40DC1P_4 series

40W - Single Output DC-DC Converter - Isolated & Regulated

DC-DC Converter 40 Watt

- Ultra-wide input voltage range 200-1200VDC (6:1)
- Input anti-reverse, under voltage protection
- Output short circuit, over-current, over-voltage protection
- Input/output isolation voltage 4000VDC
- High efficiency, high reliability, low ripple
- Applied for photovoltaic, high-voltage DC conversions
- Operating temperature: -30°C~+70°C
- Industrial grade design, international standard size

Introducing our latest power 40DC1P_4 series with an ultra-wide input voltage range of 200-1200VDC (6:1). This advanced device features input anti-reverse and under voltage protection, ensuring safe and reliable operation. It is equipped with output short circuit, over-current, and over-voltage protection, further enhancing its dependability.

Our power module boasts a robust input/output isolation voltage of 4000VDC, offering superior safety and performance. With high efficiency, high reliability, and low ripple characteristics, this module is ideal for photovoltaic applications and high-voltage DC conversions. Designed to operate in extreme conditions, it functions flawlessly within a temperature range of -30°C to +70°C.

Common specifications

Short circuit protection	Continuous; Hiccup
Over-voltage protection	Full input voltage range - Feedback clamp limit
Over current protection	Full input voltage range - ≥110%Io, burp, self recovery
Switching frequency	65kHz (typ.)
Altitude	2000 m
Operating temperature	-30°C - +70°C (with derating)
Storage temperature	-40°C - +85°C
Case temperature rise	+54°C (Ta = 30°C @ output 100% load)
Storage humidity	95% RH
Soldering temperature	Wave-soldering: 260°C (±5°C), time: 5-10s Manual-welding: 400°C (±10°C), time: 4-10s
MTBF	SR-332@25°C >300000H
Product weight	236g (typ.)
Package dimensions	89.0 x 63.5 x 25.0 mm
Case material	Plastic case
Cooling method	Free air convection
Safety levels	Class I
Safety standards	Meets EN/UL62368-1
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range*		200	600	1200	VDC
Input current	200VDC @ 100% Load 600VDC @ 100% Load 1200VDC @ 100% Load			210 82 43	mA
Input under-voltage protection	Start point Release point	100 170		120 197	VDC
Input no-load current	Output no load			0.6	mA
External fuse recommend	4A/1500VDC Slow fusing, necessary				

Note: *Please refer to Input voltage dearting curve at back

Example:
40DC1P_12S4
40 = 40Watt; DC = DC-DC; 1P = Photovoltaic; 12 = 12Vout;
S = Single Output; 4 = 4000VDC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage Accuracy	0%~100% Load	--	±2.0	±3.0	%
Minimum Load	Full Input voltage range	10			%
Line Regulation	Full Input voltage range		±1.0	±1.5	%
Load Regulation	20%~100% nominal load		±2.0	±3.0	%
Ripple & Noise	20MHz bandwidth (peak peak value)		100	250	mV
Temperature Coefficient			±0.03		%
Turn On Delay Time	Normal temperature @ output full load		2000		mS
Power off holding time*	500VDC Input 1000VDC Input		5 10		mS
Turn on overshoot	0%~100% Load			10	%
Dynamic Response Overshoot Range	25%-50%-25% 50%-75%-50%		±5.0	±6.0	%
Dynamic Response Recovery time	25%-50%-25% 50%-75%-50%			500	mS

Note: *Normal temperature @ output full load

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input- Output - test 1min, leakage current ≤5mA	4000			VDC
Insulation resistance	Input to Output - 500VDC		100		MΩ

1. The product should be used under the specification range, otherwise it will cause permanent damage to it.
2. Fuse is required at Input terminal.
3. If the product worked beyond the load range or below the minimum load, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
4. Unless otherwise specified, data in this datasheet should be tested under conditions of Ta = 25°C, humidity <75% when inputting nominal voltage and outputting rated load (pure resistance load);
5. All index testing methods in this datasheet are based on our company's corporate standards
6. 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;
7. We can provide customized product service;
8. The product specification may be changed at any time without prior notice.

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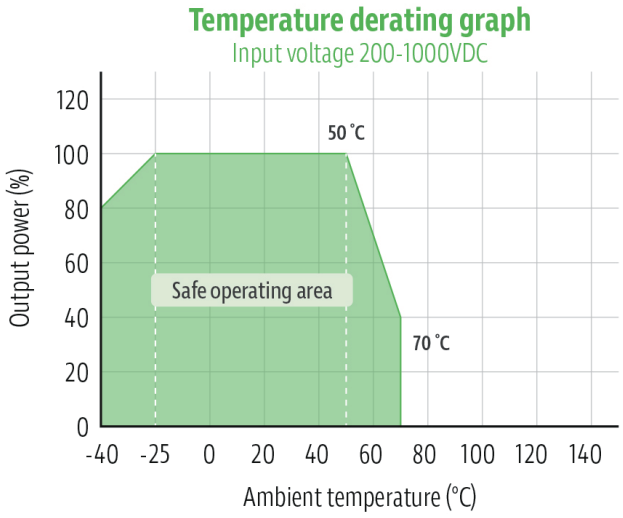
Product Selection Guide

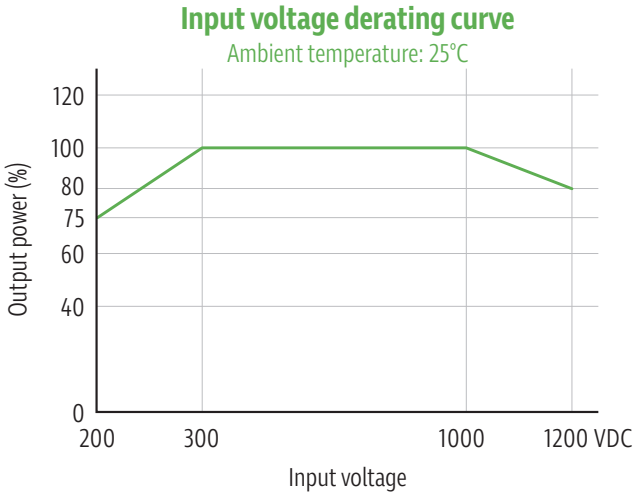
Approval	Model	Power (W)	Output Voltage (V)	Output Current (mA)	Output Efficiency (Input 600VDC) %/TYP	Max. Capacitive Load (uF)
	40DC1P_12S4	40	12	3333	83	1200
	40DC1P_15S4	40	15	2667	84	1000
	40DC1P_24S4	40	24	1667	85	800

Note:

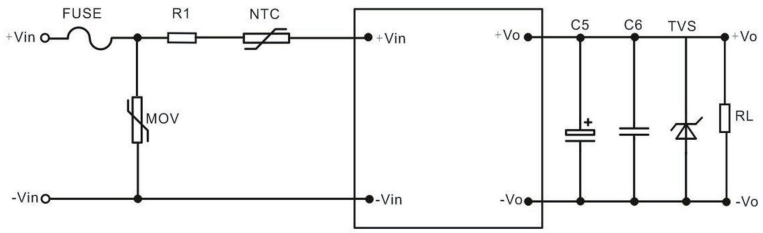
1: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
2. The fluctuation range of full load efficiency (%typ) is ±2%, full load output efficiency = total output power/module's input power.

Product characteristic curve





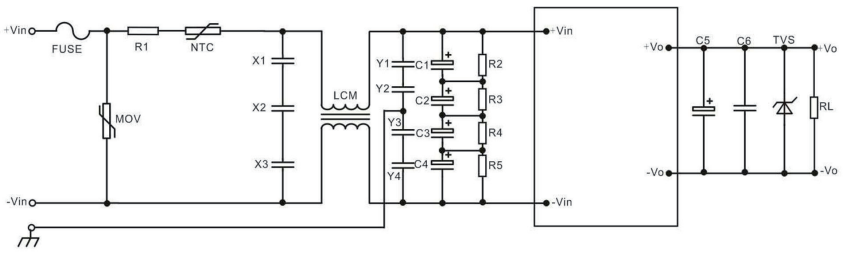
Typical application circuit



Output Voltage	FUSE	MOV	NTC	C5	C6	TVS
12V	4A/1500DC necessary	20D162K	10D-20	470uF/25V	1uF/50V 1206	SMBJ18A
15V	4A/1500DC necessary	20D162K	10D-20	330uF/50V	1uF/50V 1206	SMBJ20A
24V	4A/1500DC necessary	20D162K	10D-20	220uF/50V	1uF/50V 1206	SMBJ30A

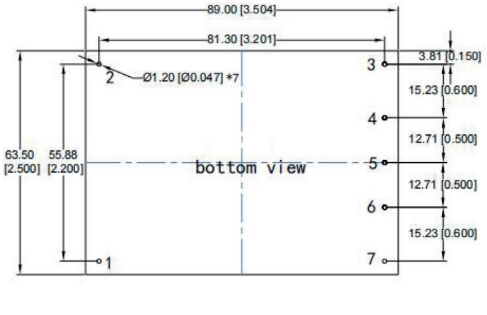
Note: The output filer capacitor C5 is electrolytic capacitor, recommended high frequency and low resistance electrolytic one. For capacitance and current of capacitor please refer to the manufacture's datasheet. The capacitance withstand voltage value should be higher 80%. C6 is ceramic capacitor, to remove high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails)

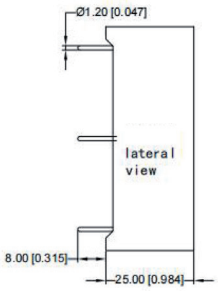
EMC external recommended circuit

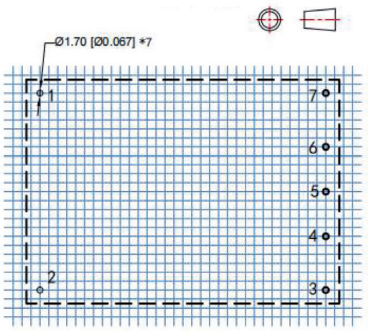


Component	Name	Recommended Value	Note
FUSE	Fuse	According to actual input current	Necessary
R1	Current limit resistor	6.8Ω/10W metal film resistor	Necessary
NTC	Thermistor	10D-20	Necessary
MOV	Varistor	20D162K	Necessary
X1/2/3	CBB Capacitor	Use 3pcs:1.0μF/450Vcapacitors in series	Add according to actual application
LCM	Common mode conductor	10mH/0.8A	Add according to actual application
Y1/Y2/Y3/Y4	Y capacitor	Use 4pcs 2.2nF/400V capacitors in series	Add according to actual application
C1/C2/C3/C4	electrolytic capacitor	100uF/400V	Add according to actual application
R2/R3/R4/R5	Chip resistor	1MΩ/1W	Add according to actual application

Dimensions and recommended layout







Note:
Grid distance 2.54 * 2.54mm
Size unit: mm[inch]
Terminal diameter tolerance: ±0.10mm [±0.004inch]
Unmarked tolerance: ±1.00mm [±0.039inch]
The product must be fixed with M3 screws in the harsh vibration environment
Refer to the dimensions of the fixed holes

Pin	1	2	3	4	5	6	7
Single	-Vin	+Vin	NP	NP	-Vo	NP	+Vo