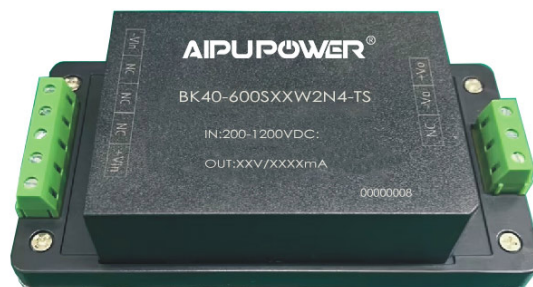


Typical Features

- ◆ Wide input voltage range 200-1200VDC
- ◆ Industrial grade design, international standard size
- ◆ Efficiency 84% (Typ.)
- ◆ Switching frequency 65KHz
- ◆ Input anti-reverse, under voltage protections
- ◆ Output short circuit, over-current, over-voltage protections
- ◆ Isolation voltage 4000VDC
- ◆ Application for Solar electric power generation, high-voltage frequency conversion



Application Field

BK40-600SXXW2N4-TS Series ----- Compact size & high-efficiency module converters with wide input voltage range, low ripple, low temperature rise, low power consumption, high reliability, safety isolated and good EMC performance. This series of products are widely used in the fields of solar electric power generation, home energy storage and industry control, etc. The multi-protection functions can keep the power supply and the load safety 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 Specifications			Max. Capacitive Load	Ripple & Noise 20MHz (Max.)	Efficiency @600VDC/ full load (Typ.)
		Power	Voltage	Current			
		(W)	Vo (V)	Io (mA)	uF	mVp-p	%
-	BK40-600S12W2N4-TS	40	12	3333	1200	250	83
-	BK40-600S15W2N4-TS		15	2667	1000	250	84
-	BK40-600S24W2N4-TS		24	1667	800	250	85

Note

- 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.
- 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.
- 3: The ripple and noise are tested by the twisted pair method. For details understood, please refer to the following Ripple & Noise Test Instructions.
- 4: Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	DC input	200	600	1200	VDC
Input Current	200VDC@100% Load	--	--	0.250	A
	600VDC@100% Load	--	--	0.082	
	1200VDC@100% Load	--	--	0.043	
Input No-load Current	Output no load	--	--	0.6	mA

Input Under-Voltage Protection	Start protection	175	--	185	VDC
	Recovery	187	--	197	
Recommended External Fuse	--	4A/1500VDC, necessary			
Input Anti-reverse	--	Available			
Hot Plug	--	Unavailable			

Output Specifications

Item		Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy		Input full voltage range, any Load	Vo	--	±2.0	±3.0	%
Line Regulation		Rated load	Vo	--	±1.0	±1.5	
Load Regulation		Input rated voltage, 20%~100% load	Vo	--	±2.0	±3.0	
Minimum Load		Single output		10	--	--	
Turn-on Delay Time		800VDC Input		-	400	-	mS
Power off hold up time		500VDC Input		-	5	-	
		1000VDC Input		-	10	-	
Dynamic Response	Overshoot Range	25%-50%-25%		-	±5.0	±6.0	%
	Recovery Time	50%-75%-50%		-	-	500	mS
Output Overshoot		Full input voltage range		≤10%Vo			%
Output Short-circuit Protection				Continuous, self-recovery			Hiccup
Temperature Drift Coefficient		--		-	±0.03%	-	%/°C
Over-current Protection		Full input voltage range		≥ 110%Io, self-recovery			Hiccup
Over-voltage Protection				Feedback-clamp amplitude limit			

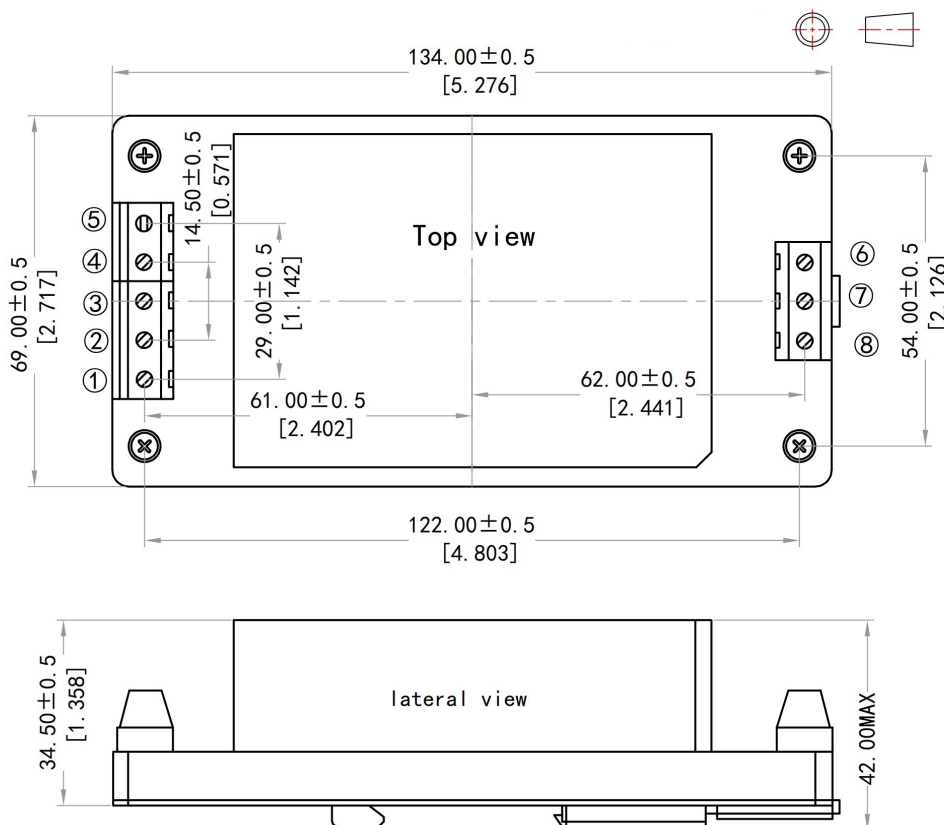
General Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency		--	--	65	--	KHz
Operating Temperature		Refer to the Temperature Derating Curve	-30	--	+70	°C
Storage Temperature			-40	--	+85	
Case Temperature Rise		Ta=30℃@ Output 100% load	--	55°	--	°C
Soldering Temperature		Wave-soldering	260±4℃, time 5-10S			
		Manual-soldering	360±8℃, time 4-7S			
Storage Humidity		--	--	--	95	%RH
Isolation Voltage	Input- Output	test 1min, leakage current ≤5mA	4000	--	--	VDC
Insulation Resistance		@500VDC	--	100	--	MΩ
Altitude		--	--	--	2000	m
Vibration		--	10-55Hz, 10G, 30 Min, along X, Y, Z			
Safety Class		--	CLASS II			
MTBF		--	MIL-HDBK-217F @ 25℃>300,000H			

Physical Characteristics

Case Material		Plastic
Dimensions	Vertical packaging	134.00x 69.00 x 42.00 mm
Product Weight		360g (TYP)
Cooling Method		Nature air

Mechanical Dimensions



Package Code	L x W x H	
-	134.00x 69.00 x 42.00 mm	5.276 × 2.717 × 1.654 inch

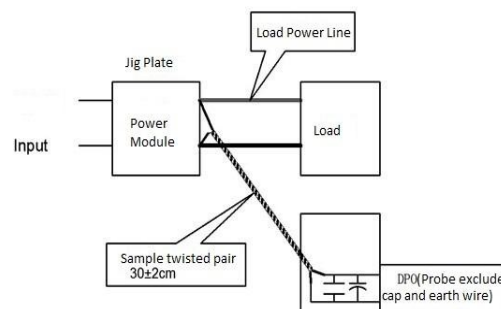
Pin function Definition

Pin No.	1	2	3	4	5	6	7	8
Single	+Vin	NC	NC	NC	-Vin	+Vo	-Vo	NC

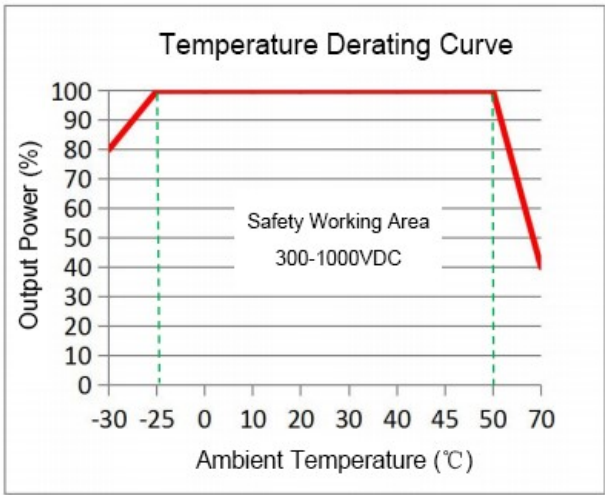
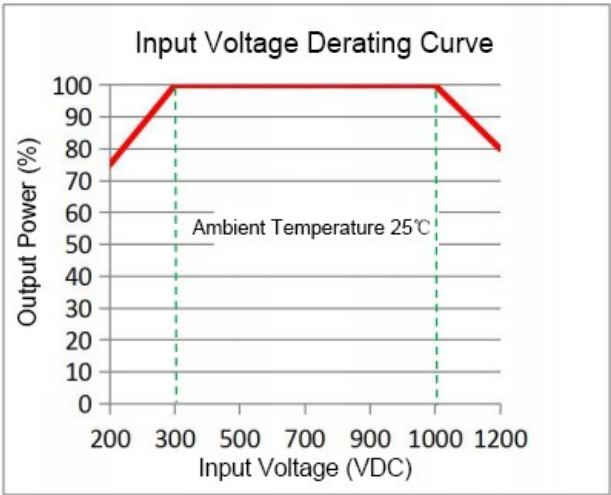
Ripple& Noise Test Instruction (Twisted Test Method, 20MHz bandwidth)

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 $30\text{cm} \pm 2\text{ cm}$) 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.



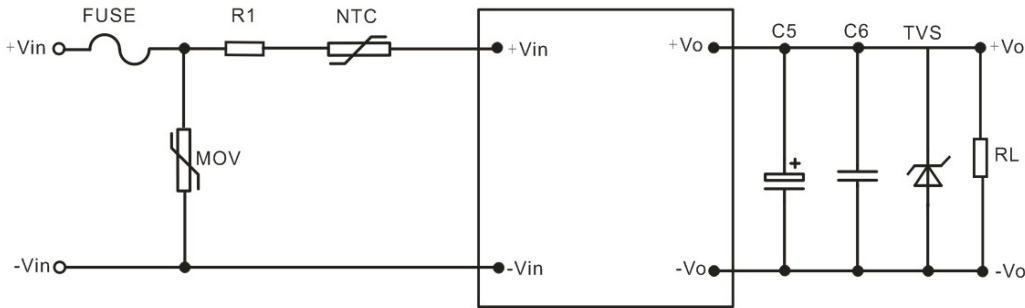
Product Performance Curves



Note 1: The output power should be derated based on the input voltage derating curve at 200~300VDC/1000~1200VDC.

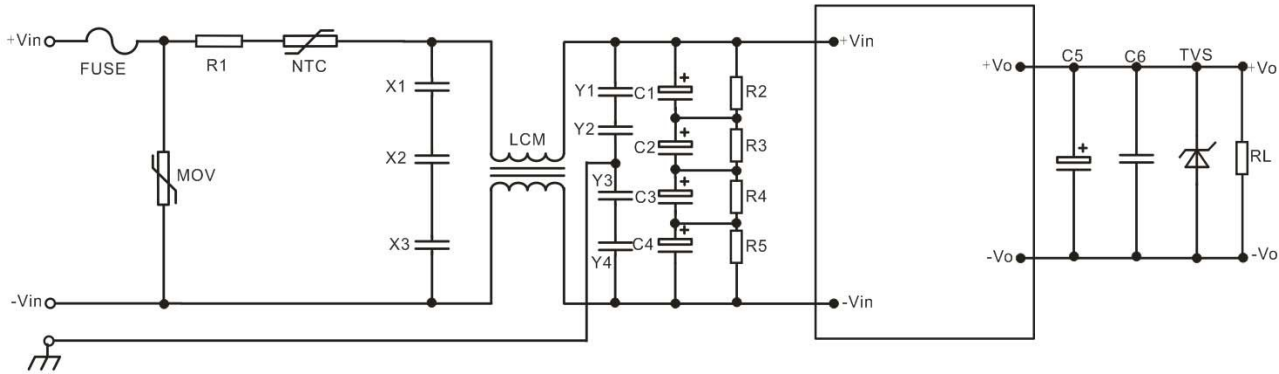
Note 2: This product should operate at a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuit for Application



Output Voltage	FUSE	MOV	R1	NTC	C5	C6	TVS
12V	4A/1500DC necessary	20D162K 6500A	6.8Ω /10W Cement type resistor	10Ω/6A/ 20D	470uF/25V	1uF/50V 1206	SMBJ18A
15V					330uF/50V		SMBJ20A
24V					220uF/50V		SMBJ30A

Recommended External Circuit for EMC



Component	Description	Recommended Value	Remarks
FUSE	Cut off the input in case converter operating at abnormal condition	TBD by actual current value	Necessary
R1(current-limiting resistor)	Suppress the start-up transient surge current	6.8Ω/10W Cement type resistor	
NTC	Suppress the surge current	10Ω/6A/20D	
MOV (Metal Oxide Varistor)	Absorb the surges	20D182K6500A	Optional according to the actual application
X1/X2/X3(CBB Capacitor)	Suppress the differential mode interference	1.0μF/630VDC	
LCM (CMC)	Suppress the Common mode interference	10mH/0.8A	
Y1/Y2/Y3/Y4 (Y Capacitor)		Y1/222M/400VAC	
C1/C2/C3/C4(E-Cap)	Low-frequency filtering	100uF/450V	
R2/R3/R4/R5 (SMD Resistor)	Voltages balance	1MΩ/1W	

Application Notice

- 1.The products should be used according to the specifications in this manual, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this manual cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance 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
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 requirements.
8. 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>