

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 ³ |
| Single or dual output | UL 94V-0 package material | Power sharing on dual output |
| Footprint from 1.17cm ² | 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 105°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°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 | Viso= 1000VDC | 1 | | | GΩ |

GENERAL CHARACTERISTICS

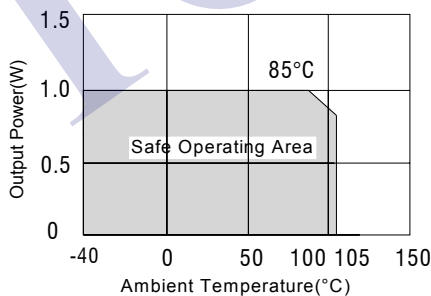
| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------------|--------------------|------|------|------|-------|
| Switching frequency | All input variants | | 110 | | kHz |

TEMPERATURE CHARACTERISTICS

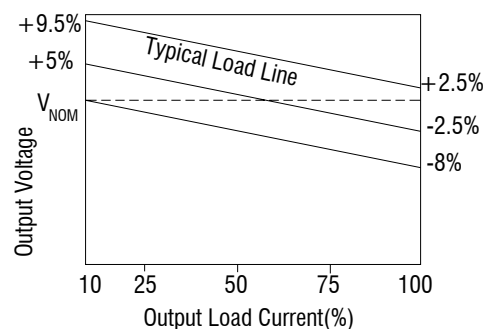
| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------|---|------|------|------|-------|
| Specification | Derating if the temperature $\geq 85^{\circ}\text{C}$ | -40 | | 105 | °C |
| Storage | | -55 | | 130 | °C |
| Cooling | Free air convection | | | | |

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

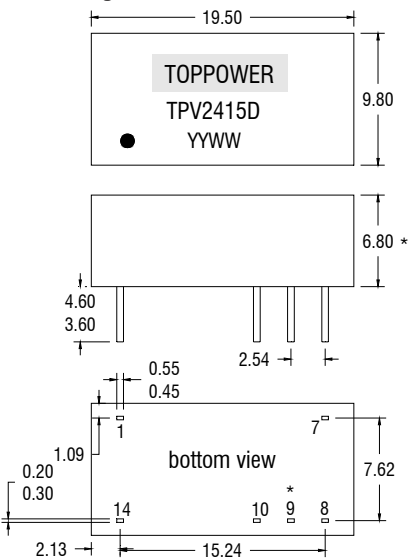


SOLDERING INFORMATION

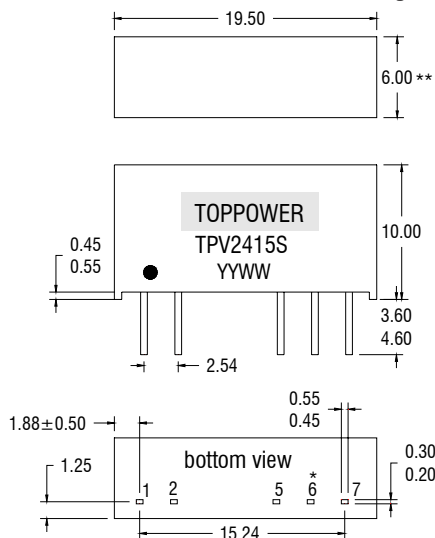
This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. Both SIP and DIP types in this series are backward compatible with Sn/Pb soldering systems.

MECHANICAL DIMENSIONS

DIP Package



SIP Package



Pin not fitted on single output variants. All dimensions in mm ± 0.25 mm.
 *7.70 for 48V variants **7.50 for 48V variants
 All pins on a 2.54mm pitch and within ± 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**

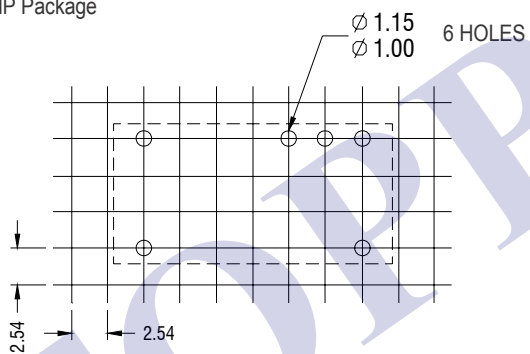
| Pin | Function |
|-----|----------|
| 1 | -Vin |
| 7 | NC |
| 8 | +Vout |
| 10 | -Vout |
| 14 | +Vin |

7 PIN SIP

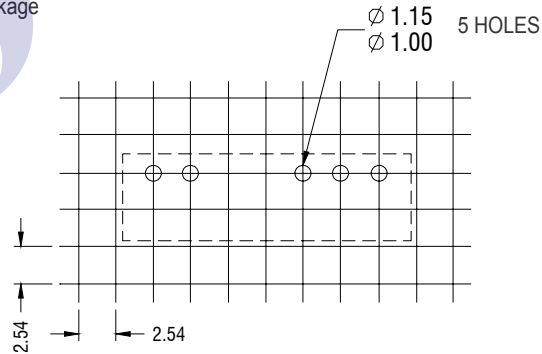
| Pin | Function |
|-----|----------|
| 1 | +Vin |
| 2 | -Vin |
| 5 | -Vout |
| 7 | +Vout |

RECOMMENDED FOOTPRINT DETAILS

14Pin DIP Package

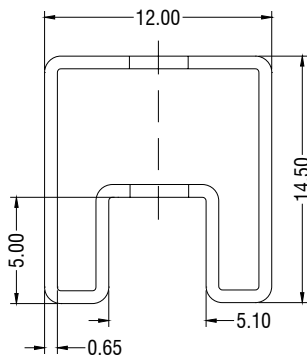


7Pin SIP Package

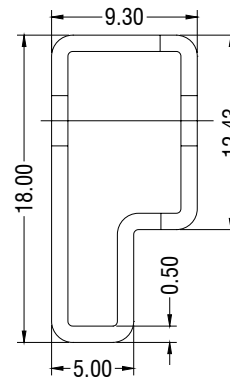


TUBE OUTLINE DIMENSIONS

14Pin DIP Tube



7Pin SIP Tube



Unless otherwise stated all dimensions in mm ± 0.5 mm.

Tube length (14 Pin DIP) : 520mm ± 2 mm.

Tube length (7 Pin DIP) : 520mm ± 2 mm.

Tube Quantity : 25PCS