MORNSUN®

15W isolation DC-DC converter with ultra-wide, ultra-high 250 - 1500V DC input for Renewable Energy

RoHS 3 years Warranty

FEATURES

- Ultra wide input voltage range: 250 - 1500VDC
- Industrial grade operating temperature: -40℃ to +85℃
- 4000VAC high isolation voltage
- High efficiency, low ripple & noise
- Input under-voltage protection, reverse input voltage protection, output short circuit, over-current, over-voltage protection
- Designed to meet UL1741, CSA-C22.2 No.107.1, EN62109 safety approved

PV15-29B32 is regulated DC-DC converters with an ultra-wide DC input of 250-1500VDC. 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. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Part No.	Output Power		Nominal Output Voltage and Current(Vo/Io)	Efficiency at 1000VDC (%) Typ.	Capacitive Load (μF) Max. (Normal temperature full load)
	Steady state	transient			
PV15-29B32	15W	30W	32V/470mA	77	500

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		250	--	1500	VDC
Input Current	250VDC	--	--	120	mA
	800VDC	--	--	30	
	1500VDC	--	--	18	
Inrush Current	250VDC	--	20	--	A
	1500VDC	--	60	--	
Under-voltage Protection		Lockout activation range: 150 - 190V Lockout deactivation range: 200 - 240V			
External Input Fuse Required		4A/1500VDC, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Line Regulation	Rated load	--	±1	--	
Load Regulation	0% - 100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	200	mV
Temperature Coefficient		--	±0.02	±0.15	%/℃
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥200%Io, self-recovery			
Over-voltage Protection		≤45VDC			
Minimum Load		0	--	--	%
Hold-up Time	Room temperature, full load, 1000VDC	--	20	--	ms
Start-up Delay Time**	250 - 1500VDC	--	--	2	s

Note: * The "Tip and barrel 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(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.		4000	--	--	VAC
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+85	
Storage Humidity				--	--	95	%RH
Soldering Temperature		Wave-soldering		260 ± 5℃; time: 5 - 10s			
		Manual-welding		360 ± 10℃; time: 3 - 5s			
Power Derating		-40℃ to 0℃	250 - 300VDC	1.5	--	--	%/℃
		+65℃ to +85℃		2.5	--	--	
Switching Frequency				--	65	--	kHz
Safety Standard				UL1741, CSA-C22.2 No.107.1, EN62109			
MTBF				MIL-HDBK-217F@25℃ ⩾ 300,000 h			

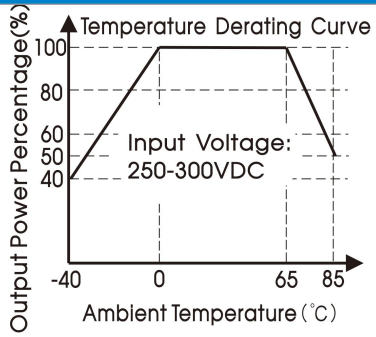
Mechanical Specifications

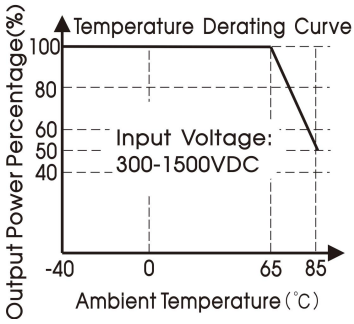
Case Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimensions	100.00 x 60.00 x 25.00mm
Weight	200g(Typ.)
Cooling method	Free air convection
Note: Washing of out-case must be avoided. We recommend using alcohol to brush clean it instead .	

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A(See Fig. 2 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A(See Fig. 2 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line±1KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A

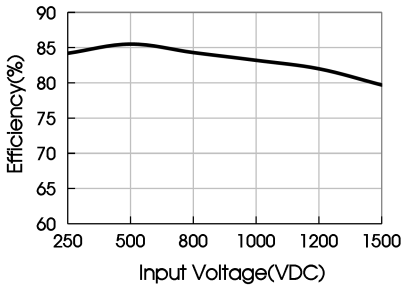
Product Characteristic Curve



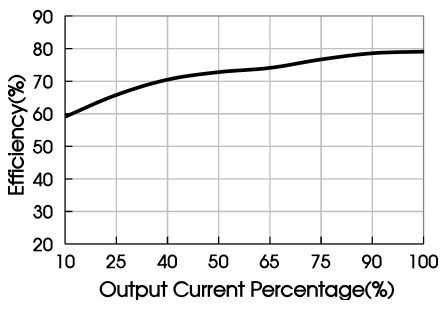


Note: ① This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=1000VDC)



Design Reference

1. Typical application

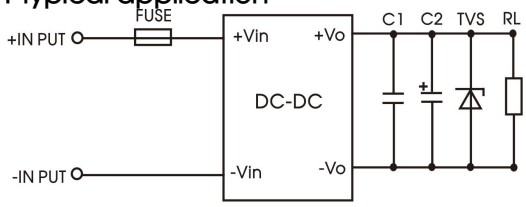


Fig. 1: Typical application circuit

Model	FUSE	C1(μF)	C2(μF)	TVS
PV15-29B32	4A/1500VDC, required	1	120	SMBJ43A

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. EMC compliance recommended circuit

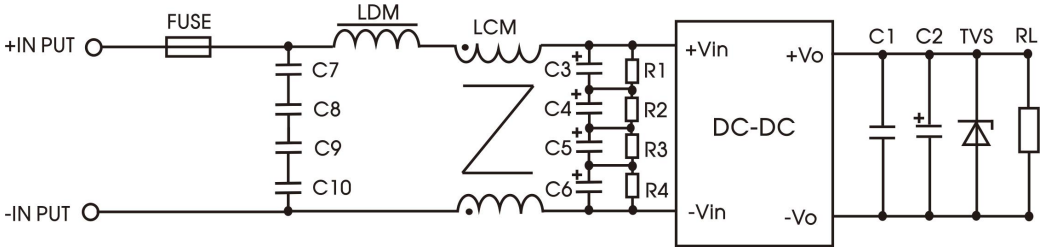


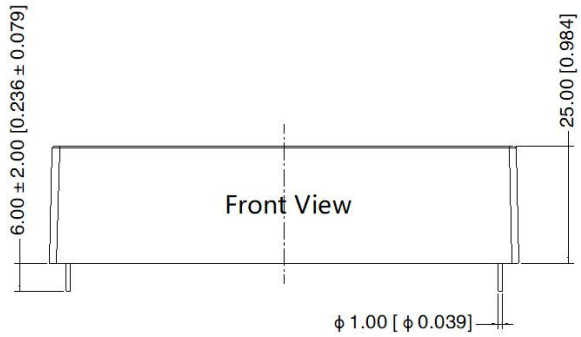
Fig 2: EMC application for higher compliance requirements (output parameters are show in Figure 1)

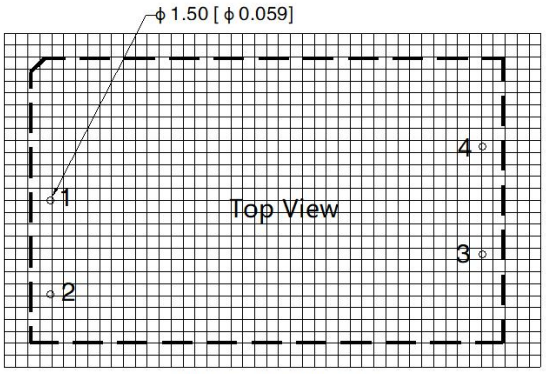
Component	Recommended value
C7/C8/C9/C10	Safety capacitor 104K/275VAC
C3/C4/C5/C6	10uF/450VDC
R1/R2/R3/R4	1MΩ/2W
LDM	330uH/1A
LCM	7mH/1A
FUSE	4A/1500VDC, required

3. For additional information please refer to application notes on www.mornsun-power.com.

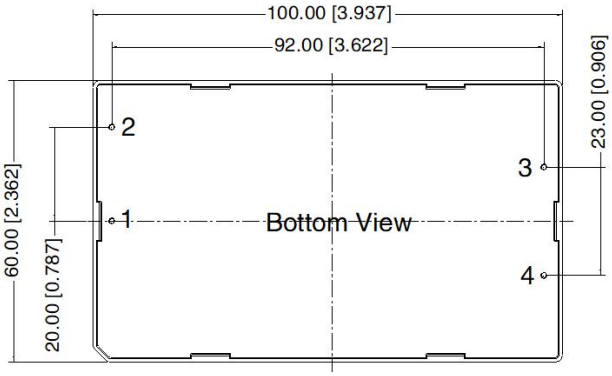
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note:Grid 2.54*2.54mm



Pin-Out	
Pin	Function
1	-Vin
2	+Vin
3	+Vo
4	-Vo

Note:
Unit :mm[inch]
Pin diameter tolerances : ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number of Horizontal package: 58220013;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, 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 1000 VDC, but it does not affect product performance and reliability;
5. It is recommended that the product be locked screw before welding;
6. If you need to replace the fuse of A8 package products, please be careful, don't allow the bottom of PCB board to bear excessive mechanical stress;
7. 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.
8. We can provide product customization service;
9. Products are related to laws and regulations: see "Features" and "EMC";
10. 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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