# KADN30 SERIES

OPEN FRAME
AC - DC POWER MODULE
25 ~ 30W UL / cUL / TUV / CE

## FEATURES

- AC/DC POWER MODULE
- UNIVERSAL INPUT 85 ~ 265 VAC
- HIGH EFFICIENCY UP TO 86%
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 2 YEARS WARRANTY
- MEDICAL SAFETY APPROVED
- LOW LEAKAGE CURRENT

UL 60950-1 UL 60601-1 EN 60950-1 EN 60601-1

## MODEL LIST

| MODEL NO. | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|---|---|---|---|---|---|---|---|
| **Single Output Models** | | | | | | | |
| KADN3003 | 85 ~ 265 VAC | 25 WATTS | +3.3 VDC | 7500 mA | 75% | 77% | 7000 μF |
| KADN3005 | 85 ~ 265 VAC | 30 WATTS | + 5 VDC | 6000 mA | 79% | 81% | 7000 μF |
| KADN3012 | 85 ~ 265 VAC | 30 WATTS | + 12 VDC | 2500 mA | 83% | 85% | 7000 μF |
| KADN3015 | 85 ~ 265 VAC | 30 WATTS | + 15 VDC | 2000 mA | 84% | 86% | 7000 μF |
| KADN3024 | 85 ~ 265 VAC | 30 WATTS | + 24 VDC | 1250 mA | 84% | 86% | 3500 μF |
| **Dual Output Models** | | | | | | | |
| KADN3012D | 85 ~ 265 VAC | 30 WATTS | ± 12 VDC | ± 1250 mA | 82% | 84% | ± 7000 μF |
| KADN3015D | 85 ~ 265 VAC | 30 WATTS | ± 15 VDC | ± 1000 mA | 83% | 85% | ± 7000 μF |
| KADN30512D | 85 ~ 265 VAC | 30 WATTS | +5 / + 12 VDC | +3A / + 1.25A | 80% | 82% | 7000 μF |
| KADN30524D | 85 ~ 265 VAC | 30 WATTS | +5 / + 24 VDC | +3A / + 0.625A | 80% | 82% | 7000 μF |

## 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 | | | MΩ |
| 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 | | | ± 0.03 | % / °C |

*NOTE1 : Pls refer to DERATING CURVE.*

# 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 | | 705000 | | Hours |
| | | 12V, 12D & 15D models | | 724000 | | Hours |
| | | 15V & 24V models | | 742000 | | 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 | AC in | 85 | | 265 | VAC |
| | | DC in | 120 | | 375 | VDC |
| Input current | Vi : 115 / 230 VAC, Io nom | | | 0.56 / 0.34 | | 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, Io nom | single output models | | | ± 1 | % |
| | | 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, Io min ...Io nom | single output models | | | ± 1 | % |
| | | dual output models | | | ± 2 | % |
| Cross regulation (Dual model) | Asymmetrical load 20% / 100% FL | | | | ± 6 | % |
| Hold up time | Vi : 115 / 230 VAC, Io nom | | 15/75 | | | 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, 1~0.5 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 86%, 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

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

## APPROVALS AND STANDARDS

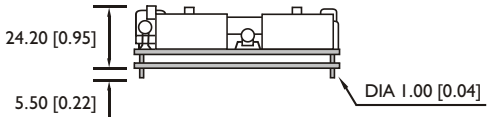
| | |
|---|---|
| UL / cUL | UL 60950-1, UL 60601-1 Recognized |
| TUV | EN 60950-1, EN 60601-1 |
| CE | EN 60601-1-2, EN 55011, EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3<br>EN 61000-6-2, EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5<br>EN 61000-4-6, EN 61000-4-8, 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) |

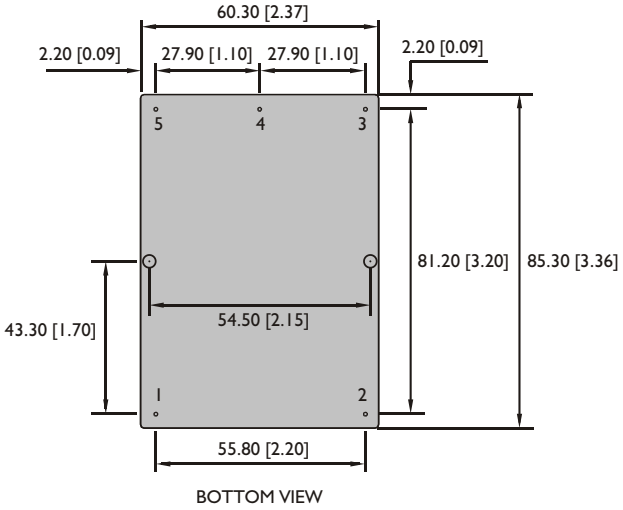
# PHYSICAL CHARACTERISTICS

| | |
|---|---|
| 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] |

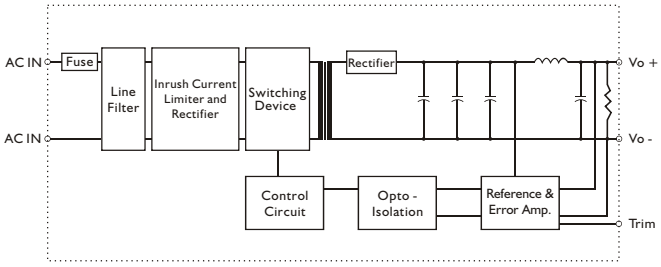
# PIN ASSIGNMENT

## GENERAL

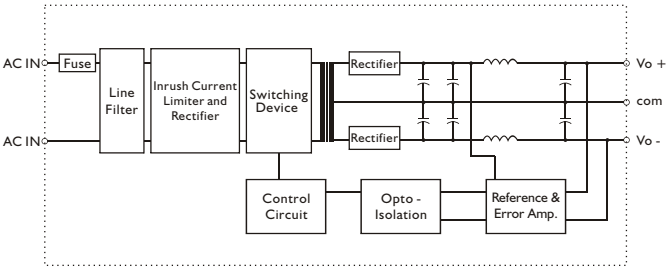
| PIN NO. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| SINGLE | | AC IN | AC IN | Vo + | Vo - | Trim |
| DUAL | 12D, 15D | AC IN | AC IN | Vo + | com | Vo - |
| | 512D | AC IN | AC IN | +5V | com | +12V |
| | 524D | AC IN | AC IN | +5V | com | +24V |

# CIRCUIT SCHEMATIC

• Block diagram for KADN30 series with single output

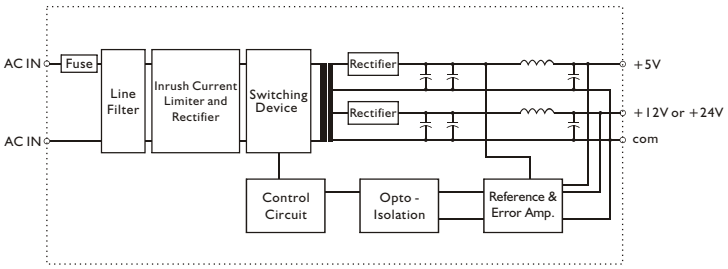



• Block diagram for KADN30 series with dual output

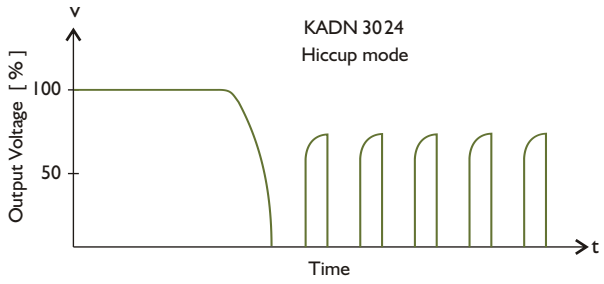


## CIRCUIT SCHEMATIC

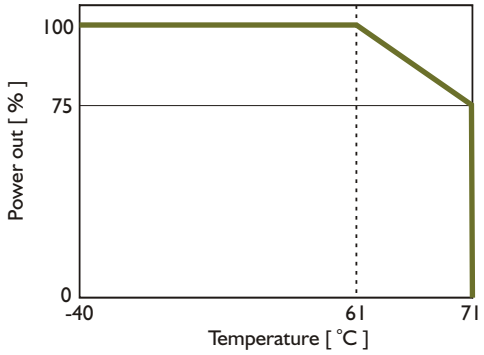
• Block diagram for KADN30512D & KADN30524D

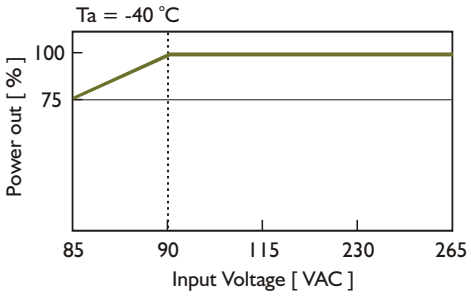



## TYP. CURRENT LIMITED CURVE

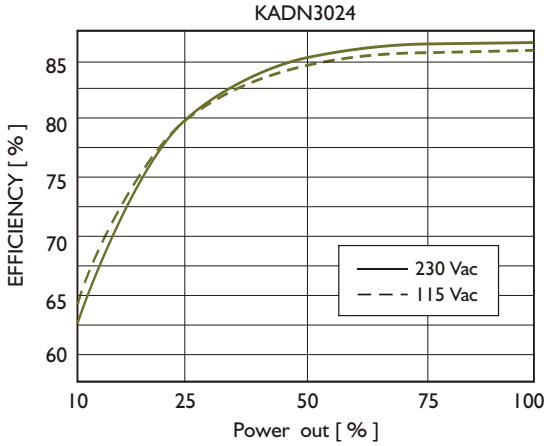



## DERATING CURVE




## TYP. EFFICIENCY CURVE




## Fig. 1 Trim connection

(For single output only)

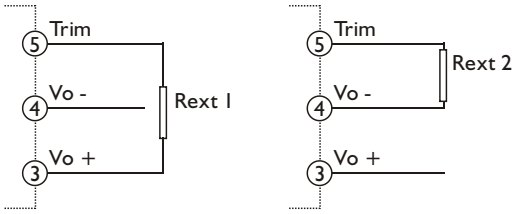



**Table 1 Typical resistor values for various output voltage adjustment settings and max continuous power**

| Type | Rext 1 | | Rext 2 | | Max continuous power |
|---|---|---|---|---|---|
| | Vo nom -5% | Vo nom -10% | Vo nom +5% | Vo nom +10% | |
| KADN3003 | 20KΩ | 5.1KΩ | 3KΩ | 1KΩ | 25 W |
| KADN3005 | 5.1KΩ | 1KΩ | 6.8KΩ | 2KΩ | 30 W |
| KADN3012 | 39KΩ | 20KΩ | 10KΩ | 0Ω | 30 W |
| KADN3015 | 180KΩ | 56KΩ | 30KΩ | 5.1KΩ | 30 W |
| KADN3024 | 150KΩ | 51KΩ | 8.2KΩ | 0Ω | 30 W |