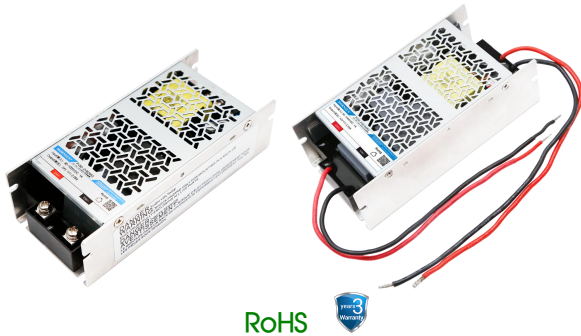


50W isolated DC-DC converter with ultra-wide, ultra-high 80-1000VDC input for Renewable Energy



## FEATURES

- Ultra-wide input voltage range of 80 - 1000VDC (Transient 1100VDC last for 10s)
- Industrial grade operating temperature -40°C to +85°C
- High I/O isolation voltage up to 4000VAC
- High efficiency, low ripple & noise
- High reliability, long lifespan, low power consumption
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage protection
- Operating up to 5000m altitude
- Design refer to UL1741, EN/IEC62109

PV50-2YBxxR3 series is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 80- 1000VDC, which design based on standard of UL1741, EN/IEC62109. 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, household energy storage. 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 (W)		Nominal Output Voltage and Current (Vo/Io)	Efficiency at 400VDC(%) Typ.	Capacitive Load (μF) Max.
		Steady	Transient (duration 3s)			
/	PV50-2YB12R3	40	80	12V/3.33A	84	2000
	PV50-2YB24R3	50		24V/2.08A	86	1000

Note: \*Use suffix "WR3" for lead type version.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		80	--	1000	VDC
	Full load	150	--	1000	
Input Current	80VDC	--	--	1.0	A
	1000VDC	--	--	0.1	
Inrush Current	80VDC	--	30	--	A
	1000VDC		180	--	
Input Under-voltage Protection	Lockout activation range	20	--	70	VDC
	Lockout deactivation range	30	--	80	
Input Reverse Polarity Protection		Available			
Start-up Delay Time		--	2	3	s
Required External Input Fuse		4A/1000VDC, required			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	--	±2	--	%
Line Regulation	Rated load	--	±1	--	
Load Regulation	400VDC	--	±1	--	mV
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	100	300	
Stand-by Power Consumption	80VDC	--	0.3	0.4	W
	400VDC	--	0.4	0.5	
	1000VDC	--	1	1.5	
Temperature Coefficient		--	±0.02	--	%/°C

Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			160%-400%Io, hiccup, self-recovery			
Over-voltage Protection	12V		≤16VDC	Output voltage clamp or hiccup		
	24V		≤32VDC			
Minimum Load			0	--	--	%
Hold-up Time	Room temperature, full load	400VDC	--	5	--	ms
		1000VDC	--	10	--	
Note: * The "parallel cable" method is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 1uF ceramic capacitor, 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		2000	--	--	
Insulation Resistance	Input - output	500VDC	50	--	--	MΩ
	Input - PE					
	Output - PE					
Operating Temperature			-40	--	+85	°C
Storage Temperature			-40	--	+85	
Storage Humidity		Non-condensing	--	--	95	%RH
Operating Humidity			--	--	85	
Switching Frequency			--	60	--	kHz
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	80VDC - 100VDC	1.5	--	--	% / VDC
100VDC - 150VDC		0.4	--	--		
Safety Standard			Design refer to UL1741, EN/IEC62109-1			
MTBF		MIL-HDBK-217F@25°C	≥300,000 h			

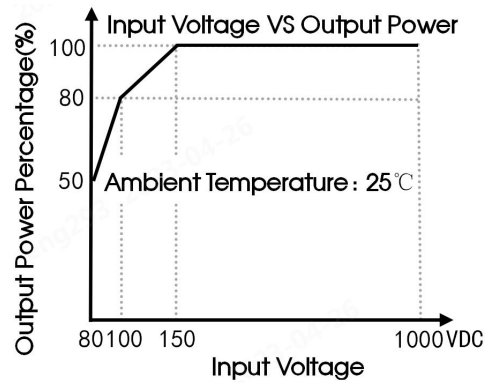
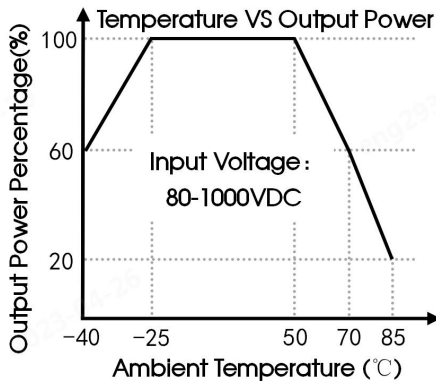
## Mechanical Specifications

Case Material	Metal
Dimensions	134.00 x 58.80 x 37.00mm
Weight	330g (Typ.)
Cooling Method	Free air convection

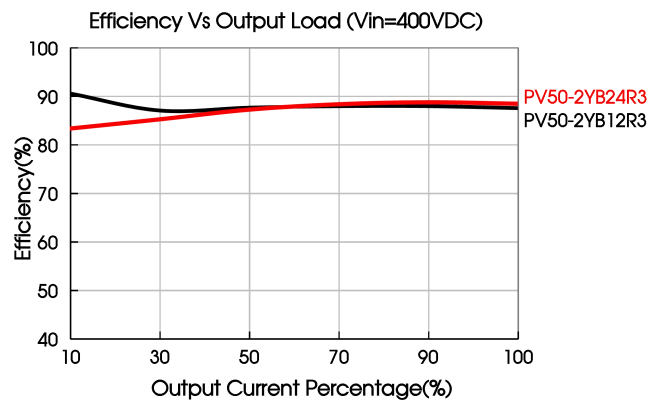
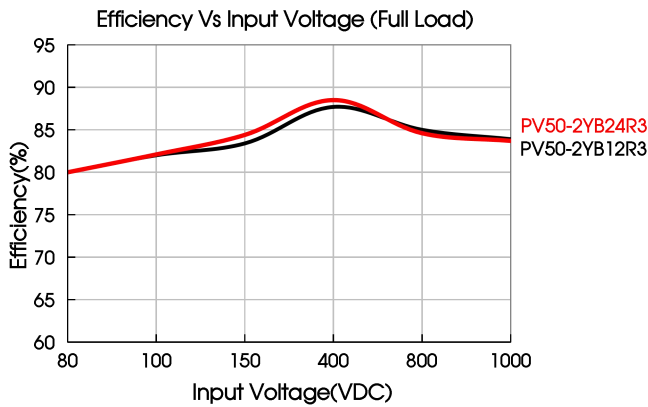
## Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
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 line ±2KV	Perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A

Product Characteristic Curve



Note: 1. With a DC input between 80-150VDC, 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

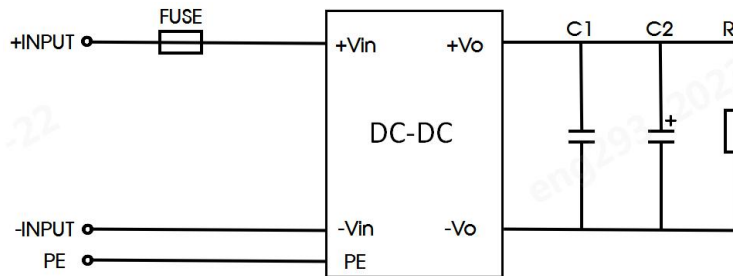


Fig. 1

Model	FUSE	C1	C2
PV50-2YB12R3	4A/1000VDC, required	1uF/50V	47uF/35V
PV50-2YB24R3			

Note on filter components:

We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor, used to filter high-frequency noise. TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. IMPORTANT SAFETY INSTRUCTIONS

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

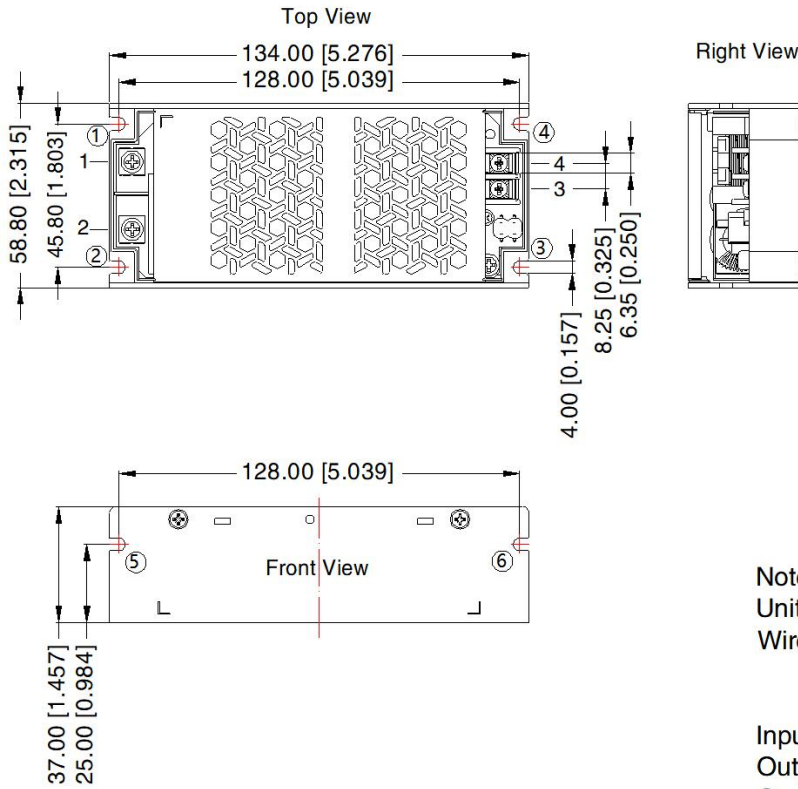
3. For additional information please refer to application notes on [www.mornsun-power.com](http://www.mornsun-power.com).

Dimensions and Recommended Layout

PV50-2YBxxR3 Series

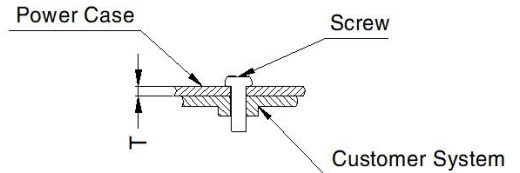
THIRD ANGLE PROJECTION 

Pin-Out	
Pin	Mark
1	+Vin
2	-Vin
3	-Vo
4	+Vo
Mounting Hole	+Vo



①-⑥ any position must be connected to the earth (⊥)

Position	Screw Spec.	T	Torque(max)
①-⑥	M3	1.5mm	0.4N·m



Note:

Unit: mm[inch]

Wire range: Input: 22-12AWG

Output: 12V 18-12AWG

24V 20-12AWG

Input connector tightening torque: M4, Max 0.9N·m

Output connector tightening torque: M3, Max 0.4N·m

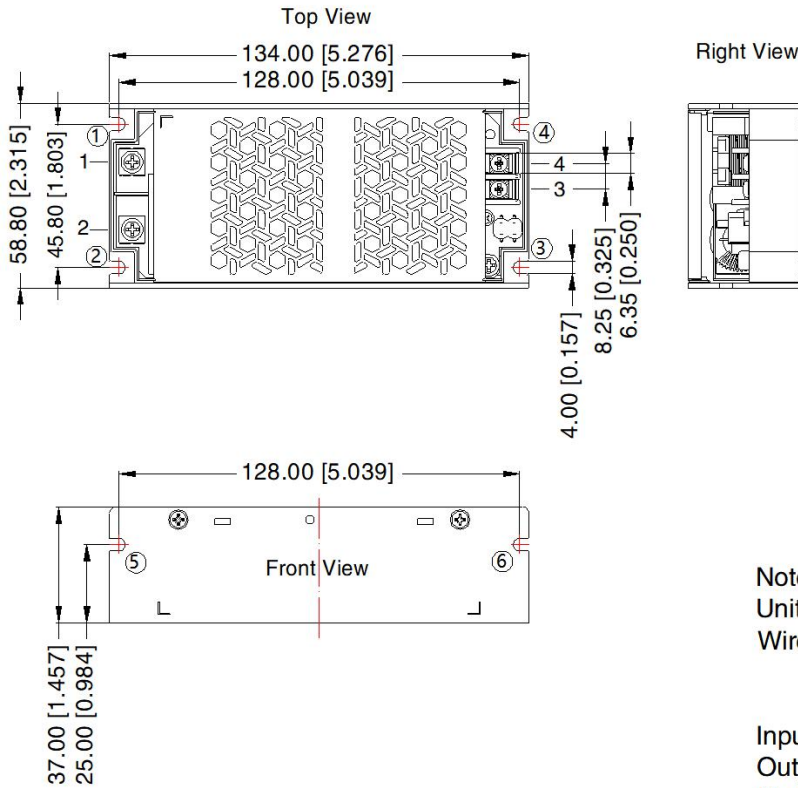
General tolerances: ± 1.00 [± 0.039]

All installation holes can be connected to PE

PV50-2YBxxWR3 Series

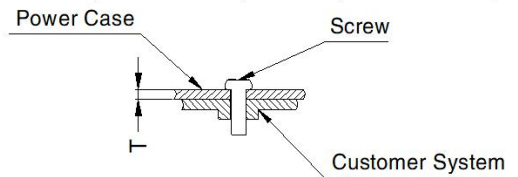
THIRD ANGLE PROJECTION 

Pin-Out	
Pin	Mark
1	+Vin
2	-Vin
3	-Vo
4	+Vo
Mounting Hole	+Vo



①-⑥ any position must be connected to the earth (⊥)

Position	Screw Spec.	T	Torque(max)
①-⑥	M3	1.5mm	0.4N·m



Note:

Unit: mm[inch]

Wire range: Input: 22-12AWG

Output: 12V 18-12AWG

24V 20-12AWG

Input connector tightening torque: M4, Max 0.9N·m

Output connector tightening torque: M3, Max 0.4N·m

General tolerances: ± 1.00 [± 0.039]

All installation holes can be connected to PE

**⚠ WARNING:**

- 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.
- WARNING: REPLACE ONLY WITH THE SAME RATINGS AND TYPE OF FUSE.
- DANGER — HIGH VOLTAGE.

**AVERTISSEMENT:**

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

**Note:**

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220648;
- 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;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
- 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 1000VDC.

**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