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
- I/O Isolation 3000VAC with Reinforced Insulation
- No Min. Load Requirement
- Operating Ambient Temp. Range -25℃ to +70℃
- Overload/Voltage and Short Circuit Protection
- EMI Emission EN 55032/14-1 Class B Approved
- EMS Immunity EN 61000-4-2,3,4,5,6,8,11 Approved
- Eco Design, No Load Input Power 300mW max.
- Safety Approval to UL/cUL/IEC/EN 62368-1(60950-1), TUV IEC/EN 60335-1 & CE Marking

PRODUCT OVERVIEW

The 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 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. This series comply with international standard pinout and input voltage range of 85-264VAC for worldwide markets.The AAF-05 power supplies provide a better 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(1)	@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	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		---	---	300	mW
Inrush Current (Cold Start at 25°C)	115VAC	---	---	20	A
	230VAC	---	---	40	A

Output Specifications

Parameter	Conditions / Model		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 P-P
		Other Output Models	---	---	1	%V_{PP} of Vo
Minimum Load	No minimum Load Requirement					
Over Voltage Protection	Zener Diode Clamp		---	125	---	% 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
	230VAC, Full Load	---	40	---	ms
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	520,000	---	---	Hours
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	EN 55014-1, EN 55032	Without external components	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

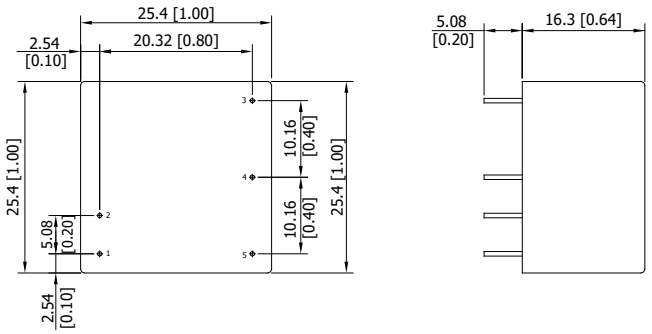
Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range		-25	+70	°C
Power Derating	+50°C to +70°C	0.125		W / °C
Storage Temperature Range		-40	+85	°C
Humidity (non condensing)		---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)		---	260	°C

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. Ripple & Noise of PCB mounting type measured with a 1μF/100V 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 MINMAX.
6. Specifications are subject to change without notice.

Package Specifications PCB Mounting

Mechanical Dimensions



Pin Connections

Pin	Function	Diameter mm (inches)
1	AC (N)	Ø 0.6 [0.02]
2	AC (L)	Ø 0.6 [0.02]
3	NC	Ø 0.6 [0.02]
4	-Vout	Ø 0.6 [0.02]
5	+Vout	Ø 0.6 [0.02]

NC: No Connection

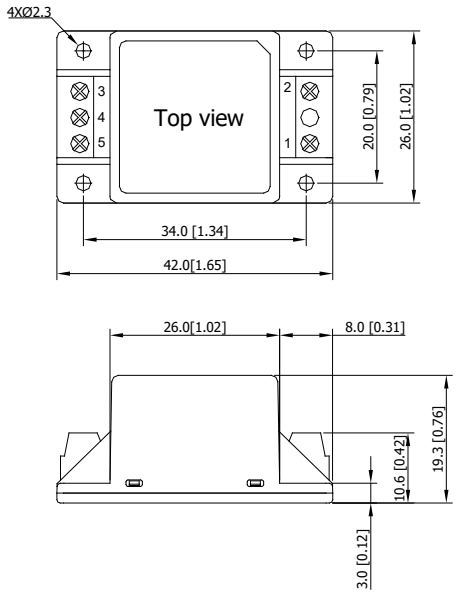
- All dimensions in mm (inches)
- Tolerance: ±0.5 (±0.02)
- Pin pitch tolerance: ±0.25 (±0.01)
- Pin diameter tolerance: X.X±0.1 (X.XX±0.004)

Physical Characteristics

Case Size	:	25.4x25.4x16.3mm (1.0x1.0x0.64 inches)
Case Material	:	Plastic resin (flammability to UL 94V-0 rated)
Pin Material	:	Copper Alloy
Weight	:	19.7g

Package Specifications Chassis Mounting

Mechanical Dimensions



Note:
Screw type Terminal: Wires 1.5mm^2 max.
Recommended Terminal Screw tightening torque: 0.2Nm (1.7lb.in.) max.

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