

180W isolation DC-DC converter with ultra-wide, ultra-high 200 - 1200VDC input for Renewable Energy



RoHS



## FEATURES

- Ultra-wide 200 - 1200VDC input voltage range
- Industrial grade operating temperature -40°C to +85°C
- High I/O isolation voltage up to 4000VAC
- High reliability, efficiency up to 90%
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Solar tracker power supply, with constant current charging function
- Operating altitude up to 5000m
- EFT immunity meets Level 4
- Design refer to UL1741, EN/IEC/BS EN62109

PV180-27A2828-BAT 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. It is widely used in renewable energy industries, such as solar tracker power supply. The converters provide multiple protection features and guarantee stable and safe operating environments even under abnormal working conditions.

## Selection Guide

Part No.	Output Power (W)	Nominal Output Voltage and Current			Efficiency at 600VDC (%) Typ.	Capacitive Load (μF) Max.
		Vo/Io	Vo2/Io2			Vo
			Constant voltage mode	Constant current mode 60%Vo2-98%Vo2		
PV180-27A2828-BAT	180	28.5V/5.26A	28.5V (Max)/1A	1A	90	1200

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		200	600	1200	VDC
Input Current	300VDC	--	--	1	A
	800VDC	--	--	0.4	
Inrush Current	800VDC	--	100	--	A
	1200VDC		150	--	
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)	120	--	190	VDC
	Under-voltage protection release (Input voltage rises from low to high)	150	--	200	
Input Reverse Polarity Protection		Available			
Start-up Delay Time*		--	1	3	s
External Input Fuse		4A/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 15s. )

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	--	±2	--	%
Constant Current Output Voltage Accuracy	18-28V, constant current mode	--	±10	--	
Line Regulation	Rated load	--	±1	--	
Load Regulation	600VDC	--	±2	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	300	mV
Temperature Coefficient	Vo	--	±0.02	--	%/°C
Short Circuit Protection	Vo	Hiccup, continuous, self-recovery			

Over-current Protection	Vo	≥130%Io, hiccup, self-recovery				
Over-voltage Protection	Vo	≤35V	Output voltage clamp or hiccup			
Ctrl**	Vo2 on	Ctrl pin open or pulled high (3.0-28.5VDC)				
	Vo2 off	Ctrl pin pulled low to -Vo (0-1.0VDC)				
Minimum Load		0	--	--	%	
Hold-up Time	Room temperature, full load	600VDC input	--	2	--	ms

Note: \*The "parallel cable" method is used for ripple and noise test, please refer to PV Converter Application Notes for specific information;  
\*\*The Ctrl pin voltage is referenced to Output -Vo.

## 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	4000	--	--		
	Output - PE		4000	--	--		
Insulation Resistance	Input - output	Test voltage: 500VDC	50	--	--	MΩ	
Operating Temperature			-40	--	+85	°C	
Storage Temperature			-40	--	+85		
Storage Humidity	Non-condensing		10	--	95	%RH	
Output Power Derating	Operating temperature derating	-40°C to -25°C	Start-up	3.33	--	--	% / °C
		-40°C to -25°C		1.33	--	--	
		+55°C to +70°C		2.4	--	--	
		+70°C to +85°C		2.27	--	--	
	Input voltage derating	200 - 300VDC	0.4	--	--	%/VDC	
Altitude derating	2000m - 5000m	10	--	--	%/Km		
Switching Frequency			--	65	--	kHz	
Safety Standard			Design refer to UL1741, EN/IEC/BS EN62109-1				
Safety Certification			CLASS I				
MTBF	MIL-HDBK-217F@25°C		≥300,000 h				

## Mechanical Specifications

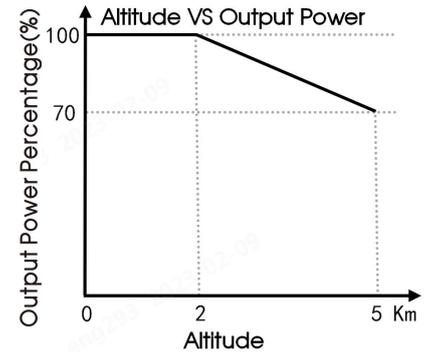
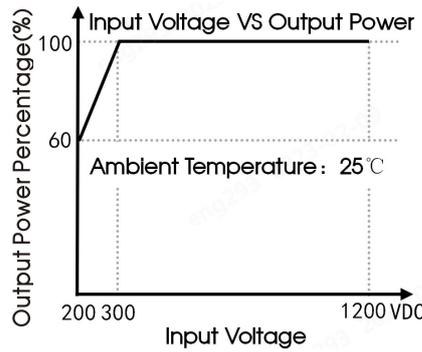
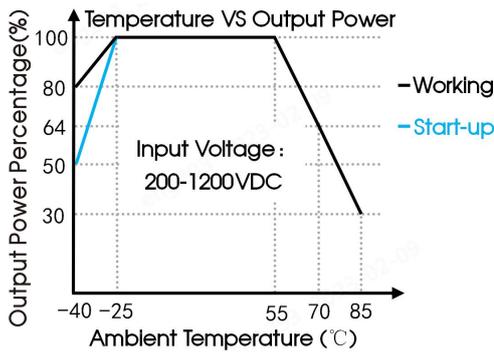
Case Material	Metal
Dimensions	168.00 x 106.00 x 41.00mm
Weight	650g (Typ.)
Cooling Method	Free air convection

## Electromagnetic Compatibility (EMC)

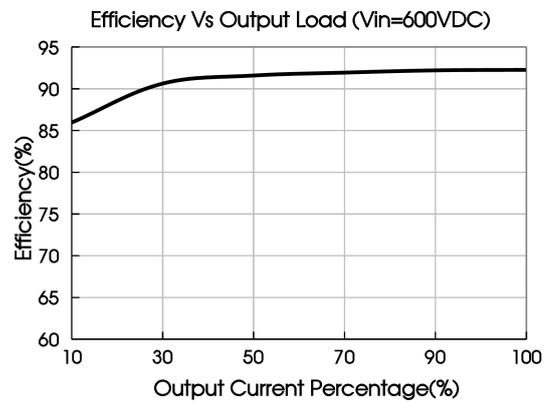
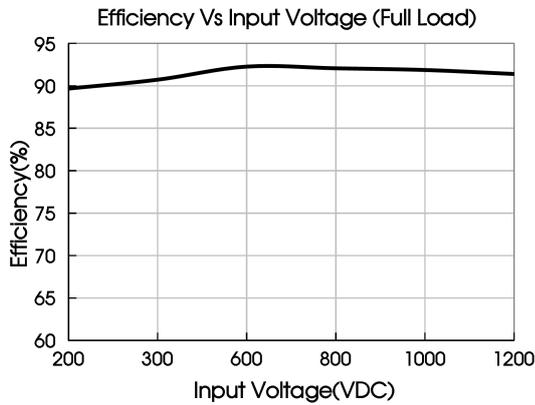
Emissions	CE	CISPR32/EN55032	CLASS A	
	RE*	CISPR32/EN55032	CLASS A	
Immunity**	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line ±1KV/ line to PE ±2KV	Perf. Criteria A
	CS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

Note: \*Radiation testing, Ctrl pin pulled low to -Vo (0-1.0VDC);  
\*\*For harsh EMS application environments, please consult FAE to add application circuits.

Product Characteristic Curve



Note: 1. With an DC input between 200-300VDC, 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

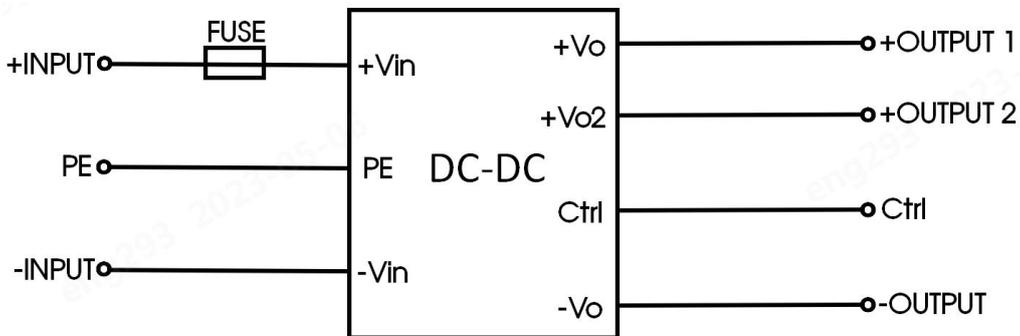


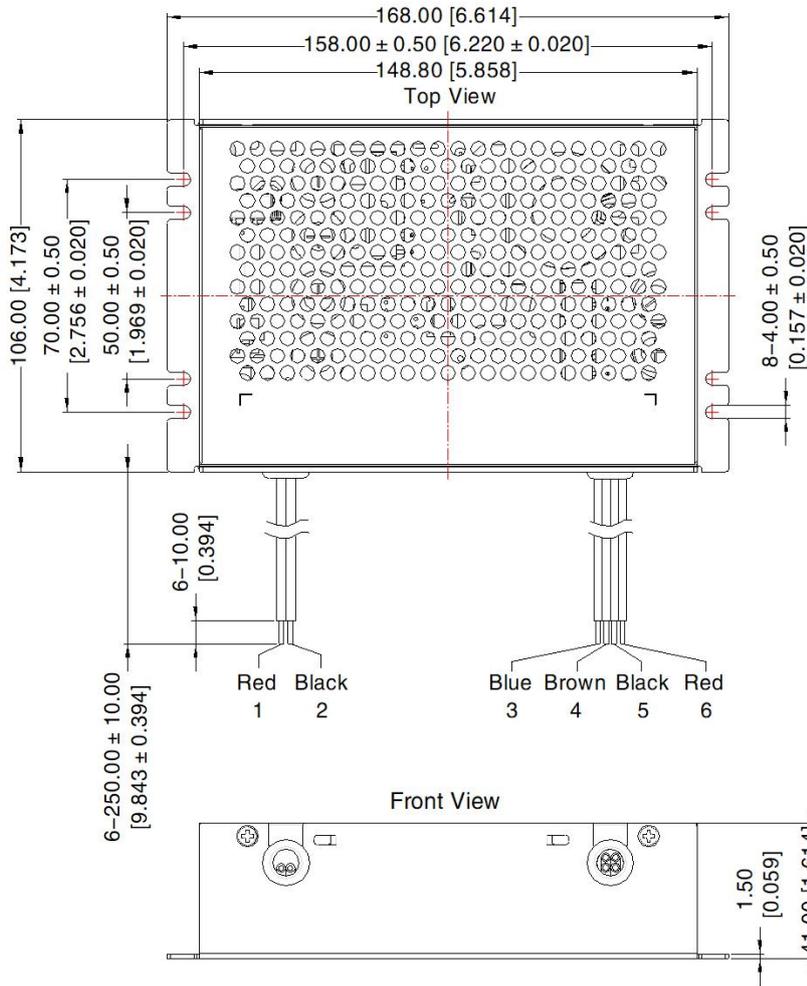
Fig. 1

Model	Recommended value
FUSE	4A/1500VDC, required

2. For additional information please refer to 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	Ctrl
4	+Vo2
5	-Vo
6	+Vo
Mounting hole	

Note:

Input wire spec. ① ② : UL3239 14AWG  
Output wire spec. ③ ④ : UL1015 18AWG  
Output wire spec. ⑤ ⑥ : UL1015 14AWG  
Unit: mm[inch]  
General tolerances: ± 1.00 [± 0.039]

Note:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220264;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°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.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China  
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com