

15W Isolation DC-DC Converter with Ultra-wide, ultra-high 200-1500V DC input for Renewable Energy



RoHS



FEATURES

- Ultra-wide 200 - 1500VDC input voltage range
- Industrial grade operating temperature -40°C to +70°C
- High I/O isolation test voltage of 4000VAC (Input-output), three-way isolation output of 3500VAC
- Meet reinforced insulation
- High efficiency, Low ripple & noise
- High reliability, Long service life
- Input undervoltage protection, reverse input voltage protection, output short circuit, overcurrent and overvoltage protection
- Meet 5000m altitude requirements

PV15-29C0505xx are a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 200-1500VDC, which design to meet standards of CSA-C22.2 No. 107.1, EN62109. 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 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			Efficiency at 600VDC(%) Typ.	Capacitive Load (uF) Max.		
		Vo1/Io1	Vo2/Io2	Vo3/Io3		Vo1	Vo2	Vo3
PV15-29C050505	15W	5V/1500mA	5V/800mA	5V/400mA	76	470	100	100
PV15-29C050524		5V/1500mA	5V/600mA	24V/150mA	76	470	100	100

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		200	--	1500	VDC
Input current	200VDC	--	--	0.12	A
	600VDC	--	--	0.04	
Inrush current	600VDC	--	45	--	
	1500VDC	--	100	--	
Under-voltage protection		Under voltage protection range: 140 - 170VDC Under voltage release range: 170 - 200VDC			
External Input Fuse		3.15A/1500VDC, slow fusing, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	Vo1	±2	--	%
		Vo2/Vo3	±10	--	
Line Regulation	Full load	Vo1	±2	--	
		Vo2/Vo3	±10	--	
Load Regulation	10% - 100% load	Vo1	±2	--	
		Vo2/Vo3	±10	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	Vo1	--	200	mV
		Vo2/Vo3	--	300	
Temperature Drift Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Overcurrent Protection		≥110%Io, Hiccup, self-recovery			
Overvoltage Protection	Vo1	≤10VDC (Output voltage clamp or hiccup)			
Min. Load		10	--	--	%
Hold-up Time	Room temperature, full load	1000VDC input	1	--	ms

Note: * The "Tip and barrel method" is used for Ripple and noise test, please refer to PV Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output	4000	--	--	VAC
	Vo1-Vo2	3500	--	--	
	Vo1-Vo3	3500	--	--	
	Vo2-Vo3	3500	--	--	
Insulation resistance	500VDC	≥50x10 ⁶ Ω			
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	%RH
Power Derating	-40°C to -25°C	3.0	--	--	% / °C
	+50°C to +70°C	3.0	--	--	
	200VDC - 300VDC	0.4	--	--	% / VDC
	1400VDC - 1500VDC	0.25	--	--	
	2000m-5000m	10	--	--	
Safety Standard*		CSA-C22.2 No.107.1, EN62109			
Switching Frequency		--	65	--	kHz
Altitude		--	--	5000	m
MTBF		MIL-HDBK-217F@25°C ≥ 300,000 h			

Note: * The product is designed to meet the standards and can be certified as required by the customer.

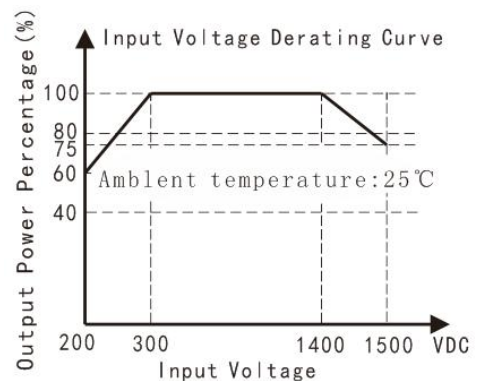
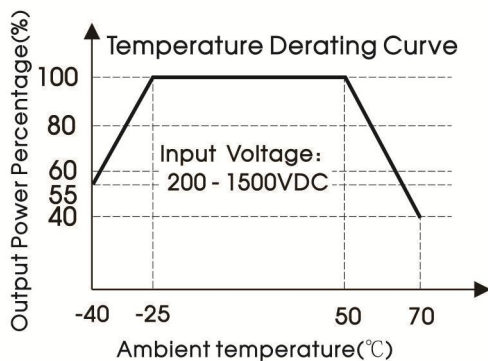
Mechanical Specifications

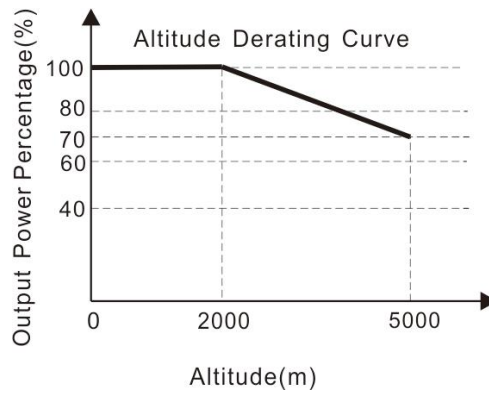
Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimensions	89.00 x 63.50 x 25.00 mm
Weight	210g(Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32 EN55032	CLASS A (See Fig.1 for recommended circuit)
	RE	CISPR32 EN55032	CLASS A (See Fig.1 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 perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV (See Fig.1 for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s perf. Criteria A
	Voltage dips, short interruptions and voltage variations	IEC/EN61000-4-11	0%, 70% perf. Criteria B

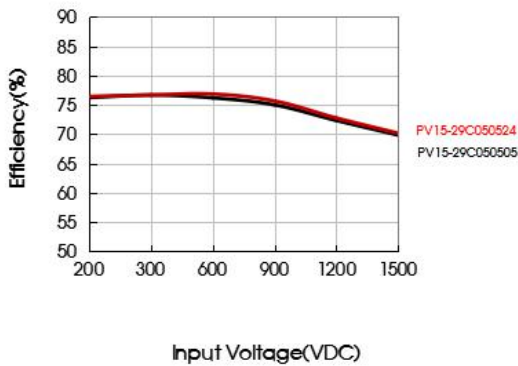
Product Characteristic Curve



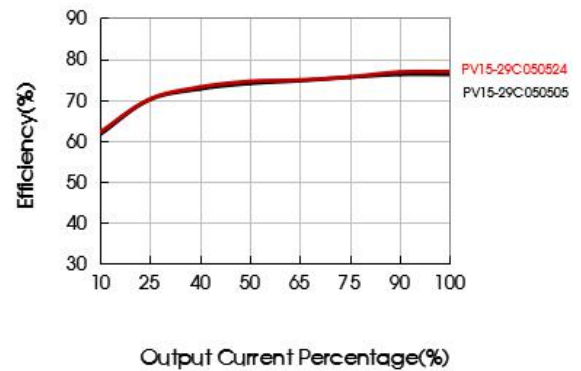


- Note:
- ① With an Input voltage between 200-300VDC/1400-1500VDC for PV15-29C050505/24 the output power must be derated as per temperature derating curves;
 - ② For operation of this converter series in an altitude between 2000 - 5000m above sea level, the output power must be derated as per the altitude derating curve;
 - ③ 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=600VDC)



Design Reference

1. EMC solution-recommended circuit

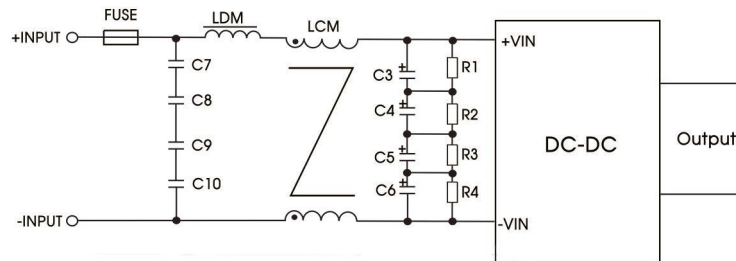



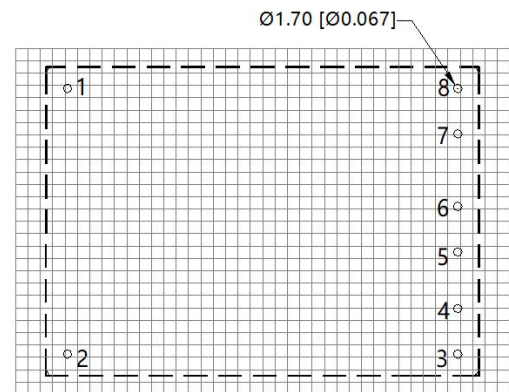
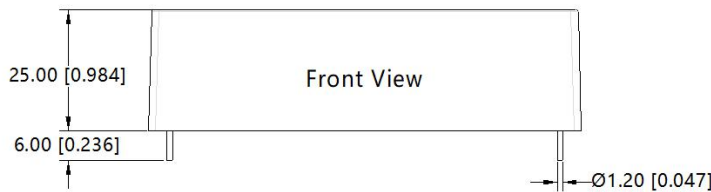
Fig.1

Model	Recommended value
C7、C8、C9、C10	104K/275VAC
C3、C4、C5、C6	10uF/450VDC
R1、R2、R3、R4	1MΩ/2W
LDM	330uH/0.38A
LCM	7mH/1A
FUSE	3.15A/1500VDC, slow fusing, required

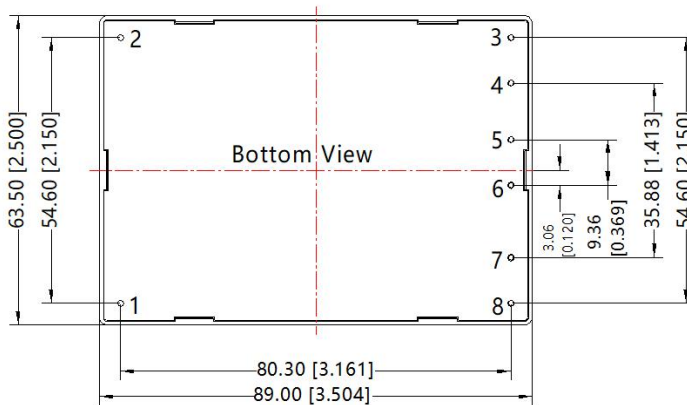
2. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note: grid 2.54*2.54mm



Pin-Out	
PIN	Function
1	-Vin
2	+Vin
3	+Vo3
4	-Vo3
5	+Vo2
6	-Vo2
7	+Vo1
8	-Vo1

Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.50[\pm 0.020]$

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packing bag number: 58220021;
- 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;
- All index testing methods in this datasheet are based on our Company's corporate standards;
- In order to improve the conversion efficiency, when the module is working under high pressure, 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;
- 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.

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