DC/DC Converter
BK20-400SXXH2N6 Series

Typical Features

- Wide input voltage range 60-750VDC (output 12V)
- Wide input voltage range 80-745VDC (output 24V)
- No-load power consumption ≤0.7W @300VDC
- Operating temperature from -40°C to +85°C
- Efficiency up to 86% (Typ.)
- Input Anti-reverse connecting protection
- Output over current, short circuit & over voltage protections
- Isolation voltage 4000VAC/6000VDC
- Altitude during operation 4000m Max

Application Field

BK20-400SXXH2N6 Series --- *Compact size & high efficiency modular DC/DC modular converters with ultra-high input voltage and wide range, high efficiency, high reliability, safety isolated and regulated output. This series of products can be widely used in the fields of Electric power, Instrument, Solar power generation and Home energy storage, etc. The multi-protection functions can keep the power supply and load safer while operating at abnormal conditions. The additional circuit diagram for EMC is recommended for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No.	Output Specification			Capacitive Load @300VDC (Max)	Ripple & Noise @20MHz (Max)	Efficiency @Full load 300VDC (Typ.)
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)	(u F)	mVp-p	%
-	BK20-400S12H2N6	20	12	1667	3000	150	84
-	BK20-400S24H2N6	20	24	833	800	150	86

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 is tested by the twisted pair method, please refer to the following test instruction.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	Rated input (for certification)	100	300	600	VDC
	DC input (output 12V)	60	300	750	
	DC input (output 24V)	80	300	745	
Input Current	Input 200VDC	-	-	0.25	A
	Input 600VDC	-	-	0.08	
Surge Current	Input 200VDC	-	30	-	
	Input 600VDC	-	65	-	
No-load Power Consumption	Input 300VDC	-	-	0.7	W

Leakage Current	-	0.5mA Typ.
Recommended External Fuse	-	3A/1000VDC, Necessary
Hot Plug	-	N/A
ON/OFF Control	-	N/A

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Full input voltage range, any load	-	±2.0	-	%
Line Regulation		Rated load	-	±0.5	-	
Load Regulation		Nominal input voltage, 0%~100% load	-	±1.0	-	
Minimum Load		Single Output	0	-	-	
Turn-on Delay		Nominal input voltage (Full load)	-	2000	-	mS
Power off Hold-up Time		Input 200VDC (Full load)	-	3	-	
		Input 600VDC (Full load)	-	50	-	
Dynamic Response	Overshoot	25%-50%-25% 50%-75%-50%	-5.0	-	+5.0	%
	Recovery		-5.0	-	+5.0	mS
Output Overshoot		Full input voltage range	≤10%Vo			%
Short circuit Protection			Continuous, self-recovery			Hiccup
Drift Coefficient		-	-	±0.02%	-	%/℃
Over Current Protection		Nominal input voltage	≥110% Io, self-recovery			Hiccup
Over Voltage Protection		Output 12VDC	≤20			VDC
		Output 24VDC	≤35			
Ripple & Noise		-	-	-	150	mV

General Specifications

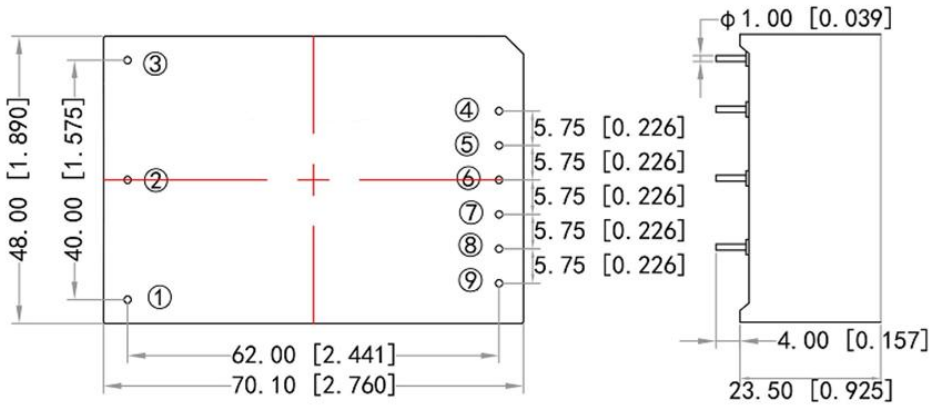
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Please refer to the Temperature Derating Graph	-40	-	+85	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±5℃，time: 5-10S			
	Manual-soldering	380±10℃，time: 4-7S			
Relative Humidity	No condensing	-	-	95	%RH
Isolation Voltage	Input-Output, Test 1min, leakage current ≤5mA	4000	-	-	VAC
Insulation Resistance	Input-Output @DC500V	50	-	-	MΩ
Vibration	-	10-55Hz,10G,30 Min, along X,Y,Z			

Safety Standard	Output 12VDC	IEC/EN62368
	Output 24VDC	UI1714, IEC/EN62368
Safety Class	-	CLASS II
MTBF	MIL-HDBK-217F@25℃	>300KH
Unit Weight	-	140g (Typ.)

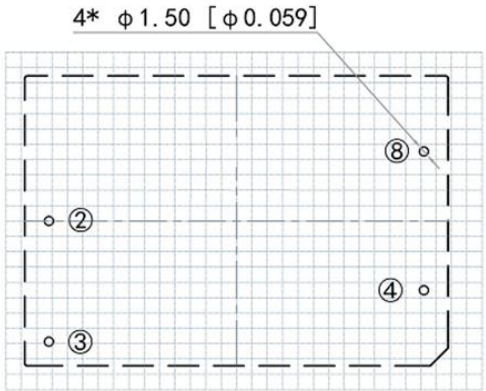
EMC Performance

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	Class B
		RE	CISPR32/EN55032	Class B
	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV, Air ±8KV 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	±2KV Perf.Criteria B
		CS	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A

Mechanical Dimensions



Pin No.	Function
2	+Vin
3	-Vin
4	+Vo
8	-Vo
1,5,6,7,9	No Pins



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

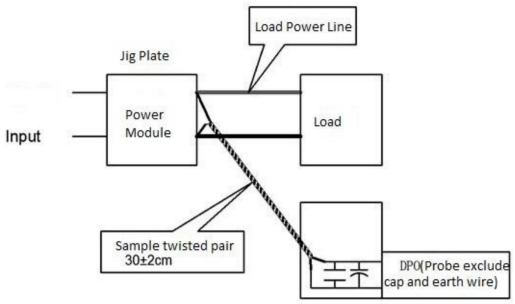
Unit: mm[inch]
Pin diameter tolerance: ±0.10[±0.004]
General tolerance: ±0.50[±0.020]

Package Code	Dimensions L x W x H	
H	70.10 X 48.00 X 23.50 mm	2.760X1.890X0.925 inch

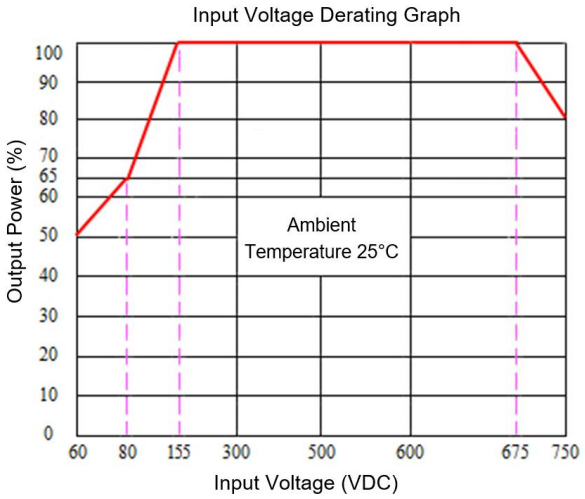
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

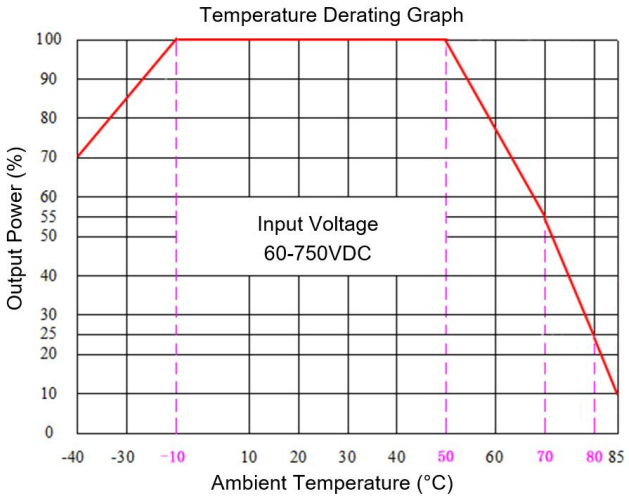
1) The Ripple & noise test needs AWG12# twisted pair cables, an oscilloscope which bandwidth should be set at 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

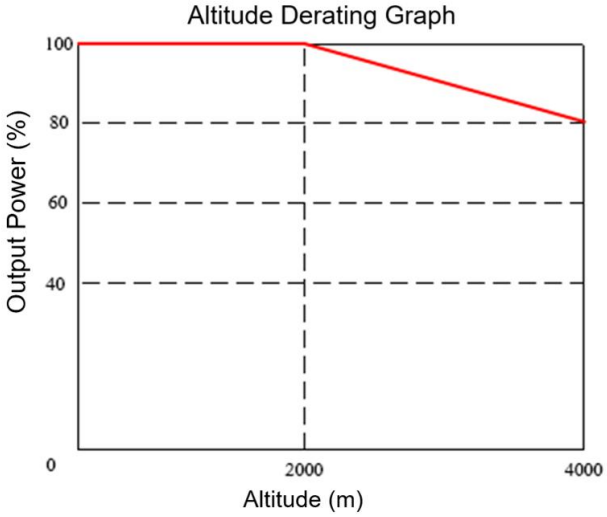
2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible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



Product Characteristics Graphs



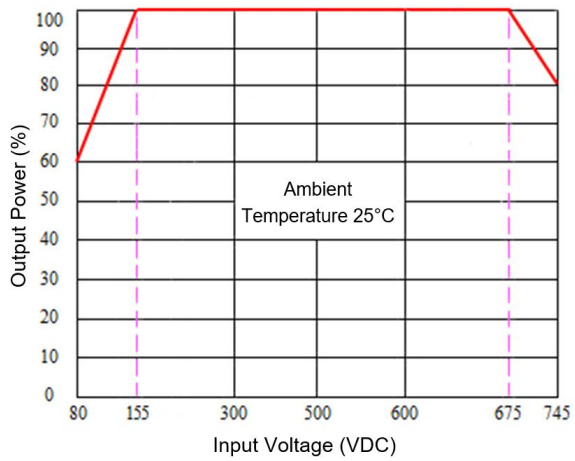




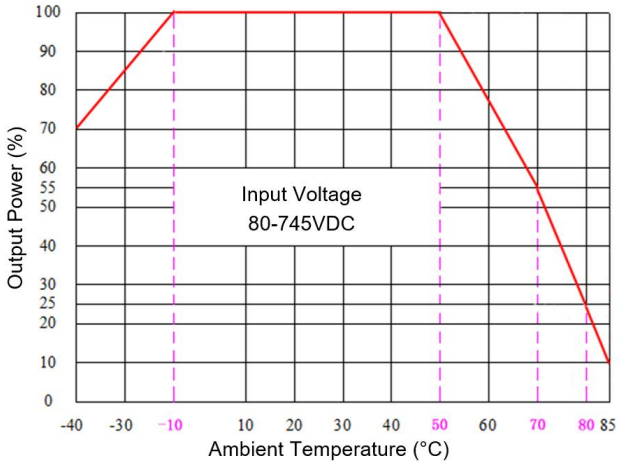
Note 1: Characteristics graphs for output 12V, the output power should be derated based on the input voltage derating graph at 60~155VDC & 675-750VDC.

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

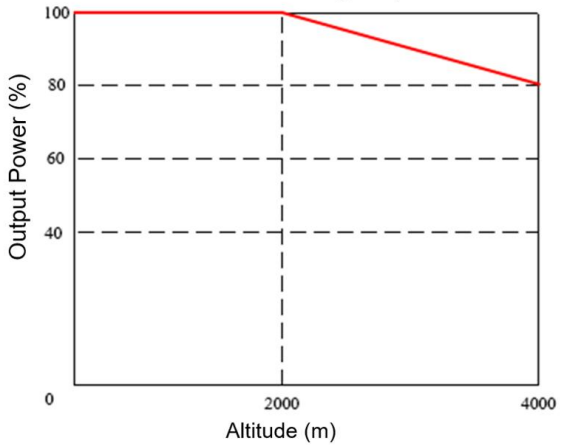
Input Voltage Derating Graph



Temperature Derating Graph



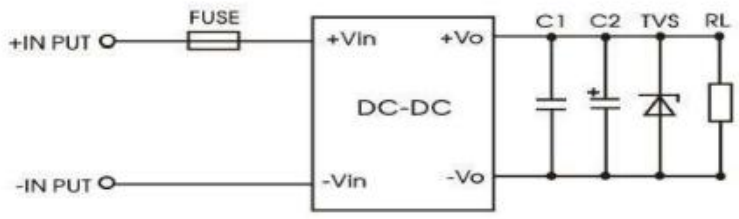
Altitude Derating Graph



Note 1: Characteristics graphs for output 24V, the output power should be derated based on the input voltage derating graph at 80~155VDC & 675-745VDC.

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

Typical Application Circuit



Part No.	FUSE	C1	C2	TVS
BK20-400S12H2N6	3A/1000VDC	1uF/50V	220uF/16V	SMBJ20A
BK20-400S24H2N6	Necessary	1uF/50V	220uF/35V	SMBJ30A

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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