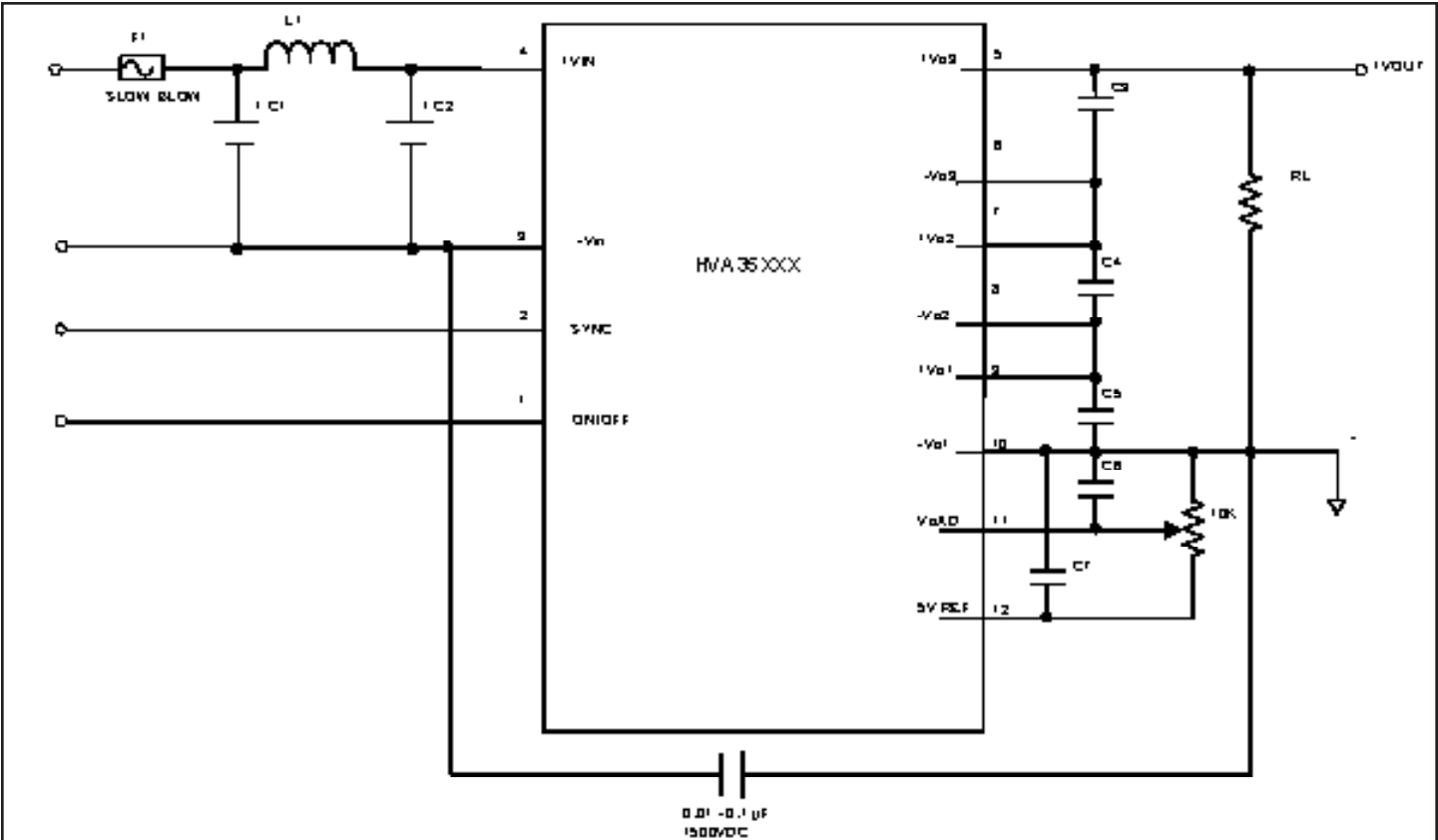


FIGURE 1. Typical Connection Diagram of HVA35 Series Single Output

24	3A	50µF@50V	100µF@50V	1µH
48	2A	22µF@100V	50µF@100V	2.2µH

0.01-0.1 uF 1500VDC

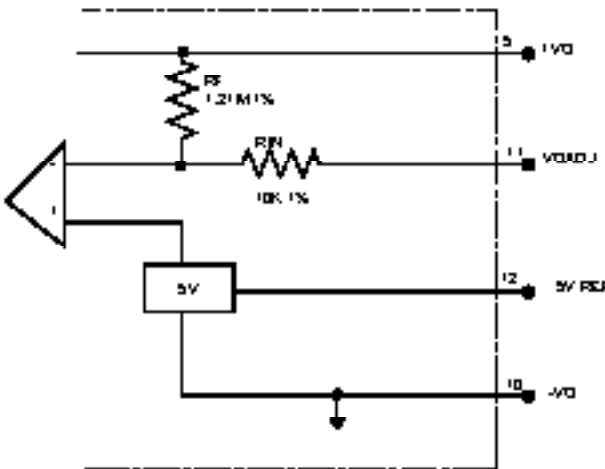


FIGURE 2. Typical Control circuit of HVA35000

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

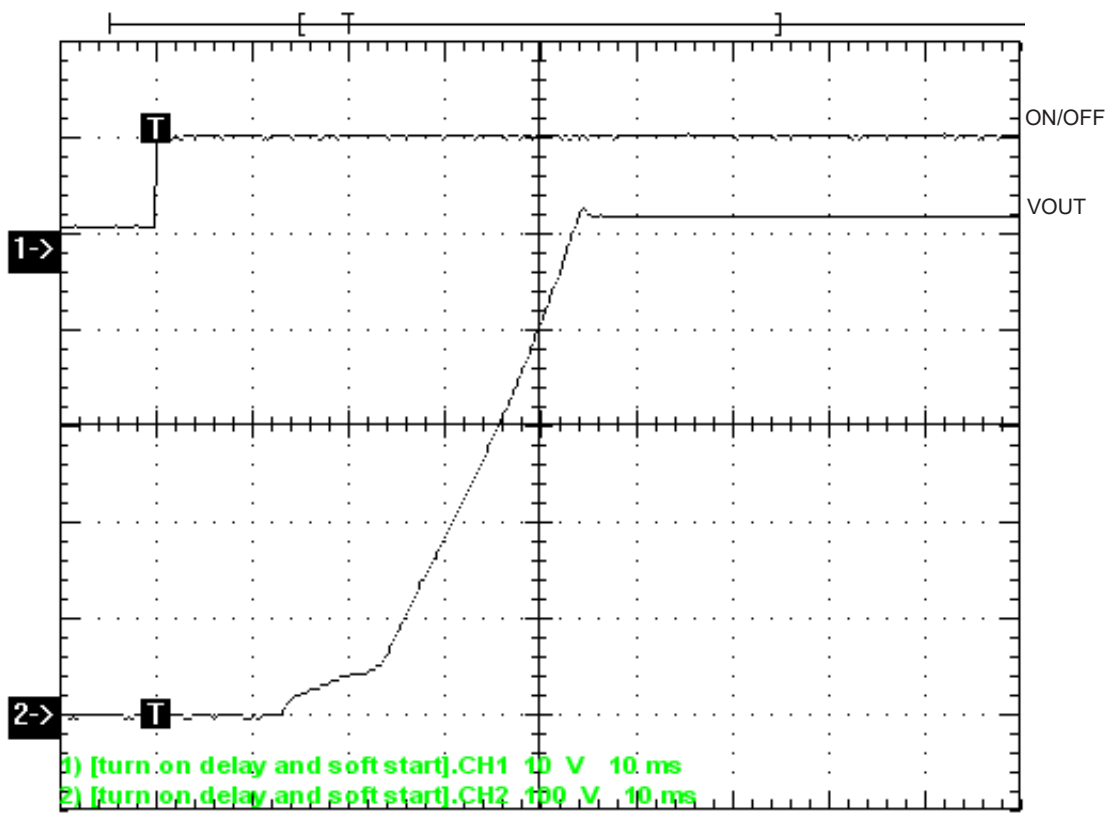


FIGURE 3 . Turn On Delay And Soft Start

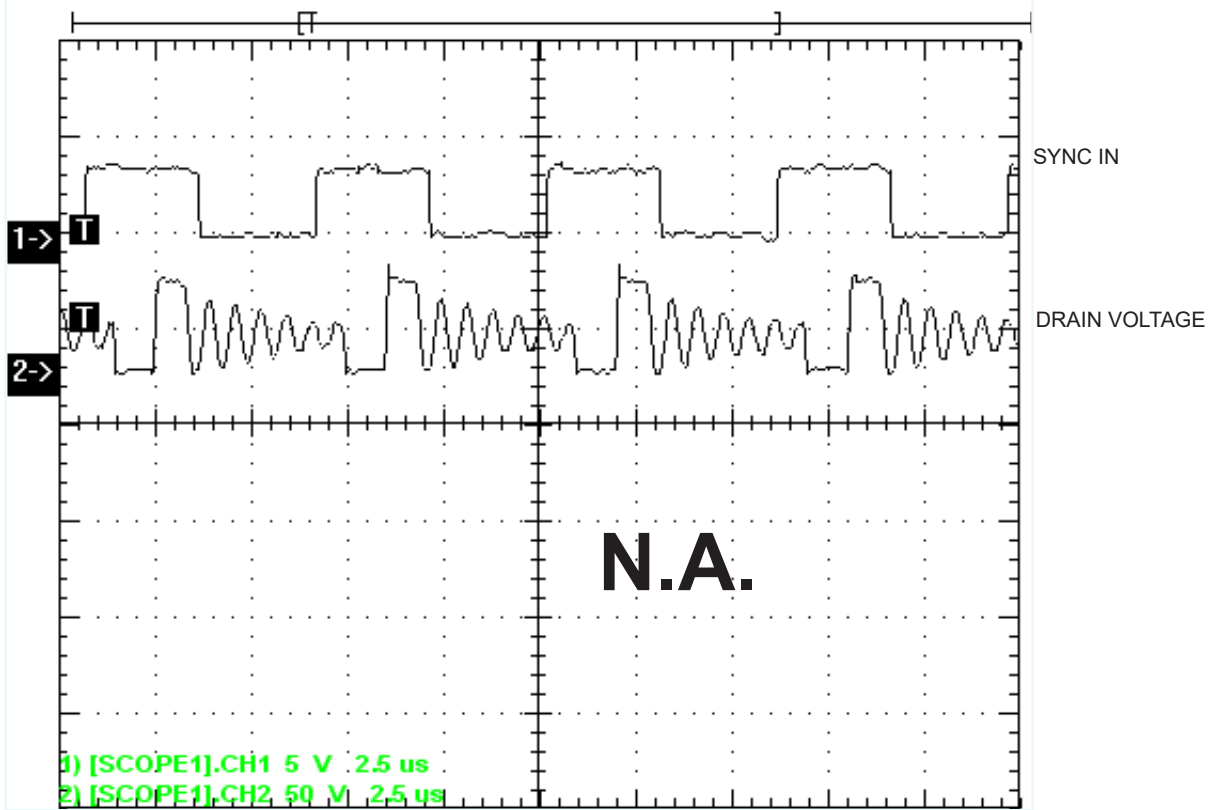


FIGURE 4 . External Synchronization

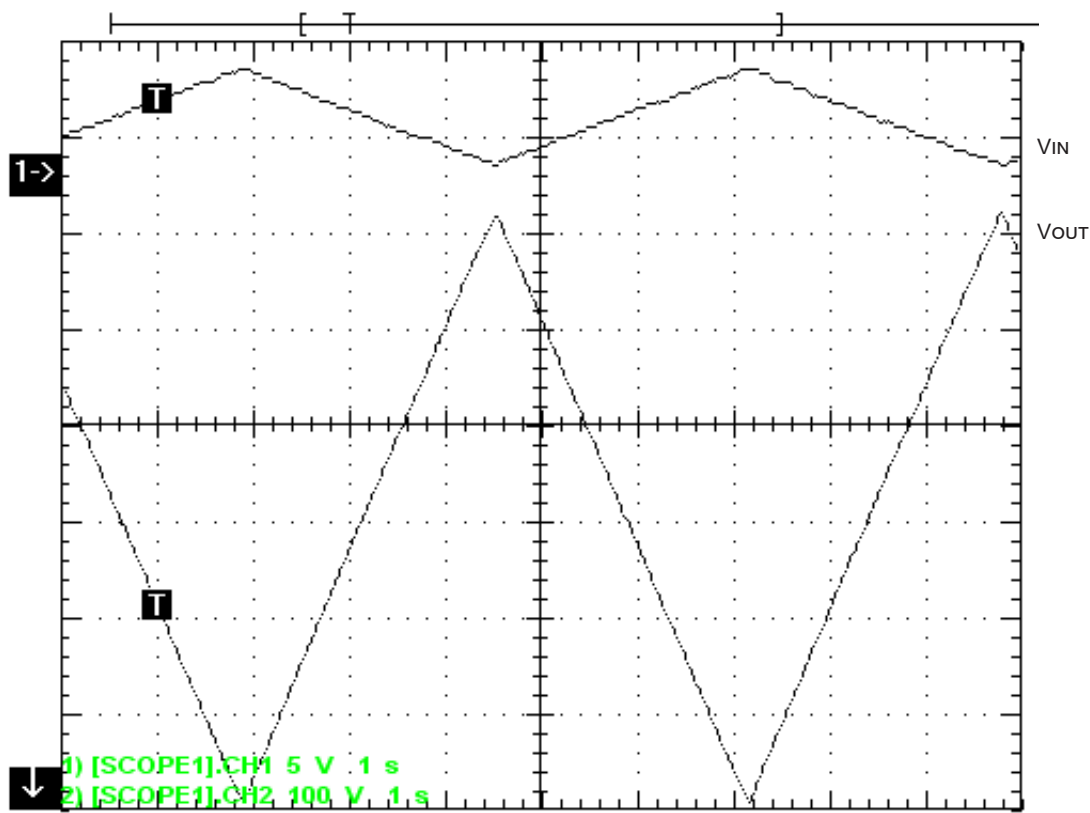


FIGURE 5 . V_{IN} Versus V_{OUT}

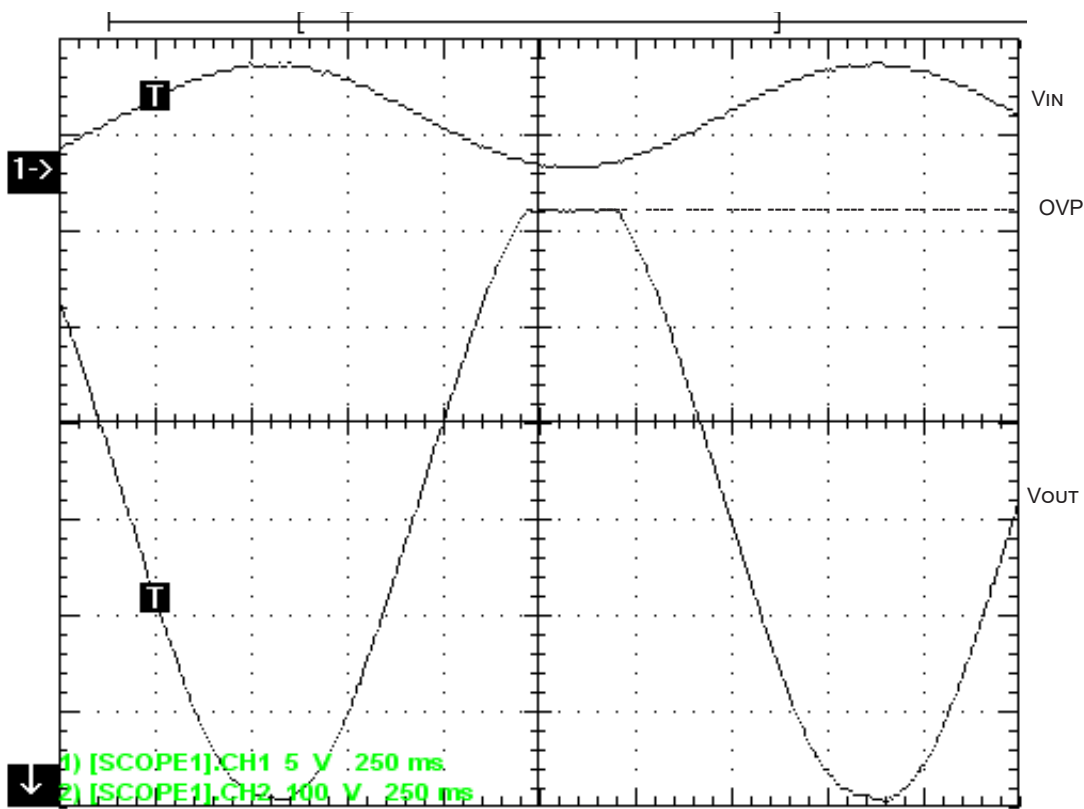
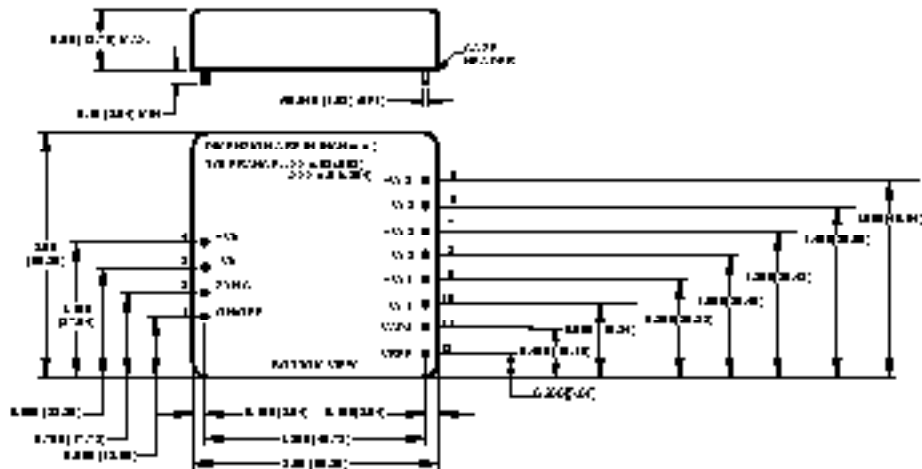


FIGURE 6 . V_{IN} Versus V_{OUT} With OVP

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	$V_{OUT REF}$