



**DESCRIPTION: 40W Wide Input Voltage DC/DC Converters**

The rated output power of TP40DG converters is 40W, the outline dimensions is "50.8\*50.8\*11.2", 2:1 input voltage range, the voltage range is 9V-18V, 18V-36V, 36V-72V. The accuracy of the converter can reach  $\pm 1\%$ , it can be widely used in telecommunications, railway transportation, instrument and etc.

**FEATURES**

40W output power	2:1 input voltage range	Input under voltage protection
50.8mm*50.8mm*11.2mm standard package	Fixed switching frequency	Over output voltage protection
Long term short-circuit protection	Operating temperature: -25°C to 55°C	RoHs compliance
Super capability with capacitive load	/	/

**SELECTION GUIDE**

Part Number	Input Voltage		Output		Efficiency(Typ.) %
	voltage (VDC)		Voltage (VDC)	Current (A)	
	Rated	Range values			
TP40DG12S03	12(2:1)	9-18	3.3	8	85
TP40DG12S05	12(2:1)	9-18	5	8	83
TP40DG12S12	12(2:1)	9-18	12	3.33	86
TP40DG12S15	12(2:1)	9-18	15	2.67	86
TP40DG12S24	12(2:1)	9-18	24	1.67	85
TP40DG12D05	12(2:1)	9-18	$\pm 5$	$\pm 4$	83
TP40DG12D12	12(2:1)	9-18	$\pm 12$	$\pm 1.67$	86
TP40DG12D15	12(2:1)	9-18	$\pm 15$	$\pm 1.33$	86
TP40DG24S03	24(2:1)	18-36	3.3	8	85
TP40DG24S05	24(2:1)	18-36	5	8	84
TP40DG24S12	24(2:1)	18-36	12	3.33	87
TP40DG24S15	24(2:1)	18-36	15	2.67	87
TP40DG24S24	24(2:1)	18-36	24	1.67	86
TP40DG24D05	24(2:1)	18-36	$\pm 5$	$\pm 4$	83
TP40DG24D12	24(2:1)	18-36	$\pm 12$	$\pm 1.67$	86
TP40DG24D15	24(2:1)	18-36	$\pm 15$	$\pm 1.33$	86
TP40DG48S03	48(2:1)	36-72	3.3	8	85
TP40DG48S05	48(2:1)	36-72	5	8	84
TP40DG48S12	48(2:1)	36-72	12	3.33	87
TP40DG48S15	48(2:1)	36-72	15	2.67	87
TP40DG48S24	48(2:1)	36-72	24	1.67	86
TP40DG48D05	48(2:1)	36-72	$\pm 5$	$\pm 4$	83
TP40DG48D12	48(2:1)	36-72	$\pm 12$	$\pm 1.67$	86
TP40DG48D15	48(2:1)	36-72	$\pm 15$	$\pm 1.33$	86

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
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	Burp, 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
Input under voltage protection	The12V input module(9V-18V)			8.5	VDC
Input under voltage protection	The24V input module(18V-36V)			17	VDC
Input under voltage protection	The48Vinput module(36V-72V)			35	VDC
Startup time	Output rise time from 5% to 100%	20			ms
Remote control CTL	Remote CTL-Vin	Turn off			
Remote control CTL	Remote CTL NC(The control level 12V-40V)	Turn on			

**OUTPUT CHARACTERISTICS**

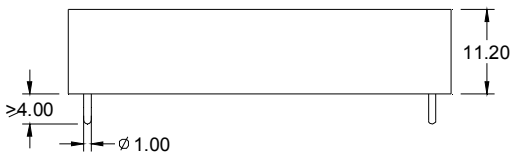
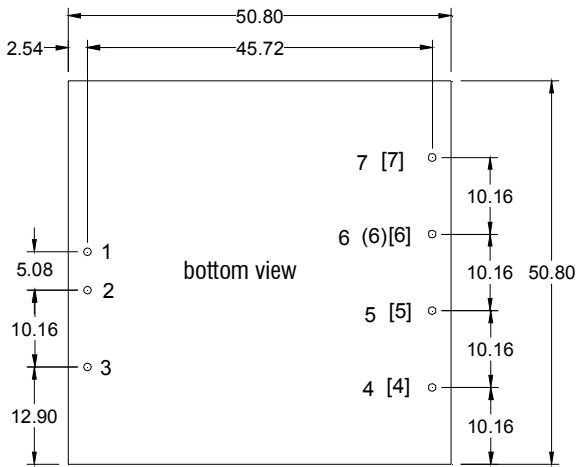
parameter	Test conditions	Min	Typ	Max	Units
Voltage accuracy	Io=0.1...1.0 x Ionom Vi=Vi rated			±1	%
Line regulation	Vimin≤Vi≤Vimax			±0.2	%
Load regulation	Io=0.1...1.0 x Ionom Vimin≤ Vi≤Vimax			±0.5	%
Auxiliary voltage accuracy	Main Load and auxiliary load differ 25%,the auxiliary circuit of the load with at least 25%, the main circuit with full load			±3	%
Ripple and noise	20MHz bandwidth			±1	%
Over-current protection	Vimin≤Vi≤Vimax	120			%
Output voltage trim range	Vimin≤Vi≤Vimax			10	%
Transient recovery time	25% load changes			±5	%
Transient overshoot time	25% load changes			400	us
Switch frequency	Vimin≤Vi≤Vimax		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			±0.02		%/℃

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

**MECHANICAL DIMENSIONS**

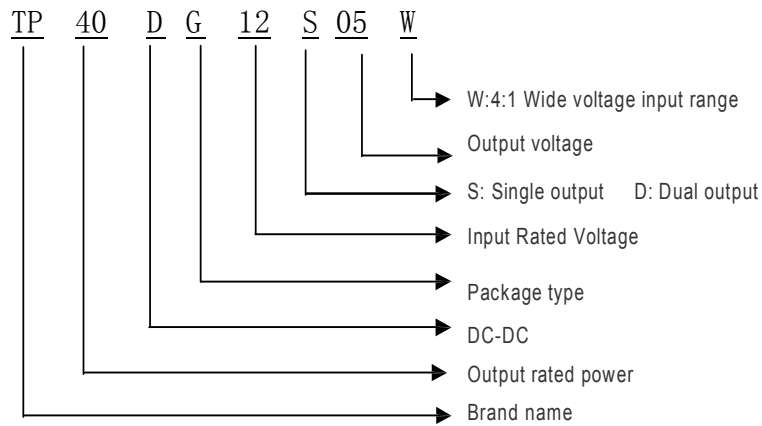


Units: mm

Tolerance:  $\pm 0.2$ mm

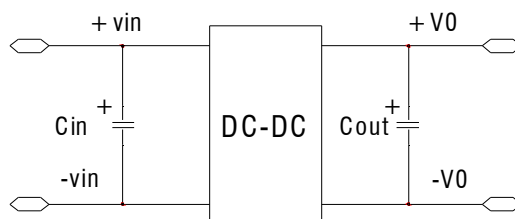
PIN CONNECTION			
Pin	Single output	Dual output	three output
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
3	CTL	CTL	CTL
4	TRM	TRM	/
[4]	/	/	-Vout3
5	-Vout	-Vout	/
[5]	/	/	COM
6	+Vout	/	/
(6)	/	COM	/
[6]	/	/	+Vout1
7	/	+Vout	/
[7]	/	/	+Vout2

**MODEL SELECTION**



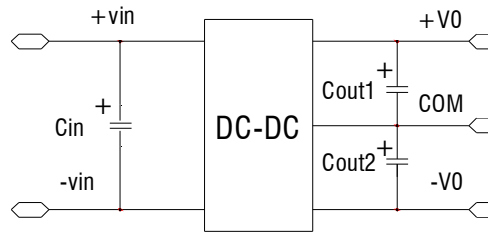
**RECOMMEND CIRCUIT**

Single Output:



**RECOMMEND CIRCUIT**

Dual Output:

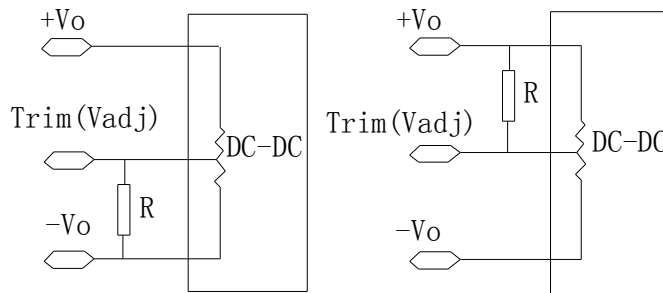


- Add input capacitance  $C_{in}$  is helpful to improve the electromagnetic compatibility, recommend  $C_{in}$  use 47  $\mu$ F-100 $\mu$ F of the electrolytic capacitors.
- If the module connect to the digital circuits, please add the  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$ .
- If  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$  value is too high or lower ESR, it will cause the module instable,
- The recommended value of  $C_{out}$ ,  $C_{out1}$ ,  $C_{out2}$  should be 100  $\mu$ F/A, the current here means the output current.

**Trim application & Trim Resistance**

Raise the output Voltage

Down the output voltage



- In dual and triple output modules, this application can just used in the main load(auxiliary road change together with the main load)

**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