



**DESCRIPTION: 5W 1.5KVDC Isolated Wide Voltage Input DC/DC Converters**

The rated output power of TP05DB converters is 5W, the outline dimensions is "25.4\*25.4\*11.2", 2:1 and 4:1 wide input voltage range, the voltage range is 4.5V-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**

5W output power	2:1 and 4:1 wide input Voltage range	Over load protection
25.4mm*25.4mm*11.2mm standard package	Fixed switching frequency	Operating temperature: -40°C to 85°C
Metal shell package	RoHS compliant	1.5KVDC isolation

**SELECTION GUIDE**

Part Number	Input Voltage		Output		Efficiency(Typ) %	Maxium Capacitive Load ( $\mu$ F)
	voltage (VDC)		Voltage (VDC)	Current (A)		
	Rated	Range values				
TP05DB05S05	5(2:1)	4.5-9	5	1	$\geq 74$	1500
TP05DB12S03	12(2:1)	9-18	3.3	1	$\geq 73$	2200
TP05DB12S05	12(2:1)	9-18	5	1	$\geq 74$	1500
TP05DB12S12	12(2:1)	9-18	12	0.42	$\geq 75$	660
TP05DB12S15	12(2:1)	9-18	15	0.33	$\geq 75$	470
TP05DB12D05	12(2:1)	9-18	$\pm 5$	$\pm 0.5$	$\geq 76$	$\pm 850$
TP05DB12D12	12(2:1)	9-18	$\pm 12$	$\pm 0.21$	$\geq 78$	$\pm 140$
TP05DB12D15	12(2:1)	9-18	$\pm 15$	$\pm 0.17$	$\geq 79$	$\pm 47$
TP05DB24S03	24(2:1)	18-36	3.3	1	$\geq 74$	2200
TP05DB24S05	24(2:1)	18-36	5	1	$\geq 76$	1500
TP05DB24S12	24(2:1)	18-36	12	0.42	$\geq 76$	660
TP05DB24S15	24(2:1)	18-36	15	0.33	$\geq 76$	470
TP05DB24S24	24(2:1)	18-36	24	0.21	$\geq 79$	470
TP05DB24D05	24(2:1)	18-36	$\pm 5$	$\pm 0.5$	$\geq 78$	$\pm 850$
TP05DB24D12	24(2:1)	18-36	$\pm 12$	$\pm 0.21$	$\geq 79$	$\pm 140$
TP05DB24D15	24(2:1)	18-36	$\pm 15$	$\pm 0.17$	$\geq 79$	$\pm 47$
TP05DB48S03	48(2:1)	36-72	3.3	1	$\geq 74$	2200
TP05DB48S05	48(2:1)	36-72	5	1	$\geq 76$	1500
TP05DB48S12	48(2:1)	36-72	12	0.42	$\geq 78$	660
TP05DB48S15	48(2:1)	36-72	15	0.33	$\geq 78$	470
TP05DB48D05	48(2:1)	36-72	$\pm 5$	$\pm 0.5$	$\geq 79$	$\pm 850$
TP05DB48D12	48(2:1)	36-72	$\pm 12$	$\pm 0.21$	$\geq 79$	$\pm 140$
TP05DB48D15	48(2:1)	36-72	$\pm 15$	$\pm 0.17$	$\geq 80$	$\pm 47$
TP05DB24S05W	24(4:1)	9-36	5	1	$\geq 75$	1500
TP05DB24S12W	24(4:1)	9-36	12	0.42	$\geq 75$	660
TP05DB24S15W	24(4:1)	9-36	15	0.33	$\geq 75$	470
TP05DB24D05W	24(4:1)	9-36	$\pm 5$	$\pm 0.5$	$\geq 77$	$\pm 850$
TP05DB24D12W	24(4:1)	9-36	$\pm 12$	$\pm 0.21$	$\geq 78$	$\pm 140$
TP05DB24D15W	24(4:1)	9-36	$\pm 15$	$\pm 0.17$	$\geq 78$	$\pm 47$
TP05DB48S05W	48(4:1)	18-72	5	1	$\geq 75$	1500
TP05DB48S12W	48(4:1)	18-72	12	0.42	$\geq 77$	660
TP05DB48S15W	48(4:1)	18-72	15	0.33	$\geq 77$	470
TP05DB48D05W	48(4:1)	18-72	$\pm 5$	$\pm 0.5$	$\geq 78$	$\pm 850$
TP05DB48D12W	48(4:1)	18-72	$\pm 12$	$\pm 0.21$	$\geq 78$	$\pm 140$
TP05DB48D15W	48(4:1)	18-72	$\pm 15$	$\pm 0.17$	$\geq 79$	$\pm 47$

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				

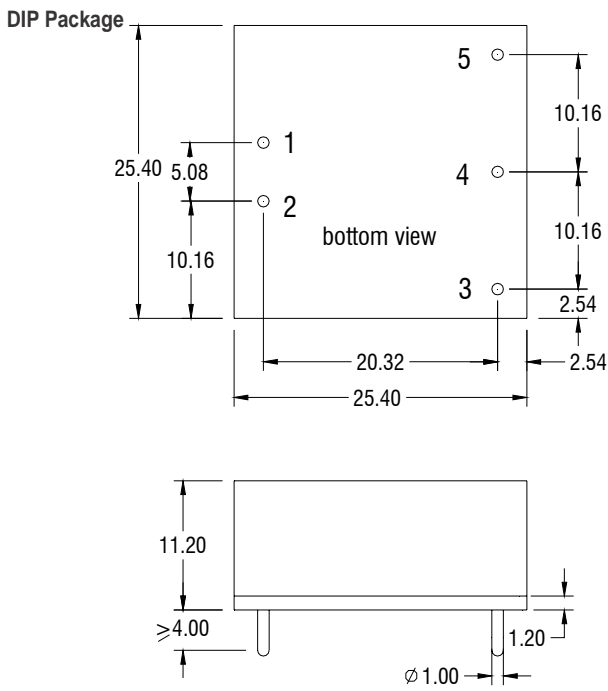
INPUT CHARACTERISTICS					
parameter	Test conditions	Min	Typ	Max	Units
Startup voltage	5V Input module(4.5V -9V)	4.5	5	9	VDC
Startup voltage	12V Input module(9V -18V)	8.8	9	9.3	VDC
Startup voltage	24V Input module(18V-36V)			18	VDC
Startup voltage	48V Input module(36V-72V )			36	VDC
Startup voltage	24V 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	$V_{imin} < V_i < V_{imax}$			±0.2	%
Load regulation	$I_o=0.1 \dots 1.0 \times I_{onom}$ $V_{imin} < V_i < V_{imax}$			±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 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°C)	-40		+85	°C
Storage Temperature		-55		+125	°C
Max. Case Temperature	Operating Temperature curve range			105	°C
Lead Temperature	1.5mm from case for 10 seconds			300	°C
Cooling	Free air convection				

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

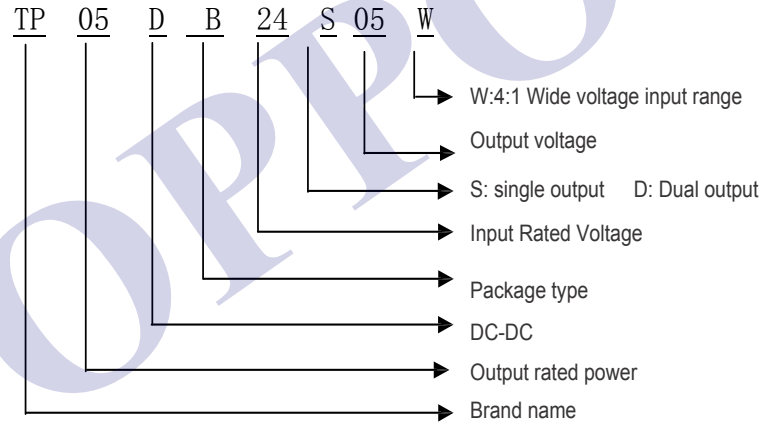
**MECHANICAL DIMENSIONS** **PIN CONNECTIONS**



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

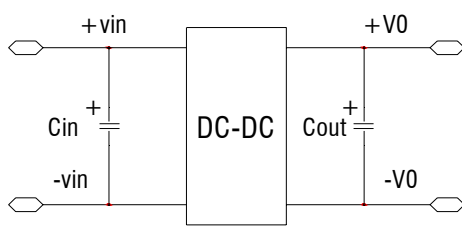
Units: mm  
Tolerance: ±0.2mm

**MODEL SELECTION**



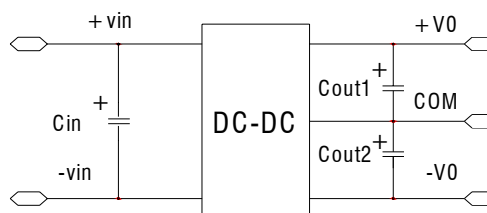
**RECOMMEND CIRCUIT:**

Single Output:



## RECOMMEND CIRCUIT:

Dual Output:



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