



**DESCRIPTION: 1W 1.5KVDC Isolated Wide Input Single And Dual Output DC/DC Converters**

TP2L-1W series are a range of isolated 1 Watt converters in a SIP package, 2:1 wide input range and tightly regulated output voltage qualifies these converters for many cost critical applications in industrial and consumer electronics. Operating temperature ranges from -40 °C to 85 °C the Internal SMD construction makes it possible to offer a product with high performance at low cost.

**FEATURES**

RoHS compliant	2:1 wide range voltage input	Continuous short circuit protection
Operating temperature: -40°C to 85°C	Low regulation	1.5KVDC isolation
Efficiency up to 83%	Power density 0.91W/cm <sup>3</sup>	Input voltage: 5V, 12V, 24V, 48V
Output voltage: 3.3V,5V, 9V, 12V, 15V,24V / ±5V, ±9V, ±12V, ±15V,±24V	Low ripple noise	External control

**SELECTION GUIDE**

Part Number	Input			Voltage (VDC)	Output		Efficiency (% Typ.)
	Voltage(VDC)				Current(mA)		
	Nominal	Raneg	Max*		Max.	Min.	
TP2L05D05S-1W	5 (2:1)	4.5-9.0	11	±5	±100	±10	72
TP2L05D09S-1W	5 (2:1)	4.5-9.0	11	±9	±55	±5	72
TP2L05D12S-1W	5 (2:1)	4.5-9.0	11	±12	±42	±4	74
TP2L05D15S-1W	5 (2:1)	4.5-9.0	11	±15	±33	±3	73
TP2L05S05S-1W	5 (2:1)	4.5-9.0	11	5	200	20	70
TP2L05S09S-1W	5 (2:1)	4.5-9.0	11	9	111	11	71
TP2L05S12S-1W	5 (2:1)	4.5-9.0	11	12	83	8	76
TP2L05S15S-1W	5 (2:1)	4.5-9.0	11	15	67	7	75
TP2L05S24S-1W	5 (2:1)	4.5-9.0	11	24	42	4	72
TP2L12D05S-1W	12 (2:1)	9.0-18	22	±5	±100	±10	76
TP2L12D09S-1W	12 (2:1)	9.0-18	22	±9	±55	±5	76
TP2L12D12S-1W	12 (2:1)	9.0-18	22	±12	±42	±4	74
TP2L12D15S-1W	12 (2:1)	9.0-18	22	±15	±33	±3	75
TP2L12D24S-1W	12 (2:1)	9.0-18	22	±24	±21	±2	73
TP2L12S03S-1W	12 (2:1)	9.0-18	22	3.3	303	30	74
TP2L12S05S-1W	12 (2:1)	9.0-18	22	5	200	20	76
TP2L12S09S-1W	12 (2:1)	9.0-18	22	9	111	11	78
TP2L12S12S-1W	12 (2:1)	9.0-18	22	12	83	8	79
TP2L12S15S-1W	12 (2:1)	9.0-18	22	15	67	7	80
TP2L12S24S-1W	12 (2:1)	9.0-18	22	24	42	4	72
TP2L24D05S-1W	24 (2:1)	18-36	40	±5	±100	±10	78
TP2L24D09S-1W	24 (2:1)	18-36	40	±9	±55	±5	76
TP2L24D12S-1W	24 (2:1)	18-36	40	±12	±42	±4	78
TP2L24D15S-1W	24 (2:1)	18-36	40	±15	±33	±3	76
TP2L24S03S-1W	24 (2:1)	18-36	40	3.3	303	30	72
TP2L24S05S-1W	24 (2:1)	18-36	40	5	200	20	76
TP2L24S09S-1W	24 (2:1)	18-36	40	9	111	11	78
TP2L24S12S-1W	24 (2:1)	18-36	40	12	83	8	80
TP2L24S15S-1W	24 (2:1)	18-36	40	15	67	7	80
TP2L24S24S-1W	24 (2:1)	18-36	40	24	42	4	77
TP2L48D05S-1W	48 (2:1)	36-72	80	±5	±100	±10	76
TP2L48D12S-1W	48 (2:1)	36-72	80	±12	±42	±4	77
TP2L48D15S-1W	48 (2:1)	36-72	80	±15	±33	±3	75
TP2L48S05S-1W	48 (2:1)	36-72	80	5	200	20	76
TP2L48S09S-1W	48 (2:1)	36-72	80	9	111	11	78
TP2L48S12S-1W	48 (2:1)	36-72	80	12	83	8	80
TP2L48S15S-1W	48 (2:1)	36-72	80	15	67	7	80

3KVDC isolation with /3H at the end of the part number. for example TP2L24S05S-1W/3H.

**COMMON SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-50		125	°C
Temp.Rise at full loat			185	35	°C
Lead temperature	1.5mm from case for 10 seconds			300	°C
No-load power consumption			120		mW
Cooling		Free Air Convection			
Short circuit protection		Continuous.automatic recovery			
Case material		Plastic (UL94-V0)			
MTBF		1000			K hours
Weight			5		g

**ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Tested for 1minute and 1mA max	1500、3000			VDC
Isolation resistance	Test at 500 VDC	1			GΩ
Isolation capacitance	Input/Output,100KHZ/1V		35		

**OUTPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Output power	Refer to product program	0.1		1	W
Output voltage accuracy	Refer to recommended circuit		±1	±3	%
Load regulation	10% to100% load (TP2L-D-1W)		±0.5	±0.75	%
Load regulation	10% to100% load (TP2L-S-1W)		±0.5	±1.0	%
Line regulation	Input Voltage from low to high		±0.2	±0.5	%
Temperature drift ( Vout )	Refer to recommended circuit			±0.03	%/°C
Ripple & Noise	20MHZ Bandwidth		25	75	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 NOTES**

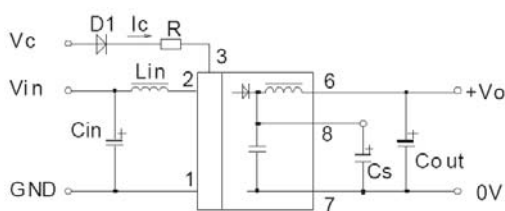
**External capacitance**

These converters will work without external capacitors, in order to guarantee the full parametric performance over the full line and load range we recommended you to use the value we listed at right side. All parts have been tested and characterized using the following values and test circuit.

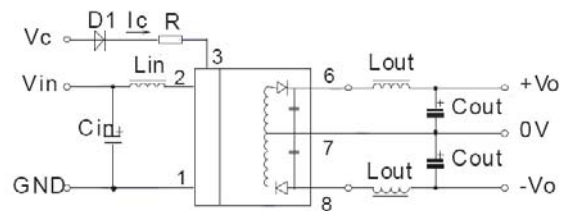
External Capacitor Table			
Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
3.3	1000	±5	330
5	680	±9	330
9	560	±12	220
12	470	±15	150
15	330	±24	100
24	220	-	-

**RECOMMENDED CIRCUIT**

Single Output

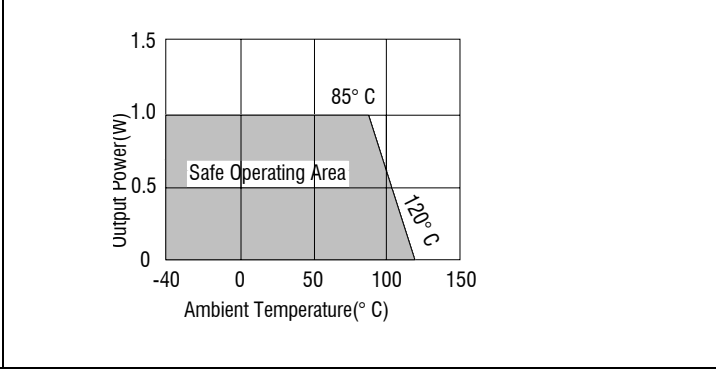


Dual Output

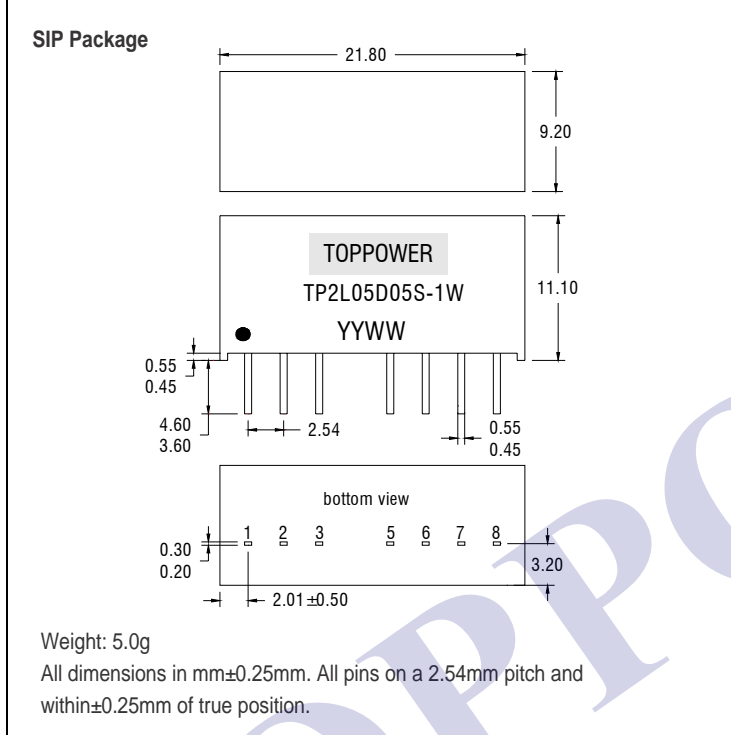


**SOLDERING INFORMATION** | **TEMPERATURE DERATING GRAPHS**

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. The series is backward compatible with Sn/Pb soldering systems.



**MECHANICAL DIMENSIONS** | **PIN CONNECTIONS**



8 PIN SIP		
Pin	Single Output	Dual Output
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5*	NC	NC
6	+V0	+V0
7	0V	0V
8	CS	-V0

\*This pin must have no external connection.

**RECOMMENDED FOOTPRINT DETAILS** | **TUBE OUTLINE DIMENSIONS**

