

# KAM07 SERIES

## AC - DC POWER MODULE

6.3 ~ 7.6W UL / cUL / TUV / CE



## FEATURES

- AC/DC POWER MODULE
- UNIVERSAL INPUT 85 ~ 265 VAC
- HIGH EFFICIENCY UP TO 79%
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 2 YEARS WARRANTY



## MODEL LIST

| MODEL NO. | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|-----------|---------------|----------------|----------------|----------------|-------------|-------------|-----------------------|
|-----------|---------------|----------------|----------------|----------------|-------------|-------------|-----------------------|

### Single Output Models

|         |            |           |           |         |     |     |              |
|---------|------------|-----------|-----------|---------|-----|-----|--------------|
| KAM0703 | 85~265 VAC | 6.6 WATTS | + 3.3 VDC | 2000 mA | 69% | 72% | 7000 $\mu$ F |
| KAM0705 | 85~265 VAC | 7.5 WATTS | + 5 VDC   | 1500 mA | 72% | 75% | 7000 $\mu$ F |
| KAM0712 | 85~265 VAC | 7.5 WATTS | + 12 VDC  | 630 mA  | 75% | 78% | 7000 $\mu$ F |
| KAM0715 | 85~265 VAC | 7.5 WATTS | + 15 VDC  | 500 mA  | 75% | 78% | 7000 $\mu$ F |
| KAM0724 | 85~265 VAC | 7.6 WATTS | + 24 VDC  | 320 mA  | 77% | 79% | 7000 $\mu$ F |

### Dual Output Models

|           |            |           |                |               |     |     |                    |
|-----------|------------|-----------|----------------|---------------|-----|-----|--------------------|
| KAM0712D  | 85~265 VAC | 7.6 WATTS | $\pm$ 12 VDC   | $\pm$ 320 mA  | 74% | 77% | $\pm$ 3500 $\mu$ F |
| KAM0715D  | 85~265 VAC | 7.5 WATTS | $\pm$ 15 VDC   | $\pm$ 250 mA  | 75% | 78% | $\pm$ 3500 $\mu$ F |
| KAM07503D | 85~265 VAC | 6.3 WATTS | +3.3 / + 5 VDC | +1 A / +0.6A  | 65% | 68% | 3500 $\mu$ F       |
| KAM07512D | 85~265 VAC | 6.6 WATTS | +5 / +12 VDC   | +0.6A / +0.3A | 72% | 75% | 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              | 80        |      | 100        | KHz        |
| Isolation voltage       | Input - Output              | 3000/4242 |      |            | VAC/VDC    |
|                         | Input - FG                  | 1500/2121 |      |            | VAC/VDC    |
| Isolation resistance    | Input - Output, @ 500VDC    | 100       |      |            | M $\Omega$ |
| Ambient temperature     | Operating at Vi nom, Io nom | -40       |      | + 71       | °C         |
| Case temperature        | Operating at Vi nom, Io nom |           |      | + 85       | °C         |
| Derating                | Vi nom, +51 to + 71 °C      |           |      | 2          | % / °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     |

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#### GENERAL

| Characteristics           | Conditions                                    | min.              | typ.    | max. | unit  |
|---------------------------|-----------------------------------------------|-------------------|---------|------|-------|
| MTBF                      | Bellcore issue 6 @40°C, GB 3.3V & 503D models |                   | 1500000 |      | Hours |
|                           |                                               |                   | 1520000 |      | Hours |
|                           |                                               |                   | 1540000 |      | Hours |
|                           |                                               |                   | 1570000 |      | Hours |
| Altitude during operation | IEC 60068-2-13                                |                   |         | 4850 | m     |
| Dimension                 |                                               | L58 x W45 x H18.5 |         |      | mm    |
| Cooling                   | Free air convection                           |                   |         |      |       |

#### INPUT SPECIFICATIONS

| Characteristics     | Conditions                   | min. | typ.      | max.  | unit |
|---------------------|------------------------------|------|-----------|-------|------|
| Rated input voltage | Io nom                       | 85   |           | 240   | VAC  |
| Input voltage range | Ta min ... Ta max,<br>Io nom | 85   |           | 265   | VAC  |
|                     |                              | 120  |           | 375   | VDC  |
| Input current       | Vi : 115 / 230 VAC, Io nom   |      | 160 / 120 |       | mA   |
| Rated input current | Vi : 85 VAC, Io nom          |      |           | 250   | mA   |
| Line frequency      | Vi nom, Io nom               | 47   |           | 63    | Hz   |
| Inrush current      | Vi : 115 / 230 VAC, Io nom   |      |           | 10/18 | A    |
| Leakage current     | Input - Output               |      |           | 0.25  | mA   |
|                     | Input - FG                   |      |           | 3.5   | mA   |

#### OUTPUT SPECIFICATIONS

| Characteristics               | Conditions                           | min.                                               | typ. | max. | unit |
|-------------------------------|--------------------------------------|----------------------------------------------------|------|------|------|
| Output voltage accuracy       | Vi nom, Io nom                       |                                                    |      | ± 2  | %    |
| Minimum load                  | Vi nom                               | 0                                                  |      |      | %    |
|                               | dual output models (each output)     | 20                                                 |      |      | %    |
| Line regulation               | Io nom, Vi min ... Vi max            |                                                    |      | ± 1  | %    |
| Load regulation               | Vi nom,<br>Io min ... Io nom         |                                                    |      | ± 2  | %    |
|                               |                                      |                                                    |      | ± 5  | %    |
| Cross regulation (Dual model) | Asymmetrical load 20% - 100% FL      |                                                    |      | ± 6  | %    |
| Hold up time                  | Vi: 115/230 VAC, Io nom              | 15/30                                              |      |      | 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, 3.3V model           |                                                    |      | 60   | mV   |
|                               | BW = 20MHz, 5V, 12V, 15V, 24V & dual |                                                    |      | 100  | mV   |
| Efficiency                    | Vi nom, Io nom, Po / Pi              | Up to 79%, See model list and typ efficiency curve |      |      |      |

#### 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              |                                        | Fold forward          |      |      |      |
| Rated over load protection        | Vi nom (see typ current limited curve) | 130                   |      | 170  | %    |

### SPECIFICATION

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### APPROVALS AND STANDARDS

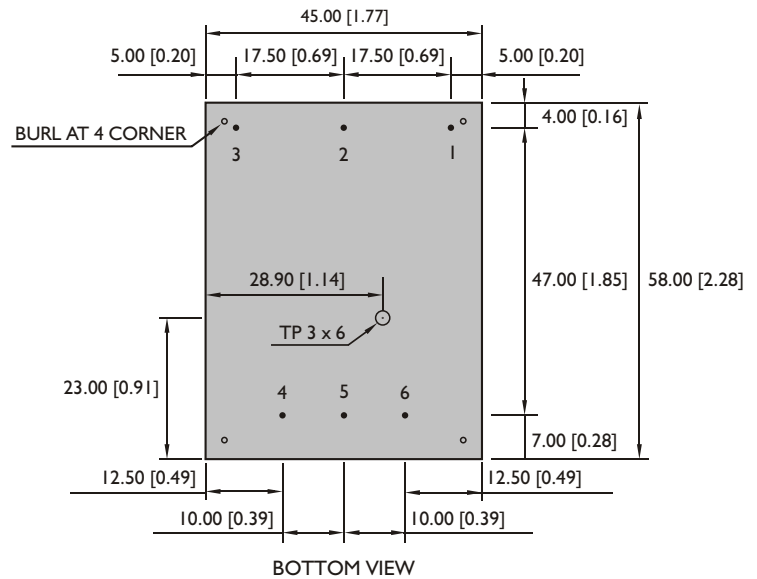
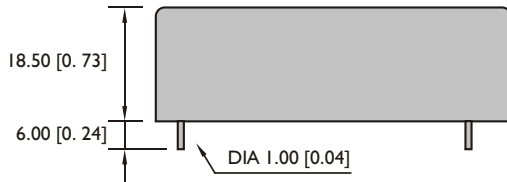
|                      |                                                                                                                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UL / cUL             | UL 60950-1, Recognized                                                                                                                                                                                  |
| TUV                  | EN 60950-1, CB scheme                                                                                                                                                                                   |
| CE                   | 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<br>EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8<br>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        | 58 x 45 x 18.5mm ( 2.28 x 1.77 x 0.73 inches) |
| Case material    | Plastic                                       |
| Weight           | 85g                                           |
| Potting material | Epoxy                                         |

### 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] |

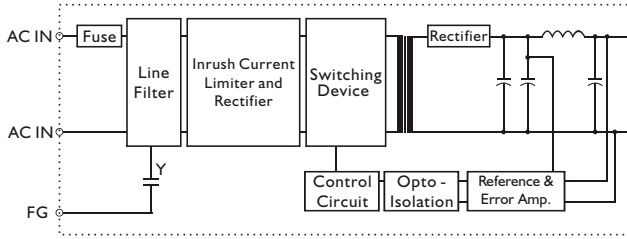
### PIN ASSIGNMENT

#### GENERAL

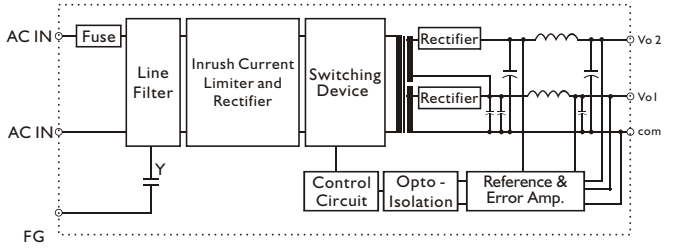
| PIN NO. | 1        | 2     | 3     | 4     | 5      | 6    |
|---------|----------|-------|-------|-------|--------|------|
| SINGLE  | AC IN    | AC IN | F. G. | Vo -  | NO PIN | Vo + |
| DUAL    | 12D, 15D | AC IN | AC IN | F. G. | Vo -   | com  |
|         | 503D     | AC IN | AC IN | F. G. | + 5V   | com  |
|         | 512D     | AC IN | AC IN | F. G. | + 12V  | com  |

### CIRCUIT SCHEMATIC

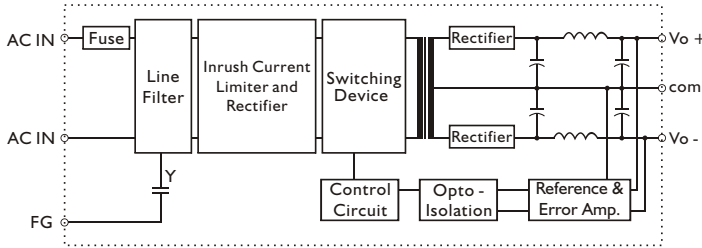
• Block diagram for KAM07 series with single output



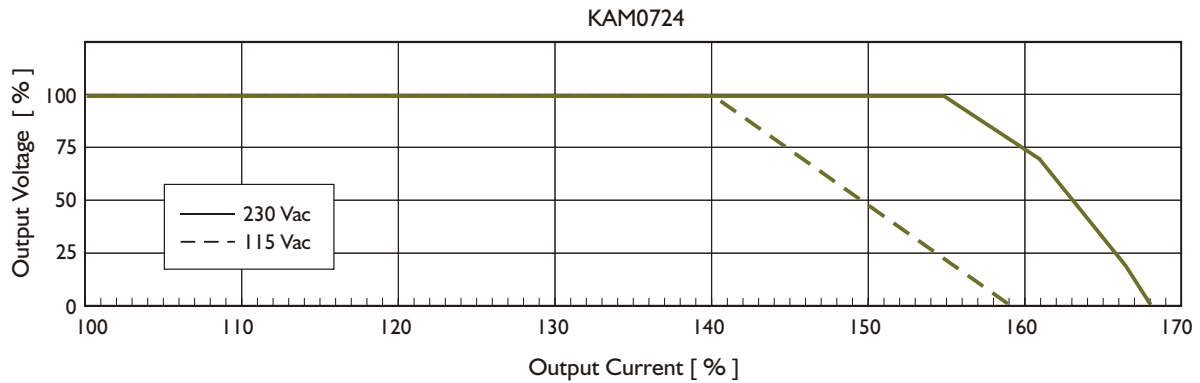
• Block diagram for KAM07503D & KAM07512D



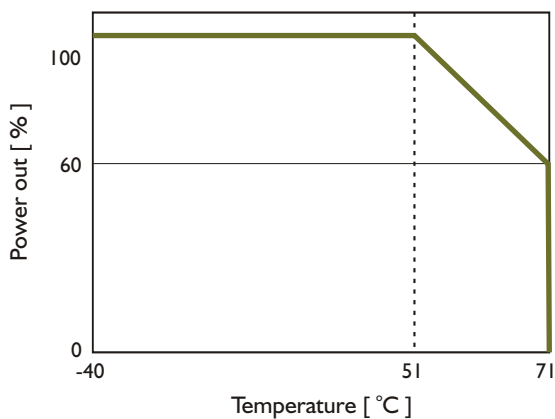
• Block diagram for KAM07 series with dual output



### TYP. CURRENT LIMITED CURVE



### DERATING CURVE



### TYP. EFFICIENCY CURVE

