

FEATURES

- ▶ Ultra Compact Size 2.06x1.07x0.93 "
- ▶ Fully Encapsulated Plastic Case for PCB, Chassis and DIN-Rail Mounting Version
- ▶ Universal Input 85-264VAC, 90-370VDC, 47-440Hz
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ No Min. Load Requirement & Low no-load power consumption
- ▶ Operating Ambient Temp. Range -40°C to +70°C
- ▶ Overload/Voltage and Short Circuit Protection
- ▶ EMI Emission EN55014-1/55032 Class B Approved
- ▶ EMS Immunity EN61000-4-2,3,4,5,6,8,11 Approved
- ▶ Safety Approval to UL/cUL/IEC/EN 62368-1, IEC/EN 60335-1 & CE Marking


NEW


PRODUCT OVERVIEW

The MINMAX AMF-15 series is a new generation of fully encapsulated AC-DC power supply modules with ultra-compact size for higher power density and space saving.

The product features universal AC input 85-264VAC and wider DC input 90-370VDC, regulated output voltages 5.1, 12, 15, 24, 48VDC ; I/O Isolation 3000VAC with Reinforced Insulation ; EMI emission EN55014-1/32 Class B and EMS immunity EN 61000-4 standards approved ; no min. load requirement and low no-load power consumption ; abnormal protection mechanism with output overload, short circuit and overvoltage protections.

The AMF-15 series equips with PCB, Chassis and DIN-Rail Mounting Version for flexible installation and comply with UL/IEC/EN 62368-1 & IEC/EN 60335-1 for safety usage. It provides a cost effective solution especially for space critical applications in industrial and household electronic equipment.

Model Selection Guide

| Model Number | Output Voltage | Output Power | Output Current | Input Current | Max. capacitive Load | Efficiency (typ.) |
|--------------|----------------|--------------|----------------|---------------|----------------------|--------------------|
| | | | | 115VAC, 60Hz | | |
| | VDC | W | mA | @Max. Load | μF | @Max. Load, 115VAC |
| AMF-15S051 | 5.1 | 15.3 | 3000 | 318 mA(typ.) | 3300 | 80% |
| AMF-15S12 | 12 | 15 | 1250 | 306 | 560 | 85% |
| AMF-15S15 | 15 | 15 | 1000 | 306 | 330 | 86% |
| AMF-15S24 | 24 | 15 | 625 | 299 | 220 | 86% |
| AMF-15S48 | 48 | 15.02 | 313 | 306 | 47 | 86% |

Input Specifications

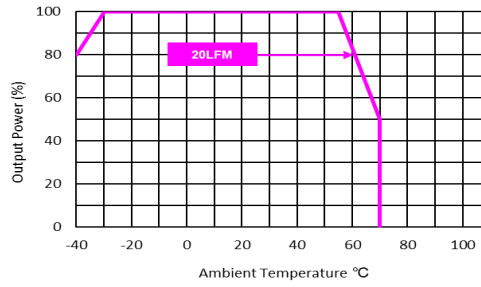
| Parameter | Conditions / Model | Min. | Typ. | Max. | Unit |
|-------------------------------------|--------------------|------|------|------|------|
| AC Input Voltage Range | All Models | 85 | --- | 264 | VAC |
| AC Input Frequency Range | | 47 | --- | 440 | Hz |
| DC Input Voltage Range | | 90 | --- | 370 | VDC |
| No-Load Power Consumption | 115VAC | --- | --- | 150 | mW |
| | 230VAC | --- | --- | 300 | mW |
| Inrush Current (Cold Start at 25°C) | 115VAC | --- | --- | 25 | A |
| | 230VAC | --- | --- | 45 | A |

| Output Specifications | | | | | | |
|---------------------------------|--|---------------------|------|-------|-------|------------------------|
| Parameter | Conditions / Model | | Min. | Typ. | Max. | Unit |
| Output Voltage Setting Accuracy | | | --- | ±1.0 | ±2.0 | % |
| Line Regulation | Vin=Min. to Max. @Full Load | | --- | --- | ±0.5 | % |
| Load Regulation | Io=0% to 100% | | --- | --- | ±1.0 | % |
| Minimum Load | No minimum Load Requirement | | | | | |
| Ripple & Noise | 0-20 MHz Bandwidth | 5.1VDC Output Model | --- | --- | 80 | mV _{P-P} |
| | | Other Output Models | --- | --- | 1 | %V _{PP} of Vo |
| Temperature Coefficient | | | --- | ±0.01 | ±0.02 | %/°C |
| Over Load Protection | auto-recovery (long term overload condition may cause damage) | | --- | 150 | --- | %Inom. |
| Short Circuit Protection | Hiccup mode, Automatic Recovery | | | | | |

| General Specifications | | | | | | |
|--------------------------|---|---------|------|------|-------|--|
| Parameter | Conditions | Min. | Typ. | Max. | Unit | |
| I/O Isolation Voltage | 60 Seconds | 3000 | --- | --- | VAC | |
| I/O Isolation Resistance | 500 VDC | 10 | --- | --- | GΩ | |
| Switching Frequency | | --- | --- | 125 | kHz | |
| Hold-up Time | 115VAC, 60Hz | 8 | --- | --- | ms | |
| | 230VAC, 50Hz | 40 | --- | --- | ms | |
| MTBF (calculated) | MIL-HDBK-217F@25°C, Ground Benign | 458,989 | --- | --- | Hours | |
| Safety Approvals | UL/cUL 62368-1 recognition(UL certificate), IEC/EN 62368-1(CB-report) IEC/EN 60335-1, 61558-1, 61558-2-16 recognition(CB-report) | | | | | |

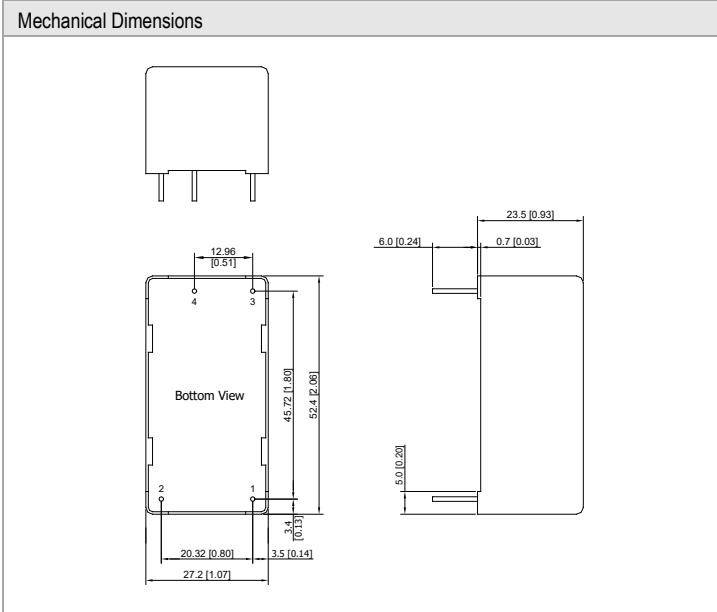
| EMC Specifications | | | | | |
|--------------------|---|------------------------|------------------------------|--|---|
| Parameter | Standards & Level | | | Performance | |
| General | Compliance with EN 61204-3 Switch mode power supplies | | | | |
| EMI | Conduction | EN 55014-1, EN 55032 | | Without external components Class B | |
| | Radiation | | | | |
| EMS | EN 55014-2, EN 55024, EN 55035 | | | | |
| | ESD | Direct discharge | Indirect discharge HCP & VCP | | A |
| | | EN 61000-4-2 Air ± 8kV | | Contact ± 6kV | |
| | Radiated immunity | EN 61000-4-3 10V/m | | | A |
| | Fast transient | EN 61000-4-4 ±2kV | | | A |
| | Surge | EN 61000-4-5 ±1kV | | | A |
| | Conducted immunity | EN 61000-4-6 10Vrms | | | A |
| | PFMF | EN 61000-4-8 30A/m | | | A |
| | Dips | EN 61000-4-11 30% 10ms | | | A |
| Interruptions | EN 61000-4-11 >95% 5000ms | | | B | |

| Environmental Specifications | | | | |
|--|------|------|----------|--|
| Parameter | Min. | Max. | Unit | |
| Operating Ambient Temperature Range (See Power Derating Curve) | -40 | +70 | °C | |
| Storage Temperature Range | -40 | +85 | °C | |
| Humidity (non condensing) | --- | 95 | % rel. H | |
| Lead Temperature (1.5mm from case for 10Sec.) | --- | 260 | °C | |

Power Derating Curve**Notes**

- 1 All specifications typical at $T_a=+25^{\circ}\text{C}$, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
- 2 We recommend to protect the converter by a slow blow fuse in the input supply line.
- 3 Other input and output voltage may be available, please contact MINMAX.
- 4 The continuous operation on DC input voltage of 80VDC to 370VDC is available after start-up at 90VDC.
- 5 Specifications are subject to change without notice.

Package Specifications PCB Mounting



Pin Connections

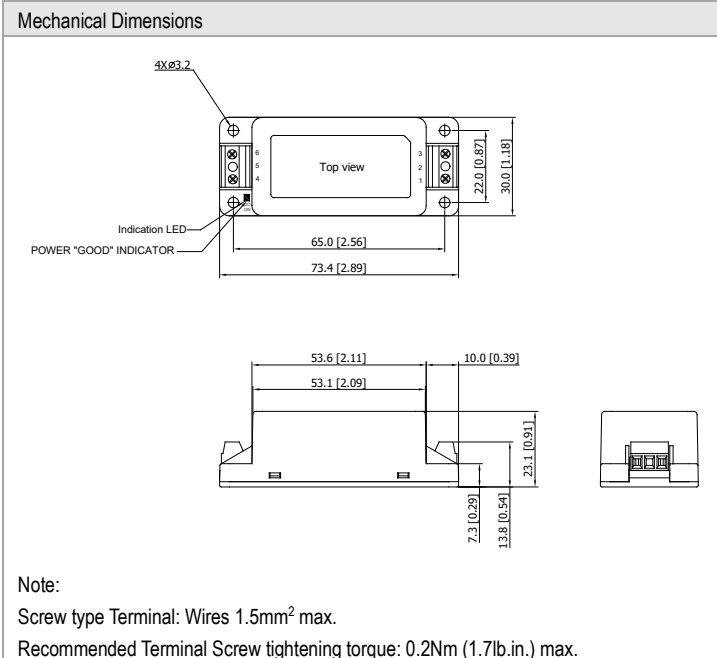
| Pin | Function | Diameter mm (inches) |
|-----|----------|----------------------|
| 1 | AC(N) | ∅ 1.0 [0.04] |
| 2 | AC(L) | ∅ 1.0 [0.04] |
| 3 | +Vout | ∅ 1.0 [0.04] |
| 4 | -Vout | ∅ 1.0 [0.04] |

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: ±0.5 (±0.02)
- ▶ Pin pitch tolerance: ±0.25 (±0.01)
- ▶ Pin diameter ∅ 1.0 ±0.1 (0.04±0.004)

Physical Characteristics

| | |
|---------------|--|
| Case Size | : 52.4x27.2x23.5mm (2.06x1.07x0.93 inches) |
| Case Material | : Plastic resin (flammability to UL 94V-0 rated) |
| Pin Material | : Copper Alloy |
| Weight | : 51g |

Package Specifications Chassis Mounting



Pin Connections

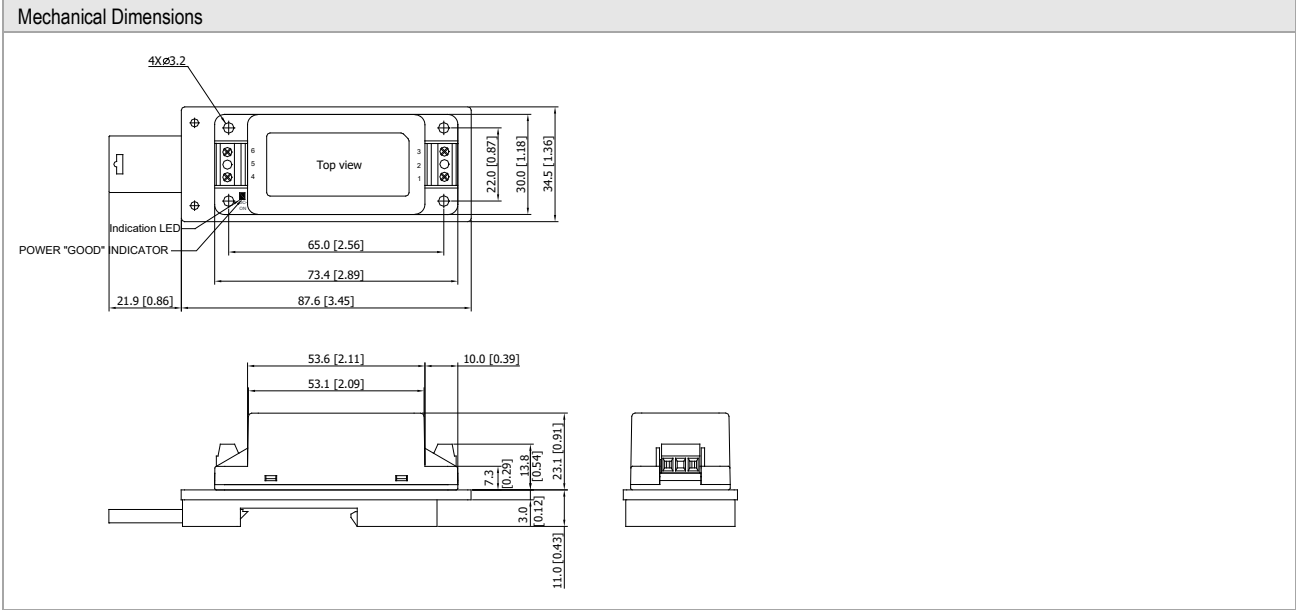
| Pin | Function |
|-----|----------|
| 1 | AC(N) |
| 2 | No Pin |
| 3 | AC(L) |
| 4 | +Vout |
| 5 | No Pin |
| 6 | -Vout |

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: ±0.5 (±0.02)

Physical Characteristics

| | |
|---------------|--|
| Case Size | : 73.4x30.0x23.1mm (2.89x1.18x0.91 inches) |
| Case Material | : Plastic resin (flammability to UL 94V-0 rated) |
| Weight | : 56g |

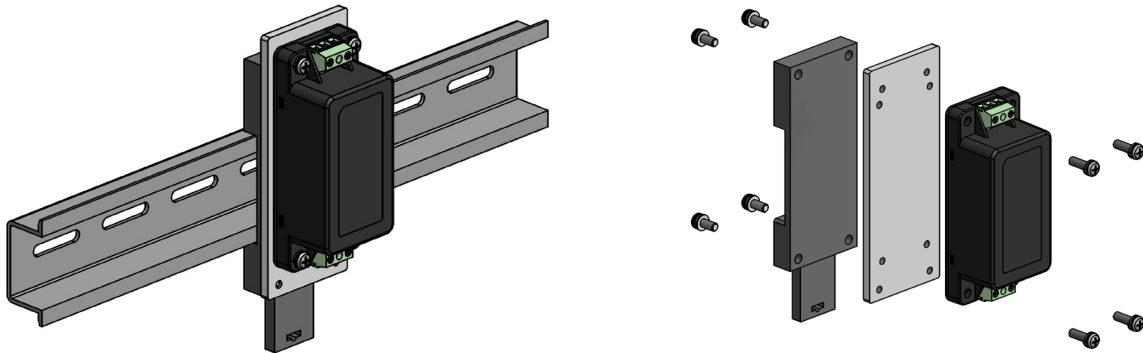
Package Specifications with DIN Rail Mounting Bracket (order code AC-DIN-06)



Physical Characteristics

| | |
|---------------|--|
| Case Size | : 73.4x30.0x23.1mm (2.89x1.18x0.91 inches) |
| Case Material | : Plastic resin (flammability to UL 94V-0 rated) |
| Weight | : 101g |

DIN-Rail Mounting Kit



Order Code Table

| PCB Mounting | Chassis Mounting | With DIN Rail Mounting by two Order Code | |
|--------------|------------------|--|-----------|
| AMF-15S051 | AMF-15S051C | AMF-15S051C | AC-DIN-06 |
| AMF-15S12 | AMF-15S12C | AMF-15S12C | AC-DIN-06 |
| AMF-15S15 | AMF-15S15C | AMF-15S15C | AC-DIN-06 |
| AMF-15S24 | AMF-15S24C | AMF-15S24C | AC-DIN-06 |
| AMF-15S48 | AMF-15S48C | AMF-15S48C | AC-DIN-06 |