Typical Features

- Input voltage range 200-1500VDC
- No-load power consumption ≤1W@800VDC
- Efficiency up to 85% (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 regulations
- 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. Additional circuit diagram for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Specification			Max Capacitive Load @800VDC	Ripple & Noise 20MHz (Max)	Efficiency @Full load 800VDC (Typ.)
		Nominal	Range	Power	Voltage	Current			
		(VDC)	(VDC)	P (W)	Vo (VDC)	Io (mA)	(uF)	mVp-p	(%)
-	BK40-850S12G2N6	800	200 - 1500	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 parts have 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 & Noise is tested by the Parallel-line method (refer to the following test instruction).

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

Input Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Input voltage range	DC Input	200	800	1500	VDC
Input current	Input 200VDC	-	-	0.30	A
	Input 800VDC	-	-	0.08	
Surge current	Input 200VDC	-	-	180	A
	Input 800VDC	-	-		
Standby power consumption	Input 200VDC	-	-	1.0	W
	Input 800VDC	-	-		
Hot-plug	-	Unavailable			
ON/OFF Control	-	Unavailable			
External fuse recommended	-	2A/1500VDC Time-delay fuse			

Output Specifications

Item		Test Condition	Min.	Typ.	Max.	Unit
Output voltage accuracy		Full input voltage range, any Load	-	±2.0	±3.0	%
Line regulation		Rated load	-	-	±0.5	
Load regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	
Ripple & Noise		5%-100% load, 20MHz bandwidth	-	-	100	mVp-p
Minimum load		Single output	0	-	-	%
Temperature drift coefficient		-	-	±0.03	-	%/℃
Turn-on delay time		Nominal input voltage (full load)	-	-	1000	mS
Power-off hold up time		Input 800VDC (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	mS
Output overshoot		Input full voltage range	≤10			%Vo
Short circuit protection			Continuous, self-recovery			Hiccup
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			

Note: The Ripple & Noise is tested by the Parallel-line method (refer to the following test instruction).

General Specifications

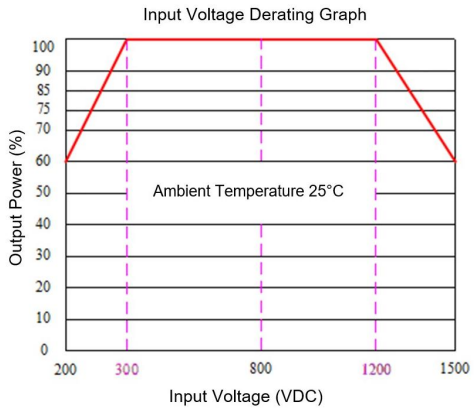
Item	Test Condition		Min.	Typ.	Max.	Unit
Switching frequency	-		-	65	-	KHz
Operating temperature	Refer to the temperature derating graph		-40	-	+70	℃
Storage temperature	-		-40	-	+85	
Soldering temperature	Wave-soldering		260±4℃, 5-10S			
	Manual soldering		360±8℃, 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1 Min., leakage current ≤5mA	4000	-	-	VAC
Insulation resistance	I/P-O/P	@500VDC	50	-	-	MΩ
MTBF	MIL-HDBK-217F@25℃		300	-	-	K hours
Safety standard	-		IEC/EN62368			
Vibration	-		10-55Hz,10G, 30Min, along X, Y, Z			
Safety class	-		CLASS II			
Flame class of case	-		UL94-V0			

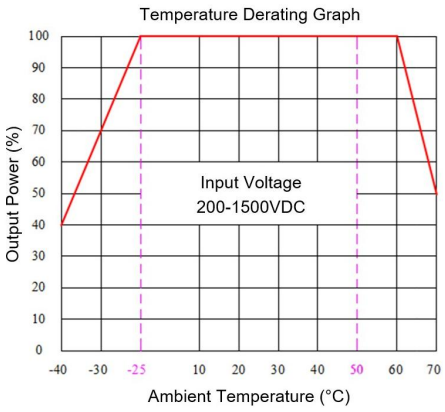
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	BK40-850SXXG2N6	360g	127.00X67.00X36.00 mm	5.000X2.638X1.417 inch

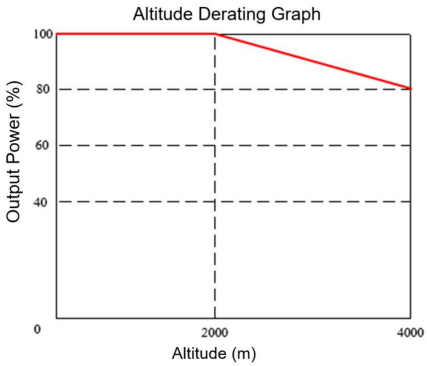
EMC Performances

Items			Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS A (with the Recommended Circuit 2)
		RE	CISPR32/EN55032	CLASS A (with the Recommended Circuit 2)
	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

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 under the condition of natural air, please contact us if it could be used at a closed space.

Recommended Circuits for Application

1. Typical application circuit diagram

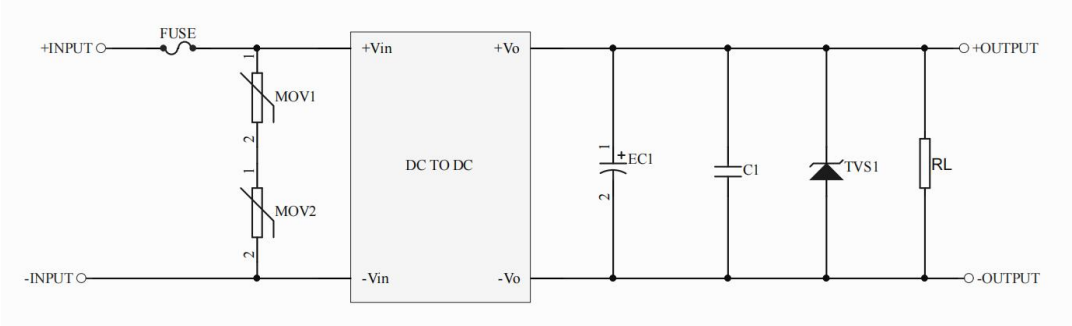


Figure - Circuit 1

Component No.	Description/Recommended values	
FUSE	Time-delay fuse	2A/1500VDC, required
MOV1, MOV2	Metal oxide varistor	14D152K/4500A
EC1	High frequency electrolytic capacitor	10uF/50V
C1	Ceramic SMD capacitor	1uF/50V

2. Recommended EMC circuit diagram

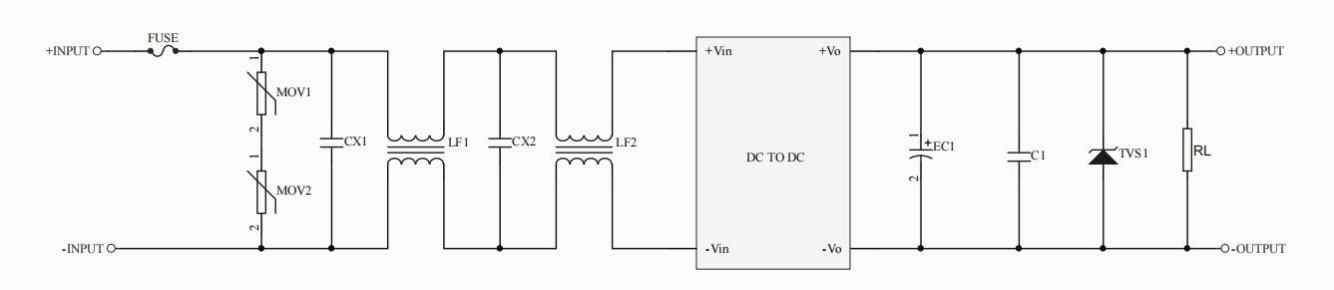
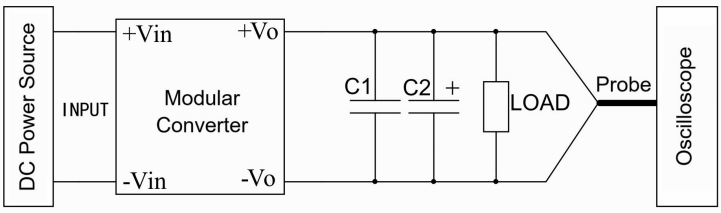


Figure - Circuit 2

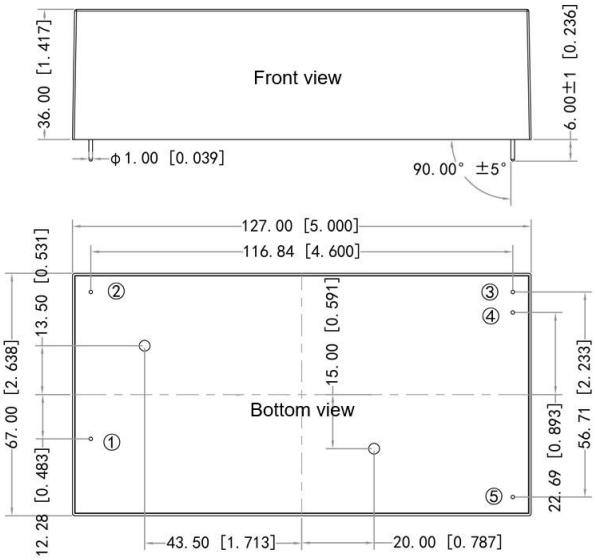
Component No.	Description/Recommended values	
FUSE	Time-delay fuse	2A/1500VDC, required
MOV1, MOV2	Metal oxide varistor	14D152K/4500A
CX1, CX2	X Capacitor	104K/1500V
LF1, LF2	Common mode choke	15mH
EC1	High frequency electrolytic capacitor	10uF/50V
C1	Ceramic SMD capacitor	1uF/50V

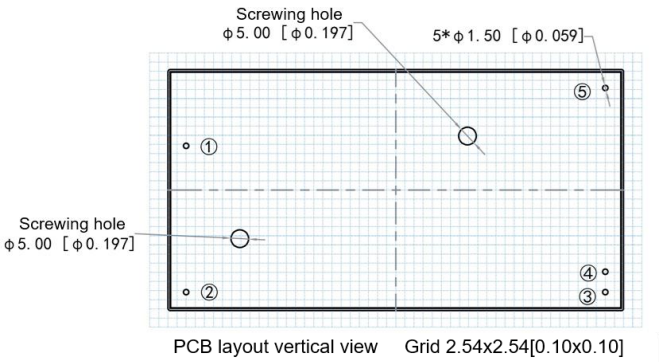
Ripple & Noise Test Instruction (Parallel-line Method, 20MHz bandwidth)



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.

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-out Function Description

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

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 Ta=25℃, 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