Typical Features

- Input voltage range 200-1500VDC
- No-load power consumption ≤1W
- Efficiency 81% (Typ.)
- Operating temperature from -40°C to +70°C
- Switching frequency 65KHz
- Short circuit, over-current & over-voltage protections
- Isolation voltage 4000VAC
- Altitude during operation 4000m Max
- Conform to CE
- Enclosed plastic case, flame class UL94-V0

Application Field

BK40-850SXXG2N6 Series ---- *High voltage DC-DC modular converters specially designed for Coal Mine developing requirements on safety power supplying, flexible & reliable assembly and technology innovation. The converters have the advantages of very wide input voltage range, low ripple, low temperature raise, low standby power consumption, high efficiency, high reliability and safety isolated. The additional circuit diagram for EMC is recommended in this data sheet for the application with high EMC requirement.*

Typical Product List

Certificate	Part No.	Output Specification			Max Capacitive Load@800VDC	Ripple & noise 20MHz (Max)	Efficiency @ Full load/800VDC
		Power	Voltage	Current			
		(W)	Vo (V)	Io (mA)	uF	mVp-p	% (Typ.)
-	BK40-850S12G2N6	40	12	3333	2000	100	77
	BK40-850S24G2N6	40	24	1667	1000	100	81
	BK40-850S28G2N6	40	28	1428	800	100	82
	BK40-850S32G2N6	40	32	1250	700	100	83
	*BK40-850S35G2N6	40	35	1150	600	100	84
	*BK40-850S37G2N6	40	37	1081	400	100	85

Note 1 - The * marked part has been developed in process.

Note 2 - The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 3 - 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 4 - The Ripple and Noise are tested by the twisted pair method according to the Test Instructions in the datasheet.

Note 5 - Please contact Aipu sales for other output voltages requirements in this series but not in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	DC Input	200	800	1500	VDC
Input Current	200VDC	-	-	0.30	A
	800VDC	-	-	0.08	

Surge Current	200VDC	-	-	180	A
	800VDC	-	-		
No-load Power Consumption	200VDC Input	-	-	1.0	W
	1500VDC Input	-	-		
Hot-plug	-	Unavailable			
Remote Control	-	Unavailable			
External Fuse Recommended	-	2A/1500VDC Time-delay fuse (Necessary)			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any Load	-	±2.0	±3.0	%
Line Regulation		Rated load	-	-	±0.5	
Load Regulation		Nominal input voltage, 10%~100% load	-	-	±1.0	
Minimum Load		Single output	0	-	-	%
Turn On Delay Time		Nominal input voltage (full load)	-	1000	-	mS
Power off hold up time		Input 200VDC (full load)	-	100	-	
		Input 1500VDC (full load)	-	150	-	
Dynamic Response	Overshoot Range	25%-50%-25% 50%-75%-50%	-5.0	-	+5.0	%
	Recovery time		-5.0	-	+5.0	mS
Output Overshoot		Input full voltage range	≤10% Vo			%
Short Circuit Protection			Self-recovery after short circuit removed			Hiccup
Drift coefficient		-	-	±0.03	-	%/℃
Ripple & Noise		-	-	-	100	mV
Over-current Protection		Input 800VDC	≥150% Io, Self-recovery			Hiccup
Over-voltage Protection		Output 12VDC	≤18			VDC
		Output 24VDC	≤30			
		Output 28VDC	≤35			
		Output 32VDC	≤40			
		Output 35VDC	≤43			
		Output 37VDC	≤45			

General Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the temperature derating graph	-40	-	+70	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4℃, 5-10S			

	Manual soldering	360±8℃, 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input - Output, 1Min, leakage current ≤5mA	4000	-	-	VAC
Insulation Resistance	Input – Output, @500VDC	50	-	-	MΩ
Vibration	-	10-55Hz,10G, 30Min, along X, Y, Z			
Safety Class	-	CLASS I			
Case Flame Class	-	UL94-V0			
MTBF	-	MIL-HDBK-217F@25℃＞300,000H			
Unit Weight	-	360g (Typ.)			

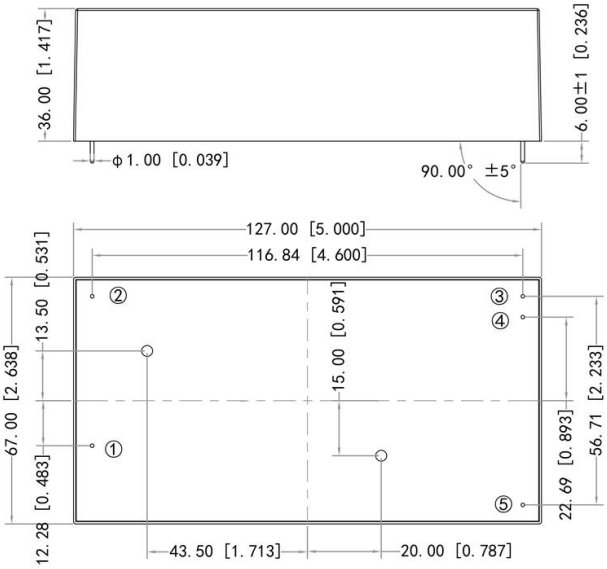
EMC Performances

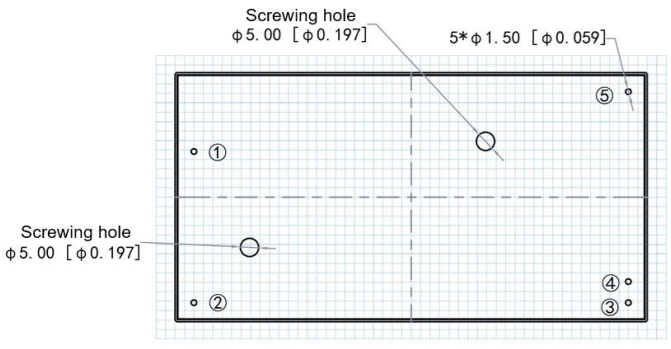
Total Item	Sub Item	Test Standard	Performance/Class
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV Perf.Criteria B
	RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
	Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B
	EFT	IEC/EN61000-4-4	±4KV Perf.Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A

Mechanical Dimensions

Unit: mm[inch]
Pin diameter tolerance ±0.10[±0.004]
General tolerance ±1.00[±0.039]
M3 screwing is recommended to meet hard vibration requirement, refer to the screwing hole dimensions.

Pin No.	Function
1	-Vin
2	+Vin
3	+Vout
4	-Vout
5	No Connection





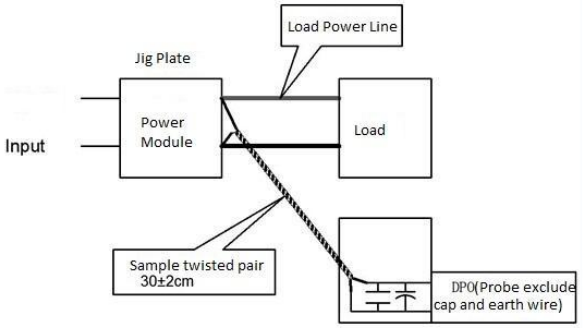
PCB layout vertical view Grid 2.54x2.54[0.10x0.10]

Package Code	Dimensions L x W x H	
-	127.00X67.00X36.00 mm	5.000X2.638X1.417 inch

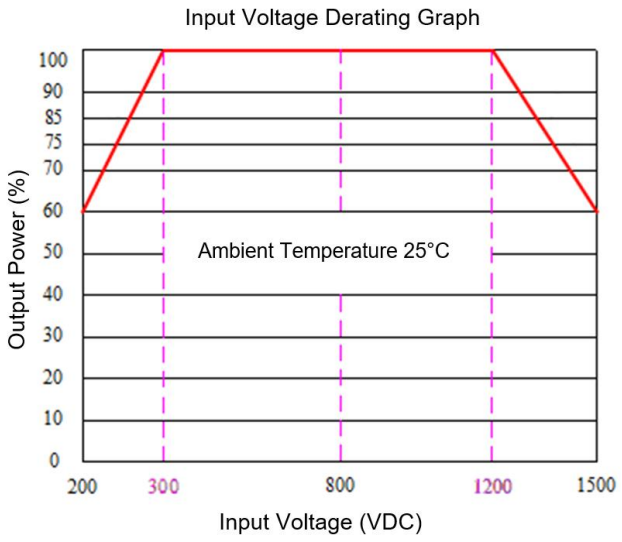
Ripple & Noise Test Instruction (Twisted Test Method, 20MHz bandwidth)

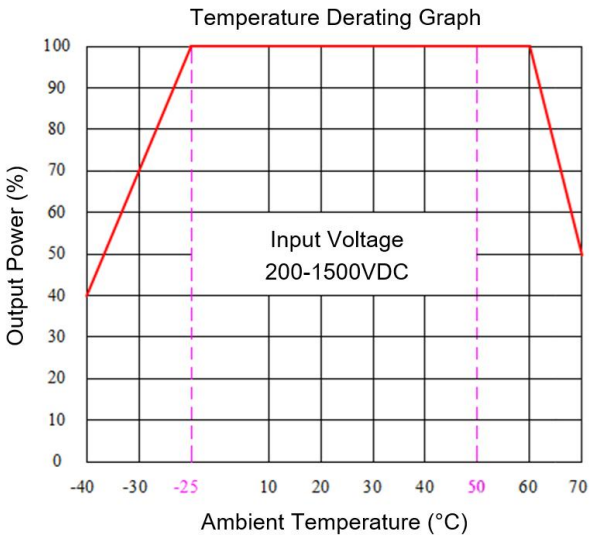
1)The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the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

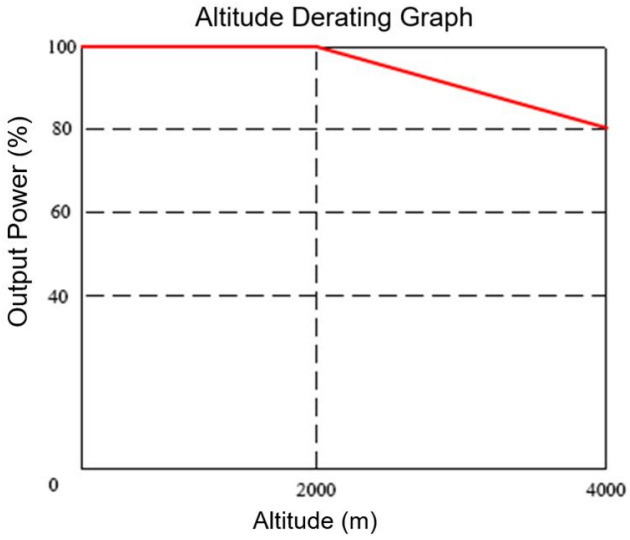
2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible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



Product Characteristics Graphs







Note 1 - The output power should be derated based on the input voltage derating graph at 200~300VDC/1200~1500VDC.

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

Typical Application Circuit Diagram

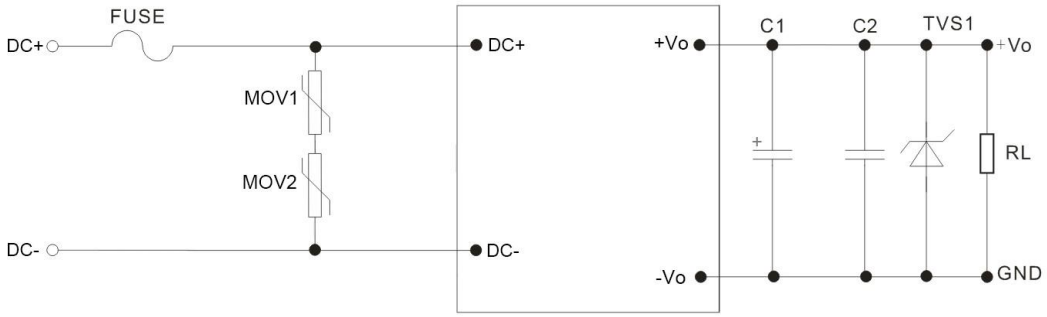


Figure - Circuit 1

Component No.	Description	Parameters
FUSE	Time-delay Fuse	2A/1500VDC, Necessary
MOV1, MOV2	Metal Oxide Varistor	14D152K/4500A
C1	High frequency electrolytic capacitor	10uF/50V
C2	Ceramic SMD capacitor	1uF/50V

Recommended Circuit Diagram for EMC

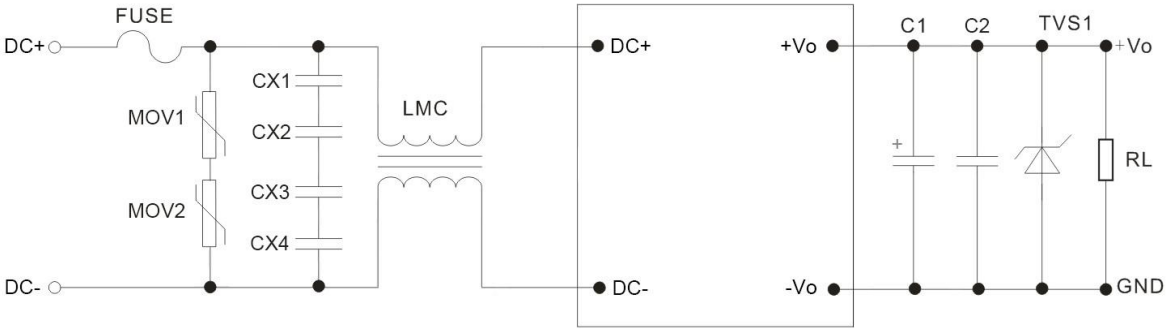


Figure - Circuit 2

Component No.	Description	Parameters
FUSE	Time-delay fuse	2A/1500VDC, Necessary
MOV1, MOV2	Metal Oxide Varistor	14D152K/4500A
C1	High frequency electrolytic capacitor	10uF/50V
C2	Ceramic SMD capacitor	1uF/50V
CX1, CX2, CX3, CX4	X Capacitor	X2/104K/275VAC
LMC	CMC Choke	7mH/1A

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 under 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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