

FEATURES

- ▶ Fully Encapsulated Plastic Case for PCB Mounting
- ▶ Universal Input 85~264VAC, 47~440Hz
- ▶ Protection Class II as per IEC/EN 60536
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ Operating Ambient Temp. Range -25°C to +70°C
- ▶ Overload/Voltage/Temp. and Short Circuit Protection
- ▶ Designed-in EMI Emission meets EN55011/22 Class B & FCC Level B
- ▶ Designed-in EMC Immunity meets EN61000-4-2,3,4,5,6,8,11
- ▶ Eco Design, Compliant to Energy Star Specification and ErP Directive 2009/125/EC
- ▶ UL/cUL/IEC/EN 60950-1 Safety Approval
- ▶ UL/cUL/IEC/EN 60950-1 Safety Approval & CE Marking


PRODUCT OVERVIEW

The MINMAX AHF-10 series is a range of fully encapsulated AC/DC power supply modules. The product features EMI-filter to EN55022, class B and EMS compliance to EN 61000-4 standard. Universal input voltage 85-264VAC and International safety approvals qualifies these power modules for applications in products with worldwide markets. The AHF-10 series provide a cost effective solution for many space critical applications in commercial and industrial electronic equipment.

Model Selection Guide

| Model Number | Output Voltage VDC | Output Current | Input Current 115VAC, 60Hz @Max. Load mA(typ.) | Max. capacitive Load µF | Efficiency (typ.) @Max. Load |
|--------------|-----------------------|----------------|---|-------------------------------|------------------------------------|
| | | Max. mA | | | % |
| AHF-10S03 | 3.3 | 2000 | 137 | 3900 | 70 |
| AHF-10S05 | 5 | 2000 | 199 | 3300 | 73 |
| AHF-10S12 | 12 | 833 | 191 | 2200 | 76 |
| AHF-10S15 | 15 | 666 | 191 | 2200 | 76 |
| AHF-10S24 | 24 | 416 | 190 | 1000 | 76 |
| AHF-10D12 | ±12 | ±380 | 172 | #1000 | 77 |
| AHF-10D15 | ±15 | ±300 | 169 | #1000 | 77 |

For each output

Input Specifications

| Parameter | Model | Min. | Typ. | Max. | Unit |
|-------------------------------------|------------|------|------|------|------|
| Input Voltage Range | All Models | 85 | --- | 264 | VAC |
| Input Frequency Range | | 47 | --- | 440 | Hz |
| Input Voltage Range | | 120 | --- | 370 | VDC |
| No-Load Power Consumption | | --- | --- | 0.3 | W |
| Inrush Current (Cold Start at 25°C) | 115VAC | --- | --- | 10 | A |
| | 230VAC | --- | --- | 20 | A |

Output Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------------------|---|----------------------------|-------|-------|---------|------------------------|
| Output Voltage Setting Accuracy | | --- | ±1.0 | ±2.0 | %Vnom. | |
| Line Regulation | Vin=Min. to Max. @Full Load | --- | ±0.5 | ±1.0 | % | |
| Load Regulation | Iout=Min. to Max. | Single Output Models | --- | ±0.5 | % | |
| | | Dual Output Models | --- | ±2.5 | ±5.0 | % |
| Ripple & Noise | 0-20 MHz Bandwidth | 3.3 & 5.0VDC Output Models | --- | 1.5 | 1.8 | %V _{PP} of Vo |
| | | Other Output Models | --- | 0.8 | 1.0 | %V _{PP} of Vo |
| Minimum Load | | --- | 10 | --- | %Inom. | |
| Over Voltage Protection | Zener diode clamp | --- | 120 | --- | % of Vo | |
| Temperature Coefficient | | --- | ±0.01 | ±0.02 | %/°C | |
| Overshoot | | --- | --- | 5 | % Vout | |
| Current Limitation | Foldback, auto-recovery | 105 | --- | --- | %Inom. | |
| | (long term overload condition may cause damage) | | | | | |
| Short Circuit Protection | Hiccup mode, Automatic Recovery | | | | | |

General Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|---|---------|------|------|--------|
| I/O Isolation Voltage | Input to Output, 60 Seconds | 3000 | --- | --- | VACrms |
| I/O Isolation Resistance | 500 VDC | 100 | --- | --- | MΩ |
| Switching Frequency | | --- | 100 | --- | KHz |
| Hold-up Time | | --- | 20 | --- | ms |
| MTBF (calculated) | MIL-HDBK-217F@25°C, Ground Benign | 300,000 | | | Hours |
| Protection Class II | According IEC/EN 60536 | | | | |
| Safety Approvals | UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-report) | | | | |

EMC Specifications

| Parameter | Standards & Level | | Performance |
|---------------|--------------------------|---------------------------------------|-------------|
| EMI | Conduction and Radiation | EN55011, EN55022, FCC part 15 | Class B |
| EMS | EN55011 ,EN55024 | | |
| | ESD | EN61000-4-2 air ± 8kV , Contact ± 4kV | B |
| | Radiated immunity | EN61000-4-3 10V/m | A |
| | Fast transient | EN61000-4-4 ±2kV | B |
| | Surge | EN61000-4-5 ±1kV | B |
| | Conducted immunity | EN61000-4-6 10Vrms | B |
| | PFMF | EN61000-4-8 30A/m | A |
| | Dips | EN61000-4-11 30% 10ms | B |
| Interruptions | EN61000-4-11 >95% 5000ms | C | |

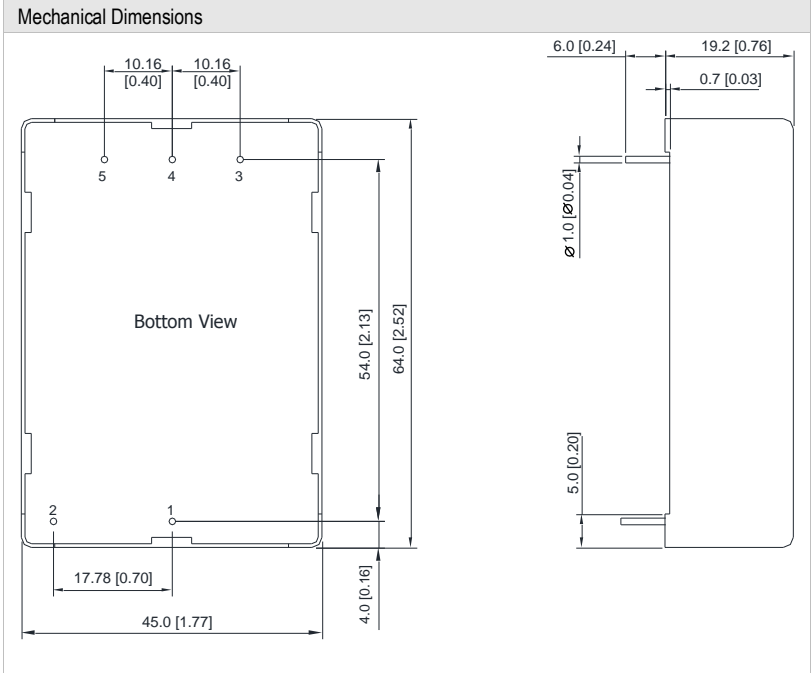
Environmental Specifications

| Parameter | Conditions | Min. | Max. | Unit |
|---|--------------------------------------|-------|------|----------|
| Operating Ambient Temperature Range (See Power Derating Curve) | Natural Convection | -25 | +70 | °C |
| Storage Temperature Range | | -40 | +85 | °C |
| Power Derating | +50°C to +70°C | 0.375 | | W / °C |
| Over Temperature Protection | at 90°C (automatic recovery at 67°C) | | | |
| Humidity (non condensing) | | --- | 95 | % rel. H |
| Cooling | Natural Convection | | | |
| Lead Temperature (1.5mm from case for 10Sec.) | | --- | 260 | °C |

Notes

- 1 All specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
- 2 These power modules require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage the power supplies however they may not meet all listed specifications.
- 3 We recommend to protect the converter by a slow blow fuse in the input supply line.
- 4 Other input and output voltage may be available, please contact factory.
- 5 Specifications are subject to change without notice

Package Specifications



Pin Connections

| Pin | Single Output | Dual Output |
|-----|--------------------|-------------|
| 1 | AC(N) – AC Neutral | |
| 2 | AC(L) – AC Line | |
| 3 | -Vout | |
| 4 | NC | Common |
| 5 | +Vout | |

NC: No Connection

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: ± 0.5 (± 0.02)
- ▶ Pin diameter $\varnothing 1.0 \pm 0.1$ (0.04 ± 0.004)

Physical Characteristics

| | |
|---------------|---|
| Case Size | : 64.0x45.0x19.2mm (2.52x1.77x0.76 Inches) |
| Case Material | : Plastic resin (flammability to UL 94V-0 rated) |
| Pin Material | : Copper Alloy with Gold Plate Over Nickel Subplate |
| Weight | : 92g |