

350W isolated DC-DC converter with ultra-wide, ultra-high 300 -1500VDC input for Renewable Energy



RoHS



FEATURES

- Input voltage up to 1700VDC (Transient, duration: 10s)
- Ultra-wide input voltage range of 300 - 1500VDC
- Industrial grade operating temperature -40°C to +85°C
- High I/O isolation test voltage of 4000VAC
- High efficiency, low ripple & noise
- High reliability, long lifespan
- Input under-voltage protection, input reverse polarity protection, over-temperature protection, output short circuit, over-current, over-voltage protection
- Operating up to 5000m altitude
- Safety according to UL1741, CSA-C22.2 No.107.1, EN/IEC62109

PV350-29Bxx is a regulated DC-DC series converter with an ultra-wide and ultra-high DC input of 300-1500VDC, which design based on standard of CSA-C22.2 No.107.1, EN/IEC62109, UL1741. 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, 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.

Selection Guide

Certification	Part No.*	Output Power**	Nominal Output Voltage and Current (Vo/Io)		Output Voltage Adjustable Range ADJ (V)	Efficiency at 1100VDC (%) Typ.	Capacitive Load (µF) Max.
			Constant voltage mode	Constant current mode (75%Vo-95%Vo)			
UL/IEC/EN-Report (pending)	PV350-29B24	350.4W	24V/14.6A	16.5A	21.6-26.4	92	2200
	PV350-29B28	350.0W	28V/12.5A	14.0A	25.2-30.8		1500
	PV350-29B32	350.4W	32V/10.95A	12.2A	28.8-35.2		1500

Note: *Use suffix "W" for wire output version.

**If need parallel connection to increase the power, please consult Mornsun FAE for solution.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	Transient (10s)	--	--	1700	VDC
		300	--	1500	
Input Current	300VDC	--	--	2	A
	1100VDC	--	--	0.75	
	1500VDC	--	--	0.6	
Inrush Current	1500VDC	--	300	--	
Input Under-voltage Protection	Lockout activation range	240	--	295	VDC
	Lockout deactivation range	265	--	305	
Input Reverse Polarity Protection		Available			
External Input Fuse		6A/1500VDC, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range, constant voltage mode	--	±2	--	%
Output Current Accuracy	75%-95% Vo, constant current mode	--	±10	--	
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 or constant current, continuous, self-recovery			
Over-voltage Protection	24V output		≤35VDC	Output voltage clamp or hiccup		
	28V output		≤40VDC			
	32V output		≤45VDC			
Over-current Protection	24V output		Constant current 16.5A output or hiccup			
	28V output		Constant current 14.0A output or hiccup			
	32V output		Constant current 12.2A output or hiccup			
Over-temperature Protection**			Output voltage turn off, self-recovery			
Minimum Load			0	--	--	%
Hold-up Time	Room temperature, full load	1100VDC input	--	8	--	ms
Start-up Delay Time***	Room temperature		--	3	5	s

Note: *The "Tip and barrel method" is used for ripple and noise test, please refer to PV Converter Application Notes for specific information.
 **Output voltage turn off, self-recovery after fault conditions is removed.
 ***Full input voltage / output load range (The cooling-time between input power-off and power-on again is greater than 15s).

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		4000	--	--	
Insulation Type			Primary and secondary meet reinforced insulation			
Insulation Resistance	Input - output	500VDC	50	--	--	MΩ
Operating Temperature			-40	--	+85	°C
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	95	%RH
Power Derating	-40°C to 0°C	300-400VDC	0.50	--	--	% / °C
	+50°C to +70°C	300-400VDC	2.50	--	--	
	+55°C to +70°C	400-1400VDC	3.33	--	--	
	+50°C to +70°C	1400-1500VDC	2.50	--	--	
	+70°C to +85°C	300-1500VDC	3.00	--	--	
	300-400VDC		0.20	--	--	% / VDC
	1400-1500VDC		0.20	--	--	
	3000- 5000m		10.00	--	--	% / Km
Switching Frequency			--	65	--	kHz
Safety Standard			Design refer to UL1741, CSA-C22.2 No.107.1, EN/IEC62109 -1			
MTBF			MIL-HDBK-217F@25°C ≥ 300,000 h			

Mechanical Specifications

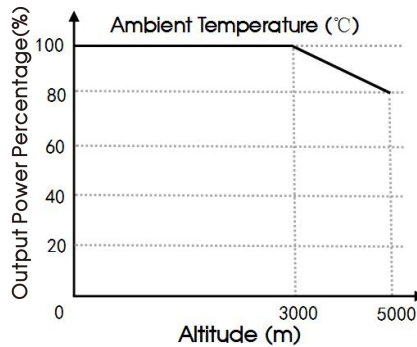
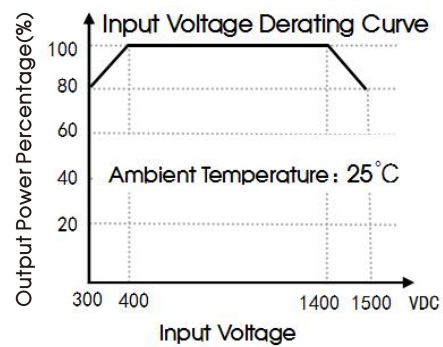
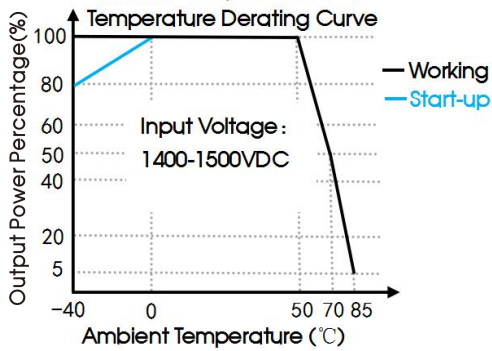
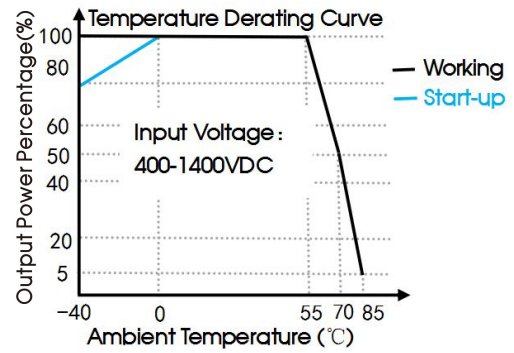
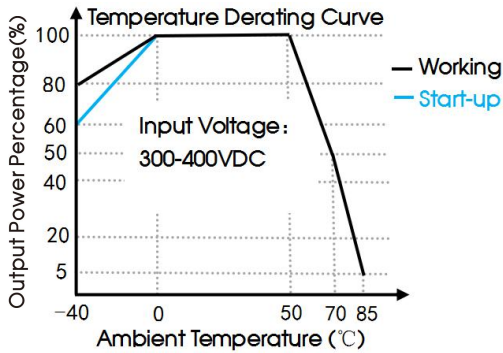
Case Material	Metal
Dimensions	215.00 x 125.00 x 50.00 mm
Weight	1500g (Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

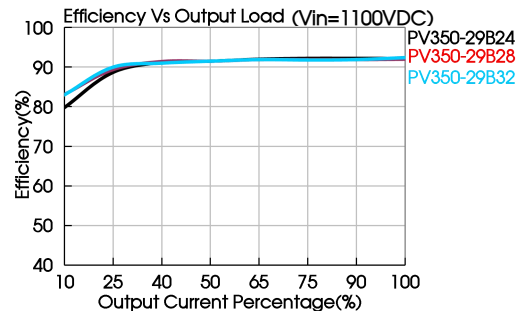
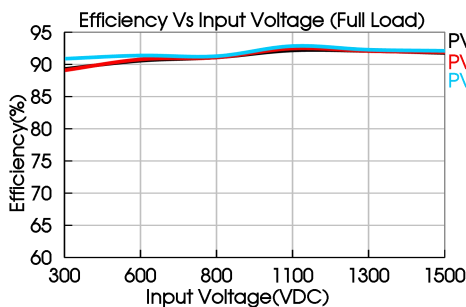
Emissions*	CE	CISPR32/EN55032	CLASS A	
	RE	CISPR32/EN55032	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±1KV/line to ground ±2KV	Perf. Criteria A
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

Note: *During conduction and radiation testing, in order to avoid new interference brought by the input line, it is necessary to cover the input line with a nickel-zinc ferrite or nanocrystalline magnetic ring.

Product Characteristic Curve



Note: ① With an input between 300 -400VDC/1400 -1500VDC, the output power of PV350-29Bxx parts 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

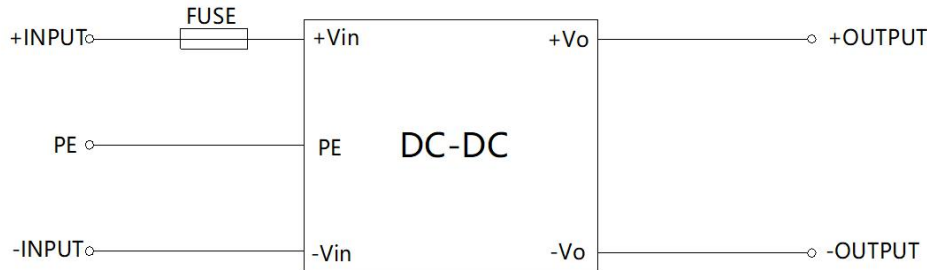


Fig. 1

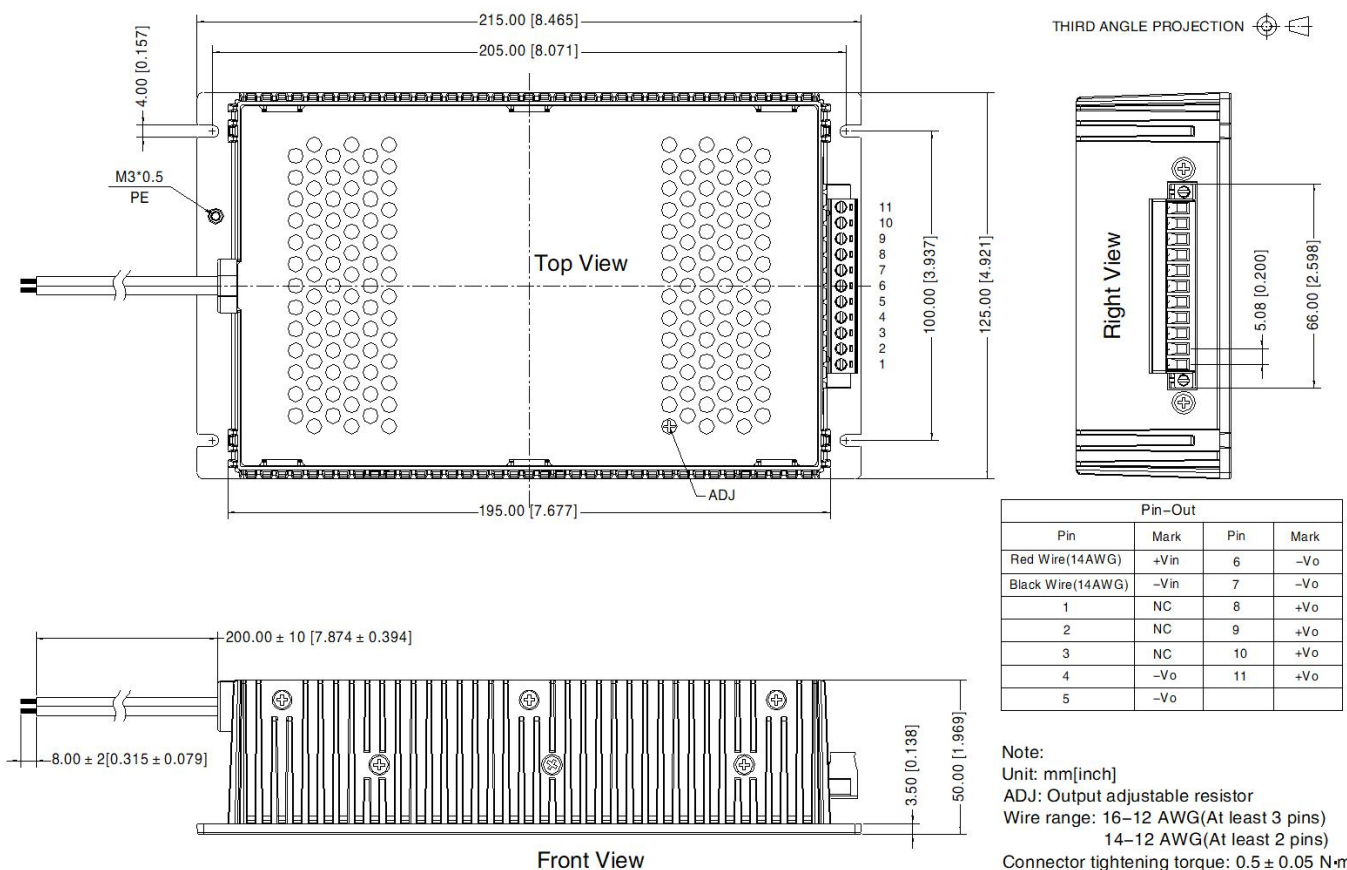
Model	Recommended value
FUSE	6A/1500VDC, required

2. For more information Please find the application notes on www.mornsun-power.com.

3. IMPORTANT SAFETY INSTRUCTIONS

Additional protective devices, such as lightning protector need to be added if there is an transient pulse voltage greater than 6KV at the input of PV products in system applications.

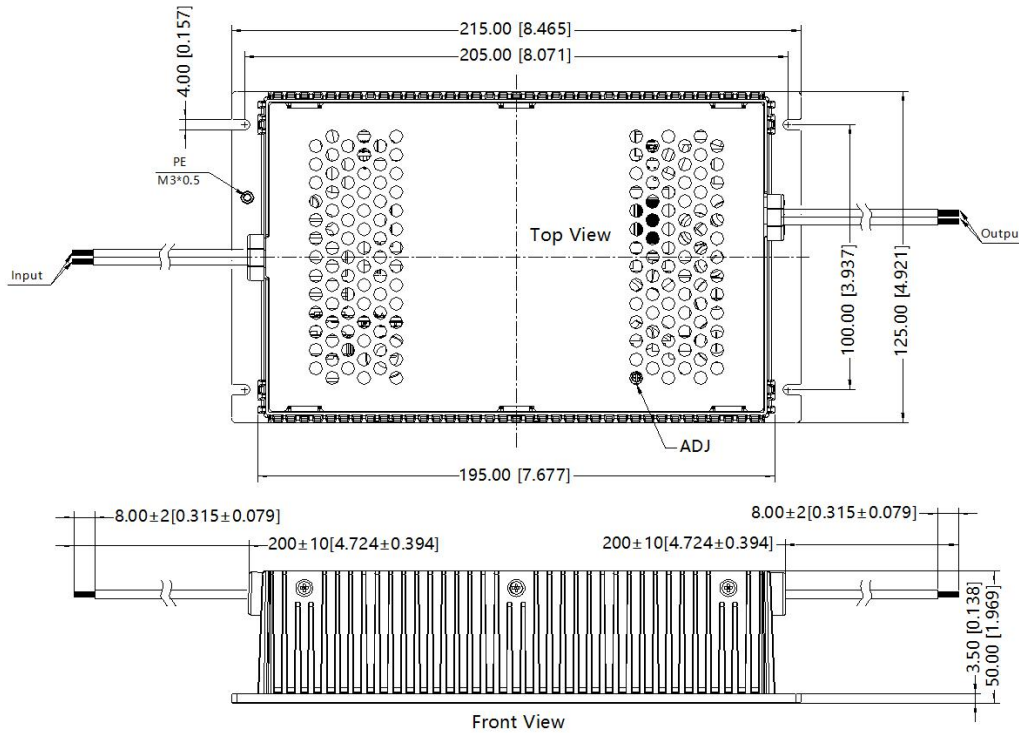
Dimensions and Recommended Layout (PV350-29Bxx)



Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Wire range: 16-12 AWG(At least 3 pins)
14-12 AWG(At least 2 pins)
Connector tightening torque: 0.5 ± 0.05 N·m
General tolerances: $\pm 1.00[\pm 0.039]$
The product must be installed in prevent fire and electric shock of enclosure for terminal use.

Dimensions and Recommended Layout (PV350-29BxxW)

THIRD ANGLE PROJECTION 



Pin-Out		
	Pin	Function
Input	Red Wire(14AWG)	Vin+
	Black Wire(14AWG)	Vin-
Output	Red Wire(14AWG)	Vo+
	Black Wire(14AWG)	Vo-

Note:
Unit: mm[inch]
Tightening torque: Max 0.4 N · m
ADJ: Output adjustable resistor
General tolerances: ± 1.00[± 0.039]
The product must be installed in prevent fire and electric shock of enclosure for terminal use.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220053;
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. 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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