

40W, 200-1200VDC ultra wide input voltage
DC/DC converter for Renewable Energy



RoHS

FEATURES

- 6:1 ultra-wide input voltage range: 200 ~ 1200VDC
- Industrial operating temperature: -25°C ~ 70°C
- 4000VDC high isolation voltage
- high efficiency, Low ripple& noise
- Under input voltage protection (self-recovery)
- Over output voltage protection(self-recovery)
- Short circuit protection(self-recovery)
- Input against reverse protection
- MTBF>300,000 H
- High reliability, long life, three years warranty

PV series are regulated output 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.

Selection Guide

Model	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (200VDC, %/Typ.)	Max. Capacitive Load(uF)
PV40-27B12	40W	12V/3.33A	83	1200
PV40-27B15		15V/2.67A	84	1000
PV40-27B24		24V/1.67A	84	680

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		200	--	1200	VDC
Input current	200VDC	--	--	320	mA
	600VDC	--	--	100	
	1200VDC	--	--	55	
Inrush current	600VDC	--	60	--	A
Input under-voltage protection		Under voltage protection range: 175~185V Under voltage release range:185~195V			
External input fuse		3.15A Slow blow			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Linear Regulation		--	±0.5	±1	
Load Regulation		--	±0.5	±1	
Output Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	100	200	mV
Temperature Drift Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection		(Feedback-clamp) Voltage limited			
Min. Load		1	--	--	%
Power-off Holding Time	600VDC input	--	5	--	ms

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

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	4000	--	--	VDC
Operating Temperature		-25	--	+70	°C
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	
Welding Temperature	Wave-soldering	260±5°C; time:5~10s			
	Manual-welding	360±10°C; time:3~5s			
Switching Frequency		--	65	--	kHz
Power Derating	+50°C to +70°C	1	--	--	%/°C
Hot Plug	Unavailable				
MTBF	MIL-HDBK-217F@25°C > 300000H				

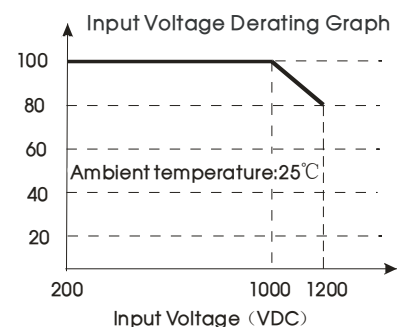
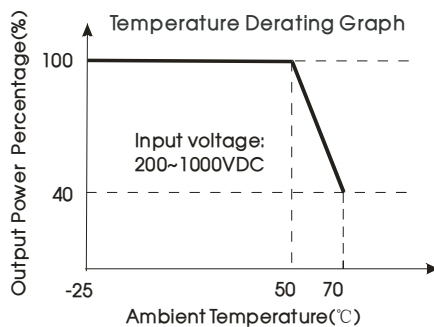
Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	89.0*63.5*25.0mm
Weight	225 g(Typ)
Cooling method	Free air convection

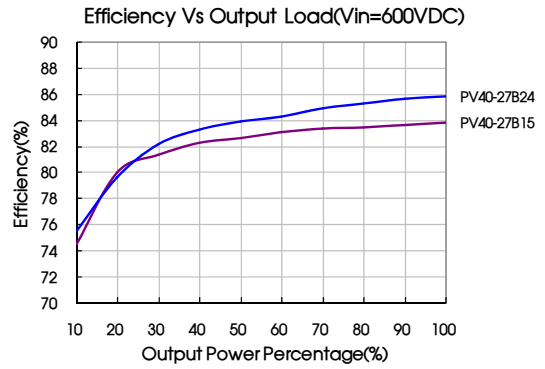
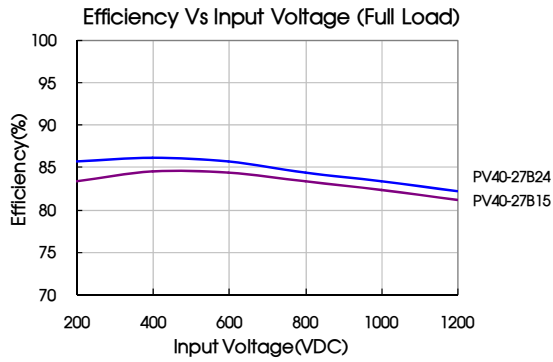
EMC Specifications

EMI	Conducted Disturbance	CISPR22/EN55022, CLASS A(Recommended Circuit Refer to Figure2)		
	Radiated Emission	CISPR22/EN55022, CLASS A (Recommended Circuit Refer to Figure2)		
EMS	Electrostatic Discharge	IEC/EN61000-4-2	±6KV/±8KV	Perf. Criteria B
	Radiation Immunity	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV(Recommended Circuit Refer to Figure2)	perf. Criteria B
	Surge Immunity	IEC/EN61000-4-5	±2KV(Recommended Circuit Refer to Figure2)	perf. Criteria B
	Conducted Disturbance immunity	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
	Immunity for Power frequency magnetic field	IEC/EN61000-4-8	10A/m	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11	0%-70%	perf. Criteria B

Product Characteristic Curve



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



Design Reference

1. Typical application circuit

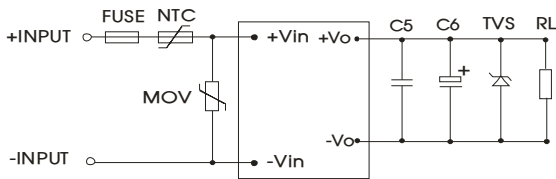


Fig. 1: Typical application circuit

Model	C5(μF)	C6(μF)	TVS tube
PV40-27B12	1	220	SMBJ20A
PV40-27B15			
PV40-27B24		120	SMBJ30A

Note:

Output filtering capacitor C5 is ceramic capacitor, recommend parameter is 1uF; 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.

2. EMC solution-recommended circuit

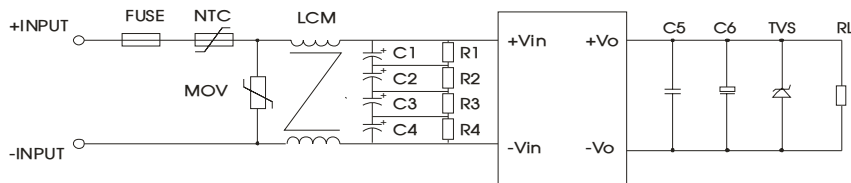


Fig 2: EMC application circuit with higher requirements

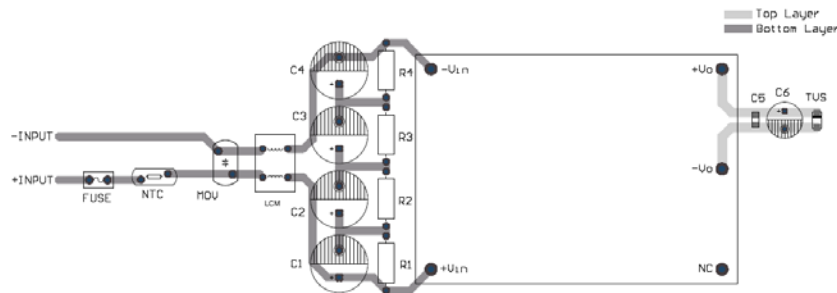


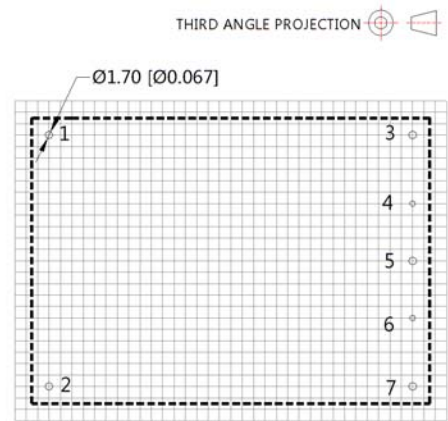
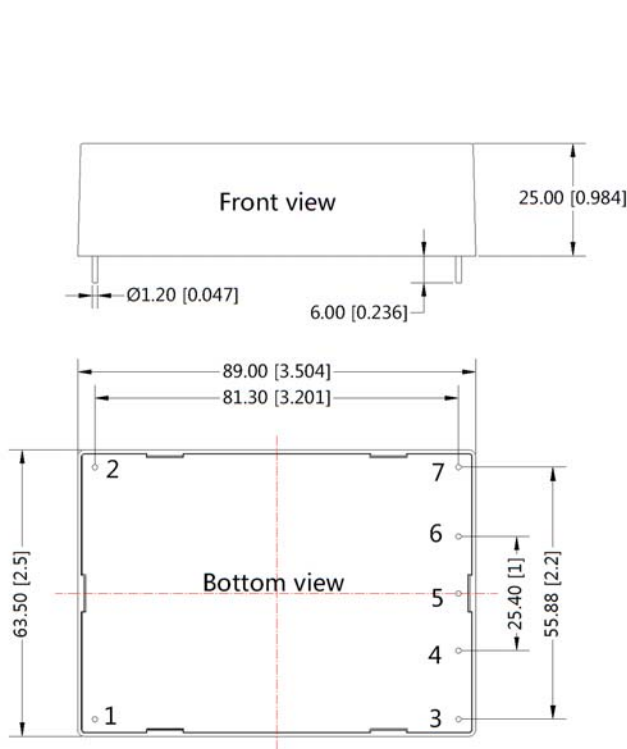
Fig 3: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width: wire width $\geq 3\text{mm}$, distance between wires $\geq 6\text{mm}$, and distance between wire and ground $\geq 6\text{mm}$

Element model	Recommended value
MOV	S20K1000
C1, C2, C3, C4	47μF/450V
R1, R2, R3, R4	1MΩ/2W
NTC	10D-20
LCM	10mH, recommended to use MORNSUN's FC-CX1D
FUSE	3.15A/250V, slow fusing, necessary

3. For more information Please find application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	PV40-27B
1	-Vin
2	+Vin
3	+Vo
4	No Pin
5	-Vo
6	No Pin
7	NC

Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

- Note:
1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58220021;
 2. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
 3. All index testing methods in this data sheet are based on our Company's corporate standards;
 4. 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;
 5. We can provide product customization service;
 6. Specifications of this product are subject to changes without prior notice.

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