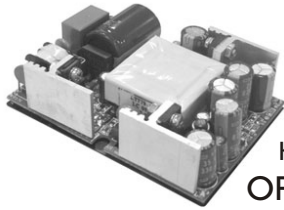


# KADN/KAMN40 SERIES

AC - DC POWER MODULE  
28 ~ 40W SINGLE & DUAL OUTPUT



KAMN40 series



KADN40 series  
OPEN FRAME

## FEATURES

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



## MODEL LIST

| MODEL NO.                   | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|-----------------------------|---------------|----------------|----------------|----------------|-------------|-------------|-----------------------|
| <b>Single Output Models</b> |               |                |                |                |             |             |                       |
| KADN/KAMN4005               | 85 ~ 265 VAC  | 40 WATTS       | + 5 VDC        | 8000 mA        | 80%         | 82%         | 7000 $\mu$ F          |
| KADN/KAMN4012               | 85 ~ 265 VAC  | 40 WATTS       | + 12 VDC       | 3400 mA        | 84%         | 86%         | 7000 $\mu$ F          |
| KADN/KAMN4015               | 85 ~ 265 VAC  | 40 WATTS       | + 15 VDC       | 2700 mA        | 85%         | 87%         | 7000 $\mu$ F          |
| KADN/KAMN4024               | 85 ~ 265 VAC  | 40 WATTS       | + 24 VDC       | 1700 mA        | 85%         | 87%         | 3500 $\mu$ 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              | 4,236 / 6,000 |        |            | VAC/VDC    |  |  |
| Isolation resistance    | Input - Output, @ 500VDC    | 100           |        |            | M $\Omega$ |  |  |
| Ambient temperature (I) | Operating at Vi nom, Io nom | -40           |        | + 71       | °C         |  |  |
| Case temperature        | Operating at Vi nom, Io nom |               | KAMN40 | + 85       | °C         |  |  |
| Derating                | Vi nom, +6I 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.

# KADN/KAMN40 SERIES

AC - DC POWER MODULE

## 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 | 5V        |                       | 606,000 |       | Hours |
|                           |                            | 12V       |                       | 615,000 |       | Hours |
|                           |                            | 15V & 24V |                       | 623,000 |       | Hours |
| Altitude during operation | IEC 60068-2-13             |           |                       |         | 4,850 | m     |
| Dimension                 |                            | KAMN40    | L89 x W63.5 x H25     |         |       | mm    |
|                           |                            | KADN40    | 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,<br>Io nom | AC in | 85   |             | 265       | VAC  |
|                          |                              | DC in | 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 (Note 2)  | Vi nom, Io nom               |       | 47   |             | 63        | Hz   |
| Inrush current           | Vi : 115 / 230 VAC, Io nom   |       |      |             | 20/40     | A    |
| Leakage current (Note 2) | Normal condition             |       |      |             | 100       | μA   |
|                          | Single fault condition       |       |      |             | 300       | μA   |

NOTE 2 : The unit can be worked at 440 Hz of line frequency but the leakage current would be 600μA max. , and output load should be derated under 90%

### OUTPUT SPECIFICATIONS

| Characteristics   | Conditions                   |                      | min.   | typ. | max.  | unit |
|---|------------------------------|----------------------|--|------|-------|------|
| Output voltage accuracy                                       | Vi nom,<br>Io nom            | single output models |  |      | ± 1   | %    |
| Minimum load  | Vi nom                       | single output models | 0  |      |       | %    |
| Line regulation   | Io nom, Vi min ... Vi max    |                      |  |      | ± 1   | %    |
| Load regulation   | Vi nom,<br>Io min ... Io nom | single output models |  |      | ± 1   | %    |
| Hold up time  | Vi : 115 / 230 VAC, Io nom   |                      | 20 / 100   |      |       | ms   |
| Turn on time  | Vi nom, Io nom               |                      |  |      | 1,000 | 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 (Note 3)<br>(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 3 : 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  | %    |

# KADN/KAMN40 SERIES

AC - DC POWER MODULE

## SPECIFICATION

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

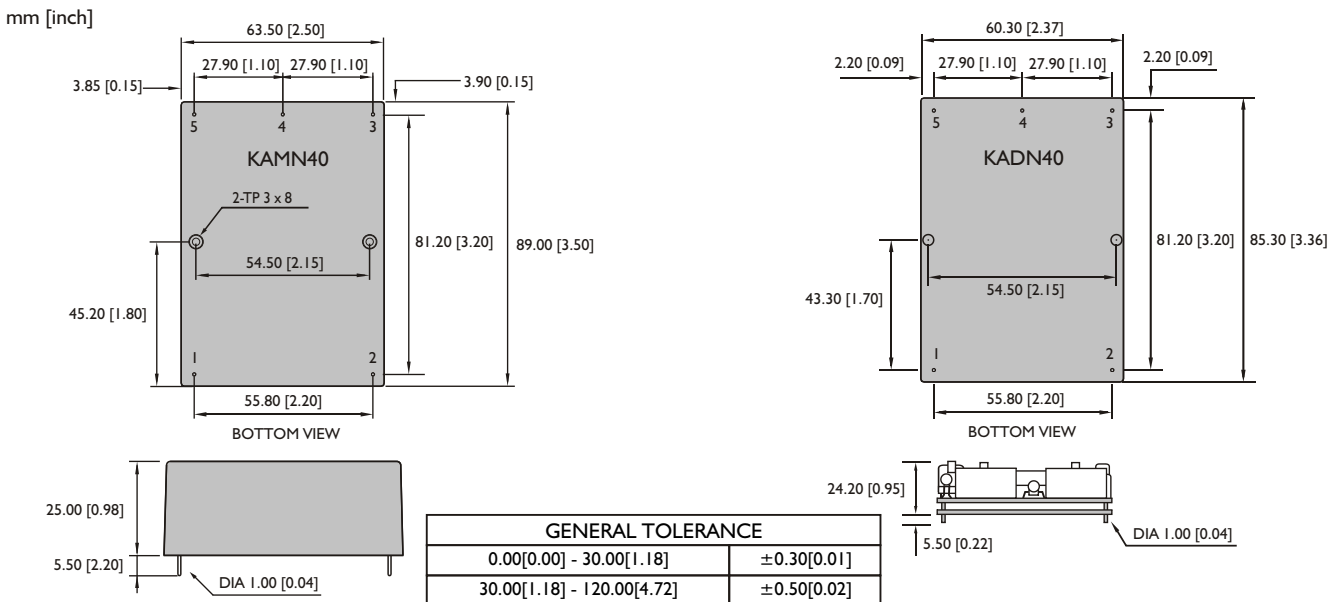
### APPROVALS AND STANDARDS

|                      |   |
|----------------------|---|
| 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 55032 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        | KAMN40 : 89 x 63.5 x 25mm ( 3.5 x 2.5 x 0.98 inches)   KADN40 : 85.3 x 60.3 x 24.2mm ( 3.36 x 2.37 x 0.95 inches) |
| Case material    | Plastic case / PCB base   |
| Weight           | KAMN40 : 250g   KADN40 : 130g   |
| Potting material | KAMN40 : Epoxy  |

### MECHANISM & PIN CONFIGURATION



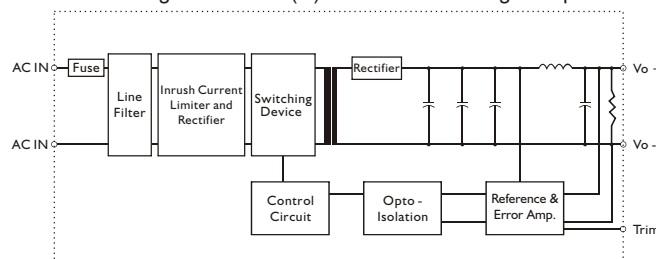
### PIN ASSIGNMENT

#### GENERAL

| PIN NO. | 1     | 2     | 3    | 4    | 5    |
|---------|-------|-------|------|------|------|
| SINGLE  | AC IN | AC IN | Vo + | Vo - | Trim |

### CIRCUIT SCHEMATIC

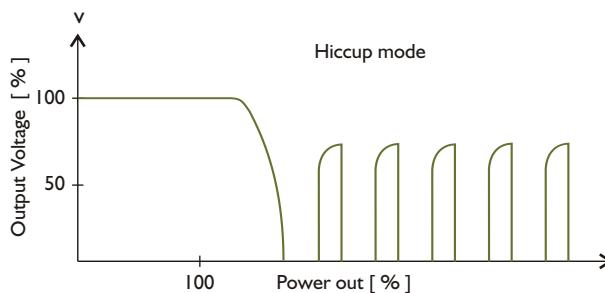
• Block diagram for KAM(D)N40 series with single output



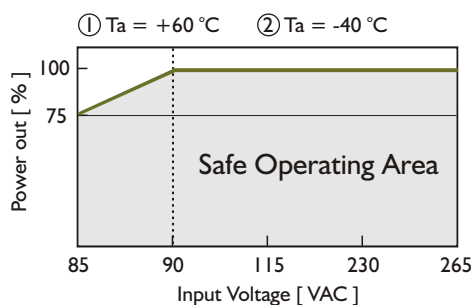
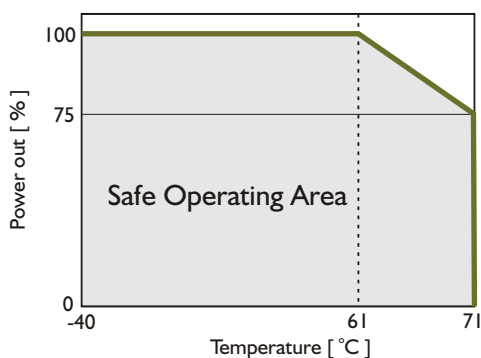
# KADN/KAMN40 SERIES

AC - DC POWER MODULE

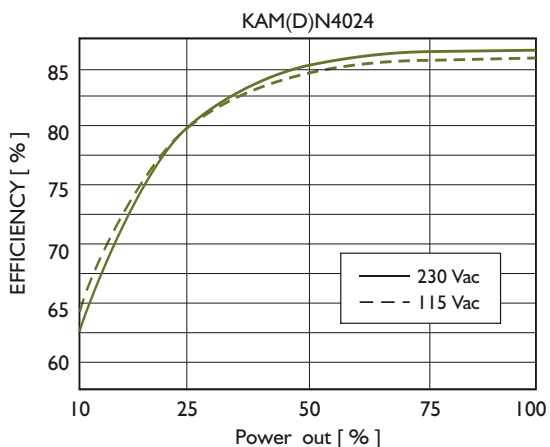
## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



## TYP. EFFICIENCY CURVE



## Fig. 1 Trim connection (For single output only)

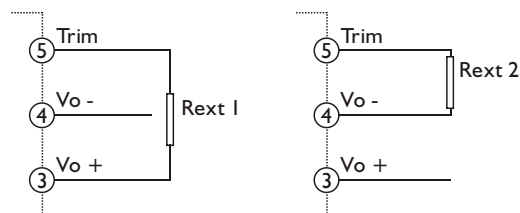


Table 1 Typical resistor values for various output voltage adjustment settings and max continuous power

| Type        | Rext 1     |             | Rext 2     |             | Max continuous power |
|-------------|------------|-------------|------------|-------------|----------------------|
|             | Vo nom -5% | Vo nom -10% | Vo nom +5% | Vo nom +10% |                      |
| KAM(D)N4005 | 5.1KΩ      | 1KΩ         | 6.8KΩ      | 2KΩ         | 40 W                 |
| KAM(D)N4012 | 39KΩ       | 20KΩ        | 10KΩ       | 0Ω          | 40.8 W               |
| KAM(D)N4015 | 180KΩ      | 56KΩ        | 30KΩ       | 5.1KΩ       | 40.5 W               |
| KAM(D)N4024 | 150KΩ      | 51KΩ        | 8.2KΩ      | 0Ω          | 40.8 W               |