

40DCP Series

40W - Single Output DC-DC Converter - Ultra Wide Input Range - High Isolated & Regulated



DC-DC Converter

15 Watt

- ⊕ 6:1 ultra-wide input voltage range: 200 ~ 1200VDC
- ⊕ Operating temperature: -25°C ~ 70°C
- ⊕ 4000VDC High isolation voltage
- ⊕ High efficiency, low ripple & noise



- ⊕ Over output voltage protection (automatic recovery)
- ⊕ Under input voltage protection (automatic recovery)
- ⊕ Short circuit protection (SCP)
- ⊕ Input against reverse protection
- ⊕ MTBF>300 K hours
- ⊕ High reliability, long life, three years warranty

The 40DCP Series are regulated DC-DC converters with features of 200-1200VDC ultra-high voltage input, high efficiency and high reliability. They can be widely used in photovoltaic power generation, high-voltage inverter and so on, which provide stable operating voltage to the equipment and improve the power and the load's safety performance with multiple protection when working under abnormal conditions.

These products apply to:

- 1) Where isolation is necessary between input and output (isolation voltage $\leq 4000\text{VDC}$)

Common specifications

Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	25°C MAX (Ta= 25°C, 100% load)
Cooling:	Free air convection
Operation temperature range:	-25°C~+70°C
Storage temperature range:	-40°C ~+85°C
Case temperature:	90°C MAX
Welding temperature:	Wave-soldering: 260 \pm 5°C; time:5~10s Manual-welding: 360 \pm 10°C; time:3~5s
Hot plug:	Unavailable
Case Material Grade:	Plastic [UL94-V0]
Install:	PCB
Storage humidity range:	< 95%
Temperature coefficient:	$\pm 0.02\%/^{\circ}\text{C}$ MAX
Power derating (+50°C to +70°C):	1%/°C
MTBF (MIL-HDBK-217F@25°C):	>300,000 hours
Weight:	225g

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input voltage range		200		1200	VDC
Input current	<ul style="list-style-type: none"> 200VDC input 600VDC input 1200VDC input 			320 100 55	mA mA mA
Inrush current	600VDC		60		A
Input under-voltage protection	<ul style="list-style-type: none"> Under voltage protection range: 175~185V Under voltage release range: 185~195V 				
External input fuse		3.15A	Slow blow		

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	4000			VDC

Output specifications

Item	Test condition	Min	Typ	Max	Units
Line regulation		± 0.5	± 1		%
Load regulation		± 0.5	± 1		%
Output voltage accuracy		± 1	± 2		%
Ripple & Noise*	20MHz Bandwidth (peak-peak value)	100	200		mVp-p
Over-current protection	$\geq 110\%$ self-recovery				
Over-voltage protection	(Feedback-clamp) Voltage limited				
Min. load		1			%
Power-off holding time	600VDC input		5		s

* Parallel line test method is adopted to test the ripple and noise, please see AC-DC Converter Application Notes for specific operation methods.

Model selection:

WCTP*_xxyyN##O

W= Watt; C= Case; T= Type; P= Pinning; **= Voltage Variation (omitted $\pm 10\%$); xx= Vin; yy= Vout; N= Numbers of Output; ##= Isolation (kVDC); O= output regulation

Example:

40DCP_12S4

40= 40Watt; DC= DIP Case; P= Photovoltaik; 12= 12Vout; S=Single output; 4= 4kVDC

Note:

1. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
2. All index testing methods in this datasheet are based on our Company's corporate standards;
3. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
4. We can provide product customization service;
5. Specifications of this product are subject to changes without prior notice.

40DCP Series

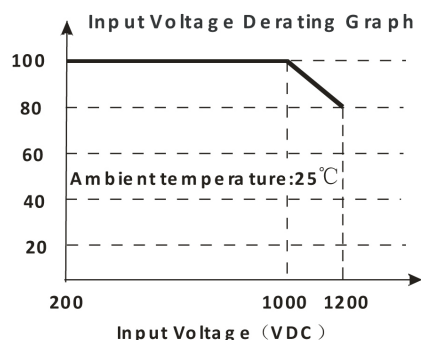
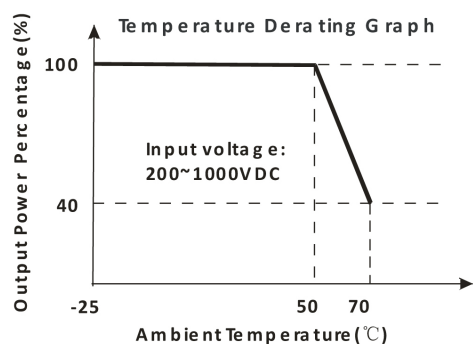
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EMC specifications

EMI	CE	CISPR22/EN55022	CLASS A (Recommended Circuit Refer to EMC recommended circuit)	
EMI	RE	CISPR22/EN55022	CLASS A (Recommended Circuit Refer to EMC recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	±6KV/±8KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±4KV	perf. Criteria B (External Circuit Refer to recommended circuit)
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to recommended circuit)
EMS	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
EMS	PFM	IEC/EN61000-4-8	10A/m	perf. Criteria A
EMS	Voltage dips, short and interruptions immunity	IEC/EN61000-4-11	0%-70%	perf. Criteria B

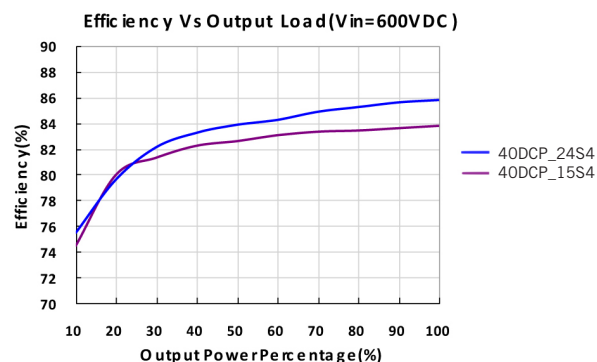
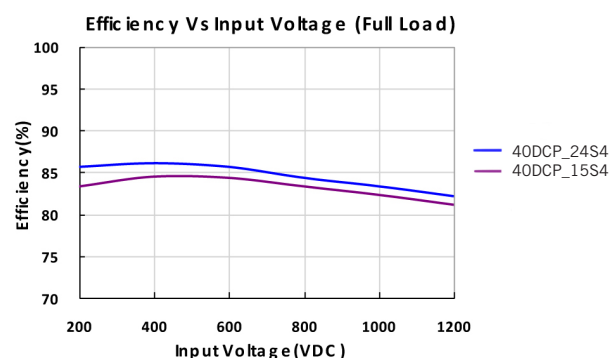
Part Number	Power [W]	Nominal Output [V; Vo]	Current Output [A; Io]	Capacitive load [μF, Max.]	Efficiency [%, max]
40DCP_12S4	40	12	3.33	1200	83
40DCP_15S4	40	15	2.67	1000	84
40DCP_24S4	40	24	1.67	680	84

Typical characteristics



Note Input voltage should be derated based on temperature derating when it is 1000-1200VDC.

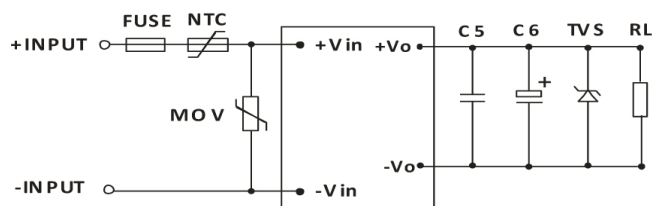
Efficiency



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Typical application circuit



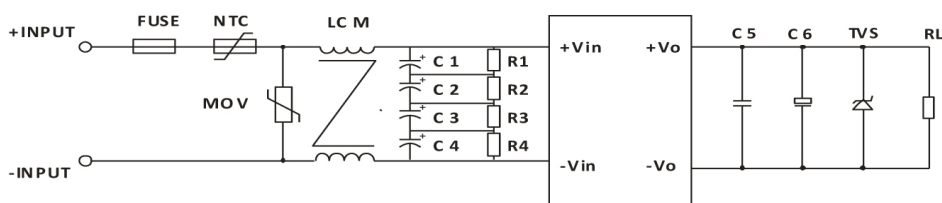
External circuit parameters			
Model	C5 (μF)	C6 (μF)	TVS tube
40DCP_12S4	1	220	SMBJ20A
40DCP_15S4	1	220	SMBJ20A
40DCP_24S4	1	120	SMBJ30A

Note:

Output filtering capacitor C5 is ceramic capacitor, recommend parameter is 1μF; Output filtering capacitor C6 is electrolytic capacitors. It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80%. TVS is a recommended component to protect post-circuits (if converter fails).

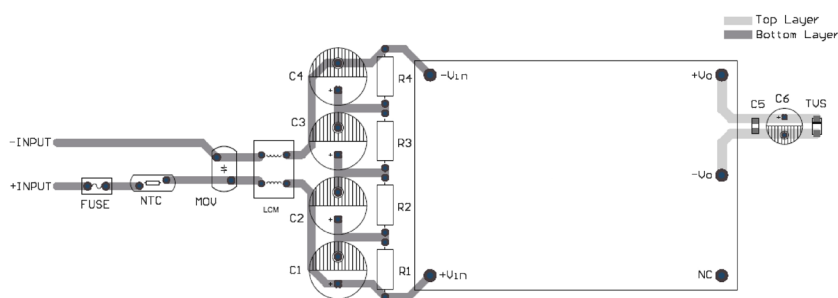
MOV: Varistor, it is used to protect the device under surge. Access as needed.

EMC solution-recommended circuit



EMC application circuit with higher requirements

EMC recommended circuit PCB layout



Safety and recommend wiring: line-width $\geq 3\text{mm}$, line-line distance $\geq 6\text{mm}$, line-ground distance $\geq 6\text{mm}$

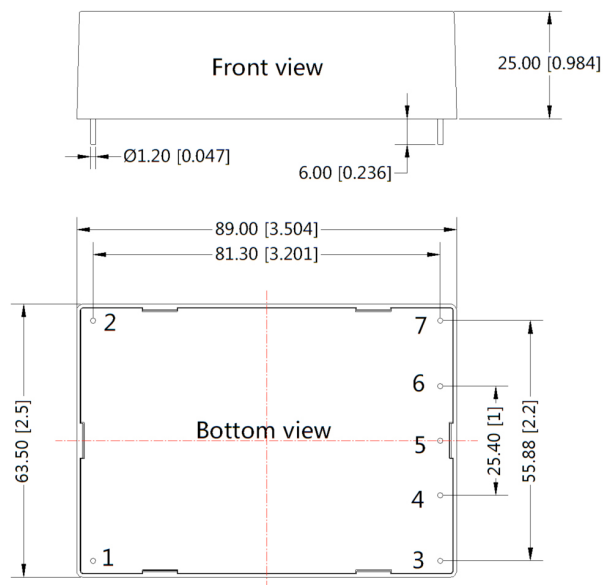
Recommended Parameter For Higher EMC Standard Circuit	
Components	Recommend Parameter
MOV	S20K1000
C1, C2, C3, C4	47μF/450V
R1, R2, R3, R4	1MΩ/2W
NTC	10D-20
LCM	10mH
FUSE	3.15A/250V, slow fusing, necessary

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Mechanical dimensions

Footprint



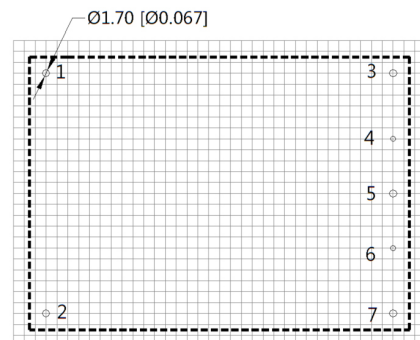
Note:

Unit: mm[inch]

Pin diameter tolerances: 0.10mm[0.004inch]

General tolerances: 0.25mm[0.010inch]

THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	40DCP
1	-Vin
2	+Vin
3	+Vo
4	No Pin
5	-Vo
6	No Pin
7	NC

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