

FEATURES

- ▶ Fully Encapsulated Plastic Case for PCB Mounting
- ▶ Universal Input 85-264VAC, 47-440Hz
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ Operating Ambient Temp. Range -25°C to +70°C
- ▶ Overload/Voltage and Short Circuit Protection
- ▶ EMI Emission EN55032 Class B Approved
- ▶ EMC Immunity EN61000-4-2,3,4,5,6,8,11 Approved
- ▶ Eco Design, Compliant to Energy Star Specification and ErP Directive 2009/125/EC
- ▶ 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 EN 55032, 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. mA			@Max. Load %
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	Conditions / 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	115VAC	Cold Start at 25°C	---	---	10	A
	230VAC		---	---	20	A

Output Specifications

Parameter	Conditions / Model	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	±1.0	%
		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	
Over Load Protection	Hiccup mode, auto-recovery (long term overload condition may cause damage)	105	---	---	%Inom.	
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	---	---	VAC
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
Safety Approvals	UL/cUL 60950-1 recognition(UL certificate), IEC/EN 60950-1(CB-report)				

EMC Specifications

Parameter	Standards & Level			Performance
EMI	Conduction	EN 55032	Without external components	Class B
	Radiation			
EMS	EN 55035			
	ESD	EN 61000-4-2 air ± 8kV, Contact ± 4kV		B
	Radiated immunity	EN 61000-4-3 10V/m		A
	Fast transient	EN 61000-4-4 ±2kV		B
	Surge	EN 61000-4-5 ±1kV		B
	Conducted immunity	EN 61000-4-6 10Vrms		B
	PFMF	EN 61000-4-8 30A/m		A
	Dips	EN 61000-4-11 30% 10ms		B
Interruptions	EN 61000-4-11 >95% 5000ms		C	

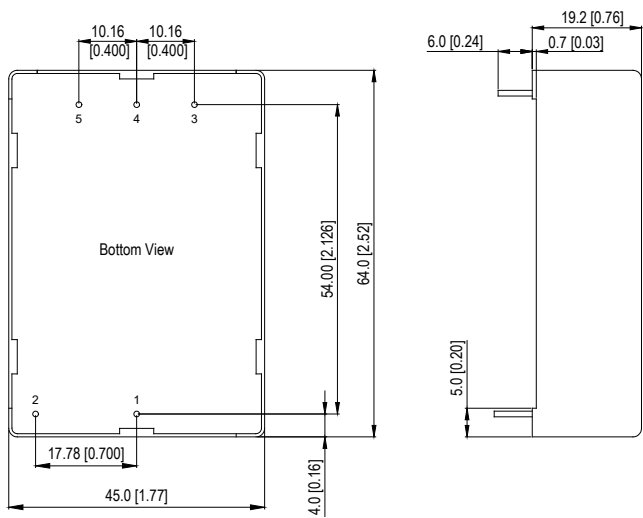
Environmental Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature Range		-25	---	+70	°C
Power Derating	+50°C to +70°C	0.375			W / °C
Storage Temperature Range		-40	---	+85	°C
Thermal Shutdown	Shutdown, Internal IC Junction Temperature	---	142	---	°C
	Automatic Recovery, Internal IC Junction Temperature	---	67	---	°C
Humidity (non condensing)		---	---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)		---	---	260	°C

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.
- 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.
- We recommend to protect the converter by a slow blow fuse in the input supply line.
- Other input and output voltage may be available, please contact MINMAX.
- Specifications are subject to change without notice

Package Specifications PCB Mounting

Mechanical Dimensions		Pin Connections			
 <p>Bottom View</p>		Pin	Single Output	Dual Output	Diameter mm (inches)
		1	AC(N) – AC Neutral		∅ 1.0 [0.04]
		2	AC(L) – AC Line		∅ 1.0 [0.04]
		3	-Vout		∅ 1.0 [0.04]
		4	NC	Common	∅ 1.0 [0.04]
		5	+Vout		∅ 1.0 [0.04]

NC: No Connection

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: ±0.5 (±0.02)
- ▶ Pin pitch tolerance: ±0.25 (±0.01)
- ▶ Pin diameter tolerance: X.X±0.1 (X.XX±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
Weight	: 92g