

**DESCRIPTION: 6W Wide Input Voltage DC/DC Converters**

The rated output power of TP06DA converters is 6W, the outline dimensions is "31.75\*20.32\*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 ±1% it can be widely used in telecommunications, railway transportation, instrument and etc.

**FEATURES**

6W 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: -25°C to 55 °C
Metal shell package	RoHS compliant	/

**SELECTION GUIDE**

Part Number	Input Voltage		Output		Efficiency(Typ) %	Maximum capacitive load (u F)		
	voltage (VDC)		Voltage (VDC)	Current (A)				
	Rated	Range values						
TP06DA12S03	12(2:1)	9-18	3.3	1.5	≥77	2200		
TP06DA12S05	12(2:1)	9-18	5	1.2	≥79	1500		
TP06DA12S12	12(2:1)	9-18	12	0.5	≥82	660		
TP06DA12S15	12(2:1)	9-18	15	0.4	≥84	470		
TP06DA12D05	12(2:1)	9-18	±5	±0.6	≥79	±850		
TP06DA12D12	12(2:1)	9-18	±12	±0.25	≥82	±140		
TP06DA12D15	12(2:1)	9-18	±15	±0.2	≥84	±47		
TP06DA24S03	24(2:1)	18-36	3.3	1.5	≥78	2200		
TP06DA24S05	24(2:1)	18-36	5	1.2	≥80	1500		
TP06DA24S12	24(2:1)	18-36	12	0.5	≥84	660		
TP06DA24S15	24(2:1)	18-36	15	0.4	≥86	470		
TP06DA24S24	24(2:1)	18-36	24	0.25	≥83	470		
TP06DA24D05	24(2:1)	18-36	±5	±0.6	≥81	±850		
TP06DA24D12	24(2:1)	18-36	±12	±0.25	≥84	±140		
TP06DA24D15	24(2:1)	18-36	±15	±0.2	≥86	±47		
TP06DA48S03	48(2:1)	36-72	3.3	1.5	≥78	2200		
TP06DA48S05	48(2:1)	36-72	5	1.2	≥80	1500		
TP06DA48S12	48(2:1)	36-72	12	0.5	≥84	660		
TP06DA48S15	48(2:1)	36-72	15	0.4	≥86	470		
TP06DA48D05	48(2:1)	36-72	±5	±0.6	≥80	±850		
TP06DA48D12	48(2:1)	36-72	±12	±0.25	≥84	±140		
TP06DA48D15	48(2:1)	36-72	±15	±0.2	≥83	±47		
TP06DA24S05W	24(4:1)	9-36	5	1.2	≥80	1500		
TP06DA24S12W	24(4:1)	9-36	12	0.5	≥82	660		
TP06DA24S15W	24(4:1)	9-36	15	0.4	≥84	470		
TP06DA24D05W	24(4:1)	9-36	±5	±0.6	≥80	±850		
TP06DA24D12W	24(4:1)	9-36	±12	±0.25	≥82	±140		
TP06DA24D15W	24(4:1)	9-36	±15	±0.2	≥84	±47		
TP06DA48S05W	48(4:1)	18-72	5	1.2	≥77	1500		
TP06DA48S12W	48(4:1)	18-72	12	0.5	≥80	660		
TP06DA48S15W	48(4:1)	18-72	15	0.4	≥84	470		
TP06DA48D05W	48(4:1)	18-72	±5	±0.6	≥80	±850		
TP06DA48D12W	48(4:1)	18-72	±12	±0.25	≥82	±140		
TP06DA48D15W	48(4:1)	18-72	±15	±0.2	≥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 <sup>5</sup>		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	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

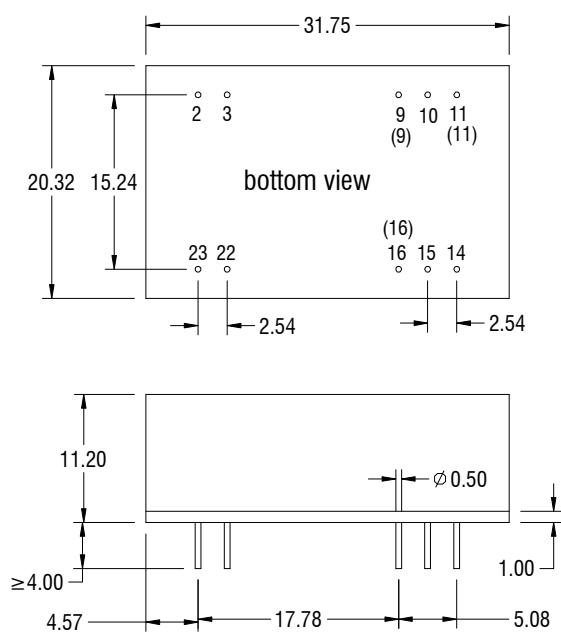
parameter	Test conditions	Min	Typ	Max	Units
Voltage accuracy	$I_o=0.1 \dots 1.0 \times I_{nom}$ $V_i=V_i$ rated			$\pm 1$	%
Line regulation	$V_{min} \leq V_i \leq V_{max}$			$\pm 0.2$	%
Load regulation	$I_o=0.1 \dots 1.0 \times I_{nom}$ $V_{min} \leq V_i \leq V_{max}$			$\pm 0.5$	%
Auxiliary voltage accuracy	Main Load and auxiliary load differ 25%, the auxiliary circuit of the load with at least 25%, the main circuit with full load			$\pm 3$	%
Ripple and noise	20MHz bandwidth			$\pm 1$	%
Over-current protection	$V_{min} \leq V_i \leq V_{max}$	120			%
Transient recovery time	25% load change			$\pm 5$	%
Transient overshoot range	25% load change			400	us
Switch frequency	$V_{min} \leq V_i \leq V_{max}$		300		KHz

### ENVIRONMENT CHARACTERISTICS

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

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

## MECHANICAL DIMENSIONS

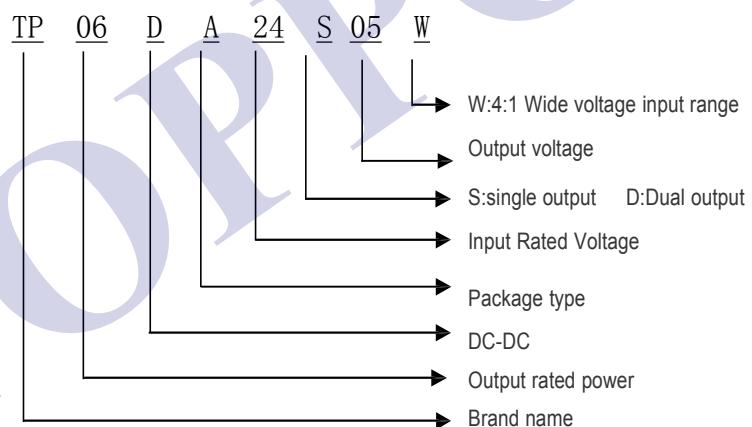


PIN CONNECTION		
Pin	Single Output	Dual Output
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	
(9)	/	Com
10	NC	NC
11	NC	
(11)	/	-Vout
14	+Vout	+Vout
15	NC	NC
16	-Vout	/
(16)	/	Com
22	+Vin	+Vin
23	+Vin	+Vin

Units: mm

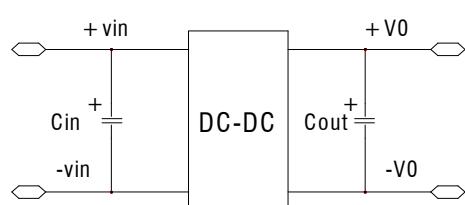
Tolerance: ±0.2mm

## MODEL SELECTION



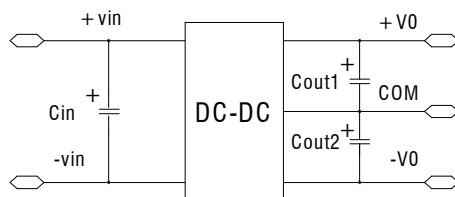
## RECOMMEND CIRCUIT:

Single Output :



## RECOMMEND CIRCUIT:

Dual Output:



- Add input capacitance  $C_{in}$  is helpful to improve the electromagnetic compatibility, recommend  $C_{in}$  use 47  $\mu F$ -100 $\mu F$  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 unstable,
- 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.