# BK25-600SXXH1N4
# Solar Energy Series DC/DC Converter

## Typical Features

- ◆ Ultra Wide input voltage range 200-1200VDC（6:1）
- ◆ Against reverse protection, output over-voltage protection, short circuit protection
- ◆ No load input current as low as 1.0mA
- ◆ Input output isolation: 4000VDC
- ◆ Efficiency up to 84%(TYP.)
- ◆ Widely used in photovoltaic power generation, high-voltage inverter
- ◆ Operating Temperature: -30℃- +70℃
- ◆ Industrial design, international pin out


## Application Field

*BK25-600SXXH1N4 series -- are regulated output DC/DC converters offered by Aipu.*
*It features ultra-high voltage input of 200-1200VDC , high efficiency and high reliability. It 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.*

## Typical Product List

| Model | Power（W） | Input Current（Input Nominal） | | Output Voltage/Current | | Output Efficiency | Max. Capacitive Load |
|---|---|---|---|---|---|---|---|
| | | Output no load | Output full load | Voltage | Current | （Input Nominal）%/TYP | （u F） |
| | | （mA） | | （V） | （mA） | | |
| *BK25-600S05H1N4 | 25 | 0.47 | 52.0 | 5 | 5000 | 80 | 3000 |
| BK25-600S12H1N4 | | 0.50 | 50.5 | 12 | 2084 | 82 | 2000 |
| BK25-600S15H1N4 | | 0.53 | 49.6 | 15 | 1667 | 83 | 1000 |
| BK25-600S24H1N4 | | 0.56 | 48.50 | 24 | 1042 | 84 | 470 |

Note 1: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.
Note 2:."*" is model under developing.
Note 3: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
Note 4: The fluctuation range of full load efficiency(%,TYP) is ±2%, full load output efficiency= total output power/module's input power.
Note 5: Input 300-1200 VDC testing, it should add a current limiting resistance (370Ω/10W,metal oxide film) at the input end of the module in series to suppress the surge current. The specific connection method is detailed in EMC External Recommended Circuit.

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## Input Specification

| Item | Operating Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input Voltage Range | -- | 200 | 600 | 1200 | VDC |
| | | Please refer to the Input Voltage Dearting Curve at back | | | |
| **Item** | **Operating Condition** | **Min.** | **Typ.** | **Max.** | **Unit** |
| Input Current | 200VDC@100% load | -- | 150 | -- | mA |
| | 600VDC@100% load | -- | 51 | -- | |
| | 1200VDC@100% load | -- | 27 | -- | |
| Stand-by Consumption | Output no load, nominal input | -- | -- | 0.4 | W |
| Input Filter | $\Pi$ type Filter | | | | |

## 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 load 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 | 200VDC | -- | 5000 | -- | mS |
| | 600VDC | -- | 2000 | -- | |
| | 1200VDC | -- | 1500 | -- | |
| Power off Holding time | 1200VDC | -- | 10 | -- | |
| Turn on overshoot | 0%~100% load | -- | 10 | -- | % |
| Output Over- current protection | Input full voltage range | 120 | 150 | -- | |
| Dynamic Response Overshoot Range | 25%-50%-25%<br>50%-75%-50% | -- | ±5.0 | ±6.0 | |
| Dynamic Response recovery time | | -- | 300 | 500 | mS |
| Short circuit protection | Input 300-900VDC | Continuous, Self-recovery | | | |

## General Specification

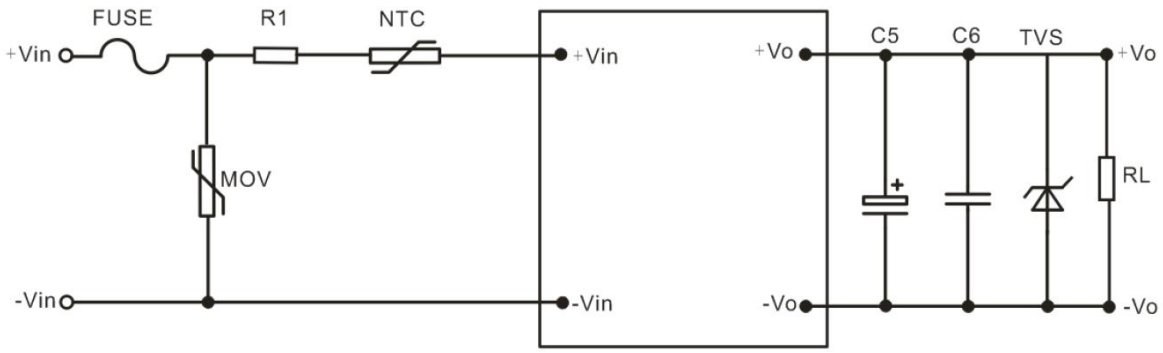
| Item | Operating Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Isolation Voltage | Input-Output, Test time: 1min, leak current≤5mA | 4000 | -- | -- | VDC |
| Operating Temperature | -- | -30 | -- | +70 | ℃ |
| | Refer to Temperature Derating Curve, details see the Product Character Curve at back | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Storage Temperature | -- | -25 | -- | +85 | |
| Soldering Temperature | Wave-soldering | 260±5℃，time: 5-10S | | | |
| | Manual-welding | 3880±10℃，time: 4-10S | | | |
| Switching Frequency | -- | -- | 65 | 70 | KHz |
| Max. Case Temperature | Within operating Curve | -- | -- | +100 | ℃ |
| Relative Humidity | No condensing | -- | -- | 95 | %RH |
| Insulation Resistance | Input-Output | -- | -- | 500 | VDC |
| | | -- | -- | 100 | MΩ |

## Physical Specifications

| | | |
|---|---|---|
| Case Material | | Black Aluminum Case |
| Package Dimensions | Horizontal package | 70.0X48.0X23.5mm |
| Product Weight | | 155g（TYP） |
| Cooling Method | | Free Air Convention |

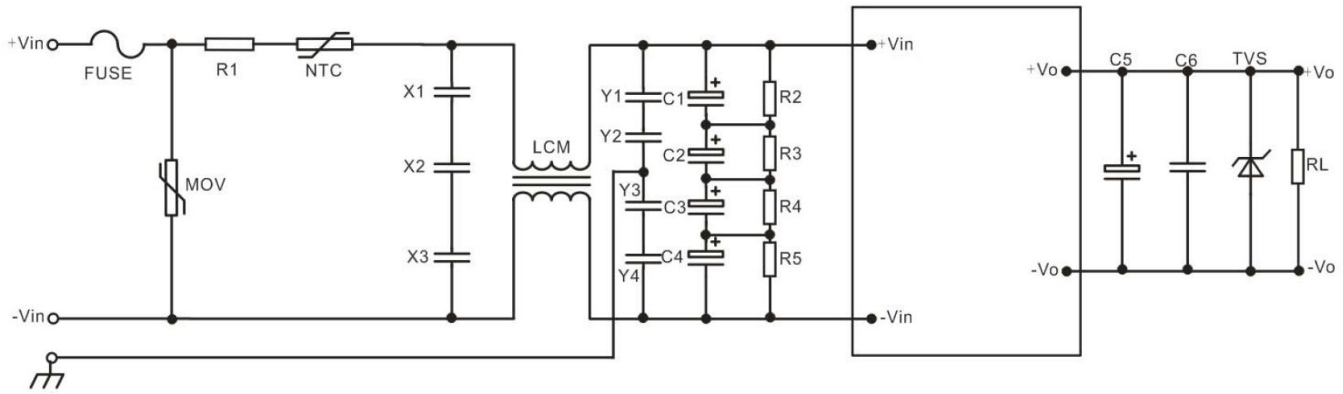
## Typical Application Circuit




| Output Voltage | C5 | C6 | TVS |
|---|---|---|---|
| 5V | 680uF/16V | 4.7uF/50V/1206 | SMBJ10A |
| 12V | 470uF/25V | 1.0uF/25V/1206 | SMBJ15A |
| 15V | 330uF/35V | 0.2uF/50V/1206 | SMBJ18A |
| 24V | 220uF/50V | 0.1uF/50V/1206 | SMBJ28A |

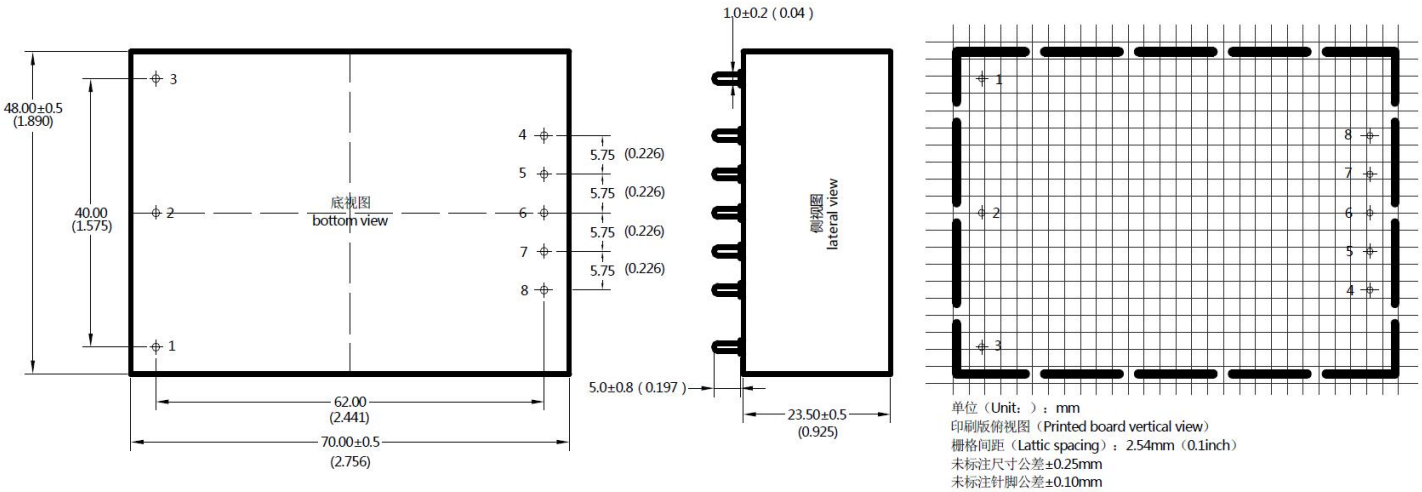
Note: The output filer capacitor C5 is electrolytic capacitor, recommended high frequency and low resistance electrolytic capacitor. For capacitance and current of capacitor please refer to the manufacture's datasheet. The capacitance withstand voltage value should be higher 80%. C6 is ceramic capacitor,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

## EMC External Recommended Circuit




| Component | Recommended Value | Remark |
|---|---|---|
| FUSE | According to customer's request | Necessary |
| R1 | 370Ω/10W Metal Oxide film | |
| NTC | 5D-15 | |
| MOV | 20D152K | According to actual application to add |
| X1/X2/X3 (CBB Capacitor) | Using 3pcs capacitance:1.0μF/450V capacitor in series connection | |
| LCM | 8mH/0.8A | |
| Y1/Y2/Y3/Y4 (Y capacitor) | Using 4pcs capacitance:2.2nF/400V in series connection | |
| C1/C2/C3/C4 | 220uF/450V | |
| R2/R3/R4/R5 | 1MΩ/2W | |

## Dimension and Pin out Specifications




Pin out Specification:

| Pin-out | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Dual（S） | NC | -Vin | +Vin | +Vo | NC | NC | NC | -Vo |

## Dimension

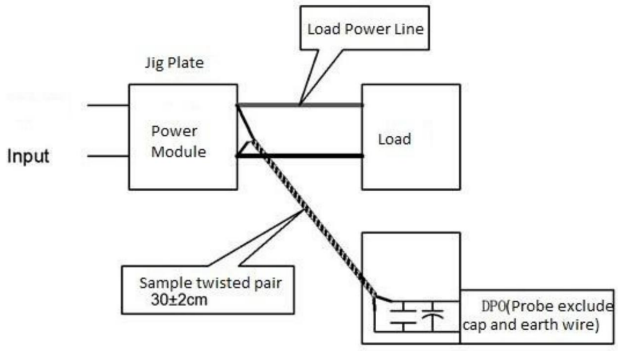
| Packing code | L x W x H | |
|---|---|---|
| H1N4 | 70.0X48.0X23.5 mm | 2.756X1.890X0.925inch |

## Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

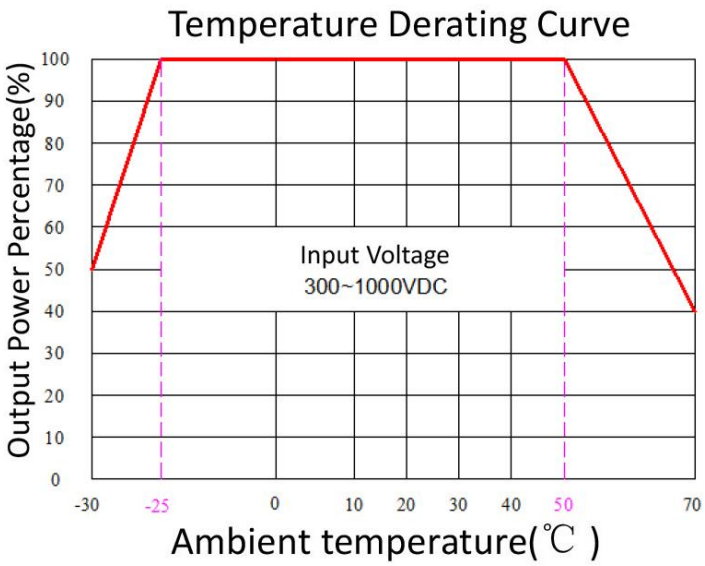
Test Method:

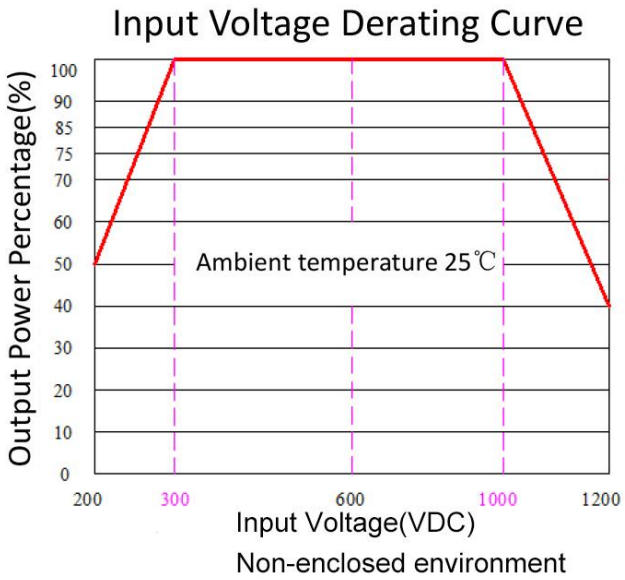
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(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




Note:

1.The product should be used under the specification range, otherwise it will cause permanent damage to it.

2.Product's input terminal should connect to fuse;

3.If the product operated below the minimum load request, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;

4.If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;

5.Unless otherwise specified, data in this datasheet are tested under conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load(pure resistance load);

6.All index testing methods in this datasheet are based on our Company's corporate standards.

7.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, please directly contact our technician for specific information;

8.We can provide customized product service;

9.The product specification may be changed at any time without prior notice.