DC/DC Converter

SPV50-25Bxx Series

50W isolated DC-DC converter with ultra-wide , ultra-high 80 (120) -750VDC input for Renewable Energy

RoHS

FEATURES

- Ultra-wide input voltage range of 120 - 750VDC (SPV50-25B12) / 80 - 750VDC (SPV50-25B24)
- Industrial grade operating temperature -40℃ to +70℃
- High I/O isolation test voltage of 4000VAC
- High efficiency, low ripple & noise
- High reliability, long lifespan
- Input undervoltage protection, reverse input voltage protection, output short circuit, over-current, over-voltage protection
- Meets UL1741, EN62109 standards
- Operating up to 5000m altitude

SPV50-25Bxx Series is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 80 (120-) - 750VDC, which design based on standard of UL1741, EN62109. the products feature high efficiency, high reliability, high insulation and a high level of safety protection. It is widely used in renewable energy industries such as photovoltaic inverter, household energy storage. 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 (Vo/Io)	Efficiency at 300VDC(%) Typ.	Capacitive Load (μF) Max.
SPV50-25B12	50W	12V/4170mA	83	820
SPV50-25B24	50W	24V/2083mA	85	820

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	SPV50-25B12		120	--	750	VDC
	SPV50-25B24		80	--	750	
Input Current	150VDC		--	--	0.9	A
	750VDC		--	--	0.3	
Inrush Current	750VDC	SPV50-25B12	--	60	--	
		SPV50-25B24	--	80	--	
Input Undervoltage Protection	Lockout activation range		60	--	70	VDC
	Lockout deactivation range		70	--	80	
External Input fuse			3.15A/1000VDC, required			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load		--	±2	--	%
Line Regulation	Rated load		--	±1	--	
Load Regulation	0% - 100% load		--	±2	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		--	--	200	mV
Stand-by Power Consumption	500VDC		--	--	1.2	W
Temperature Coefficient			--	±0.02	--	%/℃
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			⩾110%Io, hiccup, self-recovery			
Over-voltage Protection	SPV50-25B12		⩽16VDC (Output voltage clamp)			
	SPV50-25B24		⩽30VDC (Output voltage clamp)			
Minimum Load			0	--	--	%
Hold-up Time	Room temperature, full load	750VDC input	--	10	--	ms
Start-up Delay Time	Room temperature		--	--	3	s

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

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - output	Electric Strength Test for 1min., leakage current ＜10mA		4000	--	--	VAC
Insulation	Input - output	500VDC			≥50x10^6		Ω
Operating Temperature				-40	--	+70	℃
Storage Temperature				-40	--	+85	
Storage Humidity				--	--	95	%RH
Switching Frequency				--	65	--	kHz
Power Derating		-40℃ to -25℃	SPV50-25B12	3.33	--	--	%/℃
		-40℃ to -25℃	SPV50-25B24	2.66	--	--	
		+50℃ to +70℃	SPV50-25B12	2.5	--	--	
		+55℃ to +70℃	SPV50-25B24	2.66	--	--	
		120VDC - 150VDC	SPV50-25B12	0.667	--	--	%/VDC
		80VDC - 150VDC	SPV50-25B24	0.714	--	--	
		650VDC - 750VDC		0.2	--	--	
		2000m - 5000m	SPV50-25B12	10	--	--	%/Km
Switching Frequency				--	65	--	kHz
Safety Standard				UL1741, EN62109			
MTBF				MIL-HDBK-217F@25℃≥ 300,000 h			

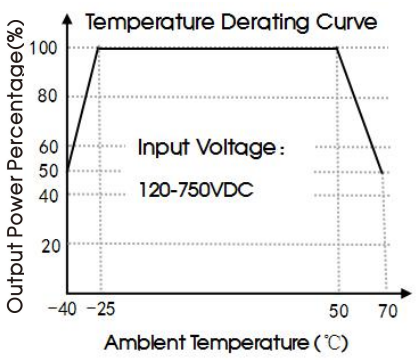
Mechanical Specifications

Case Material	Black flame-retardant and heat-resistant plastic (UL94V-0)
Dimensions	109.00 x 58.50 x 30.00mm
Weight	260 g (Typ.)
Cooling method	Free air convection

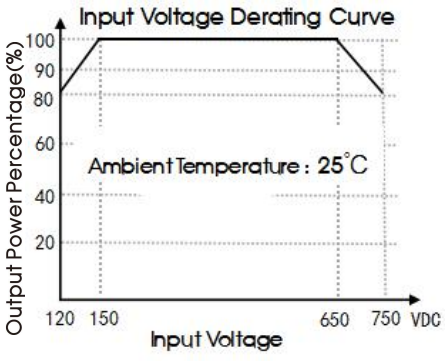
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A	
	RE	CISPR32/EN55032	CLASS A	
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/ line to line ±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	perf. Criteria A

Product Characteristic Curve



SPV50-25B12



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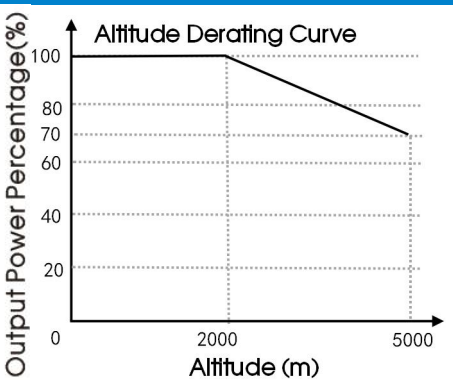

SPV50-25B12

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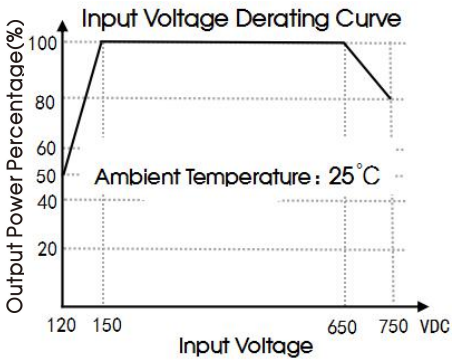
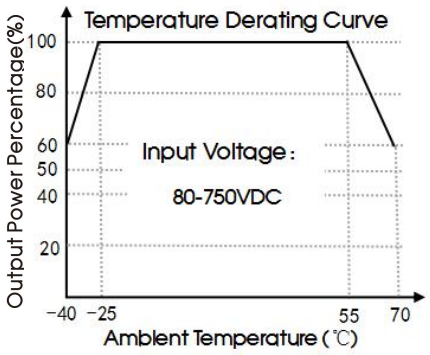


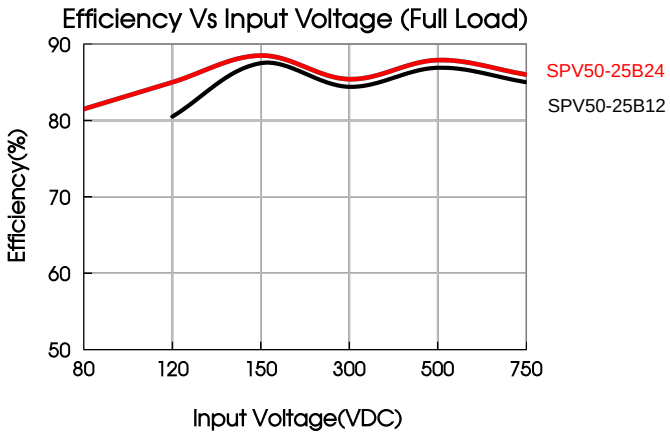
SPV50-25B24

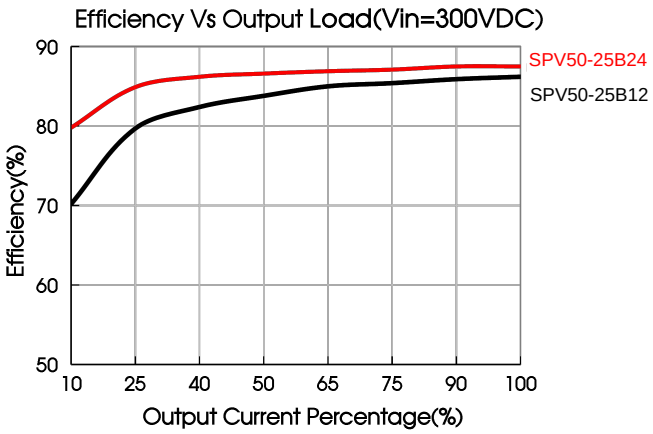


SPV50-2B24

Note: ① With an input between 80-150VDC/120 -150VDC/650 -750VDC, the output power of SPV50-25Bxx parts must be derated as per temperature derating curves;

② This 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

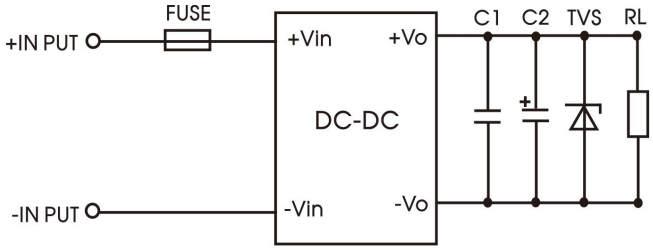


Fig. 1

Model	FUSE	C1	C2	TVS
SPV50-25B12	3.15A/1000VDC, required	1uF/25V	10uF/25V	SMBJ20A
SPV50-25B24	3.15A/1000VDC, required	1uF/50V	10uF/35V	SMBJ30A

Note on filter components:

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

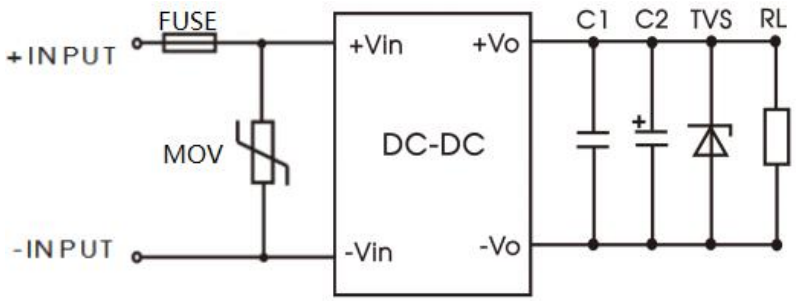
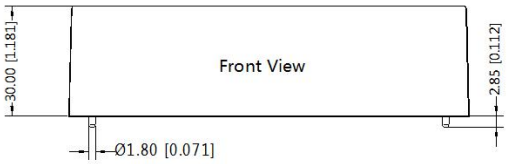


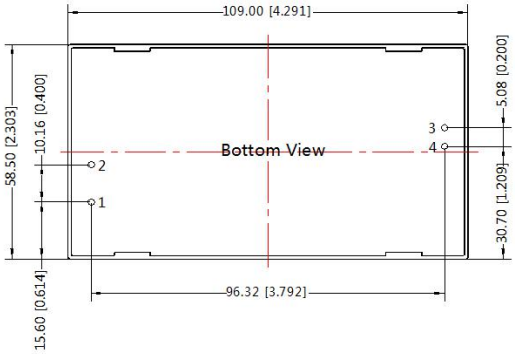
Fig. 2

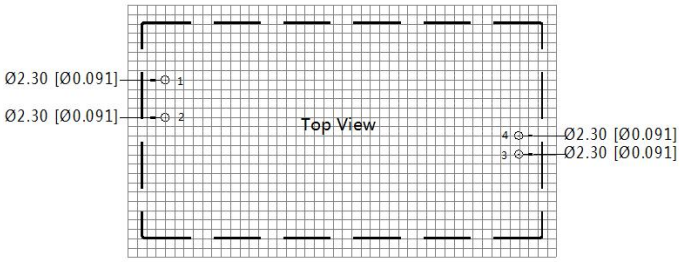
Model	FUSE	C1	C2	TVS	MOV
SPV50-25B12	3.15A/1000VDC, required	1uF/25V	10uF/25V	SMBJ20A	S10K625
SPV50-25B24	3.15A/1000VDC, required	1uF/50V	10uF/35V	SMBJ30A	S10K625

Dimensions and Recommended Layout (SPV50-25B12)

THIRD ANGLE PROJECTION





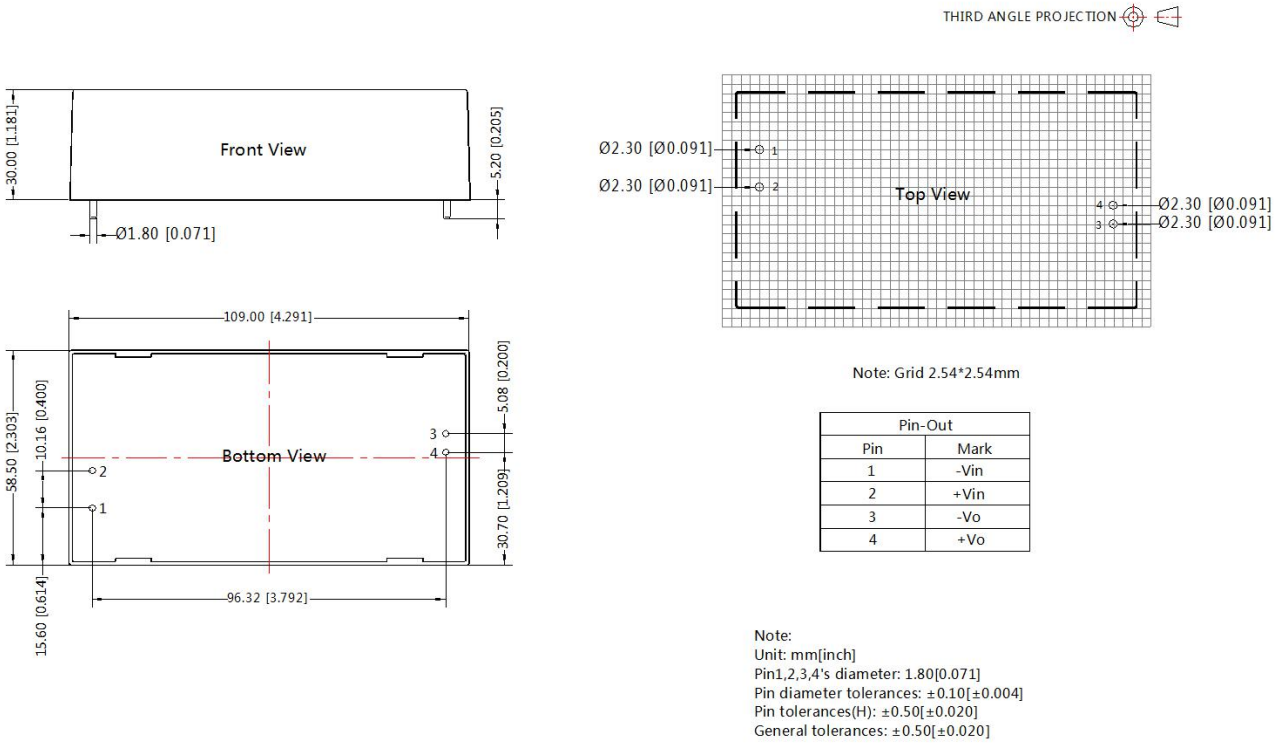


Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	-Vin
2	+Vin
3	-Vo
4	+Vo

Note:
Unit: mm[inch]
Pin1,2,3,4's diameter: 1.80[0.071]
Pin diameter tolerances: ±0.10[±0.004]
Pin tolerances(H): ±0.250[±0.010]
General tolerances: ±0.50[±0.020]

Dimensions and Recommended Layout (SPV50-25B24)



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	-Vin
2	+Vin
3	-Vo
4	+Vo

Note:
Unit: mm[inch]
Pin1,2,3,4's diameter: 1.80[0.071]
Pin diameter tolerances: ±0.10[±0.004]
Pin tolerances(H): ±0.50[±0.020]
General tolerances: ±0.50[±0.020]

Note:

1. 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;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.