



**DESCRIPTION: 3W 1KVDC Isolated Single Output DC/DC Converters**

The TP2S series are a range of isolated 3 Watt converters in a low profile DIP 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, the internal SMD construction makes it possible to offer a product with high performance at low cost.

**FEATURES**

RoHS compliant	Industry standard footprint	Single isolated output
Short circuit protection	Operating temperature : -40°C to +85°C	Low profile 24 pin case
2:1 Wide input range	Input voltage : 5V, 12V, 24V ,48V	Output voltage:3.3V, 5V, 12V ,15V
Footprint 4.73cm <sup>2</sup>	UL94V-0 Package materials	1KVDC isolation

**SELECTION GUIDE**

Part Number	Input Voltage		Rated Output Voltage	Output Current		Efficiency
	Voltage(VDC)			Min. Load	Full load	
	Rated	Range values	(V)	mA	mA	%
TP2S0503	5 (2:1)	4.5-9	3.3	226	908	62
TP2S0505	5 (2:1)	4.5-9	5	150	600	70
TP2S0512	5 (2:1)	4.5-9	12	64	252	76
TP2S0515	5 (2:1)	4.5-9	15	49	201	78
TP2S1203	12 (2:1)	9-18	3.3	226	908	71
TP2S1205	12 (2:1)	9-18	5	150	600	72
TP2S1212	12 (2:1)	9-18	12	64	252	75
TP2S1215	12 (2:1)	9-18	15	49	201	76
TP2S2403	24 (2:1)	18-36	3.3	226	908	72
TP2S2405	24 (2:1)	18-36	5	150	600	78
TP2S2412	24 (2:1)	18-36	12	64	252	79
TP2S2415	24 (2:1)	18-36	15	49	201	84
TP2S4803	48 (2:1)	36-72	3.3	226	908	71
TP2S4805	48 (2:1)	36-72	5	150	600	75
TP2S4812	48 (2:1)	36-72	12	64	252	80
TP2S4815	48 (2:1)	36-72	15	49	201	80

**INPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	All TP2S05	4.5	5	9	V
Voltage range	All TP2S12	9	12	18	V
Voltage range	All TP2S24	18	24	36	V
Voltage range	All TP2S48	36	48	72	V

**OUTPUT CHARACTERISTICS**

Parameter	Conditions	Min	Typ	Max.	Units
Voltage set point accuracy	With external input/output capacitors		±1	±3	%
Line regulation	Low line to high line with external input/ output capacitors		0.2	0.5	%
Load regulation	Minimum load to rated load with external input/ output capacitors				%
Load regulation	Minimum load to rated load with external input/ output capacitors			1.4	%

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

**ABSOLUTE MAXIMUM RATINGS**

Short-circuit protection	Continuous
Lead temperature 1.5mm from case for 10 seconds	300°C
Minimum output load for specification	25% of rated output
05V input types	10V
12 input types	20V
24 input types	40V
48 input types	80V
Free air space	10mm Min. around component

**GENERAL CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	100% to 25% load, VIN Min. to Max.	70		660	kHz

**TEMPERATURE CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Operation		-40		85	°C
Storage		-50		130	°C
Case temperature rise above ambient			40		°C

**TEMPERATURE CHARACTERISTICS**

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

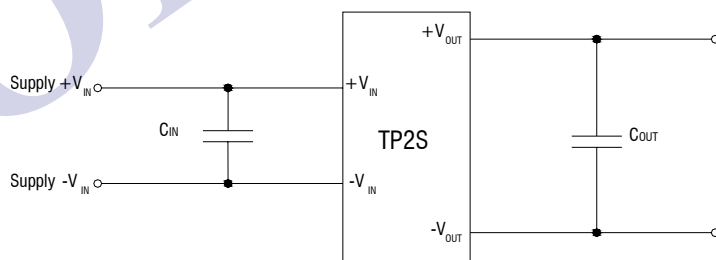
**RECOMMENDED INPUT & OUTPUT CAPACITORS**

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

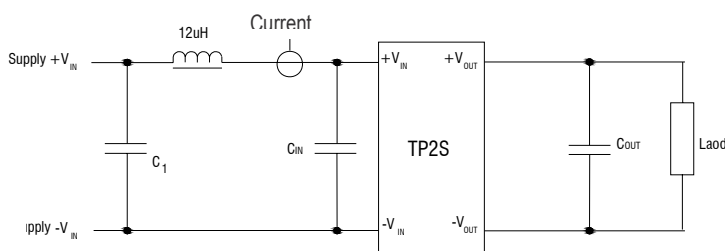
Input Voltage	Cin
5V, 12V	100µF, 25V (0.25 Ω at 100kHz)
24V, 48V	10µF, 100V (1.5 Ω at 100kHz)

Output Voltage	Cout
3.3V, 5V	220µF, 16V (0.12 Ω at 100kHz)
12V, 15V	100µF, 25V (0.25 Ω at 100kHz)

**TEST CIRCUIT**



**REFLECTED RIPPLE CURRENT MEASUREMENT**



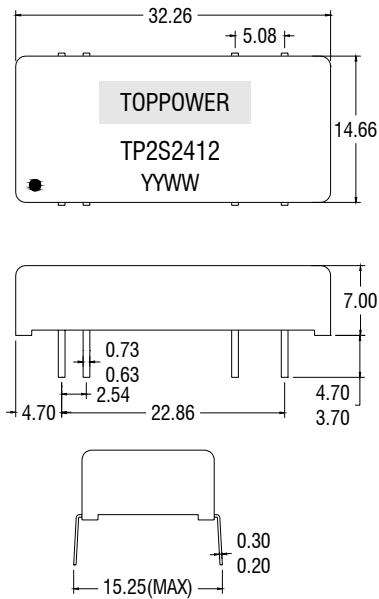
C1 = 220µF, ESR < 0.1Ω at 100kHz

**MINIMUM LOAD**

The minimum load for correct operation is 25% of the full rated load across the specified input voltage range.

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

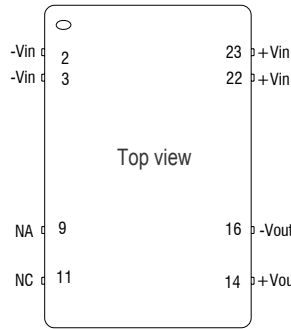
**DIP Package**



Weight: 6.2g

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

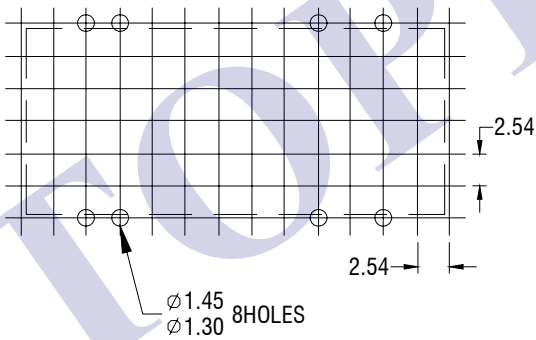
**PIN CONNECTIONS**



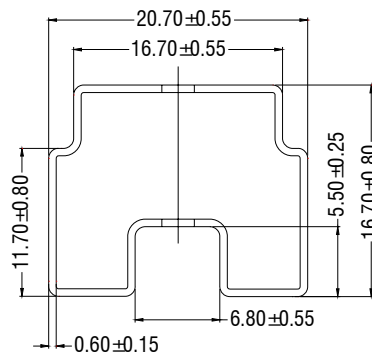
24 PIN DIP	
Pin	Function
2	-Vin
3	-Vin
9	NA
11	NC
14	+Vout
16	-Vout
22	+Vin
23	+Vin

NA - Not available for electrical connection.  
NC-No internal connection

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



All dimensions in mm  $\pm 0.25$ m. All pins on a .54mm pitch and within  $\pm 0.25$ mm of true position.



All dimensions in mm  $\pm 0.5$ mm.

Tube length : 520mm  $\pm 2$ mm. Tube Quantity:15PCS

**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.