

40W isolated DC-DC converter with ultra-wide, ultra-high 200-1200V DC Input for Renewable Energy



FEATURES

- 6:1 ultra-wide input voltage range 200 - 1200VDC
- High I/O isolation test voltage of 4000VDC
- Conversion efficiency up to 84%
- Input reverse polarity and undervoltage protection, output over-voltage and short circuit protection
- Mounting options available for PCB mounting, chassis mounting and DIN-Rail mounting

PV40-27Bxx series are regulated DC-DC converters with an ultra-high DC input of 200-1200VDC. The products feature high efficiency, high reliability, high insulation and a high level of safety protection. This type of power supply is widely used in renewable energy industries such as photovoltaic, power generation, energy storage, inverters and high-voltage DC conversions. The converters provide multiple protection features and guarantee stable and safe operating environments even under abnormal working conditions. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

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

Note: * Use suffix "A5" for chassis mounting and suffix "A6" for DIN-Rail mounting .

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 Undervoltage Protection		Lockout activation range: 175 - 185V Lockout deactivation range: 185 - 195V			
External Input Fuse		4A/1500VDC, required			
Hot Plug		Unavailable			

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-to-peak value)	--	100	200	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection		(Feedback-clamp) Voltage limited			
Minimum Load		0	--	--	%
Hold-up Time at Power-off	600VDC input	--	5	--	ms

Note: * The "parallel cable" method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation Test	Input-output	Electric Strength Test for 1min.	4000	--	--	VDC
Operating Temperature		-25	--	+70	°C	
Storage Temperature		-25	--	+85		
Storage Humidity		--	--	95	%RH	
Soldering 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	3	--	--	%/°C	
MTBF		MIL-HDBK-217F@25°C > 300,000h				

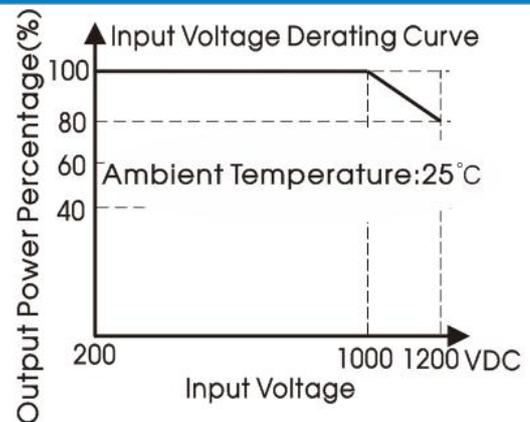
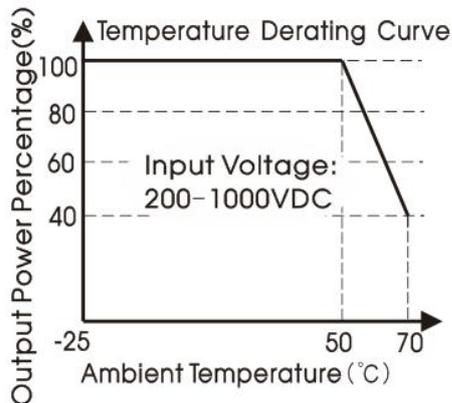
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)	
Package Dimensions	Horizontal package	89.0 x 63.5 x 25.0 mm
	A5 chassis Package	135.0 x 70.0 x 33.5 mm
	A6 DIN-Rail Package	137.0 x 70.0 x 39.0 mm
Weight	Horizontal package/A5 chassis package/A6 DIN-Rail package	210g/295g/365g (Typ.)
Cooling method	Free air convection	

Electromagnetic Compatibility (EMC)

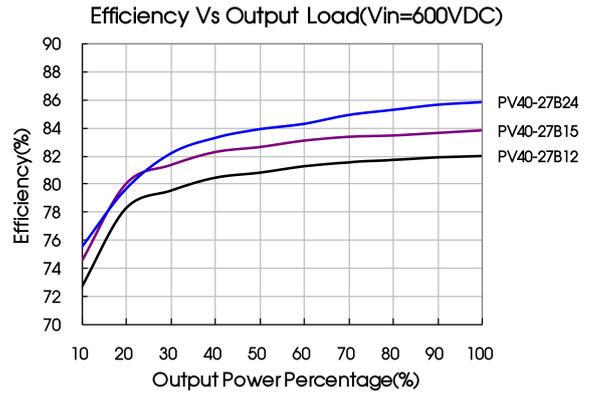
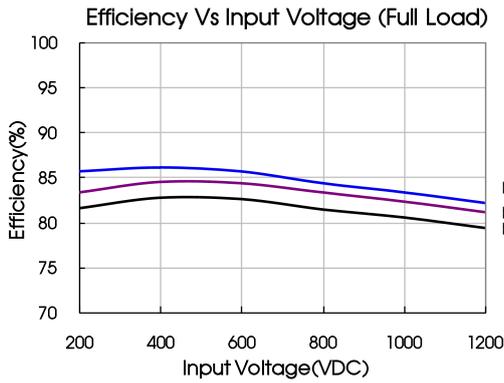
Emissions	CE	CISPR32/EN55032	CLASS A (Recommended Circuit Refer to Fig.2)
	RE	CISPR32/EN55032	CLASS A (Recommended Circuit Refer to Fig.2)
Immunity	ESD	IEC/EN61000-4-2	±6KV/±8KV Perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV (Recommended Circuit Refer to Fig.2) perf. Criteria B
	Surge	IEC/EN61000-4-5	±2KV (Recommended Circuit Refer to Fig.2) perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s perf. Criteria A
	PFM	IEC/EN61000-4-8	10A/m perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%, 70%

Product Characteristic Curve



Note: ① With an Input voltage between 1000-1200VDC, the output power must be derated as per temperature derating curves;

② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.



Design Reference

1. Typical application

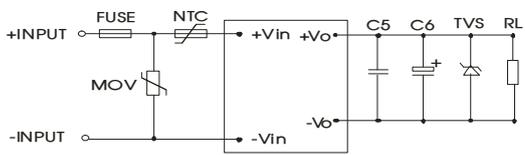


Fig. 1: Typical application circuit

Model	FUSE	MOV	NTC	C5(μF)	C6(μF)	TVS
PV40-27B12	4A/1500V DC, required	S20K1000	10D-20	1	220	SMBJ20A
PV40-27B15						
PV40-27B24						

Note on filter components:

We recommend using an electrolytic capacitor with high frequency and low ESR rating for C6 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C5 is a 1uF ceramic capacitor, used to filter high-frequency noise. TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

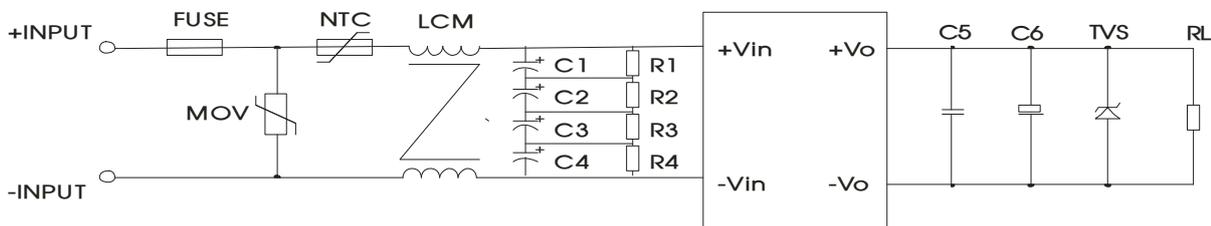


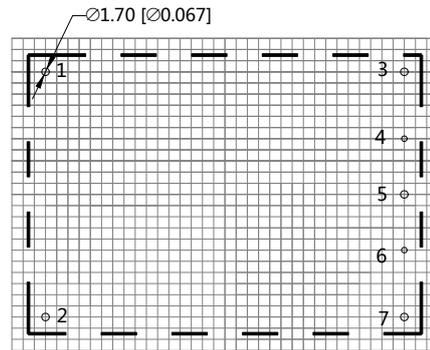
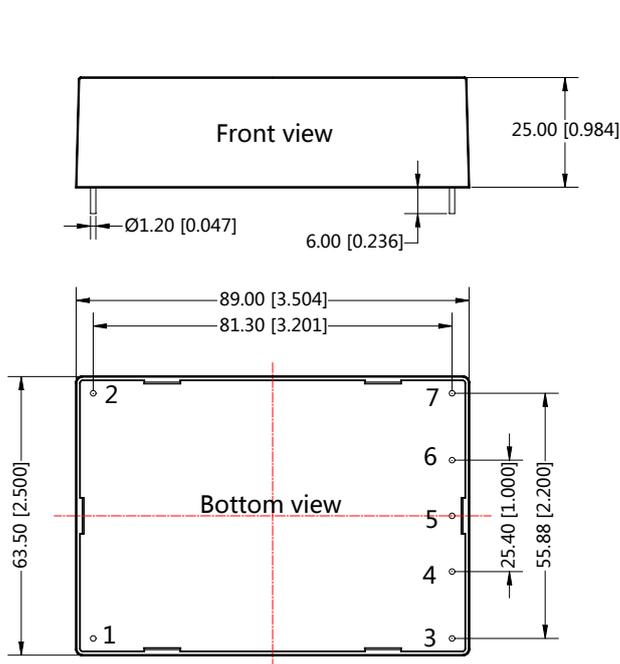
Fig. 2

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 FL2D-Z5-103
FUSE	4A/1500VDC, required

3. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



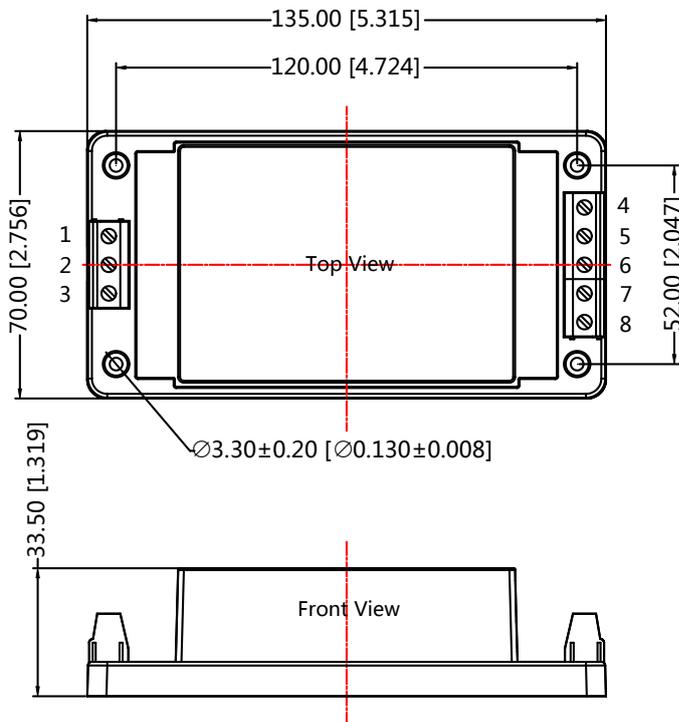
Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
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]

A5 Chassis Package Dimensions

THIRD ANGLE PROJECTION

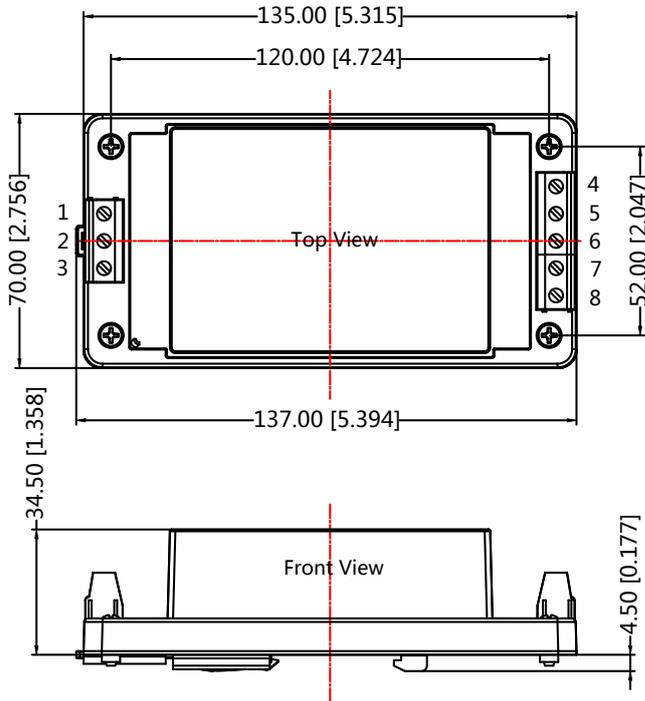


Pin-Out	
Pin	Function
1	-Vin
2	NC
3	+Vin
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±1.00[±0.040]

A6 DIN-Rail Package Dimensions

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Function
1	-Vin
2	NC
3	+Vin
4	+Vo
5	NC
6	-Vo
7	NC
8	NC

Note:
Unit:mm[inch]
Installed on DIN RAIL TS35
Wire range:24~12 AWG
General tolerances:±1.00[±0.040]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220021 (Horizontal package), 58220031 (A5/A6 package);
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this data sheet are based on our company corporate standards;
4. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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