

32W isolated DC-DC converter with ultra-wide, ultra-high 200 - 1500V DC input for renewable energy



FEATURES

- Input voltage up to 1700VDC (Transient, duration: 10s)
- Ultra wide input voltage range: 200 - 1500VDC
- Transient power 50W last for 30s (The interval is 10min)
- Industrial grade operating temperature: -40°C to +85°C
- High I/O isolation voltage up to 4000VAC
- High efficiency, low ripple & noise
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Reinforced insulation
- Design refer to UL1741, EN62109

PV50-29B400 is regulated DC-DC converters with an ultra-wide DC input of 200-1500VDC. The products feature high efficiency, high reliability, high insulation and high level of safety. 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

Part No.*	Output Power		Nominal Output Voltage and Current (Vo/Io)	Efficiency at 800VDC (%) Typ.	Capacitive Load (μF) Max.** (Normal temperature full load)
	Steady	Transient (duration 30s)			
PV50-29B400	32W	50W	400V/80mA	84	440

Note: *Use suffix "A5" for chassis mounting and suffix "A6" for DIN-Rail mounting;

**A 12K Ω resistor needs to be connected in series when test a capacitive load.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range			200	--	1500	VDC
	Transient (10s)		--	--	1700	
Input Current	200VDC		--	--	0.4	A
	800VDC		--	--	0.1	
Inrush Current	1500VDC	Cold start	--	150	--	
Input Under-voltage Protection	Lockout activation range		90	--	190	VDC
	Lockout deactivation range		100	--	200	
Input Reverse Polarity Protection	Available					
External Input Fuse Required	4A/1500VDC, required					
Hot Plug	Unavailable					

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range		--	±2.5	--	%
Stand-by Power Consumption	Room temperature, 800VDC input		--	2	3	W
Short Circuit Protection	Hiccup, continuous, self-recovery					
Over-current Protection	≥160%Io, self-recovery					
Over-voltage Protection			≤440V	Output voltage clamp		
Minimum Load			0	--	--	%
Start-up Delay Time*	200 - 1500VDC		--	1	3	s
Hold-up Time	Room temperature, full load	800VDC input	--	5	--	ms

Note: *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 <5mA	4000	--	--	VAC
Operating Temperature		-40	--	+85	°C	
Storage Temperature		-40	--	+85		
Storage Humidity	Non-condensing	--	--	95	%RH	
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s				
	Manual-welding	360 ± 10°C; time: 3 - 5s				
Output Power Derating	Operating temperature derating	-40°C to -25°C	2.67	--	--	% / °C
		+50°C to +70°C	2.0	--	--	
		+70°C to +85°C	2.67	--	--	
	Input voltage derating	200VDC-300VDC	0.5	--	--	%/VDC
Altitude derating	2000m - 5000m	6.7	--	--	%/Km	
Switching Frequency		--	65	--	kHz	
Altitude		--	--	5000	m	
Safety Standard		Design refer to CSA-C22.2 No.107.1-16, UL1741, EN62109-1				
MTBF		MIL-HDBK-217F@25°C ≥ 300,000 h				

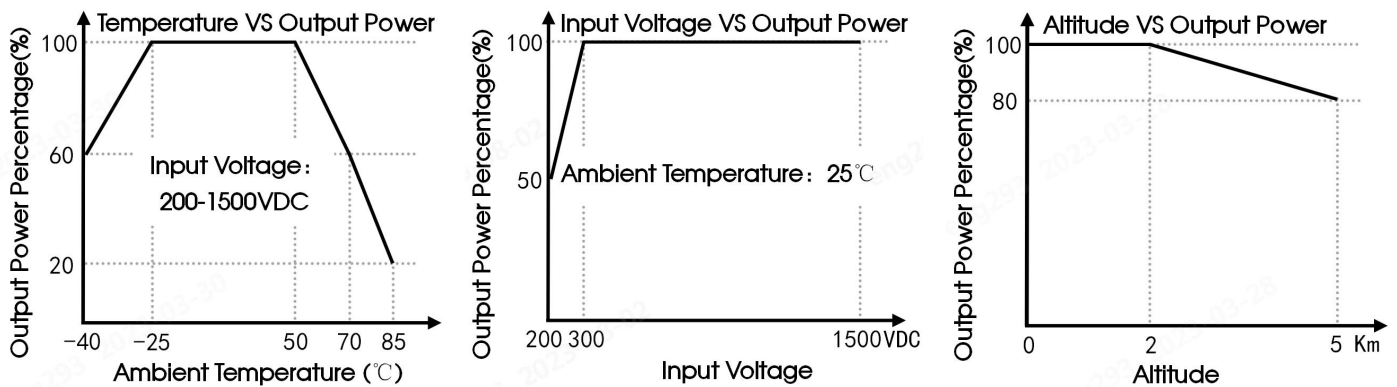
Mechanical Specifications

Case Material	Black flame-retardant and heat-resistant plastic (UL94V-0)	
Dimensions	Horizontal package	109.00 x 58.50 x 30.00 mm
	A5 chassis mounting	135.00 x 70.00 x 38.50 mm
	A6 DIN-Rail mounting	137.00 x 70.00 x 44.00 mm
Weight	Horizontal package	270g (Typ.)
	A5 chassis mounting	350g (Typ.)
	A6 DIN-Rail mounting	420g (Typ.)
Cooling Method	Free air convection	

Electromagnetic Compatibility (EMC)

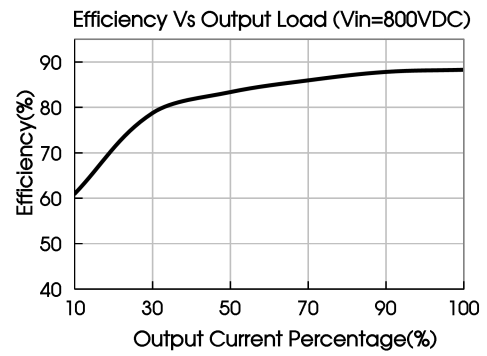
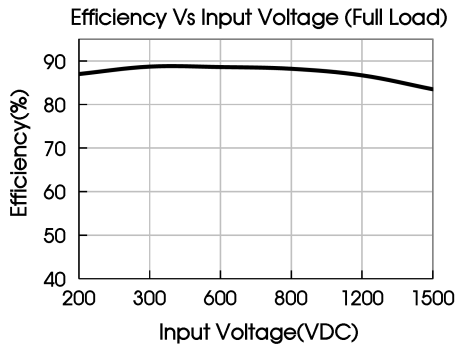
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria A
	RS	IEC/EN61000-4-3	30V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line ±2KV	Perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A

Product Characteristic Curve



Note: ① With an 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

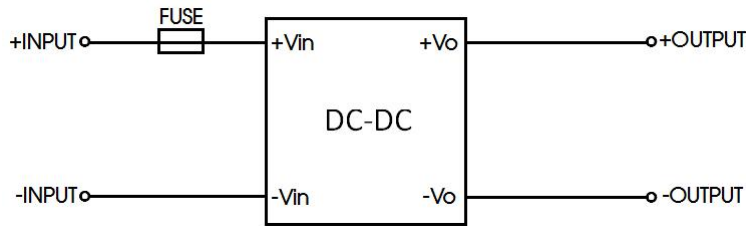


Fig. 1

Model	Recommended value
FUSE	4A/1500VDC, required

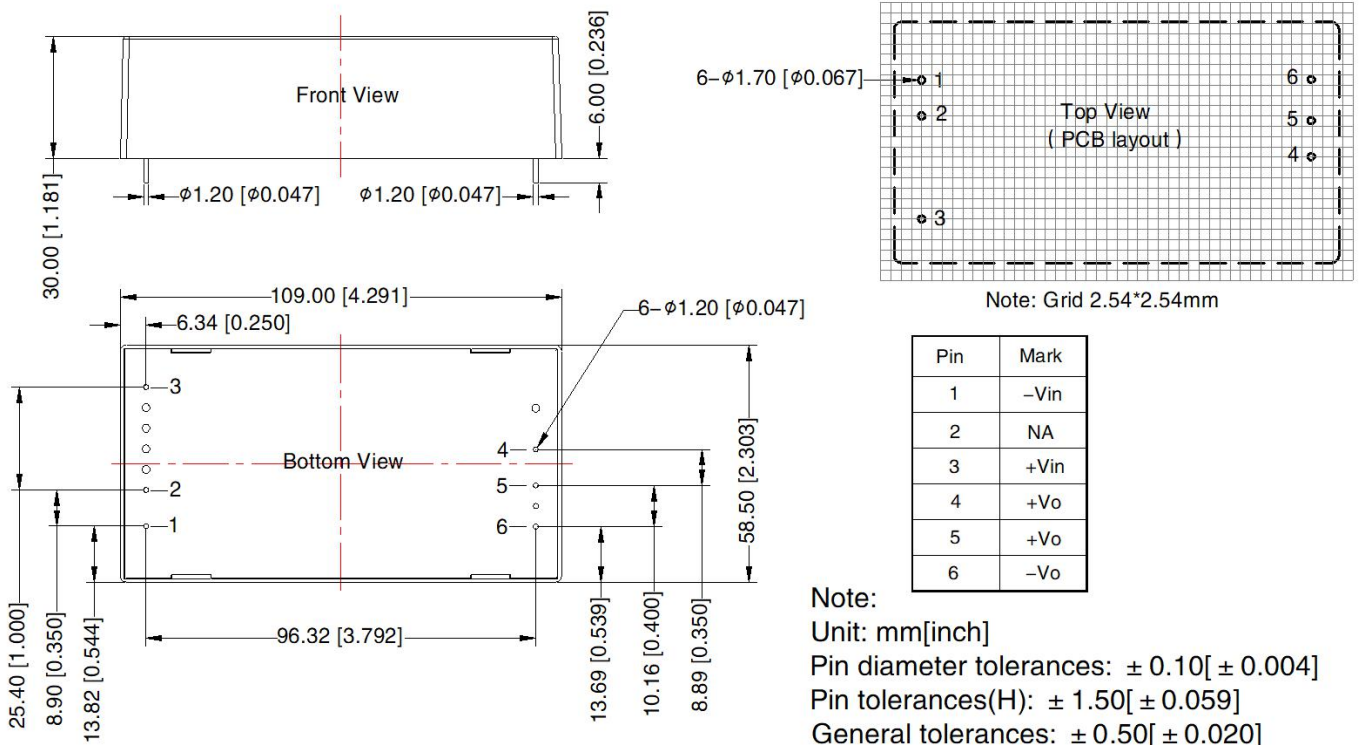
2. IMPORTANT SAFETY INSTRUCTIONS

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.


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

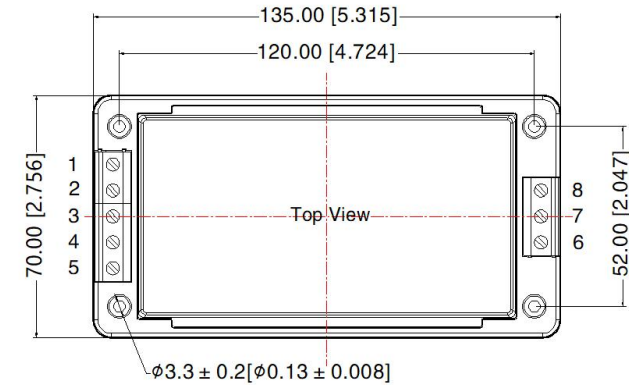
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

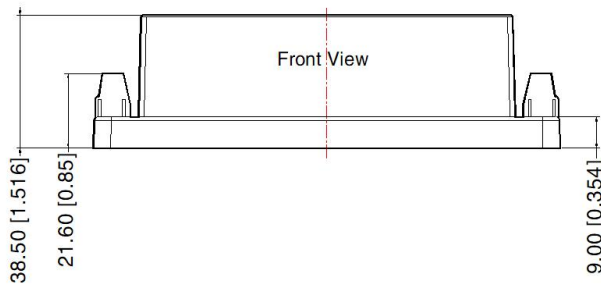


A5 Chassis Mounting Dimensions

THIRD ANGLE PROJECTION 



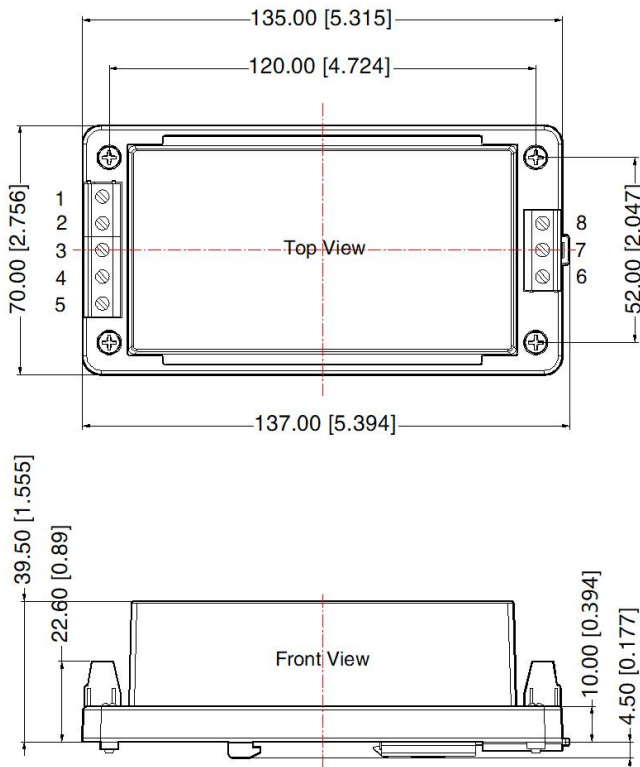
Pin	Mark
1	-Vin
2	NA
3	NA
4	NA
5	+Vin
6	-Vo
7	NA
8	+Vo



Note:
Unit: mm[inch]
Connection range: Input: 20–12 AWG
Output: 24–12AWG
Tightening torque: Max 0.4 N · m
General tolerances: $\pm 1.00 [\pm 0.040]$

A6 Din-Rail Mounting Dimensions

THIRD ANGLE PROJECTION 



Pin	Mark
1	-Vin
2	NA
3	NA
4	NA
5	+Vin
6	-Vo
7	NA
8	+Vo

Note:
Unit: mm[inch]
Connection range: Input: 20–12 AWG
Output: 24–12AWG
Tightening torque: Max 0.4 N · m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: $\pm 1.00 [\pm 0.040]$

 WARNING:

1. CAUTION: "To reduce the risk of fire, connect only to a circuit provided with 4 amperes maximum branch-circuit over-current protection in accordance with the National Electrical Code, ANSI/NFPA70."
2. WARNING: REPLACE ONLY WITH THE SAME RATINGS AND TYPE OF FUSE.
3. DANGER — HIGH VOLTAGE.

AVERTISSEMENT:

1. 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.
2. AVERTISSEMENT : N'UTILISER QUE DES FUSIBLES DE MÊME CALIBRE ET DE MÊME TYPE QUE LE FUSIBLE D'ORIGINE.
3. DANGER : HAUTE TENSION.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number of Horizontal package: 58220020; the packaging bag number of A5/A6 package: 58220031;
2. Unless otherwise specified, A5/A6 products performance are consistent with Horizontal package products;
3. 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;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. In order to improve the efficiency, there will be audible noise generated when working at input voltage higher than 1500 VDC, but it does not affect product performance and reliability;
6. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
7. We can provide product customization service;
8. Products are related to laws and regulations: see "Features" and "EMC";
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. If the final product application is connected to a photovoltaic array, the array needs to be grounded and the voltage between the positive and negative poles of the product shall not be greater than 1500VDC.

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