

# DC/DC Converter

## PV150-29Bxx Series

# MORNSUN®

150W isolated DC-DC converter with ultra-wide, ultra-high 250 - 1500VDC input for Renewable Energy



RoHS

CSA-C22.2 No.107.1-16 EN62109-1

PV150-29Bxx is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 250-1500VDC, which design based on standard of CSA-C22.2 No. 107.1, EN62109. The products feature high efficiency, high reliability, high insulation and a high level of safety protection. It is widely used in renewable energy industries such as photovoltaic inverter, energy storage systems, charging pile, industrial control. 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.

## FEATURES

- Ultra-wide input voltage range of 250 - 1500VDC
- Industrial grade operating temperature -40°C to +70°C
- High I/O isolation test voltage of 4000VAC
- High efficiency, low ripple & noise
- High reliability, long lifespan
- Input undervoltage protection, reverse input voltage protection, output short circuit, over-current, over-voltage protection
- Operating up to 5000m altitude

## Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 800VDC(%) Typ.	Capacitive Load (μF) Max.
CSA/EN	PV150-29B12	120W	12V/10000mA	84	3500
	PV150-29B15		15V/8000mA	85	3000
	PV150-29B24	150W	24V/6250mA	87	2000
	PV150-29B28		28V/5360mA	87	2000
	PV150-29B32		32V/4690mA	87	1500
	PV150-29B48		48V/3125mA	88	1000

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		250	--	1500	VDC
Input Current	250VDC	--	--	1	A
	800VDC	--	--	0.4	
Inrush Current	800VDC	--	--	100	
	1500VDC	--	--	200	
Input Undervoltage Protection	Lockout activation range	215	--	235	VDC
	Lockout deactivation range	230	--	250	
External Input fuse		4A/1500VDC, required			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load	--	±2	--	%
Line Regulation	Rated load	--	±1	--	
Load Regulation	0% - 100% load	--	±2	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	300	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, hiccup, self-recovery			
Over-voltage Protection	12V output	≤20VDC			
	15V output	≤25VDC			
	24V output	≤32VDC			
	28V output	≤35VDC			
	32V output	≤45VDC			
	48V output	≤60VDC			

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Minimum Load		0	--	--	%	
Hold-up Time	Room temperature, full load	800VDC input	--	2	--	ms
		1500VDC input	--	10	--	
Start-up Delay Time	Room temperature	--	--	3	s	

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	4000	--	--	VAC
	Input - PE	2000	--	--	
	Output - PE	2000	--	--	
Insulation	Input - output	500VDC $\geq 50 \times 10^6$			$\Omega$
Operating Temperature		-40	--	+70	$^{\circ}\text{C}$
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	%RH
Power Derating	-40 $^{\circ}\text{C}$ to -25 $^{\circ}\text{C}$	3.33	--	--	%/ $^{\circ}\text{C}$
	+55 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	2.4	--	--	
	250VDC - 300VDC	0.8	--	--	%/ $\text{VDC}$
	1400VDC - 1500VDC	0.2	--	--	
2000m - 5000m	10	--	--	%/Km	
Switching Frequency		--	65	--	kHz
Safety Standard		UL1741, CSA-C22.2 No.107.1-16, EN62109-1 safety standards			
MTBF		MIL-HDBK-217F@25 $^{\circ}\text{C}$ $\geq 300,000$ h			

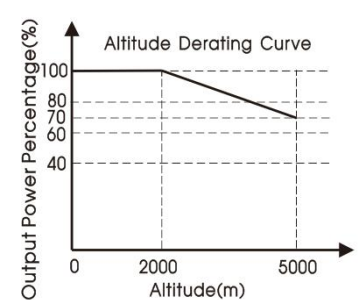
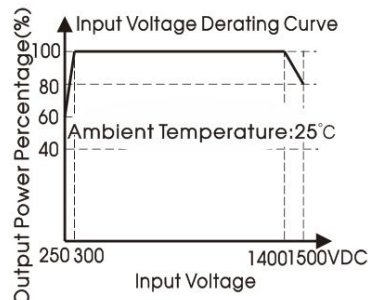
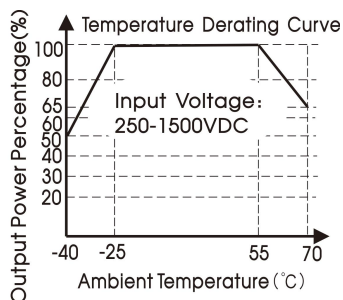
### Mechanical Specifications

Case Material	Metal
Dimensions	168.00 x 111.20 x 42.50mm
Weight	900g (Typ.)
Cooling method	Free air convection

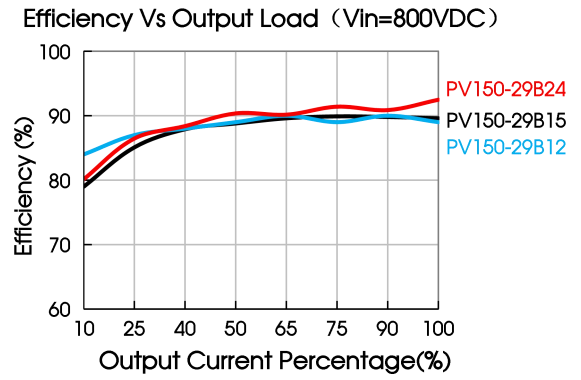
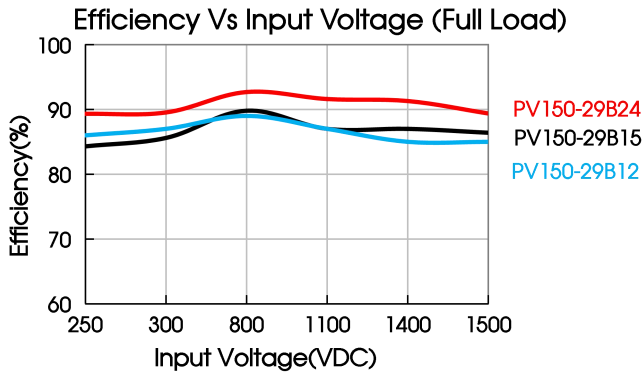
### Electromagnetic Compatibility (EMC)

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

### Product Characteristic Curve

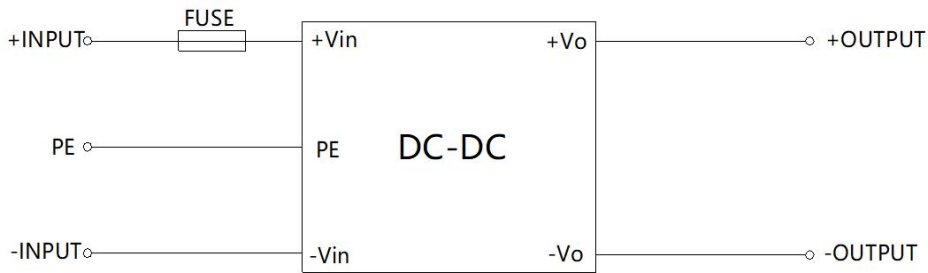


- Note: ① With an input between 250 - 300VDC/1400 - 1500VDC, the output power of PV150-29Bxx parts must be derated as per temperature derating curves;  
② This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.



Design Reference

1. Typical application circuit

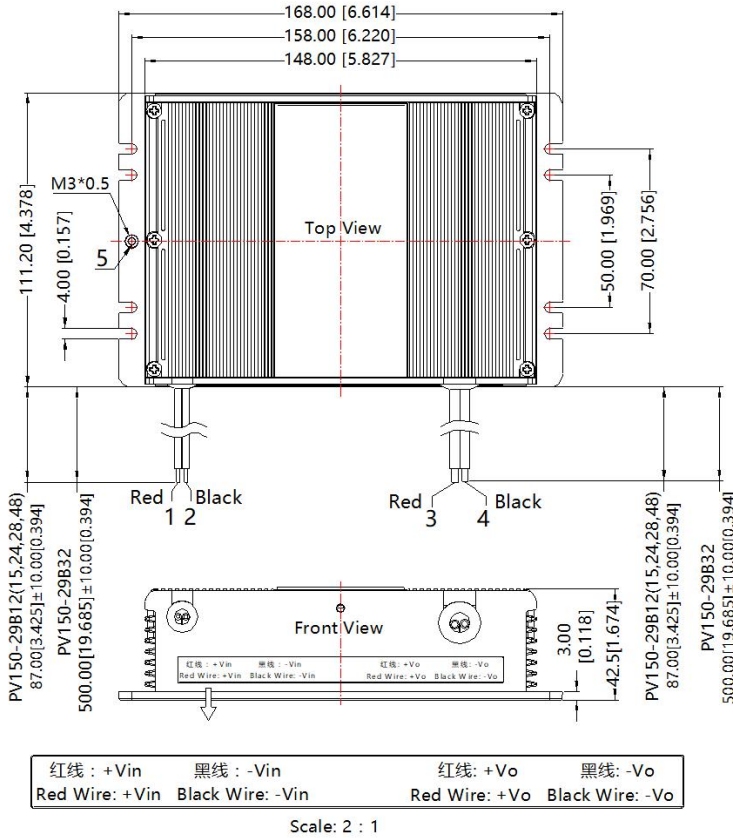


Model	Recommended value
FUSE	4A/1500VDC, required

2. For more information Please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com).

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Mark
1	+Vin
2	-Vin
3	+Vo
4	-Vo
5	PE

Input wire spec.		
Product Model	Wire Spec.	AWG
PV150-29B12	UL3239	18
PV150-29B15	UL3239/UL1015	18
PV150-29B24	UL3239/UL1015	18
PV150-29B28	UL3239	18
PV150-29B32	UL3239/UL1015	18
PV150-29B48	UL3239/UL1015	18

Note:

The input wire spec. is UL1015 heated shrinkable tube, which meets the requirements of 1500V voltage class, different wires are shipped randomly with new and old samples

Output wire spec.: UL1015 14AWG

Unit: mm[inch]

General tolerances:  $\pm 1.00[\pm 0.039]$

Warning: To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/ NFPA 70.

Avertissement: Pour réduire le risque d'incendie, veuillez connecter uniquement à des circuits de dérivation avec protection contre les surintensités conformes au code électrique national ANSI/ NFPA 70.

Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220034;
- 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;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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