


DESCRIPTION: 3W Wide Input Isolated & Regulated twin Output Dip Dc-Dc Converter

TPD-3Wseries are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board. These products apply to: 1) Where the voltage of the input power supply is wide range (voltage range $\leq 2:1$); 2) Where isolation is necessary between input and output (Isolation Voltage $< 1500\text{VDC}$); 3) Where isolation is necessary between Vout1 and Vout2 (Isolation Voltage $< 1000\text{VDC}$); 4) Where the regulation of the output voltage and the output ripple noise are demanded.

FEATURES

RoHS compliant	2:1 wide input voltage range	UL94-V0 package
Operating temperature: -40°C to $+85^{\circ}\text{C}$	Industry standard pinout	No external component required
Twin output	Five-sided metal shielding(WRD_MP)	Short circuit protection (automatic recovery)
MTBF>1,000,000 hours	No heat sink required	

SELECTION GUIDE

Part Number	Input				Output			Efficiency (%, Typ.)
	Voltage (VDC)			No-load Current (mA, Typ)	Voltage (VDC)	Current(mA)		
	Nominal	Range	Max.*			Max.	Min.	
TPD050505D-3W	5 (2:1)	4.5~9.0	11	40	5/5	300/300	30/30	68
TPD051212D-3W	5 (2:1)	4.5~9.0	11	40	12/12	125/125	12/12	71
TPD051515D-3W	5 (2:1)	4.5~9.0	11	40	15/15	100/100	10/10	72
TPD120505D-3W	12 (2:1)	9.0~18	22	20	5/5	300/300	30/30	76
TPD120909D-3W	12 (2:1)	9.0~18	22	20	9/9	166/166	16/16	78
TPD121212D-3W	12 (2:1)	9.0~18	22	20	12/12	125/125	12/12	80
TPD121515D-3W	12 (2:1)	9.0~18	22	20	15/15	100/100	10/10	81
TPD122424D-3W	12 (2:1)	9.0~18	22	20	24/24	62/62	6/6	82
TPD240505D-3W	24 (2:1)	18~36	40	10	5/5	300/300	30/30	76
TPD240512D-3W	24 (2:1)	18~36	40	10	5/12	300/125	30/12	77
TPD241212D-3W	24 (2:1)	18~36	40	10	12/12	125/125	12/12	80
TPD241515D-3W	24 (2:1)	18~36	40	10	15/15	100/100	10/10	79
TPD242424D-3W	24 (2:1)	18~36	40	10	24/24	62/62	6/6	81
TPD480505D-3W	48 (2:1)	36~72	80	5	5/5	300/300	30/30	76
TPD480512D-3W	48 (2:1)	36~72	80	5	5/12	400/83	40/8	78
TPD480909D-3W	48 (2:1)	36~72	80	5	9/9	166/166	16/16	78
TPD481212D-3W	48 (2:1)	36~72	80	5	12/12	125/125	12/12	80
TPD481515D-3W	48 (2:1)	36~72	80	5	15/15	100/100	10/10	81
TPD482424D-3W	48 (2:1)	36~72	80	5	24/24	62/62	6/6	82

COMMON SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	$^{\circ}\text{C}$
Storage Temperature		-55		125	$^{\circ}\text{C}$
Temp. rise at full load			15		$^{\circ}\text{C}$
Lead temperature	1.5mm from case for 10 seconds			300	$^{\circ}\text{C}$
Cooling	Free Air Convection				
Short circuit protection	Continuous, Automatic Recovery				
MTBF		1000			K hours
Weight			15		g

ISOLATION SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/1V		100		pF

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Units
Output power	Refer to selection guide	0.3		3	W
Main output voltage accuracy	Refer to recommended circuit		±1	±3	%
Vice-output voltage accuracy	Refer to recommended circuit		±3	±5	%
Load regulation	From 10% to 100% load		±0.5	±1	%
Line regulation	Input voltage from low to high		±0.2	±0.5	%
Temperature drift (Vout)	Refer to recommended circuit			±0.03	%/°C
Ripple	20MHz Bandwidth		20	50	mVp-p
Noise	20MHz Bandwidth		75	150	mVp-p
Switching frequency	100% load, input voltage range		300		KHZ

All specifications typical at TA=25 °C, nominal input voltage and rated output current unless otherwise specified.

APPLICATION NOTE
1.Requirement on output load

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load no less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.

2. Recommended Circuit

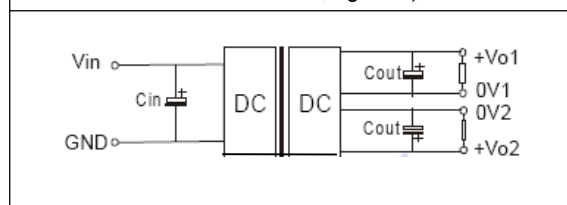
All the TPD-3W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (see Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high, or may cause start-up problem. If you want to use the products in high EMI, please choose our metal packaged products (TPD-3W). For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1).

General: Cin: 5V,12V 100μF

24V,48V 22μF/10μF

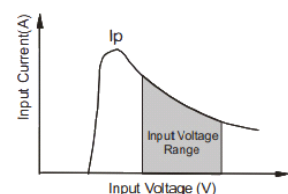
Cout: 10μF/100mA

Output External Capacitor Table (Table 1)	
Vout(VDC)	Cout(VDC)
5	680
9	470
12	330
15	220
24	100

RECOMMENDED CIRCUIT (Figure 1))

3. Input current

While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip (Figure 2).

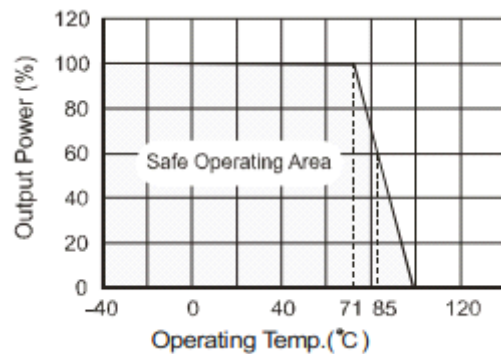
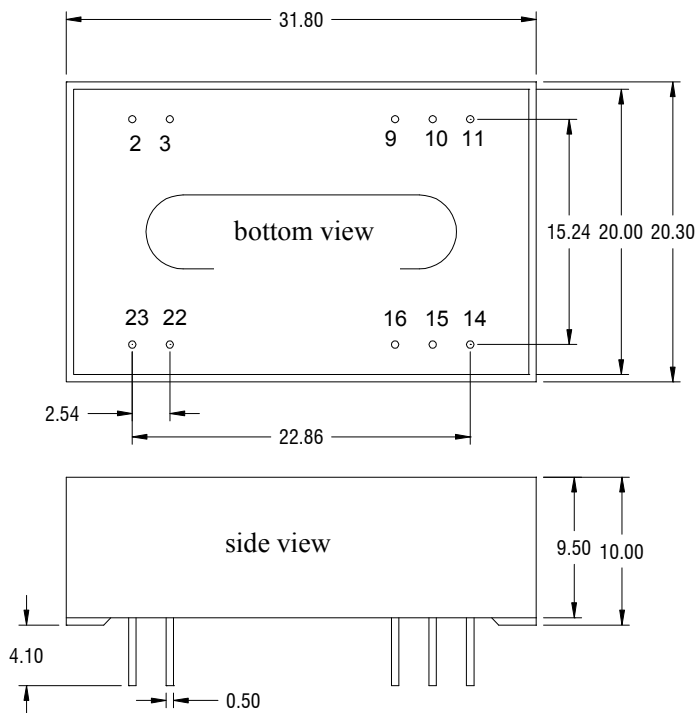
General: $I_p \leq 1.4 \cdot I_{in-max}$



(Figure 2)

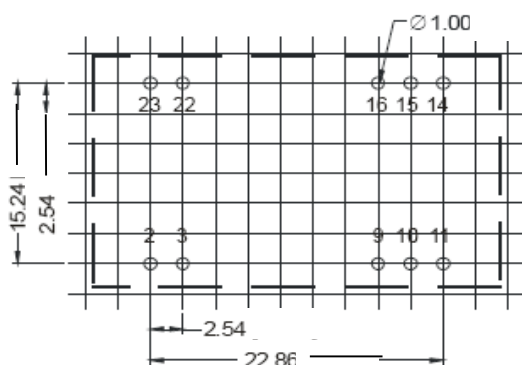
APPLICATION NOTES

- 1.No parallel connection or plug and play
- 2.The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
- 3.Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
- 4.All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.

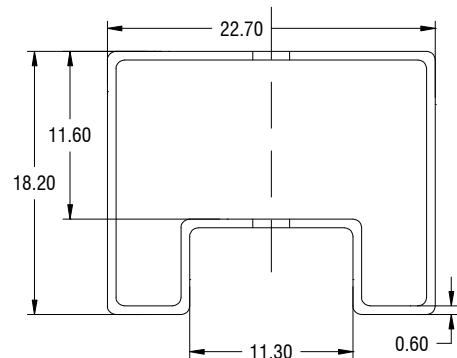
TEMPERATURE DERATING GRAPHS

MECHANICAL DIMENSIONS


PIN CONNECTION	
Pin	Function
2, 3	GND
9	0V2
10, 15	NC
11	+V02
14	+V01
16	0V1
22, 23	Vin

Units: mm Tolerance: $\pm 0.25\text{mm}$ Weight: 15g
All pins on a 2.54mm pitch.

RECOMMENDED FOOTPRINT DETAILS


Units: mm Tolerance: $\pm 0.25\text{mm}$

TUBE OUTLINE DIMENSIONS


Unit: mm Tolerance: $\pm 0.25\text{mm}$
Tube length: 530mm $\pm 2\text{mm}$ Tube quantity: 15PCS
Tube length: 220mm $\pm 2\text{mm}$ Tube quantity: 6PCS