



**DESCRIPTION: 20W Wide Input Voltage DC/DC Converters**

The rated output power of TP20DC converters is 20W, the outline dimensions is "50.8\*25.4\*11.2", 2:1 input voltage range, the voltage range is 9V-18V, 18V-36V, 36V-72V. The accuracy of the converter can reach ±1%, it can be widely used in telecommunications, railway transportation, instrument and etc.

**FEATURES**

20W output power	2:1 input voltage range	Under input voltage protection
50.8mm*25.4mm*11.2mm standard package	Fixed switching frequency	Over output voltage protection
Operating temperature: -40°C to 85°C	Long-term short circuit protection	Metal shielding package
RoHS compliant	/	/

Part Number	Input Voltage		Output		Efficiency(Typ) %
	voltage (VDC)		Voltage (VDC)	Current (A)	
	Rated	Range values			
TP20DC12S03	12(2:1)	9-18	3.3	5.4	80
TP20DC12S05	12(2:1)	9-18	5	4	82
TP20DC12S12	12(2:1)	9-18	12	1.67	83
TP20DC12S15	12(2:1)	9-18	15	1.33	84
TP20DC12D05	12(2:1)	9-18	±5	±2	80
TP20DC12D12	12(2:1)	9-18	±12	±0.83	83
TP20DC12D15	12(2:1)	9-18	±15	±0.67	80
TP20DC24S03	24(2:1)	18-36	3.3	5.4	84
TP20DC24S05	24(2:1)	18-36	5	4	83
TP20DC24S12	24(2:1)	18-36	12	1.67	85
TP20DC24S15	24(2:1)	18-36	15	1.33	85
TP20DC24S24	24(2:1)	18-36	24	0.83	86
TP20DC24D12	24(2:1)	18-36	±12	±0.83	85
TP20DC24D15	24(2:1)	18-36	±15	±0.67	85
TP20DC48S05	48(2:1)	36-72	5	4	82
TP20DC48S12	48(2:1)	36-72	12	1.67	86
TP20DC48S15	48(2:1)	36-72	15	1.33	86
TP20DC48D05	48(2:1)	36-72	±5	±2	82
TP20DC48D12	48(2:1)	36-72	±12	±0.83	85
TP20DC48D15	48(2:1)	36-72	±15	±0.67	85

**GENERAL CHARACTERISTICS**

parameter	Test conditions	Min	Typ	Max	Units
Isolation voltage	Input to output		500	1500	VDC
Insulation resistance	Input to output	100M			Ohm
Seismic	10~55Hz		5		G
MTBF	MIL-HDBK-217F2		5x10 <sup>5</sup>		hrs
Over-current protection mode	All input range	Automatic 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)	9.2	9.5	9.8	VDC
Startup voltage	The24V input module(18V-36V)			18	VDC
Startup voltage	The48Vinput module(36V-72V)			36	VDC
Under input voltage protection	The12V input module(9V-18V)			8.5	VDC
Under input voltage protection	The24V input module(18V-36V)			17	VDC
Under input voltage protection	The48Vinput module(36V-72V)			35	VDC
Start time	Input rising time from 5%-100%	20			ms

**OUTPUT CHARACTERISTICS**

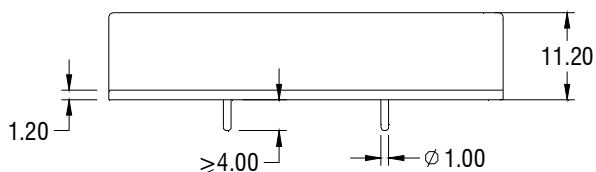
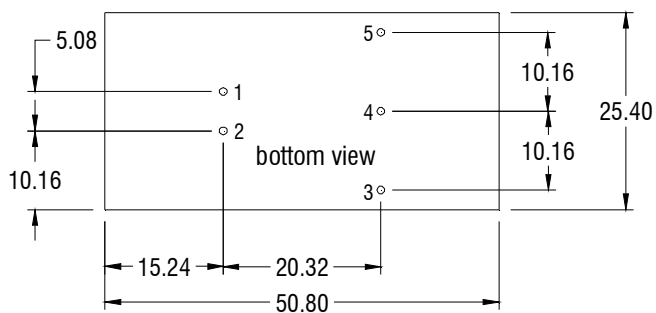
parameter	Test conditions	Min	Typ	Max	Units
Voltage accuracy	$I_o=0.1 \dots 1.0 \times I_{onom}$ $V_i=V_i$ rated			$\pm 1$	%
Line regulation	$V_{imin} \leq V_i \leq V_{imax}$			$\pm 0.2$	%
Load regulation	$I_o=0.1 \dots 1.0 \times I_{onom}$ $V_{imin} \leq V_i \leq V_{imax}$			$\pm 0.5$	%
Auxiliary voltage 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	$V_{imin} \leq V_i \leq V_{imax}$	120			%
Transient recovery time	25% load changes			$\pm 5$	%
Transient overshoot time	25% load changes			400	US
Switch frequency	$V_{imin} \leq V_i \leq V_{imax}$		300		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&J11 class	-40		+105	℃
Relative humidity	No condensation	5		90	RH(%)
Temperature coefficient			$\pm 0.02$		%/℃

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

**MECHANICAL DIMENSIONS**

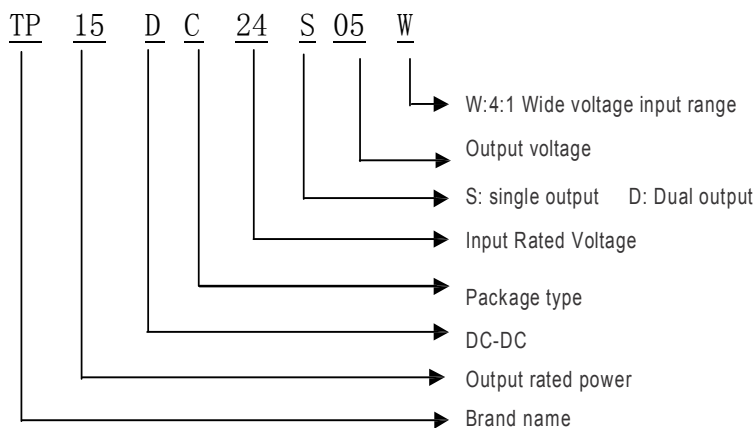


Units: mm

Tolerance: ±0.2mm

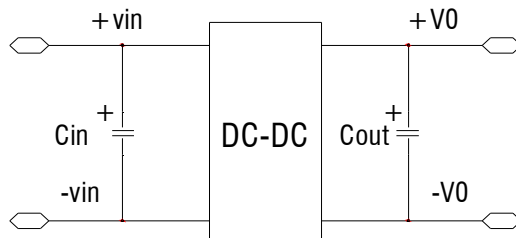
PIN CONNECTION		
Pin	Single output	Dual output
1	+Vin	+Vin
2	-Vin	-Vin
3	-Vout	-Vout
4	/	Com
5	+Vout	+Vout

**MODEL SELECTION**



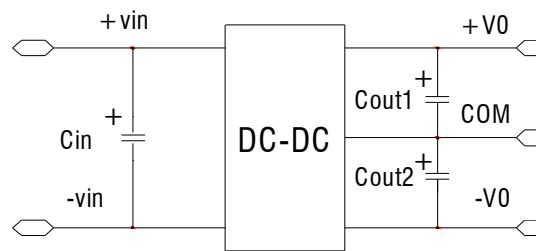
**RECOMMEND CIRCUIT**

Single Output:



## RECOMMEND CIRCUIT

Dual Output :



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

Attn: New Design, only produce when payment received