



DESCRIPTION : 20W 1.5KVDC Isolated Wide Input Voltage DC/DC Converters

The rated output power of TP20DD converters is 20W, the outline dimensions is "50.8*40.6*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

| | | |
|---|------------------------------------|---------------------------------------|
| 20W output power | 2:1 and 4:1 input voltage range | Input under voltage protection |
| 50.8mm *40.6mm *11.2mm standard package | Metal shielding package | Operating temperature:-40℃to85℃ |
| Fixed switching frequency | Long term short-circuit protection | Super capability with capacitive load |
| RoHs compliance | 1.5KVDC isolation | / |

SELECTION GUIDE

| Part Number | Input Voltage voltage (VDC) | | Output | | Efficiency(Typ) % |
|--------------|--------------------------------|--------------|---------------|-------------|----------------------|
| | Rated | Range values | Voltage (VDC) | Current (A) | |
| | | | | | |
| TP20DD12S03 | 12(2:1) | 9-18 | 3.3 | 5.4 | 80 |
| TP20DD12S05 | 12(2:1) | 9-18 | 5 | 4 | 82 |
| TP20DD12S12 | 12(2:1) | 9-18 | 12 | 1.67 | 83 |
| TP20DD12S15 | 12(2:1) | 9-18 | 15 | 1.33 | 84 |
| TP20DD12S24 | 12(2:1) | 9-18 | 24 | 0.83 | 84 |
| TP20DD12D05 | 12(2:1) | 9-18 | ± 5 | ± 2 | 80 |
| TP20DD12D12 | 12(2:1) | 9-18 | ± 12 | ± 0.83 | 83 |
| TP20DD12D15 | 12(2:1) | 9-18 | ± 15 | ± 0.67 | 84 |
| TP20DD24S03 | 24(2:1) | 18-36 | 3.3 | 5.4 | 80 |
| TP20DD24S05 | 24(2:1) | 18-36 | 5 | 4 | 83 |
| TP20DD24S12 | 24(2:1) | 18-36 | 12 | 1.67 | 85 |
| TP20DD24S15 | 24(2:1) | 18-36 | 15 | 1.33 | 85 |
| TP20DD24S24 | 24(2:1) | 18-36 | 24 | 0.83 | 86 |
| TP20DD24D05 | 24(2:1) | 18-36 | ± 5 | ± 2 | 83 |
| TP20DD24D12 | 24(2:1) | 18-36 | ± 12 | ± 0.83 | 85 |
| TP20DD24D15 | 24(2:1) | 18-36 | ± 15 | ± 0.67 | 86 |
| TP20DD48S03 | 48(2:1) | 36-72 | 3.3 | 5.4 | 82 |
| TP20DD48S05 | 48(2:1) | 36-72 | 5 | 4 | 84 |
| TP20DD48S12 | 48(2:1) | 36-72 | 12 | 1.67 | 86 |
| TP20DD48S15 | 48(2:1) | 36-72 | 15 | 1.33 | 87 |
| TP20DD48S24 | 48(2:1) | 36-72 | 24 | 0.83 | 87 |
| TP20DD48D05 | 48(2:1) | 36-72 | ± 5 | ± 2 | 84 |
| TP20DD48D12 | 48(2:1) | 36-72 | ± 12 | ± 0.83 | 86 |
| TP20DD48D15 | 48(2:1) | 36-72 | ± 15 | ± 0.67 | 86 |
| TP20DD24S05W | 24(4:1) | 9-36 | 5 | 4 | 82 |
| TP20DD24S12W | 24(4:1) | 9-36 | 12 | 1.67 | 86 |
| TP20DD24S15W | 24(4:1) | 9-36 | 15 | 1.33 | 86 |
| TP20DD24S24W | 24(4:1) | 9-36 | 24 | 0.83 | 86 |
| TP20DD24D05W | 24(4:1) | 9-36 | ± 5 | ± 2 | 82 |
| TP20DD24D12W | 24(4:1) | 9-36 | ± 12 | ± 0.83 | 85 |
| TP20DD24D15W | 24(4:1) | 9-36 | ± 15 | ± 0.67 | 85 |
| TP20DD48S05W | 48(4:1) | 18-72 | 5 | 4 | 82 |
| TP20DD48S12W | 48(4:1) | 18-72 | 12 | 1.67 | 86 |
| TP20DD48S15W | 48(4:1) | 18-72 | 15 | 1.33 | 86 |
| TP20DD48S24W | 48(4:1) | 18-72 | 24 | 0.83 | 86 |
| TP20DD48D05W | 48(4:1) | 18-72 | ± 5 | ± 2 | 82 |
| TP20DD48D12W | 48(4:1) | 18-72 | ± 12 | ± 0.83 | 85 |
| TP20DD48D15W | 48(4:1) | 18-72 | ± 15 | ± 0.67 | 85 |

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 | | | Turn off | |
| Remote control CTL | Remote CTL NC(The control level 12V-40V) | | | Turn on | |

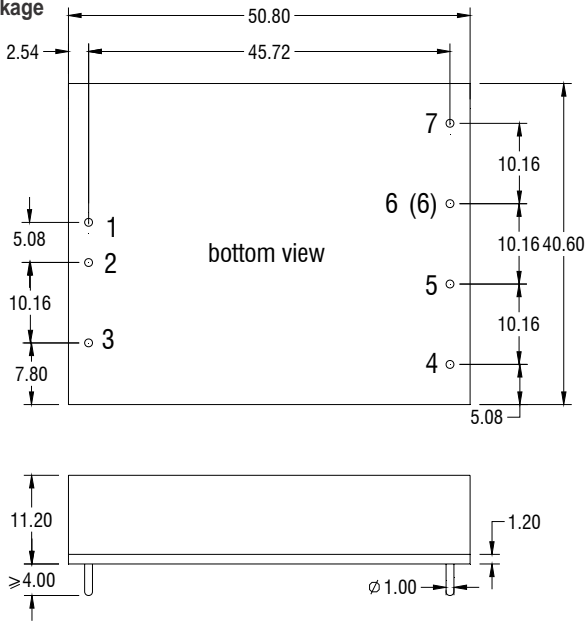
| OUTPUT CHARACTERISTICS | | | | | |
|-----------------------------|--|-----|-----|------|-------|
| parameter | Test conditions | Min | Typ | Max | Units |
| Voltage accuracy | Io=0.1...1.0 x Ionom vi=vi rated | | | ±1 | % |
| Line regulation | Vimin≤Vi≤Vimax | | | ±0.2 | % |
| Load regulation | Io=0.1...1.0 x Ionom Vimin≤Vi≤Vimax | | | ±0.5 | % |
| Auxiliary voltage accuracy | Main Load and auxiliary load differ 25%,the auxiliary circuit of the load with at least 25%, the main circuit with full load | | | ±3 | % |
| Ripple and noise | 20MHz bandwidth | | | ±1 | % |
| Over current protection | Vimin≤Vi≤Vimax | 120 | | | % |
| output voltage change 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 |
| 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.

MECHANICAL DIMENSIONS

DIP Package

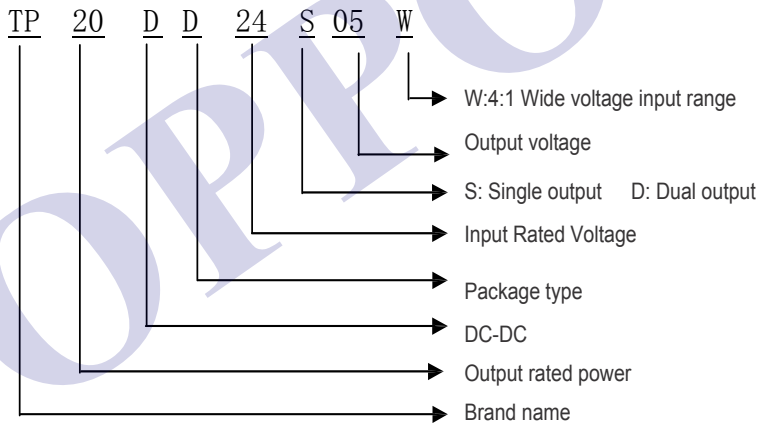


Units: mm
Tolerance: ±0.2mm

PIN CONNECTIONS

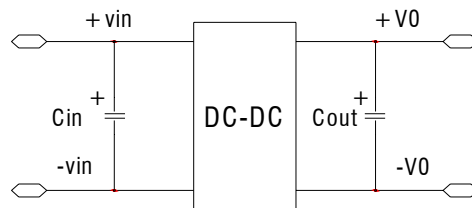
| Pin | Single output | Dual output |
|-----|---------------|-------------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | CTL | CTL |
| 4 | TRM | TRM |
| 5 | -Vout | -Vout |
| 6 | +Vout | / |
| (6) | / | COM |
| 7 | / | +Vout |

MODEL SELECTION



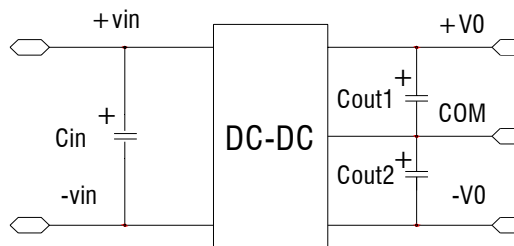
RECOMMEND CIRCUIT

Single Output:



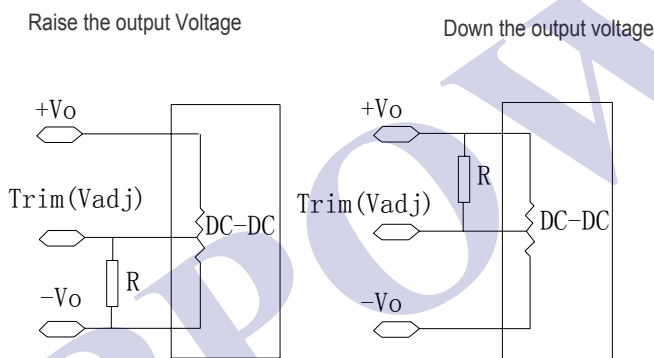
RECOMMEND CIRCUIT

Dual Output :



- Add input capacitance C_{in} is helpful to improve the electromagnetic compatibility, recommend C_{in} use 47 μ F-100 μ 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 μ F/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 load 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.

STEP-BY-STEP INSTALLATION GUIDE