


DESCRIPTION: 4W Wide Range Input Voltage DC/DC Converters

The rated output power of TP04DA converters is 4W, 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

4W 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 isolated

SELECTION GUIDE

Part Number	Input Vlotage		Output		Efficiency(Typ) %	Maxium capacitive load (u F)
	voltage (VDC)		Voltage (VDC)	Current (A)		
	Rated	Range values				
TP04DA05S05	5(2:1)	4.5-9	5	0.8	≥73	1000
TP04DA05D05	5(2:1)	4.5-9	±5	±0.4	≥73	±470
TP04DA12S04	12(2:1)	9-18	3.3	1.2	≥73	2200
TP04DA12S05	12(2:1)	9-18	5	0.8	≥74	1000
TP04DA12S12	12(2:1)	9-18	12	0.33	≥75	220
TP04DA12S15	12(2:1)	9-18	15	0.26	≥75	100
TP04DA12D05	12(2:1)	9-18	±5	±0.4	≥76	±470
TP04DA12D12	12(2:1)	9-18	±12	±0.16	≥78	±100
TP04DA12D15	12(2:1)	9-18	±15	±0.13	≥79	±47
TP04DA24S04	24(2:1)	18-36	3.3	1.2	≥74	2200
TP04DA24S05	24(2:1)	18-36	5	0.8	≥76	1000
TP04DA24S12	24(2:1)	18-36	12	0.33	≥76	220
TP04DA24S15	24(2:1)	18-36	15	0.26	≥76	220
TP04DA24D05	24(2:1)	18-36	±5	±0.4	≥78	±470
TP04DA24D12	24(2:1)	18-36	±12	±0.16	≥79	±100
TP04DA24D15	24(2:1)	18-36	±15	±0.13	≥79	±47
TP04DA48S04	48(2:1)	36-72	3.3	1.2	≥74	2200
TP04DA48S05	48(2:1)	36-72	5	0.8	≥76	680
TP04DA48S12	48(2:1)	36-72	12	0.33	≥78	330
TP04DA48S15	48(2:1)	36-72	15	0.26	≥78	100
TP04DA48D05	48(2:1)	36-72	±5	±0.4	≥79	±470
TP04DA48D12	48(2:1)	36-72	±12	±0.16	≥79	±100
TP04DA48D15	48(2:1)	36-72	±15	±0.13	≥80	±47
TP04DA24S05W	24(4:1)	9-36	5	0.8	≥75	680
TP04DA24S12W	24(4:1)	9-36	12	0.33	≥75	330
TP04DA24S15W	24(4:1)	9-36	15	0.26	≥75	100
TP04DA24D05W	24(4:1)	9-36	±5	±0.4	≥77	±470
TP04DA24D12W	24(4:1)	9-36	±12	±0.16	≥78	±100
TP04DA24D15W	24(4:1)	9-36	±15	±0.13	≥78	±47
TP04DA48S05W	48(4:1)	18-72	5	0.8	≥75	680
TP04DA48S12W	48(4:1)	18-72	12	0.33	≥77	470
TP04DA48S15W	48(4:1)	18-72	15	0.26	≥77	100

Suffix "B" for specail Pin design ,for example: TP04DA24S05WB

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	$V_{imin} \leq V_i \leq V_{imax}$			± 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 range	25% load change			400	us
Switch frequency	$V_{imin} \leq V_i \leq V_{imax}$		30		KHz

ENVIRONMENT CHARACTERISTICS

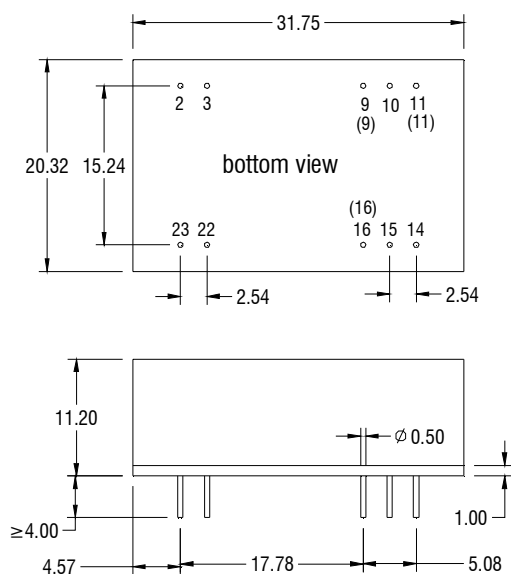
parameter	Test conditions	Min	Typ	Max	Units
Environment temperature	industrial-class	-25		+55	℃
Maximum case temperature	industrial-class			+85	℃
Storage temperature	Industry-class/ Military J1&JII class	-40		+105	℃
Relative humidity	No condensation	5		90	RH(%)
Temperature coefficient			± 0.02		%/℃

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

MECHANICAL DIMENSIONS

Units: mm

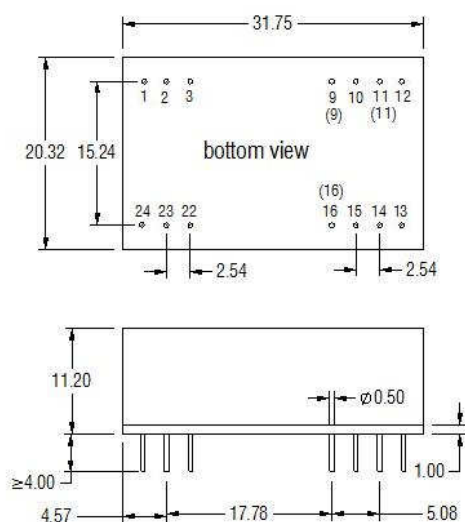
Tolerance: $\pm 0.2\text{mm}$



B packaging

Units: mm

Tolerance: $\pm 0.2\text{mm}$

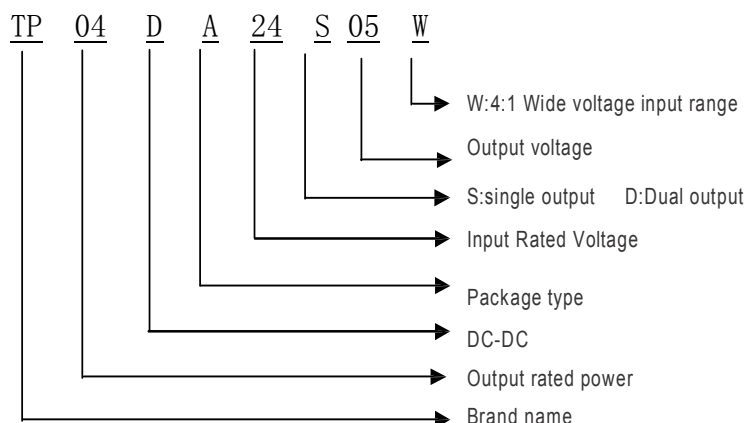


PIN CONNECTION		
Pin	Single Output	Dual Output
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	/
(9)	/	Com
10	NC	NC
11	NC	/
(11)	/	-Vout
14	+Vout	+Vout
15	NC	NC
16	-Vout	/
(16)	/	Com
22	+Vin	+Vin

B packaging

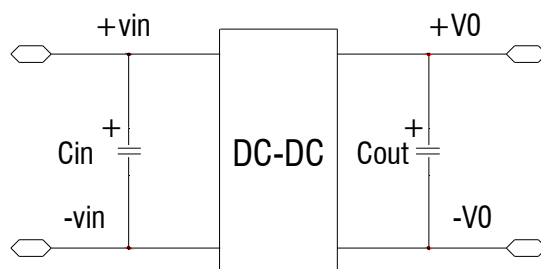
PIN CONNECTION		
Pin	Single Output	Dual Output
1	+Vin	-Vin
2	NC	-Vout
3	NC	common
9	/	/
10	-Vout	common
11	+Vout	+Vout
12	-Vin	-Vin
13	-Vin	-Vin
14	+Vout	+Vout
15	-Vout	common
16	/	/
22	NC	common
23	NC	-Vout
24	+Vin	+Vin

MODEL SELECTION

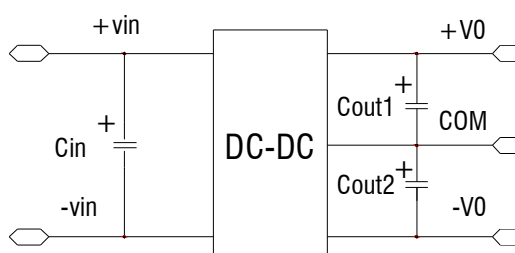


RECOMMEND CIRCUIT:

Single Output :


RECOMMEND CIRCUIT:

Dual Output :



- Add input capacitance C_{in} is helpful to improve the electromagnetic compatibility, recommend C_{in} use 47 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 DERATING CURVE

