

**FEATURES**

- ▶ Ultra Compact Size 1.0 x 1.0 x 0.64"
- ▶ Fully Encapsulated Plastic Case for PCB and Chassis Mounting Version
- ▶ Universal Input 85~264VAC
- ▶ Protection Class II as per IEC/EN 60536
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ No Min. Load Requirement
- ▶ Operating Ambient Temp. Range -25°C to +70°C
- ▶ Overload/Voltage 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, No Load Input Power 300mW max.
- ▶ Safety Approval to UL/cUL/IEC/EN 60950-1, TUV IEC/EN 60335-1 & CE Marking


**PRODUCT OVERVIEW**

The new AAF-05 Series from MINMAX is a range of ultra-small, fully encapsulated 5 Watt AC/DC power supply modules. They are designed for easy PCB mounting with solder pins. The modules feature EMI-filter to meet EN 55011/55022, class B and EN 55014. 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 these power modules for worldwide markets.

The AAF-05 power supplies provide a cost effective 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 <sup>(1)</sup>	@Max. Load		@Max. Load
	VDC	mA	mA	mA(typ.)	μF	%
AAF-05S03	3.3	1515	1970	117	2200	74
AAF-05S05	5	1000	1300	108	1000	80
AAF-05S09	9	555	721	106	300	82
AAF-05S12	12	416	540	106	160	82
AAF-05S15	15	333	433	104	100	83
AAF-05S24	24	208	270	104	43	83
AAF-05S48	48	104	135	102	10	85

**Input Specifications**

Parameter	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		---	---	300	mW
Inrush Current (Cold Start at 25°C)	115VAC	---	---	20	A
	230VAC	---	---	40	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	3.3V & 5VDC Output Models	---	---	60	mV <sub>PP</sub> of Vo
		Other Output Models	---	---	1	%V <sub>PP</sub> of Vo
Minimum Load	No minimum Load Requirement					
Over Voltage Protection	Zener Diode Clamp	---	125	190	% of Vo	
Temperature Coefficient		---	---	±0.05	%/°C	
Overshoot		---	---	5	%Vout	
Current Limitation	Foldback, auto-recovery	135	150	---	%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	60 Seconds	3000	---	---	VACrms
I/O Isolation Resistance	500 VDC	100	---	---	MΩ
Switching Frequency		---	65	---	KHz
Hold-up Time	115VAC, Full Load	---	8	---	ms
	230VAC, Full Load	---	40	---	ms
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	628,000	---	---	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	EN55011, EN55014-1, EN55022, FCC part 15	Class B
	EN55014-2, EN55024		
EMS	ESD	EN61000-4-2 Air ± 8kV, Contact ± 4kV	A
	Radiated immunity	EN61000-4-3 10V/m	A
	Fast transient	EN61000-4-4 ±2kV	A
	Surge	EN61000-4-5 ±1kV	A
	Conducted immunity	EN61000-4-6 10Vrms	A
	PFMF	EN61000-4-8 30A/m	A
	Dips	EN61000-4-11 30% 10ms	A
	Interruptions	EN61000-4-11 >95% 5000ms	B

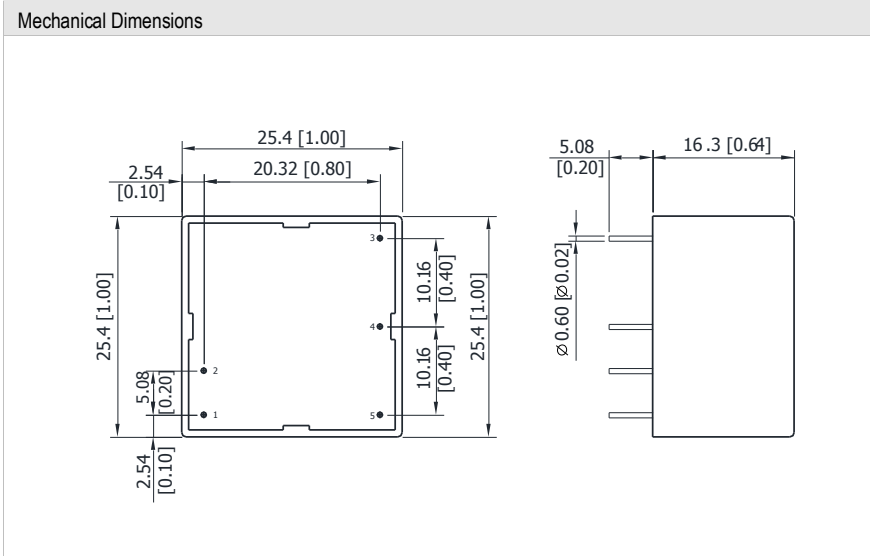
**Environmental Specifications**

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	0.125		W / °C
Humidity (non condensing)		---	95	% rel. H
Cooling	Natural Convection			
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	Ripple & Noise of PCB mounting type measured with a 1μF/50V MLCC.
4	We recommend to protect the converter by a slow blow fuse in the input supply line.
5	Other input and output voltage may be available, please contact factory.
6	That "natural convection" is about 20LFM but is not equal to still air (0 LFM).
7	Specifications are subject to change without notice.

**Package Specifications PCB Mounting**



Pin Connections	
Pin	Function
1	AC (N)
2	AC (L)
3	NC
4	-Vout
5	+Vout

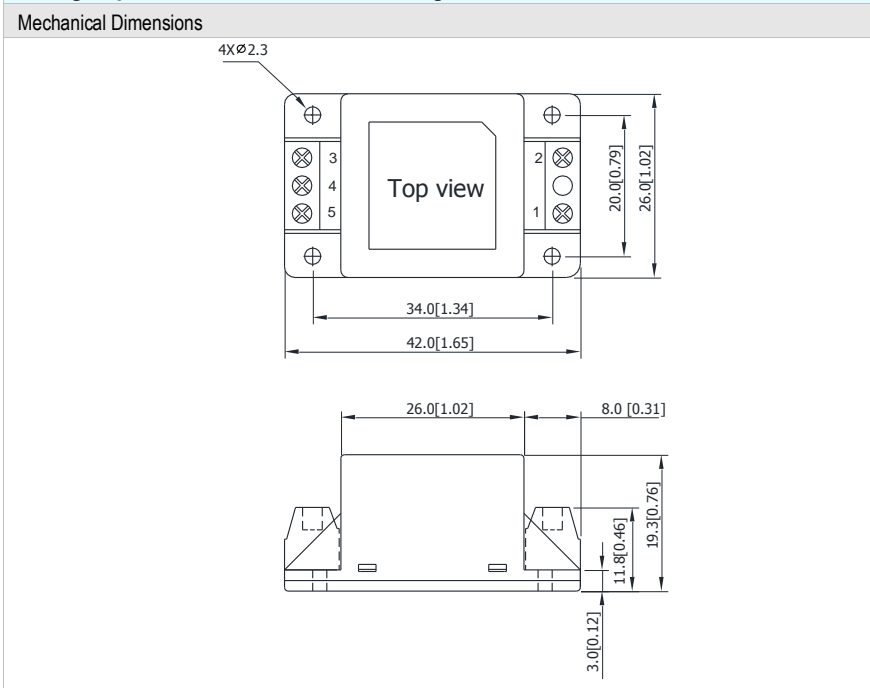
NC: No Connection

- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.01$ )
- ▶ Pin 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	: Tinned Copper
Weight	: 19.7g

**Package Specifications Chassis Mounting**



Connections	
Pin	Function
1	AC (N)
2	AC (L)
3	NC
4	-Vout
5	+Vout

- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.02$ )

**Physical Characteristics**

Case Size	: 42.0x26.0x19.3mm (1.65x1.02x0.76 inches)
Case Material	: Plastic resin (flammability to UL 94V-0 rated)
Weight	: 23.9g

Order Code Table	
PCB Mounting	Chassis Mounting
AAF-05S03	AAF-05S03C
AAF-05S05	AAF-05S05C
AAF-05S09	AAF-05S09C
AAF-05S12	AAF-05S12C
AAF-05S15	AAF-05S15C
AAF-05S24	AAF-05S24C
AAF-05S48	AAF-05S48C