



DESCRIPTION: 3W 1.5KVDC Isolated Wide Range Input Voltage DC/DC Converters

The rated output power of TP03DA converters is 3W, the outline dimensions is "31.75*20.32*11.2", 2:1 and 4:1 wide input voltage range, the voltage range is 4.9V-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

| | | |
|---|--------------------------------------|--------------------------------------|
| 3W output power | 2:1 and 4:1 wide input voltage range | Over load protection |
| 31.75mm*20.32mm*11.2mm standard package | Fixed switching frequency | Operating temperature: -40°C to 85°C |
| Metal shell packaging | RoHS compliant | 1.5KVDC isolation |

SELECTION GUIDE

| Part Number | Input Voltage | | Output | | Efficiency(Typ) % | Maxium capacitive load (u F) |
|--------------|---------------|--------------|---------------|-------------|----------------------|---------------------------------|
| | voltage (VDC) | | Voltage (VDC) | Current (A) | | |
| | Rated | Range values | | | | |
| TP03DA05S05 | 5(2:1) | 4.5-9 | 5 | 0.6 | ≥73 | 1000 |
| TP03DA05S12 | 5(2:1) | 4.5-9 | 12 | 0.25 | ≥75 | 660 |
| TP03DA05D05 | 5(2:1) | 4.5-9 | ±5 | ±0.3 | ≥73 | ±850 |
| TP03DA05D12 | 5(2:1) | 4.5-9 | ±12 | ±0.125 | ≥78 | ±140 |
| TP03DA05D15 | 5(2:1) | 4.5-9 | ±15 | ±0.1 | ≥79 | ±47 |
| TP03DA12S03 | 12(2:1) | 9-18 | 3.3 | 0.6 | ≥73 | 2200 |
| TP03DA12S05 | 12(2:1) | 9-18 | 5 | 0.6 | ≥74 | 1500 |
| TP03DA12S12 | 12(2:1) | 9-18 | 12 | 0.25 | ≥75 | 660 |
| TP03DA12S15 | 12(2:1) | 9-18 | 15 | 0.2 | ≥75 | 470 |
| TP03DA12D05 | 12(2:1) | 9-18 | ±5 | ±0.3 | ≥76 | ±850 |
| TP03DA12D12 | 12(2:1) | 9-18 | ±12 | ±0.125 | ≥78 | ±140 |
| TP03DA12D15 | 12(2:1) | 9-18 | ±15 | ±0.1 | ≥79 | ±47 |
| TP03DA24S03 | 24(2:1) | 18-36 | 3.3 | 0.6 | ≥74 | 2200 |
| TP03DA24S05 | 24(2:1) | 18-36 | 5 | 0.6 | ≥76 | 1500 |
| TP03DA24S12 | 24(2:1) | 18-36 | 12 | 0.25 | ≥76 | 660 |
| TP03DA24S15 | 24(2:1) | 18-36 | 15 | 0.2 | ≥76 | 470 |
| TP03DA24D05 | 24(2:1) | 18-36 | ±5 | ±0.3 | ≥78 | ±850 |
| TP03DA24D12 | 24(2:1) | 18-36 | ±12 | ±0.125 | ≥79 | ±140 |
| TP03DA24D15 | 24(2:1) | 18-36 | ±15 | ±0.1 | ≥79 | ±47 |
| TP03DA48S03 | 48(2:1) | 36-72 | 3.3 | 0.6 | ≥74 | 2200 |
| TP03DA48S05 | 48(2:1) | 36-72 | 5 | 0.6 | ≥76 | 1500 |
| TP03DA48S12 | 48(2:1) | 36-72 | 12 | 0.25 | ≥78 | 660 |
| TP03DA48S15 | 48(2:1) | 36-72 | 15 | 0.2 | ≥78 | 470 |
| TP03DA48D05 | 48(2:1) | 36-72 | ±5 | ±0.3 | ≥79 | ±850 |
| TP03DA48D12 | 48(2:1) | 36-72 | ±12 | ±0.125 | ≥79 | ±140 |
| TP03DA48D15 | 48(2:1) | 36-72 | ±15 | ±0.1 | ≥80 | ±47 |
| TP03DA24S03W | 24(4:1) | 9-36 | 3.3 | 0.6 | ≥73 | 2200 |
| TP03DA24S05W | 24(4:1) | 9-36 | 5 | 0.6 | ≥75 | 1500 |
| TP03DA24S12W | 24(4:1) | 9-36 | 12 | 0.25 | ≥75 | 660 |
| TP03DA24S15W | 24(4:1) | 9-36 | 15 | 0.2 | ≥75 | 470 |
| TP03DA24D05W | 24(4:1) | 9-36 | ±5 | ±0.3 | ≥77 | ±850 |
| TP03DA24D12W | 24(4:1) | 9-36 | ±12 | ±0.125 | ≥78 | ±140 |
| TP03DA24D15W | 24(4:1) | 9-36 | ±15 | ±0.1 | ≥78 | ±47 |
| TP03DA48S05W | 48(4:1) | 18-72 | 5 | 0.6 | ≥75 | 1500 |
| TP03DA48S12W | 48(4:1) | 18-72 | 12 | 0.25 | ≥77 | 660 |
| TP03DA48S15W | 48(4:1) | 18-72 | 15 | 0.2 | ≥77 | 470 |
| TP03DA48D05W | 48(4:1) | 18-72 | ±5 | ±0.3 | ≥78 | ±850 |
| TP03DA48D12W | 48(4:1) | 18-72 | ±12 | ±0.125 | ≥78 | ±140 |
| TP03DA48D15W | 48(4:1) | 18-72 | ±15 | ±0.1 | ≥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 | | | 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 |

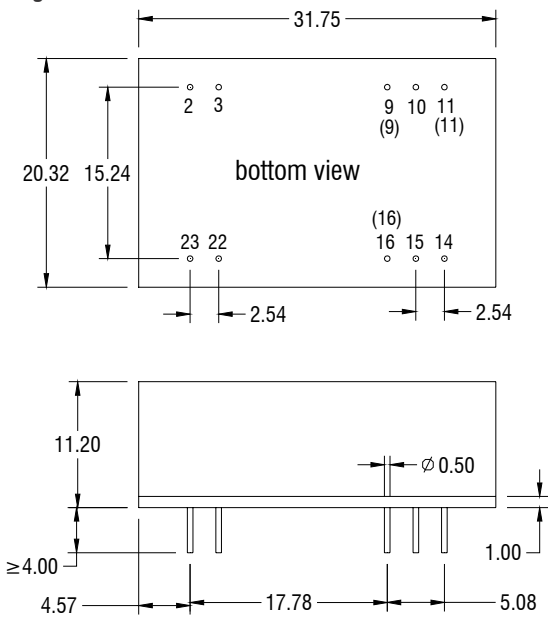
| OUTPUT CHARACTERISTICS | | | | | |
|----------------------------|--|-----|-----|------|-------|
| Parameter | Test conditions | Min | Typ | Max | Units |
| Voltage accuracy | $I_o=0.1\sim 1.0 \times I_{onom}$ $V_i=V_i$ rated | | | ±1 | % |
| Line regulation | $V_{imin} \leq V_i \leq V_{imax}$ | | | ±0.2 | % |
| Load regulation | $I_o=0.1\sim 1.0 \times I_{onom}$ $V_{imin} \leq V_i \leq V_{imax}$ | | | ±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 | $V_{imin} \leq V_i \leq V_{imax}$ | 120 | | | % |
| Transient recovery time | 25% load change | | | ±5 | % |
| Transient overshoot range | 25% load change | | | 400 | us |
| Switch frequency | $V_{imin} \leq V_i \leq V_{imax}$ | | 30 | | 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**

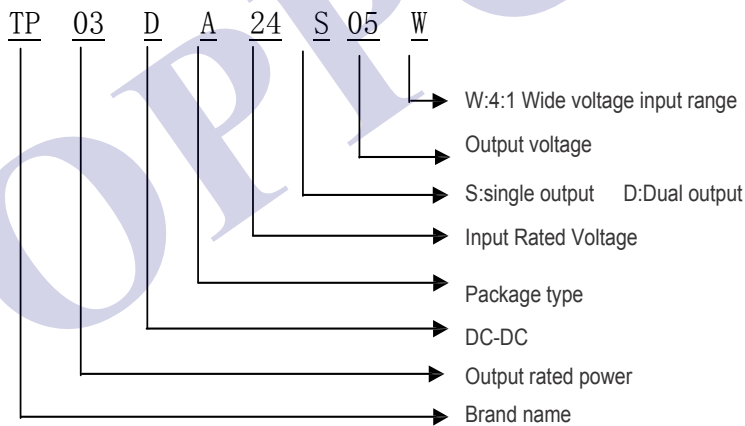
DIP Package



Units: mm
Tolerance: ±0.2mm

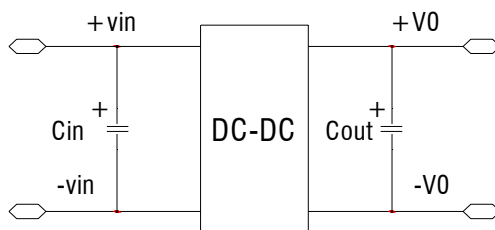
| Pin | Single Output | Dual Output |
|------|---------------|-------------|
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | NC | / |
| (9) | / | Com |
| 10 | NC | NC |
| 11 | NC | / |
| (11) | / | -Vout |
| 14 | +Vout | +Vout |
| 15 | NC | NC |
| 16 | -Vout | / |
| (16) | / | Com |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |

MODEL SELECTION



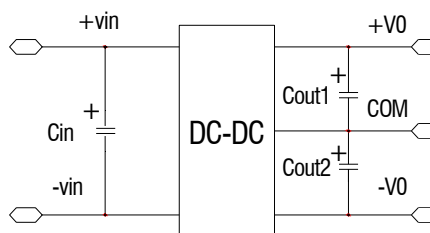
RECOMMEND CIRCUIT:

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.

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 RATING: 0°C