



DESCRIPTION: 30W Wide Voltage Input DC/DC Converters

The rated output power of TP30DG converters is 30W, the outline dimensions is 50.8*50.8*11.2, 2:1 and 4:1 wide input voltage range, the voltage range is 9V-18V, 18V-36V, 36V-72V, 9V-36V and 18V-72VDC. The accuracy of the converter can reach $\pm 1\%$, it can be widely used in telecommunications, railway transportation, instrument and etc.

FEATURES

| | | |
|---------------------------------------|--------------------------------------|---------------------------------------|
| 30W output power | 2:1 and 4:1 wide input voltage range | Long term short-circuit protection |
| 50.8mm*50.8mm*11.2mm standard package | Over output voltage protection | Super capability with capacitive load |
| Fixed switching frequency | Operating temperature: -25°C to 55°C | Metal shielding package |
| Input under voltage protection | RoHs compliance | / |

SELECTION GUIDE

| Part Number | Input Voltage | | Output | | Efficiency(Typ.) % |
|--------------|---------------|--------------|---------------|-------------|-----------------------|
| | voltage (VDC) | | Voltage (VDC) | Current (A) | |
| | Rated | Range values | | | |
| TP30DG12S03 | 12(2:1) | 9-18 | 3.3 | 6 | 85 |
| TP30DG12S05 | 12(2:1) | 9-18 | 5 | 6 | 83 |
| TP30DG12S12 | 12(2:1) | 9-18 | 12 | 2.5 | 86 |
| TP30DG12S15 | 12(2:1) | 9-18 | 15 | 2 | 86 |
| TP30DG12S24 | 12(2:1) | 9-18 | 24 | 1.25 | 85 |
| TP30DG12D05 | 12(2:1) | 9-18 | ± 5 | ± 3 | 83 |
| TP30DG12D12 | 12(2:1) | 9-18 | ± 12 | ± 1.25 | 86 |
| TP30DG12D15 | 12(2:1) | 9-18 | ± 15 | ± 1 | 86 |
| TP30DG24S03 | 24(2:1) | 18-36 | 3.3 | 6 | 85 |
| TP30DG24S05 | 24(2:1) | 18-36 | 5 | 6 | 84 |
| TP30DG24S12 | 24(2:1) | 18-36 | 12 | 2.5 | 87 |
| TP30DG24S15 | 24(2:1) | 18-36 | 15 | 2 | 87 |
| TP30DG24S24 | 24(2:1) | 18-36 | 24 | 1.25 | 86 |
| TP30DG24D05 | 24(2:1) | 18-36 | ± 5 | ± 3 | 83 |
| TP30DG24D12 | 24(2:1) | 18-36 | ± 12 | ± 1.25 | 86 |
| TP30DG24D15 | 24(2:1) | 18-36 | ± 15 | ± 1 | 86 |
| TP30DG48S03 | 48(2:1) | 36-72 | 3.3 | 6 | 85 |
| TP30DG48S05 | 48(2:1) | 36-72 | 5 | 6 | 84 |
| TP30DG48S12 | 48(2:1) | 36-72 | 12 | 2.5 | 87 |
| TP30DG48S15 | 48(2:1) | 36-72 | 15 | 2 | 87 |
| TP30DG48S24 | 48(2:1) | 36-72 | 24 | 1.25 | 86 |
| TP30DG48D05 | 48(2:1) | 36-72 | ± 5 | ± 3 | 83 |
| TP30DG48D12 | 48(2:1) | 36-72 | ± 12 | ± 1.25 | 86 |
| TP30DG48D15 | 48(2:1) | 36-72 | ± 15 | ± 1 | 86 |
| TP30DG24S05W | 24(4:1) | 9-36 | 5 | 6 | 81 |
| TP30DG24S12W | 24(4:1) | 9-36 | 12 | 2.5 | 85 |
| TP30DG24S15W | 24(4:1) | 9-36 | 15 | 2 | 85 |
| TP30DG24S24W | 24(4:1) | 9-36 | 24 | 1.25 | 85 |
| TP30DG24D05W | 24(4:1) | 9-36 | ± 5 | ± 3 | 81 |
| TP30DG24D12W | 24(4:1) | 9-36 | ± 12 | ± 1.25 | 84 |
| TP30DG24D15W | 24(4:1) | 9-36 | ± 15 | ± 1 | 84 |
| TP30DG48S05W | 48(4:1) | 18-72 | 5 | 6 | 81 |
| TP30DG48S12W | 48(4:1) | 18-72 | 12 | 2.5 | 85 |
| TP30DG48S15W | 48(4:1) | 18-72 | 15 | 2 | 85 |
| TP30DG48S24W | 48(4:1) | 18-72 | 24 | 1.25 | 85 |
| TP30DG48D05W | 48(4:1) | 18-72 | ± 5 | ± 3 | 81 |
| TP30DG48D12W | 48(4:1) | 18-72 | ± 12 | ± 1.25 | 84 |
| TP30DG48D15W | 48(4:1) | 18-72 | ± 15 | ± 1 | 84 |

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

| 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 | | 5*10 ⁵ | | hrs |
| Over-current protection mode | All input range | Burp, Automatic recovery | | | |
| Cooling | Free air convection | | | | |
| Case material | Metal case | | | | |

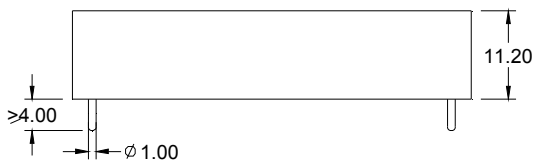
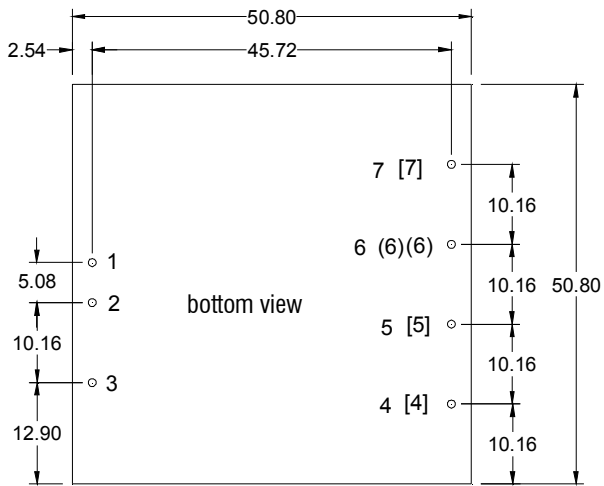
| INPUT CHARACTERISTICS | | | | | |
|--------------------------------|--|---------|-----|-----|-------|
| parameter | Test conditions | Min | Typ | Max | Units |
| Startup voltage | The12V input module(9V-18V) | 9.2 | 9.5 | 9.8 | VDC |
| Startup voltage | The24V input module(18V-36V) | | | 18 | VDC |
| Startup voltage | The48Vinput module(36V-72V) | | | 36 | VDC |
| Startup voltage | The24V input module(9V-36V) | 8.8 | 9 | 9.3 | VDC |
| Startup voltage | The48Vinput module(18V-72V) | | | 18 | VDC |
| Input under voltage protection | The12V input module(9V-18V) | | | 8.5 | VDC |
| Input under voltage protection | The24V input module(18V-36V) | | | 17 | VDC |
| Input under voltage protection | The48Vinput module(36V-72V) | | | 35 | VDC |
| Startup time | Output rise time from 5% to 100% | 20 | | | ms |
| Remote control CTL | Remote CTL-Vin | | | | |
| Remote control CTL | Remote CTL NC(The control level 12V-40V) | Turn on | | | |

| OUTPUT CHARACTERISTICS | | | | | |
|----------------------------|---|-----|-----|------|-------|
| parameter | Test conditions | Min | Typ | Max | Units |
| Voltage accuracy | Io=0.1...1.0 x Ionom Vi=Vi rated | | | ±1 | % |
| Line regulation | Vimin≤Vi≤Vimax | | | ±0.2 | % |
| Load regulation | Io=0.1...1.0 x Ionom Vimin≤ Vi≤Vimax | | | ±0.5 | % |
| Auxiliary voltage accuracy | Main Load and auxiliary load differ 25%,the auxiliary circuit of the load carrying at least 25%, the main circuit running the full load | | | ±3 | % |
| Ripple and noise | 20MHz bandwidth | | | ±1 | % |
| Over-current protection | Vimin≤Vi≤Vimax | 120 | | | % |
| Output voltage trim range | Vimin≤Vi≤Vimax | | | 10 | % |
| Transient recovery time | 25% load changes | | | ±5 | % |
| Transient overshoot time | 25% load changes | | | 400 | us |
| Switch frequency | Vimin≤Vi≤Vimax | | 300 | | KHz |

| ENVIRONMENT CHARACTERISTICS | | | | | |
|-----------------------------|---------------------------------------|-----|-------|------|-------|
| parameter | Test conditions | Min | Typ | Max | Units |
| Environment temperature | industrial-class | -25 | | +55 | °C |
| Maximum case temperature | industrial-class | | | +85 | °C |
| Storage temperature | Industry-class/ Military JI&JII class | -40 | | +105 | °C |
| Relative humidity | No condensation | 5 | | 90 | RH(%) |
| Temperature coefficient | | | ±0.02 | | %/°C |

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

MECHANICAL DIMENSIONS

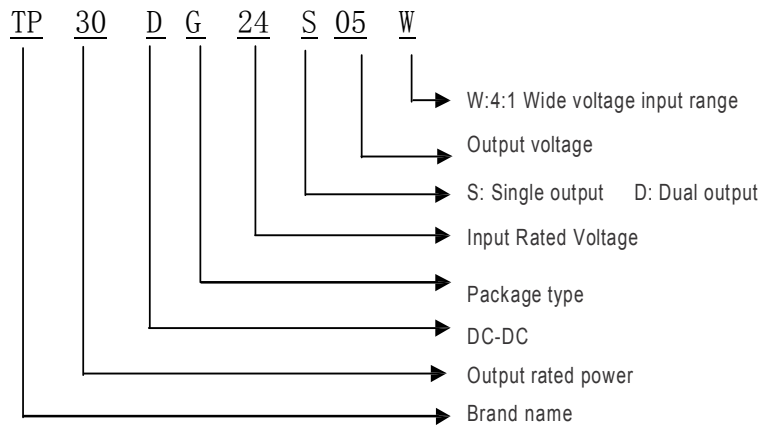


Units: mm

Tolerance:±0.2mm

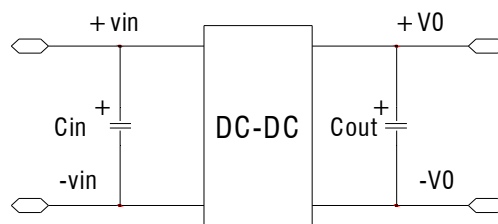
| PIN CONNECTION | | | |
|----------------|---------------|-------------|--------------|
| Pin | Single output | Dual output | Three output |
| 1 | +Vin | +Vin | +Vin |
| 2 | -Vin | -Vin | -Vin |
| 3 | CTL | CTL | CTL |
| 4 | TRM | TRM | / |
| [4] | / | / | -Vout3 |
| 5 | -Vout | -Vout | / |
| [5] | / | / | Com |
| 6 | +Vout | / | / |
| (6) | / | Com | / |
| [6] | / | / | +Vout1 |
| 7 | / | +Vout | / |
| [7] | / | / | +Vout2 |

MODEL SELECTION



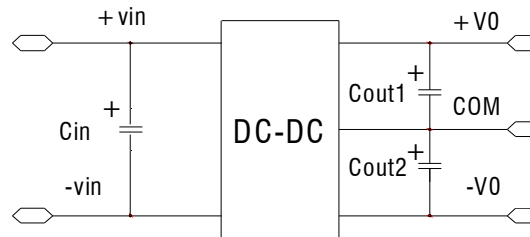
RECOMMEND CIRCUIT

Single Output:



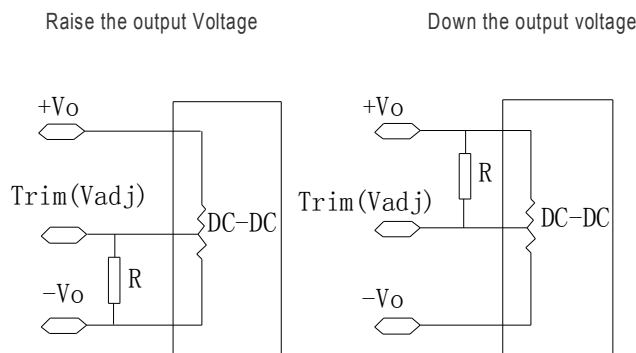
RECOMMEND CIRCUIT

Dual Output:



- Add input capacitance C_{in} is helpful to improve the electromagnetic compatibility, recommend C_{in} use 47 μF -100 μF 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 $\mu\text{F}/\text{A}$, the current here means the output current.

Trim application & Trim Resistance



- In dual and triple output modules, this application can just used in the main load(auxiliary road change together with the main load)

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.

TEMPERATURE DERATING