

200W Isolation DC-DC Converter with Ultra-wide, ultra-high 300 - 1500VDC input for Renewable Energy



FEATURES

- Ultra-wide 300 - 1500VDC input voltage range
- High I/O isolation test voltage of 4000VAC
- Industrial grade operating temperature -40°C to +70°C
- High efficiency, Low ripple & noise
- High reliability, Long lifespan
- Input reverse polarity and undervoltage protection, output short circuit, overcurrent and overvoltage protection
- Meets CSA-C22.2 No.107.1, EN62109 standards (Pending)
- Meets 5000m altitude requirements

PV200-29Bxx 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 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.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 850VDC (%) Typ.	Capacitive Load (μF) Max.
CSA/CE (Pending)	PV200-29B24	200W	24V/8.4A	86	5000
	PV200-29B48		48V/4.2A	87	2000

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		300	--	1500	VDC
Input current	300VDC	--	--	1200	mA
	850VDC	--	--	450	
	1500VDC	--	--	200	
Inrush current	850VDC	--	150	--	A
	1500VDC	--	250	--	
Input under-voltage protection	Under-voltage protection begins	265	--	285	VDC
	Under-voltage protection release	275	--	295	
External input fuse		15A/1500VDC, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	0% - 100% load	--	--	±2	%	
Line Regulation	Full load	--	--	±1		
Load Regulation	0% - 100% load	--	--	±1		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	200	300	mV	
Temperature Drift Coefficient		--	±0.02	--	%/°C	
Short Circuit Protection		Hiccup, continuous, self-recovery				
Overcurrent Protection		110 - 300%Io, hiccup, self-recovery				
Overvoltage Protection	24V output	≤35VDC or hiccup protection				
	48V output	≤60VDC or hiccup protection				
Min. Load		0	--	--	%	
Hold-up Time	Room temperature, Full load	850VDC input	5	--	--	ms
		1500VDC input	8	--	--	
Start delay time**	300-1500VDC	--	3	--	s	

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

**Start-up delay time Test conditions:full voltage input range,full output load range(product input power-down to the input voltage re-power-on cooler time is greater than 15s.)

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation test	Input - output	Electric Strength Test for 1min, leakage current $\leq 10\text{mA}$	4000	--	--	VAC
	Input - PE	Electric Strength Test for 1min, leakage current $\leq 5\text{mA}$	2000	--	--	
	Output - PE		2000	--	--	
Operating Temperature		-40	--	+70	°C	
Storage Temperature		-40	--	+85		
Storage Humidity		--	--	95	%RH	
Power Derating	-40°C to -25°C	3.33	--	--	% / °C	
	+55°C to +70°C	3.33	--	--		
	1400 - 1500VDC	0.20	--	--	% / VDC	
Switching Frequency		--	65	--	kHz	
Safety Standard		CSA-C22.2 No.107.1, EN62109				
Safety Certification		CSA-C22.2 No.107.1, EN62109 (Pending)				
MTBF		MIL-HDBK-217F@25°C $\geq 300,000$ h				

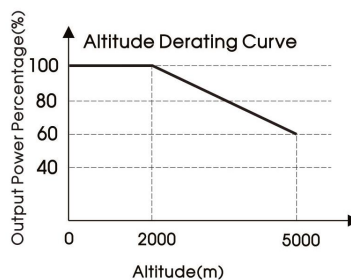
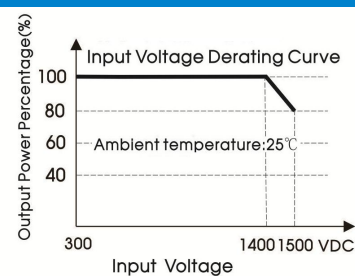
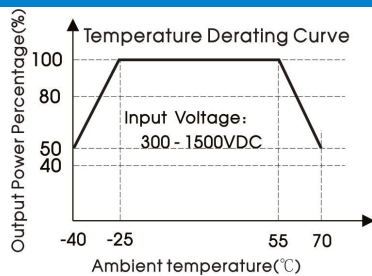
Mechanical Specifications

Casing Material	Metal
Dimensions	215.00 x 125.00 x 50.00mm
Weight	1550g (Typ.)
Cooling method	Free air convection

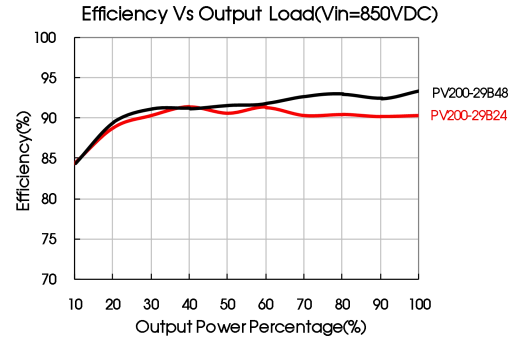
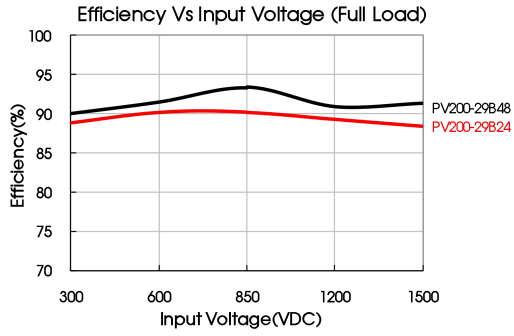
Electromagnetic Compatibility (EMC)

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

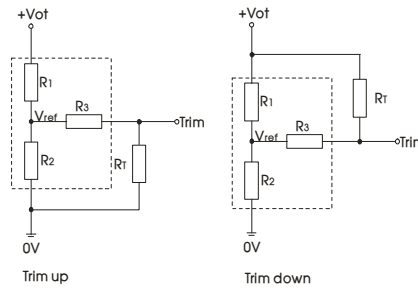


- Note: ① With an input between 1400-1500VDC, the output power must be derated as per temperature derating curves;
 ② For operation of this converter series in an altitude between 2000 - 5000m above sea level, the output power must be derated as per the altitude derating curve;
 ③ This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.



Design Reference

1. Application of Trim and calculation of Trim resistance



Applied circuits of Trim (Part in broken line is the interior of models)

Calculation formula of Trim resistance:

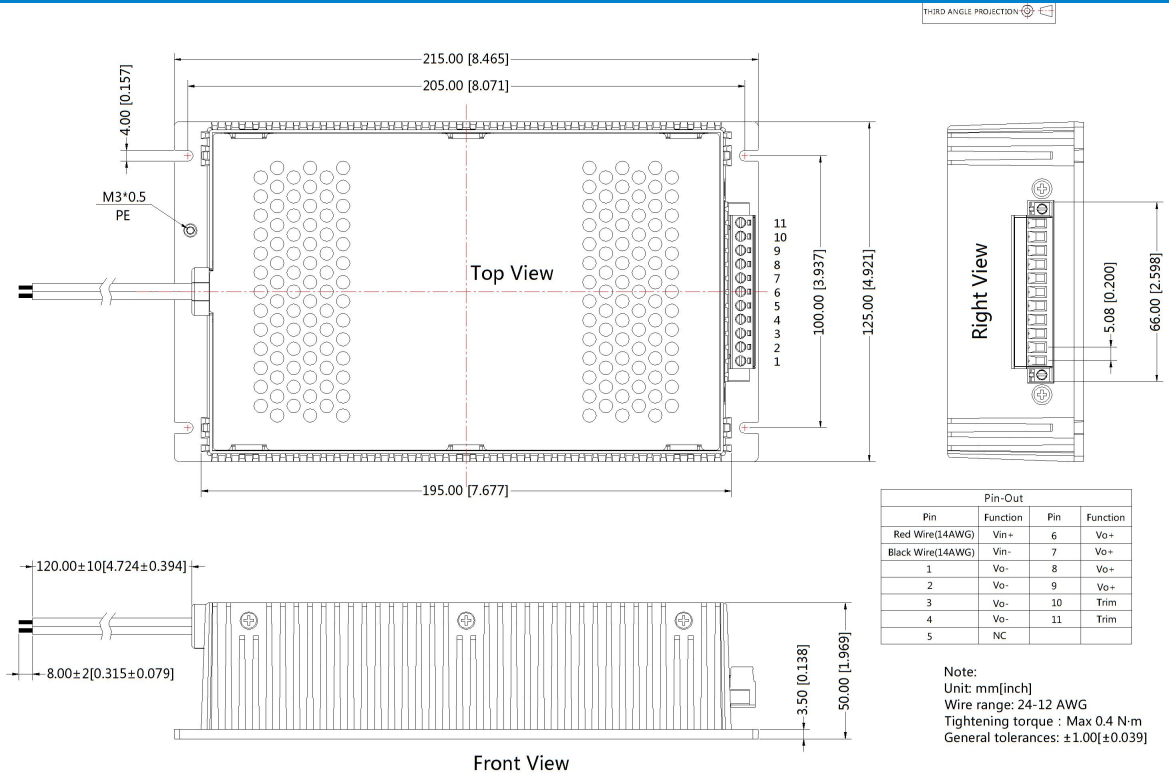
$$\begin{aligned} \text{up: } R_T &= \frac{\alpha R_2}{R_2 - \alpha} - R_3 & \alpha &= \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1 \\ \text{down: } R_T &= \frac{\alpha R_1}{R_1 - \alpha} - R_3 & \alpha &= \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2 \end{aligned}$$

R_T is Trim resistance
 α is a self-defined parameter, with no real meaning.

Vout	R1(K Ω)	R2(K Ω)	R3(K Ω)	Vref(V)	Vot(V)
24V	8.66	1	1	2.5	Output voltage after regulation, variation $\leq \pm 10\%$
48V	17.8	1	1	2.5	

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

Dimensions and Recommended Layout



Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packing bag number: 58220053;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. In order to improve the conversion efficiency, when the module is working under high pressure, the module may have certain audio noise, but does not affect the reliability of the product;
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.

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