

Typical Features

- ◆ Wide input voltage range 100-1000VDC
- ◆ Standby power consumption $\leq 0.4\text{W}@500\text{VDC}$
- ◆ Efficiency up to 85% (Typ.)
- ◆ Operating temperature from -30°C to $+70^{\circ}\text{C}$
- ◆ Input reverse polarity protection
- ◆ Output over current & short circuit protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operation 3000m Max
- ◆ Compliant with IEC/EN62368
- ◆ Conform to CE regulations
- ◆ Enclosed plastic case, flame class UL94-V0
- ◆ Industrial level design, standard size



Application Field

BK15-500SXXH2N6 Series --- High efficiency & high reliability DC/DC modular converters with ultra-wide input voltage range from 100 to 1000VDC. This series of products can be widely used for Solar power generation and High voltage inverter, etc. The multi-protection functions can keep the power supply and load safety while operating under abnormal conditions. Additional circuit diagram for EMC is recommended for the application with high EMC requirements.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Specification			Max Capacitive Load @500VDC	Ripple & Noise 20MHz (Max)	Efficiency @Full load 500VDC (Typ.)
		Nominal	Range	Power	Voltage	Current			
		(VDC)	(VDC)	P(W)	Vo(VDC)	Io(mA)			
-	BK15-500S12H2N6	500	100-1000	15	12	1250	2000	200	82
-	BK15-500S15H2N6				15	1000	2000	200	82
-	BK15-500S24H2N6				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 $\pm 2\%$ 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: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Note 4: The suffix -T indicates the chassis package, -TS indicates the package of DIN Rail which width is 35mm.

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input voltage range	DC Input	100	500	1000	VDC
Standby power consumption	Input 100VDC	-	-	0.4	W
	Input 500VDC				

Input current	100VDC	-	0.305	-	A
	500VDC	-	0.060	-	
Surge current	200VDC	-	7	-	A
	500VDC	-	20	-	
Recommended external fuse	-	2A /1000VDC, required			
Hot-Plug	-	N/A			
ON/OFF Control	-	N/A			

Output Specifications

Item		Test Condition	Min.	Typ.	Max.	Unit
Output voltage accuracy		Full input voltage range, any load	-	±2.0	±3.0	%
Line regulation		Full input voltage range	-	±0.5	±1.2	
Load regulation		Nominal input voltage, 20%~100% load	-	±1.0	±2.0	
Ripple & Noise		Full input voltage range, 20MHz bandwidth	-	-	200	mVp-p
Dynamic response	Overshoot range	25%-50%-25%	-	±5.0	±6.0	%
	Recovery time	50%-75%-50%	-	500	-	ms
Minimum load		Single Output	10	-	-	%
Temperature Drift coefficient		-	-	-	±0.05	%/°C
Turn-on delay time		Input 100VDC (Full load)	-	-	5000	ms
		Input 500VDC (Full load)	-	-	1000	
Power off hold-up time		Input 500VDC (Full load)	-	100	-	ms
Output start-up overshoot		0%-100% load	≤10			%Vo
Short circuit protection		Input 100-700VDC	Continuous, self-recovery			Hiccup
Over current protection		Input 200-1000VDC	110%Io	-	200%Io	mA

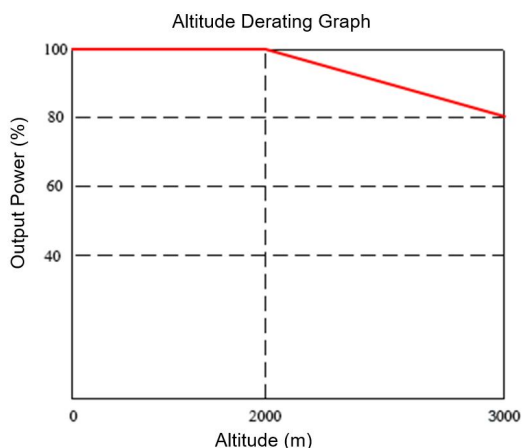
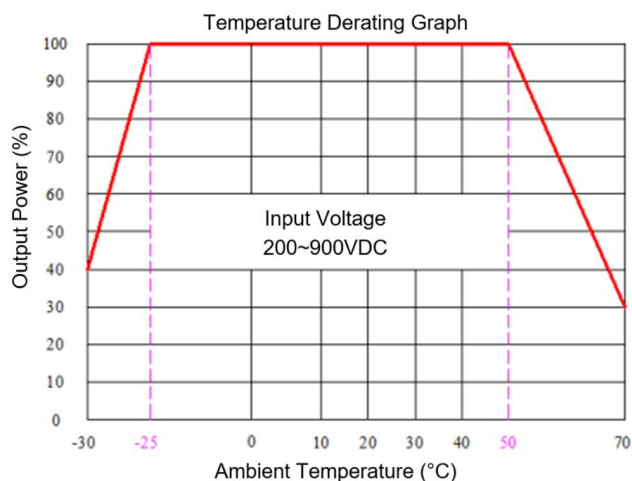
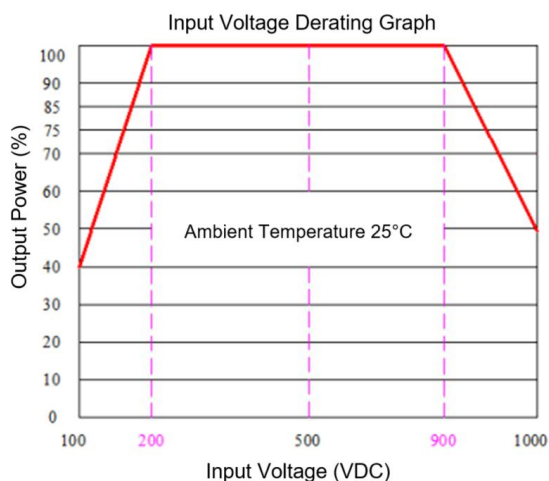
Note: The Ripple and Noise is tested by the Parallel-line method, please refer to the following test instruction.

General Specifications

Item	Test Condition		Min.	Typ.	Max.	Unit
Switching frequency	-		-	65	70	KHz
Operating temperature	Please refer to the Temperature Derating Graph		-30	-	+70	℃
Storage temperature	-		-40	-	+85	
Soldering temperature	Wave-soldering		260±4℃, time: 5-10S			
	Manual-soldering		360±8℃, time: 4-7S			
Relative humidity	No condensing		-	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current ≤5mA	4000	-	-	VAC
Insulation resistance	I/P-O/P	@DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F@25℃		300	-	-	K Hours
Vibration	-		10-55Hz,10G,30 Min, along X, Y, Z			
Flame class of case	-		UL94-V0			

Weights & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	BK15-500SXXH2N6	115g	70.0 X 48.0 X 23.5 mm	2.756 X 1.890 X 0.925 inch
	BK15-500SXXH2N6-T	160g	96.0 X 53.8 X 32.5 mm	3.779 X 2.118 X 1.279 inch
	BK15-500SXXH2N6-TS	195g	96.0 X 53.8 X 37.0 mm	3.779 X 2.118 X 1.456 inch

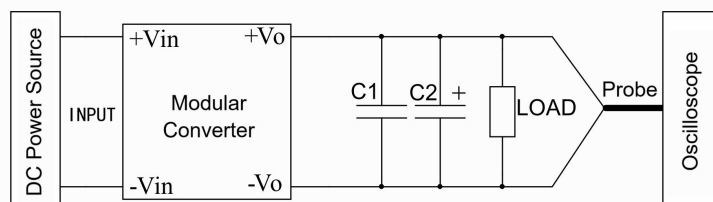
Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 100~200VDC & 900~1000VDC.

Note 2: This product should operate under the condition of natural air, please contact us if it could be used at a closed space.

Ripple & Noise Test Instruction (Parallel-line Method, 20MHz Bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high frequency low impedance electrolytic capacitor C2(10uF) are connected in parallel with the probe.

2. Refer to the test diagram, 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 test can start at the converter output terminals after the input power on.

Recommended Circuits for Application

1. Typical application circuit diagram

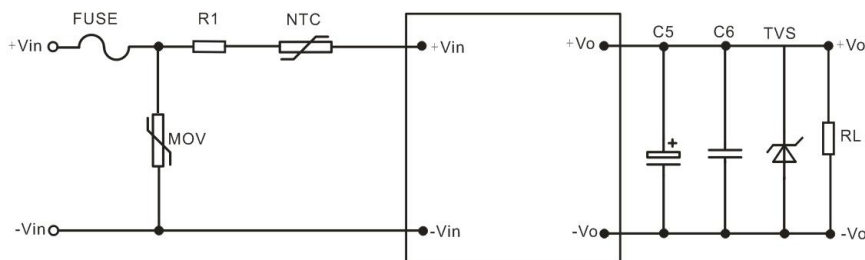


Figure – Circuit 1

Output Voltage	C5	C6	TVS
12V	330uF/35V	0.22uF/50V/1206	SMBJ18A
15V	330uF/35V	0.22uF/50V/1206	SMBJ18A
24V	220uF/50V	0.1uF/50V/1206	SMBJ28A

Note: A high-frequency low-impedance electrolytic capacitor is recommended for C5 which capacitance and current should refer to the manufacturer's technical specification, it's withstanding voltage should be derated at least 80% of rated. A ceramic capacitor is recommended for C6 to suppress the high-frequency noise. TVS is to protect the output circuit under abnormal conditions.

2. Recommended EMC circuit diagram (for high EMC requirements)

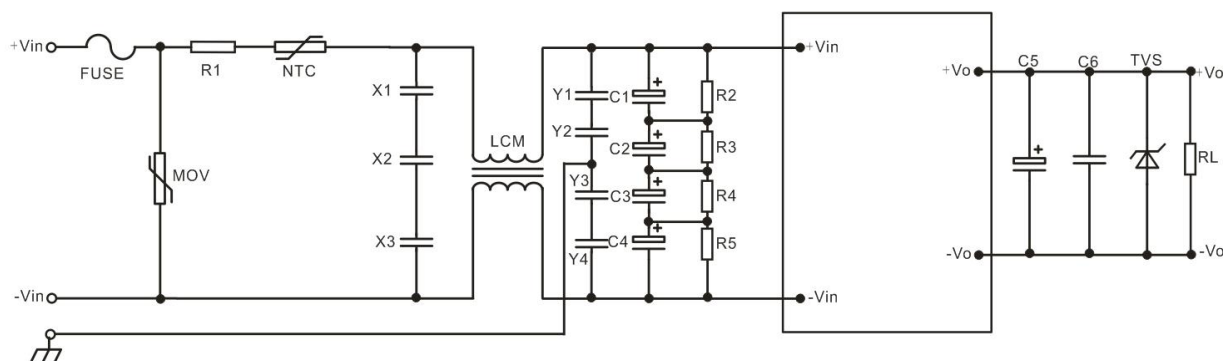
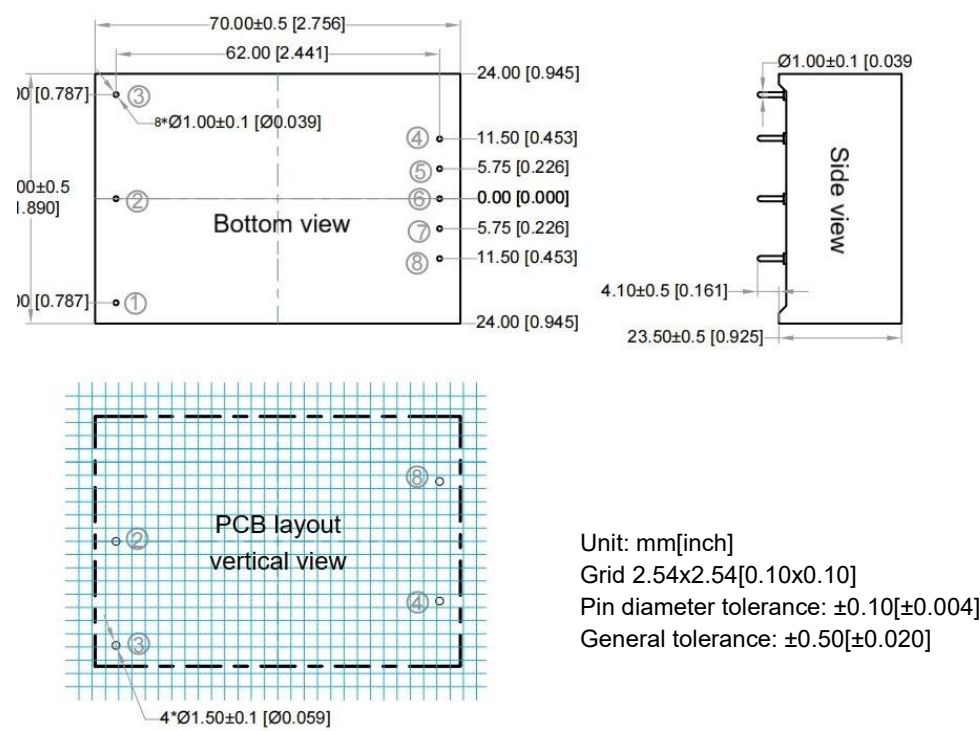


Figure – Circuit 2

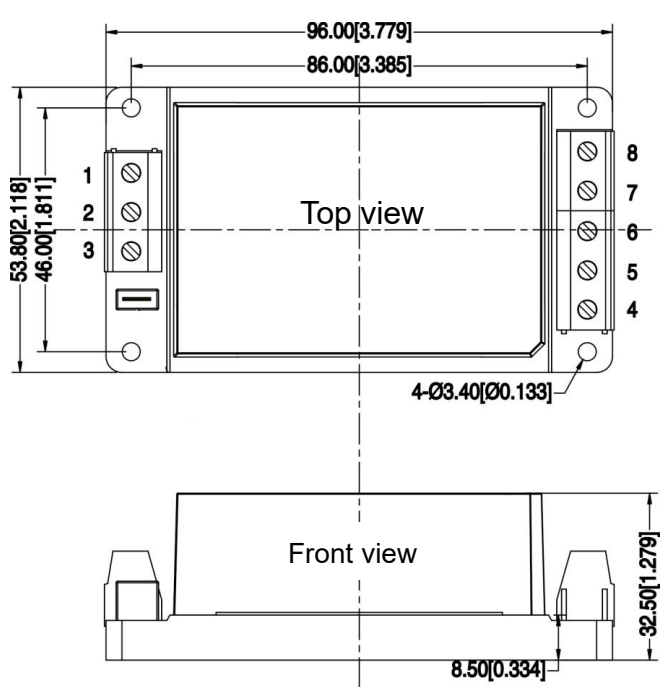
Component	Function Description	Recommended Value	Remarks
FUSE	Shut off the input while the converter operating under abnormal conditions	2A/1000VDC	Required
R1 (Current-Limiting Resistor)	Suppress the start-up transient surge current	100Ω/10W (Cement type resistor)	
NTC	Suppress the surge current	5D-15	
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/450V	
R2/R3/R4/R5(SMD resistor)	Voltages balance	1MΩ/2W	

Mechanical Dimensions



Pin-out Function Description								
Pin No.	1	2	3	4	5	6	7	8
Function	No Pin	-Vin	+Vin	+Vo	No Pin	No Pin	No Pin	-Vo

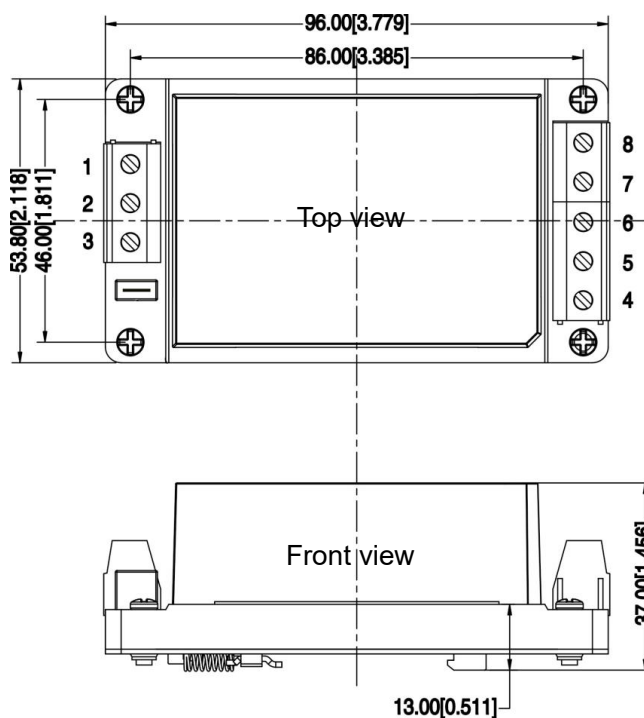
-T Package Mechanical Dimensions



Note:
Unit: mm[inch]
Lead wires gauge: 24-12 AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00 [±0.039]

Terminal Function Description								
Terminal No.	1	2	3	4	5	6	7	8
Function	NC	-Vin	+Vin	+Vo	NC	NC	NC	-Vo

-TS Package Mechanical Dimensions



Note:

Unit: mm[inch]

Lead wires gauge: 24-12 AWG

Screwing torque: 0.4 N.m Max

General tolerance: $\pm 1.00[\pm 0.039]$

Terminal Function Description

Terminal No.	1	2	3	4	5	6	7	8
Function	NC	-Vin	+Vin	+Vo	NC	NC	NC	-Vo

Application Notice

1. The product should be used according to the specifications, otherwise it could be permanently damaged.
2. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.
3. The product performance cannot be guaranteed if it works under over-load condition.
4. Unless otherwise specified, all values or indicators on this datasheet are tested at $T_a=25^{\circ}\text{C}$, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
5. All values or indicators on this datasheet have been tested based on Aipupower test specifications.
6. The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
7. Aipupower can provide customization service.

Guangzhou Aipu Electron Technology Co., Ltd

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.

Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com Website: [https:// www.aipupower.com](https://www.aipupower.com)