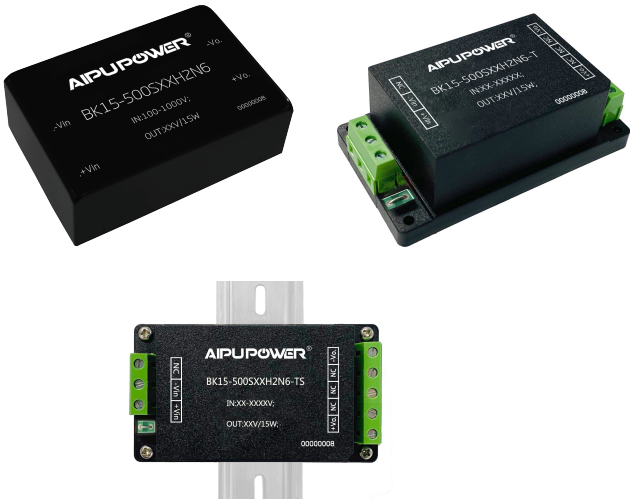
DC/DC Converter
BK15-500SXXH2N6(-T)(-TS) Series

Typical Features

- ◆ Wide input voltage range 100-1000VDC
- ◆ No-load power consumption ≤0.4W @500VDC
- ◆ Switching Frequency 65KHz
- ◆ Efficiency 85% (Typ.)
- ◆ Input Anti-reverse, output over-voltage, over-current & short circuit protections
- ◆ Isolation voltage 4000VAC
- ◆ Compliant with IEC/EN62368
- ◆ Conform to CE & RoHS regulation
- ◆ Encapsulated in plastic case, flame class UL94V-0



Application Field

BK15-500SXXH2N6 Series ---- *High efficiency & high reliability DC/DC modular converters with ultra-wide input voltage range from 100 to1000VDC. This series of products can be widely used in the solar power generation and high voltage inverter, etc. The multi-protection functions can keep the power supply and load safety while operating at abnormal conditions. The additional circuit for EMC is recommended in this data sheet for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No.	Output Specification			Capacitive Load Max. (200-1000VDC)	Ripple & Noise 20MHz (Max)	Efficiency @Full load 500VDC (Typ.)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)	(u F)	mVp-p	%
-	BK15-500S12H2N6(-T)(-TS)	15	12	1250	2000	200	82
-	BK15-500S15H2N6(-T)(-TS)	15	15	1000	2000	200	82
-	BK15-500S24H2N6(-T)(-TS)	15	24	625	800	200	85

Note 1 - The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2 - The full load efficiency should be in ±2% of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.

Note 3 - The ripple and noise are tested by the twisted pair method, refer to the following Test Instructions.

Note 4 - Please contact with Aipu sales for other output voltages requirement in this series but not in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	--	--	65	70	KHz
Input Voltage Range	DC Input	100	500	1000	VDC
Input Current	100VDC	--	0.305	--	A
	500VDC	--	0.060	--	
Surge Current	200VDC	--	7	--	
	600VDC	--	20	--	

No-load Power consumption	Input 500VDC	--	--	0.40	W
Recommended External Fuse	--	2A/1000V, necessary			
Hot Plug	--	N/A			
Remote Control	--	N/A			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Input full voltage range, any load	--	±2.0	±3.0	%
Line Regulation		Rated load	--	±0.5	±1.2	
Load Regulation		Input nominal voltage, 20%~100% load	--	±1.0	±2.0	
Minimum Load		Single Output	10	--	--	
Turn-on delay		Input 100VDC (Full load)	--	5000	--	mS
		Input 1000VDC (Full load)	--	1000	--	
Power off Holde up time		Input 500VDC (Full load)	--	10	--	
Dynamic Response	Overshoot	25%-50%-25% 50%-75%-50%	-6.0	--	+6.0	%
	Recovery		--	500	--	mS
Output Overshoot		Input full voltage range	≤10%Vo			%
Short circuit protection		Input 100-700VDC	Continuous, self-recovery			Hiccup
Drift coefficient		--	--	±0.05%	--	%/℃
Over current protection		Input 200-1000VDC	≥110% Io, self-recovery			Hiccup
Over-voltage protection		12V	≤16			VDC
		15V	≤19			
		24V	≤32			

General Specifications

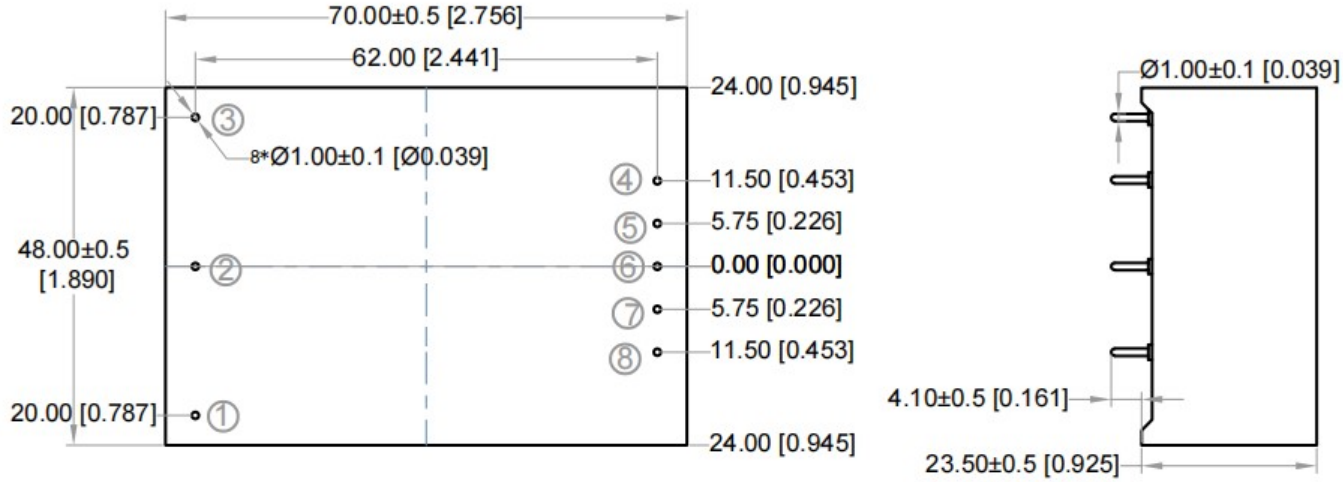
Item	Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature	Please refer to the Temperature Derating Curve	-30	--	+70	℃
Storage Temperature	--	-40	--	+85	
Soldering Temperature	Wave-soldering	260±5℃，time: 5-10S			
	Manual-soldering	380±10℃，time: 4-7S			
Relative Humidity	No condensing	--	--	90	%RH
Isolation Voltage	Input-Output, Test 1min, leakage current ≤5mA	4000	--	--	VAC
Insulation Resistance	Input-Output @DC500V	100	--	--	MΩ
Safety Standard	--	IEC/EN62368			
Vibration	--	10-55Hz,10G,30 Min, along X,Y,Z			
Safety Class	--	CLASS Ⅱ			
Flame class of case	--	UL94V-0			

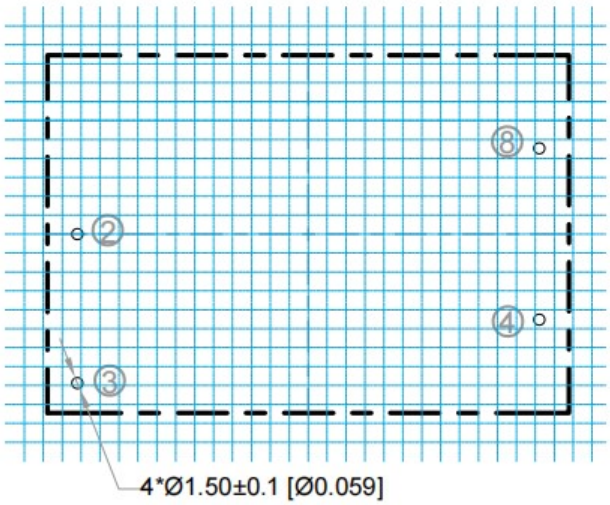
MTBF	MIL-HDBK-217F@25℃	＞300KH
Cooling Method	--	Nature air

Physical Characteristics

Case Material	Plastic in Black, flame class UL94V-0		
Packaging	DIP Mounting(H2N6)	Chassis with terminals(-T)	DIN rail with terminals(-TS)
Unit Dimensions	70.0X48.0X23.5mm	96.0X53.8X32.5mm	96.0X53.8X37.0mm
Unit Weight	115g（TYP）	130g（TYP）	150g（TYP）

H2N6 Mechanical Dimensions



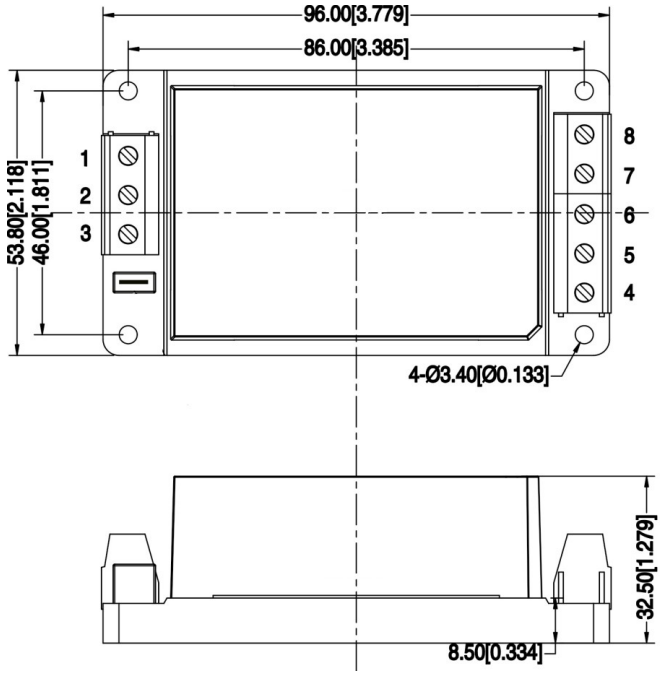


PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

Note:
Unit: mm[inch]
Pin diameter tolerance: ±0.10 [±0.004]
General tolerance: ±0.50 [±0.020]

Packaging Code	Dimensions L x W x H	
H2N6	70.0 X 48.0 X 23.5 mm	2.756X1.890X0.925 inch

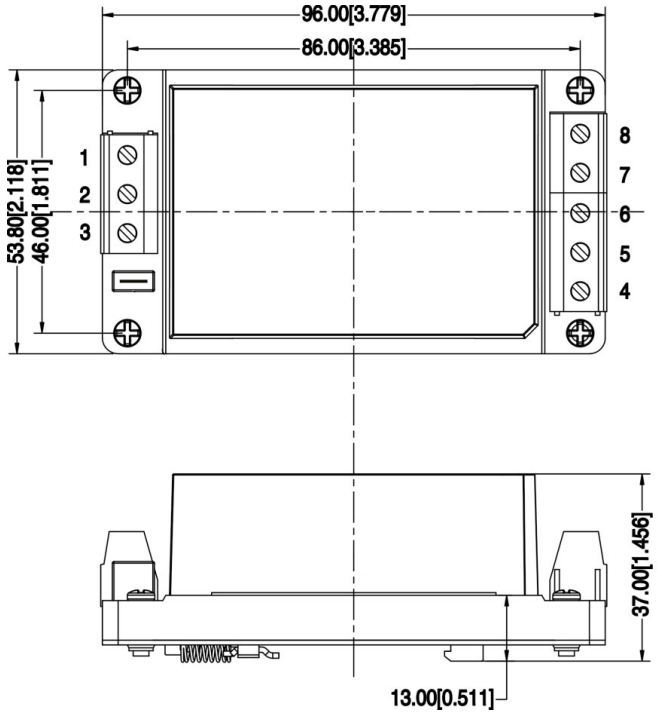
H2N6-T Mechanical Dimensions



Unit	mm[inch]
Lead Wire Size	22-12AWG
Screwing torque	Max 0.4N.m
General tolerance	±1.00 [±0.039]

Packaging Code	Dimensions L x W x H	
H2N6-T	96.0X53.8X32.5 mm	3.779X2.118X1.279 inch

H2N6-TS Mechanical Dimensions



Unit	mm[inch]
Lead Wire Size	22-12AWG
Screwing torque	Max 0.4N.m
General tolerance	±1.00 [±0.039]

Packaging Code	Dimensions L x W x H	
H2N6-TS	96.0X53.8X37.0 mm	3.779X2.118X1.456 inch

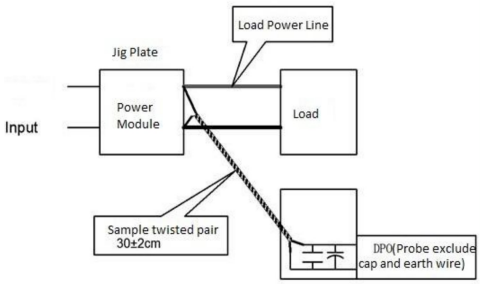
Pin/Terminal Function Description

No.	1	2	3	4	5	6	7	8
Single (S)	No Pin	-Vin	+Vin	+Vout	No Pin	No Pin	No Pin	GND

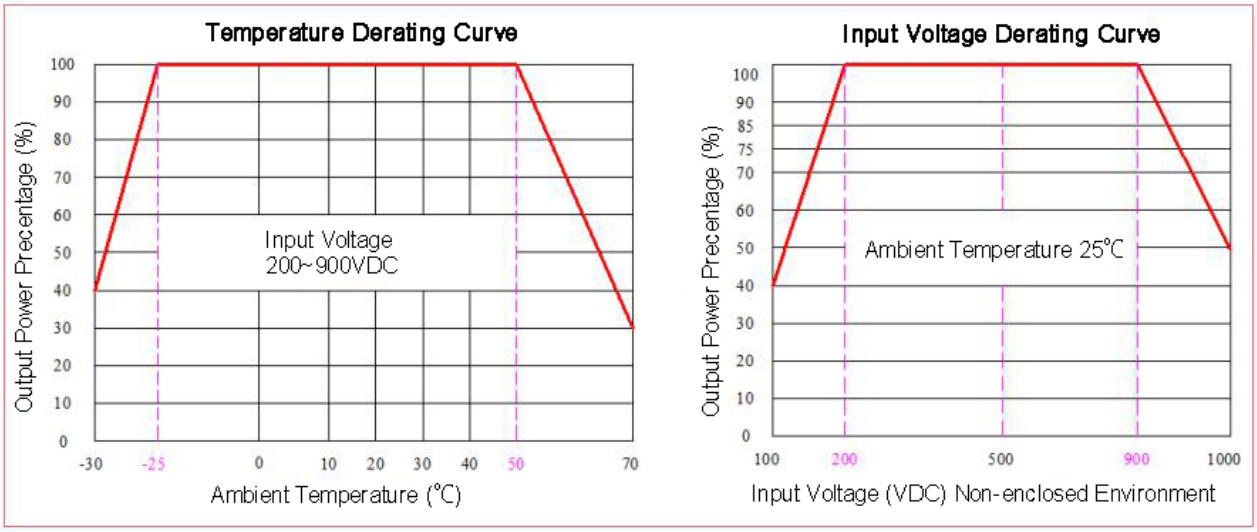
Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

1) The Ripple & noise test needs AWG12# 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 at the Sample Mode.

2) The 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.



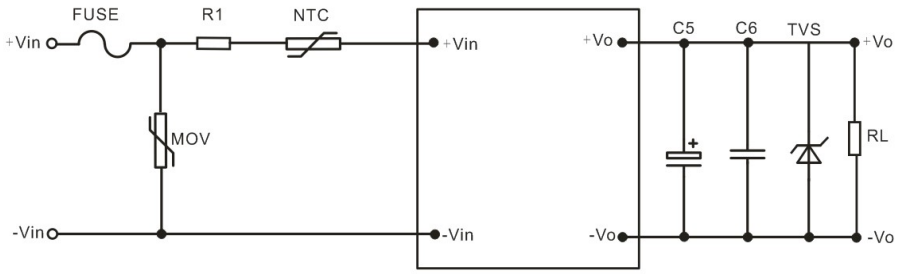
Product Performance Curves



Note 1 - The output power should be derated based on the input voltage derating curve at 100~200/900-1000VDC.

Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

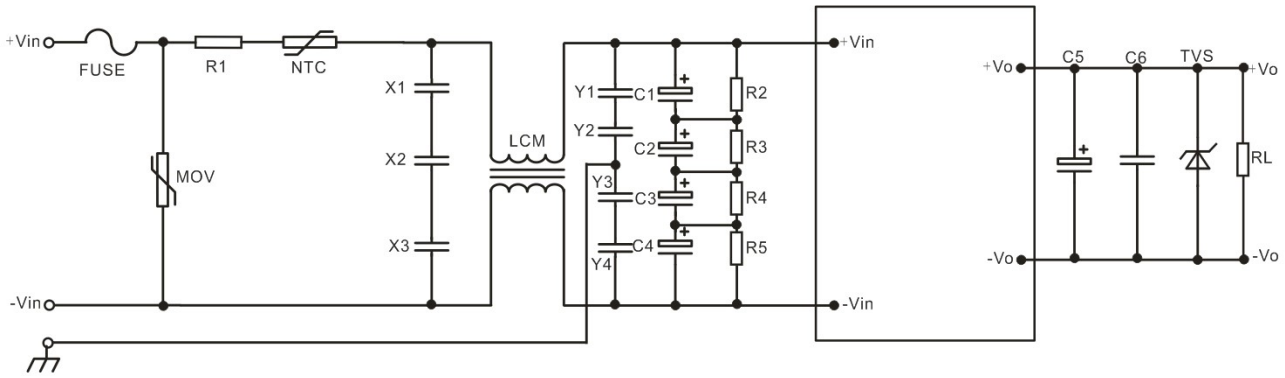
Typical Application Circuit



Output Voltage	C5	C6	TVS
12V	330uF/35V	0.2uF/50V/1206	SMBJ18A
15V	330uF/35V	0.2uF/50V/1206	SMBJ18A
24V	220uF/50V	0.1uF/50V/1206	SMBJ28A

Note - A high-frequency low-resistance electrolytic capacitor is recommended for C5 which capacitance and current should refer to the manufacturer's technical specification, its withstand voltage should be derated at least 80% of rated. A ceramic SMD capacitor is recommended for C6 which can suppress the high-frequency noise. TVS is recommended to protect the output circuit while the power supply operating at abnormal condition.

Recommended EMC Circuit



Component	Function	Recommended Value	Remarks
FUSE	Shut off the input when the converter operating at abnormal condition	TBD according to the actual input current	Necessary
R1 (Current-Limiting Resistor)	Suppress the start-up transient surge current	300Ω/10W (Cement type resistor)	
NTC	Suppress the surge current	5D-15	
MOV (Metal Oxide Varistor)	Absorb the surges	20D152K/6500A	Optional according to the actual application
X1/X2/X3 (X1 capacitor)	Suppress the differential mode interference	X1/105K/440VAC	
LCM (Common mode Choke)	Suppress the Common mode interference	8mH/0.8A	
Y1/Y2/Y3/Y4 (Y capacitor)		Y1/222M/400VAC	
C1/C2/C3/C4 (E-cap)	Low frequency Filtering	200uF/400V	
R2/R3/R4/R5(SMD resistor)	Voltages balance	1MΩ/2W	

Application Notice

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

2. A fuse should be connected at input.

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

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

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

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

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

8. Aipupower can provide customization service.

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