DC/DC Converter

PV05-10 Series

MORNSUN®

New power sources 200-1200VDC overwide and overhigh input voltage isolation converter

RoHS

FEATURES

- Input voltage up to 1200VDC
- 6:1 ultra-wide input voltage range: 200 ~ 1200VDC
- Industrial grade operating temperature: -25℃ ~ 70℃
- 4000VDC high isolation voltage
- high efficiency, Low ripple& noise
- Under input voltage protection (automatic recovery)
- Over output voltage protection(automatic recovery)
- Short circuit protection(automatic recovery)
- Input against reverse protection
- MTBF>300 K hours
- High reliability, long life, three years warranty

PV05-10 series -----is 200-1200VDC input voltage regulated DC-DC converter. It features ultra-high input voltage, high efficiency, high reliability, it can be widely used in PV power generation and high voltage inverter occasion, provide a stable operating voltage to the load equipment. Its own multiple protection features can enhance the safety performance of the power and load when module work under abnormal conditions.

Selection Guide

Model	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency (200VDC, %/Typ.)	Max. Capacitive Load (μF)
PV05-27B05	5W	5V/1A	73	10000
PV10-27B05	10W	5V/2A	75	6000
PV10-27B09		9V/1.1A	78	4000
PV10-27B24		24V/0.42A	83	1500

Input Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range			200	--	1200	VDC
Input current	PV05	200VDC	--	--	34	mA
		600VDC	--	--	12	
		1200VDC	--	--	9	
	PV10	200VDC	--	--	66	
		600VDC	--	--	22	
		1200VDC	--	--	14	
Inrush current		200VDC	--	8	--	A
		600VDC	--	12	--	
		1200VDC	--	25	--	
External input fuse			1A Slow fusing			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Linear Regulation	Full load	--	±0.5	±1	
Load Regulation	5%-100% load	--	±0.5	±1	
Output Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Drift Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Under input voltage protection		Undervoltage protection range: 175~185V Undervoltage release range:185~195V			

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Over-voltage Protection	PV05-27B05	(Feedback-clamp) Voltage limited < 6.5V			
	PV10-27B05	(Feedback-clamp) Voltage limited < 6.5V			
	PV10-27B09	(Feedback-clamp) Voltage limited < 11.5V			
	PV10-27B24	(Feedback-clamp) Voltage limited < 27V			
Min. Load		0	--	--	%
Delay time		--	--	1	s
Note: *Parallel line test method is adopted to test the ripple and noise, please see *AC-DC Product Application Notes* for specific operation methods.					

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min	4000	--	--	VDC
Isolation Resistance		Test at 500VDC	100	--	--	MΩ
Operating Temperature			-25	--	+70	℃
Storage Temperature			-25	--	+105	
Storage Humidity			--	--	95	%RH
Welding Temperature		Wave-soldering	260±5℃; time:5~10s			
		Manual-welding	360±10℃; time:3~5s			
Hot Plug		Unavailable				
MTBF		MIL-HDBK-217F@25°C > 300,000 h				

Physical Specifications

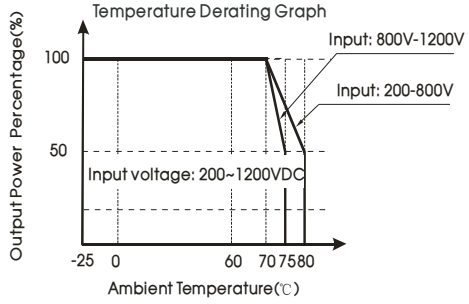
Casing Material	Aluminum
Package Dimensions	74.00*52.00*28.00mm
Weight	190 g(Typ)
Cooling method	Free air convection

EMC Specifications

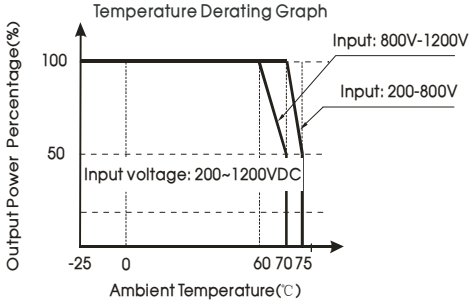
EMI	Conducted Disturbance	CISPR22/EN55022, CLASS A(See Fig. 2 for recommended circuit)	
	Radiated Emission	CISPR22/EN55022, CLASS A(See Fig. 2 for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN61000-4-2 ±6KV/±8KV	Perf. Criteria B
	Radiation Immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV(See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge Immunity	IEC/EN61000-4-5 ±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Conducted Disturbance immunity	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Immunity for Power frequency magnetic field	IEC/EN61000-4-8 10A/m	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11 0%-70%	perf. Criteria B

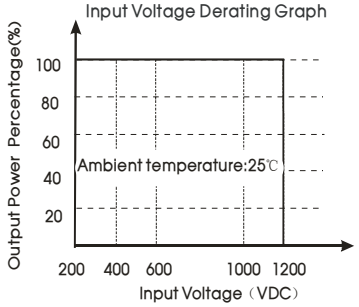
Product Characteristic Curve

PV05-27B05/PV10-27B24:



PV10-27B05/PV10-27B09:





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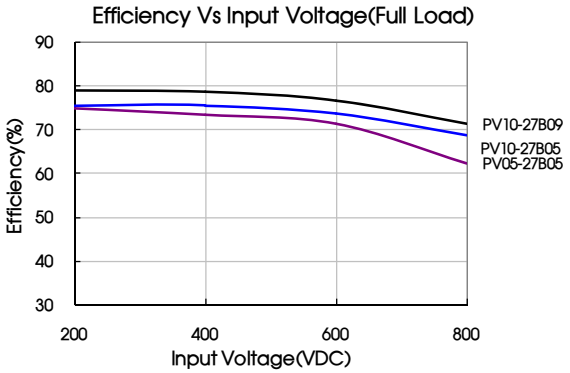

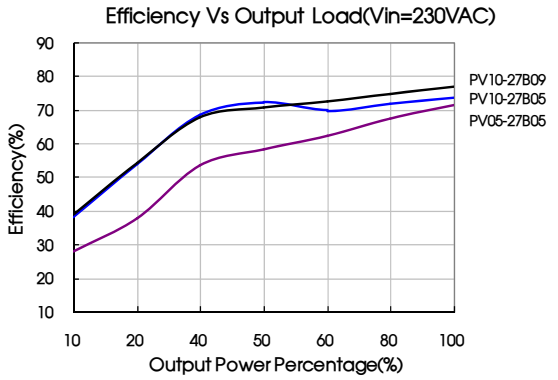

Design Reference

1. Typical application circuit

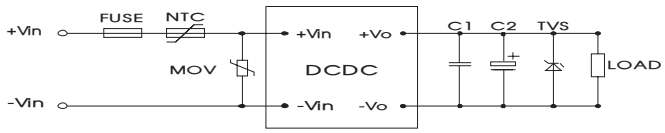

Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	TVS tube
PV05-27B05	1	224K/50V	SMBJ7.0A
PV10-27B05			
PV10-27B09			SMBJ12A
PV10-27B24			SMBJ33A

Note:
Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

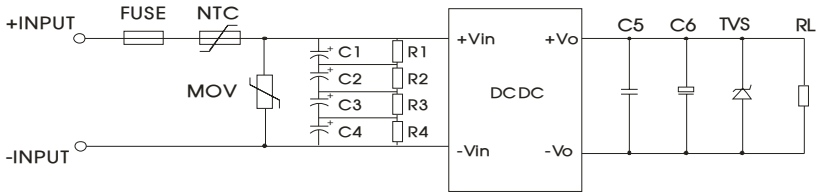

Fig 2: EMC application circuit with higher requirements

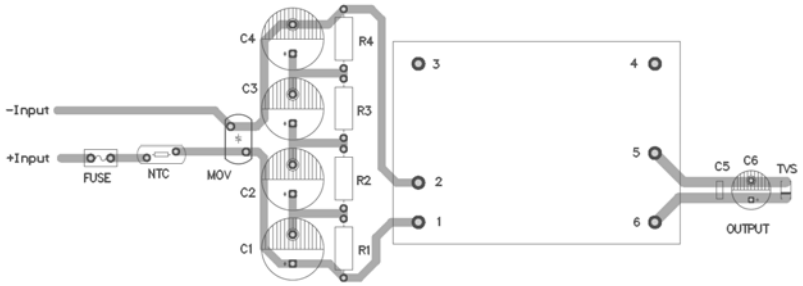

Fig 3: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width: wire width ≥3mm, distance between wires ≥6mm, and distance between wire and ground ≥6mm

Element model	Recommended value
MOV	S20K1000
,C3, C4, C5, C6	47μF/450V
R1, R2, R3, R4,	1MΩ/2W
NTC	5D-9
FUSE	1A/250V, slow fusing, necessary

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

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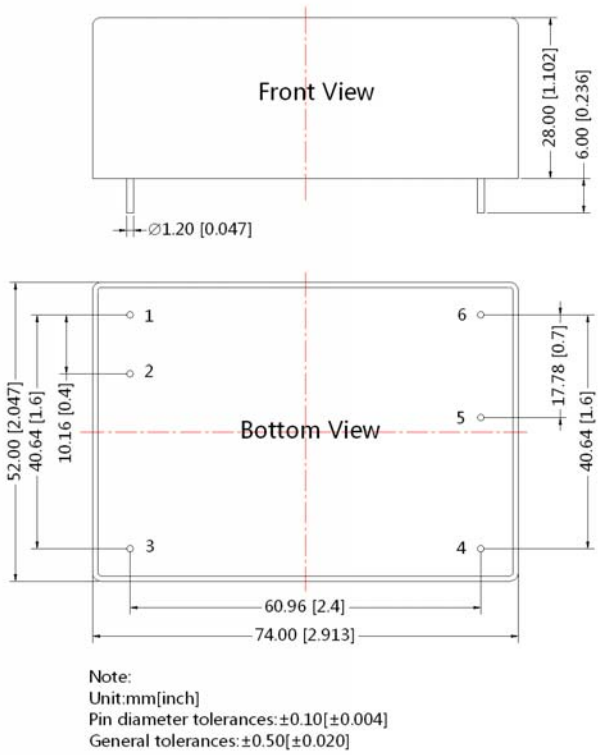
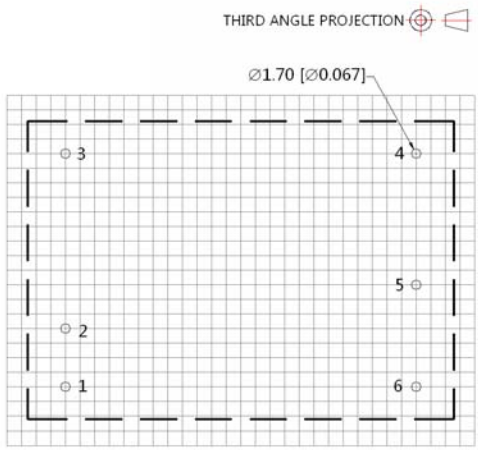
Dimensions and Recommended Layout



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



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	+Vin
2	-Vin
3,4	NC
5	-Vo
6	+Vo

NC:No connection

Note:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58220010,;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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