



DESCRIPTION: 5W 1.5KVDC Isolated Wide Voltage Input DC/DC Converters

The rated output power of TP05DB converters is 5W, the outline dimensions is "25.4*25.4*11.2", 2:1 and 4:1 wide input voltage range, the voltage range is 4.5V-9V, 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

| | | |
|---------------------------------------|--------------------------------------|--------------------------------------|
| 5W output power | 2:1 and 4:1 wide input Voltage range | Over load protection |
| 25.4mm*25.4mm*11.2mm standard package | Fixed switching frequency | Operating temperature: -40°C to 85°C |
| Metal shell package | RoHS compliant | 1.5KVDC isolation |

SELECTION GUIDE

| Part Number | Input Voltage | | Output | | Efficiency(Typ) % | Maxium Capacitive Load (μ F) |
|--------------|---------------|--------------|---------------|-------------|----------------------|--------------------------------------|
| | voltage (VDC) | | Voltage (VDC) | Current (A) | | |
| | Rated | Range values | | | | |
| TP05DB05S05 | 5(2:1) | 4.5-9 | 5 | 1 | ≥ 74 | 1500 |
| TP05DB12S03 | 12(2:1) | 9-18 | 3.3 | 1 | ≥ 73 | 2200 |
| TP05DB12S05 | 12(2:1) | 9-18 | 5 | 1 | ≥ 74 | 1500 |
| TP05DB12S12 | 12(2:1) | 9-18 | 12 | 0.42 | ≥ 75 | 660 |
| TP05DB12S15 | 12(2:1) | 9-18 | 15 | 0.33 | ≥ 75 | 470 |
| TP05DB12D05 | 12(2:1) | 9-18 | ± 5 | ± 0.5 | ≥ 76 | ± 850 |
| TP05DB12D12 | 12(2:1) | 9-18 | ± 12 | ± 0.21 | ≥ 78 | ± 140 |
| TP05DB12D15 | 12(2:1) | 9-18 | ± 15 | ± 0.17 | ≥ 79 | ± 47 |
| TP05DB24S03 | 24(2:1) | 18-36 | 3.3 | 1 | ≥ 74 | 2200 |
| TP05DB24S05 | 24(2:1) | 18-36 | 5 | 1 | ≥ 76 | 1500 |
| TP05DB24S12 | 24(2:1) | 18-36 | 12 | 0.42 | ≥ 76 | 660 |
| TP05DB24S15 | 24(2:1) | 18-36 | 15 | 0.33 | ≥ 76 | 470 |
| TP05DB24S24 | 24(2:1) | 18-36 | 24 | 0.21 | ≥ 79 | 470 |
| TP05DB24D05 | 24(2:1) | 18-36 | ± 5 | ± 0.5 | ≥ 78 | ± 850 |
| TP05DB24D12 | 24(2:1) | 18-36 | ± 12 | ± 0.21 | ≥ 79 | ± 140 |
| TP05DB24D15 | 24(2:1) | 18-36 | ± 15 | ± 0.17 | ≥ 79 | ± 47 |
| TP05DB48S03 | 48(2:1) | 36-72 | 3.3 | 1 | ≥ 74 | 2200 |
| TP05DB48S05 | 48(2:1) | 36-72 | 5 | 1 | ≥ 76 | 1500 |
| TP05DB48S12 | 48(2:1) | 36-72 | 12 | 0.42 | ≥ 78 | 660 |
| TP05DB48S15 | 48(2:1) | 36-72 | 15 | 0.33 | ≥ 78 | 470 |
| TP05DB48D05 | 48(2:1) | 36-72 | ± 5 | ± 0.5 | ≥ 79 | ± 850 |
| TP05DB48D12 | 48(2:1) | 36-72 | ± 12 | ± 0.21 | ≥ 79 | ± 140 |
| TP05DB48D15 | 48(2:1) | 36-72 | ± 15 | ± 0.17 | ≥ 80 | ± 47 |
| TP05DB24S05W | 24(4:1) | 9-36 | 5 | 1 | ≥ 75 | 1500 |
| TP05DB24S12W | 24(4:1) | 9-36 | 12 | 0.42 | ≥ 75 | 660 |
| TP05DB24S15W | 24(4:1) | 9-36 | 15 | 0.33 | ≥ 75 | 470 |
| TP05DB24D05W | 24(4:1) | 9-36 | ± 5 | ± 0.5 | ≥ 77 | ± 850 |
| TP05DB24D12W | 24(4:1) | 9-36 | ± 12 | ± 0.21 | ≥ 78 | ± 140 |
| TP05DB24D15W | 24(4:1) | 9-36 | ± 15 | ± 0.17 | ≥ 78 | ± 47 |
| TP05DB48S05W | 48(4:1) | 18-72 | 5 | 1 | ≥ 75 | 1500 |
| TP05DB48S12W | 48(4:1) | 18-72 | 12 | 0.42 | ≥ 77 | 660 |
| TP05DB48S15W | 48(4:1) | 18-72 | 15 | 0.33 | ≥ 77 | 470 |
| TP05DB48D05W | 48(4:1) | 18-72 | ± 5 | ± 0.5 | ≥ 78 | ± 850 |
| TP05DB48D12W | 48(4:1) | 18-72 | ± 12 | ± 0.21 | ≥ 78 | ± 140 |
| TP05DB48D15W | 48(4:1) | 18-72 | ± 15 | ± 0.17 | ≥ 79 | ± 47 |

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 |
| Isolation resistance | Input to Output | 100M | | | ohm |
| Seismic | 10~55Hz | | 5 | | G |
| MTBF | MIL-HDBK-217F2 | | 5 x 10 ⁵ | | hrs |
| Over-current protection mode | Full input range | | Auto recovery | | |
| Cooling | Free air convection | | | | |
| Case material | Metal case | | | | |

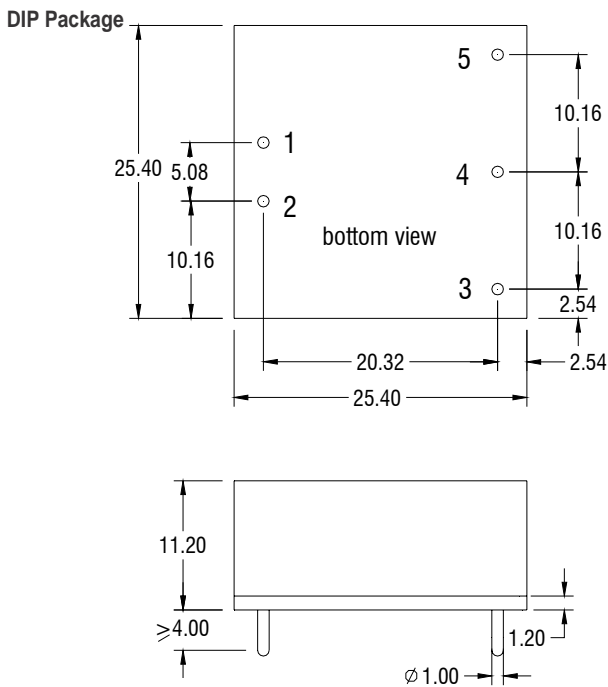
| INPUT CHARACTERISTICS | | | | | |
|-----------------------|--------------------------------|-----|-----|-----|-------|
| parameter | Test conditions | Min | Typ | Max | Units |
| Startup voltage | 5V Input module(4.5V -9V) | 4.5 | 5 | 9 | VDC |
| Startup voltage | 12V Input module(9V -18V) | 8.8 | 9 | 9.3 | VDC |
| Startup voltage | 24V Input module(18V-36V) | | | 18 | VDC |
| Startup voltage | 48V Input module(36V-72V) | | | 36 | VDC |
| Startup voltage | 24V Input module(9V -36V) | 8.8 | 9 | 9.3 | VDC |
| Startup voltage | 48V Input module(18V-72V) | | | 18 | VDC |
| Start rising 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 | | | ±1 | % |
| Line regulation | $V_{imin} < V_i < V_{imax}$ | | | ±0.2 | % |
| Load regulation | $I_o=0.1 \dots 1.0 \times I_{onom}$ $V_{imin} < V_i < V_{imax}$ | | | ±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 | $V_{imin} < V_i < V_{imax}$ | 120 | | | % |
| Transient recovery time | 25% load change | | | ±5 | % |
| Transient overshoot range | 25% load change | | | 400 | us |
| Switch frequency | $V_{imin} < V_i < V_{imax}$ | | 300 | | KHz |

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

- Case temperature under shall not exceed the maximum case temperature level.

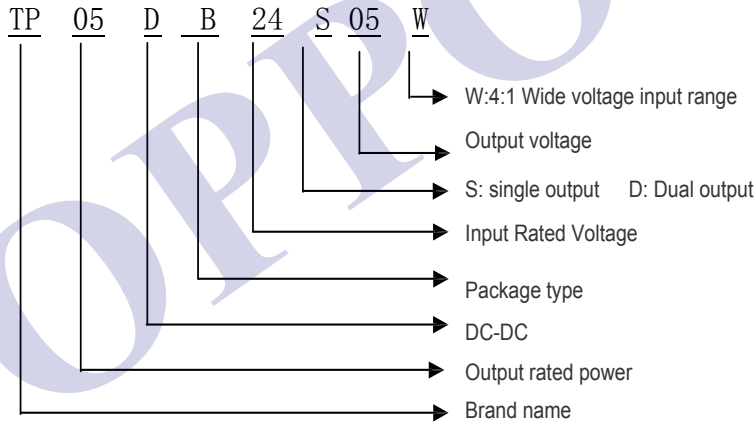
MECHANICAL DIMENSIONS **PIN CONNECTIONS**



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

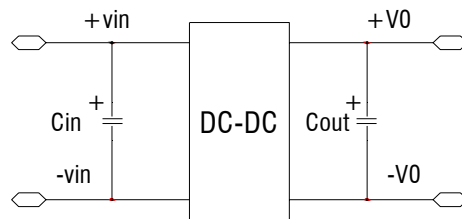
Units: mm
Tolerance: ±0.2mm

MODEL SELECTION



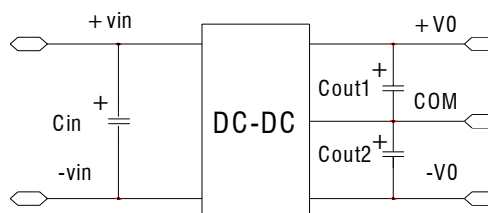
RECOMMEND CIRCUIT:

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.

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.