



**DESCRIPTION: 10W 1.5KVDC Isolated Wide Input Voltage DC/DC Converters**

The rated output power of TP10DC converters is 10W, the outline dimensions is "50.8\*25.4\*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  $\pm 1\%$ , it can be widely used in telecommunications, railway transportation, instrument and etc.

**FEATURES**

10W output power	2:1&4:1 input voltage range	Over load protection
50.8mm*25.4mm*11.2mm standard package	Fixed switching frequency	Operating temperature: -40°C to 85°C
Metal shielding package	RoHS compliant	1.5KVDC isolation

**SELECTION GUIDE**

Part Number	Input Voltage		Output		Efficiency(Typ) %	Maximum Capacitive Load ( $\mu$ F)
	voltage (VDC)		Voltage (VDC)	Current (A)		
	Rated	Range values				
TP10DC12S03	12(2:1)	9-18	3.3	2	$\geq 75$	6800
TP10DC12S05	12(2:1)	9-18	5	2	$\geq 77$	4700
TP10DC12S12	12(2:1)	9-18	12	0.84	$\geq 80$	690
TP10DC12S15	12(2:1)	9-18	15	0.66	$\geq 82$	470
TP10DC12D05	12(2:1)	9-18	$\pm 5$	$\pm 1$	$\geq 77$	$\pm 680$
TP10DC12D12	12(2:1)	9-18	$\pm 12$	$\pm 0.42$	$\geq 79$	$\pm 330$
TP10DC12D15	12(2:1)	9-18	$\pm 15$	$\pm 0.33$	$\geq 80$	$\pm 110$
TP10DC24S03	24(2:1)	18-36	3.3	2	$\geq 76$	6800
TP10DC24S05	24(2:1)	18-36	5	2	$\geq 79$	4700
TP10DC24S12	24(2:1)	18-36	12	0.84	$\geq 81$	690
TP10DC24S15	24(2:1)	18-36	15	0.66	$\geq 83$	470
TP10DC24S24	24(2:1)	18-36	24	0.42	$\geq 82$	470
TP10DC24D05	24(2:1)	18-36	$\pm 5$	$\pm 1$	$\geq 80$	$\pm 680$
TP10DC24D12	24(2:1)	18-36	$\pm 12$	$\pm 0.42$	$\geq 80$	$\pm 330$
TP10DC24D15	24(2:1)	18-36	$\pm 15$	$\pm 0.33$	$\geq 83$	$\pm 110$
TP10DC48S03	48(2:1)	36-72	3.3	2	$\geq 78$	6800
TP10DC48S05	48(2:1)	36-72	5	2	$\geq 81$	4700
TP10DC48S12	48(2:1)	36-72	12	0.84	$\geq 82$	690
TP10DC48S15	48(2:1)	36-72	15	0.66	$\geq 83$	470
TP10DC48D05	48(2:1)	36-72	$\pm 5$	$\pm 1$	$\geq 81$	$\pm 680$
TP10DC48D12	48(2:1)	36-72	$\pm 12$	$\pm 0.42$	$\geq 82$	$\pm 330$
TP10DC48D15	48(2:1)	36-72	$\pm 15$	$\pm 0.33$	$\geq 83$	$\pm 110$
TP10DC24S05W	24(4:1)	9-36	5	2	$\geq 78$	4700
TP10DC24S12W	24(4:1)	9-36	12	0.84	$\geq 80$	690
TP10DC24S15W	24(4:1)	9-36	15	0.66	$\geq 82$	470
TP10DC24D05W	24(4:1)	9-36	$\pm 5$	$\pm 1$	$\geq 79$	$\pm 680$
TP10DC24D12W	24(4:1)	9-36	$\pm 12$	$\pm 0.42$	$\geq 79$	$\pm 330$
TP10DC24D15W	24(4:1)	9-36	$\pm 15$	$\pm 0.33$	$\geq 82$	$\pm 110$
TP10DC48S05W	48(4:1)	18-72	5	2	$\geq 80$	4700
TP10DC48S12W	48(4:1)	18-72	12	0.84	$\geq 81$	690
TP10DC48S15W	48(4:1)	18-72	15	0.66	$\geq 82$	470
TP10DC48D05W	48(4:1)	18-72	$\pm 5$	$\pm 1$	$\geq 79$	$\pm 680$
TP10DC48D12W	48(4:1)	18-72	$\pm 12$	$\pm 0.42$	$\geq 80$	$\pm 330$
TP10DC48D15W	48(4:1)	18-72	$\pm 15$	$\pm 0.33$	$\geq 81$	$\pm 110$

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	The12V input module(9V-18V)	8.8	9	9.3	VDC
Startup voltage	The24V input module(18V-36V)			18	VDC
Startup voltage	The48Vinput module(36V-72V)			36	VDC
Startup voltage	The24V input module(18V-36V)	8.8	9	9.3	VDC
Startup voltage	The48Vinput module(36V-72V)			18	VDC
Start time	Input rising time from 5%-100%	20			ms

**OUTPUT CHARACTERISTICS**

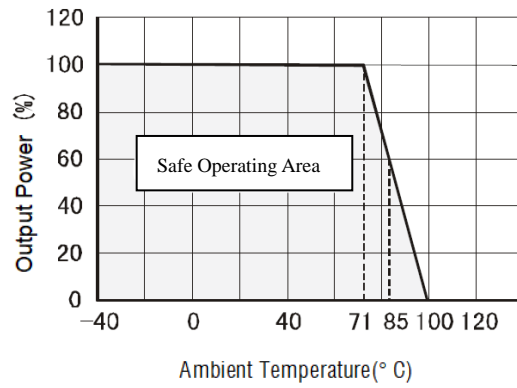
parameter	Test conditions	Min	Typ	Max	Units
Voltage accuracy	$I_o=0.1\cdots 1.0 \times I_{onom}$ $V_i=V_i$ rated			±1	%
Line regulation	$V_{imin} < V_i < V_{imax}$			±0.2	%
Load regulation	$I_o=0.1\cdots 1.0 \times I_{onom}$ $V_{imin} < V_i < V_{imax}$			±0.5	%
Auxiliary voltage accuracy	Main Load and auxiliary load differ 25%,the auxiliary circuit of the load with at least 25%, the main circuit with the 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℃)	-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				

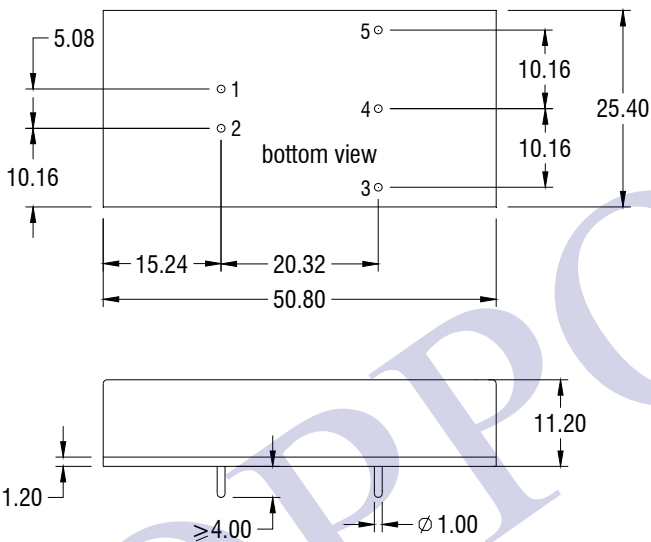
- Module in every environment temperature rating, case temperature under shall not exceed the maximum case temperature level.

TEMPERATURE DERATING GRAPHS



MECHANICAL DIMENSIONS

DIP Package



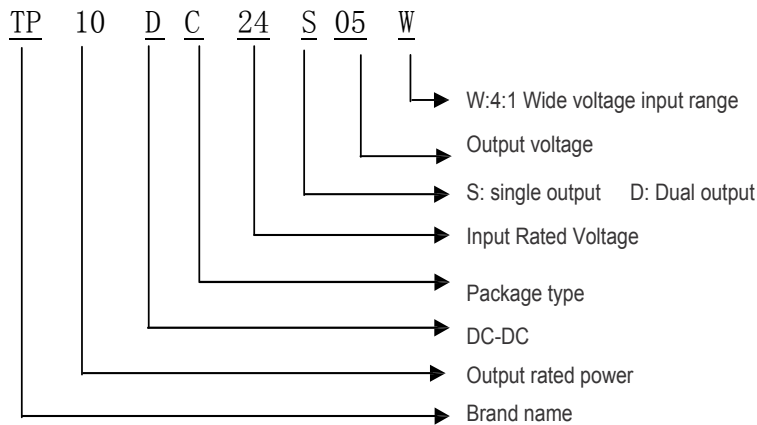
Units: mm

Tolerance: ±0.2mm

PIN CONNECTIONS

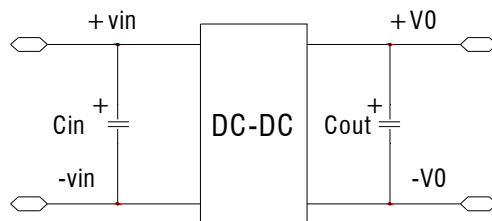
Pin	Single output	Dual output
1	+Vin	+Vin
2	-Vin	-Vin
3	-Vout	-Vout
4	/	Com
5	+Vout	+Vout

MODEL SELECTION

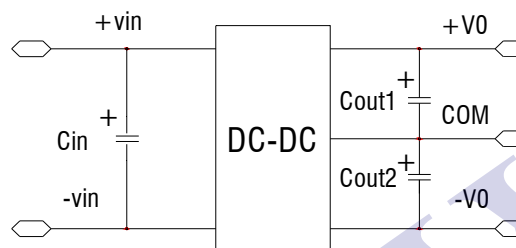


**RECOMMEND CIRCUIT:**

Single Output :



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 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