



DESCRIPTION: 2W 3KVDC Isolated Single And Dual Output DC/DC Converters

The TPK series are miniature, isolated 2W DC/DC converters in a SIP 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, lower output ripple noise and 3KVDC isolation.

FEATURES

| | | |
|---------------------------------------|----------------------------|--|
| RoHS compliant | Efficiency from 80% | Input voltage: 3.3V, 5V, 12V, 15V, 24V |
| Operating temperature: -40°C to 105°C | UL 94V-0 package material | Output voltage: 3.3V, 5V, 9V, 12V, 15V, 24V / ±5V, ±9V, ±12V, ±15V, ±24V |
| Industry standard pinout | 3KVDC isolation (1 minute) | CE certification |

SELECTION GUIDE

| Part Number | Nominal Input Voltage | Output Voltage | Output Current(Max./Min) | Load Regulation (Max) | Efficiency (Typ.) | Package Style |
|-------------|-----------------------|----------------|--------------------------|-----------------------|-------------------|---------------|
| | V | V | mA | % | % | |
| TPK0303SA | 3.3 | 3.3 | 606/60.6 | 7.2 | 82 | SIP |
| TPK0305SA | 3.3 | 5 | 400/40 | 7.2 | 82 | SIP |
| TPK0503SA | 5 | 3.3 | 606/60.6 | 7.2 | 82 | SIP |
| TPK0505SA | 5 | 5 | 400/40 | 7.2 | 82 | SIP |
| TPK0509SA | 5 | 9 | 222/22.2 | 5.8 | 86 | SIP |
| TPK0512SA | 5 | 12 | 167/16.7 | 5.0 | 86 | SIP |
| TPK0515SA | 5 | 15 | 133/13.3 | 4.6 | 87 | SIP |
| TPK1205SA | 12 | 5 | 400/40 | 4.9 | 82 | SIP |
| TPK1209SA | 12 | 9 | 222/22.2 | 3.0 | 87 | SIP |
| TPK1212SA | 12 | 12 | 167/16.7 | 2.9 | 87 | SIP |
| TPK1215SA | 12 | 15 | 133/13.3 | 2.5 | 89 | SIP |
| TPK1515SA | 15 | 15 | 133/13.3 | 2.5 | 84 | SIP |
| TPK2405SA | 24 | 5 | 400/40 | 4.9 | 82 | SIP |
| TPK2412SA | 24 | 12 | 167/16.7 | 5.0 | 84 | SIP |
| TPK2415SA | 24 | 15 | 133/13.3 | 2.5 | 84 | SIP |
| TPK2424SA | 24 | 24 | 83.3/8.33 | 5.0 | 83 | SIP |
| TPK0505S | 5 | ±5 | ±200/±20 | 6.3 | 82 | SIP |
| TPK0509S | 5 | ±9 | ±111/±11.1 | 5.4 | 86 | SIP |
| TPK0512S | 5 | ±12 | ±83/±8.3 | 4.8 | 86 | SIP |
| TPK0515S | 5 | ±15 | ±67/±6.7 | 5.3 | 87 | SIP |
| TPK0524S | 5 | ±24 | ±41.65/±4.165 | 5.0 | 83 | SIP |
| TPK1205S | 12 | ±5 | ±200/±20 | 3.9 | 82 | SIP |
| TPK1209S | 12 | ±9 | ±111/±11.1 | 2.9 | 86 | SIP |
| TPK1212S | 12 | ±12 | ±83/±8.3 | 2.8 | 87 | SIP |
| TPK1215S | 12 | ±15 | ±67/±6.7 | 2.5 | 87 | SIP |
| TPK1515S | 15 | ±15 | ±67/±6.7 | 2.5 | 87 | SIP |
| TPK2405S | 24 | ±5 | ±200/±20 | 3.9 | 82 | SIP |
| TPK2409S | 24 | ±9 | ±111/±11.1 | 2.9 | 86 | DIP |
| TPK2412S | 24 | ±12 | ±83/±8.3 | 2.8 | 87 | SIP |
| TPK2415S | 24 | ±15 | ±67/±6.7 | 2.5 | 87 | SIP |
| TPK2424S | 24 | ±24 | ±41.65/±4.165 | 5.0 | 83 | SIP |
| TPK0305DA | 3.3 | 5 | 400/40 | 7.2 | 82 | DIP |
| TPK0505DA | 5 | 5 | 400/40 | 7.2 | 82 | DIP |
| TPK0509DA | 5 | 9 | 222/22.2 | 5.8 | 86 | DIP |
| TPK0512DA | 5 | 12 | 167/16.7 | 5.0 | 86 | DIP |
| TPK0515DA | 5 | 15 | 133/13.3 | 4.6 | 87 | DIP |
| TPK1205DA | 12 | 5 | 400/40 | 4.9 | 82 | DIP |
| TPK1209DA | 12 | 9 | 222/22.2 | 3.0 | 87 | DIP |
| TPK1212DA | 12 | 12 | 167/16.7 | 2.9 | 87 | DIP |
| TPK1215DA | 12 | 15 | 133/13.3 | 2.5 | 89 | DIP |
| TPK1515DA | 15 | 15 | 133/13.3 | 2.5 | 84 | DIP |
| TPK2405DA | 24 | 5 | 400/40 | 4.9 | 82 | DIP |
| TPK2412DA | 24 | 12 | 167/16.7 | 5.0 | 84 | DIP |
| TPK2424DA | 24 | 24 | 83.3/8.33 | 5.0 | 83 | DIP |
| TPK0505D | 5 | ±5 | ±200/±20 | 6.3 | 82 | DIP |
| TPK0509D | 5 | ±9 | ±111/±11.1 | 5.4 | 86 | DIP |
| TPK0512D | 5 | ±12 | ±83/±8.3 | 4.8 | 86 | DIP |
| TPK0515D | 5 | ±15 | ±67/±6.7 | 5.3 | 87 | DIP |
| TPK1205D | 12 | ±5 | ±200/±20 | 3.9 | 82 | DIP |
| TPK1209D | 12 | ±9 | ±111/±11.1 | 2.9 | 86 | DIP |
| TPK1212D | 12 | ±12 | ±83/±8.3 | 2.8 | 87 | DIP |
| TPK1215D | 12 | ±15 | ±67/±6.7 | 2.5 | 87 | DIP |
| TPK1515D | 15 | ±15 | ±67/±6.7 | 2.5 | 87 | DIP |
| TPK2405D | 24 | ±5 | ±200/±20 | 3.9 | 82 | DIP |
| TPK2412D | 24 | ±12 | ±83/±8.3 | 2.8 | 87 | DIP |
| TPK2424D | 24 | ±24 | ±41.65/±4.164 | 5.0 | 83 | DIP |

Add Suffix "P" for Continuous Short Circuit Protection, for example TPK0505SAP.

INPUT CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------|------------|------|------|------|-------|
| Voltage range | 3.3V input | 2.9 | 3.3 | 3.6 | V |
| Voltage range | 5V input | 4.5 | 5 | 5.5 | V |
| Voltage range | 12V input | 11 | 12 | 13 | V |
| Voltage range | 15V input | 13.4 | 15 | 16.4 | V |
| Voltage range | 24V input | 22 | 24 | 26 | V |

OUTPUT CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------------|------------------------|------|------|------|-------|
| Rated Power | TA=-40°C to 85°C | | | 2 | W |
| Voltage Set Point Accuracy | See tolerance envelope | | | | |
| Line regulation | High Vin to low Vin | | 1.0 | 1.2 | %/% |

ABSOLUTE MAXIMUM RATINGS

| | |
|---|-------|
| Lead temperature 1.5mm from case for 10 seconds | 300°C |
| Internal power dissipation | 650mW |
| Input voltage Vin, TPK03 | 5.5V |
| Input voltage Vin, TPK05 | 7V |
| Input voltage Vin, TPK12 | 15V |
| Input voltage Vin, TPK15 | 18V |
| Input voltage Vin, TPK24 | 28V |

ISOLATION CHARACTERISTICS

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

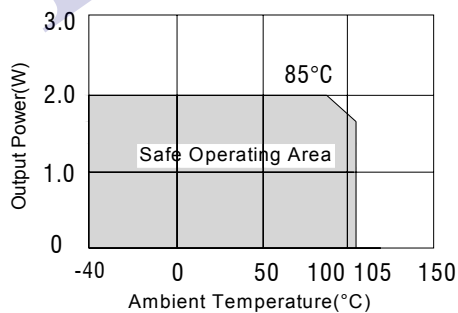
GENERAL CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---------------------|------------|------|------|------|-------|
| Switching frequency | | | 65 | | kHz |

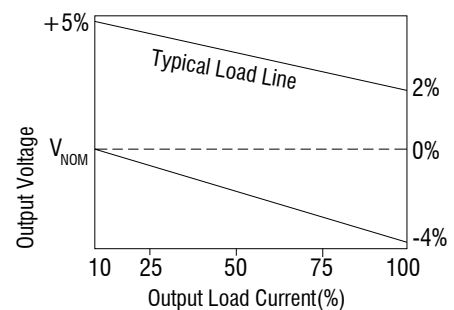
TEMPERATURE CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------------|-----------------------------------|------|------|------|-------|
| Specification | Derating if the temperature ≥85°C | -40 | | 105 | °C |
| Storage | | -50 | | 150 | °C |
| Case Temperature above ambient | 5V output | | | 30 | °C |
| Case Temperature above ambient | All other output | | | 30 | °C |
| Cooling | Free air convection | | | | |

TEMPERATURE DERATING GRAPHS



TOLERANCE ENVELOPES

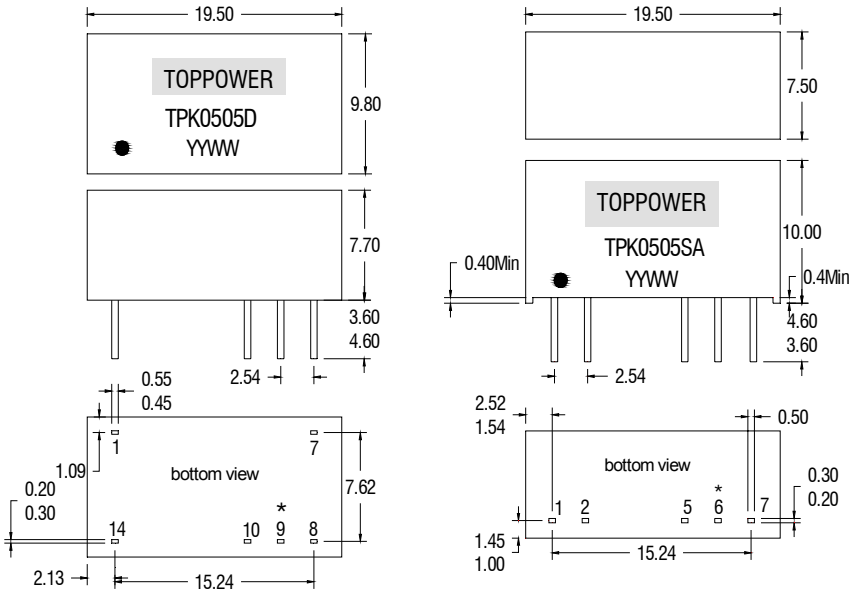


MECHANICAL DIMENSIONS

PIN CONNECTIONS

DIP Package

SIP Package



Dual Output Variants

14 PIN DIP

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

Single output variants

14 PIN DIP

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

7 PIN SIP

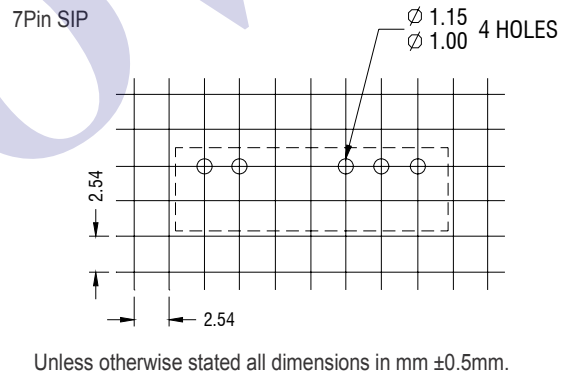
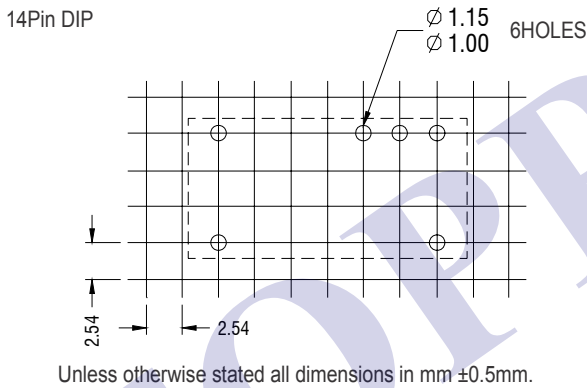
| Pin | Function |
|-----|----------|
| 1 | +Vin |
| 2 | -Vin |
| 5 | -Vout |
| 6 | 0V |
| 7 | +Vout |

7 PIN SIP

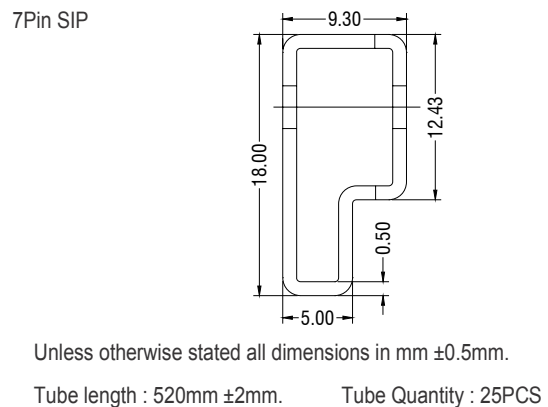
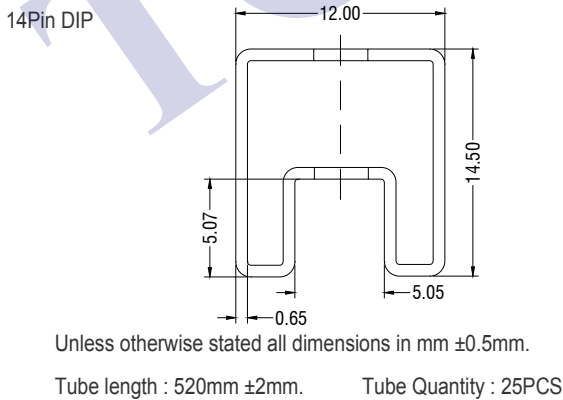
| Pin | Function |
|-----|----------|
| 1 | +Vin |
| 2 | -Vin |
| 5 | -Vout |
| 7 | +Vout |

All dimensions in mm ± 0.25 mm .
 All pins on a 2.54mm pitch and within ± 0.25 mm of true position. Weight: 2.8g
 * Pin not fitted on single output variants

RECOMMENDED FOOTPRINT DETAILS



TUBE OUTLINE DIMENSIONS



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