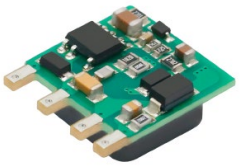
PNZR Series

1 ... 5W, Open Frame, Non-isolated SIP Package AC/DC Power Converters

Features

- Rated power: 1 ... 5W Max
- Universal input: 85~305VAC, 47~63Hz
- Non-isolated, regulated output
- Typical efficiency up to 77%
- Energy saving, standby power only 0.1W typ.
- Operating temperature range: -40~+85°C
- RoHS compliance
- Compact SIP package
- Over current and short circuit protection
- Comply to IEC/EN 62368-1, CISPR32, EN55032
- 5 year warranty



Overview

PNZR series are non-isolated AC/DC power converters, featuring universal input voltage range 85~305VAC, low standby power consumption, high efficiency. They are certified to IEC/EN 62368-1, and EMC performance meets CISPR32, EN55032, ideally suitable for industrial, and critical commercial applications.

Model Numbers

Model Number	Output Power [W]	Output Voltage [VDC]	Output Current [mA] Max.	Efficiency [%] Typ.	Capacitive Load [uF] Max.
PNZR01S-050	1	5	200	56	500
PNZR03S-120	3	12	250	73	330
PNZR04S-120	4	12	330	75	160
PNZR05S-150	5	15	330	76	160
PNZR05S-180	5	18	280	77	160

* Only typical models are listed, other models may be available, upon request.

Electrical Specifications

Unless otherwise indicated, specifications are measured at T_A=25°C, humidity<75%, nominal input voltage and rated output load.

Parameters	Condition	Min.	Typ.	Max.	Unit	Note
Input voltage range	AC in DC in	85 70	-	305 430	VAC VDC	
Input frequency		47	-	63	Hz	
Nominal input voltage		100	-	277	VAC	
Input current	115VAC 230VAC 277VAC	-	-	0.20 0.14 0.10	A	
Inrush current Cold start	115VAC 277VAC	-	25 40	-	A	
Output voltage accuracy I_{OUT}=10%~100% of $I_{OUT, rated}$		-	±5	±8	%	
Line regulation Full load		-	±1.5	-	%	
Load regulation I_{OUT}=10%~100% of $I_{OUT, rated}$		-	±4	-	%	
Ripple and noise 20MHz bandwidth, peak to peak		-	50	150	mV	
Standby power consumption	230VAC	-	0.10	0.40	W	
Temperature coefficiency		-	±0.15	-	%/°C	
Minimum load		10	-	-	%	
Over current protection	Automatic recovery	110	-	-	% I_{OUT}	
Short circuit protection	Automatic recovery	Continuous, hiccup mode				
Recommended external fuse		1A, 300V slow blow *required*				

* Ripple and noise measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 1uF ceramic capacitor and a 10uF electrolytic capacitor in parallel.

General Specifications

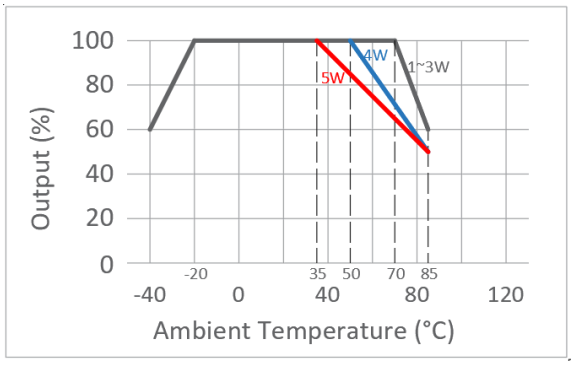
Parameters	Condition	Min.	Typ.	Max.	Unit	Note
Isolation voltage	Input to Output	-	0	-	VAC	
Operating temperature range	See "Derating Curve"	-40	-	85	°C	
Storage temperature		-40	-	105	°C	
Storage humidity		-	-	95	%RH	
Soldering temperature	Wave Manual	-	260 360	-	°C	
Cooling method		Free air convection				
MTBF	MIL-HDBK-217F	>300,000 Hours, 25°C				
Design based on standards		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 62368-1				
EMC		CISPR32, EN55032 Class B with external circuit				
Size, and Weight						

Design based on standards		RoHS & REACH directives, IEC/EN/UL 62368, FCC, UKCA, IEC EN 60335, IEC EN 61558
Safety certifications		IEC/EN 62368-1
EMC [1] With External Circuit as shown in "Figure 1" [2] With External Circuit as shown in "Figure 2"	CE ESD RS EFT EFT Surge CS DIP	CISPR32, EN55032 Class B with "External Circuit", [2] IEC/EN61000-4-2, Contact ±6kV, Criteria B, [1] IEC/EN61000-4-3, 10V/m, Criteria A, [2] IEC/EN61000-4-4, ±2kV, Criteria B, [1] IEC/EN61000-4-4, ±4kV, Criteria B, [2] IEC/EN61000-4-5, Line to Line ±1kV, Criteria B, [1] IEC/EN61000-4-6, 10Vrms, Criteria A, [2] IEC/EN61000-4-11, 0%, 70%, Criteria B, [2]
Size, and Weight		16.1 x 15.1 x 9.5 mm, 4.2g

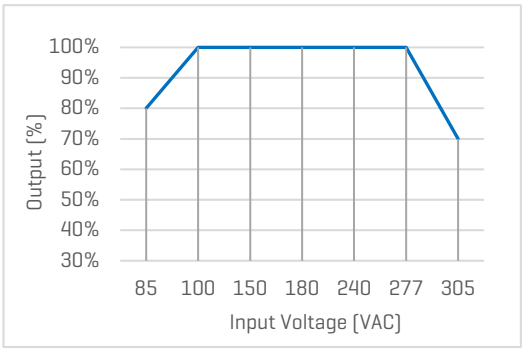
Characteristic Curves

Derating Curves

Output vs Ambient Temperature



Output vs Input Voltage



Recommended External Circuits

Typical External Circuit

This circuit is the basic design reference, components with "" are required for the converter's operating.
FUSE to be 1A, 300V slow blow and is also required for safety.

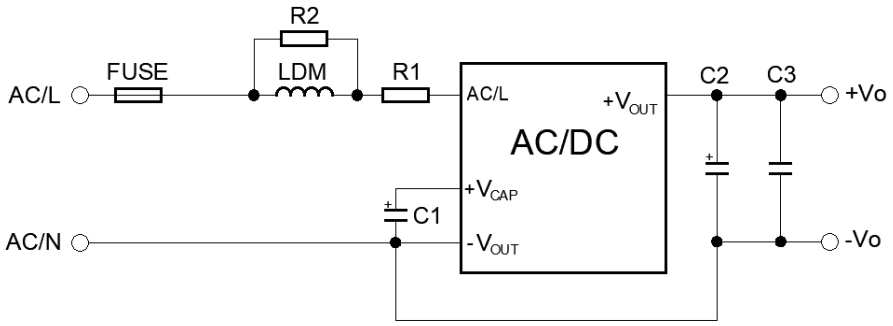


Figure 1. Typical external circuit

Recommended Component Spec [Table 1]

Model Number	LDM*	R1*	R2	C1*	C2*	C3
PNZR01S-050	1.2mH, 0.2A	-	-	22uF, 450V	220uF, 16V	-
PNRZ03S-120	1.2mH, 0.2A	-	-	22uF, 450V	220uF, 16V	-
PNZR04S-120	2.2mH, 0.24A	2 Ohm, 2W	8.2KOhm, 0.25W	22uF, 450V	470uF, 16V	0.1uF, 50V
PNZR05S-150	2.2mH, 0.24A	2 Ohm, 2W	8.2KOhm, 0.25W	22uF, 450V	470uF, 35V	0.1uF, 50V
PNZR05S-180	2.2mH, 0.24A	2 Ohm, 2W	8.2KOhm, 0.25W	22uF, 450V	470uF, 35V	0.1uF, 50V

EMC Enhancement for EN55032 Class B

*This application circuit is recommended for EMC enhancement. It is not mandatory if this is not critical in the application.

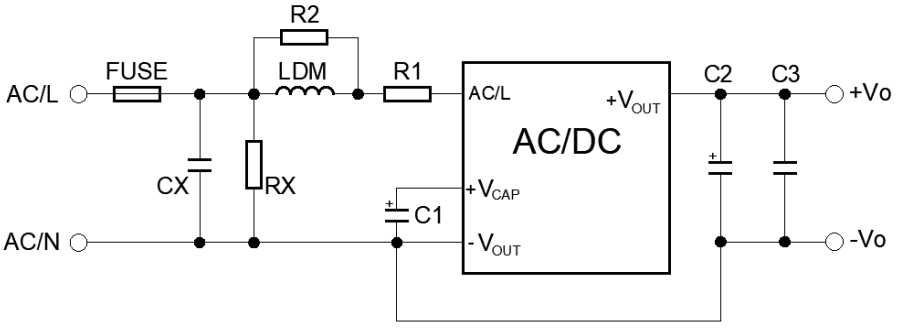


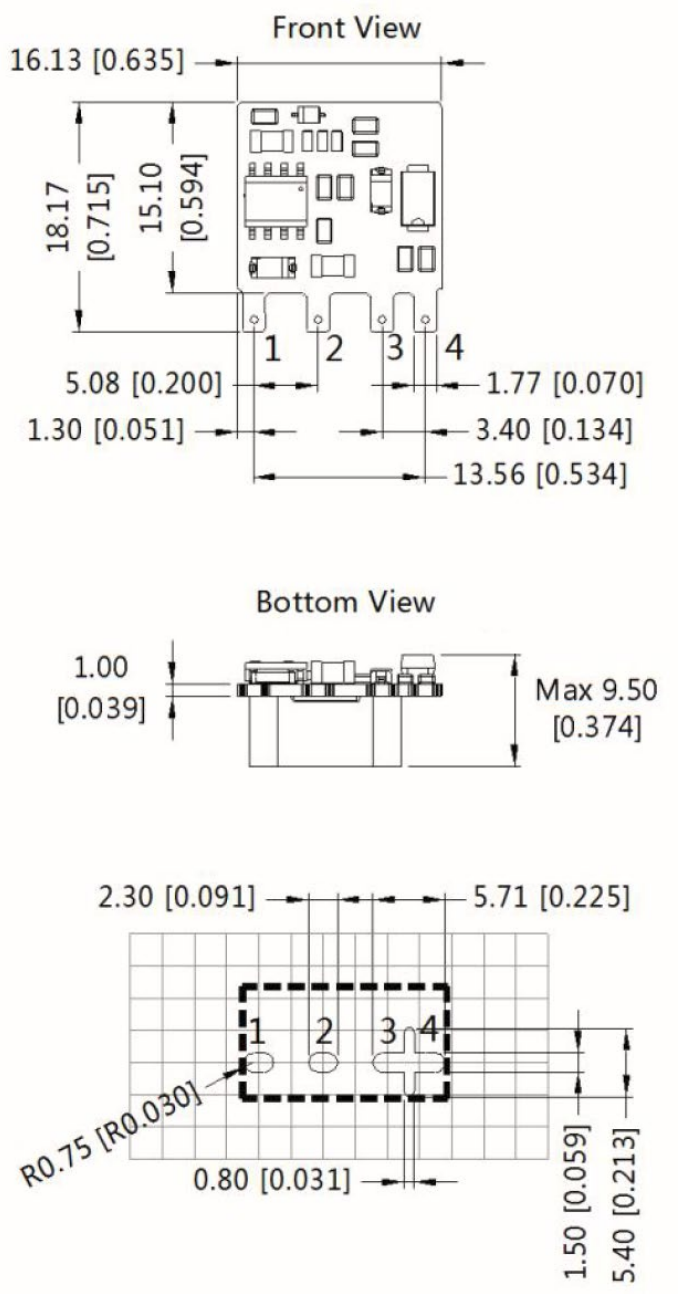
Figure 2. External circuit for EMC enhancement

Recommended Component Spec [Table 2]

Item	CX	RX*
Spec	0.1uF, 310VAC	5M ... 8M Ohm

Components above with "" are required for the converter's operating.
*Refer to Table 1 for other components

Mechanical Specifications



Pin Definition

Pin #	Single Out
1	AC (L)
2	+V (CAP)
3	AC (N) / $-V_{OUT}$
4	$+V_{OUT}$

* Unless otherwise specified unit: mm [inch]
* General tolerance: ±0.50 [±0.020]
* PIN thickness: ±0.10 [±0.004]
* Footprint grid 2.54 x 2.54 mm
* Component positions are for reference only