

DC/DC Converter

PVxx-27BxxR2 Series

Distributed by:



MORNSUN®

New energy isolation converter with ultra wide input voltage of 100-1000VDC



CE RoHS

FEATURES

- Input voltage up to 1000VDC
- 10:1 ultra-wide input voltage range: 100 ~ 1000VDC
- Industrial grade operating temperature: -40°C~70°C
- 4000VAC high isolation voltage
- High efficiency, Low ripple& noise
- Output over-voltage, short circuit protection (automatic recovery), Input against reverse protection
- Meet CE certification standards
- High reliability, long life, three years warranty

PVxx-27BxxR2 series are regulated output DC/DC converters with features of 100-1000VDC ultra-high voltage input, high efficiency and high reliability. They can be widely used in photovoltaic power generation, high-voltage inverter and so on, which provide stable operating voltage to the equipment and improve the power and the load's safety performance with multiple protection when working under abnormal conditions.

Selection Guide

Certification	Model	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (200VDC, %/Typ.)	Max. Capacitive Load(μF) (Full load)
CE	PV05-27B05R2	5W	5V/1A	72	6000
Pending	PV10-27B05R2	10W	5V/2A	72	6000
	PV10-27B09R2	10W	9V/1.11A	76	4000
	PV10-27B24R2	10W	24V/0.42A	80	470
CE	PV15-27B12R2	15W	12V/1.25A	77	2000
	PV15-27B15R2	15W	15V/1A	78	1200
	PV15-27B24R2	15W	24V/0.625A	80	470

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range			100	--	1000	VDC
Input Current	PV05 model	200VDC	--	--	38	mA
		600VDC	--	--	15	
		1000VDC	--	--	10	
	PV10 model	200VDC	--	--	75	
		600VDC	--	--	25	
		1000VDC	--	--	16	
	PV15 model	200VDC	--	--	120	
		600VDC	--	--	40	
		1000VDC	--	--	22	
Inrush Current	200VDC		--	7	--	A
	600VDC		--	20	--	
	1000VDC		--	30	--	
External Input Fuse	PV05/ PV10 model		Necessary, 1A Slow fusing			
	PV15 model		Necessary, 2A Slow fusing			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Line Regulation		--	±0.5	±1	
Load Regulation		--	±0.5	±1	

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Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	100	200	mV
Temperature Drift Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection	PVxx-27B05R2	(Feedback-clamp) Voltage limited < 7.5V			
	PVxx-27B09R2	(Feedback-clamp) Voltage limited < 12V			
	PVxx-27B12R2	(Feedback-clamp) Voltage limited < 15V			
	PVxx-27B15R2	(Feedback-clamp) Voltage limited < 19V			
	PVxx-27B24R2	(Feedback-clamp) Voltage limited < 28V			
Min. Load		0	--	--	%
Delay Time	200~1000VDC	--	--	1	s

Note: *Parallel line test method is adopted to test the ripple and noise, please see *DC-DC Product Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Welding Temperature	Wave-soldering	260±5°C; time:5~10s			
	Manual-welding	360±10°C; time:3~5s			
Switching Frequency		--	--	75	kHz
Power Derating	+50°C to +70°C	PV10/15-27BxxR2	2	--	%/°C
Hot Plug	Unavailable				
MTBF	MIL-HDBK-217F@25°C > 300,000 h				

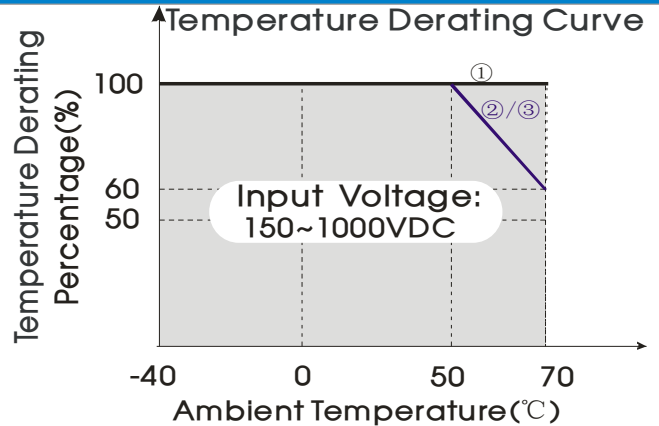
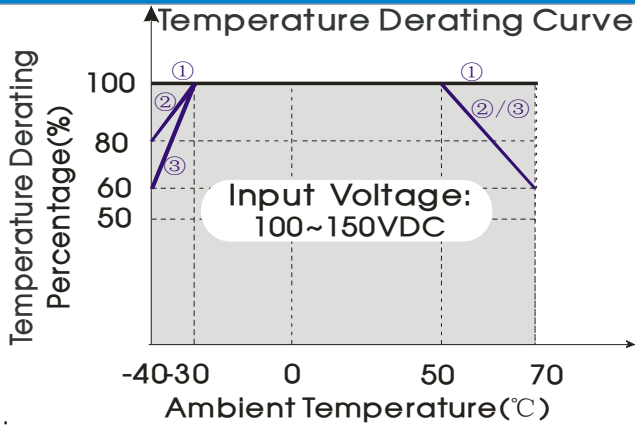
Physical Specifications

Casing Material	UL94V-0
Package Dimensions	70.00*48.00*23.50 mm
Weight	95 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

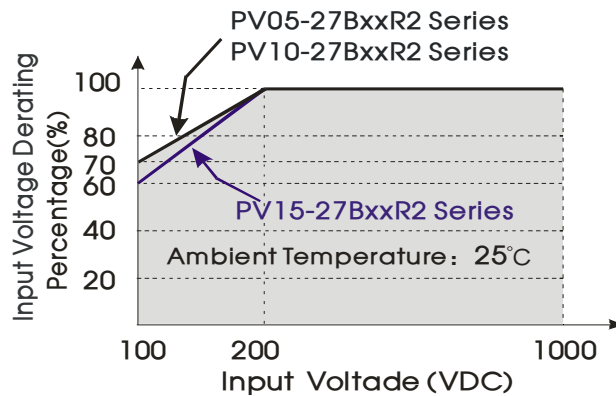
Product Characteristic Curve



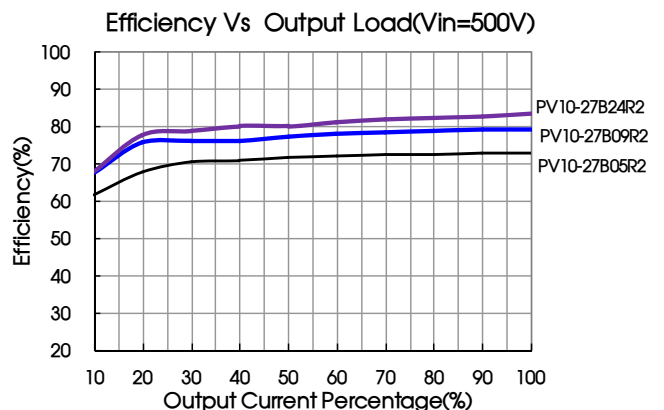
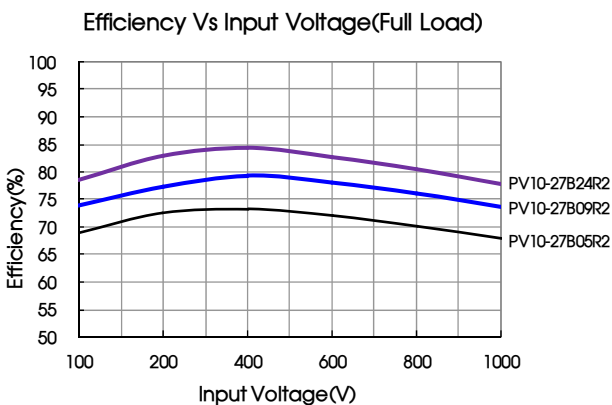
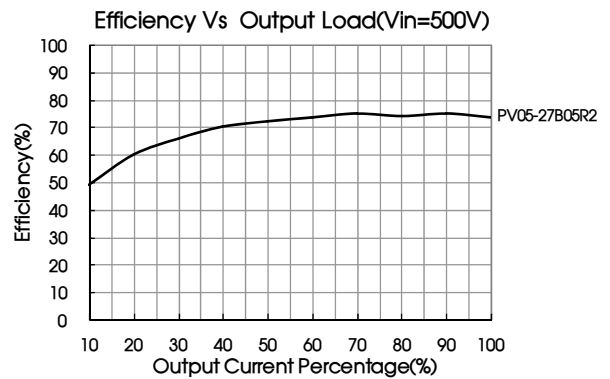
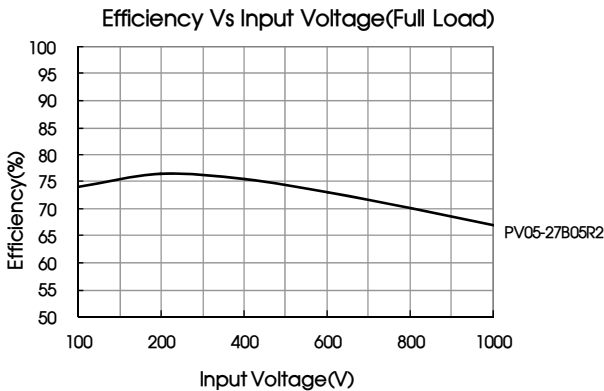
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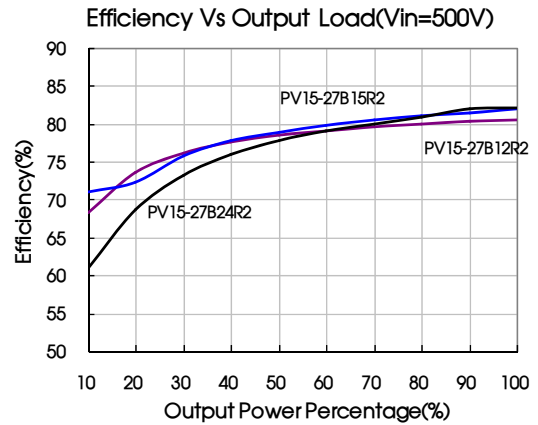
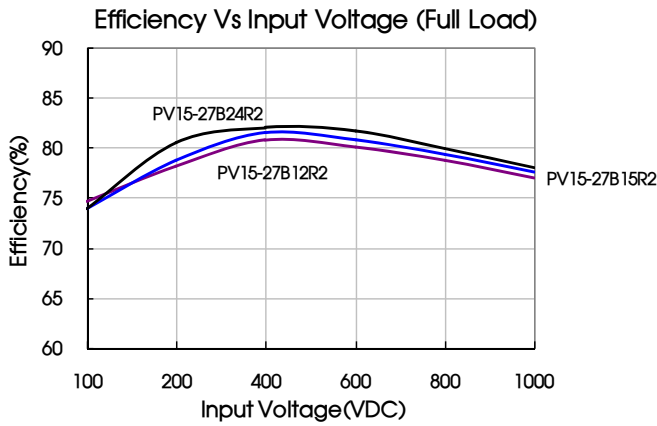
1. For PV05-27BxxR2 Series, derating curve is line①;
for PV10-27BxxR2 Series, derating curve is line②;
for PV15-27BxxR2 Series, derating curve is line③.
2. This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.

Input Voltage Derating Curve



Note: The actual output power = Nominal output power x Temperature derating x Input voltage derating.





Design Reference

1. Typical application circuit

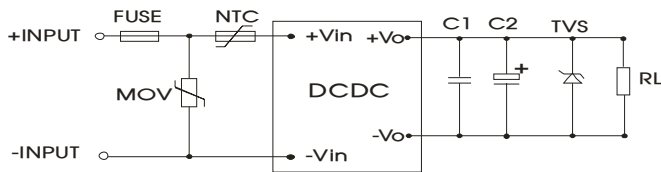


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	TVS
PV05-27B05R2	1	220	SMBJ7.0A
PV10-27B05R2		220	SMBJ7.0A
PV10-27B09R2		120	SMBJ12A
PV10-27B24R2		68	SMBJ33A
PV15-27B12R2		120	SMBJ15A
PV15-27B15R2		120	SMBJ20A
PV15-27B24R2	68	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

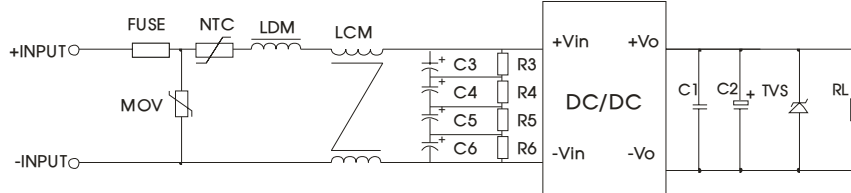


Fig 2: EMC application circuit with higher requirements

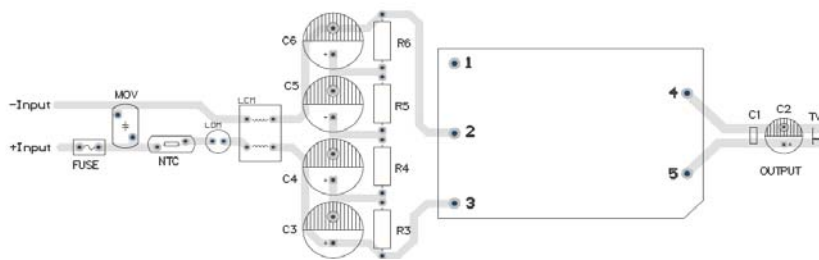


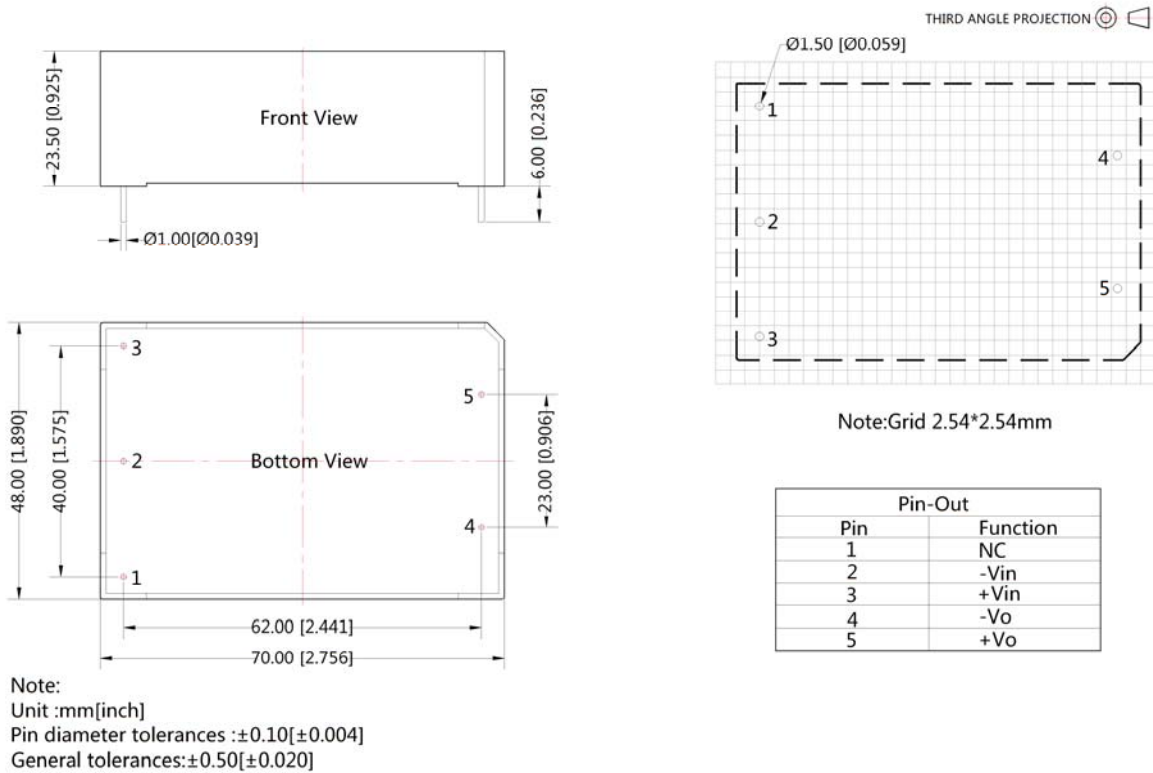
Fig 3: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width: wire width $\geq 3\text{mm}$, distance between wires $\geq 6\text{mm}$, and distance between wire and ground $\geq 6\text{mm}$

Element model	Recommended value
MOV	S14K1000
C3, C4, C5, C6	47μF/400VDC
R3, R4, R5, R6	1MΩ/2W
NTC	10D-11
LDM	5mH/0.5A
LCM	10mH, recommended to use MORNSUN's FL2D-Z5-103
FUSE	1A/2A, necessary

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

Dimensions and Recommended Layout



- Note:
1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58220006;
 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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