


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

The rated output power of TP03DB converters is 3W, 2:1 and 4:1 wide input voltage range, the voltage range is 4.5-9V, 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 voltage	2:1 and 4:1 wide input voltage range	Over load protection
RoHS compliant	1.5KVDC isolation	Operating temperature -40°C to 85°C
Metal shell package	/	/

SELECTION GUIDE

Part Number	Input Voltage		Output		Efficiency(Typ) %	Maximum capacitive load (u F)
	voltage (VDC)		Voltage (VDC)	Current (A)		
	Rated	Range values				
TP03DB05S05	5(2:1)	4.5-9	5	0.6	≥74	1500
TP03DB05D05	5(2:1)	4.5-9	±5	±0.3	≥76	±850
TP03DB05D12	5(2:1)	4.5-9	±12	±0.125	≥78	±140
TP03DB12S03	12(2:1)	9-18	3.3	0.6	≥73	2200
TP03DB12S05	12(2:1)	9-18	5	0.6	≥74	1500
TP03DB12S12	12(2:1)	9-18	12	0.25	≥75	660
TP03DB12S15	12(2:1)	9-18	15	0.2	≥75	470
TP03DB12D05	12(2:1)	9-18	±5	±0.3	≥76	±850
TP03DB12D12	12(2:1)	9-18	±12	±0.125	≥78	±140
TP03DB12D15	12(2:1)	9-18	±15	±0.1	≥79	±47
TP03DB24S03	24(2:1)	18-36	3.3	0.6	≥74	2200
TP03DB24S05	24(2:1)	18-36	5	0.6	≥76	1500
TP03DB24S12	24(2:1)	18-36	12	0.25	≥76	660
TP03DB24S15	24(2:1)	18-36	15	0.2	≥76	470
TP03DB24D05	24(2:1)	18-36	±5	±0.3	≥78	±850
TP03DB24D12	24(2:1)	18-36	±12	±0.125	≥79	±140
TP03DB24D15	24(2:1)	18-36	±15	±0.1	≥79	±47
TP03DB48S03	48(2:1)	36-72	3.3	0.6	≥74	2200
TP03DB48S05	48(2:1)	36-72	5	0.6	≥76	1500
TP03DB48S12	48(2:1)	36-72	12	0.25	≥78	660
TP03DB48S15	48(2:1)	36-72	15	0.2	≥78	470
TP03DB48D05	48(2:1)	36-72	±5	±0.3	≥79	±850
TP03DB48D12	48(2:1)	36-72	±12	±0.125	≥79	±140
TP03DB48D15	48(2:1)	36-72	±15	±0.1	≥80	±47
TP03DB24S05W	24(4:1)	9-36	5	0.6	≥75	1500
TP03DB24S12W	24(4:1)	9-36	12	0.25	≥75	660
TP03DB24S15W	24(4:1)	9-36	15	0.2	≥75	470
TP03DB24D05W	24(4:1)	9-36	±5	±0.3	≥77	±850
TP03DB24D12W	24(4:1)	9-36	±12	±0.125	≥78	±140
TP03DB24D15W	24(4:1)	9-36	±15	±0.1	≥78	±47
TP03DB48S05W	48(4:1)	18-72	5	0.6	≥75	1500
TP03DB48S12W	48(4:1)	18-72	12	0.25	≥77	660
TP03DB48S15W	48(4:1)	18-72	15	0.2	≥77	470
TP03DB48D05W	48(4:1)	18-72	±5	±0.3	≥78	±850
TP03DB48D12W	48(4:1)	18-72	±12	±0.125	≥78	±140
TP03DB48D15W	48(4:1)	18-72	±15	±0.1	≥79	±47

Input voltage 9-18VDC, start-up voltage 9.5-18VDC, input voltage 9-36VDC, start-up voltage 9.5-36VDC.

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		5x10 ⁵		hrs
Over-current protection	Full input range	Auto recovery			
Cooling	Free air convection				
Case material	Metal case				

INPUT CHARACTERISTICS

parameter	Test conditions	Min	Typ	Max	Units
Input voltage	5V Input module(4.5V-9V)	4.5	5	9	VDC
Input voltage	12V Input module(9V-18V)	9.5	12	18	VDC
Input voltage	24V Input module(18V-36V)	18	24	36	VDC
Input voltage	48V Input module(36V-72V)	36	48	72	VDC
Input voltage	24V Input module(9V-36V)	9.5	24	36	VDC
Input voltage	48V Input module(18V-72V)	18	48	72	VDC
Start rising time	Start rising time from 5% to 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	$V_{imin} \leq V_i \leq V_{imax}$			±0.2	%
Load regulation	$I_o=0.1 \dots 1.0 \times I_{onom}$ $V_{imin} \leq V_i \leq V_{imax}$			±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 time	25% load change			400	us
Switch frequency	$V_{imin} \leq V_i \leq V_{imax}$		300		KHz

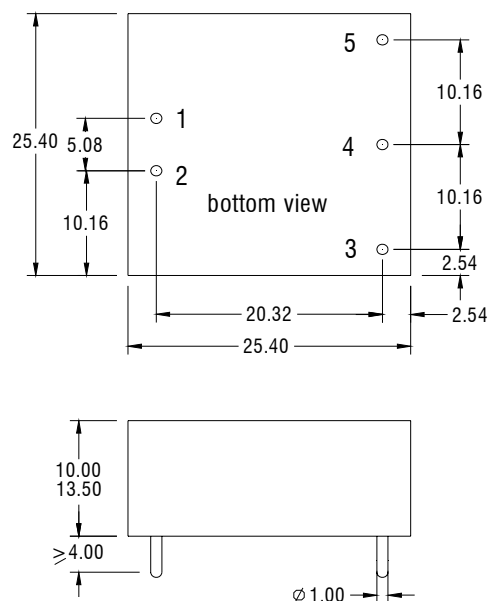
ENVIRONMENT CHARACTERISTICS

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				

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

MECHANICAL DIMENSIONS

DIP Package



Units: mm

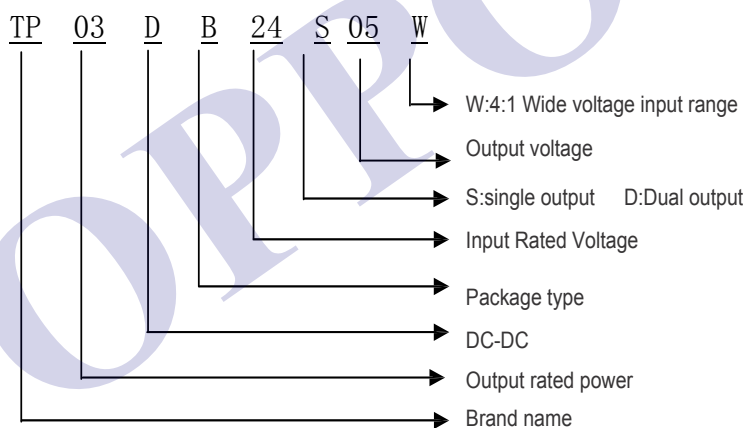
Pin diameter tolerances: $\pm 0.1\text{mm}$

General Tolerance: $\pm 0.5\text{mm}$

PIN CONNECTIONS

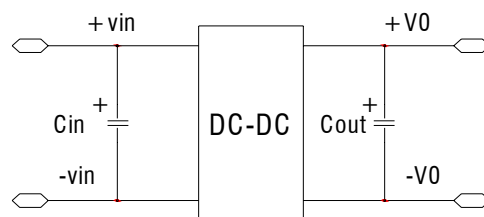
PIN	Single output	Dual output
1	+Vin	+Vin
2	-Vin	-Vin
3	-Vout	-Vout
4	/	Com
5	+Vout	+Vout

MODEL SELECTION



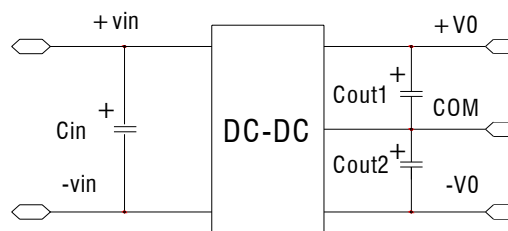
RECOMMEND CIRCUIT:

Single Output:



RECOMMEND CIRCUIT:

Dual Output:



- Add input capacitance C_{in} is helpful to improve the electromagnetic compatibility, recommend C_{in} use 47 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 $\mu F/A$, 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