

KADN40 SERIES



OPEN FRAME

AC - DC POWER MODULE

28 ~ 40W UL / cUL / TUV / CE

FEATURES

- AC/DC POWER MODULE
- UNIVERSAL INPUT 85 ~ 265 VAC
- HIGH EFFICIENCY UP TO 87%
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 2 YEARS WARRANTY
- MEDICAL SAFETY APPROVED
- LOW LEAKAGE CURRENT



MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
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Single Output Models

KADN4003	85 ~ 265 VAC	28 WATTS	+ 3.3 VDC	8500 mA	76%	78%	7000 μ F
KADN4005	85 ~ 265 VAC	40 WATTS	+ 5 VDC	8000 mA	80%	82%	7000 μ F
KADN4012	85 ~ 265 VAC	40.8 WATTS	+ 12 VDC	3400 mA	84%	86%	7000 μ F
KADN4015	85 ~ 265 VAC	40.5 WATTS	+ 15 VDC	2700 mA	85%	87%	7000 μ F
KADN4024	85 ~ 265 VAC	40.8 WATTS	+ 24 VDC	1700 mA	85%	87%	3500 μ F

Dual Output Models

KADN4012D	85 ~ 265 VAC	40.8 WATTS	$\pm$ 12 VDC	$\pm$ 1700 mA	83%	85%	$\pm$ 7000 μ F
KADN4015D	85 ~ 265 VAC	40.5 WATTS	$\pm$ 15 VDC	$\pm$ 1350 mA	84%	86%	$\pm$ 7000 μ F
KADN40512D	85 ~ 265 VAC	40 WATTS	+5 / + 12 VDC	+5A / + 1.25A	81%	83%	7000 μ F
KADN40524D	85 ~ 265 VAC	39 WATTS	+5 / + 24 VDC	+3A / + 1A	81%	83%	7000 μ F

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions	min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom		65		KHz
Isolation voltage	Input - Output	4236/6000			VAC/VDC
Isolation resistance	Input - Output, @ 500VDC	100			M Ω
Ambient temperature 1)	Operating at Vi nom, Io nom	-40		+ 71	°C
Derating	Vi nom, + 61 to + 71 °C			2.5	% / °C
Storage temperature	Non operational	-40		+ 100	°C
Relative humidity	Vi nom, Io nom	20		95	% RH
Temperature coefficient	Vi nom, Io min			$\pm$ 0.03	% / °C

NOTE1 : Pls refer to DERATING CURVE.

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ISO 9001 Certified

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SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions	min.	typ.	max.	unit
MTBF	Bellcore issue 6 @40°C, GB 3.3V, 5V, 512D & 524D models 12V, 12D & 15D models 15V & 24V models		608000		Hours
			618000		Hours
			625000		Hours
Altitude during operation	IEC 60068-2-13			4850	m
Dimension		L85.3 x W60.3 x H24.2			mm
Cooling	Free air convection				

INPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Rated input voltage	Io nom	100		240	VAC
Input voltage range	Ta min ... Ta max, Io nom	85		265	VAC
		120		375	VDC
Input current	Vi : 115 / 230 VAC, Io nom		0.75 / 0.45		A
Rated input current	Vi : 100 ~ 240 VAC, Io nom			0.8 - 0.4	A
Line frequency	Vi nom, Io nom	47		63	Hz
Inrush current	Vi : 115 / 230 VAC, Io nom			20/40	A
Leakage current	Normal condition			100	μA
	Single fault condition			300	μA

OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy	Vi nom, single output models			± 1	%
	Io nom, dual output models			± 2	%
	524D model			± 4	%
Minimum load	Vi nom, single output models	0			%
	dual output models (each output)	20			%
Line regulation	Io nom, Vi min ... Vi max			± 1	%
Load regulation	Vi nom, single output models			± 1	%
	Io min ... Io nom, dual output models			± 2	%
Cross regulation (Dual model)	Asymmetrical load 20% / 100% FL			± 6	%
Hold up time	Vi : 115 / 230 VAC, Io nom	20/100			ms
Turn on time	Vi nom, Io nom			1000	ms
Rise time	Vi nom, Io nom			150	ms
Fall time	Vi nom, Io nom			150	ms
Transient recovery time	Vi nom, I ~ 0.5 Io nom			1	ms
Ripple & noise	Vi nom, Io nom, BW = 20MHz			50	mV
External trim ADJ. Range 2) (for single output only)	Io = 5% ... 100%	-10		+10	%
Efficiency	Vi nom, Io nom, Po / Pi	Up to 87%, See model list and typ efficiency curve			

NOTE 2 : Pls refer to Fig 1 & Table 1 for connection and resistance recommended.

CONTROL AND PROTECTION

Characteristics	Conditions	min.	typ.	max.	unit
Input fuse		T2A / 250VAC internal			
Internal surge voltage protection	IEC 61000-4-5	Varistor			
Output short circuit		Hiccup mode			
Rated over load protection	Vi nom (see typ current limited curve)	120		160	%

SPECIFICATION

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APPROVALS AND STANDARDS

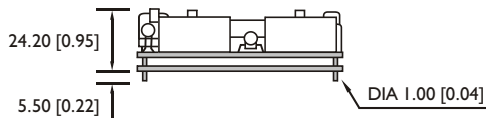
UL / cUL	UL 60950-1, UL 60601-1 Recognized
TUV	EN 60950-1, EN 60601-1
CE	EN 60601-1-2, EN 55011, EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3 EN 61000-6-2, EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5 EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61204-3
Vibration resistance	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)
Shock resistance	meet IEC 60068-2-27 (15G, 11ms, 3 axes, 6 Faces, 3 times for each Face)

PHYSICAL CHARACTERISTICS

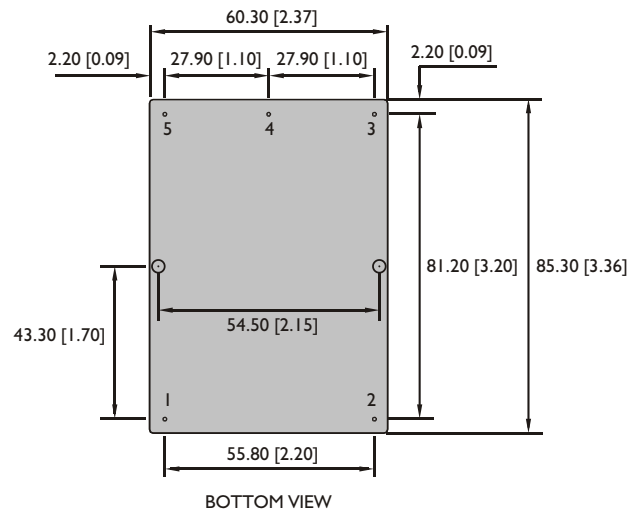
Case size	85.3 x 60.3 x 24.2mm (3.36 x 2.37 x 0.95 inches)
Case material	Plastic
Weight	130g

MECHANISM & PIN CONFIGURATION

mm [inch]



GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]



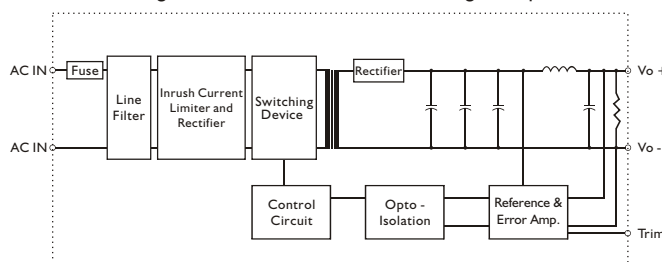
PIN ASSIGNMENT

GENERAL

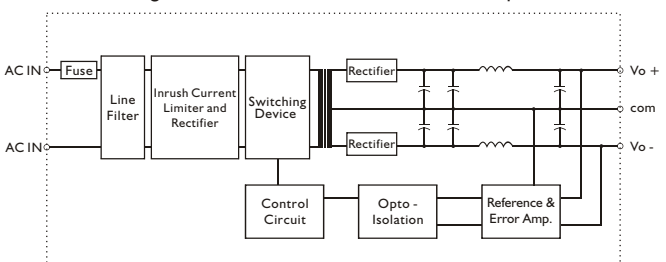
PIN NO.		1	2	3	4	5
SINGLE		AC IN	AC IN	Vo +	Vo -	Trim
DUAL	12D, 15D	AC IN	AC IN	Vo +	com	Vo -
	512D	AC IN	AC IN	+5V	com	+12V
	524D	AC IN	AC IN	+5V	com	+24V

CIRCUIT SCHEMATIC

• Block diagram for KADN40 series with single output

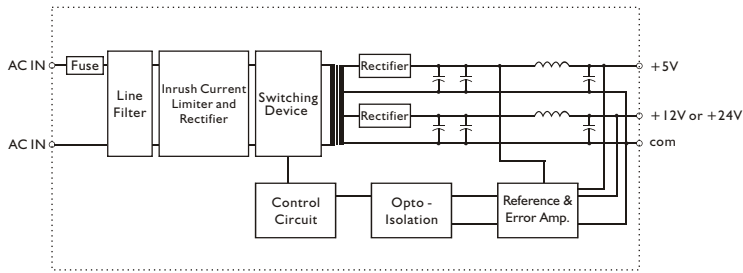


• Block diagram for KADN40 series with dual output

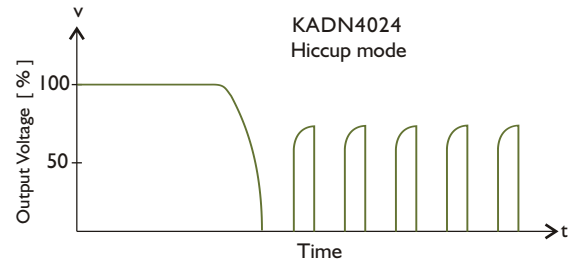


CIRCUIT SCHEMATIC

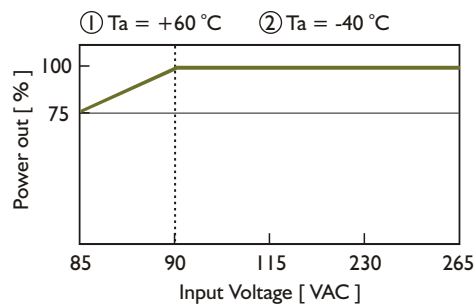
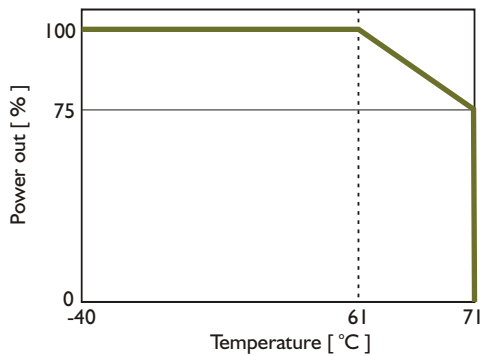
• Block diagram for KADN40512D & KADN40524D



TYP. CURRENT LIMITED CURVE



DERATING CURVE



TYP. EFFICIENCY CURVE

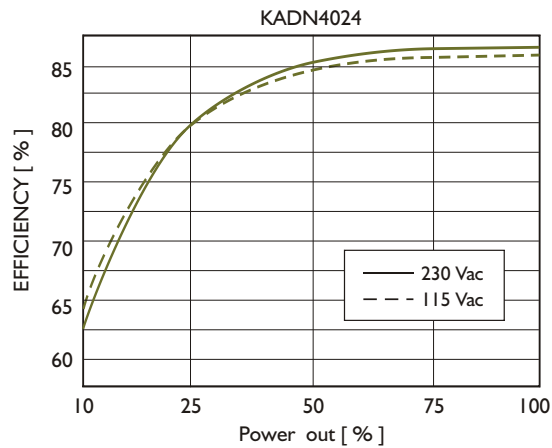


Fig. 1 Trim connection (For single output only)

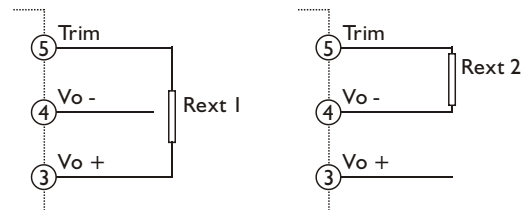


Table 1 Typical resistor values for various output voltage adjustment settings and max continuous power

Type	Rext 1		Rext 2		Max continuous power
	Vo nom -5%	Vo nom -10%	Vo nom +5%	Vo nom +10%	
KADN4003	20KΩ	5.1KΩ	3KΩ	1KΩ	28 W
KADN4005	5.1KΩ	1KΩ	6.8KΩ	2KΩ	40 W
KADN4012	39KΩ	20KΩ	10KΩ	0Ω	40.8 W
KADN4015	180KΩ	56KΩ	30KΩ	5.1KΩ	40.5 W
KADN4024	150KΩ	51KΩ	8.2KΩ	0Ω	40.8 W