



# 3.6W DUAL ISOLATED DC/DC CONVERTER 24-PIN DIP

$36-72V_{IN}$ ,  $\pm 18V_{OUT}$  @  $\pm 100mA$

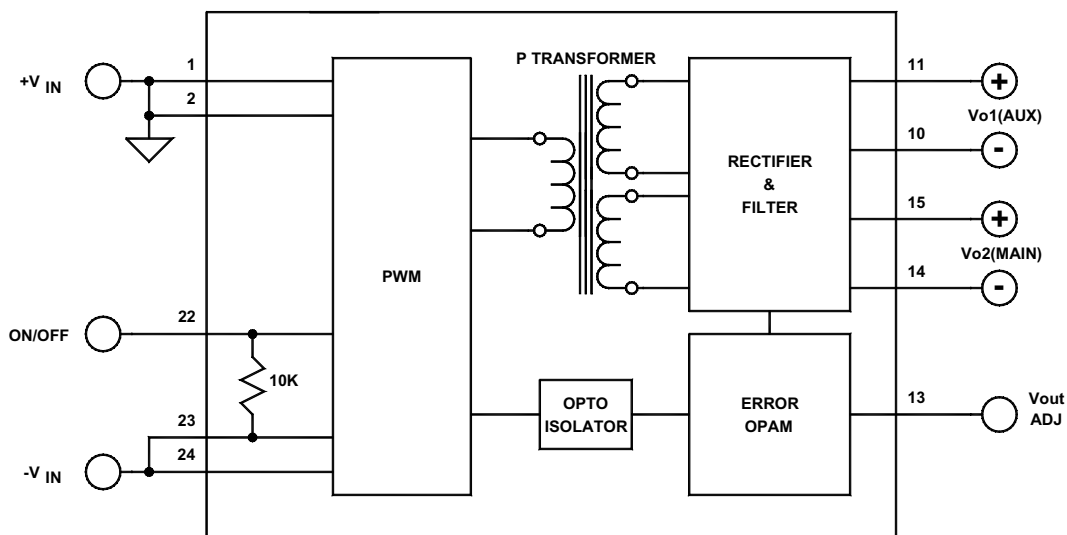
## Key Features

- Efficiency up to 80%
- 1500Vdc isolation
- Short circuit and thermal protection
- 2:1 input voltage range
- Metal case
- Six-sided shielding
- 2mA off state current
- Industry standard pinout



## Functional Description

The 5D18/48DI Dual Isolated DC/DC Converter 24-Pin DIP offers a wide input voltage range of  $36-72V_{IN}$  and dual isolated outputs of  $\pm 18V_{OUT}$  @  $\pm 100mA$ . Additional features include total input-to-output isolation, short circuit protection, thermal protection, soft start, adjustable outputs, and efficiency up to 80%.



Typical Block Diagram

## Electrical Specifications

### ABSOLUTE MAXIMUM RATINGS

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
Output Short Circuit Duration	Continuous				
Internal Power Dissipation				1.2	W

### INPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range (2:1)		36		72	Vdc
No Load Input Current			10		mA
Full Load Input Current			94		mA
Input Filter	C = 3.3 for 24V <sub>IN</sub> , 2.2 for 48V <sub>IN</sub> , 0.47 for 120V <sub>IN</sub>				μF
Reverse Polarity	External series-blocking diode				
Reflected Ripple	I <sub>O</sub> = FL, C <sub>IN</sub> = 10μF, See Figure 4				
Input Surge Current (20μS Spike)				10	A
Short Circuit Current Limit	See Short Circuit Protection		150		% I <sub>IN</sub>
Off State Current			2		mA
Remote ON/OFF Control					
Supply ON	Pin 22 Open (Open circuit voltage: 0V)				
Supply OFF	Pin 22	5	10	15	Vdc
Logic Input Reference	-Input for ON/OFF				

### OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			±18		Vdc
Output Voltage Accuracy			±1	±2	%
Ripple & Noise	With specified minimum output capacities		1	2	%V <sub>PP</sub> of V <sub>OUT</sub>
Output Current			±100		mA
Line Regulation, Single and Dual			±1	±2	%
Line Regulation, Dual Isolated (AUX)	See Single for V <sub>O2</sub>		±3	±5	%
Load Regulation, Single			±1	±2	%
Load Regulation, Dual	With balanced loads		±1	±2	%
Dual Isolated Output (AUX)	Output fully loaded, See Figure 4; See Single for V <sub>O2</sub>		±3	±5	%
Temperature Coefficient @ FL			0.02		%/°C
Transient Response Time	50% FL to FL to 50% FL, C <sub>O</sub> =22μF, See Figure 2		1	2	mS
Short Circuit Protection <sup>1</sup>	By input current limiting				
Output Adjust Range	See Figure 4;	±5		±10	%

### GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			80		%
Isolation Voltage (1 min.), Input to Output			1500		Vdc
Isolation Voltage (1 min.), Output to Output			500		Vdc
Isolation Resistance			10 <sup>9</sup>		Ω
Isolation Capacitance			1000		pF
Switching Frequency			125		kHz
Turn On Delay	See Figure 2		5	10	mS
Soft Start Time	See Figure 2		20		mS

### PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	1.25×0.80×0.40 in. (31.75×20.32×10.16mm)				
Weight	0.56 oz. (15.8g)				
Case Material	Coated metal				
Shielding	Six-sided continuous				
Case Connection					

## ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range (Ambient)	See Figure 1	-40		+70	°C
Storage Temperature Range		-60		+105	°C
Thermal Shutdown	Case temperature (Input power must be recycled)	96	100	104	°C
Thermal Resistance <sup>2</sup>	Maximum case temperature is 36°C above ambient		36	43	°C/W
Derating	See Figure 1				
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		1.3x10 <sup>6</sup>		hours

## Model Selection Guide

MODEL NUMBER	INPUT				Reflected Ripple <sup>4</sup> (mA <sub>PP</sub> )	OUTPUT		
	Voltage (Vdc)		Current (mA)			Voltage (Vdc)	Current (mA)	Efficiency Full Load (%)
	Nominal	Range	No Load	Full Load <sup>3</sup>				
5D18/48DI	48	36-72	10	94	30	±18	±100	80

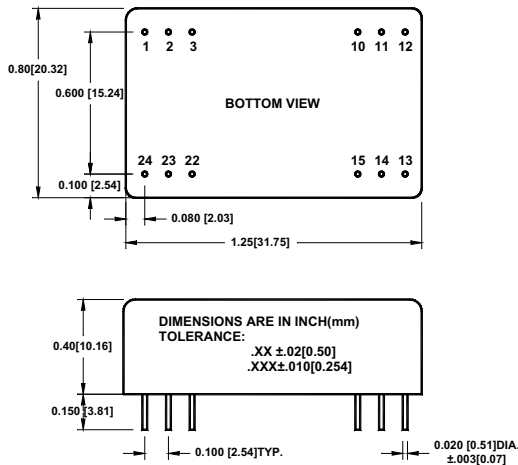
<sup>1</sup> Input power may need to be recycled if the input overcurrent threshold is exceeded after a hard output short circuit or thermal shutdown.

<sup>2</sup> Maximum thermal resistance is given for 24V<sub>IN</sub> models.

<sup>3</sup> The maximum input current at any given input range measured at minimum input voltage is given as 1.6\*I<sub>NOMINAL</sub>. Nominal input current is the typical value measured at the input of the converter under full-load room temperature and nominal input voltage (48Vdc).

<sup>4</sup> With a 10µH input inductor and 10µF input capacitor.

## MECHANICAL SPECIFICATIONS



Pin	Function
1	+V <sub>IN</sub>
2	+V <sub>IN</sub>
3	CASE
10	-V <sub>O1</sub> (AUX)
11	+V <sub>O1</sub> (AUX)
12	No Pin
13	V <sub>OUT</sub> ADJ
14	-V <sub>O2</sub> (MAIN)
15	+V <sub>O2</sub> (MAIN)
22	ON/OFF
23	-V <sub>IN</sub>
24	-V <sub>IN</sub>

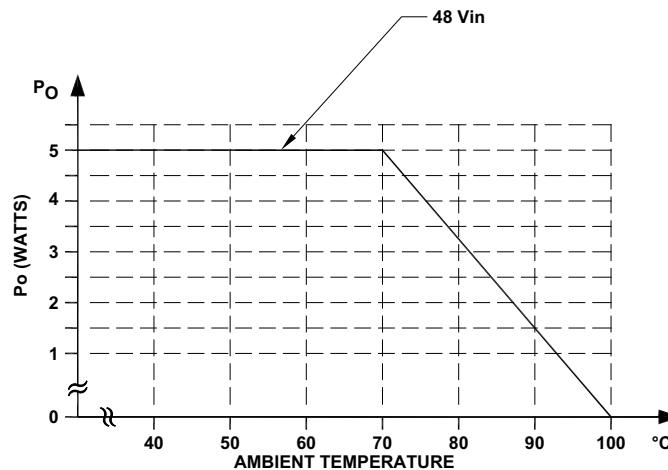


FIGURE 1. Typical derating curves of 5W DIP series

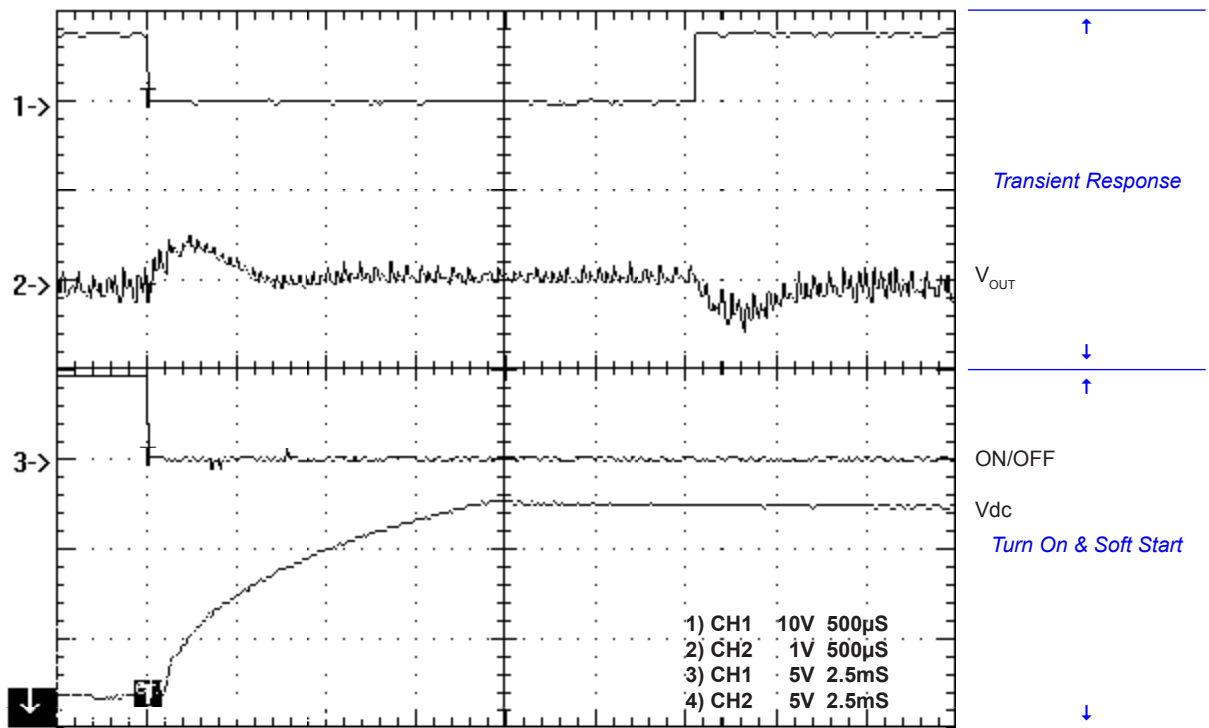


FIGURE 2. Typical Transient Response and Soft Start of 5D18/48DI  
( $R_L=10k$ ,  $C_o=3.3\mu F@400V$ )

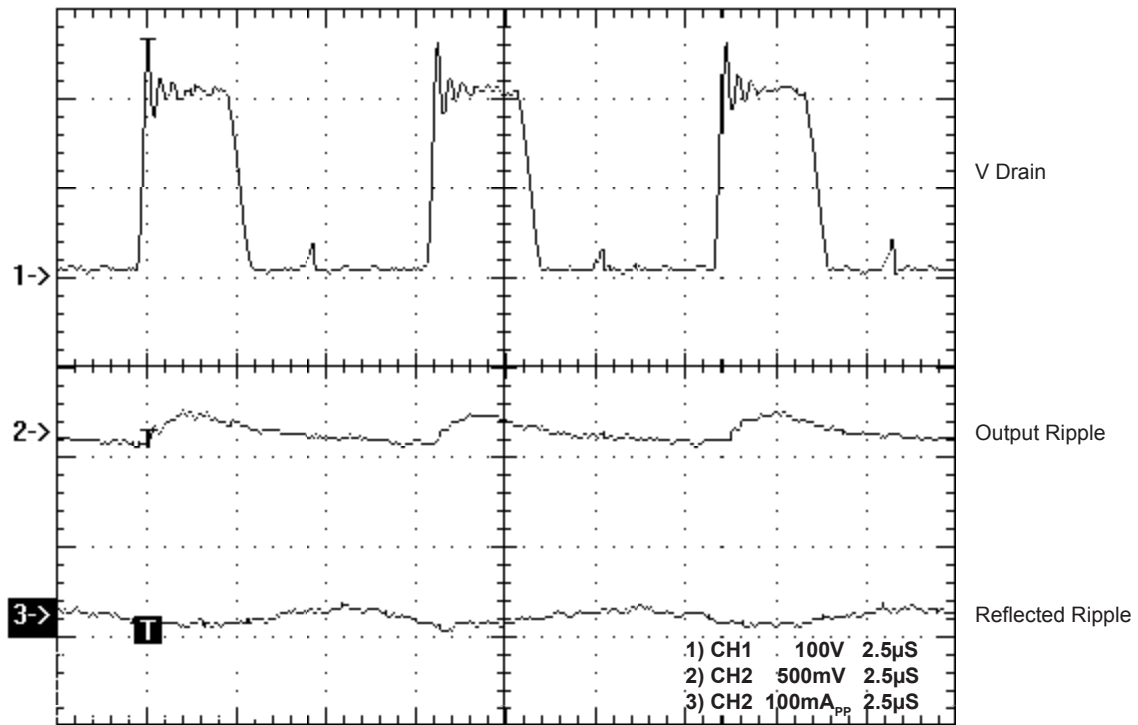


FIGURE 3. Typical waveforms of 5D18/48DI

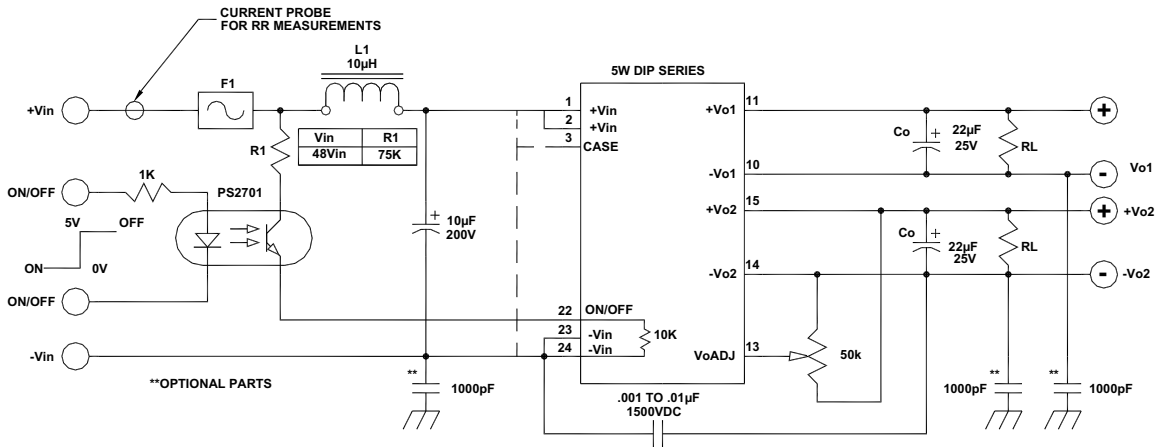


FIGURE 4. Typical connection diagram of 5W DIP Dual Isolated