Product Features



- Enclosure Type: DIN rail;
- Input Protection: Lightning, surge;
- Output Protection: Overcurrent, short circuit, overvoltage protection;
- Temperature Range: -40°C to +85°C;
- Conversion Efficiency: 87.3% (MAX);
- Isolation Withstand Voltage: 2750 VDC;
- Input Range: 85–450 VAC;
- Application Areas: Industrial, instrumentation, rail transit, smart streetlights, smart switches, smart home.

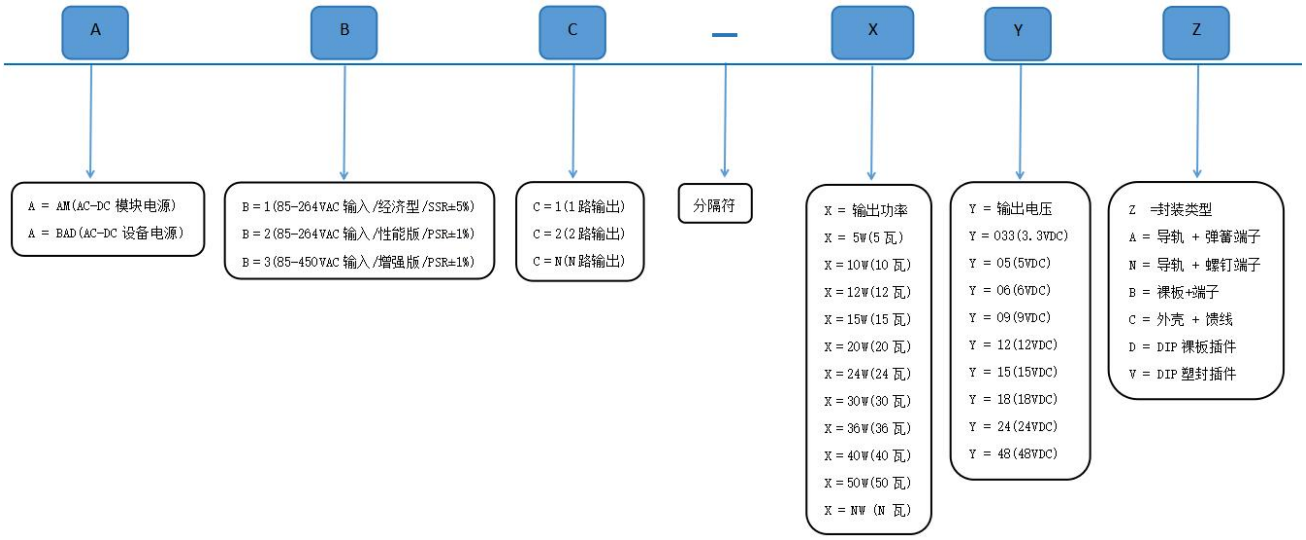
Version	Edit description	Release Date	Maintainer
V1.0	Initial release	2024-07-03	L J
V1.01	Added product series and model descriptions.	2025-07-23	L J

Product Selection Chart

Product Model	Input voltage range	Output			Efficiency (%) Min./Typ.	Maximum capacitive load (μF)
		Power (W)	Voltage (VDC)	Current (mA) Max./Min.		
BAD31-12W05N2	85 - 450VAC 120 - 630VDC	12	5	2400	76	2200
BAD31-12W12N2		12	12	1000	79	1500
BAD31-12W24N2		12	24	500	83	680

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Product Series and Model Descriptions



Input parameters

Items	Operating Conditions	Min.	Typical	Max.	Unit
Input Voltage Range	AC Input	85	380	450	Vac
	DC Input	120	532	630	Vdc
Input Frequency	AC Input	47	--	63	Hz
Input Current	DC Input (532 V)	--	28	--	mA
Start-up Time		--	800	1500	ms
Inrush Current	AC Input	--	10	--	A
Input Filter Type		C			
External Fuse	BAD31-12WXN2	AC input: 1 A/500 VAC, slow-blow fuse, required. DC input: 1 A/1 kV, slow-blow fuse, required.			

Output parameters

Model	Operating Conditions		Min.	Typical	Max.	Unit
Output Voltage Accuracy	--	--	--	±1.0	±1.5	%
Voltage Regulation	Full load		--	±0.25	±0.5	%
Load Regulation	10%–100% load	AM21-12W-V	--	±1.0	±2	%
Ripple and Noise	20 MHz bandwidth,	AM21-12W-	--	--	120	mV

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	100% load	V				
Temperature Coefficient	Full load		--	±0.05	--	%/℃
Short-Circuit Protection			Sustainable, self-regenerating			
Overcurrent Protection	BAD31-12WXN2		110–150% Io self-recovery			
Minimum Load			0	--	--	%

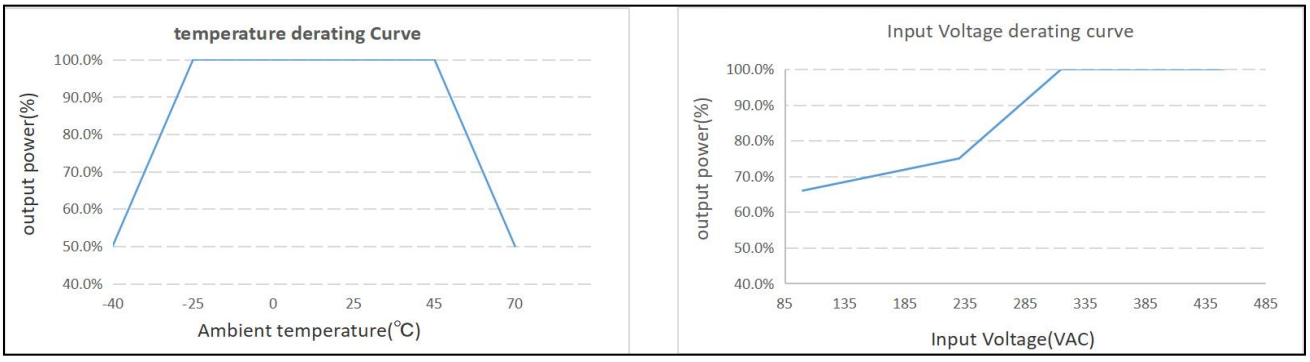
General Features

Model	Operating Conditions	Min.	Typical	Max.	Unit
Insulation Voltage	Input - Output	3000	--	--	Vac
Operating Temperature		-40	25	+55	℃
Storage Temperature		-40	25	+85	℃
Operating Humidity		--	--	95	%RH
Switching Frequency		--	65	72	KHz
Mean Time Between Failures		MIL-HDBK-217F@25°C > 200,000 h			

Mechanical Specifications

Shell material		Flame-retardant and heat-resistant
Dimensions	BAD31-12WXN2	87.5 × 24 × 58.7 mm
Product Weight	BAD31-12WXN2	g (typ.)
Cooling Method		Air-cooled

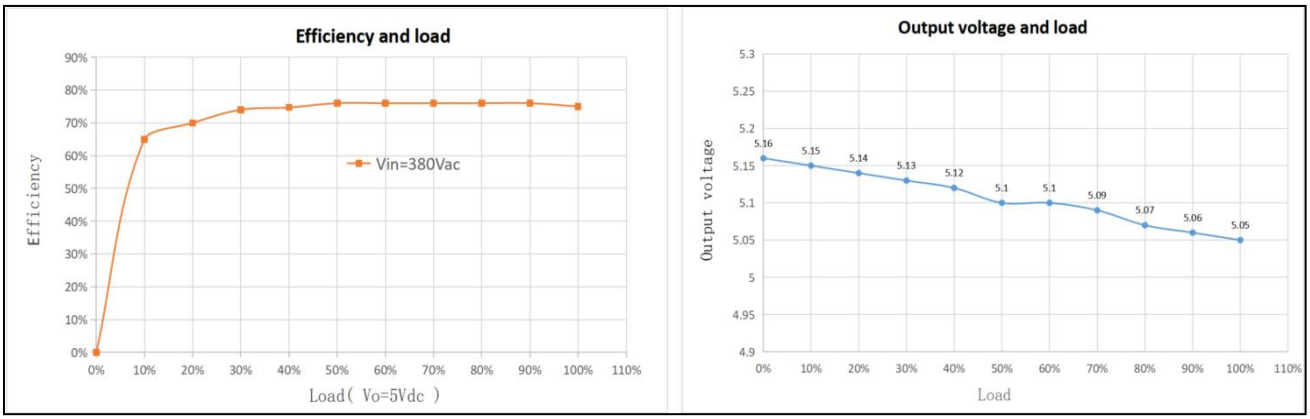
Product Performance Curve



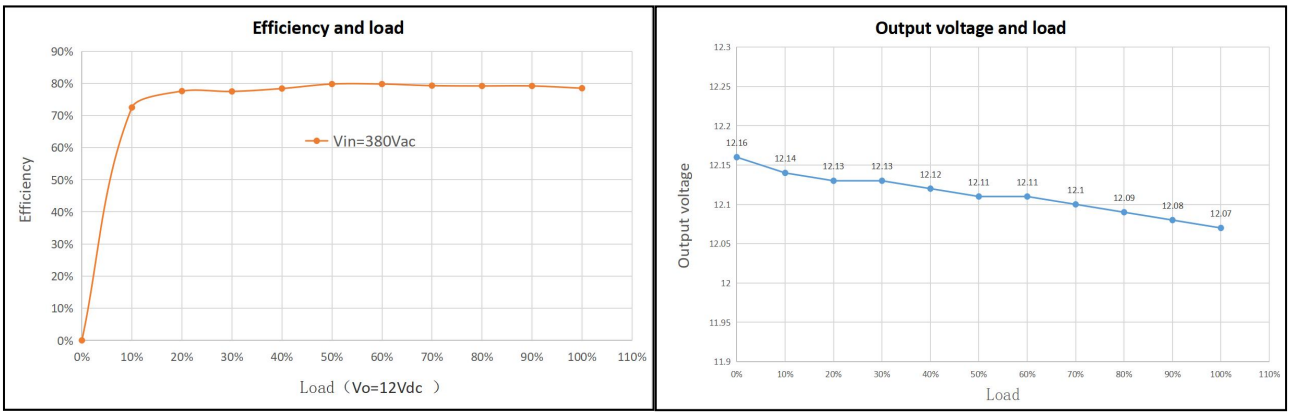
Conversion Efficiency and Load

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BAD31-12W05N2

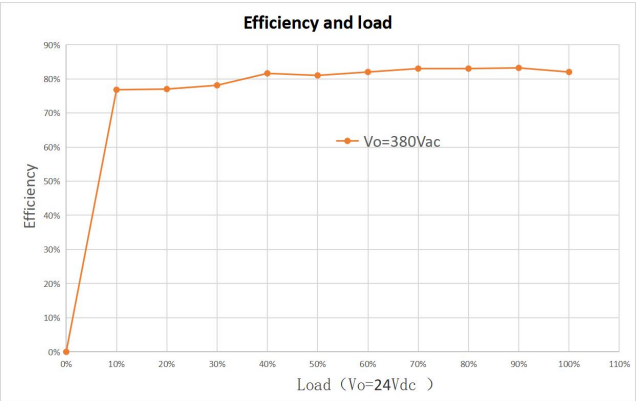


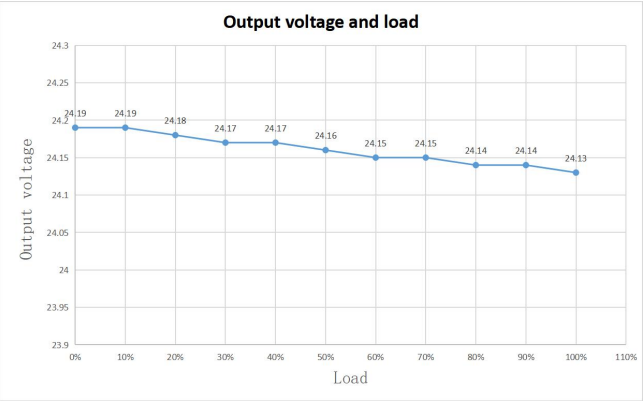
BAD31-12W12N2



BAD31-12W24N2

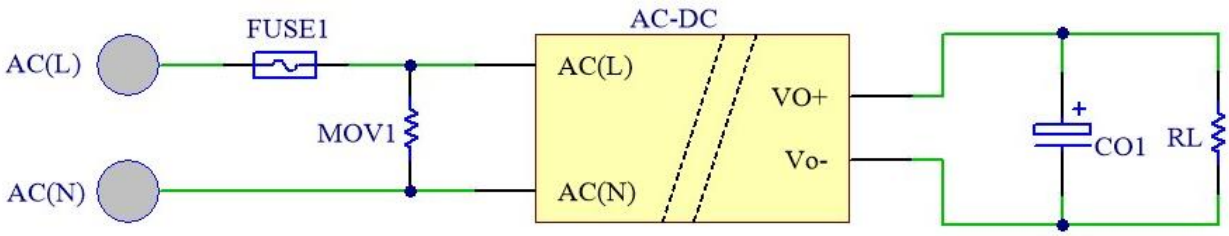
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Reference Design

Typical Application Designs

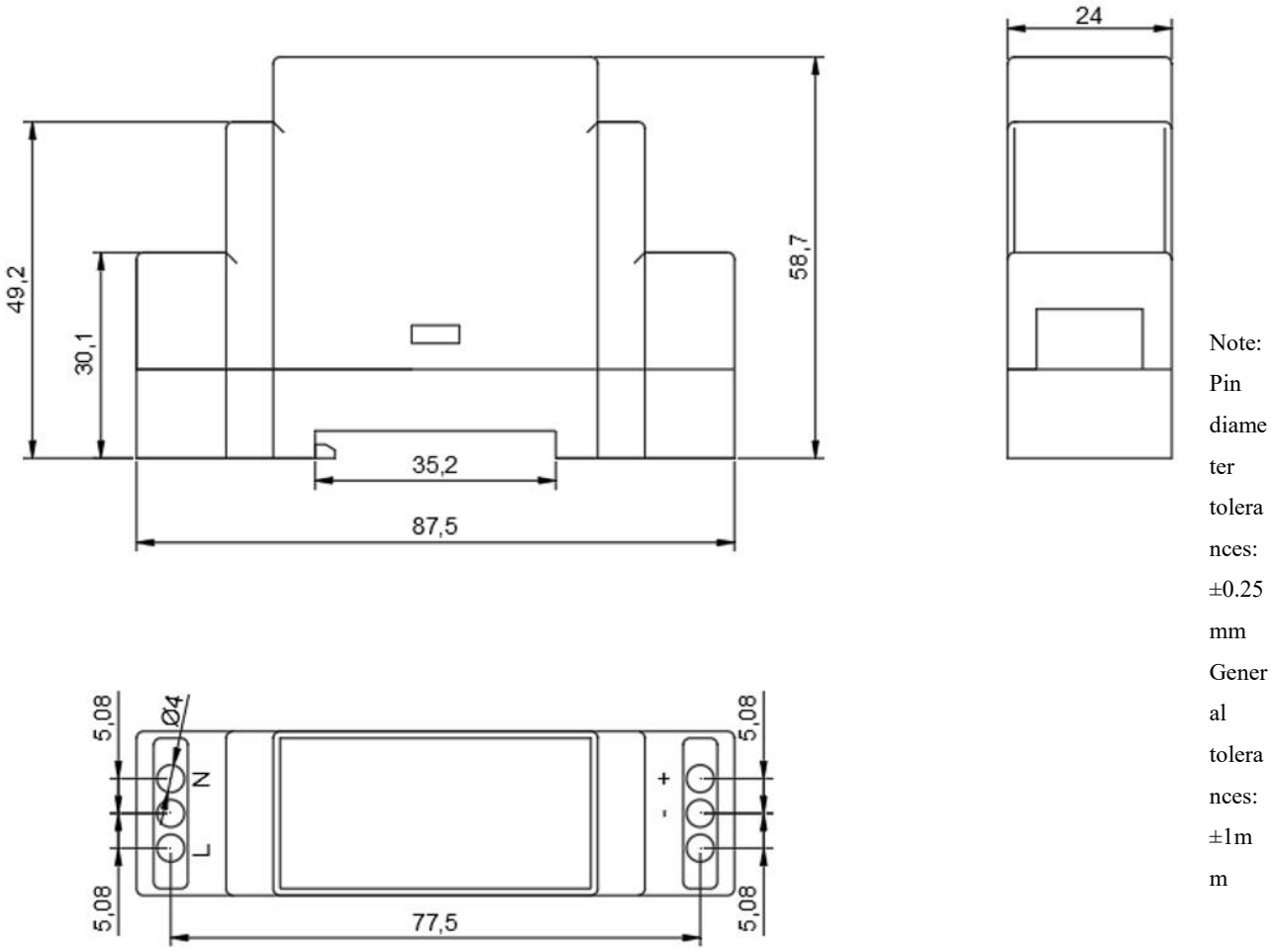


FUSE1	CO1	MOV1
2A/500VAC Slow-blow, required	NC	NC

Notes: co1 select High frequency low resistance Electrolytic capacitor

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Product Dimensions



Note: Pin diameter tolerances: ±0.25 mm General tolerances: ±1mm

PIN	Note
L	AC_L AC Input_Live Wire
N	AC_N AC Input_Neutral Wire
+	+DC DC Output Positive Terminal
-	-DC DC Output Negative Terminal

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