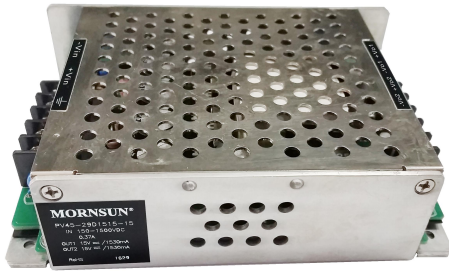


45W Isolation DC-DC Converter with Ultra-wide ,ultra-high 150-1500V DC input for Renewable Energy



RoHS

PV45-29D1515-15 is regulated DC-DC converters with an ultra-high DC input of 150-1500VDC. The products feature high efficiency, high reliability, high insulation and a high level of safety protection. This type of power supply is widely used in renewable energy industries such as SVG, 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.

FEATURES

- Ultra wide input voltage range (10:1): 150 - 1500VDC
- Industrial grade operating temperature: -40°C to +85°C
- High I/O isolation test voltage of 4000VAC
- High efficiency, Low ripple & noise
- Input undervoltage protection, reverse input voltage protection, output short circuit, overcurrent, overvoltage protection
- High reliability, Long lifespan
- Meet 5000m altitude requirements

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)		Efficiency (%)Typ.			Capacitive Load (μF) Max.	
		Vo1/Io1	Vo2/Io2	200VDC	850VDC	1400VDC	Vo1	Vo2
PV45-29D1515-15	45W	15V/1.53A	15V/1.53A	78	78	76	1500	470

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		150	--	1500	VDC
Input current	200VDC	--	350	--	mA
	300VDC	--	230	--	
	850VDC	--	90	--	
	1500VDC	--	50	--	
Inrush current	200VDC	--	30	--	A
	300VDC	--	40	--	
	850VDC	--	100	--	
	1500VDC	--	180	--	
Undervoltage protection		Lockout activation range: 125 - 140VDC Lockout deactivation range:135 - 150VDC			
Maximum transients input voltage	1600VDC	Duration time: 1s, normal output			
External Input Fuse		15A/1500VDC required			
Hot Plug		Unavailable			



Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	Vo1	--	±1	
		Vo2	--	±1	
Line Regulation	Full load	Vo1	--	±1	%
		Vo2	--	±1	
Load Regulation	10% - 100% load	Vo1	--	±2	
		Vo2	--	±2	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	Vo1	--	150	mV
		Vo2	--	150	
Temperature Coefficient		--	±0.02	--	%/°C

Short Circuit Protection		Hiccup, continuous, self-recovery				
Overcurrent Protection		110% - 300%Io, hiccup, self-recovery				
Overvoltage Protection	Vo1	≤25VDC				
	Vo2	≤25VDC				
Min. Load	Vo1	0	--	--	%	
	Vo2	0	--	--		
Hold-up Time	Room temperature, Full load	300VDC input	5	--	--	ms
		850VDC input	15	--	--	
Delay Time **	150 - 1500VDC	--	2	--	s	

Note: * The "parallel cable" method is used for Ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.
 ** Delay Time is tested over the full input voltage and the full output load range (waiting time between Input power-off and next input Power-on cycle is >15s).

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation test	Input-output	Electric Strength Test for 1min, leakage current ≤10mA	4000	--	--	VAC
	Input - 		2500	--	--	
	Output-output		4000	--	--	
	Output - 		2500	--	--	
Operating Temperature		-40	--	+85	°C	
Storage Temperature		-40	--	+85		
Storage Humidity		--	--	95	%RH	
Power Derating	-40°C to 0°C	150VDC - 200VDC	1.5	--	--	% / °C
	-40°C to 0°C	200VDC - 1500VDC	1.0	--	--	
	+60°C to +70°C		4.0	--	--	
	+70°C to +85°C		2.0	--	--	
Switching Frequency		--	65	--	kHz	
Altitude		--	--	5000	m	
MTBF		MIL-HDBK-217F@25°C ≥ 300,000 h				

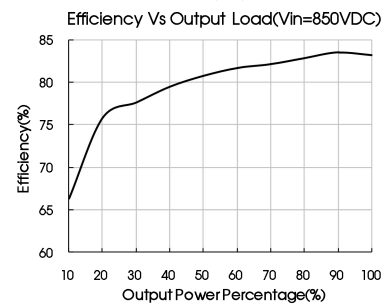
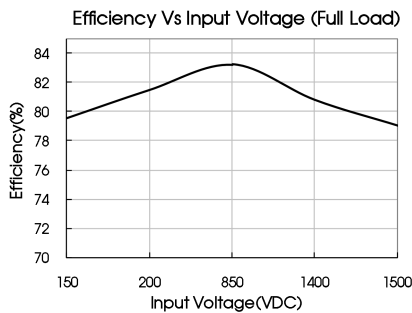
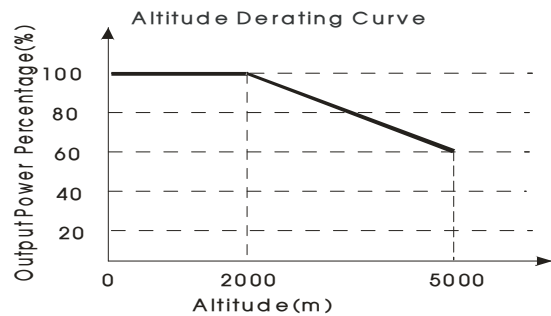
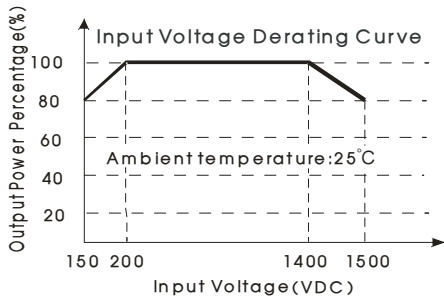
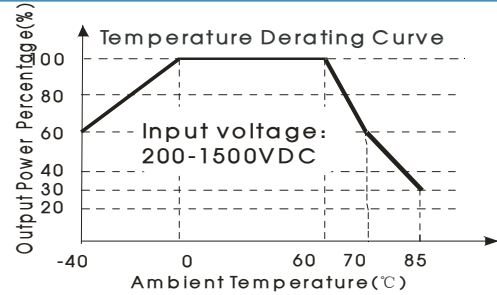
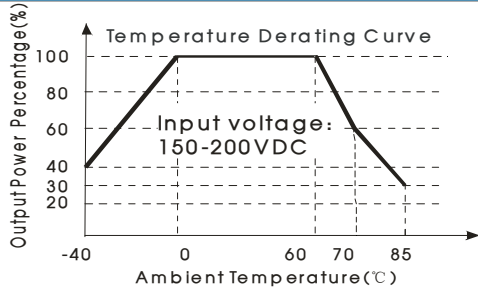
Mechanical Specifications

Case Material	Metal
Dimensions	144.50 x 105.00 x 40.00 mm
Weight	520g(Typ.)
Cooling method	Free air convection

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	±4KV perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV/ line to ground ±4KV perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s (See Fig. 2 for recommended circuit) perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-11	0%, 70% perf. Criteria B

Product Characteristic Curve



- Note: ① With an input between 150 - 200VDC/1400-1500VDC, the output power of PV45-29D1515-15 parts must be derated as per temperature derating curves;
 ② For operation of this converter series in an altitude between 2000 - 5000m above sea level, the output power must be derated as per the altitude derating curve;
 ③ Electrolytic capacitor having a constant period of use, its life depends on the actual ambient temperature, in the harsh operating environment will affect the life of the product and shorten the life of the product, the product is not recommended for long-term work in high temperature environment of more than 70 °C;
 ④ This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Design Reference

1. Typical application circuit

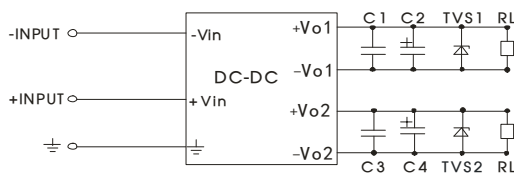


Fig. 1: Typical application circuit

Model	C1, C3(μF)	C2, C4(μF)	TVS1, TVS2
PV45-29D1515-15	1	100	SMBJ20A

Note:
 We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2, C4 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1, C3 are 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 solution-recommended circuit

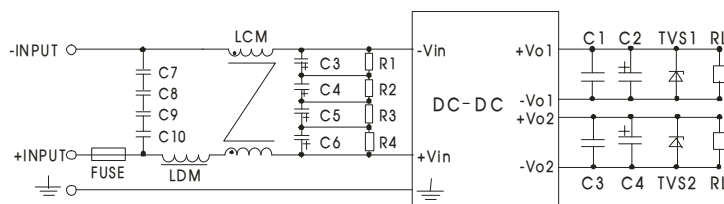


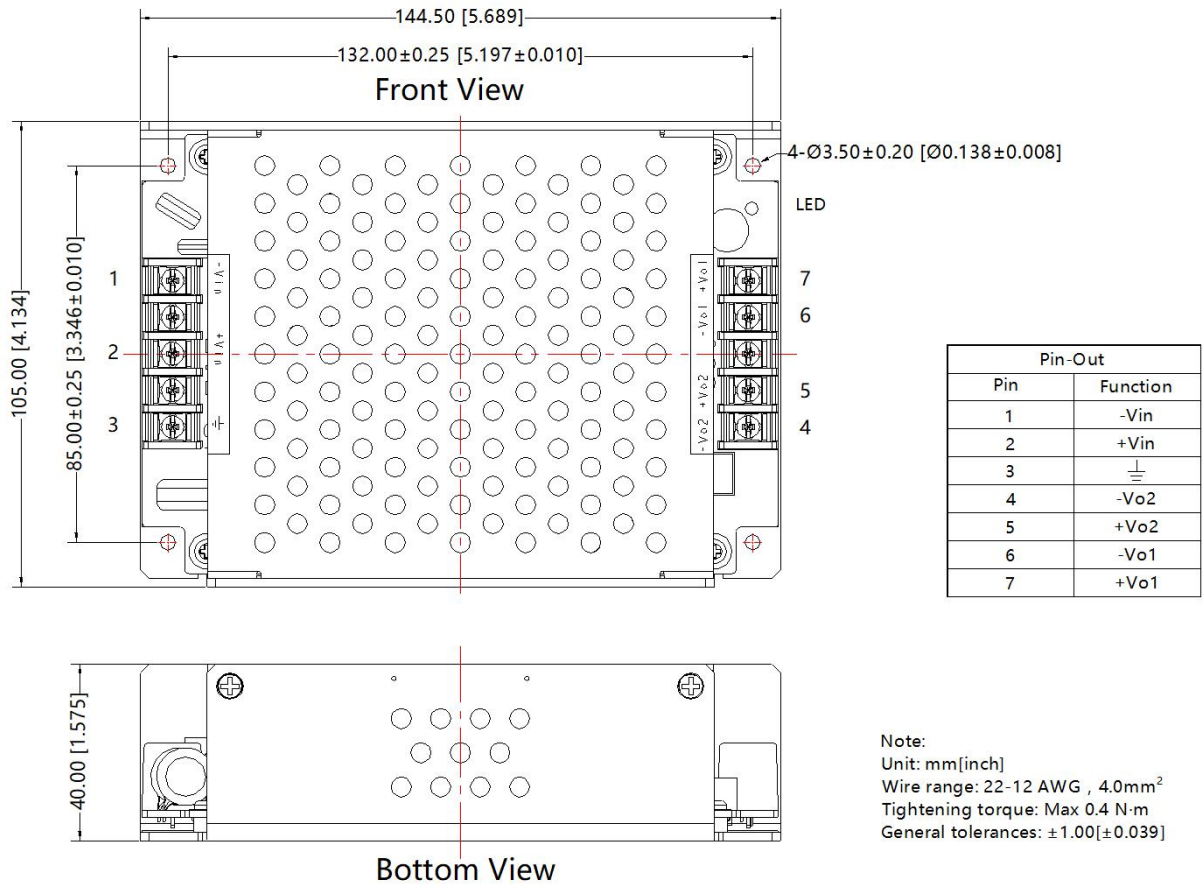
Fig 2: EMC compliance recommended circuit (The output circuit parameters show in Figure 1)

Element model	Recommended value
C7, C8, C9, C10	104K/275VAC
C3, C4, C5, C6	47 μ F/450VDC
R1, R2, R3, R4	1M Ω /2W
LDM	330uH/0.38A
LCM	7mH/1A
FUSE	15A/1500VDC, required

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

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



- Note:
- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220039;
 - 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's corporate standards;
 - In order to improve the conversion efficiency, when the product is working high voltage, the module may have certain audio noise, but does not affect the reliability of the product;
 - We can provide product customization service, please contact our technicians directly for specific information;
 - Specifications are subject to change without prior notice.
 - 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.

Mornsun Guangzhou Science & Technology Co., Ltd.

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