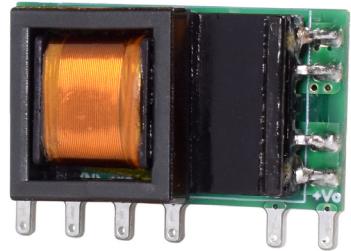


SERIES: PBO-3E | DESCRIPTION: AC-DC POWER SUPPLY
FEATURES

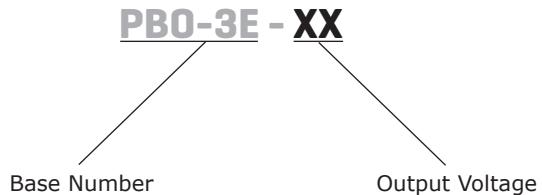
- small size, industrial design
- PCB SIP mounting
- universal input voltage range 85~305 Vac / 100~430 Vdc
- IEC/EN/UL 62368-1 certified
- designed to meet IEC/EN 61558 and IEC/EN 60335
- operating temperature -40°C ~ 85°C
- short-circuit, over current, and over voltage protection
- isolation voltage 4,000 Vac
- OVC III


MODEL

MODEL	output voltage (Vdc)	output current max (mA)	output power max (W)	ripple and noise ¹ max (mVp-p)	efficiency typ (%)
PBO-3E-3	3.3	600	1.98	150	68
PBO-3E-5	5	600	3.0	150	73
PBO-3E-12	12	250	3.0	150	77
PBO-3E-15	15	200	3.0	150	78
PBO-3E-24	24	125	3.0	150	81

Notes: 1. 20 MHz bandwidth oscilloscope, 10% to full load.

2. All specifications are measured at Ta=25°C, humidity <75%, 115 or 230 Vac input voltage, and rated output load unless otherwise specified.

PART NUMBER KEY


INPUT

parameter	conditions/description	min	typ	max	units
voltage	ac input dc input	85 100		305 430	Vac Vdc
frequency		47	50~60	63	Hz
current	at 110 Vac at 230 Vac			0.12 0.07	A A
fuse	1A, slow-blow, required				
no load power consumption	at 230 Vac		0.10	0.15	W

OUTPUT

parameter	conditions/description	min	typ	max	units
capacitive load ³	3.3 Vdc output model			820	μF
	5 Vdc output model			680	μF
	12 Vdc output model			470	μF
	15 Vdc output model			330	μF
	24 Vdc output model			220	μF
initial set point accuracy	from 10~100% load		±5		%
line regulation	at rated load				
	3.3 Vdc output model all other models		±2.5 ±1.5		% %
load regulation	from 10~100% load		±3		%
temperature coefficient			±0.15		%/°C

Notes: 3. The maximum capacitive load is tested within the input voltage range and under full load conditions.

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over current protection		110			%
short circuit protection	continuous, auto recovery				

SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute, 5mA max	4,000			Vac
safety approvals	certified to 62368: IEC, EN, UL designed to meet 61558: IEC, EN designed to meet 60335: IEC, EN				
safety class	Class II				
conducted emissions	CISPR32/EN55032 Class A (see Recommended Circuit 1 & 4) CISPR32/EN55032 Class B (see Recommended Circuit 2 & 3)				
radiated emissions	CISPR32/EN55032 Class A (see Recommended Circuit 1 & 4) CISPR32/EN55032 Class B (see Recommended Circuit 2 & 3)				
ESD	IEC/EN61000-4-3 10 V/m, perf. Criteria A				
radiated immunity	IEC/EN61000-4-4 ±2 kV (see Recommended Circuit 1 & 2), perf. Criteria B IEC/EN61000-4-4 ±4 kV (see Recommended Circuit 3 & 4), perf. Criteria B				
EFT/burst	IEC/EN61000-4-5 line to line ±1 kV (see Recommended Circuit 1 & 2), perf. Criteria B IEC/EN61000-4-5 line to line ±2 kV (see Recommended Circuit 3 & 4), perf. Criteria B				
surge	IEC/EN61000-4-6 10 Vrms, perf. Criteria A				
conducted immunity	IEC/EN61000-4-2 Contact ±6 kV, perf. Criteria B				
MTBF	as per MIL-HDBK-217F at 25 °C	1,000,000			hours
RoHS	yes				

ENVIRONMENTAL

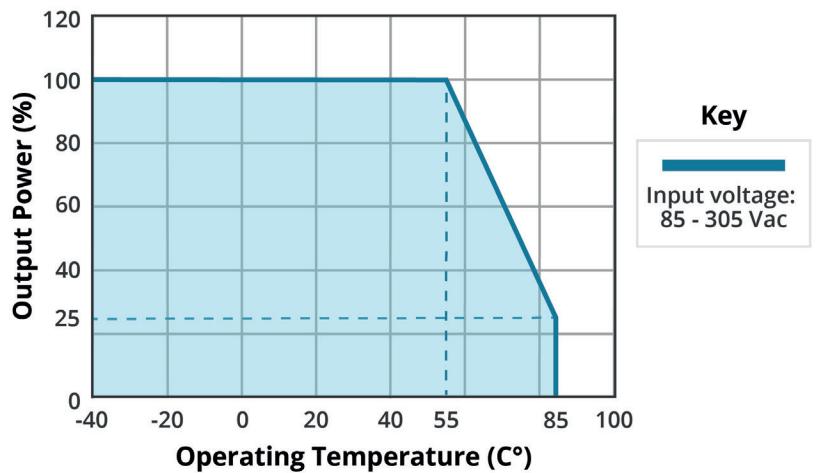
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-40		85	°C
storage temperature		-40		105	°C

SOLDERABILITY

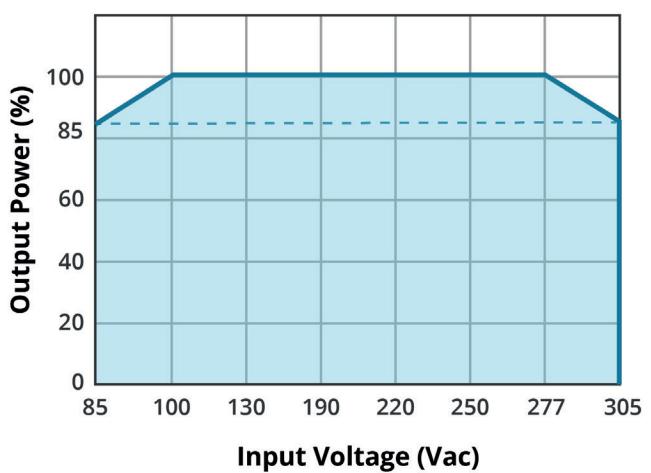
parameter	conditions/description	min	typ	max	units
wave soldering	for 5~10 seconds	255	260	265	°C
hand soldering	for 3~5 seconds	355	360	365	°C

DERATING CURVES

TEMPERATURE DERATING CURVE



INPUT VOLTAGE DERATING CURVE (25°C)

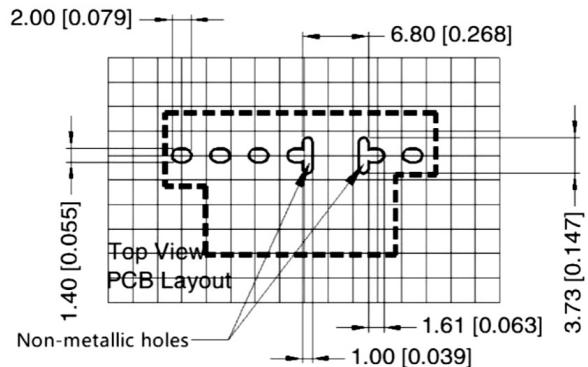
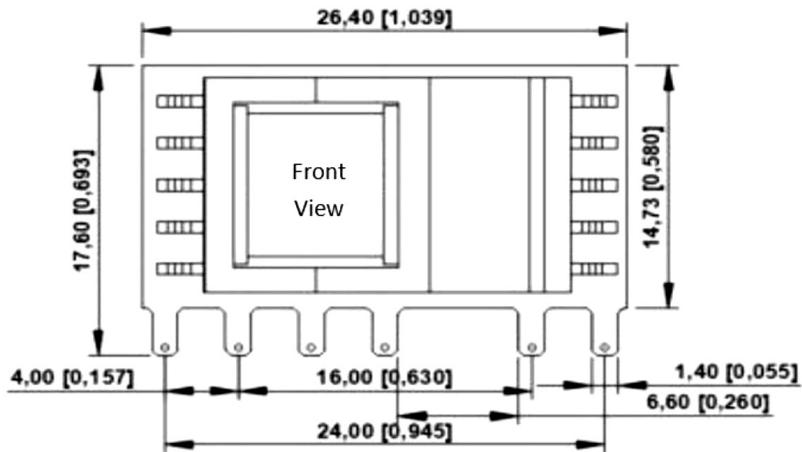


MECHANICAL

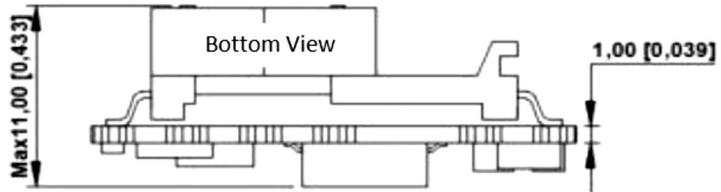
parameter	conditions/description	min	typ	max	units
dimensions	26.40 x 17.60 x 11.00 [1.039 x 0.623 x 0.433 inch]				mm
weight				5.9	g

MECHANICAL DRAWING

units: mm [inch]
pin section tolerance: ± 0.10 [± 0.004]
tolerance: ± 0.50 [± 0.020]



Grid size: 2.54 x 2.54mm



PIN CONNECTIONS	
PIN	Function
1	AC (L)
2	AC (N)
3	+V(CAP)
4	-V(CAP)
5	-Vo
6	+Vo

APPLICATION DESIGN REFERENCE

Figure 1

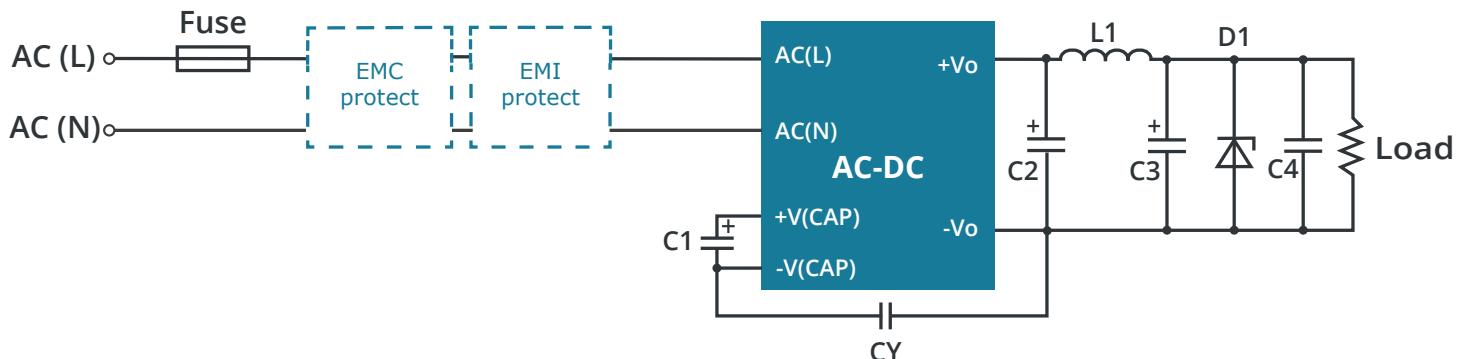


Table 1

Additional component selection guide							
Vout	C1 (required)	C2 (required)	L1 (required)	C3 (required)	C4	CY (required)	D1
3.3, 5	10μF/450V	470μF/16V (solid-state capacitor)	2.2μH 3A 15 mΩ max	150μF/16V	0.1μF/50V	1nF/400V	D1 is a TVS transistor that can protect the downstream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage
12		270μF/16V (solid-state capacitor)		150μF/25V			
15, 24		470μF/35V	3.3μH 3A 25 mΩ max	100μF/35V			

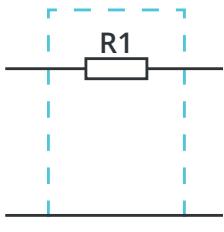
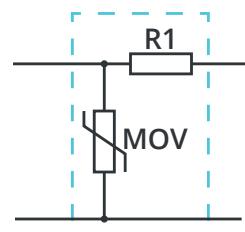
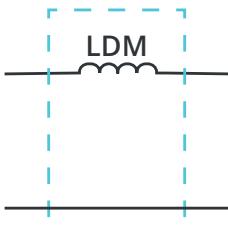
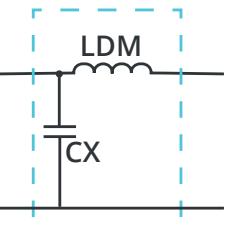
Note: 1. FUSE, EMC protection, and EMI protection are selected based on actual application needs.
 2. C1 is a filtering electrolytic capacitor, which is a required component. It is recommended to use ripple current > 400mA at 100KHz electrolytic capacitors.
 3. C2, C4, and L1 form a Pi type filtering circuit, and it is recommended to use high-frequency low resistance electrolytic capacitors or solidstate capacitors.
 When selecting L1, ripple requirements can be considered, while paying attention to current and internal resistance values.

Table 2

Environmental and EMC selection guide						
Recommended circuit	Application environmental	Typical industry	Input voltage range	Environment temperature	EMI	EMS
1	Basic application	None		-40° ~ 88°C	Class A	Class III
2	Indoor civil environment	Smart home / Home appliances	85 ~ 305 Vac	-25° ~ 55°C	Class B	Class III
	Indoor general environment	Intelligent building / Intelligent agriculture				
3	Indoor industrial environment	Manufacturing workshop		-25° ~ 55°C	Class B	Class IV
4	Outdoor general environment	Intelligent transportation / Charging point / Communication / Security		-40° ~ 85°C	Class A	Class IV

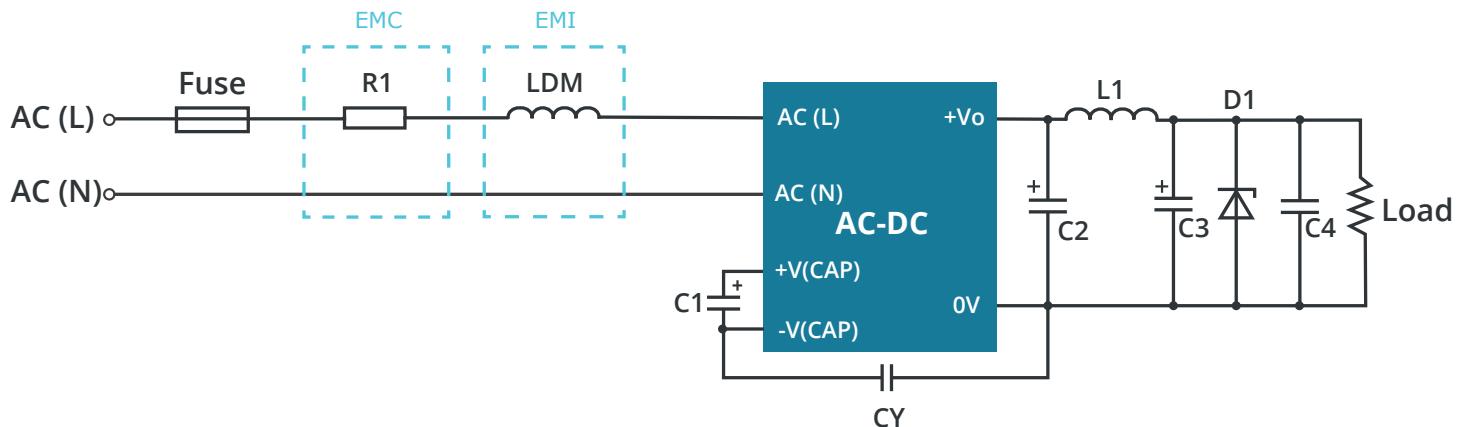
APPLICATION DESIGN REFERENCE (CONTINUED)

Figure 2

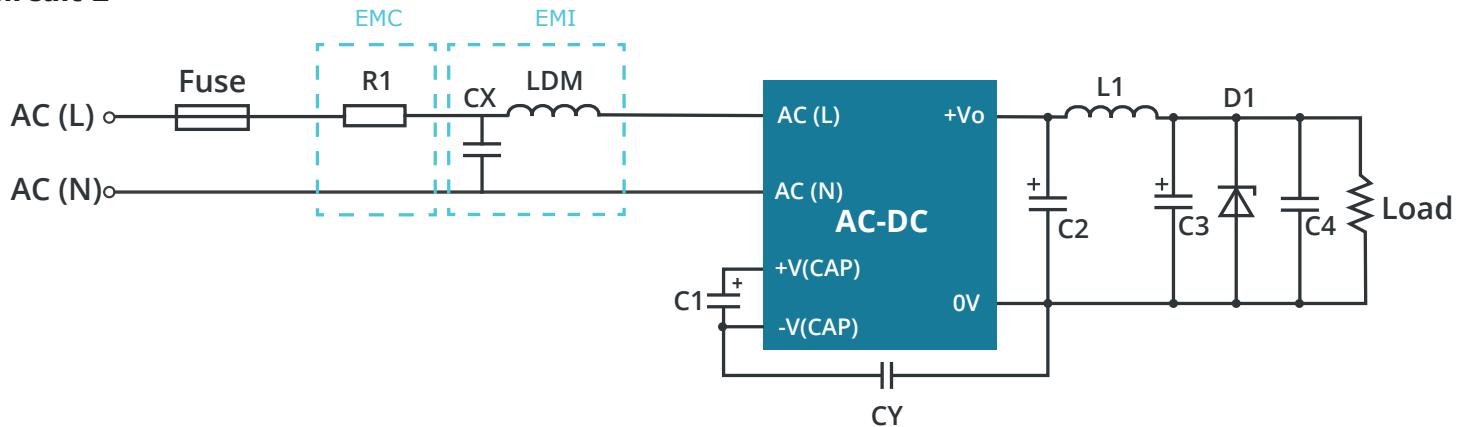
Additional circuits design reference			
Immunity design circuits for reference		Emissions design circuits for reference	
Class III	Class IV	Class A	Class B
			

EMC RECOMMENDED CIRCUIT

Circuit 1

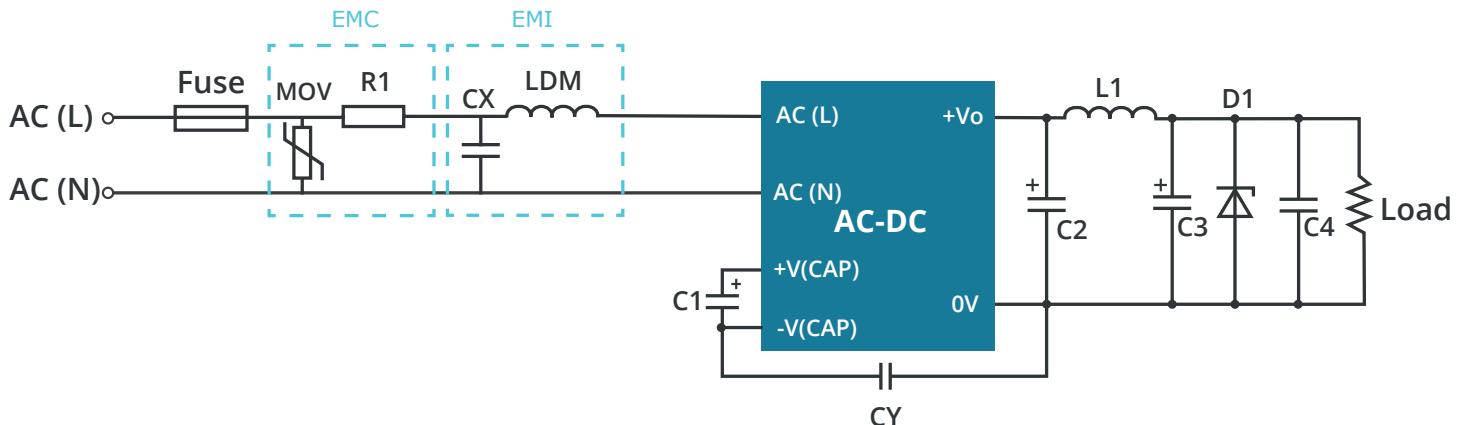


Circuit 2



EMC RECOMMENDED CIRCUIT (CONTINUED)

Circuit 3



Circuit 4

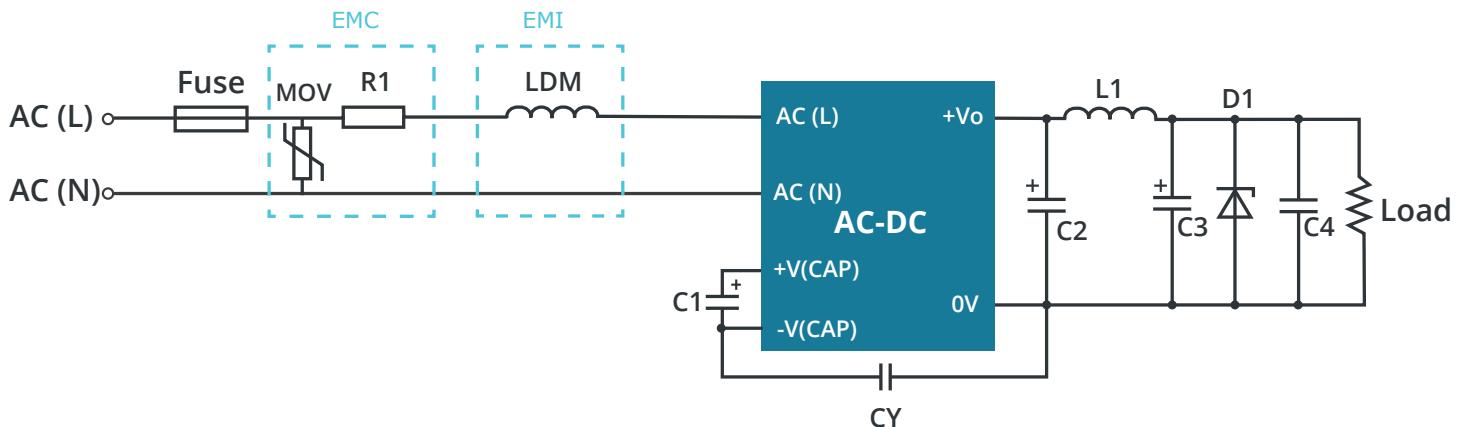


Table 3

Component	Recommended value			
	Circuit 1	Circuit 2	Circuit 3	Circuit 4
FUSE	1A/300V, slow-blow, required		2A/300V, slow-blow, required	
R1		12Ω/3W, winding resistance, required		
MOV			14D561	
LDM			2.2mH/max: 4Ω/min: 0.2A	
CX			0.1µF/310Vac	

Notes:

- The input voltage must remain within the specified range to prevent potential permanent and irreparable damage.
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product.
- Recommended load imbalance for the dual output module: $\leq \pm 5\%$. Exceeding this threshold may result in the product failing to meet all performance specifications outlined in this manual.

REVISION HISTORY

rev.	description	date
1.0	initial release	04/16/2025

The revision history provided is for informational purposes only and is believed to be accurate.



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

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