


**DESCRIPTION: 15W 1.5KVDC Isolated Wide Input Voltage DC/DC Converters**

The rated output power of TP15DC converters is 15W, the outline dimensions is "50.8\*25.4\*11.2", 2:1 input voltage range, the voltage range is 9V-18V, 18V-36V, 36V-72V. The accuracy of the converter can reach  $\pm 1\%$ , it can be widely used in telecommunications, railway transportation, instrument and etc.

**FEATURES**

|                                       |                           |                                    |
|---------------------------------------|---------------------------|------------------------------------|
| 15W output power                      | 2:1 input voltage range   | Over load protection               |
| 50.8mm*25.4mm*11.2mm standard package | Fixed switching frequency | Operating temperature: -40℃ to 85℃ |
| Metal shielding package               | RoHS compliant            | 1.5KVDC isolation                  |

**SELECTION GUIDE**

| Part Number | Input Voltage |              | Output        |             | Efficiency(Typ)<br>% | Maximum capacitive load<br>(u F) |
|-------------|---------------|--------------|---------------|-------------|----------------------|----------------------------------|
|             | voltage (VDC) |              | Voltage (VDC) | Current (A) |                      |                                  |
|             | Rated         | Range values |               |             |                      |                                  |
| TP15DC12S03 | 12(2:1)       | 9-18         | 3.3           | 3           | 81                   | 6800                             |
| TP15DC12S05 | 12(2:1)       | 9-18         | 5             | 3           | 82                   | 4700                             |
| TP15DC12S12 | 12(2:1)       | 9-18         | 12            | 1.25        | 83                   | 690                              |
| TP15DC12S15 | 12(2:1)       | 9-18         | 15            | 1           | 84                   | 470                              |
| TP15DC12D05 | 12(2:1)       | 9-18         | ±5            | ±1.5        | 82                   | ±680                             |
| TP15DC12D12 | 12(2:1)       | 9-18         | ±12           | ±0.63       | 84                   | ±330                             |
| TP15DC12D15 | 12(2:1)       | 9-18         | ±15           | ±0.5        | 84                   | ±110                             |
| TP15DC24S03 | 24(2:1)       | 18-36        | 3.3           | 3           | 81                   | 6800                             |
| TP15DC24S05 | 24(2:1)       | 18-36        | 5             | 3           | 84                   | 4700                             |
| TP15DC24S12 | 24(2:1)       | 18-36        | 12            | 1.25        | 84                   | 690                              |
| TP15DC24S15 | 24(2:1)       | 18-36        | 15            | 1           | 84                   | 470                              |
| TP15DC24D05 | 24(2:1)       | 18-36        | ±5            | ±1.5        | 83                   | ±680                             |
| TP15DC24D12 | 24(2:1)       | 18-36        | ±12           | ±0.63       | 84                   | ±330                             |
| TP15DC24D15 | 24(2:1)       | 18-36        | ±15           | ±0.5        | 84                   | ±110                             |
| TP15DC48S03 | 48(2:1)       | 36-72        | 3.3           | 3           | 81                   | 6800                             |
| TP15DC48S05 | 48(2:1)       | 36-72        | 5             | 3           | 84                   | 4700                             |
| TP15DC48S12 | 48(2:1)       | 36-72        | 12            | 1.25        | 85                   | 690                              |
| TP15DC48S15 | 48(2:1)       | 36-72        | 15            | 1           | 85                   | 470                              |
| TP15DC48D05 | 48(2:1)       | 36-72        | ±5            | ±1.5        | 83                   | ±680                             |
| TP15DC48D12 | 48(2:1)       | 36-72        | ±12           | ±0.63       | 84                   | ±330                             |
| TP15DC48D15 | 48(2:1)       | 36-72        | ±15           | ±0.5        | 84                   | ±110                             |

**GENERAL CHARACTERISTICS**

| parameter                    | Test conditions     | Min                | Typ               | Max  | Units |
|------------------------------|---------------------|--------------------|-------------------|------|-------|
| Isolation voltage            | Input to output     |                    | 500               | 1500 | VDC   |
| Insulation resistance        | Input to output     | 100M               |                   |      | Ohm   |
| Seismic                      | 10~55Hz             |                    | 5                 |      | G     |
| MTBF                         | MIL-HDBK-217F2      |                    | 5x10 <sup>5</sup> |      | hrs   |
| Over-current protection mode | All input range     | Automatic recovery |                   |      |       |
| Cooling                      | Free air convection |                    |                   |      |       |
| Case material                | Metal case          |                    |                   |      |       |

**INPUT CHARACTERISTICS**

| parameter                      | Test conditions                | Min | Typ | Max | Units |
|--------------------------------|--------------------------------|-----|-----|-----|-------|
| Startup voltage                | The12V input module(9V-18V)    | 9.2 | 9.5 | 9.8 | VDC   |
| Startup voltage                | The24V input module(18V-36V)   |     |     | 18  | VDC   |
| Startup voltage                | The48Vinput module(36V-72V)    |     |     | 36  | VDC   |
| Under input voltage protection | The12V input module(9V-18V)    |     |     | 8.5 | VDC   |
| Under input voltage protection | The24V input module(18V-36V)   |     |     | 17  | VDC   |
| Under input voltage protection | The48Vinput module(36V-72V)    |     |     | 35  | VDC   |
| Start time                     | Input rising time from 5%-100% | 20  |     |     | ms    |

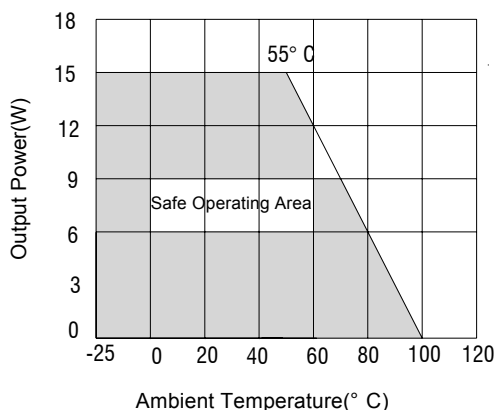
**OUTPUT CHARACTERISTICS**

| parameter                  | Test conditions                                                                                                              | Min | Typ | Max       | Units |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------|-------|
| Voltage accuracy           | $I_o=0.1 \dots 1.0 \times I_{onom}$ $V_i=V_i$ rated                                                                          |     |     | $\pm 1$   | %     |
| Line regulation            | $V_{imin} \leq V_i \leq V_{imax}$                                                                                            |     |     | $\pm 0.2$ | %     |
| Load regulation            | $I_o=0.1 \dots 1.0 \times I_{onom}$ $V_{imin} \leq V_i \leq V_{imax}$                                                        |     |     | $\pm 0.5$ | %     |
| Auxiliary voltage accuracy | Main Load and auxiliary load differ 25%,the auxiliary circuit of the load with at least 25%, the main circuit with full load |     |     | $\pm 3$   | %     |
| Ripple and noise           | 20MHz bandwidth                                                                                                              |     |     | $\pm 1$   | %     |
| Over current protection    | $V_{imin} \leq V_i \leq V_{imax}$                                                                                            | 120 |     |           | %     |
| Transient recovery time    | 25% load changes                                                                                                             |     |     | $\pm 5$   | %     |
| Transient overshoot time   | 25% load changes                                                                                                             |     |     | 400       | US    |
| Switch frequency           | $V_{imin} \leq V_i \leq V_{imax}$                                                                                            |     | 300 |           | KHZ   |

**ENVIRONMENT CHARACTERISTICS**

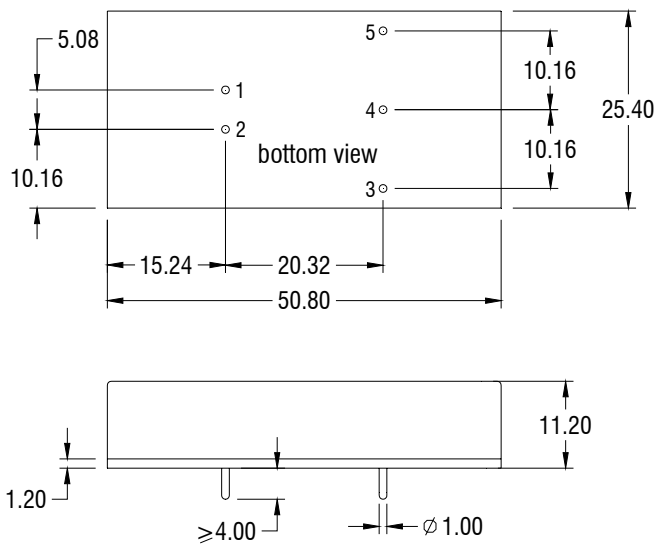
| parameter             | Test conditions                   | Min                 | Typ | Max  | Units |
|-----------------------|-----------------------------------|---------------------|-----|------|-------|
| Storage Humidity      | Non condensing                    | 5                   |     | +95  | %     |
| Operating Temperature | Power derating (above 71℃)        | -40                 |     | +85  | ℃     |
| Storage Temperature   |                                   | -55                 |     | +125 | ℃     |
| Max. Case Temperature | Operating Temperature curve range |                     |     | 105  | ℃     |
| Lead Temperature      | 1.5mm from case for 10 seconds    |                     |     | 300  | ℃     |
| Cooling               |                                   | Free air convection |     |      |       |

- Module in every environment temperature rating, case temperature under shall not exceed the maximum case temperature level.

**TEMPERATURE DERATING GRAPHS**


## MECHANICAL DIMENSIONS

### DIP Package



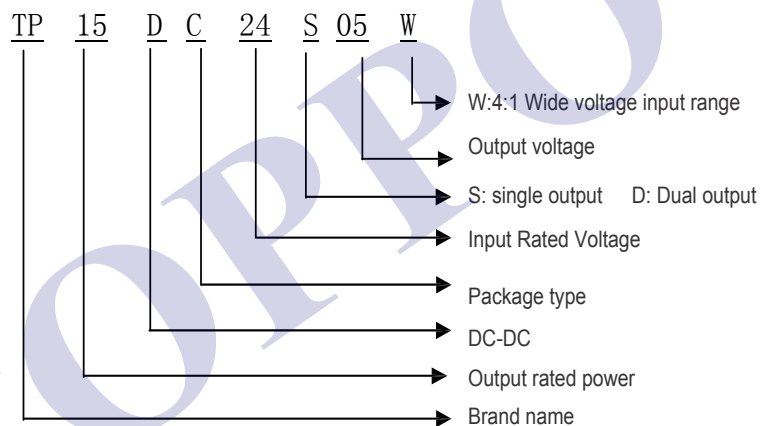
Units: mm

Tolerance:±0.2mm

## PIN CONNECTIONS

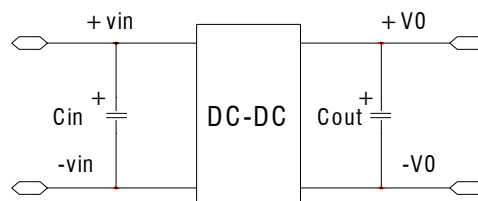
| Pin | Single output | Dual output |
|-----|---------------|-------------|
| 1   | +Vin          | +Vin        |
| 2   | -Vin          | -Vin        |
| 3   | -Vout         | -Vout       |
| 4   | /             | Com         |
| 5   | +Vout         | +Vout       |

## MODEL SELECTION



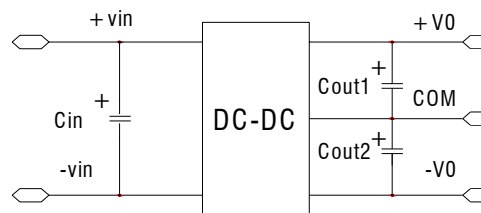
## RECOMMEND CIRCUIT

Single Output:



## RECOMMEND CIRCUIT

Dual Output:



- Add input capacitance  $C_{in}$  is helpful to improve the electromagnetic compatibility, recommend  $C_{in}$  use 47  $\mu$ F-100 $\mu$ F of the electrolytic capacitors.
- If the module connect to the digital circuits, please add the  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$ .
- If  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$  value is too high or lower ESR, it will cause the module instable,
- The recommended value of  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$  should be 100  $\mu$ F/A, the current here means the output current.

## USING ATTENTIONS

- Module will cause irreversible damage when in the state of the input reverse polarity.
- Module will cause irreversible damage when in the long-term overload conditions.
- Module will cause irreversible damage when out of the maximum input voltage range.