

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

The TPV series are miniature, isolated 1W DC/DC converters in a SIP and DIP package. They offer the ideal solution in many space critical applications for board level power distribution. The Internal SMD construction makes it possible to offer a product with high performance at low cost. The series offers smaller size, improved efficiency and 3KVDC isolation.



**FEATURES**

RoHS compliant, CE certification	Efficiency to 80%	Power density up to 0.85W/cm <sup>3</sup>
Single or dual output	UL 94V-0 package material	Power sharing on dual output
Footprint from 1.17cm <sup>2</sup>	Industry standard pinout	3KVDC isolation (1 minute)
Input voltage: 24V, 48V	Output voltage: 3.3V,5V, 9V, 12V, 15V / ±5V, ±9V, ±12V, ±15V	Operating temperature: -40°C to 85°C

**SELECTION GUIDE**

Part Number	Nominal Input Voltage	Output Voltage	Output Current(Max./Min)	Efficiency	Package Style
	V	V	mA	%	
TPV2405DA	24	5	200/20	71	DIP
TPV2409DA	24	9	111/11.1	79	DIP
TPV2412DA	24	12	84/8.4	80	DIP
TPV2415DA	24	15	67/6.7	81	DIP
TPV2403SA	24	3.3	303/30.3	70	SIP
TPV2405SA	24	5	200/20	71	SIP
TPV2409SA	24	9	111/11.1	79	SIP
TPV2412SA	24	12	84/8.4	80	SIP
TPV2415SA	24	15	67/6.7	81	SIP
TPV2424SA	24	24	42/4.2	77	SIP
TPV4805DA	48	5	200/20	71	DIP
TPV4809DA	48	9	111/11.1	79	DIP
TPV4812DA	48	12	84/8.4	80	DIP
TPV4815DA	48	15	67/6.7	81	DIP
TPV4803SA	48	3.3	303/30.3	71	SIP
TPV4805SA	48	5	200/20	71	SIP
TPV4809SA	48	9	111/11.1	79	SIP
TPV4812SA	48	12	84/8.4	80	SIP
TPV4815SA	48	15	67/6.7	81	SIP
TPV2405D	24	±5	±100/±10	71	DIP
TPV2409D	24	±9	±56/±5.6	79	DIP
TPV2412D	24	±12	±41/±4.1	80	DIP
TPV2415D	24	±15	±33/±3.3	81	DIP
TPV2405S	24	±5	±100/±10	71	SIP
TPV2409S	24	±9	±56/±5.6	79	SIP
TPV2412S	24	±12	±41/±4.1	80	SIP
TPV2415S	24	±15	±33/±3.3	81	SIP
TPV4805D	48	±5	±100/±10	71	DIP
TPV4809D	48	±9	±56/±5.6	79	DIP
TPV4812D	48	±12	±41/±4.1	80	DIP
TPV4815D	48	±15	±33/±3.3	81	DIP
TPV4805S	48	±5	±100/±10	71	SIP
TPV4809S	48	±9	±56/±5.6	79	SIP
TPV4812S	48	±12	±41/±4.1	80	SIP
TPV4815S	48	±15	±33/±3.3	81	SIP

Add suffix "P" for continuous short circuit protection, for example TPV2405SAP.

**INPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	24V input variants	22	24	26.5	V
Voltage range	48V input variants	43	48	53	V

**ABSOLUTE MAXIMUM RATINGS**

Short-circuit protection	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage $V_{in}$ , TPV24 variants	28V
Input voltage $V_{in}$ , TPV48 variants	54V

**OUTPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	$T_A = -40^{\circ}\text{C}$ to $85^{\circ}\text{C}$			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High $V_{in}$ to low $V_{in}$			1.32	%/%

**ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Tested for 1 minute	3000			VDC
Resistance	$V_{iso} = 1000\text{VDC}$	1			$G\Omega$

**GENERAL CHARACTERISTICS**

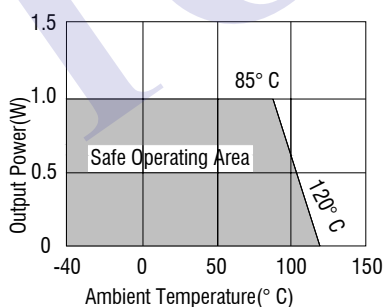
Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	All input variants		110		kHz

**TEMPERATURE CHARACTERISTICS**

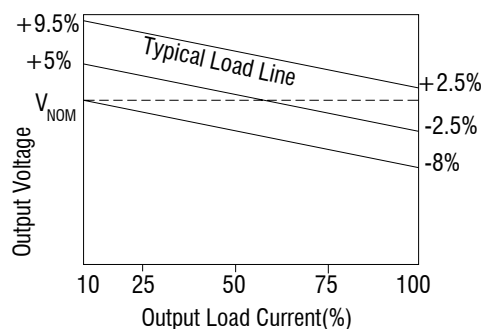
Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output variants	-40		85	$^{\circ}\text{C}$
Storage		-55		130	$^{\circ}\text{C}$
Cooling	Free air convection				

All specifications typical at  $T_A = 25^{\circ}\text{C}$ , nominal input voltage and rated output current unless otherwise specified.

**TEMPERATURE DERATING GRAPHS**



**TOLERANCE ENVELOPES**

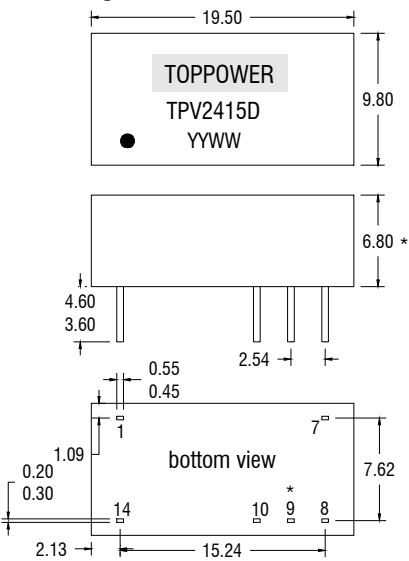


**SOLDERING INFORMATION**

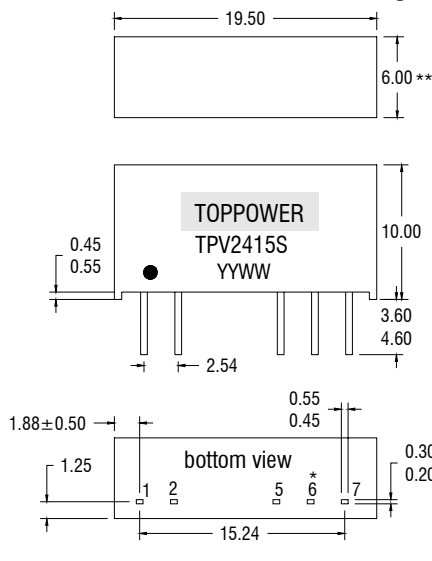
This series is compatible with RoHS soldering systems with a peak wave solder temperature of  $300^{\circ}\text{C}$  for 10 seconds. Both SIP and DIP types in this series are backward compatible with Sn/Pb soldering systems.

**MECHANICAL DIMENSIONS**

**DIP Package**



**SIP Package**



Pin not fitted on single output variants. All dimensions in mm  $\pm 0.25$ mm.  
 \*7.70 for 48V variants                      \*\*7.50 for 48V variants  
 All pins on a 2.54mm pitch and within  $\pm 0.25$ mm of true position.  
 Weight: 2.11g (DIP and SIP)

**PIN CONNECTIONS**

**Dual output variants  
14 PIN DIP**

Pin	Function
1	-Vin
7	NC
8	+Vout
9	0V
10	-Vout
14	+Vin

**7 PIN SIP**

Pin	Function
1	+Vin
2	-Vin
5	-Vout
6	0V
7	+Vout

**Single output variants  
14 PIN DIP**

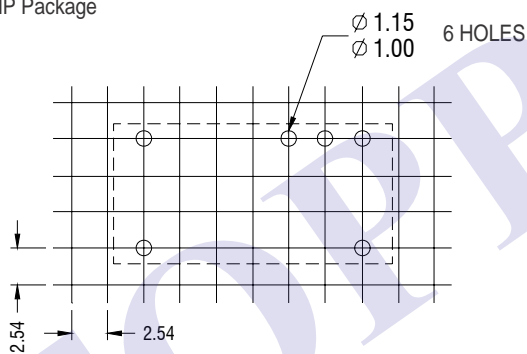
Pin	Function
1	-Vin
7	NC
8	+Vout
10	-Vout
14	+Vin

**7 PIN SIP**

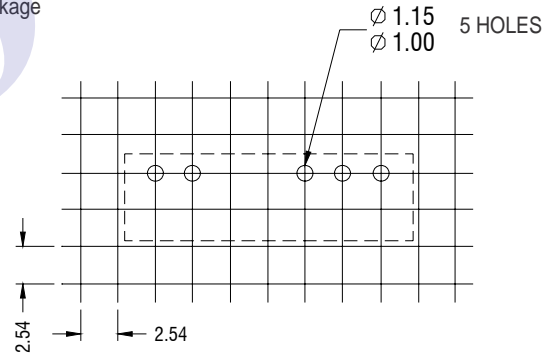
Pin	Function
1	+Vin
2	-Vin
5	-Vout
7	+Vout

**RECOMMENDED FOOTPRINT DETAILS**

**14Pin DIP Package**

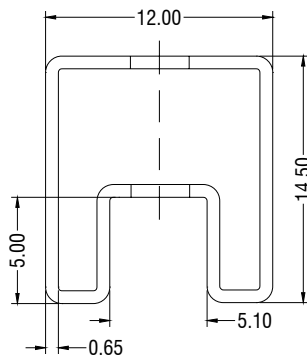


**7Pin SIP Package**

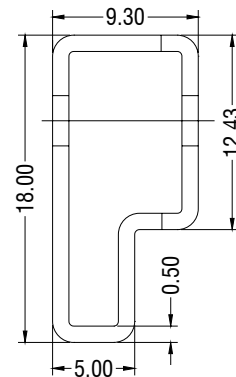


**TUBE OUTLINE DIMENSIONS**

**14Pin DIP Tube**



**7Pin SIP Tube**



Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm.

Tube length (14 Pin DIP) : 520mm  $\pm 2$ mm.

Tube length (7 Pin DIP) : 520mm  $\pm 2$ mm.

Tube Quantity : 25PCS