

**FEATURES**

- ▶ Fully encapsulated Plastic Case
- ▶ PCB Mounting with Solder Pins
- ▶ Universal Input 85-264 VAC, 47-440 Hz
- ▶ Single- and Dual Output Models
- ▶ Eco Design, compliant to Energy Star specification and ErP Directive 2009/125/EC
- ▶ Protection Class II
- ▶ Safety Approval to cUL/UL/IEC/EN 60950-1
- ▶ Over Load and Over Voltage Protection
- ▶ 3 Years Product Warranty


**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 Max. mA	Input Current 115VAC, 60Hz		Max. capacitive Load uF	Efficiency (typ.) @Max. Load %
			@Max. Load mA(typ.)	@No Load mA(typ.)		
			AHF-10S03	3.3		
AHF-10S05	5	2000	199	15	3300	73
AHF-10S12	12	833	191	15	2200	76
AHF-10S15	15	666	191	15	2200	76
AHF-10S24	24	416	190	15	1000	76
AHF-10D12	±12	±380	172	15	#1000	77
AHF-10D15	±15	±300	169	15	#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
Inrush Current (Cold Start at 25°C)	115VAC	---	---	10	A
	230VAC	---	---	20	A

**Output Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		---	±1.0	±2.0	%	
Line Regulation	Vin=Min. to Max.	---	±0.5	±1.0	%	
Load Regulation	Iout=Min. to Max.	Single Output Models	---	±0.5	±1.0	%
		Dual Output Models	---	±2.5	±5.0	%
Ripple & Noise (20MHz)	3.3 & 5.0VDC Output Models	---	1.5	1.8	%V <sub>PP</sub> of Vo	
	Other Output Models	---	0.8	1.0	%V <sub>PP</sub> of Vo	
Minimum Load		---	10	---	%I <sub>nom.</sub>	
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	---	---	%I <sub>nom.</sub>	
	(long term overload condition may cause damage)					
Short Circuit Protection	Hiccup mode, indefinite (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
EMC Emission	Conducted and radiated	EN 55011, class B, EN 55022, class B, FCC part 15, class B			
EMC Immunity according EN61000-6-1	Standard	Sepcification Requirement			Performance Criteria
	EN61000-4-2	Air ±8KV Cont. ±4KV			B
	EN61000-4-3	80~1000MHz, 10V/m 80% AM, 1KHz modulation			A
	EN61000-4-4	AC port ±2KV DC, SL, TL ±2KV not less than 1 min.			B
	EN61000-4-5	1.2/50uS(8/20uS) AC dif. ±1KV DC ±0.5KV			B
	EN61000-4-6	0.15~80MHz, 10Vrms (functional earth ports included) 80% AM, 1KHz modulation			B
	EN61000-4-8	50Hz/60Hz, 30A/m			A
	EN61000-4-11	30%, 10ms 60%, 100ms, 95%, 5000ms			B C
Protection Class II		According IEC/EN 60536			
Safety Approvals		cUL/UL 60950-1, IEC/EN 60950-1			

**Input Fuse**

All Models	
Built-in Fuse	2A / 250VAC
External Fuse (Recommended)	1.5A Slow – Blow Type

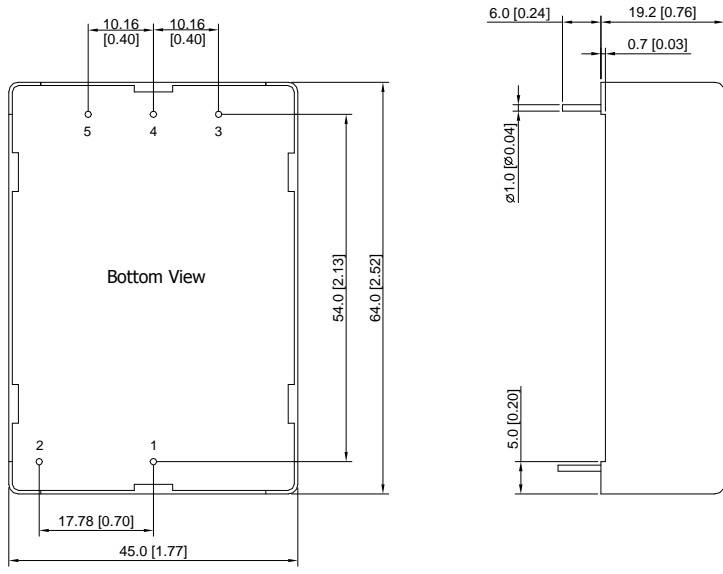
**Environmental Specifications**

Parameter	Conditions
Temperature Range (operational)	Ambient -25°C to +70°C
Power Derating	+50°C to +70°C 0.375W / °C
Storage Temperature Range	-40 to +85
Over Temperature Protection	at 90°C (automatic recovery at 67°C)
Cooling	Free-Air convection
Humidity (non condensing)	--- 95 % rel. H

**Notes**

- All specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
- Ripple & Noise measurement bandwidth is 0~20 MHz
- 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.
- Other input and output voltage may be available, please contact factory.
- Specifications subject to change without notice

**Package Specifications**

Mechanical Dimensions		Pin Connections																			
		<table border="1"> <thead> <tr> <th>Pin</th> <th>Single</th> <th>Dual</th> </tr> </thead> <tbody> <tr> <td>1</td> <td colspan="2">AC(N) – AC Neutral</td> </tr> <tr> <td>2</td> <td colspan="2">AC(L) – AC Line</td> </tr> <tr> <td>3</td> <td colspan="2">-Vout</td> </tr> <tr> <td>4</td> <td>NC</td> <td>Common</td> </tr> <tr> <td>5</td> <td colspan="2">+Vout</td> </tr> </tbody> </table>		Pin	Single	Dual	1	AC(N) – AC Neutral		2	AC(L) – AC Line		3	-Vout		4	NC	Common	5	+Vout	
Pin	Single	Dual																			
1	AC(N) – AC Neutral																				
2	AC(L) – AC Line																				
3	-Vout																				
4	NC	Common																			
5	+Vout																				
		<p>NC: No Connection</p>																			
		<ul style="list-style-type: none"> <li>▶ All dimensions in mm (inches)</li> <li>▶ Tolerance: <math>\pm 0.5</math> (<math>\pm 0.02</math>)</li> <li>▶ Pin diameter <math>\varnothing 1.0 \pm 0.1</math> (<math>0.04 \pm 0.004</math>)</li> </ul>																			

**Physical Characteristics**

Case Size	: 64.0x45.0x19.2mm (2.52x1.77x0.76 Inches)
Case Material	: Plastic resin + Fiberglass (flammability to UL 94V-0 rated)
Weight	: 92g