

**FEATURES**

- ▶ Ultra Compact Size 1.0" x 1.0" x 0.64"
- ▶ Fully Encapsulated Plastic Case for PCB Mounting
- ▶ Universal Input 85-264VAC
- ▶ Protection Class II as per IEC/EN 60536
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ Operating Ambient Temp. Range -25°C to +70°C
- ▶ No Min. Load Requirement
- ▶ Overload/Voltage and Short Circuit Protection
- ▶ EMI Emission EN 55032/14-1 Class B & FCC Level B Approved
- ▶ EMC Immunity EN 61000-4-2,3,4,5,6,8,11 Approved
- ▶ Eco Design, Low No Load Power Consumption < 150mW
- ▶ UL/cUL/IEC/EN 62368-1(60950-1), TUV/IEC/EN 60335-1 Safety Approval & CE Marking


**PRODUCT OVERVIEW**

The AAF-03 Series from MINMAX is a range of ultra-small, fully encapsulated 3 Watt AC-DC power supply modules. They are designed for easy PCB mounting with solder pins. The modules feature EMI emission EN 55032/14-1 class B approved. EMC immunity complies with EN 61000-6-1. The low stand-by power consumption complies with European ErP Directive 2009/125/EC.

Universal input voltage range of 85-264VAC and an International safety approval package qualifies the power modules for worldwide markets.

The AAF-03 series provide a superior solution for space critical applications in consumer appliances and instrumentation and communication equipment.

**Model Selection Guide**

Model Number	Output Voltage VDC	Output Current		Input Current @Max. Load mA(typ.)	Max. capacitive Load µF	Efficiency (typ.) @Max. Load %
		Max. mA	Peak <sub>(1)</sub> mA			
AAF-03S03	3.3	900	1170	62	1200	70
AAF-03S05	5	600	780	61	820	72
AAF-03S09	9	333	430	57	470	77
AAF-03S12	12	250	320	56	330	78
AAF-03S15	15	200	260	56	270	78
AAF-03S24	24	125	160	56	180	78

**Input Specifications**

Parameter	Conditions / Model	Min.	Typ.	Max.	Unit
Input Voltage Range	All Models	85	---	264	VAC
Input Frequency Range		47	---	63	Hz
Input Voltage Range		120	---	370	VDC
No-Load Power Consumption		---	---	150	maw
Inrush Current (Cold Start at 25°C)	115VAC	---	---	15	A
	230VAC	---	---	25	A

Output Specifications					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	---	±2.0	%V <sub>o</sub> m.
Line Regulation	V <sub>in</sub> =Min. to Max. @Full Load	---	---	±1.0	%
Load Regulation	I <sub>o</sub> =0% to 100%	---	---	±1.0	%
Ripple & Noise	0-20 MHz Bandwidth	---	---	70	mV <sub>P-P</sub>
Minimum Load	No minimum Load Requirement				
Over Voltage Protection	Zener Diode Clamp	---	125	190	% of V <sub>o</sub>
Temperature Coefficient		---	---	±0.05	%/°C
Overshoot		---	---	5	%V <sub>out</sub>
Over Load Protection	Foldback, auto-recovery	135	150	---	%I <sub>nom</sub> .
	(long term overload condition may cause damage)				
Short Circuit Protection	Hiccup mode, Automatic Recovery				

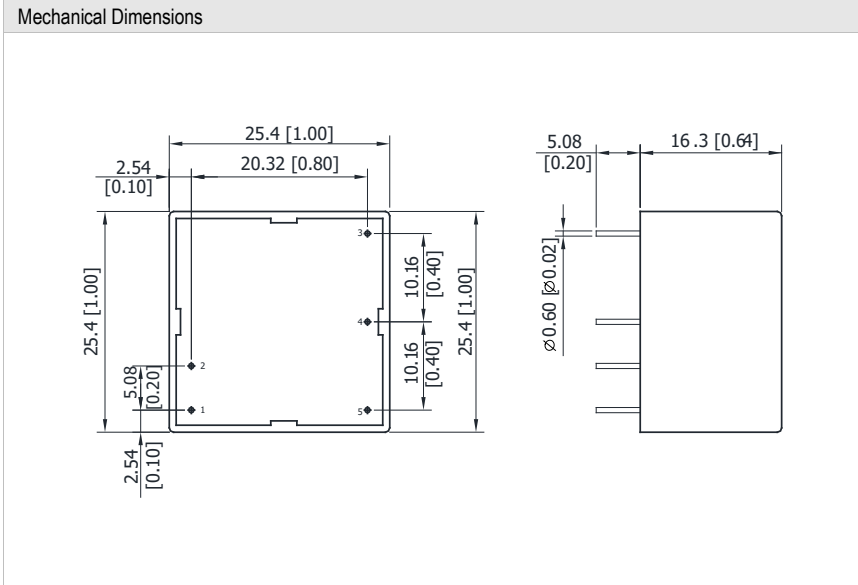
General Specifications					
Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	60 Seconds	3000	---	---	VAC
I/O Isolation Resistance	500 VDC	100	---	---	MΩ
Switching Frequency		---	65	---	kHz
Hold-up Time	115VAC, Full Load	---	8	---	ms
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	1,200,000			Hours
Protection Class II	According IEC/EN 60536				
Safety Approvals	UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-report)				
	UL/cUL 62368-1 recognition (UL certificate), IEC/EN 62368-1 (CB-report)				
	IEC/EN 60335-1 recognition (CB-report, TUV certificate)				

EMC Specifications			
Parameter	Standards & Level		Performance
EMI	Conduction & Radiation Class B without any external components		EN 55014-1, EN 55032, FCC part 15
	EN 55014-2, EN 55024		Class B
EMS	ESD		EN 61000-4-2 Air ± 8kV, Contact ± 4kV
	Radiated immunity		EN 61000-4-3 10V/m
	Fast transient		EN 61000-4-4 ±2kV
	Surge		EN 61000-4-5 ±1kV
	Conducted immunity		EN 61000-4-6 10Vrms
	PFMF		EN 61000-4-8 30A/m
	Dips		EN 61000-4-11 30% 10ms
	Interruptions		EN 61000-4-11 >95% 5000ms

Environmental Specifications				
Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range		-25	+70	°C
Storage Temperature Range		-40	+85	°C
Power Derating	+60°C to +70°C	0.15		W / °C
Humidity (non condensing)		---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)		---	260	°C

Notes	
1	Peak load lasting <30s with a maximum duty cycle of 10%, average output power not to exceed maximum power.
2	All specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
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	Function
1	AC (N)
2	AC (L)
3	NC
4	-Vout
5	+Vout

NC: No Connection

- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.01$ )
- ▶ Pin pitch tolerance:  $\pm 0.25$  ( $\pm 0.01$ )
- ▶ Pin diameter  $\varnothing 0.6 \pm 0.1$  ( $0.02 \pm 0.004$ )

**Physical Characteristics**

Case Size	:	25.4x25.4x16.3mm (1.0x1.0x0.64 inches)
Case Material	:	Plastic resin (flammability to UL 94V-0 rated)
Pin Material	:	Copper Alloy with Gold Plate Over Nickel Subplate
Weight	:	17.4g