



DESCRIPTION: 0.11W 3KVDC Isolated Single & Dual Output DC/DC Converters

The TPV-W1 series are miniature, isolated 0.1W 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 | Efficiency to 80% | Power density up to 0.85W/cm ³ |
| Operating temperature: -40°C to 85°C | Single or dual output | UL 94V-0 package material |
| Power sharing on dual output | 3KVDC isolation (1 minute) | Input voltage: 3.3V,5V,9V,12V,15V |
| CE certification | / | Output voltage: 3.3V,5V,9V,12V,15V,24V /±5V,±9V,±12V,±15V |

SELECTION GUIDE

| Part Number | Nominal Input Voltage | Output Voltage | Output Current (Max./Min) | Efficiency | Package Style |
|--------------|-----------------------|----------------|---------------------------|------------|---------------|
| | V | V | mA | % | |
| TPV0303DA-W1 | 3.3 | 3.3 | 30.3/3.03 | 72 | DIP |
| TPV0305DA-W1 | 3.3 | 5 | 20.0/2.0 | 72 | DIP |
| TPV0503DA-W1 | 5 | 3.3 | 30.3/3.03 | 73 | DIP |
| TPV0505DA-W1 | 5 | 5 | 20.0/2.0 | 72 | DIP |
| TPV0509DA-W1 | 5 | 9 | 11.1/1.11 | 75 | DIP |
| TPV0512DA-W1 | 5 | 12 | 8.4/0.84 | 76 | DIP |
| TPV0515DA-W1 | 5 | 15 | 6.7/0.67 | 78 | DIP |
| TPV0524DA-W1 | 5 | 24 | 4.2/0.42 | 79 | DIP |
| TPV0303SA-W1 | 3.3 | 3.3 | 30.3/3.03 | 72 | SIP |
| TPV0305SA-W1 | 3.3 | 5 | 20.0/2.0 | 72 | SIP |
| TPV0503SA-W1 | 5 | 3.3 | 30.3/3.03 | 73 | SIP |
| TPV0505SA-W1 | 5 | 5 | 20.0/2.0 | 83 | SIP |
| TPV0509SA-W1 | 5 | 9 | 11.1/1.11 | 75 | SIP |
| TPV0512SA-W1 | 5 | 12 | 8.4/0.84 | 76 | SIP |
| TPV0515SA-W1 | 5 | 15 | 6.7/0.67 | 78 | SIP |
| TPV0524SA-W1 | 5 | 24 | 4.2/0.42 | 79 | SIP |
| TPV0909SA-W1 | 9 | 9 | 11.1/1.11 | 79 | SIP |
| TPV0915SA-W1 | 9 | 15 | 6.7/0.67 | 82 | SIP |
| TPV1205DA-W1 | 12 | 5 | 20.0/2.0 | 72 | DIP |
| TPV1209DA-W1 | 12 | 9 | 11.1/1.11 | 75 | DIP |
| TPV1212DA-W1 | 12 | 12 | 8.4/0.84 | 77 | DIP |
| TPV1215DA-W1 | 12 | 15 | 6.7/0.67 | 78 | DIP |
| TPV1205SA-W1 | 12 | 3.3 | 30.3/3.03 | 70 | SIP |
| TPV1205SA-W1 | 12 | 5 | 20.0/2.0 | 72 | SIP |
| TPV1209SA-W1 | 12 | 9 | 11.1/1.11 | 75 | SIP |
| TPV1212SA-W1 | 12 | 12 | 8.4/0.84 | 77 | SIP |
| TPV1215SA-W1 | 12 | 15 | 6.7/0.67 | 78 | SIP |
| TPV1224SA-W1 | 12 | 24 | 4.2/0.42 | 79 | SIP |
| TPV1505DA-W1 | 15 | 5 | 20.0/2.0 | 69 | DIP |
| TPV1505SA-W1 | 15 | 5 | 20.0/2.0 | 72 | SIP |
| TPV1509SA-W1 | 15 | 9 | 11.1/1.11 | 73 | SIP |
| TPV1512SA-W1 | 15 | 12 | 8.4/0.84 | 74 | SIP |
| TPV1515SA-W1 | 15 | 15 | 6.7/0.67 | 78 | SIP |
| TPV0505D-W1 | 5 | ±5 | ±10.0/±1.0 | 72 | DIP |
| TPV0509D-W1 | 5 | ±9 | ±5.5/±0.55 | 77 | DIP |
| TPV0512D-W1 | 5 | ±12 | ±4.3/±0.43 | 78 | DIP |
| TPV0515D-W1 | 5 | ±15 | ±3.3/±0.33 | 80 | DIP |
| TPV0505S-W1 | 5 | ±5 | ±10.0/±1.0 | 72 | SIP |
| TPV0509S-W1 | 5 | ±9 | ±5.5/±0.55 | 77 | SIP |
| TPV0512S-W1 | 5 | ±12 | ±4.3/±0.43 | 78 | SIP |
| TPV0515S-W1 | 5 | ±15 | ±3.3/±0.33 | 80 | SIP |
| TPV0518S-W1 | 5 | ±18 | ±2.7/±0.27 | 79 | SIP |
| TPV1205D-W1 | 12 | ±5 | ±10.0/±1.0 | 72 | DIP |
| TPV1209D-W1 | 12 | ±9 | ±5.5/±0.55 | 74 | DIP |
| TPV1212D-W1 | 12 | ±12 | ±4.3/±0.43 | 76 | DIP |
| TPV1215D-W1 | 12 | ±15 | ±3.3/±0.33 | 77 | DIP |

SELECTION GUIDE

| Part Number | Nominal Input Voltage | Output Voltage | Output Current (Max./Min) | Efficiency | Package Style |
|-------------|-----------------------|----------------|---------------------------|------------|---------------|
| | V | V | mA | % | |
| TPV1205S-W1 | 12 | ±5 | ±10.0/±1.0 | 72 | SIP |
| TPV1209S-W1 | 12 | ±9 | ±5.5/±0.55 | 74 | SIP |
| TPV1212S-W1 | 12 | ±12 | ±4.3/±0.43 | 76 | SIP |
| TPV1215S-W1 | 12 | ±15 | ±3.3/±0.33 | 77 | SIP |
| TPV1505S-W1 | 15 | ±5 | ±10.0/±1.0 | 72 | SIP |
| TPV1512S-W1 | 15 | ±12 | ±4.3/±0.43 | 74 | SIP |
| TPV1515S-W1 | 15 | ±15 | ±3.3/±0.33 | 78 | SIP |

Add suffix "P" for continuous short circuit protection, for example TPV0505SA-W1P.

INPUT CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------|---------------------|------|------|------|-------|
| Voltage range | 3.3V input variants | 2.9 | 3.3 | 3.6 | V |
| Voltage range | 5V input variants | 4.4 | 5 | 5.6 | V |
| Voltage range | 9V input variants | 8.03 | 9 | 10 | V |
| Voltage range | 12V input variants | 11 | 12 | 13.3 | V |
| Voltage range | 15V input variants | 13.4 | 15 | 16.4 | V |

ABSOLUTE MAXIMUM RATINGS

| | |
|---|----------|
| Short-circuit protection | 1 second |
| Lead temperature 1.5mm from case for 10 seconds | 300°C |
| Internal power dissipation | 540mW |
| Input voltage Vin, TPV03 variants | 5.5V |
| Input voltage Vin, TPV05 variants | 6.6V |
| Input voltage Vin, TPV09 variants | 11.5V |
| Input voltage Vin, TPV12 variants | 14.5V |
| Input voltage Vin, TPV15 variants | 18V |

OUTPUT CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------------|------------------------|------|------|------|-------|
| Rated Power | TA=-45°C to 85°C | | | 1 | W |
| Voltage Set Point Accuracy | See tolerance envelope | | | | |
| Line regulation | High Vin to low Vin | | 1.0 | 1.2 | %/% |

ISOLATION CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------------|---------------------|------|------|------|-------|
| Isolation test voltage | Tested for 1 minute | 3000 | | | VDC |
| Resistance | Viso= 1000VDC | 1 | | | G°C |

GENERAL CHARACTERISTICS

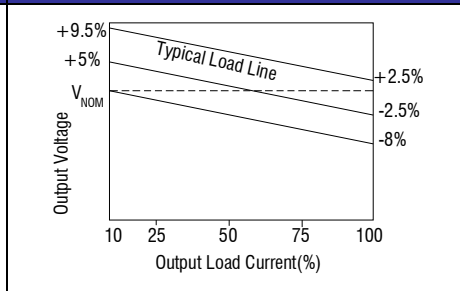
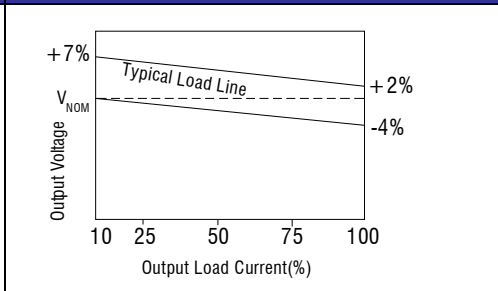
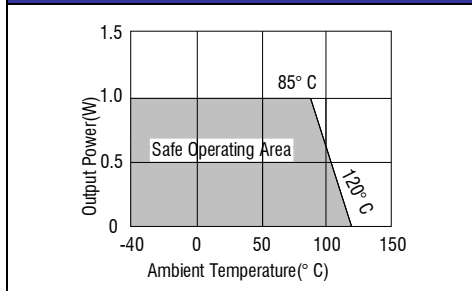
| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------------|---------------------|------|------|------|-------|
| Switching frequency | 3.3V input variants | | 95 | | kHz |
| Switching frequency | 5V input variants | | 120 | 140 | kHz |
| Switching frequency | 9V input variants | | 120 | 140 | kHz |
| Switching frequency | 12V input variants | | 145 | 180 | kHz |
| Switching frequency | 15V input variants | | 90 | 180 | kHz |

TEMPERATURE CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------------|---------------------------|------|------|------|-------|
| Specification | All output variants | -40 | | 85 | °C |
| Storage | | -50 | | 130 | °C |
| Case Temperature above ambient | 5V output variants | | | 30 | °C |
| Case Temperature above ambient | All other output variants | | | 30 | °C |
| Cooling | Free air convection | | | | |

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

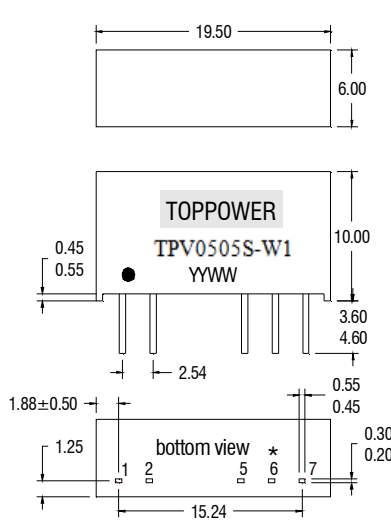
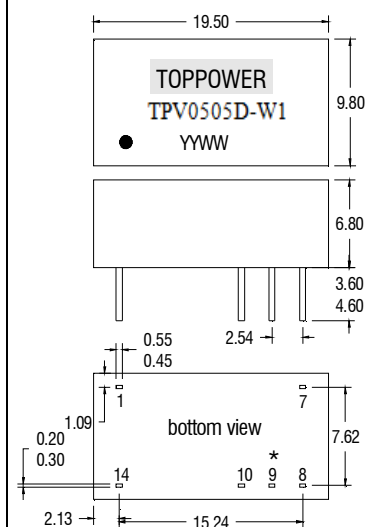
TEMPERATURE DERATING GRAPHS TPV0505SA-W1 TOLERANCE ENVELOPES OTHER TOLERANCE ENVELOPES



MECHANICAL DIMENSIONS

DIP Package

SIP Package



* Pin not fitted on single output variants. Weight: 2.4g (DIP) 2.1g (SIP)
All dimensions in mm ±0.25mm. All pins on a 2.54 mm pitch and within ±0.25mm of true position.

PIN CONNECTIONS

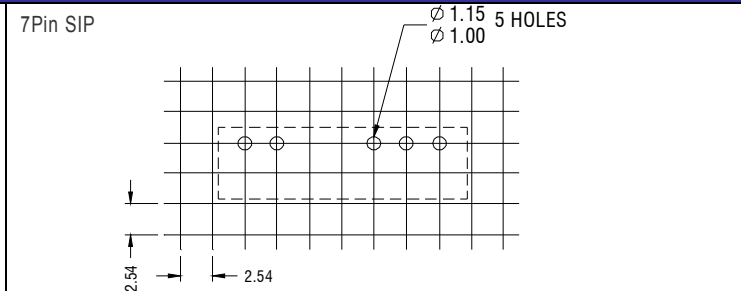
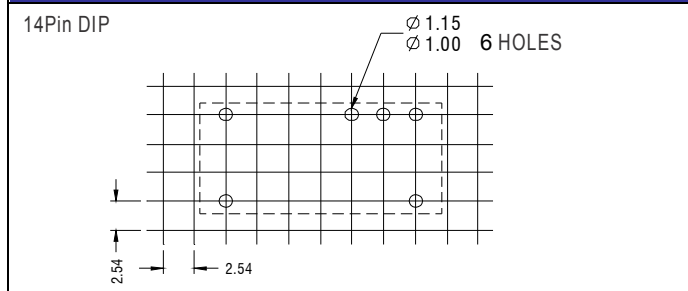
| Dual output variants | |
|----------------------|----------|
| 14 PIN DIP | |
| Pin | Function |
| 1 | -Vin |
| 7 | NC |
| 8 | +Vout |
| 9 | 0V |
| 10 | -Vout |
| 14 | +Vin |

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

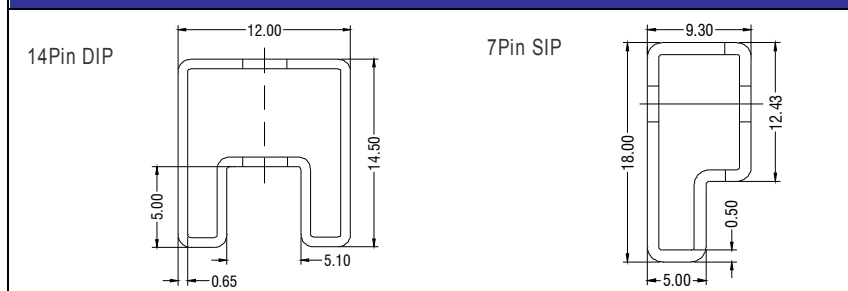
| Single output variants | |
|------------------------|----------|
| 14 PIN DIP | |
| Pin | Function |
| 1 | -Vin |
| 7 | NC |
| 8 | +Vout |
| 10 | -Vout |
| 14 | +Vin |

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

RECOMMENDED FOOTPRINT DETAILS



TUBE OUTLINE DIMENSIONS



Unless otherwise stated all dimensions in mm ±0.5mm.
Tube length (14 Pin DIP) : 520mm ±2mm.
Tube length (7 Pin SIP) : 520mm ±2mm.
Tube Quantity : 25PCS

SOLDERING INFORMATION

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