<table>
<thead>
<tr>
<th>Model</th>
<th>Power</th>
<th>Page</th>
</tr>
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<tbody>
<tr>
<td>CFM21</td>
<td>20W</td>
<td>2</td>
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<td>CFM21M</td>
<td>20W</td>
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<td>CFM40M</td>
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<td>CFM60M</td>
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<td>130W</td>
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<td>CFM351M</td>
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<td>CFM500M</td>
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<td>TR15RAM</td>
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<td>TR18RDM</td>
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<td>TR30RDM</td>
<td>30W</td>
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<td>TR30RAM</td>
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<td>TR36M</td>
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<td>TR60M</td>
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<td>TR70M</td>
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<td>36</td>
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<td>TR100M</td>
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<td>TR160M</td>
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<tr>
<td>EC4AW-H6</td>
<td>6W</td>
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<td>AC POWER CORD</td>
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<td>CABLE &amp; DC PLUG</td>
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<td>46</td>
</tr>
<tr>
<td>REQUEST FOR QUOTE</td>
<td></td>
<td>48</td>
</tr>
</tbody>
</table>
CFM21 SERIES
20 WATT, LOW PROFILE 0.8"

Features

- Universal Input Range 90-264VAC
- Miniature Size Low Profile 0.8"
- Industry-Standard Pin Out
- Efficiency to 85%
- Option for On-Board, Connector, Screw Terminal or Encapsulated type
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Input Power < 0.3W
- Leakage Current < 0.1mA
- UL60601-1/IEC60601-1/EN60601-1 Medical Safety Approved
- UL60950-1/IEC60950-1/EN60950-1 ITE Safety Approved

Mechanical Dimensions

All Dimensions in Inches (mm)
Tolerance
Inches: X.XXX=±0.02, X.XXX=±0.01
Millimeters: X.XX=±0.5, X.XX=±0.25

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>INPUT VOLTAGE</th>
<th>OUTPUT VOLTAGE</th>
<th>MIN. LOAD</th>
<th>MAX. LOAD</th>
<th>OUTPUT RATED POWER</th>
<th>RIPPLE &amp; NOISE</th>
<th>VOLTAGE ACCURACY</th>
<th>% EFF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM21S033</td>
<td>90-264 VAC</td>
<td>3.3 V</td>
<td>0</td>
<td>4.0 A</td>
<td>13.2 W</td>
<td>50 mV</td>
<td>±1%</td>
<td>75%</td>
</tr>
<tr>
<td>CFM21S050</td>
<td>90-264 VAC</td>
<td>5 V</td>
<td>0</td>
<td>4.0 A</td>
<td>20.0 W</td>
<td>50 mV</td>
<td>±1%</td>
<td>80%</td>
</tr>
<tr>
<td>CFM21S090</td>
<td>90-264 VAC</td>
<td>9 V</td>
<td>0</td>
<td>2.3 A</td>
<td>20.7 W</td>
<td>90 mV</td>
<td>±1%</td>
<td>81%</td>
</tr>
<tr>
<td>CFM21S120</td>
<td>90-264 VAC</td>
<td>12 V</td>
<td>0</td>
<td>1.7 A</td>
<td>20.4 W</td>
<td>100 mV</td>
<td>±1%</td>
<td>83%</td>
</tr>
<tr>
<td>CFM21S150</td>
<td>90-264 VAC</td>
<td>15 V</td>
<td>0</td>
<td>1.4 A</td>
<td>21.0 W</td>
<td>100 mV</td>
<td>±1%</td>
<td>84%</td>
</tr>
<tr>
<td>CFM21S240</td>
<td>90-264 VAC</td>
<td>24 V</td>
<td>0</td>
<td>0.9 A</td>
<td>21.6 W</td>
<td>100 mV</td>
<td>±1%</td>
<td>85%</td>
</tr>
</tbody>
</table>
**Derating Curve**

![Derating Curve Graph]

**Specifications**

All Specifications Typical At Nominal Line, 75% Load, and 25°C Unless Otherwise Noted

**INPUT SPECIFICATIONS**
- Voltage: 90-264Vac, 120-370Vdc
- Frequency: 47 to 63Hz
- Inrush Current: 0.3 to 0.5A
- Cold Start @25°C: 40A max. @230Vac
- Leakage Current: 0.1mA max.

**OUTPUT SPECIFICATIONS**
- Voltage Accuracy: ±1.0% max.
- Line Regulation (note 3): ±0.5% max.
- Load Regulation (note 4): ±1.0% max.
- Hold-up Time: 10ms typ. @115Vac
- Short Circuit Protection
- Over Voltage Protection (TVS)

**GENERAL SPECIFICATIONS**
- Efficiency: see Table
- Switching Frequency: 100KHz typ.
- Isolation: Input to output = 5656VDC
- Operating Temperature: -25-70°C (with de-rating)
- Storage Temperature: -40-85°C
- Cooling: Natural Convection
- Humidity: 93% RH max. Non condensing
- MTBF: ….. MIL-STD-217F, GB
- Dimensions:
  - T: 2.38 x 1.60 x 0.80 inches (60.5 x 40.6 x 20.4 mm)
  - E: 2.53 x 1.74 x 0.80 inches (64.2 x 44.2 x 20.4 mm)
  - S: 3.00 x 1.60 x 0.77 inches (76.2 x 40.6 x 19.5 mm)
- Weight:
  - 50 g, 55 g (-T, -S), 105 g (-E)

**SAFETY AND EMISSION**
- CE Directive
- Safety Approvals

**NOTE**
1. Voltage accuracy is set of 100% rated load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from 10% to 100% full load.
5. "T" Version Connection: JST B3P-VH / B4P-VH or equivalent.
# CFM21M SERIES
## 20 WATT SINGLE OUTPUT AC-DC MODULES

### Features
- Universal Input Range 90-264VAC
- Class II
- Miniature Size Low Profile 0.8"
- Industry-Standard Pin Out
- Efficiency to 87%
- Option for On-Board, Connector,Screw Terminal or Encapsulated type
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Input Power < 0.1W
- Leakage Current < 100uA
- UL60601-1/IEC60601-1/EN60601-1 Ed.3.1 Medical Safety Approved
- 2 MOPP
- Peak Load 130% (note 8)
- Meet UL62368/IEC62368/EN62368
- Meet UL60335-1/IEC60335-1/EN60335-1

### Mechanical Dimensions

All Dimensions In Inches[mm]
Tolerance: Inches>x.xxx= ±0.02,x.xxx± ±0.01
Millimeters:x.x= ±0.5,x.xxx= ±0.25

### MODEL OUTPUT

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>OUTPUT RATED POWER</th>
<th>% EFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM21M050</td>
<td>5.0 V</td>
<td>4.0 A</td>
<td>50mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1.0%</td>
<td>20.0W</td>
<td>81%</td>
</tr>
<tr>
<td>CFM21M090</td>
<td>9.0 V</td>
<td>2.3 A</td>
<td>90mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1.0%</td>
<td>20.7W</td>
<td>83%</td>
</tr>
<tr>
<td>CFM21M120</td>
<td>12 V</td>
<td>1.7 A</td>
<td>100mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1.0%</td>
<td>20.4W</td>
<td>85%</td>
</tr>
<tr>
<td>CFM21M150</td>
<td>15 V</td>
<td>1.4 A</td>
<td>100mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1.0%</td>
<td>21.0W</td>
<td>86%</td>
</tr>
<tr>
<td>CFM21M240</td>
<td>24 V</td>
<td>0.9 A</td>
<td>100mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1.0%</td>
<td>21.6W</td>
<td>87%</td>
</tr>
</tbody>
</table>

www.cincon.com
Derating Curve

Specifications

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

INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Voltage</th>
<th>90-264Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>47 to 63Hz</td>
</tr>
<tr>
<td>Input Current</td>
<td>0.3 to 0.5A</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>Cold Start@25°C</td>
</tr>
<tr>
<td>Cold Start@25°C</td>
<td>40A max. @230Vac</td>
</tr>
<tr>
<td>70μA Typical - 100μA max</td>
<td></td>
</tr>
<tr>
<td>Leakage Current</td>
<td>10μs typ. @ 115Vac</td>
</tr>
</tbody>
</table>

OUTPUT SPECIFICATIONS

| Isolation              | Input to output = 4000VAC |
| Hold-up Time           | 10ms typ. @ 115Vac |
| Short Circuit Protection| Continuous |
| Over Voltage Protection(TVS) | 110%-140% of Nominal Output Voltage |

SAFETY AND EMISSION

| Emission and Immunity (Ed. 4.0) | EN55011 Class B, EN61000-3-2(3) |
| Safety Approved (Ed. 3.1)       | EN60601-1:2005 |
|                                  | (R)2012&2010/(R)2012 |
|                                  | IEC 60601-1 |
|                                  | ANSI/AAMI ES 60601-1:2005 |

GENERAL SPECIFICATIONS

| Efficiency              | see Table |
| Switching Frequency     | 65kHz typ |
| Operating Temperature   | -25-70°C (with de-rating) |
| Storage Temperature     | -40-85°C |
| Cooling                 | Natural Convection |
| Humidity                | 93% RH max. Non condensing |
| Operating Altitude      | 5000m |
| MTBF                    | MIL-HDBK-217F, GB 500Khrs min |

| Dimensions              | 2.38x1.60x0.80inches |
|                        | (60.5x40.6x20.4mm) |
|                        | -T: 3.00x1.60x0.77inches |
|                        | (76.2x40.6x19.5mm) |
|                        | -E: 2.53x1.74x0.80inches |
|                        | (64.2x44.2x20.4mm) |
|                        | -S: 3.00x1.60x0.77inches |
|                        | (76.2x40.6x19.5mm) |

| Weight                  | 55g, 60g(T, -S), 110g(-T, -S) |

NOTE

1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Voltage accuracy is set of 100% rated load.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from 10% to 100% full load.
5. T Version Connection: JST B3P-VH / B4P-VH or equivalent.
7. Typical efficiency at 230VAC and 100% load at 25°C.
8. Peak load 130% lasting < 10 seconds with a maximum duty cycle of 10% at nominal Line.
CFM40M SERIES
40 WATT, 2" X 3" OPEN FRAME

Features

◆ Universal Input Range 90-264VAC
◆ Medical and ITE Safety Approved
◆ Efficiency to 88% Typical
◆ Continuous Short Circuit Protection
◆ Meets EN55011 and EN55032 Class B
◆ No Load Power Consumption < 0.3W
◆ 2" x 3" Package
◆ Meets 2 MOPP

Mechanical Dimensions

All Dimensions in inches (mm)
Tolerance

Inches: X.XXX±0.02
Millimeters: X.XX±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 2)</th>
<th>VOLTAGE ACCURACY (NOTE 1)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM40M033</td>
<td>3.3 V</td>
<td>6 A</td>
<td>50 mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>76%</td>
</tr>
<tr>
<td>CFM40M050</td>
<td>5 V</td>
<td>6 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>80%</td>
</tr>
<tr>
<td>CFM40M090</td>
<td>9 V</td>
<td>4.45 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>84%</td>
</tr>
<tr>
<td>CFM40M120</td>
<td>12 V</td>
<td>3.34 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>86%</td>
</tr>
<tr>
<td>CFM40M150</td>
<td>15 V</td>
<td>2.67 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>87%</td>
</tr>
<tr>
<td>CFM40M240</td>
<td>24 V</td>
<td>1.67 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>88%</td>
</tr>
<tr>
<td>CFM40M300</td>
<td>30 V</td>
<td>1.33 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>88%</td>
</tr>
<tr>
<td>CFM40M360</td>
<td>36 V</td>
<td>1.11 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>88%</td>
</tr>
<tr>
<td>CFM40M480</td>
<td>48 V</td>
<td>0.834 A</td>
<td>1%</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>88%</td>
</tr>
</tbody>
</table>
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Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

**INPUT SPECIFICATIONS**

- **Voltage**: 90-264Vac, 120-370Vdc
- **Frequency**: 47 to 63Hz
- **Inrush Current**: Cold start @25˚C
  - 60A max. @240Vac
  - 100Vac/1A max
  - 240Vac/0.55A max.
  - 100uA max.
- **Input Current**: 10ms typ. @115Vac
- **Leakage Current**: Hiccup Mode (Auto Recover)
  - TVS Component to Clamp
  - ±0.05%/˚C

**OUTPUT SPECIFICATIONS**

- **Hold-up Time**: 60A max. @240Vac
- **Short Circuit Protection**: 100Vac/1A max
- **Over Voltage Protection**: 240Vac/0.55A max.
- **Temperature Coefficient**: ±0.05%/˚C

**GENERAL SPECIFICATIONS**

- **Isolation**: Input to output = 4,000Vac
- **Operating Temperature**: 0˚C-70˚C
- **Storage Temperature**: -20˚C-85˚C
- **Humidity**: 93% RH max.
- **Cooling**: Natural Convection
- **Switching Frequency**: 65KHz Typical
- **MTBF**: MIL-HDBK-217F, GB, 25˚C/115VAC
- **Altitude**: 3000m
- **Dimensions**: 3.00 x 2.00 x 0.91 inches
  - (76.2 x 50.8 x 23.1 mm)
  - CFM40M050-P:
  - 3.000x2.000x0.948 Inches
  - (76.20x50.80x25.00 mm)
  - CFM40M050-C:
  - 3.200x2.441x1.260 Inches
  - (81.28x62.00x32.00 mm)
  - CFM40M033, CFM40M050-P: 90g,
  - CFM40M033-C: 176g

**SAFETY AND EMISSION**

- **Emission and immunity (Ed.4.0)**
  - EN55011, EN55032 Class B,
  - EN61204-3, EN61000-6-1,
  - EN61000-6-3
  - EN60601-3-2, FCC CFR 47 Part 15, 18
  - EN61000-3-2, EN61000-3-3
  - Class Ι, IEC60100-1-2, EN61000-3-3
  - EN60601-1-2, EN61000-3-3
  - Class Ι, IEC60601-1:2005 +A1:2012,
  - EN60601-1:2006/A1:2013

- **Safety(Ed.3.1)**
  - Class I, IEC60601-1:2005 +A1:2012,
  - EN60601-1:2006/A1:2013
  - UL ANSI/AAMI ES60601-1:2005,
  - IEC60950-1, EN60950-1, U60950-1

**NOTE**

1. Voltage accuracy is set at full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measurement @20MHz BW.
3. Line regulation is measured from full load to line with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230VAC and full load 25˚C.
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series or equivalent.
CFM60M SERIES
60 WATT, 2" X 4" OPEN FRAME

Features

- Universal Input Range 90-264VAC
- Medical and ITE Safety Approved
- Efficiency to 90%
- Continuous Short Circuit Protection
- Meets EN55011 and EN55032 Class B
- Meets 2 MOPP
- No Load Power Consumption < 0.5W
- 2” x 4” Size

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5
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Derating Curve

Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25°C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage: 90-264Vac, 120-370Vdc
Frequency: 47 to 63Hz
Inrush Current: Cold Start @25°C
75% max. @240Vac
Input Current: 100Vac/1.6A max., 240Vac/0.8A max.
Leakage Current: 100μA max.

OUTPUT SPECIFICATIONS

Hold-up Time: 16ms typ. @115Vac
Short Circuit Protection: Hiccup Mode (Auto Recover)
Over Voltage Protection: TVS Component to Clamp
Temperature Coefficient: ±0.05%/°C

GENERAL SPECIFICATIONS

Isolation: Input to output = 4000VAC (5,656VDC)
Operating Temperature: -20-70°C (See Derating Curve)
Storage Temperature: -20-85°C
Humidity: 93% RH max. Non-Condensing
Cooling: Natural Convection
Switching Frequency: 65kHz Typical

MTBF ...... MIL-HDBK-217F, GB, 25°C/115VAC
Altitude: 4.000 x 2.000 x 1.100 inches
Dimensions: (101.6 x 50.8 x 27.94 mm)
Weight: 125 g

SAFETY AND EMISSION

Emission and Immunity (Ed.4.0)
Safety (Ed.3.1)

NOTE

1. Voltage accuracy is set at full load and 25°C Ta.
2. Add a 0.1μF ceramic capacitor and a 1μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100VAC to 240VAC with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical Efficiency at 230VAC and Full Load at 25°C.
6. Standard input and output connectors (CN1 and CN2) waffer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series and JST SVH-21/41T-P1.1 series crimp terminal or Equivalent.
7. Optional input and output connectors (CN1 and CN2) waffer with LONG CHU P3060 series and mate with MOLEX housing 5195 series and MOLEX 5194 series crimp terminal or equivalent.
8. Safety approvals do not apply to the covered versions, only to the open frame versions.
9. Other model refer to application note.
CFM100M SERIES
100 WATT, LOW PROFILE 1.05”

Features

- Universal Input Range 90-264VAC
- Medical and ITE Safety Approved
- 3” x 5” Compact Size
- Less than 1 U high
- Industry Standard Pin Out
- Active PFC Meets EN61000-3-2
- High Efficiency up to 92%
- Meets CISPR/FCC Class B
- Remote Voltage Sense
- Over Voltage Protection
- Continuous Short Circuit Protection
- No Load Power Consumption < 0.5W
- Meets 2 MOPP

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>MAX. LOAD</th>
<th>MIN. LOAD</th>
<th>RIPPLE &amp; NOISE</th>
<th>VOLTAGE ADJ. RANGE</th>
<th>VOLTAGE ACCURACY</th>
<th>LINE REGULATION</th>
<th>LOAD REGULATION</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM100M050</td>
<td>5 V</td>
<td>20 A</td>
<td>0 A</td>
<td>2%</td>
<td>4.75-5.25</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>83%</td>
</tr>
<tr>
<td>CFM100M075</td>
<td>7.5 V</td>
<td>13.4 A</td>
<td>0 A</td>
<td>2%</td>
<td>7.13-7.88</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>87%</td>
</tr>
<tr>
<td>CFM100M090</td>
<td>9 V</td>
<td>11.2 A</td>
<td>0 A</td>
<td>1%</td>
<td>8.55-9.45</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>89%</td>
</tr>
<tr>
<td>CFM100M120</td>
<td>12 V</td>
<td>8.4 A</td>
<td>0 A</td>
<td>1%</td>
<td>11.4-12.6</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>89%</td>
</tr>
<tr>
<td>CFM100M150</td>
<td>15 V</td>
<td>6.7 A</td>
<td>0 A</td>
<td>1%</td>
<td>14.25-15.75</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>90%</td>
</tr>
<tr>
<td>CFM100M180</td>
<td>18 V</td>
<td>5.6 A</td>
<td>0 A</td>
<td>1%</td>
<td>17.1-18.9</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>90%</td>
</tr>
<tr>
<td>CFM100M240</td>
<td>24 V</td>
<td>4.2 A</td>
<td>0 A</td>
<td>1%</td>
<td>22.8-25.2</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>91%</td>
</tr>
<tr>
<td>CFM100M280</td>
<td>28 V</td>
<td>3.6 A</td>
<td>0 A</td>
<td>1%</td>
<td>26.6-29.4</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>90%</td>
</tr>
<tr>
<td>CFM100M360</td>
<td>36 V</td>
<td>2.8 A</td>
<td>0 A</td>
<td>1%</td>
<td>34.2-37.8</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>91%</td>
</tr>
<tr>
<td>CFM100M480</td>
<td>48 V</td>
<td>2.1 A</td>
<td>0 A</td>
<td>1%</td>
<td>45.6-50.4</td>
<td>±1%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>92%</td>
</tr>
</tbody>
</table>
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Derating Curve

![CFM100M Derating Curve]

Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

**INPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>90-264Vac, 120-370Vdc</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 to 63Hz</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>80A max. @240Vac</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>300uA max.</td>
</tr>
</tbody>
</table>

**OUTPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold-up Time</td>
<td>16ms typ.</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Hiccup mode (Auto Recovery) ±5%</td>
</tr>
<tr>
<td>Adjustment Range on Vout</td>
<td>Recycle AC input to restart ±0.05%/˚C</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20˚C-70˚C (see derating curve)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20-85˚C</td>
</tr>
<tr>
<td>Humidity</td>
<td>93% RH max. Non condensing</td>
</tr>
<tr>
<td>Cooling</td>
<td>Natural Convection</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>90KHz Typical</td>
</tr>
<tr>
<td>MTBF — MIL-HDBK-217F, GB, 25˚C/115VAC</td>
<td>200Khrs min.</td>
</tr>
<tr>
<td>Altitude</td>
<td>5.000 x 3.000 x 1.050 inches (127.00 x 76.20 x 26.67 mm)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>270 g (0.6 Pounds)</td>
</tr>
</tbody>
</table>

**SAFETY AND EMISSION**

| Emission and Immunity      | EN55024, EN61000-6-1, EN61204-3 EN60601-1-2, EN61000-3-2 Class A, B, C, D, EN61000-3-3 EN55011 Class B, EN55032 Class B, FCC Part15 Class B ANSI/AAMI ES60601-1:2005 IEC60950-1, EN60950-1, UL60950-1 |
| Safety                     |                                    |

**NOTE**

1. CFM100M050: Add a 0.1µF ceramic capacitor and 220µF E.L. capacitor to output for ripple & noise measuring @20MHz BW. Other model add a 1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25˚C Ta.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230VAC and full load at 25˚C.
6. Standard input and output connectors wafer with LONG CHU P3060 series and mate with MOLEX housing 09-50-1031 and 09-50-1081 or equivalent.
7. DC output pin 1, 2, 3, 4: Vout (-), DC output pin 5, 6, 7, 8: Vout (+).
CFM130M SERIES
130 WATT MEDICAL AC-DC POWER SUPPLY WITH PFC

Features
- Universal Input 80-264Vac
- 2”x 3” Open Frame Compact Size
- 100W with Natural Convection
- 130W with Fan-Cooled
- No Load Input Power Consumption<150mW
- Active PFC Function
- High Efficiency up to 94%
- Meets 2 MOPP IEC/EN60335-1
- EMI Safety Meets Class I & Class II
- Operating Altitude 5000m

Ordering information
CFM130MXXXX - X
Blank: WAFFER
B: Base Cooling
C: with Cover

Mechanical Dimensions
All Dimensions In inches[mm]
Tolerance Inches x.xxx= ± 0.02
Millimeters: x.xx = ± 0.5

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE</th>
<th>VOLTAGE ACCURACY</th>
<th>LINE REGULATION</th>
<th>LOAD REGULATION</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM130M120</td>
<td>12V</td>
<td>8.34A</td>
<td>10.8A</td>
<td>1%</td>
<td>±2%</td>
<td>±0.5%</td>
<td>93%</td>
</tr>
<tr>
<td>CFM130M240</td>
<td>24V</td>
<td>4.2A</td>
<td>5.4A</td>
<td>1%</td>
<td>±2%</td>
<td>±0.5%</td>
<td>93%</td>
</tr>
<tr>
<td>CFM130M360</td>
<td>36V</td>
<td>2.8A</td>
<td>3.6A</td>
<td>1%</td>
<td>±2%</td>
<td>±0.5%</td>
<td>94%</td>
</tr>
<tr>
<td>CFM130M480</td>
<td>48V</td>
<td>2.1A</td>
<td>2.7A</td>
<td>1%</td>
<td>±2%</td>
<td>±0.5%</td>
<td>94%</td>
</tr>
</tbody>
</table>

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Derating Curve

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Specifications

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

INPUT SPECIFICATIONS
Voltage
80-264Vac
Frequency
47 to 63Hz
Inrush Current
Cold start @25°C 100A max. @240Vac
100Vac/1.5A max., 240Vac/0.8Amax.
Input Current
100µA max.
Leakage Current
20ms min. @115Vac
Output Current
Auto Recover
±0.05%/°C max

OUTPUT SPECIFICATIONS
Holdup Time
Short Circuit Protection
Over Voltage Protection
20ms min. @115Vac
Hiccup Mode [Auto Recover]
Auto Recover
Temperature Coefficient

SAFETY AND EMISSION
Emission and Immunity (Ed. 4.0)
EN55011 Class B, IEC61000-3-2
IEC61000-4-2, 3, 4, 5, 6, 8, 11
IEC61000-3-3
FCC Part 18 Class B
Class I, Class II, IEC60601-1, EN60601-1
UL ANSI/AAMI ES60601-1

GENERAL SPECIFICATIONS
Isolation
Operating Temperature
Storage Temperature
Humidity
Cooling
Altitude
Dimensions:

Weight

NOTE
1. Voltage accuracy is set at full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230 VAC and full load at 25°C
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing KH series or equivalent.
7. Requires 10CFM.
CFM150M SERIES
150 WATT, LOW PROFILE 1.05”

Features

- Universal Input Range 90-264VAC
- Medical and ITE Approved
- 3” x 5” Compact Size
- Less than 1 U high : 1.05”
- Industry Standard Pin Out
- Active PFC Meets EN61000-3-2
- High Efficiency up to 93%
- Meets CISPR/FCC Class B
- Remote Voltage Sense
- Over Voltage Protection
- Continuous Short Circuit Protection
- No Load Power Consumption < 0.5W
- Meets 2 MOPP

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance inches: ±0.02
Millimeters: ±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>MAX. LOAD</th>
<th>MIN. LOAD</th>
<th>RIPPLE &amp; NOISE</th>
<th>VOLTAGE ACCURACY</th>
<th>LINE REGULATION</th>
<th>LOAD REGULATION</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM150M120</td>
<td>12 V</td>
<td>12.5 A</td>
<td>0 A</td>
<td>1% (NOTE 1)</td>
<td>±1% (NOTE 2)</td>
<td>±0.5% (NOTE 3)</td>
<td>±1% (NOTE 4)</td>
<td>90%</td>
</tr>
<tr>
<td>CFM150M240</td>
<td>24 V</td>
<td>6.25 A</td>
<td>0 A</td>
<td>1% (NOTE 1)</td>
<td>±1% (NOTE 2)</td>
<td>±0.5% (NOTE 3)</td>
<td>±1% (NOTE 4)</td>
<td>92%</td>
</tr>
<tr>
<td>CFM150M360</td>
<td>36 V</td>
<td>4.17 A</td>
<td>0 A</td>
<td>1% (NOTE 1)</td>
<td>±1% (NOTE 2)</td>
<td>±0.5% (NOTE 3)</td>
<td>±1% (NOTE 4)</td>
<td>92%</td>
</tr>
<tr>
<td>CFM150M480</td>
<td>48 V</td>
<td>3.13 A</td>
<td>0 A</td>
<td>1% (NOTE 1)</td>
<td>±1% (NOTE 2)</td>
<td>±0.5% (NOTE 3)</td>
<td>±1% (NOTE 4)</td>
<td>93%</td>
</tr>
</tbody>
</table>
### Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

#### INPUT SPECIFICATIONS

- **Voltage**: 90-264Vac, 120-370Vdc
- **Frequency**: 47 to 63Hz
- **Inrush Current**: 110A max. @240Vac
- **Leakage Current**: 300µA max.

#### OUTPUT SPECIFICATIONS

- **Hold-up Time**: 16ms typ.
- **Short Circuit Protection**: Hiccup mode (Auto Recovery) ±5%
- **Adjustment Range on Vout**: Recycle AC input to restart ±0.05%/°C
- **Over Voltage Protection**: Input to output = 5.656VDC
- **Temperature Coefficient**: -20˚C to 70˚C (see derating curve)

#### GENERAL SPECIFICATIONS

- **Isolation**: 93% RH max. Non condensing
- **Cooling**: Natural Convection
- **Switching Frequency**: 90kHz Typical.
- **MTBF**: 100Khrs min.
- **Altitude**: 3000m
- **Dimensions**: 5.000 x 3.000 x 1.050 inches (127.00 x 76.20 x 26.67 mm)
- **Weight**: 270 g (0.6 Pounds)

#### SAFETY AND EMISSION

- **Emission and Immunity**: EN55011 Class B, FCC Part 15 Class B
- **Safety**: Class A, B, C, D, EN61000-3-3

### NOTE

1. Add a 0.1µf ceramic capacitor and 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25˚C Ta.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230VAC and full load at 25˚C.
6. Standard input and output connectors wafer with LONG CHU P3060 series and mate with MOLEX housing 09-50-1031 and 09-50-1081 or equivalent.
7. DC output pin 1, 2, 3, 4: Vout (-), DC output pin 5, 6, 7, 8: Vout (+).

---

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**CFM200M SERIES**

**200 WATT, 2” X 4” WITH PFC**

### Features
- Universal Input Range 90-264Vac
- 2”x 4” Open Frame/CFM200M
- 180W with Natural Convection @220Vac/CFM200M
- 200W with Natural Convection @220Vac/CFM200MXXXC
- Active PFC Meets EN61000-3-2
- No Load Power Consumption<0.3W
- High Power Density Up to 16.9W/Inch³/CFM200M
- +12V Fan Output
- High Efficiency up to 93.5%
- Meet Class II & Class I
- Meets 2 MOPP

### Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM200M120</td>
<td>+12 V</td>
<td>16.67 A</td>
<td>150 mVp-p</td>
<td>±2.0%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>92.5%</td>
</tr>
<tr>
<td>CFM200M240</td>
<td>+24 V</td>
<td>8.33 A</td>
<td>240 mVp-p</td>
<td>±2.0%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>93.5%</td>
</tr>
<tr>
<td>CFM200M480</td>
<td>+48 V</td>
<td>4.17 A</td>
<td>480 mVp-p</td>
<td>±2.0%</td>
<td>±0.5%</td>
<td>±1%</td>
<td>93.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fan Output Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
</tr>
<tr>
<td>+12 V</td>
</tr>
<tr>
<td>0.5 A</td>
</tr>
</tbody>
</table>
Derating Curve

Output Power vs. Ambient Input Voltage (Natural Convection)

Output Power vs. Ambient Temperature (Natural Convection)

Specifications

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

INPUT SPECIFICATIONS

AC Input Voltage
Frequency
Inrush Current
Leakage Current (Earth)
Touch Current (CFM200M XXXC)

OUTPUT SPECIFICATIONS

Total Rated Output Power
Hold-up Time
Over Voltage Protection
Short Circuit Protection
Temperature Coefficient

SAFETY AND EMISSION

Emission and Immunity (Ed.4.0)

Safety (Ed.3.1)

Note

1. Add a 0.1µF ceramic capacitor and a 47µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% rated load and 25°C Ta.
3. Line regulation is measured from High Line to Low Line with rated load.
4. Load regulation is measured from full to 10% rated.
5. Typical efficiency at 230VAC and full load at 25°C.
6. 12V/0.3A with nature convection; 12V/0.5A with 10 CFM air flow, tolerance ±10% at main output 100% full load.
7. Need an external 1mH choke at input for Class II type to pass EN55011 Class B.
8. Input connectors (CN1) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST Housing VHR series or equivalent.
9. Fan output connector wafer with TOWNES ENTERPRISE 2001BW series and mate with JST SPH series crimp terminal or equivalent.
10. Output connectors (Vo+ & Vo- with M3 screw) mate with round terminal and round terminal of the max outer diameter is 6.75mm, max inner diameter is 3.9mm.

GENERAL SPECIFICATIONS

Input to output = 4000VAC
Auto Recovery
-20-80°C (See Derating Curve)
93% RH max. Non condensing 85KHz Typical
MIL-HDBK-217F, GB, 25˚C/115VAC
279Khrs typ

EN55011 Class B, FCC CFR 47
ISO 1000-1-3:2-2, 3
IEC61000-4-2, 3, 4, 5, 6, 8, 11
EN60601-1:2006+A11:2012+A1+A12,
ULANSI/AAMI ES60601-1

Note

1. Add a 0.1µF ceramic capacitor and a 47µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% rated load and 25°C Ta.
3. Line regulation is measured from High Line to Low Line with rated load.
4. Load regulation is measured from full to 10% rated.
5. Typical efficiency at 230VAC and full load at 25°C.
6. 12V/0.3A with nature convection; 12V/0.5A with 10 CFM air flow, tolerance ±10% at main output 100% full load.
7. Need an external 1mH choke at input for Class II type to pass EN55011 Class B.
8. Input connectors (CN1) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST Housing VHR series or equivalent.
9. Fan output connector wafer with TOWNES ENTERPRISE 2001BW series and mate with JST Housing PHR series and JST SPF series crimp terminal or equivalent.
10. Output connectors (Vo+ & Vo- with M3 screw) mate with round terminal and round terminal of the max outer diameter is 6.75mm, max inner diameter is 3.9mm.
CFM300M SERIES
300 WATT, 3” X 5” WITH PFC

Features

- Universal Input Range 90-264VAC
- Active PFC Meets EN61000-3-2
- High Efficiency up to 94%
- High Power Density up to 14.1W/in³
- Meets EN55011 Class B
- Meets 2 MOPP
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote Voltage Sense
- PS On/Off Remote Control
- Power Good & Power Fail Signal
- +5V Stand-by Output Power
- 12V Fan Output
- No Load Power Consumption < 0.3W (note 6)
- 3”x5” Size

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance

Inches: X.XXX±0.02
Millimeters: X.XX±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT RATED 1</th>
<th>OUTPUT CURRENT RATED 2</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>Voltage ADJ. Range</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM300M120</td>
<td>+12 V</td>
<td>25 A</td>
<td>16.67 A</td>
<td>120 mV</td>
<td>± 1%</td>
<td>± 0.5%</td>
<td>11.4-12.6</td>
<td>± 1%</td>
<td>92.5%</td>
</tr>
<tr>
<td>CFM300M240</td>
<td>+24 V</td>
<td>12.5 A</td>
<td>8.34 A</td>
<td>150 mV</td>
<td>± 1%</td>
<td>± 0.5%</td>
<td>22.8-25.2</td>
<td>± 1%</td>
<td>93.5%</td>
</tr>
<tr>
<td>CFM300M360</td>
<td>+36 V</td>
<td>8.34 A</td>
<td>5.56 A</td>
<td>150 mV</td>
<td>± 1%</td>
<td>± 0.5%</td>
<td>34.2-37.8</td>
<td>± 1%</td>
<td>93.5%</td>
</tr>
<tr>
<td>CFM300M480</td>
<td>+48 V</td>
<td>6.25A</td>
<td>4.17 A</td>
<td>150 mV</td>
<td>± 1%</td>
<td>± 0.5%</td>
<td>45.6-50.4</td>
<td>± 1%</td>
<td>94.0%</td>
</tr>
</tbody>
</table>

Main Output Voltage

Stand-by Output Voltage

- All +5 V 1 A 0.6 A 100 mV ± 3% ± 1% -- ± 5% --

Fan Output Voltage

- All +12 V 0.5 A -- -- -- -- --

Rated 1: Forced air convection
Rated 2: Natural convection
For covered versions add “C” to model number or order part no. For example CFM300M120C

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CFM300M Series

Specifications

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

INPUT SPECIFICATIONS
- AC Input Voltage
- Input current
- Frequency
- Inrush Current
- Leakage Current

OUTPUT SPECIFICATIONS
- Isolation
- Hold-up Time
- Over Voltage Protection
- Short Circuit Protection
- Temperature Coefficient

SAFETY AND EMISSION
- Emission and Immunity (Ed.4.0)
- Safety (Ed. 3.1)

NOTE
1. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25°C Ta.
3. Line regulation is measured from high line to low line with rated load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230 VAC and full load at 25°C.
6. No load power consumption < 0.3W by PS On/Off remote control.
7. Input connector (CN1) wafer with TAIWAN KING PIN TERMINAL P110I series and mate with JST housing PH series or equivalent.
8. Optional Input connector (CN1) wafer with LONG CHU P3060 series and mate with MOLEX housing 5195 series or equivalent.
9. Output connector CN4 wafer with JST PH series and mate with JST housing PH series or equivalent.
10. Output connector CN5 wafer with TAIWAN KING PIN TERMINAL P110I series and mate with JST housing PH series or equivalent.
11. Output connectors (Vo+ & Vo- with M3 screw) mate with round terminal and round terminal of the max outer diameter is 6.75mm, max inner diameter is 3.9mm.
12. PS-ON and GND short, IPS-ON = 4.5 mA typical.
CFM351M SERIES
350 WATT, OPEN FRAME

Features

- Universal Input Range 90-264VAC
- Meets EN60601-1 and EN55011 Class B
- 350W with Free Air Convection @ 220VAC
- Active PFC Meets EN61000-3-2 Class D
- High Efficiency Up to 93% Typical
- Remote Voltage Sense
- PS On/Off Remote Control
- +5V Stand-By Output Power
- 12V Fan Output
- Meets 2 MOPP

Mechanical Dimensions

All Dimensions in Inches (mm)
Tolerance Inches: X.XXX=±0.04, X.XX=±0.010
Millimeters: X.X=±1.0, X.XX=±0.50.25

Note: 1. RATED1: 10CFM Air Flow
2. RATED2: Natural Convection (at 110 - 200 Vac, refer to derating curve)
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---

**Derating Curve**

**Natural Convection**

**10CFM Air Flow**

---

### Specifications

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

#### INPUT SPECIFICATIONS

- **AC Input Voltage**: 90-264Vac, 120-370Vdc
- **Frequency**: 47 to 63Hz
- **Inrush Current**: 50A max. @240Vac
- **Leakage Current @ 264Vac**: 300µA max.

#### OUTPUT SPECIFICATIONS

- **Total Rated Output Power**: 350W
- **Compensates for Wire Voltage Drop**: ±5%
- **16ms typ.**
- **Recycle AC Input to restart Hiccup mode (Auto Recovery)**: ±0.05%/°C
- **Rated Load (%):**
  - **12V, 24V, 48V**: 0% - 100%
  - **5V**: 0% - 100%

#### GENERAL SPECIFICATIONS

- **Input to output**: 5656VDC
- **Operating Temperature**: -20-70°C (See Derating Curve)
- **Storage Temperature**: -40-85°C
- **Humidity**: 93% RH max. Non condensing
- **Switching Frequency**: 55KHz Typical
- **MTBF** : MIL-HDBK-217F, GB, 25°C/115VAC
- **Altitude**: 6.500 x 4.000 x 1.516 inches (165.00 x 101.60 x 38.60 mm)
- **Weight**: 640 g (1.42 Pounds)

---

### SAFETY AND EMISSION

**Emission and immunity (Ed. 4.0)**


**Safety (Ed. 3.1)**

1. Add a 0.1µF ceramic capacitor and a 47µF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% rated load and 25˚C.Ta.
3. Line regulation is measured from high line to low line with rated load.
4. Load regulation is measured at 60%±40% rated.
5. **CN1**: LONG CHU P3060 Series or Equivalent
6. **CN2**: JST B2B-PH-K-S or equivalent
7. **CN5**: LONG CHU P220V Series or Equivalent
8. **CN1**: LONG CHU P3060 Series or Equivalent

**NOTE**

- Add a 0.1µF ceramic capacitor and a 47µF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
- Voltage accuracy is set at 60% rated load and 25˚C.Ta.
- Line regulation is measured from high line to low line with rated load.
- Load regulation is measured at 60%±40% rated.
CFM500M SERIES
500 WATT AC-DC POWER SUPPLY WITH PFC

Features

- Universal Input Range 85-264Vac
- Active PFC Meets EN61000-3-2
- High Efficiency up to 94%
- Meets IEC/EN60335
- Meets 2MOPP
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote Voltage Sense
- PS On/Off Remote Control
- Power Good & Power Fail Signal
- +5V Stand-by Output Power
- 12V Fan Output
- No Load Power Consumption<0.5W (NOTE 6)
- 3”x 5” Size
- Class I

Mechanical Dimensions

All Dimensions are in inches[mm]

Tolerance Inches ±XX±0.02
Millimeters: ±XX±0.5

Table: Main Output Voltage

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT RATED1</th>
<th>OUTPUT RATED2</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>Voltage ADJ. Range</th>
<th>Voltage LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM500M120</td>
<td>+12 V</td>
<td>41.67 A</td>
<td>20.83 A</td>
<td>120mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>11.4-12.6</td>
<td>±1%</td>
<td>91.5%</td>
</tr>
<tr>
<td>CFM500M240</td>
<td>+24 V</td>
<td>20.83 A</td>
<td>13.33 A</td>
<td>150mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>22.8-25.2</td>
<td>±1%</td>
<td>93.0%</td>
</tr>
<tr>
<td>CFM500M360</td>
<td>+36 V</td>
<td>13.89 A</td>
<td>8.89 A</td>
<td>150mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>34.2-37.8</td>
<td>±1%</td>
<td>94.0%</td>
</tr>
<tr>
<td>CFM500M480</td>
<td>+48 V</td>
<td>10.42 A</td>
<td>6.67 A</td>
<td>150mV</td>
<td>±1%</td>
<td>±0.5%</td>
<td>45.6-50.4</td>
<td>±1%</td>
<td>94.0%</td>
</tr>
</tbody>
</table>

Table: Stand-by Output Voltage

| ALL | +5 V | 1 A | 100mV | ±3% | ±1% | - | - | - | - |

Table: Fan Output Voltage

| ALL | +12 V | 0.5 A | 100mV | ±3% | ±1% | - | - | - | - |

Note:
Rated 1: Forced air convection
Rated 2: Natural convection
For covered versions add “C” to model number or order part no. For example CFM500M120C
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**Derating Curve**

Output Power vs. Ambient Temperature
- Natural Convection
- 21 CFM Air Flow

**Specifications**

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

**INPUT SPECIFICATIONS**
- AC Input Voltage
- Frequency
- Inrush Current
- Input Current
- Leakage Current

**OUTPUT SPECIFICATIONS**
- Isolation
- Holdup Time
- Over Voltage Protection
- Short Circuit Protection
- Temperature Coefficient

**SAFETY AND EMISSION**
- Emission and Immunity (Ed. 4.0)
- Safety (Ed. 3.1)

**GENERAL SPECIFICATIONS**
- Operating Temperature
- Storage Temperature
- Humidity
- Cooling
- Over Temperature Protection
- PS-On Signal
- Power Good/Poor Fail (PG)
- MTBF
- Switching Frequency
- Altitude
- Dimensions
- Weight
- Open frame versions
- -C covered versions

**NOTE**
1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple Bnoise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25°C.Ta.
3. Line regulation is measured from high line to low line with rated load.
4. Load regulation is measured from full to 10% load.
5. Efficiency is at 230VAC and full load at 25°C
6. No load power consumption 0.5W by PS on/off remote control.
7. Input connector (CN1) wafer with TAIWAN KING PIN TERMINAL P110I series and mate with JST housing PH series or equivalent.
8. Optional Input connector (CN1) wafer with LONG CHU P3060 series and mate with MOLEX housing 5195 series or equivalent.
9. Output connector CM4 wafer with JST PH series and mate with JST housing PH series or equivalent.
10. Output connector CNS wafer with TAIWAN KING PIN TERMINAL P110I series and mate with JST housing PH series or equivalent.
11. Output connectors (Vo+ & Vo-) with M3 screw) mate with round terminal and round terminal of the max outer diameter is 6.75mm, max inner diameter is 3.9mm.
12. PS-ON and GND short, IPS-ON =4.5 mA typical.
# TR15RAM SERIES

1.5 WATT, MEDICAL SWITCHING ADAPTER

## Features

- Universal Input Range 90-264VAC
- Meets EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Interchangeable AC Plugs
- Over Voltage Protection
- Efficiency & Standby Power Meet Level V
  (Output Cable Length ≤ 1800mm)
- Meets 2 MOPP

## Ordering information

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DC Plug Type</th>
<th>DC Cable Length and Type</th>
<th>Color of Overmold Case</th>
<th>Overmold Case Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR15RAM050</td>
<td>BE</td>
<td>520mm</td>
<td>Blue</td>
<td>Purple</td>
</tr>
<tr>
<td>TR15RAM120</td>
<td>BE</td>
<td>1220mm</td>
<td>Grey</td>
<td>Orange</td>
</tr>
<tr>
<td>TR15RAM150</td>
<td>BE</td>
<td>1800mm</td>
<td>Red</td>
<td>Orange</td>
</tr>
<tr>
<td>TR15RAM240</td>
<td>BE</td>
<td>7200mm with Ferrite Core</td>
<td>Purple</td>
<td>Orange</td>
</tr>
</tbody>
</table>

## Mechanical Dimensions

All Dimensions are in Inches (mm)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR15RA05</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TR15RA12</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TR15RA15</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TR15RA24</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

## Model Output

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR15RAM050</td>
<td>5 V</td>
<td>2.0 A</td>
<td>1%</td>
<td>±3%</td>
<td>±1%</td>
<td>±4%</td>
<td>73%</td>
</tr>
<tr>
<td>TR15RAM120</td>
<td>12 V</td>
<td>1.1 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>82%</td>
</tr>
<tr>
<td>TR15RAM150</td>
<td>15 V</td>
<td>1.0 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>81%</td>
</tr>
<tr>
<td>TR15RAM240</td>
<td>24 V</td>
<td>625 mA</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>82%</td>
</tr>
</tbody>
</table>
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Derating Curve

Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25°C Unless Otherwise Noted

INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>90-264Vac, 120-370Vdc</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 to 63Hz</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>50A max. @240Vac</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>0.1mA max.</td>
</tr>
</tbody>
</table>

OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold-up Time</td>
<td>10ms typ. @115Vac</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>±0.05%/°C</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Continuous (Auto Recovery)</td>
</tr>
<tr>
<td>Over Voltage Protection</td>
<td>TVS Component to Clamp</td>
</tr>
</tbody>
</table>

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation</td>
<td>Input to output = 5,656VDC</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>65KHz typical</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0-70°C (See Derating Curve)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20-85°C Natural Convection</td>
</tr>
<tr>
<td>Cooling</td>
<td>200Khrs min.</td>
</tr>
<tr>
<td>Humidity</td>
<td>93% RH max. Non condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>300m</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3.173 x 1.885 x 1.704 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>130 g (0.29 Pounds)</td>
</tr>
</tbody>
</table>

SAFETY AND EMISSION

<table>
<thead>
<tr>
<th>Emission and Immunity (Ed. 4.0)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety (Ed. 3.1)</td>
<td>EN55011 Class B, FCC47 CFR Part 15</td>
</tr>
<tr>
<td></td>
<td>EN60601-1-2, EN61000-3-2, 3, IEC61000-4-2, 3, 4, 5, 6, 8, 11</td>
</tr>
<tr>
<td></td>
<td>IEC60601-1:2005+A1</td>
</tr>
<tr>
<td></td>
<td>EN60601-1:2006+A11+A1+A12, UL ANSI/AAMI ES60601-1: 2005</td>
</tr>
</tbody>
</table>

NOTE

1. Add a 0.1µF ceramic capacitor and a 10µF E.L capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation measured from 100VAC to 240VAC full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).
5. Typical efficiency at 230VAC and full load at 25°C.
6. "Various TR Series adapters are PSE certified. PSE certification alone is not sufficient for importation into Japan. A valid PSE mark must contain the name of the importer as shown in the example below. If PSE mark is required, the name of the registered importer must be supplied to Cincon on order placement. Product labels will not contain PSE mark if importer name is not supplied. Consult factory or local representative for details".
TR18RDM SERIES
18W MEDICAL SWITCHING ADAPTER

Features

- Universal Input Range 80-264VAC
- Interchangeable AC Plugs
- Meets EN60601-1-11 and IEC/EN60335
- Leakage Current < 30μA
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meet IP22
- Meet CoC Tier 2 & DoE Level VI
  (Output Cable Length ≤ 1800mm)
- No Load Power Consumption < 75mW

Mechanical Dimensions

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR18RDM050</td>
<td>5 V</td>
<td>3 A</td>
<td>100mVp-p</td>
<td>±5%</td>
<td>±1%</td>
<td>±5%</td>
<td>81.84%</td>
</tr>
<tr>
<td>TR18RDM090</td>
<td>9 V</td>
<td>2 A</td>
<td>100mVp-p</td>
<td>±3%</td>
<td>±1%</td>
<td>±3%</td>
<td>85.45%</td>
</tr>
<tr>
<td>TR18RDM120</td>
<td>12 V</td>
<td>1.5 A</td>
<td>120mVp-p</td>
<td>±3%</td>
<td>±1%</td>
<td>±2%</td>
<td>85.45%</td>
</tr>
<tr>
<td>TR18RDM150</td>
<td>15 V</td>
<td>1.2 A</td>
<td>120mVp-p</td>
<td>±3%</td>
<td>±1%</td>
<td>±2%</td>
<td>85.45%</td>
</tr>
<tr>
<td>TR18RDM180</td>
<td>18 V</td>
<td>1 A</td>
<td>120mVp-p</td>
<td>±3%</td>
<td>±1%</td>
<td>±2%</td>
<td>85.45%</td>
</tr>
<tr>
<td>TR18RDM240</td>
<td>24 V</td>
<td>0.75 A</td>
<td>120mVp-p</td>
<td>±3%</td>
<td>±1%</td>
<td>±2%</td>
<td>85.45%</td>
</tr>
</tbody>
</table>

Ordering information

TR18RDMSXXX -XXG XX
Model No. DC Plug Type UL1571 WITH OVP DC Cable Length and Type
01: 720mm
02: 1220mm
03: 1800mm
10: 720mm with Ferrite Core
11: 1220mm with Ferrite Core
12: 1800mm with Ferrite Core
* 22AWG / UL1571 or Equivalent for Vo: 9V, 12V, 18V
* 18AWG / UL1571 or Equivalent for Vo: 5V
Derating Curve

![Derating Curve Graph]

Specifications

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

**INPUT SPECIFICATIONS**

- **Voltage:** 80-264Vac
- **Frequency:** 47 to 63Hz
- **Inrush Current:** Cold start @ 25°C 45A max. @ 240Vac
- **Input Current:** 0.6A max.
- **Leakage Current:** 30uA max.

**OUTPUT SPECIFICATIONS**

- **Holdup Time:** 12ms typ. @ 115Vac
- **Short Circuit Protection:** Hiccup mode (Auto Recovery)
- **Over Voltage Protection:** TVS Component to Clamp

**SAFETY AND EMISSION**

- **Emission and Immunity (Ed. 4.0):** ENS5011 Class B, EN61000-3-2, EN61000-3-3, EN60601-1-2, IEC61000-4-2,4,5,6,8,11
- **FCC CFR47 Part 18 Class B:** Typical 65KHz
- **Dimensions:** 3.165x1.693x1.453 inches (80.40x43.00x36.90mm)
- **Weight:** TBD

**GENERAL SPECIFICATIONS**

- **Isolation:** Input to output 4,000VAC
- **Operating Temperature:** -30-70°C (see derating curve)
- **Storage Temperature:** -30-85°C
- **Humidity:** 93% RH max. Non condensing
- **Cooling:** Natural convection
- **MTBF:** MIL-HDBK-217F, GB, 25°C / 115VAC

**NOTE**

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for Ripple & Noise measuring @ 20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation is measured from 100Vac to 240Vac full load.
4. Load regulation is measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).
5. Average Efficiency measured at 25%, 50%, 75%, 100% load and input voltage is 115Vac / 230Vac.

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# TR30RDM SERIES
## 30W MEDICAL SWITCHING ADAPTER

### Features
- Universal Input 80-264Vac
- Interchangeable AC Plugs
- Approved EN55011, FCC CFR47 Part 18 Class B
- Meets EN60335-1
- Approved EN60601-1-11 for Home Healthcare Applications
- Low Leakage Current <50uA
- Meets IP22
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meet CoC Tier 2 & DoE Level VI
  - (Output Cable Length ≤ 1800mm)
  - (TR30RDM050: Output Cable Length ≤ 1220mm)
- No Load Power Consumption<75mW
- 2MOPP Class II

### Ordering Information

<table>
<thead>
<tr>
<th>TR30RDMXXX</th>
<th>DC Plug Type</th>
<th>UL1571 WITH OVP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XX</th>
<th>DC Cable Length and Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>720mm</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>1220mm</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>1800mm</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>720mm with Ferrite Core</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1220mm with Ferrite Core</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1800mm with Ferrite Core</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical Dimensions

All Dimensions are in inches[mm]  
Tolerance Inches: X.XXX±0.02  
Millimeters: X.XXX±0.5

### Table of Specifications

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR30RDM050</td>
<td>5 V</td>
<td>5.0 A</td>
<td>100mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±6%</td>
<td>84%</td>
</tr>
<tr>
<td>TR30RDM090</td>
<td>9 V</td>
<td>3.3 A</td>
<td>100mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±3%</td>
<td>88%</td>
</tr>
<tr>
<td>TR30RDM120</td>
<td>12 V</td>
<td>2.5 A</td>
<td>120mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR30RDM150</td>
<td>15 V</td>
<td>2.0 A</td>
<td>120mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR30RDM180</td>
<td>18 V</td>
<td>1.67 A</td>
<td>120mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR30RDM240</td>
<td>24 V</td>
<td>1.25 A</td>
<td>120mVp-p</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
</tbody>
</table>
Derating Curve

![Derating Curve Image]

Specifications

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

**INPUT SPECIFICATIONS**

- Voltage
- Frequency
- Inrush Current
- Input Current
- Leakage Current

**OUTPUT SPECIFICATIONS**

- Holdup Time
- Short Circuit Protection
- Over Voltage Protection

**SAFETY AND EMISSION**

- Emission and Immunity (Ed. 4.0)
- Safety (Ed. 3.1)

**GENERAL SPECIFICATIONS**

- Isolation
- Operating Temperature
- Storage Temperature
- Humidity
- Cooling
- Switching Frequency
- MTBF
- Life time
- Altitude
- Dimensions
- Weight

**NOTE**

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation is measured from 100Vac to 240Vac full load.
4. Load regulation is measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).
5. Efficiency measured at 75% load and input voltage is 230Vac.

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**TR30RAM SERIES**

**30 WATT, MEDICAL SWITCHING ADAPTER**

**Features**

- Universal Input Range 90-264VAC
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meets EN60601-1 and EN55011 Class B
- Meets 2 MOPP
- Efficiency & Standby Power Meet Level V (Output Cable Length ≤ 1800mm)
- Provide PSE Mark

**Ordering Information**

<table>
<thead>
<tr>
<th>TR30RAMXXX Model No.</th>
<th>DC Plug Type</th>
<th>DC Cable Length and Type</th>
<th>Color of Overmold Case</th>
<th>E2XXE00BK</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR30RAM050</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR30RAM090</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR30RAM120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR30RAM150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR30RAM180</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR30RAM240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All Dimensions are in Inches (mm)

- Tolerance Inches: X.XXX±0.02
- Millimeters: X.XX±0.5

**Mechanical Dimensions**

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR30RAM050</td>
<td>5 V</td>
<td>4.0 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±6%</td>
<td>80%</td>
</tr>
<tr>
<td>TR30RAM090</td>
<td>9 V</td>
<td>3.0 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±3%</td>
<td>84%</td>
</tr>
<tr>
<td>TR30RAM120</td>
<td>12 V</td>
<td>2.5 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>84%</td>
</tr>
<tr>
<td>TR30RAM150</td>
<td>15 V</td>
<td>2.0 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>85%</td>
</tr>
<tr>
<td>TR30RAM180</td>
<td>18 V</td>
<td>1.67 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>85%</td>
</tr>
<tr>
<td>TR30RAM240</td>
<td>24 V</td>
<td>1.25 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>86%</td>
</tr>
</tbody>
</table>
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## Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25°C Unless Otherwise Noted

### INPUT SPECIFICATIONS

- **Voltage**: 90-264Vac, 120-370Vdc
- **Frequency**: 47 to 63Hz
- **Input Current**: 100Vac/0.8A max., 240Vac/0.4A max.
- **Inrush Current**: Cold start@25°C 100A max.
- **Leakage Current**: Cold start@25°C 100µA max.

### OUTPUT SPECIFICATIONS

- **Hold-up Time**: 10ms typ. @115Vac
- **Short Circuit Protection**: Hiccups Mode (Auto Recovery)
- **Over Voltage Protection**: TVS Component to Clamp
- **Temperature Coefficient**: ±0.05%/°C

### GENERAL SPECIFICATIONS

- **Isolation**: Input to output = 4,000VAC (5,656VDC)
- **Operating Temperature**: 0-60°C (See Derating Curve)
- **Storage Temperature**: -20-85°C
- **Humidity**: 93% RH max. Non condensing
- **Cooling**: Natural Convection
- **Switching Frequency**: 70KHz Typical
- **MTBF**: 200Khrs min.
- **Altitude**: 3000m
- **Dimensions**: 4.278 x 2.440 x 1.445 inches (108.67 x 61.98 x 36.70 mm)
- **Weight**: 300 g (0.67 Pounds)

### SAFETY AND EMISSION

- **Emission and Immunity (Ed. 4.0)**: EN55011 Class B, FCC CFR47 Part 15 Class B, EN60601-1-2, EN61000-3-2, EN61000-4-2, 3, 4, 5, 6, 8, 11
- **Safety (Ed. 3.1)**: IEC60601-1-2005+A1:2012
- **NOTE**:
  1. Voltage accuracy is set at 60% load and 25°C Ta.
  2. Add a 0.1µF ceramic capacitor and a 10µF E.I. capacitor to output for ripple & noise measuring @20MHz BW.
  3. Line regulation measured from 100VAC to 240VAC with full load.
  4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)
  5. Typical efficiency with 230VAC and max. load at 25°C.
Features

- Universal Input Range 80-264VAC
- Approved EN55011, FCC CFR47 Part15 Class B
- Meets EN60335
- Approved EN60601-1-11 for Home Healthcare Applications
- Low Leakage Current < 80uA
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meet CoC Tier 2 & DoE Level VI
- (Output Cable Length ≦ 1800mm)
- (TR36M050: Output Cable Length ≦ 1220mm)
- No Load Power Consumption < 75mW
- 2 MOPP Class II

Ordering information

<table>
<thead>
<tr>
<th>TR36XXX</th>
<th>XX</th>
<th>DC Plug Type</th>
<th>G: UL1571 WITH OVP</th>
<th>E: UL1185 WITH OVP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>01</td>
<td>DC Cable Length and Typ</td>
<td>720mm</td>
<td>1200mm</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>1500mm</td>
<td>1800mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>03</td>
<td>1800mm</td>
<td>2200mm</td>
<td></td>
</tr>
</tbody>
</table>

Mechanical Dimensions

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE</th>
<th>VOLTAGE ACCURACY</th>
<th>LINE REGULATION</th>
<th>LOAD REGULATION</th>
<th>% EFF. (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR36M050</td>
<td>5 V</td>
<td>5.0 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±6%</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>TR36M090</td>
<td>9 V</td>
<td>3.3 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±4%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>TR36M120</td>
<td>12 V</td>
<td>2.5 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M135</td>
<td>13.5 V</td>
<td>2.4 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M150</td>
<td>15 V</td>
<td>2.4 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M180</td>
<td>18 V</td>
<td>2.0 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M240</td>
<td>24 V</td>
<td>1.5 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M360</td>
<td>36 V</td>
<td>1.0 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>TR36M480</td>
<td>48 V</td>
<td>0.75 A</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
<td></td>
</tr>
</tbody>
</table>
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Derating Curve

![Derating Curve Graph](image)

Specifications

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

**INPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>80-264Vac (see derating curve)</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 to 63Hz</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>Cold start @25°C 100A max. @240Vac</td>
</tr>
<tr>
<td>Input Current</td>
<td>0.9A max.</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>80uA max.</td>
</tr>
</tbody>
</table>

**OUTPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holdup Time</td>
<td>10ms typ. @115Vac</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Hiccup Mode Continuous (Auto Recovery)</td>
</tr>
<tr>
<td>Over Voltage Protection</td>
<td>IC Component to Clamp (Auto Recovery)</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>±0.05%/˚C</td>
</tr>
</tbody>
</table>

**SAFETY AND EMISSION**

<table>
<thead>
<tr>
<th>Emission and Immunity (Ed. 4.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN55011, EN60601-1-2</td>
</tr>
<tr>
<td>IEN61000-3-2, EN61000-3-3</td>
</tr>
<tr>
<td>IEC61000-4-2, 3, 4, 5, 6, 8, 11</td>
</tr>
<tr>
<td>FCC CFR47 Part 15 Class B</td>
</tr>
<tr>
<td>IEC60601-1:2005+A1,EN60601-1-11</td>
</tr>
<tr>
<td>EN60601-1:2006+A11:2011+A1+A12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety Approved (Ed.3.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple &amp; noise measuring @20MHz BW.</td>
</tr>
<tr>
<td>2. Voltage setpoint at 60% full load.</td>
</tr>
<tr>
<td>3. Line regulation is measured from 100Vac to 240Vac full load.</td>
</tr>
<tr>
<td>4. Load regulation is measured from 60% to full load and from 60% to 30% load (60% +/- 40% load).</td>
</tr>
<tr>
<td>5. Efficiency measured at 75% load and input voltage is 230Vac.</td>
</tr>
</tbody>
</table>

**GENERAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation</td>
<td>-30 - 60˚C (see derating curve)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-30 - 85˚C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>93% RH max. Non condensing</td>
</tr>
<tr>
<td>Humidity</td>
<td>Natural Convection</td>
</tr>
<tr>
<td>Cooling</td>
<td>65KHz Typical</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>MIL-HDBK-217F, GB, 25˚C/115VAC</td>
</tr>
<tr>
<td>MTBF</td>
<td>1000Khrs max</td>
</tr>
<tr>
<td>Altitude</td>
<td>5000m</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>3.937x1.771x0.886 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>(100.00x45.00x22.50mm)</td>
</tr>
<tr>
<td></td>
<td>150g(0.33 Pounds)</td>
</tr>
</tbody>
</table>

**NOTE**

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation is measured from 100Vac to 240Vac full load.
4. Load regulation is measured from 60% to full load and from 60% to 30% load (60% +/- 40% load).
5. Efficiency measured at 75% load and input voltage is 230Vac.
**TR60M SERIES**

**60 WATT, MEDICAL SWITCHING ADAPTER**

**Features**

- Universal Input Range 90-264VAC
- Meets EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meets 2 MOPP
- Meets CEC Level IV
  (Output Cable Length ≤ 1800mm)
  (TR60M Series Meets CEC IV Except TR60M05 is Non-CEC Compliant)
  (TR60M12: Output Cable Length ≤ 1220mm 16AWG)
- Efficiency & Standby Power Meet Level V (Option)
  (Output Cable Length ≤ 1800mm)
  (TR60M12: Output Cable Length ≤ 720mm 16AWG)
  (TR60M15: Output Cable Length ≤ 1220mm 16AWG)
  (TR60M18, TR60M19: Output Cable Length ≤ 1500mm)

**Ordering information**

<table>
<thead>
<tr>
<th>TR60MXX: Model No.</th>
<th>XX</th>
<th>X</th>
<th>DC Plug Type</th>
<th>X</th>
<th>DC Cable Length and Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plug</td>
<td>DVF</td>
<td>E</td>
<td>With OVP</td>
<td>01</td>
<td>720mm</td>
</tr>
<tr>
<td>02</td>
<td>1220mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>1800mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>720mm with Ferrite Core</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1220mm with Ferrite Core</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1800mm with Ferrite Core</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*18AWG/UL1185

**Mechanical Dimensions**

All Dimensions are in Inches (mm)
Tolerance: Inches: X.XXX±0.02
Millimeters: X.X±0.5

![Mechanical Dimensions Diagram](image)

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 2)</th>
<th>VOLTAGE ACCURACY (NOTE 1)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR60M05</td>
<td>5 V</td>
<td>6 A</td>
<td>50 mV</td>
<td>±4%</td>
<td>±1%</td>
<td>±6%</td>
<td>75%</td>
</tr>
<tr>
<td>TR60M12</td>
<td>12 V</td>
<td>5 A</td>
<td>120 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±5%</td>
<td>85%</td>
</tr>
<tr>
<td>TR60M15</td>
<td>15 V</td>
<td>4 A</td>
<td>150 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±3%</td>
<td>85%</td>
</tr>
<tr>
<td>TR60M18</td>
<td>18 V</td>
<td>3.33 A</td>
<td>180 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>86%</td>
</tr>
<tr>
<td>TR60M19</td>
<td>19 V</td>
<td>3.15 A</td>
<td>190 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>86%</td>
</tr>
<tr>
<td>TR60M24</td>
<td>24 V</td>
<td>2.5 A</td>
<td>240 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>87%</td>
</tr>
<tr>
<td>TR60M36</td>
<td>36 V</td>
<td>1.66 A</td>
<td>360 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>87%</td>
</tr>
<tr>
<td>TR60M48</td>
<td>48 V</td>
<td>1.25 A</td>
<td>480 mV</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>87%</td>
</tr>
</tbody>
</table>
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### Derating Curve

![Derating Curve Diagram]

### Specifications

**All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted**

#### INPUT SPECIFICATIONS
- Voltage: 90-264Vac, 120-370Vdc
- Frequency: 47 to 63Hz
- Inrush Current: Cold Start @25°C 80A max. @240Vac
- Conducted EMI: CISPR/FCC Class B
- Leakage Current: 0.1mA max.

#### OUTPUT SPECIFICATIONS
- Hold-up Time: 8ms typ. @115Vac
- Short Circuit Protection: Continuous
- Over Voltage Protection: Yes
- Temperature Coefficient: ±0.05%/°C

#### GENERAL SPECIFICATIONS
- Isolation: 4.000VAC
- Operating Temperature: 0-60°C (See Derating Curve)
- Storage Temperature: -20-85°C
- Humidity: 93% RH max. Non condensing
- Cooling: Natural Convection
- Switching Frequency: 100kHz Typical
- Mounting: 200Khrs min.
- Altitude: 3000m
- Dimensions: 5.197 x 2.283 x 1.201 inches (132.00 x 58.00 x 30.50 mm)
- Weight: 345 g (0.76 Pounds)

#### SAFETY AND EMISSION

**NOTE**

1. Voltage accuracy at 60% full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation is measured from 100VAC to 240VAC full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency at 230VAC and full load at 25°C.
TR70M SERIES
70W MEDICAL SWITCHING ADAPTER

Features

- Universal Input Range 80-264VAC
- Meets EN55011 Class B and CISPR/FCC Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Power Consumption <150mW
- Meets CoC Tier 2 & DoE Level VI
- Meets IEC/EN60335-1
- Meets 2 MOPP
- Class I (TR70MA) & Class II (TR70MB)
- Altitude 5000m

TR70MAXXX Series TR70MBXXX Series

All Dimensions are in inches(mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.X±0.5

MODEL NUMBER | OUTPUT VOLTAGE | OUTPUT CURRENT | RIPPLE & NOISE (NOTE 2) | VOLTAGE ACCURACY (NOTE 1) | LINE REGULATION (NOTE 3) | LOAD REGULATION (NOTE 4) | % EFF. (Typ.) (NOTE 5)
--- | --- | --- | --- | --- | --- | --- | ---
TR70MA120 | 12 V | 5.8 A | 120mVp-p | ±2% | ±1% | ±5% | 89%
TR70MA150 | 15 V | 4.65 A | 150mVp-p | ±2% | ±1% | ±3% | 89%
TR70MA180 | 18 V | 3.9 A | 180mVp-p | ±2% | ±1% | ±2% | 89%
TR70MA240 | 24 V | 3.0 A | 240mVp-p | ±2% | ±1% | ±2% | 90%
TR70MA360 | 36 V | 1.9 A | 360mVp-p | ±2% | ±1% | ±2% | 90%
TR70MA480 | 48 V | 1.5 A | 480mVp-p | ±2% | ±1% | ±2% | 91%

TR70MB120 | 12 V | 5.8 A | 120mVp-p | ±2% | ±1% | ±5% | 89%
TR70MB150 | 15 V | 4.65 A | 150mVp-p | ±2% | ±1% | ±3% | 89%
TR70MB180 | 18 V | 3.9 A | 180mVp-p | ±2% | ±1% | ±2% | 89%
TR70MB240 | 24 V | 3.0 A | 240mVp-p | ±2% | ±1% | ±2% | 90%
TR70MB360 | 36 V | 1.9 A | 360mVp-p | ±2% | ±1% | ±2% | 90%
TR70MB480 | 48 V | 1.5 A | 480mVp-p | ±2% | ±1% | ±2% | 91%

Ordering Information

<table>
<thead>
<tr>
<th>TR70MAXXX Model No.</th>
<th>DC Plug Type</th>
<th>DC Cable Length and Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>X: A or B</td>
<td>V+ ●- V-</td>
<td></td>
</tr>
<tr>
<td>A: CLASS I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: CLASS II</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mechanical Dimensions

All Dimensions are in inches(mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.X±0.5

UNIT: inches [mm]

TR70M SERIES
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### Derating Curve

![Derating Curve Diagram]

### Specifications

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

#### INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>80-264 Vac (80 Vac with derating curve)</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 to 63 Hz</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>Cold start @ 25°C 100A max. @ 240 Vac</td>
</tr>
<tr>
<td>Conducted EMI</td>
<td>CISPR/FCC Class B</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>90μA max.</td>
</tr>
</tbody>
</table>

#### OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holdup Time</td>
<td>10 ms typ. @ 115 Vac</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Hiccup Mode (Auto Recovery)</td>
</tr>
<tr>
<td>Over Voltage Protection</td>
<td>IC Component to Clamp (Auto Recovery)</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>±0.05%°C max.</td>
</tr>
</tbody>
</table>

#### SAFETY AND EMISSION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission and Immunity</td>
<td>EN55011 Class B, EN61000-3-2,3</td>
</tr>
<tr>
<td></td>
<td>EN60601-1-2, IEC 61000-4-2, 3, 4, 5, 6, 8, 11</td>
</tr>
<tr>
<td></td>
<td>CLASS I and CLASS II, IEC60601-1</td>
</tr>
<tr>
<td></td>
<td>UL ANSI/AAMI ES60601-1</td>
</tr>
<tr>
<td>Safety Approved</td>
<td>(Ed. 3.1)</td>
</tr>
</tbody>
</table>

#### GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>26000 hours min. @ 75% 40 deg C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>IEC320/C14/TR70MA</td>
</tr>
<tr>
<td>Humidity</td>
<td>IEC320/C8/TR70MB</td>
</tr>
<tr>
<td>Cooling</td>
<td>4.72 x 0.43 x 1.22 inches</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>(120.00 x 52.00 x 31.00 mm)</td>
</tr>
<tr>
<td>MTBF</td>
<td>300g (0.66 Pounds)</td>
</tr>
<tr>
<td>Altitude</td>
<td></td>
</tr>
<tr>
<td>Life time</td>
<td></td>
</tr>
<tr>
<td>AC Inlet</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
</tbody>
</table>

#### NOTE

1. Voltage accuracy at 60% full load.
2. Add a 0.1uf ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measurement @ 20MHz BW.
3. Line regulation is measured from 100 Vac to 240 Vac, full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency at 230 Vac and 75% load at 25°C.
6. -30°C can be start-up at full load.
7. TR70MA120 & TR70MB120 of 115 VAC full load meet DoE Level VI and 230VAC full load meet CoC Tier 2.
TR100M SERIES
100 WATT, MEDICAL SWITCHING ADAPTER

Features

- Universal Input Range 90-264VAC
- Meets EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- Efficiency & Standby Power Meet Level V
  (TR100M120-150: Output Cable Length ≤ 1500mm 14AWG /UL1185)
  (TR100M180-480: Output Cable Length ≤ 1800mm 16AWG /UL1185)
- Meets 2 MOPP

Ordering information

TR100MXXX:
- Model No. XX
- DC Plug Type X
- DVP
- L or DVP
- XX or XXX
- DC Cable Length and Type
  11: 720mm with Ferrite Core
  12: 1220mm with Ferrite Core
  36: 1500mm with Ferrite Core
  13: 1800mm with Ferrite Core

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance: Inches: X.XXX±0.02
Millimeters: X.XX±0.5
UNIT: inches(mm)

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 2)</th>
<th>VOLTAGE ACCURACY (NOTE 1)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR100M120</td>
<td>12 V</td>
<td>8.34 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±4%</td>
<td>88%</td>
</tr>
<tr>
<td>TR100M150</td>
<td>15 V</td>
<td>6.67 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±3%</td>
<td>88%</td>
</tr>
<tr>
<td>TR100M180</td>
<td>18 V</td>
<td>5.56 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR100M190</td>
<td>19 V</td>
<td>5.27 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR100M200</td>
<td>20 V</td>
<td>5.0 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>88%</td>
</tr>
<tr>
<td>TR100M240</td>
<td>24 V</td>
<td>4.17 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
</tr>
<tr>
<td>TR100M480</td>
<td>48 V</td>
<td>2.1 A</td>
<td>1%</td>
<td>±2%</td>
<td>±1%</td>
<td>±2%</td>
<td>89%</td>
</tr>
</tbody>
</table>
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### Derating Curve

![Derating Curve Image]

### Specifications

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

#### INPUT SPECIFICATIONS

- **Voltage**: 90-264Vac, 120-370Vdc
- **Frequency**: 47 to 63Hz
- **Inrush Current**: Cold Start @25°C 100A max. @240Vac
- **Conducted EMI**: CISPR/FCC Class B
- **Isolation**: Input to output = 4,000 Vac
- **Leakage Current**: 100uA max.

#### OUTPUT SPECIFICATIONS

- **Hold-up Time**: 16ms typ. @115Vac
- **Short Circuit Protection**: Hiccup Mode (Auto Recover)
- **Over Voltage Protection**: TVS Component to Clamp
- **Temperature Coefficient**: ±0.05%/°C

#### GENERAL SPECIFICATIONS

- **Operating Temperature**: -20-70°C (See Derating Curve)
- **Storage Temperature**: -20-85°C
- **Humidity**: 93% RH max. Non condensing
- **Cooling**: Natural Convection
- **Switching Frequency**: 70KHz Typical
- **MTBF**: 150Khrs min.
- **Altitude**: 3000m
- **Dimensions**: 5.591 x 2.283 x 1.457 inches (142.00 x 58.00 x 37.00 mm)
- **Weight**: 500 g
- **AC Inlet**: IEC320/C8

#### SAFETY AND EMISSION

- **Emission and Immunity (Ed. 4.0)** EN55011, FCC CRF47 Part 18
- **Safety (Ed. 3.1)** EN60601-1, EN61000-3-2, 3, IEC61000-4-2, 3, 4, 5, 6, 8, 11

**NOTE**

1. Voltage accuracy at 60% full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measurement @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac, full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency with 230 VAC and full load at 25°C
TR160M SERIES
160W SWITCHING ADAPTER

Features

- Compact Size
- Universal Input Range 80-264VAC
- Approved IEC/EN/UL 60601-1
- Meets EN55011 Class B & CISPR/FCC Class B
- Meets IEC/EN60335-1
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Power Consumption<150mW
- Meets 2 MOPP
- Class I (TR160MA) & Class II (TR160MB)
- CoC Tier 2 & DoE Level VI
  (TR160M120:Output Cable Length ≦ 950mm)
  (TR160M240~480:Output Cable Length ≦ 1220mm)

Ordering information

<table>
<thead>
<tr>
<th>TR160MXXX</th>
<th>X</th>
<th>DC Plug Type</th>
<th>X</th>
<th>DC Cable Length and Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>A or B</td>
<td>A:CLASS I</td>
<td>E: With OVP</td>
<td>471-950mm with Ferrite Core</td>
</tr>
<tr>
<td></td>
<td>B:CLASS II</td>
<td></td>
<td>12-1220mm with Ferrite Core</td>
<td></td>
</tr>
<tr>
<td>X: A or B</td>
<td>E: With OVP</td>
<td>471-950mm with Ferrite Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E: With OVP</td>
<td>12-1220mm with Ferrite Core</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*UL2464 Cable For all models

Mechanical Dimensions

All Dimensions are in inches[mm]
Tolerance:Inches:±0.02
Millimeters:±0.5

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>RIPPLE &amp; NOISE (NOTE 1)</th>
<th>VOLTAGE ACCURACY (NOTE 2)</th>
<th>LINE REGULATION (NOTE 3)</th>
<th>LOAD REGULATION (NOTE 4)</th>
<th>% EFF. (Typ.) (NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR160MA120</td>
<td>12 V</td>
<td>12.5 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>91%</td>
</tr>
<tr>
<td>TR160MA240</td>
<td>24 V</td>
<td>6.66 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>92%</td>
</tr>
<tr>
<td>TR160MA360</td>
<td>36 V</td>
<td>4.44 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>92%</td>
</tr>
<tr>
<td>TR160MA480</td>
<td>48 V</td>
<td>3.33 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>93%</td>
</tr>
<tr>
<td>TR160MB120</td>
<td>12 V</td>
<td>12.5 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>91%</td>
</tr>
<tr>
<td>TR160MB240</td>
<td>24 V</td>
<td>6.66 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>92%</td>
</tr>
<tr>
<td>TR160MB360</td>
<td>36 V</td>
<td>4.44 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>92%</td>
</tr>
<tr>
<td>TR160MB480</td>
<td>48 V</td>
<td>3.33 A</td>
<td>1%</td>
<td>±2.5%</td>
<td>±1%</td>
<td>±4%</td>
<td>93%</td>
</tr>
</tbody>
</table>
Derating Curve

Specifications

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

**INPUT SPECIFICATIONS**
- Voltage: 80-264Vac
- Frequency: 47 to 63Hz
- Inrush Current: 120A max. @240Vac
- 100Vac/2.0A max
- 240Vac/1.0A max
- Leakage Current: 0.1mA max.
- Conducted EMI: CISPR/FCC Class B

**OUTPUT SPECIFICATIONS**
- Isolation: 4,000VAC
- Short Circuit Protection: Hiccup mode (Auto Recovery) latch
- Over Voltage Protection: ± 0.05%/71°C
- Temperature Coefficient: ± 0.05%/°C

**SAFETY AND EMISSION**
- Emission and Immunity (Ed. 4.0)
- Safety Approved (Ed.3.1)

**GENERAL SPECIFICATIONS**
- Isolation: 20 ~ 70°C (see derating curve)
- Storage Temperature: -30°C can be start-up
- Humidity: 93% RH max. Non condensing
- Cooling: Natural convection
- MTBF: MIL-HDBK-217F, GB, 25°C/115VAC
- Dimensions: 5.906x2.756x1.497 inches (150x70x38mm)
- Weight: 540g

**NOTE**
1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to 100% full load and from 60% to 20% load (60% +/- 40% full load
5. Typical efficiency at 230VAC and 75% load at 25°C.
EC4AW-H6 SERIES
5-6 WATT, ISOLATION 6000 VDC

Features

- 5-6W Isolated Output
- DIP-24 Package
- Regulated Outputs
- Efficiency to 85%
- Continuous Short Circuit Protection
- I/O Isolation Voltage 6000VDC
- Reinforced Insulation Rated For Working Voltage 300VAC
- 5µA Leakage Current
- EMI Meets EN55022 Class A
- Safety Meets UL60950-1 and UL60601-1

Mechanical Dimensions

NOTE: Pin Size is 0.02" Inch (0.5mm) Dia±0.05
All Dimensions in Inches (mm)
Tolerance Inches: X.XX=±0.02 , X.XXX=±0.010
Millimeters: X.X=±0.5 , X.XX=±0.25

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>INPUT VOLTAGE</th>
<th>OUTPUT VOLTAGE</th>
<th>OUTPUT CURRENT</th>
<th>INPUT CURRENT</th>
<th>% EFF.</th>
<th>CAPACITOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC4AW-24S05H6</td>
<td>9-36 VDC</td>
<td>5 VDC</td>
<td>100 mA</td>
<td>10 mA</td>
<td>260 mA</td>
<td>81</td>
</tr>
<tr>
<td>EC4AW-24S12H6</td>
<td>9-36 VDC</td>
<td>12 VDC</td>
<td>25 mA</td>
<td>15 mA</td>
<td>298 mA</td>
<td>84.5</td>
</tr>
<tr>
<td>EC4AW-24D12H6</td>
<td>9-36 VDC</td>
<td>±12 VDC</td>
<td>25 mA</td>
<td>15 mA</td>
<td>298 mA</td>
<td>84.5</td>
</tr>
<tr>
<td>EC4AW-24D15H6</td>
<td>9-36 VDC</td>
<td>±15 VDC</td>
<td>25 mA</td>
<td>15 mA</td>
<td>298 mA</td>
<td>84.5</td>
</tr>
<tr>
<td>EC4AW-48S05H6</td>
<td>18-72 VDC</td>
<td>5 VDC</td>
<td>100 mA</td>
<td>5 mA</td>
<td>130 mA</td>
<td>81</td>
</tr>
<tr>
<td>EC4AW-48S12H6</td>
<td>18-72 VDC</td>
<td>12 VDC</td>
<td>25 mA</td>
<td>5 mA</td>
<td>149 mA</td>
<td>85</td>
</tr>
<tr>
<td>EC4AW-48D12H6</td>
<td>18-72 VDC</td>
<td>±12 VDC</td>
<td>25 mA</td>
<td>5 mA</td>
<td>149 mA</td>
<td>85</td>
</tr>
<tr>
<td>EC4AW-48D15H6</td>
<td>18-72 VDC</td>
<td>±15 VDC</td>
<td>25 mA</td>
<td>5 mA</td>
<td>149 mA</td>
<td>85</td>
</tr>
</tbody>
</table>

NOTE:
1. Nominal Input Voltage 24 or 48VDC
2. Measured at 12VDC for 24Vin Models, 24VDC for 48Vin Models
3. Measured at Nominal Input Voltage
4. Operation Under Minimum Load Will not Damage The Converter, But It May not Meet All Specifications
Derating Curve

![Derating Curve Graph](image)

Specifications

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

**INPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>24Vin .......................... 9-36V</td>
</tr>
<tr>
<td></td>
<td>48Vin .......................... 18-72V</td>
</tr>
<tr>
<td>Under Voltage Protection</td>
<td>24Vin power up ...... 8.8V typ.</td>
</tr>
<tr>
<td></td>
<td>48Vin power up ...... 17V typ.</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>5uA max.</td>
</tr>
<tr>
<td>Input Filter</td>
<td>Pi Type</td>
</tr>
<tr>
<td>Input Surge (100ms max.)</td>
<td>24Vin ..................... 50V max.</td>
</tr>
<tr>
<td></td>
<td>48Vin ..................... 100V max.</td>
</tr>
</tbody>
</table>

**OUTPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Accuracy</td>
<td>±1.5% max.</td>
</tr>
<tr>
<td>Voltage Balance (Dual)</td>
<td>±2.0% max.</td>
</tr>
<tr>
<td>Transient Response: 75%-100%</td>
<td>±16% Vout nominal</td>
</tr>
<tr>
<td>Step Load Change</td>
<td>&lt; 500μs</td>
</tr>
<tr>
<td>Error Band</td>
<td>5V .......... 100mV pk-pk max.</td>
</tr>
<tr>
<td>Recovery Time</td>
<td>12V/15V ...... 1% pk-pk max.</td>
</tr>
<tr>
<td>Ripple &amp; Noise, 20MHz BW (with 0.1μF MLCC)</td>
<td>±0.05%/°C</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>±1.0% max.</td>
</tr>
<tr>
<td>Line Regulation (note 1)</td>
<td>±1.0% max.</td>
</tr>
<tr>
<td>Load Regulation (note 2)</td>
<td>±1.0% max.</td>
</tr>
<tr>
<td>Cross Regulation (Dual output)</td>
<td>±1.5% max. Continuous</td>
</tr>
<tr>
<td>Load Cross Variation 25%/100%</td>
<td>1.5ms typ.</td>
</tr>
<tr>
<td>Output Short Circuit Protection</td>
<td></td>
</tr>
<tr>
<td>Start up Time</td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>See Table</td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>6000VDC min.</td>
</tr>
<tr>
<td>Isolation Resistance</td>
<td>10Ω ohm min.</td>
</tr>
<tr>
<td>Isolation Capacitance</td>
<td>40pf typ.</td>
</tr>
<tr>
<td>Reinforced Insulation</td>
<td>CREE PAGE DISTANCES 8mm MIN.</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>Air Clearances 8mm min.</td>
</tr>
<tr>
<td>Operating Ambient Temperature De-rating, Above 71°C</td>
<td>100KHz min.</td>
</tr>
<tr>
<td>Case Temperature (note 4)</td>
<td>-40°C to +71°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Linearly to Zero power at 100°C</td>
</tr>
<tr>
<td>EMI</td>
<td>100°C max.</td>
</tr>
<tr>
<td>Humidity</td>
<td>-40°C to +100°C</td>
</tr>
<tr>
<td>MTBF</td>
<td>Conductive EMI Meet EN55022 Class A</td>
</tr>
<tr>
<td></td>
<td>95% RH max. Non condensing</td>
</tr>
<tr>
<td></td>
<td>MIL-HDBK-217-F, GB, 25˚C, Full Load</td>
</tr>
<tr>
<td></td>
<td>1430Khrs typ.</td>
</tr>
<tr>
<td>Dimensions</td>
<td>1.25 x 0.80 x 0.40 inches</td>
</tr>
<tr>
<td>Case Material</td>
<td>(31.8 x 20.3 x 10.2 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>Non-Conductive Black Plastic</td>
</tr>
<tr>
<td></td>
<td>13.1g</td>
</tr>
</tbody>
</table>

**NOTE**

1. Measured from high line to low line.
2. Measured from full load to 10% load.
3. Measured from full load to 25% load.
4. Maximum case temperature under any operating condition should not be exceeded 100°C.
AC POWER CORD

C13+US Plug
P/N: G7472205014
LT-202+501

C13+European Plug
P/N: G7472205414
LT-322+501

C13+UK Plug
P/N: G7472206214
LT-318+501A

C13+Australian Plug
P/N: G7472205514
LT-208+501
Visit www.cincon.com for new releases and a wider selection of products.
# WALL-MOUNT AC-DC SWITCHING ADAPTER

<table>
<thead>
<tr>
<th>Model No.</th>
<th>AC Plug Type</th>
<th>DC Plug Type</th>
<th>OVP Option</th>
<th>DC Cable Length and Type</th>
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<tbody>
<tr>
<td>TRXxxx</td>
<td>A : USA 2 Pin</td>
<td>11 : 5.5 x 2.1 x 12mm +</td>
<td>A : Without OVP Option</td>
<td>01 : 720mm</td>
</tr>
<tr>
<td></td>
<td>E : Europe 2 Pin</td>
<td>12 : 5.5 x 2.5 x 12mm +</td>
<td>E : With OVP Option</td>
<td>02 : 1220mm</td>
</tr>
<tr>
<td></td>
<td>U : British 3 Pin</td>
<td>18 : 5.5 x 2.5 x 11mm +</td>
<td></td>
<td>03 : 1800mm</td>
</tr>
<tr>
<td></td>
<td>S : Australia 2 Pin</td>
<td>23 : 5.5 x 2.1 x 9.5mm +</td>
<td></td>
<td>11 : 720mm with Ferrite Core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 : 5.5 x 2.5 x 9.5mm +</td>
<td></td>
<td>12 : 1220mm with Ferrite Core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 : 5.5 x 2.1 x 7.5mm +</td>
<td></td>
<td>13 : 1800mm with Ferrite Core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33 : 5.5 x 2.1 x 11.5mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>35 : 4.0 x 1.7 x 9.5mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>37 : 5.5 x 2.5 x 7.5mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>39 : 3.5 x 1.35 x 9mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>41 : 3.5 x 1.35 x 7.5mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 : 4.75 x 1.7 x 9.5mm +</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 : 4.0 x 1.7 x 11mm +</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Right Angle/Inner-Out+</th>
<th>Straight/Inner-Out+</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 : 5.5 x 2.1 x 12mm</td>
<td>03 : 5.5 x 2.1 x 12mm</td>
<td>01 : 5.5 x 2.1 x 12mm</td>
</tr>
<tr>
<td>13 : 5.5 x 2.1 x 12mm</td>
<td>16 : 5.5 x 2.1 x 11mm</td>
<td>04 : 5.5 x 2.5 x 12mm</td>
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<tr>
<td>14 : 5.5 x 2.5 x 12mm</td>
<td>22 : 5.5 x 2.5 x 9.5mm</td>
<td>07 : 5.5 x 2.1 x 9.5mm</td>
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<tr>
<td>27 : 5.5 x 2.5 x 9.5mm</td>
<td>43 : 3.5 x 1.35 x 7.5mm</td>
<td>105 : 3.5 x 1.35 x 9mm</td>
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<td>44 : 3.5 x 1.35 x 9.5mm</td>
<td>111 : 3.5 x 1.35 x 9.5mm</td>
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<tr>
<td></td>
<td>105 : 3.5 x 1.35 x 9mm</td>
<td>111 : 3.5 x 1.35 x 9mm</td>
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<td>122 : 3.5 x 1.35 x 12mm</td>
<td>141 : 5.5 x 2.1 x 11mm</td>
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<tr>
<td></td>
<td>150 : 3.5 x 1.35 x 9mm</td>
<td>317 : 5.5 x 2.5 x 9.5mm</td>
</tr>
</tbody>
</table>

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Cincon provides a broad range of standard products that address the needs of many applications, there are occasions when a standard product doesn’t address all your application requirements.

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First Name __________________________ Last Name __________________________

Country __________________________ City __________________________

Address __________________________

Telephone __________________________ Fax __________________________

E-mail __________________________

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Application</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Output Voltages</th>
<th>Output Currents</th>
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</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Input Voltages</th>
<th>Efficiency</th>
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<table>
<thead>
<tr>
<th>Isolation</th>
<th>Protection</th>
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</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Storage / Operating Temperature Range</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Safety Standard</th>
<th>EMC Standard</th>
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<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical Description</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Remarks

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