



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

TPB-1W series are specially designed for 3KVDC isolation & regulated single and output application, the input voltage range within  $\pm 5\%$ , regulated output with very low ripple noise. short circuit protection

## FEATURES

|                           |                                     |                                       |
|---------------------------|-------------------------------------|---------------------------------------|
| SIP ,DIP package          | 3000VDC Isolation                   | Operating temperature -40°C to 105°C  |
| Regulated single output   | Continuous short circuit protection | RoHS Compliance、CE certification      |
| Low ripple noise          | Small footprint                     | No external component required        |
| Internal SMD construction | Input voltage:3.3V,5V,12V,15V,24V   | Output voltage:3.3V,5V,9V,12V,15V,24V |

## SELECTION GUIDE

| Part Number   | Input         |             | Output        |              |     | Efficiency (%) | Package Style |
|---------------|---------------|-------------|---------------|--------------|-----|----------------|---------------|
|               | Voltage (VDC) |             | Voltage (VDC) | Current (mA) |     |                |               |
|               | Nominal       | Range       |               | Max          | Min |                |               |
| TPB0303S-1W   | 3.3           | 3.13~3.47   | 3.3           | 303          | 30  | 66             | SIP           |
| TPB0305S-1W   | 3.3           | 3.13~3.47   | 5             | 200          | 20  | 66             | SIP           |
| TPB0503S-1W   | 5             | 4.75~5.25   | 3.3           | 303          | 30  | 66             | SIP           |
| TPB0505S-W75  | 5             | 4.75~5.25   | 5             | 150          | 15  | 68             | SIP           |
| TPB0505S-1W   | 5             | 4.75~5.25   | 5             | 200          | 20  | 66             | SIP           |
| TPB0505S-1W/I | 5             | 4.5-6       | 5             | 200          | 20  | 70             | SIP           |
| TPB0509S-1W   | 5             | 4.75~5.25   | 9             | 111          | 12  | 70             | SIP           |
| TPB0512S-1W   | 5             | 4.75~5.25   | 12            | 83           | 9   | 71             | SIP           |
| TPB0515S-1W   | 5             | 4.75~5.25   | 15            | 67           | 7   | 73             | SIP           |
| TPB0524S-1W   | 5             | 4.75~5.25   | 24            | 42           | 5   | 68             | SIP           |
| TPB0905S-1W   | 9             | 8.55~9.45   | 5             | 200          | 20  | 66             | SIP           |
| TPB1205S-W75  | 12            | 11.4~12.6   | 5             | 150          | 15  | 70             | SIP           |
| TPB1205S-1W   | 12            | 11.4~12.6   | 5             | 200          | 20  | 67             | SIP           |
| TPB1209S-1W   | 12            | 11.4~12.6   | 9             | 111          | 12  | 72             | SIP           |
| TPB1212S-1W   | 12            | 11.4~12.6   | 12            | 83           | 9   | 70             | SIP           |
| TPB1215S-1W   | 12            | 11.4~12.6   | 15            | 67           | 7   | 74             | SIP           |
| TPB1224S-1W   | 12            | 11.4~12.6   | 24            | 42           | 5   | 68             | SIP           |
| TPB1505S-W75  | 15            | 14.25~15.75 | 5             | 150          | 15  | 68             | SIP           |
| TPB1505S-1W   | 15            | 14.25~15.75 | 5             | 200          | 20  | 67             | SIP           |
| TPB1509S-1W   | 15            | 14.25~15.75 | 9             | 111          | 12  | 71             | SIP           |
| TPB1512S-1W   | 15            | 14.25~15.75 | 12            | 83           | 9   | 71             | SIP           |
| TPB1515S-1W   | 15            | 14.25~15.75 | 15            | 67           | 7   | 72             | SIP           |
| TPB1524S-1W   | 15            | 14.25~15.75 | 24            | 42           | 5   | 68             | SIP           |
| TPB2405S-W75  | 24            | 22.8~25.2   | 5             | 150          | 15  | 68             | SIP           |
| TPB2405S-1W   | 24            | 22.8~25.2   | 5             | 200          | 20  | 68             | SIP           |
| TPB2409S-1W   | 24            | 22.8~25.2   | 9             | 111          | 12  | 68             | SIP           |
| TPB2412S-1W   | 24            | 22.8~25.2   | 12            | 83           | 9   | 73             | SIP           |
| TPB2415S-1W   | 24            | 22.8~25.2   | 15            | 67           | 7   | 75             | SIP           |
| TPB2424S-1W   | 24            | 22.8~25.2   | 24            | 42           | 5   | 68             | SIP           |
| TPB0303D-1W   | 3.3           | 3.13~3.47   | 3.3           | 303          | 30  | 66             | DIP           |
| TPB0305D-1W   | 3.3           | 3.13~3.47   | 5             | 200          | 20  | 66             | DIP           |
| TPB0503D-1W   | 5             | 4.75~5.25   | 3.3           | 303          | 30  | 66             | DIP           |
| TPB0505D-W75  | 5             | 4.75~5.25   | 5             | 150          | 15  | 68             | DIP           |
| TPB0505D-1W   | 5             | 4.75~5.25   | 5             | 200          | 20  | 66             | DIP           |
| TPB0509D-1W   | 5             | 4.75~5.25   | 9             | 111          | 12  | 70             | DIP           |
| TPB0512D-1W   | 5             | 4.75~5.25   | 12            | 83           | 9   | 71             | DIP           |
| TPB0515D-1W   | 5             | 4.75~5.25   | 15            | 67           | 7   | 73             | DIP           |
| TPB0524D-1W   | 5             | 4.75~5.25   | 24            | 42           | 5   | 68             | DIP           |
| TPB0905D-1W   | 9             | 8.55~9.45   | 5             | 200          | 20  | 66             | DIP           |
| TPB1205D-W75  | 12            | 11.4~12.6   | 5             | 150          | 15  | 70             | DIP           |
| TPB1205D-1W   | 12            | 11.4~12.6   | 5             | 200          | 20  | 67             | DIP           |
| TPB1209D-1W   | 12            | 11.4~12.6   | 9             | 111          | 12  | 72             | DIP           |
| TPB1212D-1W   | 12            | 11.4~12.6   | 12            | 83           | 9   | 70             | DIP           |
| TPB1215D-1W   | 12            | 11.4~12.6   | 15            | 67           | 7   | 74             | DIP           |

**SELECTION GUIDE**

| Part Number  | Input         |             | Output        |              |       | Efficiency (%) | Package Style |
|--------------|---------------|-------------|---------------|--------------|-------|----------------|---------------|
|              | Voltage (VDC) |             | Voltage (VDC) | Current (mA) |       |                |               |
|              | Nominal       | Range       |               | Nominal      | Range |                |               |
| TPB1224D-1W  | 12            | 11.4~12.6   | 24            | 42           | 5     | 68             | DIP           |
| TPB1505D-W75 | 15            | 14.25~15.75 | 5             | 150          | 15    | 68             | DIP           |
| TPB1505D-1W  | 15            | 14.25~15.75 | 5             | 200          | 20    | 67             | DIP           |
| TPB1509D-1W  | 15            | 14.25~15.75 | 9             | 111          | 12    | 71             | DIP           |
| TPB1512D-1W  | 15            | 14.25~15.75 | 12            | 83           | 9     | 71             | DIP           |
| TPB1515D-1W  | 15            | 14.25~15.75 | 15            | 67           | 7     | 72             | DIP           |
| TPB1524D-1W  | 15            | 14.25~15.75 | 24            | 42           | 5     | 68             | DIP           |
| TPB2405D-W75 | 24            | 22.8~25.2   | 5             | 150          | 15    | 68             | DIP           |
| TPB2405D-1W  | 24            | 22.8~25.2   | 5             | 200          | 20    | 68             | DIP           |
| TPB2409D-1W  | 24            | 22.8~25.2   | 9             | 111          | 12    | 68             | DIP           |
| TPB2412D-1W  | 24            | 22.8~25.2   | 12            | 83           | 9     | 73             | DIP           |
| TPB2415D-1W  | 24            | 22.8~25.2   | 15            | 67           | 7     | 75             | DIP           |
| TPB2424D-1W  | 24            | 22.8~25.2   | 24            | 42           | 5     | 68             | DIP           |

Add suffix "P" for continuous short circuit protection, for example TPB0505SP-1W.

**ISOLATION CHARACTERISTICS**

| Item                 | Test condition                  | Min. | Typ. | Max. | Units |
|----------------------|---------------------------------|------|------|------|-------|
| Isolation voltage    | Tested for 1 minute and 1mA max | 3000 |      |      | VDC   |
| Isolation resistance | Test at 1000VDC                 | 1    |      |      | GΩ    |

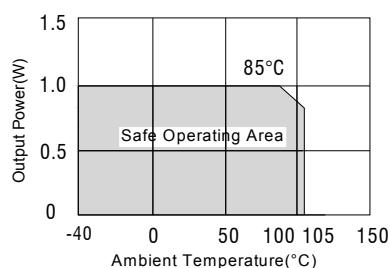
**OUTPUT SPECIFICATIONS**

| Item                    | Test Conditions          | Min. | Typ. | Max.  | Units  |
|-------------------------|--------------------------|------|------|-------|--------|
| Output power            |                          | 0.1  |      | 1     | W      |
| Line regulation         | For Vin change of ±5%    |      |      | ±0.25 | %      |
| Load regulation         | 10% to 100% load         |      |      | ±1    | %      |
| Output voltage accuracy | 100% full load           |      |      | ±3    | %      |
| Temperature drift       | 100% full load           |      |      | ±0.03 | %/°C   |
| Ripple                  | 20MHz Bandwidth          |      | 10   | 20    | mv p-p |
| Noise                   | 20MHz Bandwidth          |      | 50   | 75    | mv p-p |
| Switching frequency     | 100% load, nominal input |      | 100  |       | KHz    |

**COMMON SPECIFICATIONS**

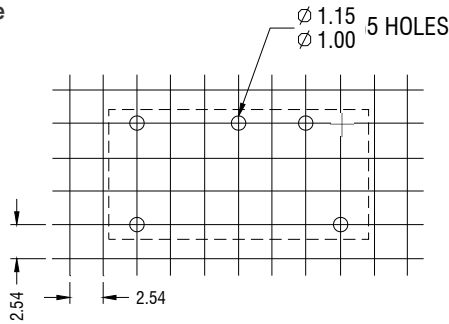
| Item                     | Test condition                    | Min.                | Typ. | Max. | Units   |
|--------------------------|-----------------------------------|---------------------|------|------|---------|
| Storage humidity         | Test Condition                    |                     |      | 95   | %       |
| Operating temperature    | Derating if the temperature ≥85°C | -40                 |      | 105  | °C      |
| Storage temperature      |                                   | -55                 |      | 125  | °C      |
| Temp. Rise at full load  |                                   |                     | 15   | 25   | °C      |
| Lead temperature         |                                   |                     |      | 300  | °C      |
| Short circuit protection | TPBxx05S-1W                       |                     |      |      |         |
| Short circuit protection | Others                            | Continuous          |      |      |         |
| Cooling                  |                                   | Free air convection |      |      |         |
| Case material            |                                   | Plastic (UL94-V0)   |      |      |         |
| MTBF                     |                                   | 3500                |      |      | K hours |
| Weight                   | SIP/2.1g, DIP/2.8g                |                     |      |      |         |

**TEMPERATURE DERATING GRAPHS**

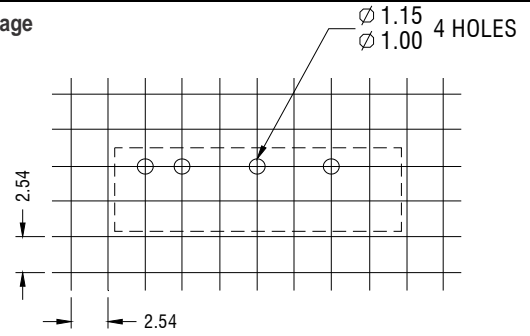


**RECOMMENDED FOOTPRINT DETAILS**

**DIP Package**

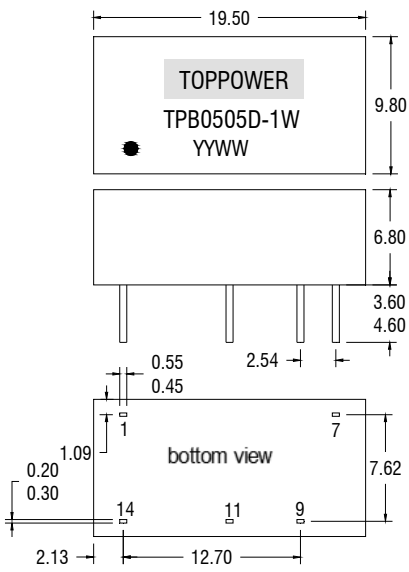


**SIP Package**

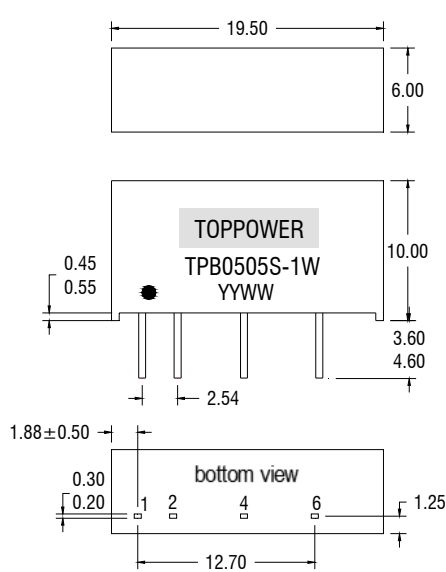


**MECHANICAL DIMENSIONS**

**DIP Package**



**SIP Package**



**PIN CONNECTIONS**

| 7 PIN SIP |          |
|-----------|----------|
| Pin       | Function |
| 1         | +Vin     |
| 2         | -Vin     |
| 4         | -Vout    |
| 6         | +Vout    |

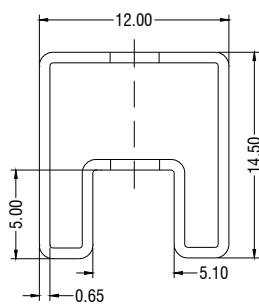
| 14 PIN DIP |          |
|------------|----------|
| Pin        | Function |
| 1          | GND      |
| 7          | NC       |
| 9          | +Vo      |
| 11         | 0V       |
| 14         | Vin      |

NC: no external connection.

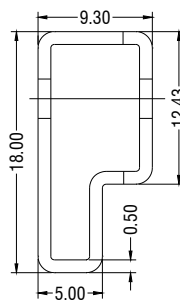
All dimensions in mm  $\pm 0.25$  mm. All pins on a 2.54mm pitch. Weight: SIP/2.1g ,DIP/2.8g

**TUBE OUTLINE DIMENSIONS**

**14Pin DIP**



**7Pin SIP**



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

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

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

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.