



**DESCRIPTION: 2W 1.5KVDC Isolated Wide Input Single And Dual Output DC/DC Converters**

TP2L-2W series are a range of isolated 2 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 range from -40 °C to 85 °C .

**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 80%	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	Low noise	External control

**SELECTION GUIDE**

Part Number	Input			Output			Efficiency (Typ.) %
	Voltage(VDC)			Voltage	Current(mA)		
	Rated	Range values	Max*	VDC	Max.	Min.	
TP2L05D05S-2W	5 (2:1)	4.5-9	11	±5	±200	±20	67
TP2L05D09S-2W	5 (2:1)	4.5-9	11	±9	±111	±11	71
TP2L05D12S-2W	5 (2:1)	4.5-9	11	±12	±83	±8	72
TP2L05D15S-2W	5 (2:1)	4.5-9	11	±15	±67	±7	73
TP2L05D24S-2W	5 (2:1)	4.5-9	11	±24	±42	±4	72
TP2S05S03S-2W	5 (2:1)	4.5-9	11	3.3	500	50	64
TP2L05S05S-2W	5 (2:1)	4.5-9	11	5	400	40	67
TP2L05S09S-2W	5 (2:1)	4.5-9	11	9	222	22	72
TP2L05S12S-2W	5 (2:1)	4.5-9	11	12	167	16	73
TP2L05S15S-2W	5 (2:1)	4.5-9	11	15	133	13	72
TP2L05S24S-2W	5 (2:1)	4.5-9	11	24	80	8	71
TP2L12D05S-2W	12 (2:1)	9-18	22	±5	±200	±20	73
TP2L12D09S-2W	12 (2:1)	9-18	22	±9	±111	±11	74
TP2L12D12S-2W	12 (2:1)	9-18	22	±12	±83	±8	78
TP2L12D15S-2W	12 (2:1)	9-18	22	±15	±67	±7	77
TP2L12S03S-2W	12 (2:1)	9-18	22	3.3	500	50	68
TP2L12S05S-2W	12 (2:1)	9-18	22	5	400	40	75
TP2L12S09S-2W	12 (2:1)	9-18	22	9	222	22	77
TP2L12S12S-2W	12 (2:1)	9-18	22	12	167	16	79
TP2L12S15S-2W	12 (2:1)	9-18	22	15	133	13	80
TP2L12S24S-2W	12 (2:1)	9-18	22	24	80	8	78
TP2L24D05S-2W	24 (2:1)	18-36	40	±5	±200	±20	76
TP2L24D09S-2W	24 (2:1)	18-36	40	±9	±111	±11	78
TP2L24D12S-2W	24 (2:1)	18-36	40	±12	±83	±8	79
TP2L24D15S-2W	24 (2:1)	18-36	40	±15	±67	±7	78
TP2L24S03S-2W	24 (2:1)	18-36	40	3.3	500	50	67
TP2L24S05S-2W	24 (2:1)	18-36	40	5	400	40	77
TP2L24S09S-2W	24 (2:1)	18-36	40	9	222	22	79
TP2L24S12S-2W	24 (2:1)	18-36	40	12	167	16	80
TP2L24S15S-2W	24 (2:1)	18-36	40	15	133	13	80
TP2L24S24S-2W	24 (2:1)	18-36	40	24	80	8	80
TP2L48D05S-2W	48 (2:1)	36-72	80	±5	±200	±20	75
TP2L48D09S-2W	48 (2:1)	36-72	80	±9	±111	±11	78
TP2L48D12S-2W	48 (2:1)	36-72	80	±12	±83	±8	79
TP2L48D15S-2W	48 (2:1)	36-72	80	±15	±67	±7	79
TP2L48S03S-2W	48 (2:1)	36-72	80	3.3	500	50	71
TP2L48S05S-2W	48 (2:1)	36-72	80	5	400	40	75
TP2L48S09S-2W	48 (2:1)	36-72	80	9	222	22	76
TP2L48S12S-2W	48 (2:1)	36-72	80	12	167	16	78
TP2L48S15S-2W	48 (2:1)	36-72	80	15	133	13	78
TP2L48S24S-2W	48 (2:1)	36-72	80	24	80	8	80

3KVDC isolation with /3H at the end of the part number. for example TP2L24S05S-2W/3H.

**COMMON SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	°C
Temp.Rise at full load			15		°C
Lead temperature	1.5mm from case for 10 seconds			300	°C
No-load power consumption			300		mW
Cooling	Free Air Convection				
Short circuit protection	Continuous. automatic recovery				
Case material	Plastic (UL94-V0)				
MTBF		1000			K hours
Weight			6		g

**ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1500, 3000			VDC
Isolation Resistance	Test at 500VDC	1			GΩ
Isolation Capacitance	Input/Output, 100KHz/1V		80		pF

**OUTPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Output power	Refer to product program	0.3		3	W
Positive voltage accuracy	Refer to recommended circuit		±1	±3	%
Negative voltage accuracy	Refer to recommended circuit		±3	±5	%
Load regulation	10% to 100% load (TP2L-D-3W)		±0.5	±0.75	%
Load regulation	10% to 100% load (TP2L-S-3W)		±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		50	100	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**

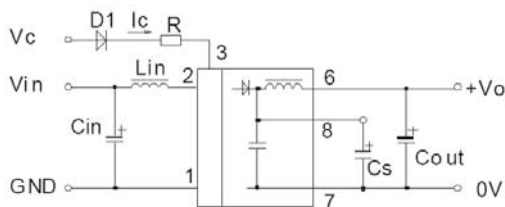
**External capacitance**

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.

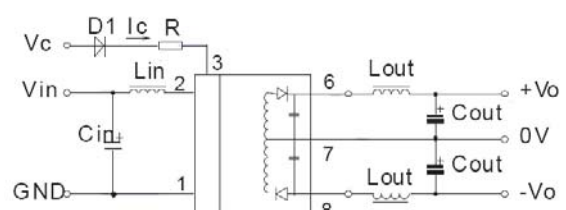
External Capacitor Table			
Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
3.3	2200	±5	680
5	1000	±9	470
9	680	±12	330
12	470	±15	220
15	330	-	-
24	220	-	-

**RECOMMENDED CIRCUIT**

**Single Output**

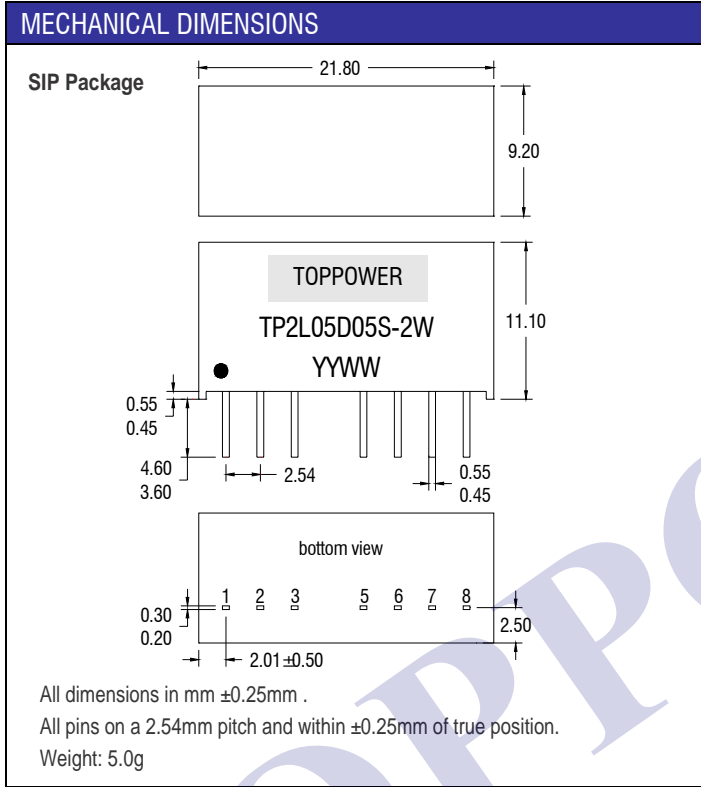
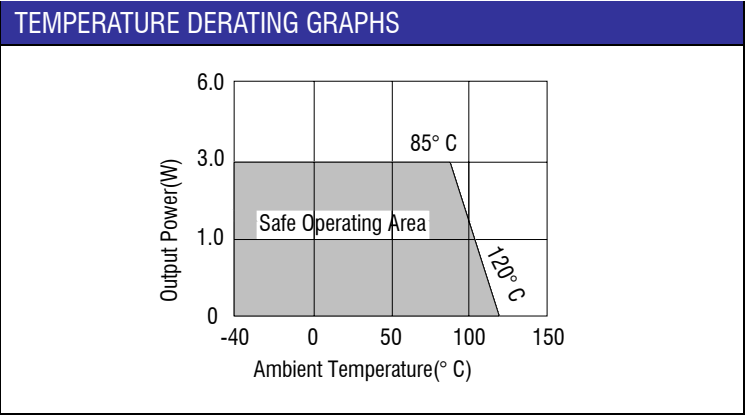


**Dual Output**



**SOLDERING INFORMATION**

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.



**PIN CONNECTIONS**

8 PIN SIP		
Pin	Single	Dual
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.

