

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 VDC	Output Current		Input Current	Max. Capacitive Load μF	Efficiency (typ.)
		Max. mA	Peak ⁽¹⁾ mA	@Max. Load mA(typ.)		@Max. Load %
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 _{PP} of Vo
		Other Output Models	---	---	1	%V _{PP} 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

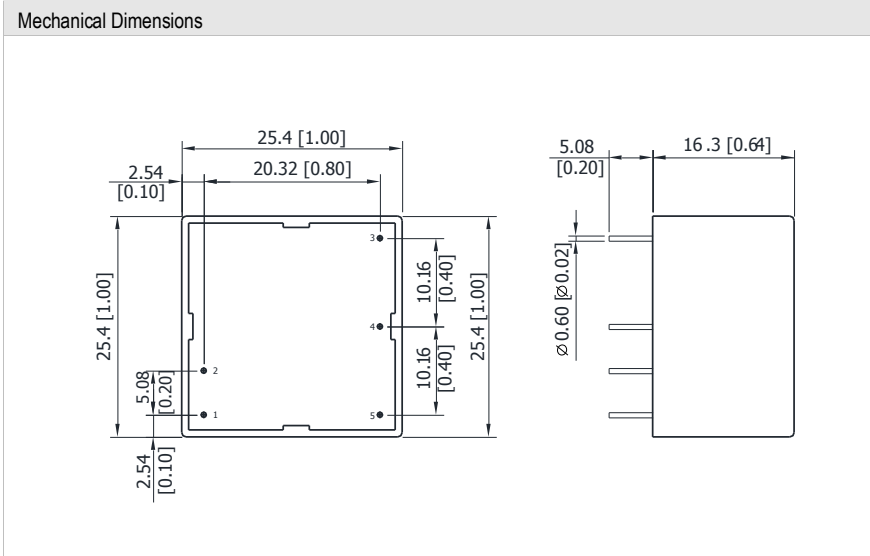
Environmental Specifications

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

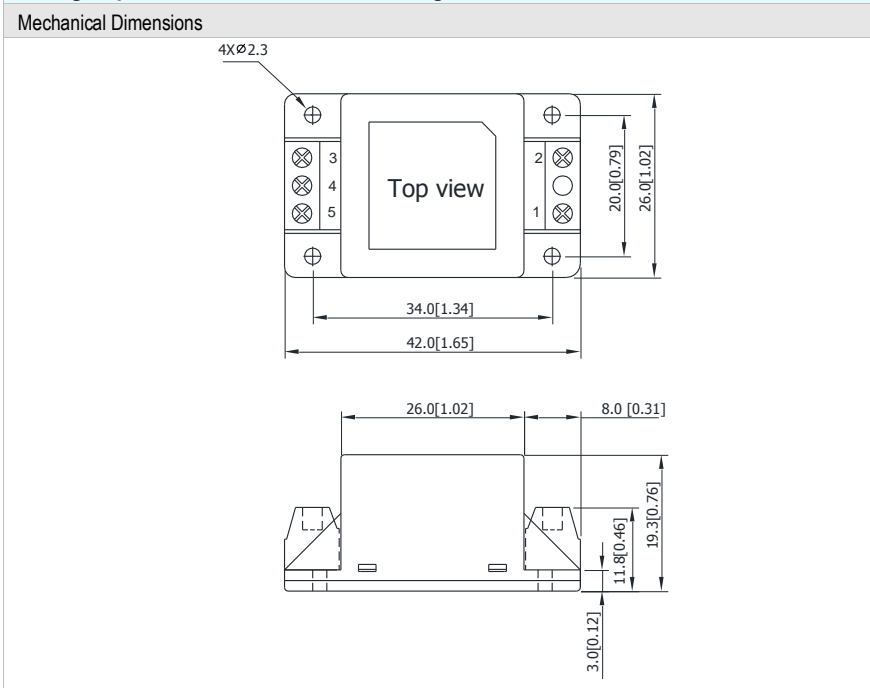
NC: No Connection

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