

200W isolation DC-DC converter with ultra-wide, ultra-high 250 - 1500VDC input for Renewable Energy



FEATURES

- Ultra-wide 250 - 1500VDC input voltage range (Transient 1700VDC last for 10s)
- Industrial grade operating temperature -40°C to +70°C
- High I/O isolation voltage up to 4000VAC
- High reliability, efficiency up to 93%
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Operating altitude up to 5000m
- EFT immunity meets Level 4
- Design refer to UL1741, EN/IEC/BS EN62109

PV200-29BxxR3 series is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 250-1500VDC. 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 as 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 (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 850VDC (%) Typ.	Capacitive Load (μF) Max.
/	PV200-29B12R3	150	12V/12.5A	88	5000
	PV200-29B24R3	200	24V/8.333A	91	5000
	PV200-29B28R3		28V/7.143A	91	3500
	PV200-29B48R3		48V/4.167A	93	1250

Note: *Use suffix "W" for lead type version.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit	
Input Voltage Range			250	--	1500	VDC	
Input Current	300VDC		--	--	1.2	A	
	850VDC		--	--	0.45		
Inrush Current	850VDC	Cold start	--	100	150	VDC	
	1500VDC		--	180	280		
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)		110	--	240	VDC	
	Under-voltage protection release (Input voltage rises from low to high)		120	--	250		
Input Reverse Polarity Protection			Available				
Start-up Delay Time*			--	1	2	s	
External Input Fuse			6A/1500VDC, required				
Hot Plug			Unavailable				

Note: *Start-up delay time test conditions: full voltage input range, full output load range (the cooling-time between input power-off and power-on again is greater than 10s.)

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range		--	±1	±2	%
Line Regulation	Rated load		--	±1	--	
Load Regulation			--	±1	--	
Stand-by Power Consumption		850VDC	--	1	2	W
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		--	150	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	≤20V	Output voltage clamp or hiccup		
	24V	≤32V			
	28V	≤35V			
	48V	≤58V			
Minimum Load		0	--	--	%
Hold-up Time	Room temperature, full load	850VDC input	20	--	ms

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 <10mA	4000	--	--	VAC
	Input - PE		4000	--	--	
	Output - PE	Electric strength test for 1min., leakage current <5mA	2000	--	--	
Insulation Resistance	Input - output	Ambient temperature: 25 ± 5°C				MΩ
	Input - PE	Relative humidity: < 95%RH, no condensation	100	--	--	
	Output - PE	Test voltage: 500VDC				
Operating Temperature			-40	--	+70	°C
Storage Temperature			-40	--	+85	
Storage Humidity	Non-condensing		--	--	95	%RH
Power Derating	Operating temperature derating	-40°C to -25°C	2.67	--	--	%/°C
		+55°C to +70°C	2.67	--	--	
	Input voltage derating	250 - 300VDC	0.8	--	--	%/VDC
	Altitude derating	2000m - 5000m	6.67	--	--	%/Km
Switching Frequency			--	65	--	kHz
Safety Standard			Design refer to UL1741, EN/IEC/BS EN62109-1			
MTBF	MIL-HDBK-217F@25°C		≥300,000 h			

Mechanical Specifications

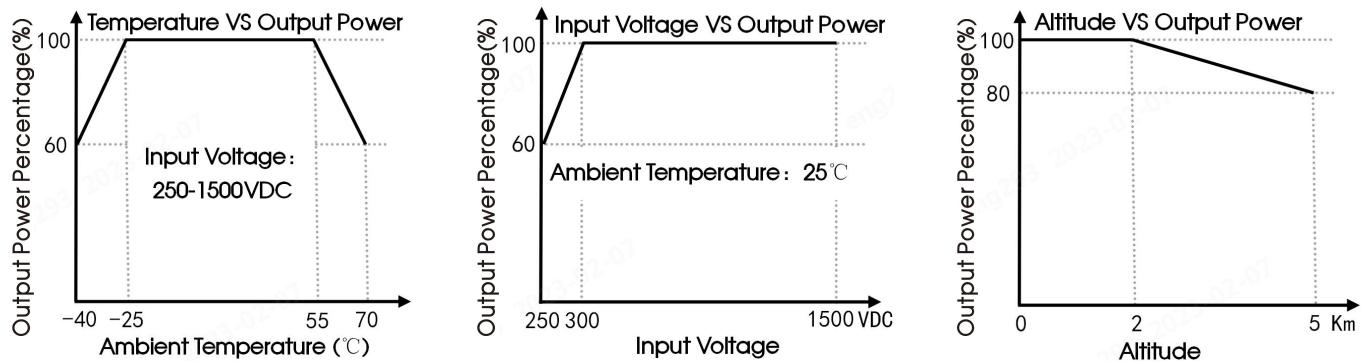
Case Material	Metal		
Dimensions	201.00 x 70.00 x 42.00mm		
Weight	620g (Typ.)		
Cooling Method	Free air convection		

Electromagnetic Compatibility (EMC)

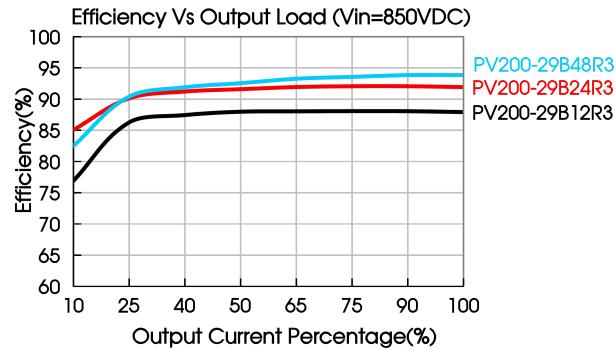
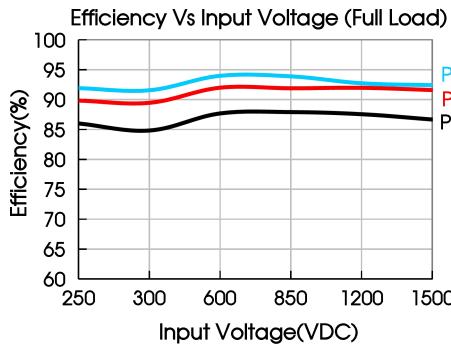
Emissions	CE	CISPR32/EN55032 CLASS A	
	RE	CISPR32/EN55032 CLASS A	
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	Perf. Criteria B
	Surge	IEC/EN61000-4-5 Line to line ±1KV/ line to PE ±2KV	Perf. Criteria B
	CS	IEC/EN61000-4-6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

Note: For harsh EMC application environments, please consult FAE to add application circuits.

Product Characteristic Curve



Note: 1. With an DC input between 250-300VDC, 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 Mornsun FAE.



Design Reference

1. Typical application circuit

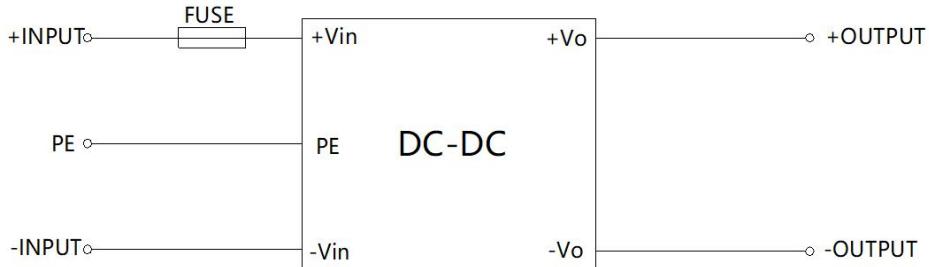
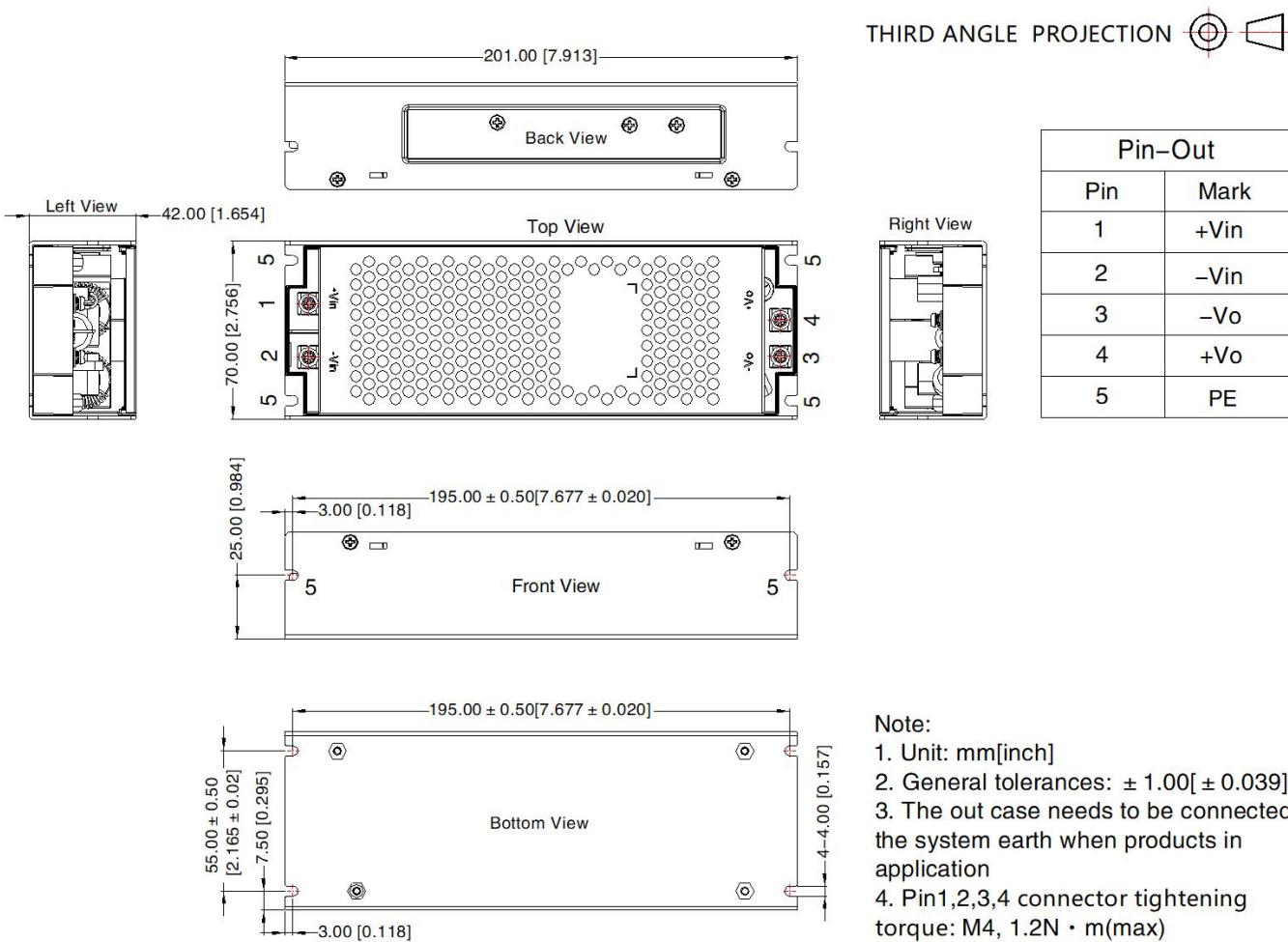


Fig. 1

Model	Recommended value
FUSE	6A/1500VDC, required

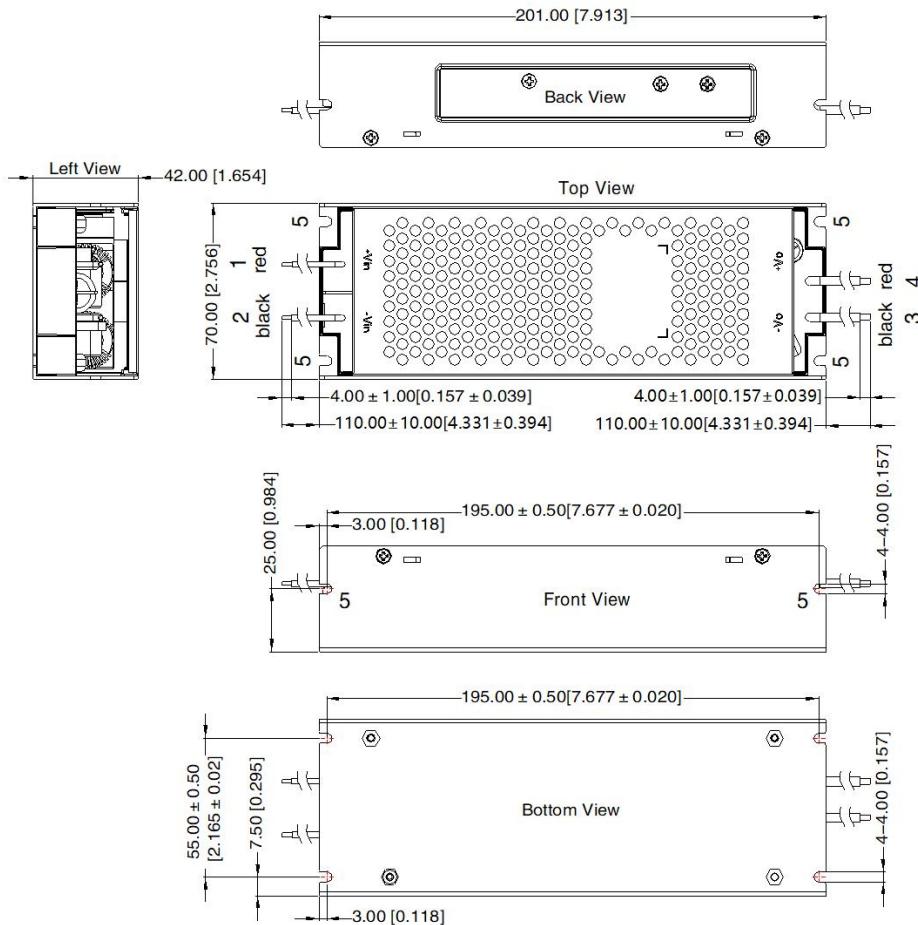
2. For additional information please refer to application notes on www.mornsun-power.com.

Dimensions and Recommended Layout (PV200-29BxxR3)



Dimensions and Recommended Layout (PV200-29BxxWR3)

THIRD ANGLE PROJECTION



Front View

Note:

1. Unit: mm[inch]
2. General tolerances: ± 1.00 [± 0.039]
3. The out case needs to be connected to the system earth when products in application
4. 1~2 wire spec.: UL3239 18AWG
3~4 wire spec.: UL1015 14AWG

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220211;
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 datasheet are based on our company corporate standards;
4. In order to improve the efficiency, there will be audible noise generated when working at input voltage higher than 1000VDC, but it does not affect product performance and reliability;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
8. If UL certification is required, an external lightning protection device (SVR=6000V) should be connected to the input.

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