



**DESCRIPTION: 2W Isolated Wide Input Single Output DC/DC Converters**

TP2L 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 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	1KVDC Isolation/3KVDC 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	Low noise	External control

**SELECTION GUIDE**

Part Number	Input voltage		Rated output voltage	Output current		Efficiency
	Voltage(VDC)			Min. Load	Full load	
	Rated	Range values	(V)	mA	mA	%
TP2L0503S	5 (2:1)	4.5-9	3.3	150	600	65
TP2L0505S	5 (2:1)	4.5-9	5	100	400	65
TP2L0509S	5 (2:1)	4.5-9	9	56	220	70
TP2L0512S	5 (2:1)	4.5-9	12	43	168	70
TP2L0515S	5 (2:1)	4.5-9	15	33	134	74
TP2L1205S	12 (2:1)	9-18	5	100	400	74
TP2L1209S	12 (2:1)	9-18	9	56	220	78
TP2L1212S	12 (2:1)	9-18	12	43	168	80
TP2L1215S	12 (2:1)	9-18	15	33	134	81
TP2L2405S	24 (2:1)	18-36	5	100	400	75
TP2L2409S	24 (2:1)	18-36	9	56	220	80
TP2L2412S	24 (2:1)	18-36	12	43	168	83
TP2L2415S	24 (2:1)	18-36	15	33	134	83
TP2L4805S	48 (2:1)	36-72	5	100	400	73
TP2L4809S	48 (2:1)	36-72	9	56	220	80
TP2L4812S	48 (2:1)	36-72	12	43	168	80
TP2L4815S	48 (2:1)	36-72	15	33	134	81

**GENERAL CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Control pin (CTRL) input current	Please refer to control pin application note	6	10	15	mA
Switching frequency	Max. rated load to Min. rated load, Vin Min. to Vin. Max.	90		610	kHz

**INPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage range	5V input voltage	4.5	5	9	VDC
Input Voltage range	12V input voltage	9	12	18	VDC
Input Voltage range	24V input voltage	18	24	36	VDC
Input Voltage range	48V input voltage	36	48	72	VDC

**OUTPUT CHARACTERISTICS**

Parameter	Conditions	Typ.	MAX.	Units
Voltage set point accuracy(with external input/output capacitors)	All TP2L05/12 input voltage types	±1	±3	%
Voltage set point accuracy(with external input/output capacitors)	All TP2L24/48 input voltage types	±2	±5	%
Line regulation (with external input/output capacitors)	All TP2L05/12 input types, low line to high line	0.06	0.5	%
Line regulation (with external input/output capacitors)	All TP2L24/48 input types, low line to high line	0.05	0.4	%
Load regulation (with external input/output capacitors)	All TP2L05/12 input types, minimum load to rated load	0.2	0.8	%
Load regulation (with external input/output capacitors)	All TP2L24/48 input types, minimum load to rated load	0.2	0.8	%
Shutdown power	+Vin nominal	2.8		mW

**ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Tested for 1 second	1000		3000	VDC
Resistance	VISO = 1000VDC	1			GΩ

**TEMPERATURE CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Operation		-40		85	°C
Storage		-50		130	°C
Cooling	Free air convection				

**ABSOLUTE MAXIMUM RATINGS**

Short-circuit protection	Continuous
Lead temperature 1.5mm from case for 10 seconds	300°C
Control pin input current	15mA
Input voltage 05	10V
Input voltage 12	20V
Input voltage 24	40V
Input voltage 48	80V

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

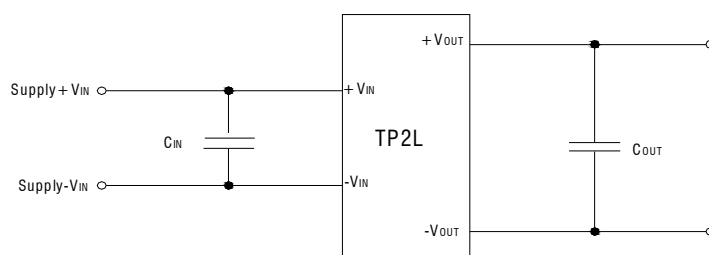
**APPLICATION NOTES**

**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.

Input Voltage (V)	Value	
	Cin	Cout
5&12	100uF,25V	100uF,25V
24&48	10uF,200V	100uF,25V

**Test Circuit**



**Pin 8 (CS)**

This pin provides a connection point to the main internal reservoir capacitor. Additional capacitance can be added between pin8 and pin 7. Any lower ESR capacitor will remove ripple and noise.

