DC/DC Switching Power Supply
PV45-29D1505-10

MORNSUN®

New energy 150-1500VDC over wide and over high input voltage isolation switching power supply

RoHS

FEATURES

- Ultra wide input voltage range (10:1): 150 - 1500VDC
- 4KVAC high isolation voltage
- Industrial grade operating temperature: -40℃ to +85℃
- High efficiency, Low ripple & noise
- Reverse input voltage protection, Output short circuit, over-current, over-voltage protection
- High reliability, Long lifespan
- Meet 5000m altitude requirements

PV45-29D1505-10 ----- 150-1500VDC ultra wide input voltage regulated DC-DC Switching Power Supply, which has advantages such as high efficiency, high reliability and high safety isolation. The product is widely used in industries such as SVG, photovoltaic power generation and high voltage frequency conversion, providing a stable operating voltage for the system, The multiple protection features enhance the safety performance of the power supply and the System under Harsh working conditions. For harsh EMC environment, this product must use the refered application circuit.

Selection Guide

Part No.	Output Power	nominal Output Voltage and Current(Vo/Io)		Efficiency (%/Typ.)	Max. Capacitive Load (μF)	
		Vo1/Io1	Vo2/Io2	850VDC	Vo1	Vo2
PV45-29D1505-10	45W	15V/2.66A	5V/1A	78	1500	330

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	--	
Maximum transients input voltage	1600VDC	Duration time: 1s, normal output (Maximum transient input voltage interval 15S)			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	Main circuit (vo1)	--	--	±1	%
		Auxiliary circuit (vo2)	--	--	±1	
Line Regulation	Full load	Main circuit (vo1)	--	--	±1	
		Auxiliary circuit (vo2)	--	--	±1	
Load Regulation	10% - 100% load	Main circuit (vo1)	--	--	±2	
		Auxiliary circuit (vo2)	--	--	±2	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	Main circuit (vo1)	--	--	150	mV
		Auxiliary circuit (vo2)	--	--	150	
Temperature Drift Coefficient			--	±0.02	--	%/℃
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			110% - 300%Io, Hiccup, self-recovery			
Over-voltage Protection	Main circuit (Vo1)		≤25VDC			
	Auxiliary circuit (vo2)		≤13VDC			

Min. Load	Main circuit (vo1)		10	--	--	%
	Auxiliary circuit (vo2)		10	--	--	
Hold-up Time	Room temperature, Full load	300VDC input	5	--	--	ms
		850VDC input	15	--	--	
Delay Time **	150 - 1500VDC		--	2	--	s

Note: * Ripple and noise are measured by "parallel cable" method, please see AC-DC Switching Power Supply Application Notes for specific operation.
** Delay Time test condition: Full input voltage range, full output load range (The cooling time between Input power-off and the next input Power-on is bigger than 15s).

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min, Leakage current ≤10mA	4000	--	--	VAC
	Input- ⏚		2500	--	--	
	Output-output		2500	--	--	
	Output- ⏚		2500	--	--	
Operating Temperature			-40	--	+85	° C
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	95	%RH
Power Derating	Temperature derating	-40℃ to 0℃ (Input Voltage: 150VDC - 200VDC)	1.5	--	--	%/℃
		-40℃ to 0℃ (Input Voltage: 200VDC - 1500VDC)	1.0	--	--	
		+60℃ to +70℃	4.0	--	--	
		+70℃ to +85℃	2.0	--	--	
	Input Voltage derating	150 - 200VDC (Ambient temperature: 25℃)	0.4	--	--	%/VDC
		1400 - 1500VDC (Ambient temperature: 25℃)	0.2	--	--	
Switching Frequency			--	65	--	kHz
Altitude*			--	--	5000	m
MTBF			MIL-HDBK-217F@25° C≥ 300,000 h			

Note: * Products are used at altitudes above 2000m, refer to "Altitude derating curve" to use the output power derating.

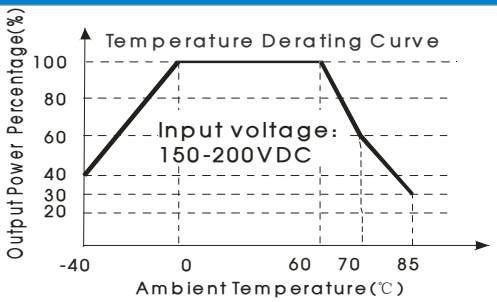
Physical Specifications

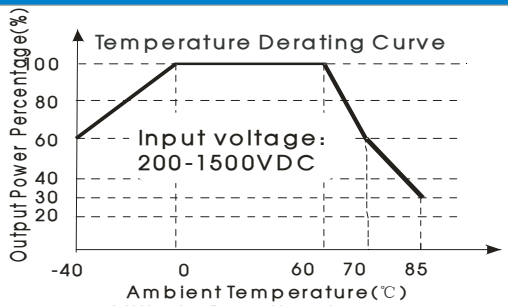
Casing Material	metal
Dimensions	144.50*105.00*43.00 mm
Weight	510g (Typ.)
Cooling method	Free air convection

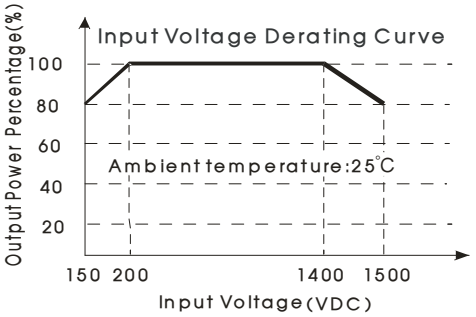
EMC Specifications

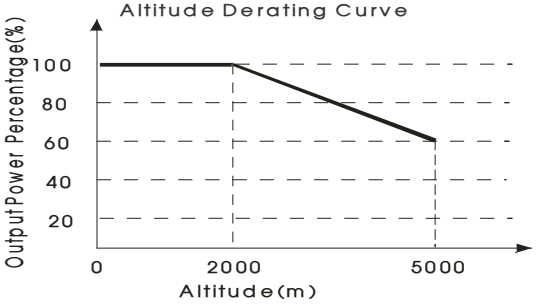
EMI	CE	CISPR32/EN55032 CLASS A (See Fig. 2 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS A (See Fig. 2 for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV/ line to ground ±4KV	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s (See Fig. 2 for recommended circuit)	perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29 0%, 40%, 70%	perf. Criteria B

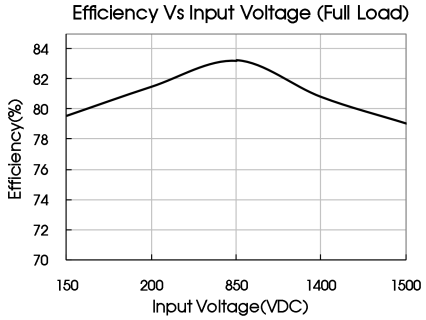
Product Characteristic Curve

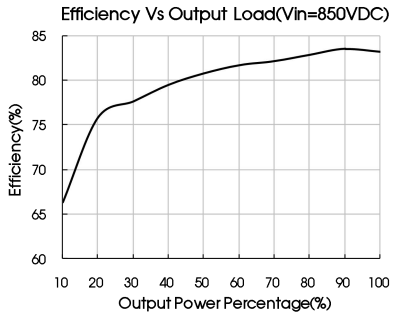












Note: ①For the PV45-29D1505-10, input voltage should be derated based on temperature de-rating profile when it is 150 - 200VDC, 1400VDC - 1500VDC;
②For the PV45-29D1505-10, altitude should be derated based on temperature de-rating profile when it is 2000 - 5000m;
③Electrolytic capacitor having a constant 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 ℃
④This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.

Design Reference

1. Typical application circuit

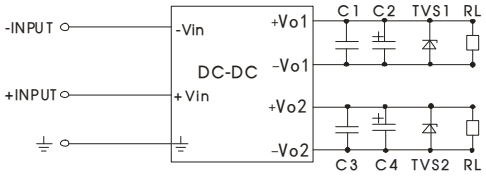


Fig. 1: Typical application circuit

Model	C1, C3	C2, C4	TVS1	TVS2
PV45-29D1505-10	1μF	100μF	SMBJ20A	SMBJ7.0A

Note:
Output filtering capacitors C2、C4 are electrolytic capacitors, they are recommended to apply electrolytic capacitors with high frequency and low resistance. For capacitance and current of capacitors please refer to manufacture's datasheets. Capacitor voltage reduced to at least 80%. C1、C3 are ceramic capacitors, which are used to filter high-frequency noise. TVS1, TVS2 are recommended component to protect post-circuits if Switching Power Supply fails.

2. EMC solution-recommended circuit

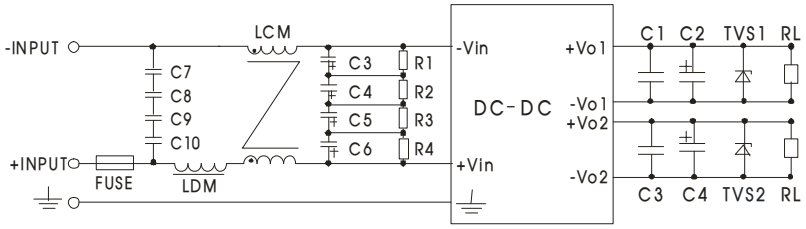
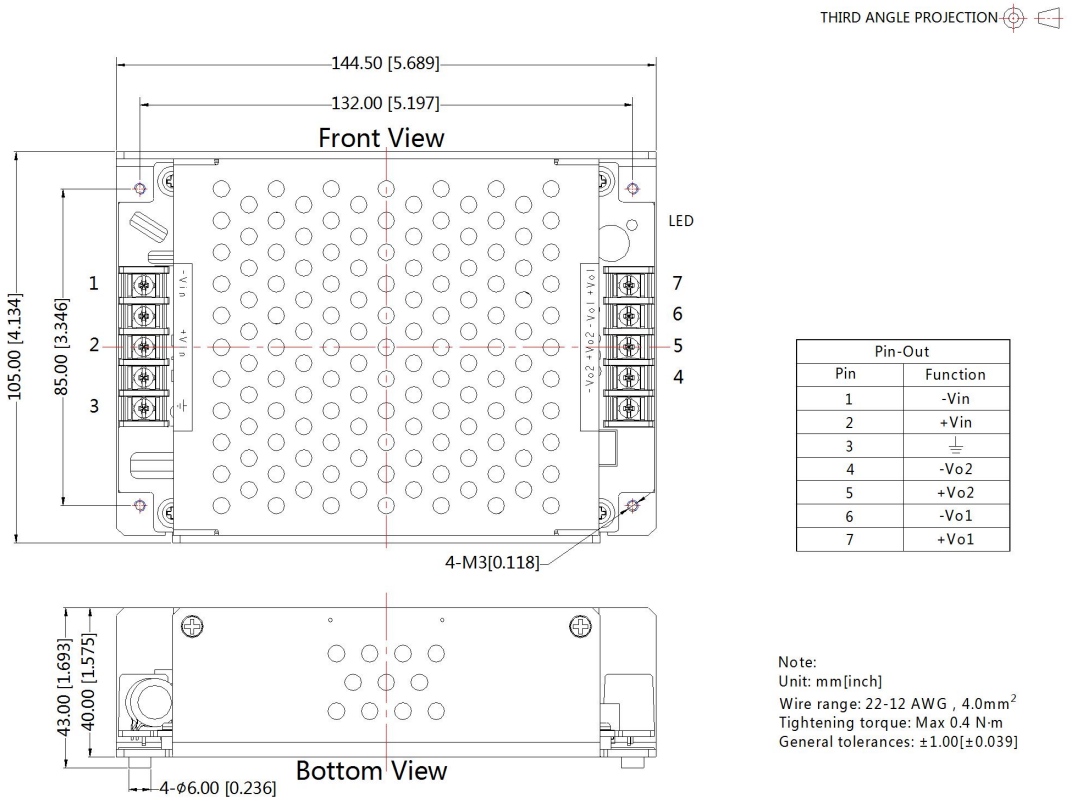


Fig 2: EMC application circuit (The output circuit parameters show in Figure 1)

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

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

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	-Vin
2	+Vin
3	⏚
4	-Vo2
5	+Vo2
6	-Vo1
7	+Vo1

Note:
Unit: mm[inch]
Wire range: 22-12 AWG , 4.0mm^2
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Note:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220039;
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's corporate standards;
4. 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;
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.

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