DC/DC Converter

PV200-27Bxx Series

MORNSUN®

120-200W isolated DC-DC converter with Ultra-wide, ultra-high 200 - 1000V DC Input for renewable energy

CE Report RoHS EN62109-1

FEATURES

- Ultra-wide 200 - 1000VDC input voltage range
- High I/O isolation test voltage of 4000VAC
- Industrial grade operating temperature -40℃ to +70℃
- High efficiency, low ripple & noise
- Input undervoltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- High reliability, long lifespan

PV200-27Bxx series is a regulated DC-DC converter with an ultra-wide DC input range. The product features 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 photo voltaic, 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.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 600VDC (%) Typ.	Capacitive Load (μF) Max.
EN	PV200-27B12	120W	12V/10A	86	6000
	PV200-27B15	150W	15V/10A	87	4000
	PV200-27B24	200W	24V/8.333A	87	2000
	PV200-27B26		26V/7.692A	87	2000
	PV200-27B48		48V/4.166A	87	1000

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	PV200-27B12/15		200	--	1000	VDC
	PV200-27B24/26/48		250	--	1000	
Input Current	PV200-27B12/15	250VDC	--	--	0.8	A
		600VDC	--	--	0.4	
	PV200-27B24/26/48	250VDC	--	--	1.0	
		600VDC	--	--	0.5	
Inrush Current	600VDC		--	100	--	
	1000VDC		--	180	--	
Input Undervoltage Protection	PV200-27B12/15	Lockout activation range	155	--	185	VDC
		Lockout deactivation range	180	--	200	
	PV200-27B24/26/48	Lockout activation range	205	--	230	
		Lockout deactivation range	230	--	250	
External Input Fuse			6A/1000VDC, required			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0% - 100% load	--	±2	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	200	mV
Temperature Coefficient		--	±0.02	--	%/℃
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, hiccup, self-recovery			

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Over-voltage Protection	12V output		≤20VDC (Output voltage clamp)			
	15V output		≤25VDC (Output voltage clamp)			
	24V output		≤33VDC (Output voltage clamp)			
	26V output		≤35VDC (Output voltage clamp)			
	48V output		≤60VDC (Output voltage clamp)			
Minimum Load			0	--	--	%
Trim Range	Output power constant		--	--	±10	
Hold-up Time	Room temperature, full load	600VDC input	--	8	--	ms
		1000VDC input	--	20	--	

Note: * The "Tip and barrel method" is used for ripple and noise test, please refer to PV Converter Application Notes for specific information.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - output	Electric Strength Test for 1min., leakage current ≤5mA		4000	--	--	VAC
	Input - PE	Electric Strength Test for 1min., leakage current ≤10mA		2000	--	--	
	Output - PE	Electric Strength Test for 1min., leakage current ≤5mA		2000	--	--	VDC
Operating Temperature				-40	--	+70	℃
Storage Temperature				-40	--	+85	
Storage Humidity				--	--	95	%RH
Power Derating		-40℃ to -25℃		1.0	--	--	%/℃
		+50℃ to +70℃	PV200-27B12/15	2.0	--	--	
		+50℃ to +70℃	PV200-27B24/26/48	2.5	--	--	
		200VDC-250VDC	PV200-27B12/15	0.45	--	--	%/VDC
		250VDC-300VDC	PV200-27B24/26/48	1.5	--	--	
Switching Frequency				--	65	--	kHz
Safety Standard				EN62109-1 (Report)			
MTBF				MIL-HDBK-217F@25℃≥ 300,000 h			

Mechanical Specifications

Case Material	Metal
Dimensions	168.0 x 121.35 x 42.5 mm
Weight	1000g (Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A	
	RE	CISPR32/EN55032	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV/ line to ground ±2KV	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A

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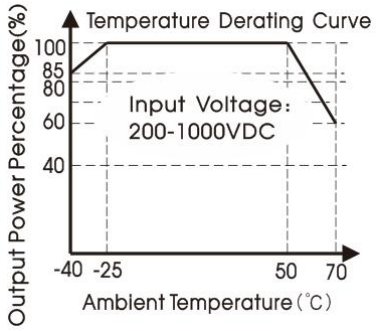
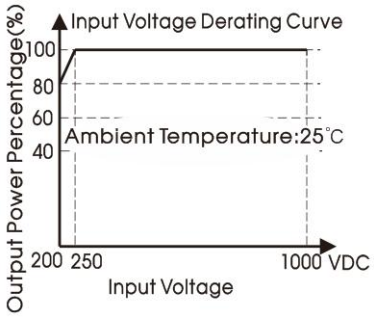
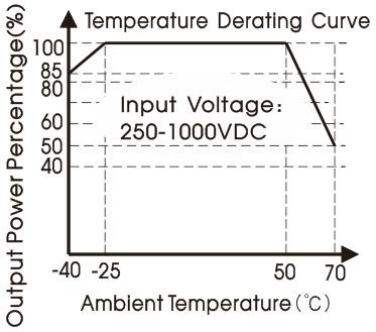
Product Characteristic Curve



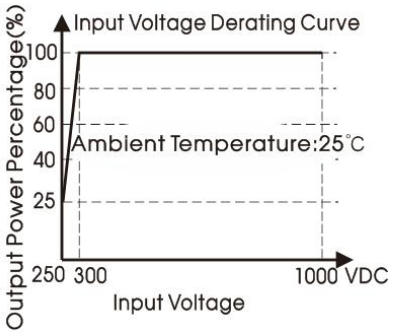
PV200-27B12/15



PV200-27B12/15



PV200-27B24/26/48



PV200-27B24/26/48

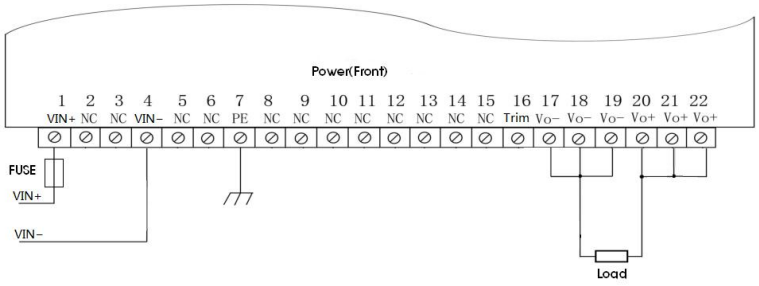
Note: ① With an input between 200-250VDC for PV200-27B12/15 and 250-300VDC for PV200-27B24/26/48, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Wiring Description

1.Terminal Definition

Terminal No.	Terminal name	Definition	Terminal No.	Terminal name	Definition	Terminal No.	Terminal name	Definition
1	VIN+	Input (+)	9	NC	No electrical connection	17	Vo-	Load output (-)
2	NC	No electrical connection	10	NC	No electrical connection	18	Vo-	Load output (-)
3	NC	No electrical connection	11	NC	No electrical connection	19	Vo-	Load output (-)
4	VIN-	Input (-)	12	NC	No electrical connection	20	Vo+	Load output (+)
5	NC	No electrical connection	13	NC	No electrical connection	21	Vo+	Load output (+)
6	NC	No electrical connection	14	NC	No electrical connection	22	Vo+	Load output (+)
7	PE	Protective grounding	15	NC	No electrical connection			
8	NC	No electrical connection	16	Trim	Adjustable Output Voltage			

2.Wiring diagram



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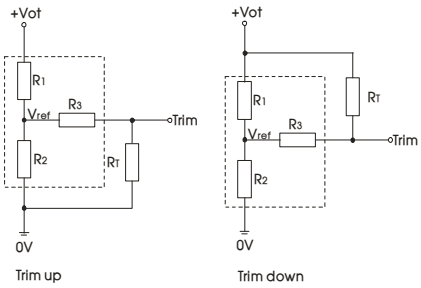
Design Reference

1. Trim Function for Output Voltage Adjustment (open if unused)



TRIM resistor connection (dashed line shows internal resistor network)

Calculating Trim resistor values:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

R_T = Trim Resistor value;
a = self-defined parameter;
Vot = desired output voltage

Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Vot(V)
12V	3.83	1	1	2.5	Output voltage after regulation, variation ⩽ ±10%
15V	7.5	1.5	1	2.5	
24V	8.66	1	1	2.5	
26V	8.66	0.91	1	2.5	
48V	33	1.8	1	2.5	

2. For additional information Please refer to application note on www.mornsun-power.com

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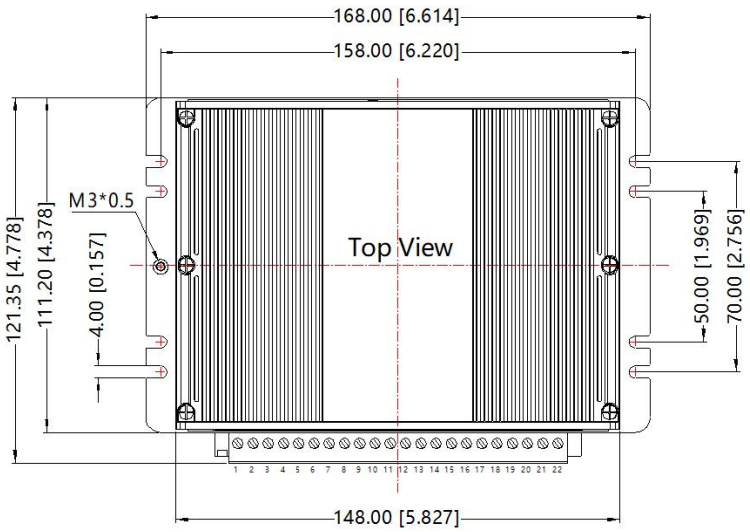
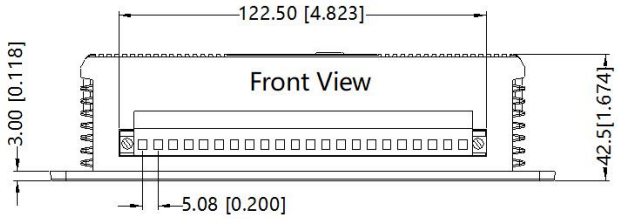
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Pin-Out			
Pin	Function	Pin	Function
1	Vin+	12	NC
2	NC	13	NC
3	NC	14	NC
4	Vin-	15	NC
5	NC	16	Trim
6	NC	17	Vo-
7	PE	18	Vo-
8	NC	19	Vo-
9	NC	20	Vo+
10	NC	21	Vo+
11	NC	22	Vo+



Note:
Unit: mm[inch]
Wire range: 28-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packing bag number of Horizontal package: 58220034;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. 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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