

## 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 60950-1, TUV/IEC/EN 60335-1 Safety Approval & CE Marking



## PRODUCT OVERVIEW

The new 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	Output Current		Input Current	Max. capacitive Load	Efficiency (typ.)
		Max.	Peak <sub>(1)</sub>	@Max. Load		@Max. Load
		VDC	mA	mA		mA(typ.)
<b>AAF-03S03</b>	<b>3.3</b>	<b>900</b>	1170	62	1200	70
<b>AAF-03S05</b>	<b>5</b>	<b>600</b>	780	61	820	72
<b>AAF-03S09</b>	<b>9</b>	<b>333</b>	430	57	470	77
<b>AAF-03S12</b>	<b>12</b>	<b>250</b>	320	56	330	78
<b>AAF-03S15</b>	<b>15</b>	<b>200</b>	260	56	270	78
<b>AAF-03S24</b>	<b>24</b>	<b>125</b>	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	mW
Inrush Current (Cold Start at 25°C)		115VAC	---	---	15
	230VAC	---	---	25	A

**Output Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	---	±2.0	%Vnom.
Line Regulation	Vin=Min. to Max. @Full Load	---	---	±1.0	%
Load Regulation	Io=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 Vo
Temperature Coefficient		---	---	±0.05	%/°C
Overshoot		---	---	5	%Vout
Over Load Protection	Foldback, auto-recovery (long term overload condition may cause damage)	135	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	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) IEC/EN 60335-1 recognition (CB-report, TUV certificate)				

**EMC Specifications**

Parameter	Standards & Level		Performance
EMI	Conduction & Radiation	EN 55014-1, EN 55032, FCC part 15	Class B
EMS	EN 55014-2, EN 55024		
	ESD	EN 61000-4-2 Air ± 8kV, Contact ± 4kV	A
	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	

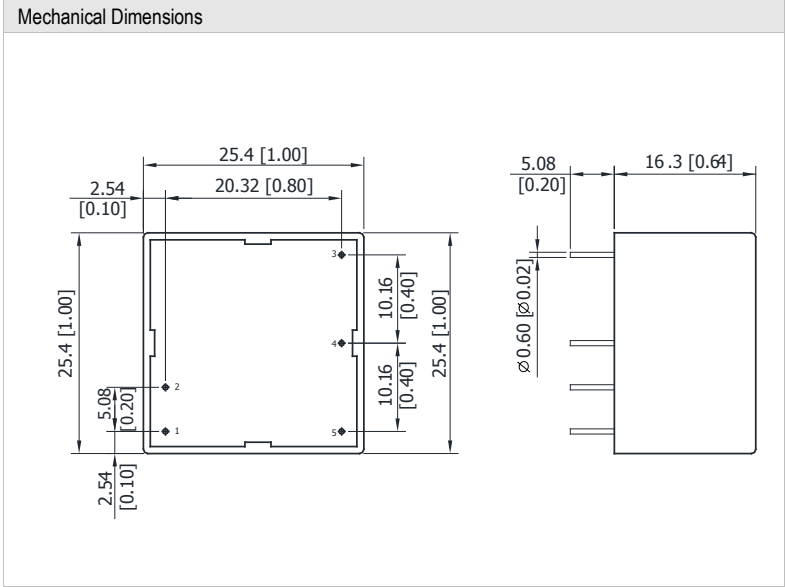
**Environmental Specifications**

Parameter	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