CBK25-170S12H2N4

DC/DC Converter

Typical Features

- ◆Wide input voltage range 45-300VDC
- ◆ 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

CBK25-170S12H2N4--- is a small-sized, high-efficiency module power supply
This series of power supplies has the advantages of global input voltage range, AC and DC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, high safety isolation, and good EMC performance. EMC and safety specifications meet international EN55032 and IEC/EN61000 standards. This series of products are widely used in many fields such as electric power, industry, instrumentation and smart home. When the product is used in a harsh electromagnetic compatibility environment, please refer to the application circuit provided by our company.

Typical Product List

Model	Output specifications			Max. Capacitive Load	Ripple &noise 20MHz(MAX)	Full load efficiency, 170VDC (Typ.)
	Power (W)	Voltage Vo(V)	Current Io(mA)	(u F)	mVp-p	%
CBK25-170S12H2N4	25	12	2080	3000	250	80

Note 1: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
Note 2: The fluctuation range of full load efficiency(%,TYP) is ±2%, full load output efficiency= total output power/module's input power.
Note 3: The test method for ripple and noise adopts the twisted pair test method. Please see the following (ripple & noise test instructions) for specific test methods and combinations.

Input Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	DC Input	45	170	300	VDC
Input Current	45VDC	--	--	0.5	A
	300VDC	--	--	0.2	
Surge Current	45VDC	--	20	--	
	300VDC	--	45	--	
No Load Consumption	Input 45 VDC	--	0.10	0.30	W
	Input 300 VDC	--			
Recommended External Fuse	2A/250VAC Slow Fusing				

Hot Plug	Unavailable
Remote Control Terminal	Unavailable

Output Specification

Item		Operating Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		0%~100% load	--	±2.0	±3.0	%
Line Regulation		Nominal load	--	--	±0.5	
Load Regulation		20%~100% nominal load, balance load	--	--	±1.0	
Minimum Load		Single output	10	--	--	
Turn-on Delay Time		Input 45VDC (full load)	--	1500	--	mS
		Input 300VDC (full load)	--		--	
Power Off Holding Time		Input 45VDC (full load)	--	50	--	mS
		Input 300VDC (full load)	--		--	
Dynamic Response	Overshoot Range	25%-50%-25% 50%-75%-50%	-5.0	--	+5.0	%
	Recovery Time		-5.0	--	+5.0	mS
Output Overshoot		0%~100% load	⩽10%Vo			%
Short circuit protection			Continuous, Self-recovery			Hiccup
Drift Coefficient		--	--	±0.03%	--	%/℃
Over-current Protection		--	⩾130% Io, self-recovery			Hiccup
Output Over-voltage Protection		Output 12V	--	--	16	VDC

General Specification

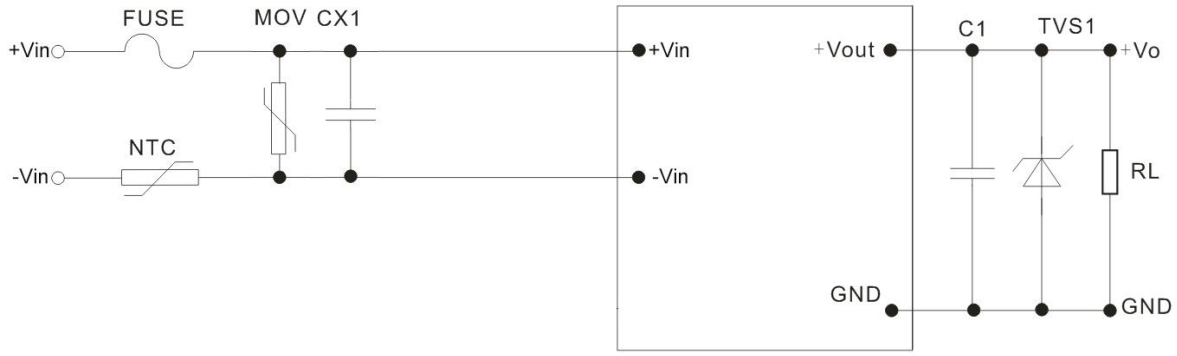
Item		Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature		--	-40	--	+85	℃
		Refer to Temperature Derating Curve, details see the Product Character Curve at back				
Storage Temperature		--	-40	--	+105	℃
Soldering Temperature		Wave-soldering	260±5℃，time: 5-10S			
		Manual-welding	380±10℃，time: 4-10S			
Relative Humidity		--	10	--	90	%RH
Isolation Voltage	Input-Output	Test for 1 minute, leakage current ≤5mA	4000	--	--	VAC
Insulation Resistance	Input-Output	@DC500V	100	--	--	MΩ
Safety Standard		--	IEC/EC62368			
Vibration		--	10-55Hz, 10G, 30Min, along X,Y, Z			

Safety Class	--	CLASS Ⅱ
Case Class	--	UL94V-0
Mean Time Between Failures	--	MIL-HDBK-217F 25℃>300,000H

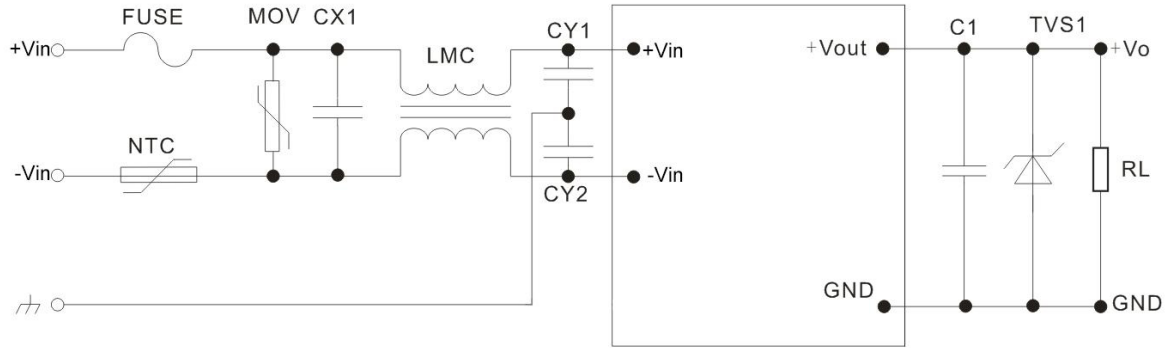
Physical Specifications

Case Material		Black Aluminum Case
Package Dimensions	Horizontal package	70.0X48.0X23.5mm
Product Weight		115g(TYP)
Cooling Method		Free Air Convention

EMC External Recommended Circuit



Picture 1



Picture 2

Note:

1. To remove high-frequency noise, the output filter capacitor C1 is recommended to be a 1μF ceramic capacitor, and the capacitor withstand voltage derating is greater than 80%.

2. It is recommended to use TVS tube to protect the downstream circuit (when the module is abnormal). It is recommended to use the 600W model.

5V output recommended use: SMBJ7.0A, 9V output recommended use: SMBJ12.0A, 12V output recommended use: SMBJ20A, 15V output recommended use: SMBJ20.0A, 24V

Recommended output: SMBJ30.0A, 48V Recommended output: SMBJ64A

3. MOV is a varistor, recommended model: 10D561K, which is used to protect the module from damage during lightning surges.

4. For customers' general application requirements, use the recommended circuit in Figure 1. If there are higher EMC requirements, please use the recommended circuit in Figure 2. Figure 2 The specific recommended values are as follows:

1) Varistor MOV: Recommended model: 10D-561K, used to protect the module from damage during lightning surges.

2) Thermistor NTC: 10D-9;

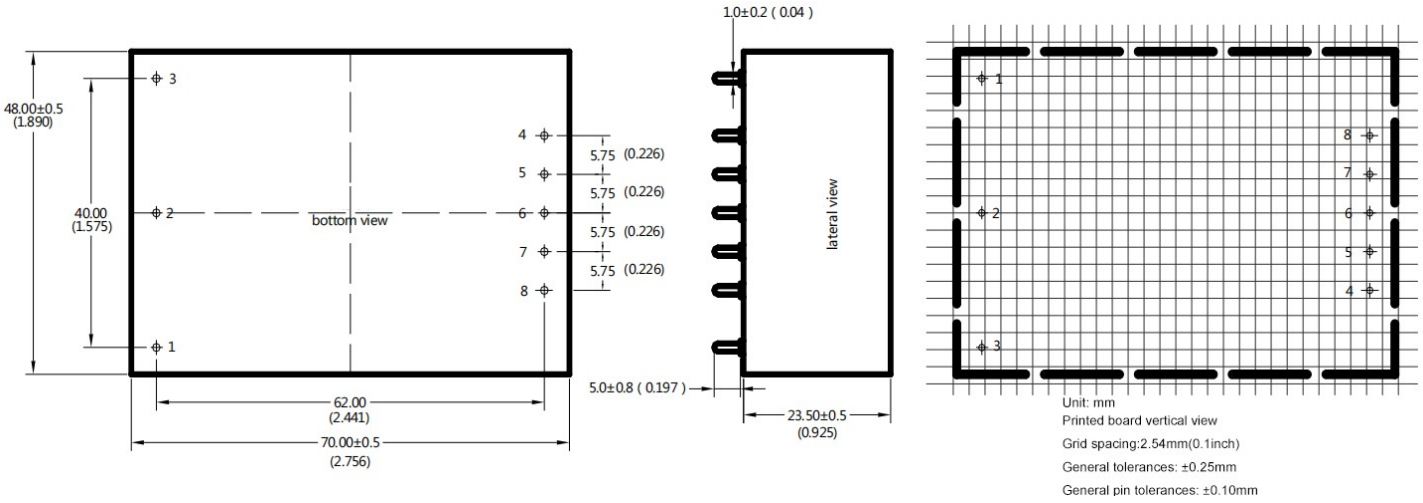
3) Safety capacitors CY1 and CY2: 1000pF/400VAC;

4) Safety capacitor CX: 0.1μF/275VAC;

5) Common mode inductor LCM: 15mH-30mH;

6). FUSE (fuse): Must be connected, recommended specification is 3.15A/250V, slow fusing.

Dimension and Pin out Specifications



Pin out Specification:

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

Dimension

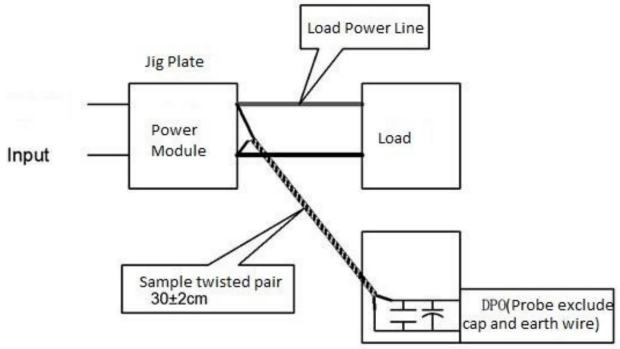
Packing code	L x W x H	
H1N4	70.0X48.0X23.5 mm	2.756X1.890X0.925inch

Ripple & Noise Test Instruction (Twisted Pair Method, 20MHZ bandwidth)

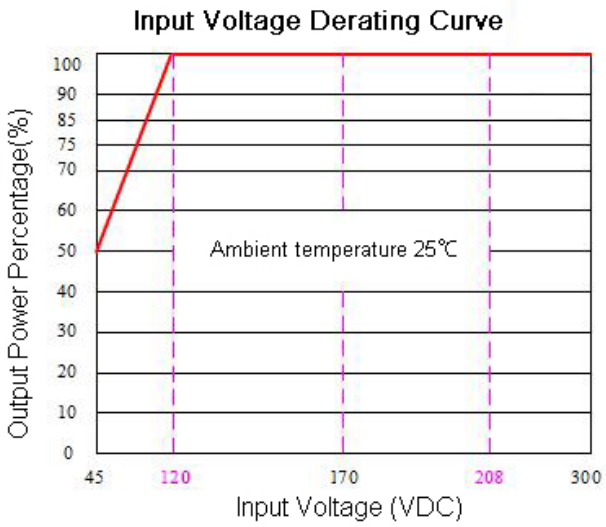
Test Method:

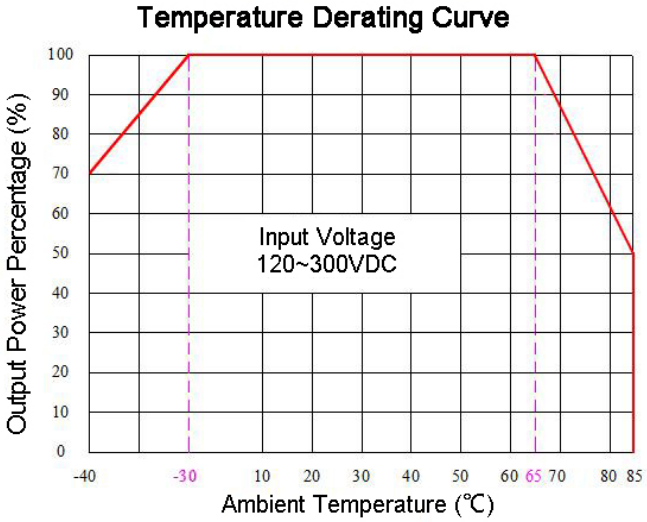
1) Ripple noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set on the Sample Mode.

2) The output ripple noise test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curve





Note 1: When the input voltage is 45~120VDC and the temperature is -40~85℃, voltage derating must be performed based on the input voltage derating curve.

Note 2: This product is suitable for use in a natural wind cooling environment. If it is used in a closed environment, please contact our company.

Note:

1.The products should be used according to the specifications in this manual, otherwise it could be permanently damaged.

2. A fuse should be used at input.

3. The product performances in this manual cannot be guaranteed if it works at a lower load than the minimum load defined.

4. The product performances in this manual cannot be guaranteed if it works at over-load condition.

5. Unless otherwise specified, all values or indicators in this manual are tested at Ta=25℃, humidity<75%RH, rated input voltage and rated load (pure resistance load).

6. All values or indicators in this manual had been tested based on Aipupower test specifications.

7.The specifications are specially for the parts listed in this manual, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirement.

8. Aipupower can provide customization service.

9. The product specifications may be modified without a prior notice. Please refer to the published data sheet in Aipupower website.