



2W Isolated Wide Input Single Output DC/DC Converters

DESCRIPTION

The TP2L is a series of high performance miniature DC/DC converters having regulated outputs over the wide temperature range of -40°C to 85°C. The input voltage range is 2:1 isolation is 1kVDC. Continuous short circuit protection, external control and extremely small SIP packaging.

FEATURES

RoHS compliant	2:1 wide range voltage input	Continuous short circuit protection with current foldback
Operating temperature range -40°C to 85°C	Low regulation	1kVDC Isolation
Efficiency to 83%	Power density 0.91W/cm ³	Input voltage: 5V, 12V, 24V, 48V
Output voltage: 5V, 9V, 12V, 15V	Low noise	External control

SELECTION GUIDE

Order code	Input voltage	Rated output voltage	Output current		Input current	Efficiency	Isolation capacitance
			Min. Load	Full load			
	V (Nom.)	V	mA	mA	mA	%	pF
TP2L0505S	5	5	100	400	605	65	27
TP2L0509S	5	9	56	220	557	70	27
TP2L0512S	5	12	43	168	558	70	27
TP2L0515S	5	15	33	134	550	74	27
TP2L1205S	12	5	100	400	227	74	40
TP2L1209S	12	9	56	220	210	78	40
TP2L1212S	12	12	43	168	209	80	47
TP2L1215S	12	15	33	134	205	81	47
TP2L2405S	24	5	100	400	111	75	37
TP2L2409S	24	9	56	220	100	80	40
TP2L2412S	24	12	43	168	100	83	51
TP2L2415S	24	15	33	134	100	83	58
TP2L4805S	48	5	100	400	58	73	40
TP2L4809S	48	9	56	220	52	80	40
TP2L4812S	48	12	43	168	50	80	55
TP2L4815S	48	15	33	134	50	81	65

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage range	05V input voltage	4.5	5	9	VDC
	12V input voltage	9	12	18	
	24V input voltage	18	24	36	
	48V input voltage	36	48	72	

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

OUTPUT CHARACTERISTICS

Parameter	Conditions	TYP.	MAX.	Units
Voltage set point accuracy(with external input/output capacitors)	All TP2L05/12 input voltage types	±1	±3	%
	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	%
	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	%
	All TP2L24/48 input types, minimum load to rated load	0.2	0.8	
Shutdown power	+VIN nominal	2.8		mW

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

ISOLATION CHARACTERISTICS

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

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

TEMPERATURE CHARACTERISTICS

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

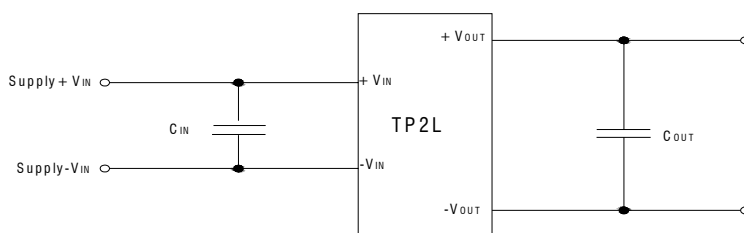
APPLICATION NOTES

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.

Value		
Input Volatage(V)	C _{IN}	C _{OUT}
5 & 12	100uF,25V	100uF,25V
24 & 48	10uF,200V	100uF,25V

Test Circuit



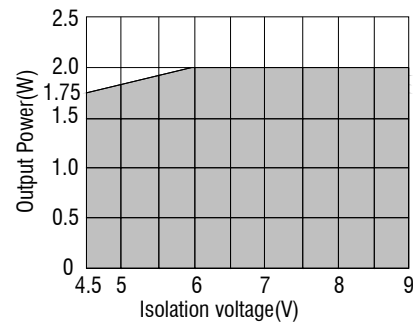
Pin 8 (CS)

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.

RoHS COMPLIANCE INFORMATION

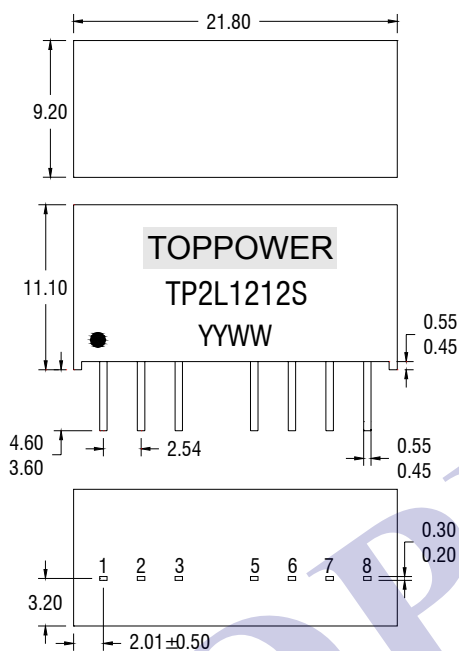
This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. The series is backward compatible with Sn/Pb soldering systems.

NDL05 POWER DERATING CURVE



PACKAGE SPECIFICATIONS

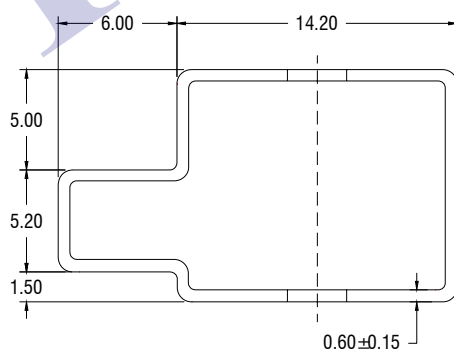
MECHANICAL DIMENSIONS



Weight: 5.0g

All dimensions in mm ± 0.25 mm. All pins on a 2.54mm pitch and within ± 0.25 mm of true position.

TUBE OUTLINE DIMENSIONS



All dimensions in mm ± 0.5 mm.
Tube length : 520mm ± 2 mm.

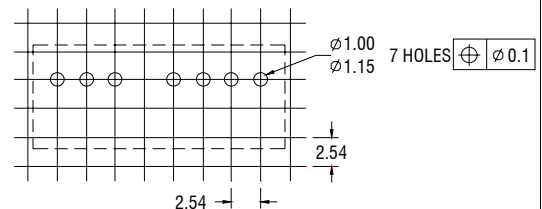
Tube Quantity : 23

PIN CONNECTIONS

Pin	Function
1	-Vin
2	+Vin
3	CTRL
5	IC
6	+Vout
7	-Vout
8	Cs

*This pin must have no external connection to anything will connection and is used for mechanical reasons, External result in converter failure

RECOMMENDED FOOTPRINT DETAILS



All dimensions in mm ± 0.5 mm.