PV Power DC/DC Converter
BK20-500SXXH1D4

Typical Features

- Ultra-wide input voltage range 100-1000VDC(10:1)
- Reverse input voltage protection, output short circuit, over-voltage protection
- Isolation Voltage 4000VDC
- Output Efficiency as high as 83%
- Applied for Photovoltaic and home stored energy
- Operating Temperature: -30°C~+70°C
- International standard pin-out

Application Field

BK20-500SXXH1D4 Series *is regulated DC-DC converters with an ultra-wide DC input of 100-1000VDC. The products feature high efficiency, high reliability. 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 stable operating voltage to the equipment and improve the power and the load's safety performance with multiple protection when working under abnormal conditions.*

Typical Product List

Part No	Power(W)	Input Current (Nominal input)	Output Voltage/Current		Output Efficiency	Max. Capacitive Load	Ripple&Noise
		Output Full Load	Voltage	Current	(Input Nominal) %/TYP	(uF)	(mV)
		(mA)	(V)	(mA)			
BK20-500S12H1D4	20	49	12	1667	82	1500	250
BK20-500S24H1D4		48	24	833	83	680	

Note

1: Due to space limit, above is only a part of our product list, please contact our sales team for more items.

2:The typical output efficiency is based on that product is full loaded and burned-in after half an hour.

3: The fluctuation range of full load efficiency(%,TYP) is ±2%, full load output efficiency= total output power/module's input power.

4: A current limiting resistor of 10Ω/3W should be connected in series with the input of the module to suppress the input inrush current during the product application test.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	--	100	500	1000	VDC
		Please refer to Input Voltage Dearting Curve at Back			
Input Current	100VDC@100% Load	--	244	--	mA
	500VDC@100% Load	--	49	--	
	1000VDC@100% Load	--	25	--	
Surge Current	300VDC@100% Load	--	25	--	A

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	500VDC@100% Load	--	35	--	
Stand-by Consumption	Output no load@ nominal input	--	1.0	--	W
Hot Plug	N/A				

Output Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%~100% Load	--	±2.0	±3.0	%
Minimum Load	--	10	--	--	
Line Regulation	Input full voltage range	--	±0.5	±1.2	
Load Regulation	20%~100% nominal load, balance load	--	±1.0	±2.0	
Ripple & Noise	20MHz bandwidth (peak peak value)	--	200	250	mV
Temperature Coefficient	--	--	±0.05	--	%
Turn On Delay Time	100VDC	--	800	--	mS
	500VDC	--	200	--	
	1000VDC	--	100	--	
Power off holding time	500VDC	--	10	--	
Turn on overshoot	0%~100% Load	--	10	--	%
Output over-current protection	Input 100-1000VDC	≥110%Io Self recovery			
Dynamic Response Overshoot Range	25%-50%-25% 50%-75%-50%	--	±5.0	±6.0	
Dynamic Response Recovery time		--	300	500	mS
Short circuit protection	Input 100-700VDC	Continuous			

General Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, test 1min, leakage current ≤5mA	4000	--	--	VDC
Operating Temperature	--	-30	--	+70	℃
	Refer to Temperature Derating Curve at back				
Storage Temperature	--	-25	--	+85	
Soldering Temperature	Wave-soldering	260±5℃, time: 5-10S			
	Manual-welding	380±10℃,time: 4-10S			
Switching Frequency	--	--	65	70	KHz
Max. Case Temperature	Within operating Curve	--	--	+100	℃
Storage Humidity	No condensing	--	--	95	%RH
Insulation Resistance	Input-Output	--	--	500	VDC
		--	--	100	MΩ

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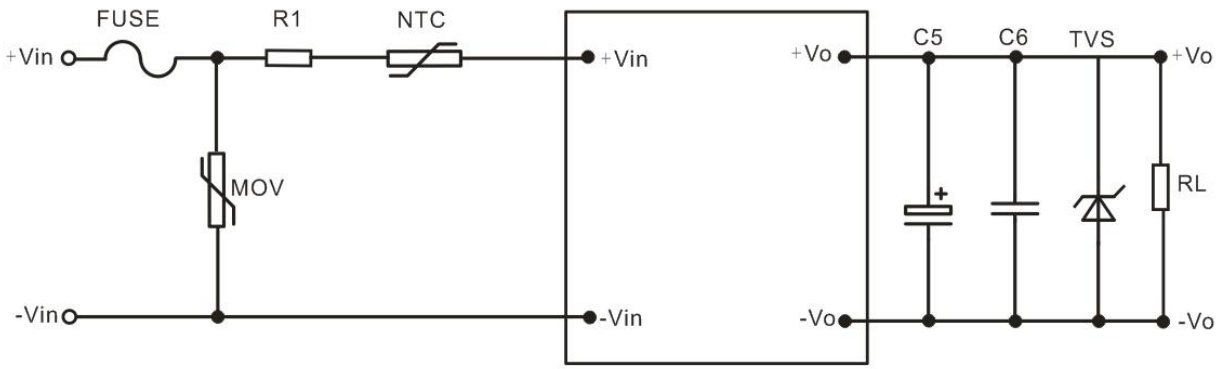
Physical Specification

Case Material		Black Aluminum Case
Package Dimensions	Horizontal package	70.0X48.0X23.5mm
Product Weight		156g(TYP)
Cooling method		Free air convection

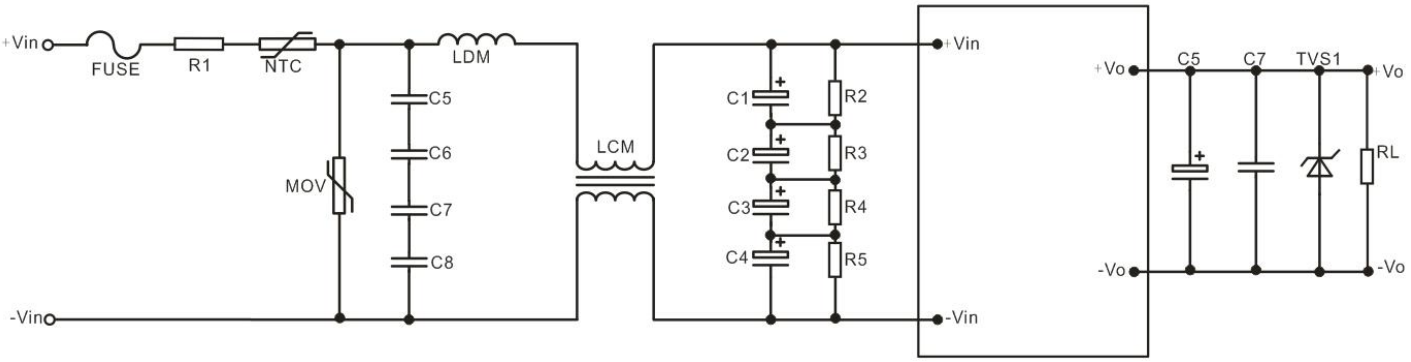
Typical Application Circuit



Output Voltage	C5	C6	TVS	FUSE	R1	NTC	MOV
12V	470uF/25V	1.0uF/25V/1206	SMBJ15A	3A 1500VDC	5Ω/3W (Wirewound Resistors)	5D-15	14D142K
15V	330uF/35V	0.2uF/50V/1206	SMBJ18A				
24V	220uF/50V	0.1uF/50V/1206	SMBJ28A				

Note: The output filer capacitor C5 is electrolytic capacitor, recommended high frequency and low resistance electrolytic one. For capacitance and current of capacitor please refer to the manufacture's datasheet. The capacitance withstand voltage value should be higher than 80%. C6 is ceramic capacitor, to remove high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails)

EMC External Recommended Circuit



Component	Function	Recommended Value	Remark
FUSE	Cut off when module is abnormal	3A/1500VDC	Necessary
R1(current-limited resistor)	Suppress inrush current at power-on moment	5Ω/3W (wirewound resistor)	

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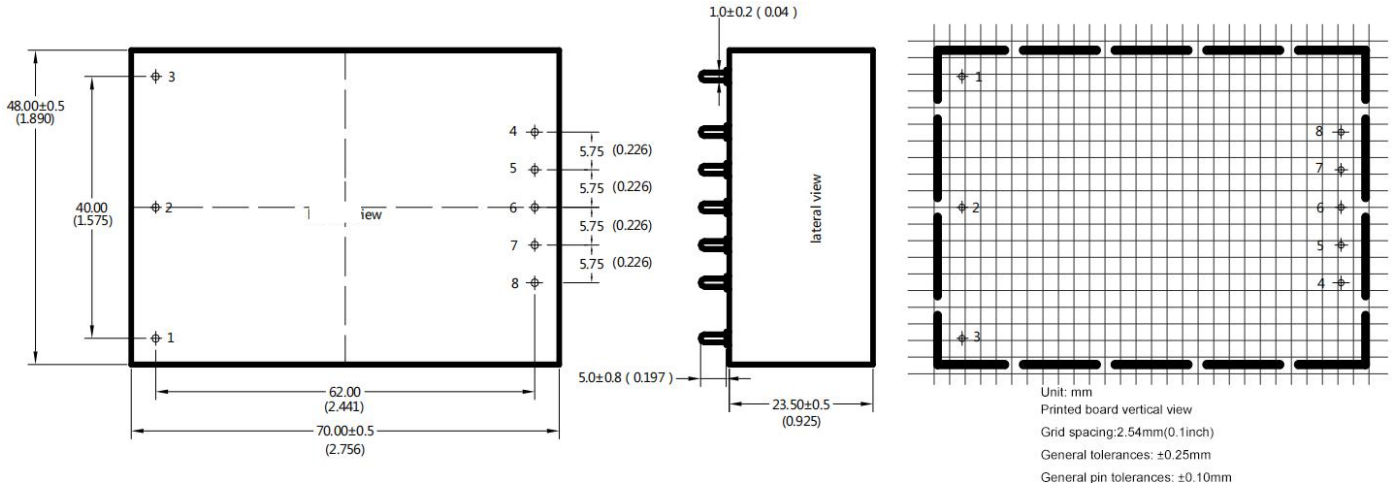
NTC (thermistor)	Suppress inrush current	5D-15	
MOV (Varistor)	Absorbs lightning surge voltage	14D142K	Add according to actual application
C5/C6/C7/C8(safety capacitor)	Suppress differential mode interference	334K/275VAC	
LDM (Differential Mode Inductor)	Suppressing differential mode interference	680uH/1A	
LCM (Common mode inductor)	Common mode interference suppression	10mH /1A	
C1/C2/C3/C4 (Electrolytic capacitor)	Low frequency filtering	47uF/400V	
R2/R3/R4/R5 (chip resistors)	for voltage equalization, to ensure equal capacitance dividing voltage	1MΩ/1206	

Dimension



Pin-Out	1	2	3	4	5	6	7	8
Single(S)	NC	-Vin	+Vin	+Vo	NC	NC	NC	-Vo

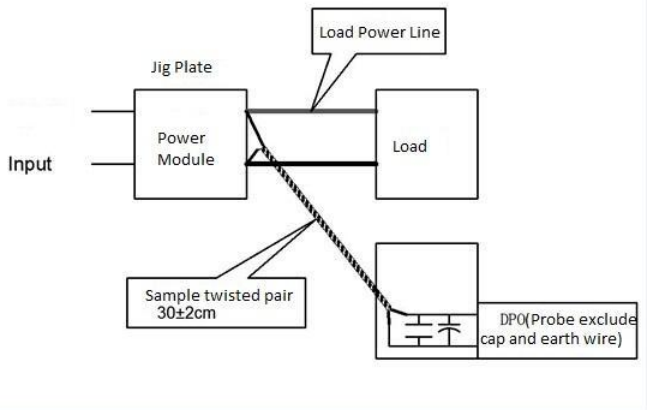
Code	L X W X H	
H1D4	70.0X48.0X23.5 mm	2.756X1.890X0.925 inch

Ripple& Noise Test: （Twisted Test Method 20MHz bandwidth）

Test Method:

(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve

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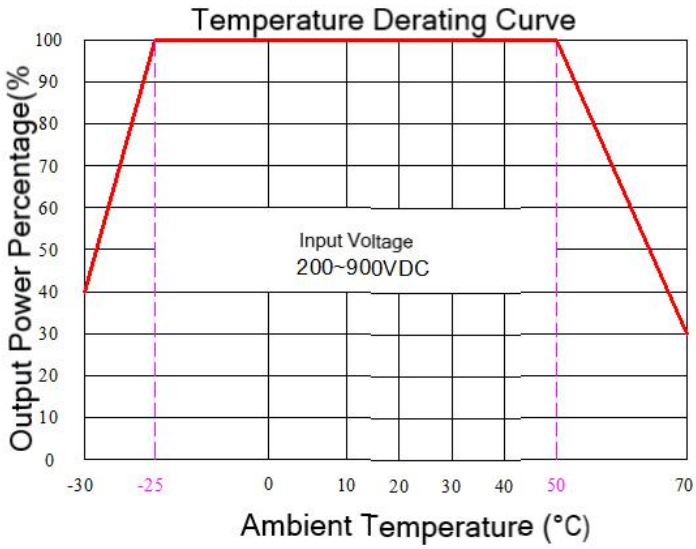

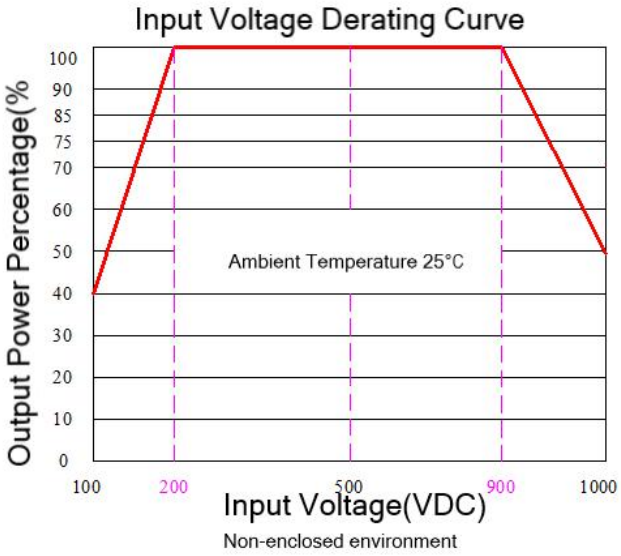

Note:

1. The product should be used under the specification range, otherwise it will cause permanent damage to it.
2. Fuse is required at Input terminal.
3. If the product worked beyond the load range or below the minimum load, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
4. Unless otherwise specified, data in this datasheet should be tested under conditions of **Ta=25℃**, **humidity<75%** when inputting nominal voltage and outputting rated load(pure resistance load);
5. All index testing methods in this datasheet are based on our Company's corporate standards
6. 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;
7. We can provide customized product service;
8. The product specification may be changed at any time without prior notice.

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