

PV40-27SxxH Series

DC-DC Converter | 40W | DIP Package | Ultra-high Voltage Input | 4000VAC Isolation



Features

- Input Voltage Range: 200-1200VDC
 - Maximum Output Power: 40W
 - Operating Temperature Range: -40°C ~ +70°C
 - Isolation Voltage: 4000VAC
 - Full Load Efficiency up to: 84%
- Protection Functions: Input Under-voltage and Reverse
- Polarity Protection, Output Short Circuit and Over-voltage Protection, etc.
 - Application Areas: Photovoltaic Tracking Systems, Combiner Boxes, Energy Storage Systems, etc.

Product Description



The PV40-27SxxH Series is a 200-1200VDC ultra-high voltage input DC DC converter. The products feature high efficiency, high reliability, 4KVAC high isolation voltage, full protections and so on. It is mainly used in H-bridge power take-off applications such as SVG, photovoltaic inverters, ESS and high-voltage frequency converters. It provides a stable operating voltage for load equipment, and its built-in multiple protection functions enhance the safety performance of the power supply and its load under abnormal operating conditions.

Selection Guide

Part No.	Input Voltage (VDC)	Output Power (W)	Output Voltage (VDC)	Output Current (mA)	Full Load Efficiency (%)	Capacitive Load (μF)
					Typ.	Max.
PV40-27S12H	200~1200	40	12	3330	82	2200
PV40-27S15H	200~1200	40	15	2666	83	1500
PV40-27S24H	200~1200	40	24	1670	83	820

Note:

1. The above data are all tested within the parameters of the typical application circuit;
2. The product pictures are for reference only, please refer to the actual product.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage		200	--	1200	VDC
Input Current	200VDC	--	--	0.32	A
	600VDC	--	--	0.1	A
Inrush Current	600VDC	--	60	--	A
	1200VDC	--	100	--	A
Under-voltage Protection		Under-voltage protection point: <195V, under-voltage release point: ≥200V			
External Fuse		4A/1500VDC, must be connected			
Hot plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1.0	±5.0	%
Line Regulation	Full Load	--	±0.5	±3.0	%
Load Regulation	0~100% Load	--	±0.5	±3.0	%
Ripple & Noise	20MHz Bandwidth (Peak-to-Peak), Parallel Line Test Method	--	100	200	mV
Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption	230VAC	--	±0.5	±3.0	W
Min. Load		0	--	--	%
Over-current Protection		≥105%Io, Self-recovery			
Short Circuit Protection		Hiccup mode, continuous short-circuit protection with auto-recovery			
Hold-up time	600VDCInput	--	5	--	ms

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, test time 1 minute, leakage current <5mA	4000	--	--	VAC
Power Derating	-40°C - -25°C	2.67	--	--	%/°C
	+50°C - +70°C	2.50	--	--	%/°C
	2000m - 5000m altitude	6.70	--	--	%/Km
Operating Temperature		-40	--	70	°C
Storage Temperature		-40	--	85	°C
Storage Humidity	No condensation	--	--	95	%RH
Soldering Profile	Wave soldering	260±5°C; Time: 5~10s			
	Manual soldering	360±10°C; Time: 3~5s			

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Safety Standard	Product design complies with UL1741, CSA-C22.2 No.107.1, EN62109-1	
MTBF	MIL-HDBK-217F@25℃	≥300,000h

Physical Characteristics

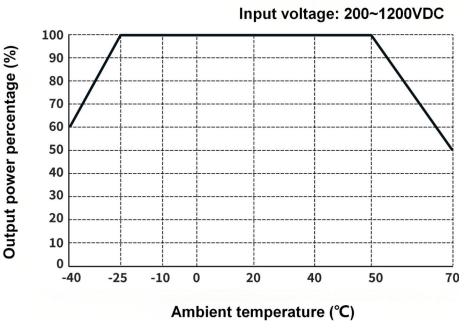
Case Material	Black flame-retardant and heat-resistant plastic (UL94V-0)	
Mechanical Dimensions	89.00 * 63.50 * 25.00mm	
Weight	195.0g (typ.)	
Cooling Method	Natural air convection	

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS A (Recommended circuit see Figure 2)	
	RE	CISPR32/EN55032 CLASS A (Recommended circuit see Figure 2)	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (Recommended circuit see Figure 2)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria A
		IEC/EN61000-4-5 line to line ±2KV (Recommended circuit see Figure 2)	perf. Criteria A
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
	ESD	IEC/EN61000-4-2 Contact ±6KV / Air ±8KV	perf. Criteria A

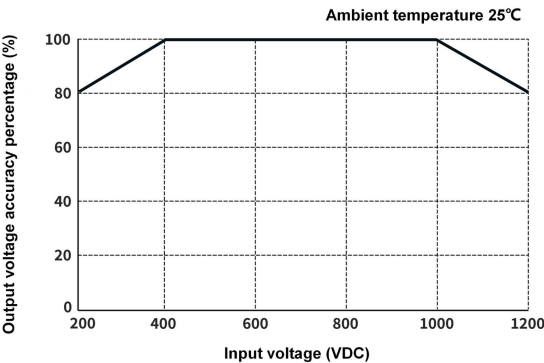
Product Characteristic Curve

Temperature Derating Curve

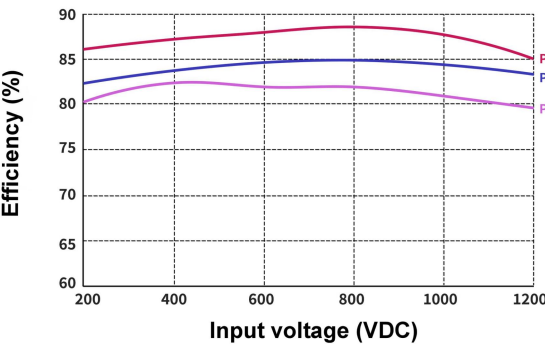


Note:
① For input voltages of 1000-1200VDC, voltage derating should be performed on the basis of temperature derating;
② This product is suitable for use in natural wind cooling environments. If used in a closed environment, please consult our F&E.

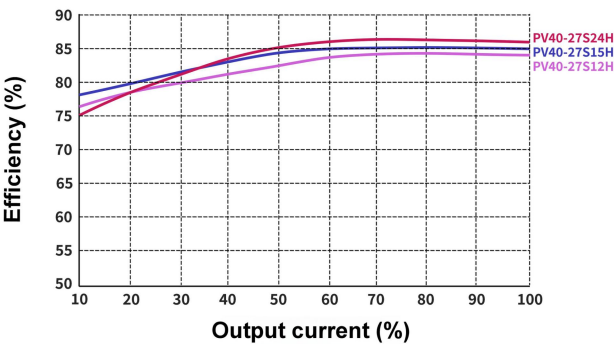
Input Voltage Derating Curve



Efficiency vs Input Voltage Curve (Full Load)

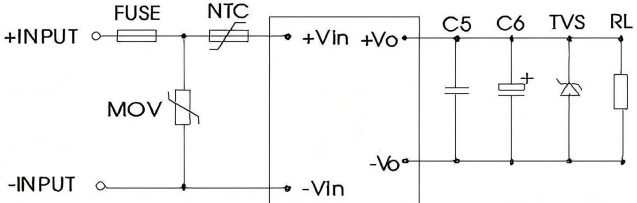


Efficiency vs Output Load Curve (Vin=600VDC)



Design Reference - Application Circuit

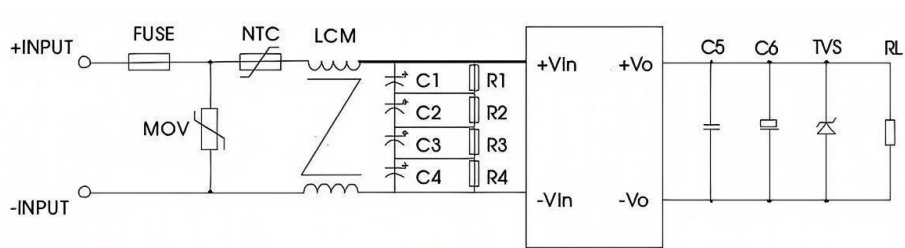
External Circuit Design Scheme (Figure 1)

	Recommended Capacitive Load Value		
	Output Voltage	12/15VDC	24VDC
	FUSE	4A/1500VDC, must be connected	
	MOV	20D162K	
	NTC	10D-20	
	C5 (μF)	1	
	C6 (μF)	220	120
	TVS diode	SMBJ20A	SMBJ30A

Note: Output filter capacitor C5 is a ceramic capacitor, recommended value 1μF; C6 is an electrolytic capacitor, recommended to use a high-frequency low-ESR electrolytic capacitor. For capacitance and current rating, refer to the technical specifications provided by each manufacturer. Capacitor voltage derating should be greater than 80%. The TVS diode protects the downstream circuit during module abnormalities and is recommended for use.

Design Reference - EMC Solutions - Recommended Circuits

Design Reference - EMC Solutions - Recommended Circuits (Figure 2)

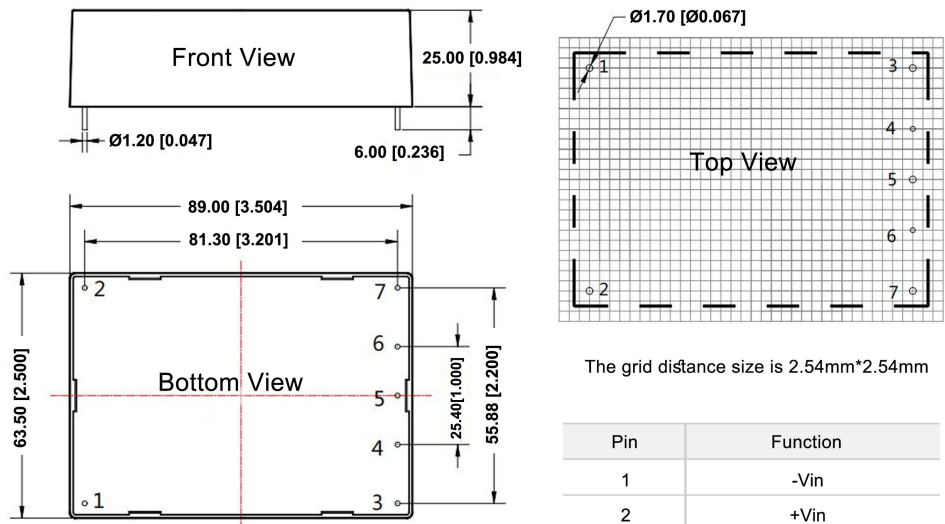


EMCRecommended Circuit Parameter Values	Component Name	Recommended Reference Value
	FUSE	4A/1500VDC, must be connected
	MOV	20D162K
	C1, C2, C3, C4	47μF/450V
	R1, R2, R3, R4	1MΩ/2W
	NTC	10D-20
	LCM	10mH

Dimensions and Recommended Layout

PV40-27SxxH Dimensions and Recommended Layout

Third Angle Projection 



Note:
Size unit: mm [inch]
Pin diameter tolerance: ± 0.10 [± 0.004]
Unmarked dimensional tolerance: ± 0.50 [± 0.020]

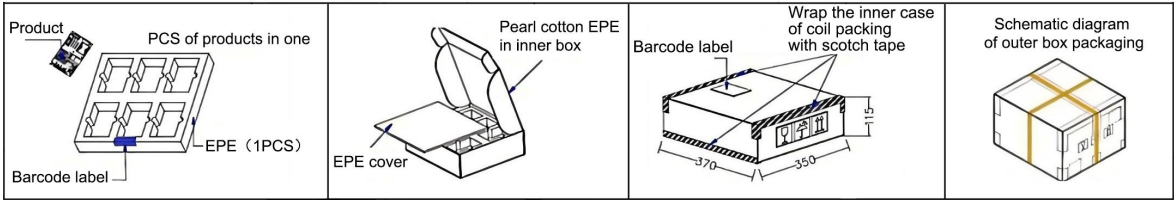
The grid distance size is 2.54mm*2.54mm

Pin	Function
1	-Vin
2	+Vin
3	+Vo
5	-Vo
4, 6, 7	No Pin

Packaging Information

Model Series	Product Quantity (pcs/Tray)	Inner Carton Quantity (pcs/carton)	OuterCarton Quantity (pcs/carton)
PV40-27SxxH	12	36	72

The schematic diagram of pearl cotton packaging is shown below:



Product precautions

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. The maximum capacitive load is tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at $T_a=25^{\circ}\text{C}$, humidity<75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this manual are based on our company's corporate standards;
6. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
7. Product specifications are subject to change without prior notice.

Manufacturer contact information

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