

**FEATURES**

- ▶ Fully Encapsulated Plastic Case for PCB, Chassis and DIN-Rail Mounting Version
- ▶ Universal Input 85-264VAC
- ▶ Protection Class II as per IEC/EN 60536
- ▶ I/O Isolation 3000VAC with Reinforced Insulation
- ▶ Operating Ambient Temp. Range -10°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
- ▶ UL508 Safety Approval (Option) Specifically for Industrial Application
- ▶ UL/cUL/IEC/EN 60950-1 Safety Approval & CE Marking


**PRODUCT OVERVIEW**

The MINMAX AZF-60 series is a new range of fully encapsulated AC/DC power supply modules. The product features EMI-filter to EN55022, class B and EMS compliance to EN 61000-4 standard. Universal input voltage 85-264VAC and International safety approvals qualifies these power modules for applications in products with worldwide markets. For industrial applications, the models for chassis mounting can also be supplied as option with UL508 approval. The AZF-60 series provide a cost effective solution for many space critical applications in commercial and industrial electronic equipment.

**Model Selection Guide**

Model Number PCB Mounting	Output Voltage	Output Current Max. mA	Input Current 115VAC, 60Hz		Max. capacitive Load μ F	Efficiency (typ.) @Max. Load %
			@Max. Load mA(typ.)	@No Load mA(typ.)		
			VDC			
AZF-60S051	5.1	10,000	936	50	8000	79
AZF-60S12	12	5000	1060	50	3900	82
AZF-60S15	15	4000	1047	50	3300	83
AZF-60S24	24	2500	1035	50	1500	84
AZF-60S36	36	1666	1035	50	1000	84
AZF-60S48	48	1250	1035	50	680	84

**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
Inrush Current	115VAC	Cold Start at 25°C	---	---	30	A
	230VAC		---	---	50	A

**Output Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		---	±1.0	±2.0	%	
Line Regulation	Vin=Min. to Max. @Full Load	---	±0.2	±1.0	%	
Load Regulation	Io=10% to 100%	---	±0.5	±1.0	%	
Ripple & Noise	0-20 MHz Bandwidth	5.1VDC Output Models	---	2.0	3.0	%V <sub>PP</sub> of Vo
		Other Output Models	---	1.0	1.3	%V <sub>PP</sub> of Vo
Minimum Load		---	10	---	%Inom.	
Over Voltage Protection	Zener diode clamp	---	120	---	% of Vo	
Transient Response Deviation	(I <sub>out</sub> =100% to I <sub>out</sub> =50%)		±3	±6	%	
Temperature Coefficient		---	±0.02	---	%/°C	
Overshoot		---	---	5	% Vout	
Over Load Protection	Foldback, auto-recovery (long term overload condition may cause damage)	105	---	---	%Inom.	
Short Circuit Protection	Hiccup mode, Automatic Recovery					

**General Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	Input to Output, 60 Seconds	3000	---	---	VACrms
I/O Isolation Resistance	500 VDC	100	---	---	MΩ
Switching Frequency		---	100	---	KHz
Hold-up Time		---	20	---	ms
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign		125,000		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 508 listed certificate				

**Environmental Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature Range	Natural Convection	-10	---	+70	°C
Storage Temperature Range		-40	---	+85	°C
Power Derating	+50°C to +70°C		2.25		W / °C
Power Derating (5.1Vout)	+40°C to +70°C		2.25		W / °C
Thermal Shutdown	Shutdown, Internal IC Junction Temperature	---	142	---	°C
	Automatic Recovery, Internal IC Junction Temperature	---	67	---	°C
Humidity (non condensing)		---	---	95	% rel. H
Cooling	Natural Convection				
Lead Temperature (1.5mm from case for 10Sec.)		---	---	260	°C

**EMC Specifications**

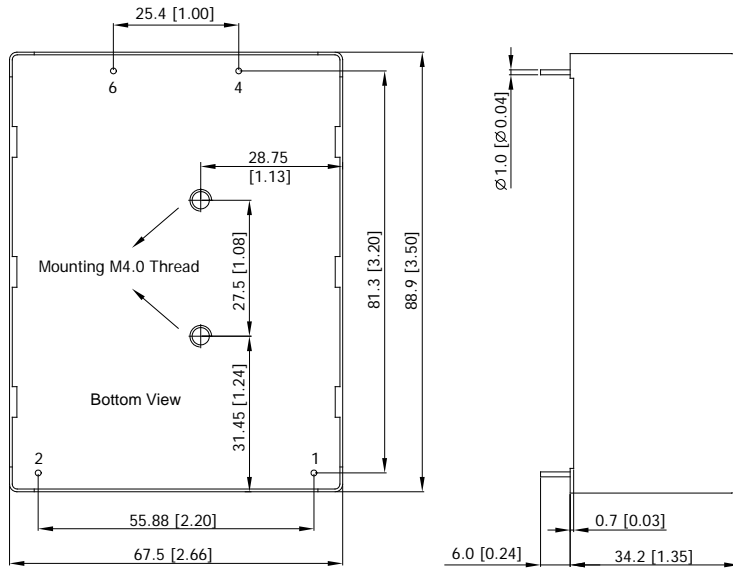
Parameter	Standards & Level		Performance
EMI	Conduction and Radiation	EN55011, EN55022, FCC part 15	Class B
EMS	EN55011 ,EN55024		
	ESD	EN61000-4-2 Air ± 8kV , Contact ± 4kV	B
	Radiated immunity	EN61000-4-3 10V/m	A
	Fast transient	EN61000-4-4 ±2kV	B
	Surge	EN61000-4-5 ±1kV	B
	Conducted immunity	EN61000-4-6 10Vrms	B
	PFMF	EN61000-4-8 30A/m	A
	Dips	EN61000-4-11 30% 10ms	B
Interruptions	EN61000-4-11 >95% 5000ms	C	

**Notes**

- All specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
- These power modules require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage the power supplies however they may not meet all listed specifications.
- Other input and output voltage may be available, please contact factory.
- That "natural convection" is about 20LFM but is not equal to still air (0 LFM).
- Specifications are subject to change without notice

**Package Specifications PCB Mounting**

Mechanical Dimensions



Pin Connections

Pin	Function
1	AC(N) – AC Neutral
2	AC(L) – AC Line
4	+Vout
6	-Vout

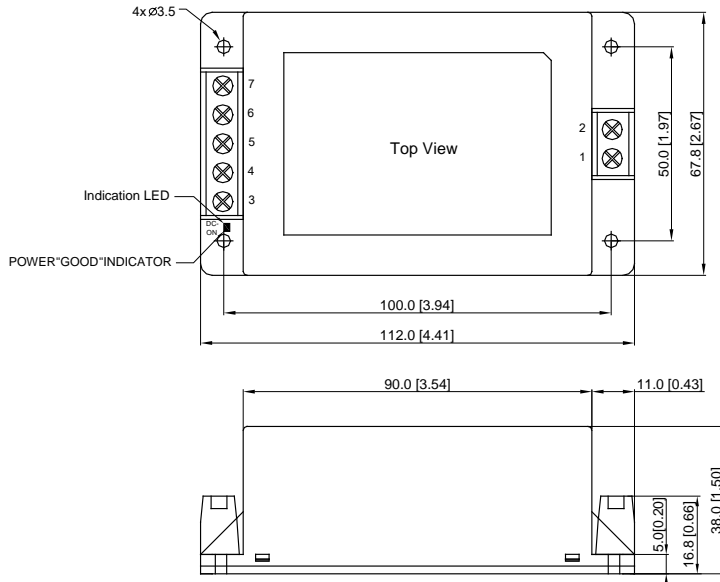
All dimensions in mm (inches)  
Tolerance:  $\pm 1.0$  ( $\pm 0.04$ )  
Pin diameter  $\varnothing 1.0 \pm 0.1$  ( $0.04 \pm 0.004$ )

**Physical Characteristics**

Case Size	: 88.9x67.5x34.2mm (3.50x2.66x1.35 inches)
Case Material	: Plastic resin (flammability to UL 94V-0 rated)
Pin Material	: Copper Alloy with Gold Plate Over Nickel Subplate
Weight	: 345g

**Package Specifications Chassis Mounting (order code suffix C)**

Mechanical Dimensions



Connections

Terminal	Function
1	AC(N) – AC Neutral
2	AC(L) – AC Line
3	NC
4	+Vout
5	NC
6	-Vout
7	NC

NC: No Connection

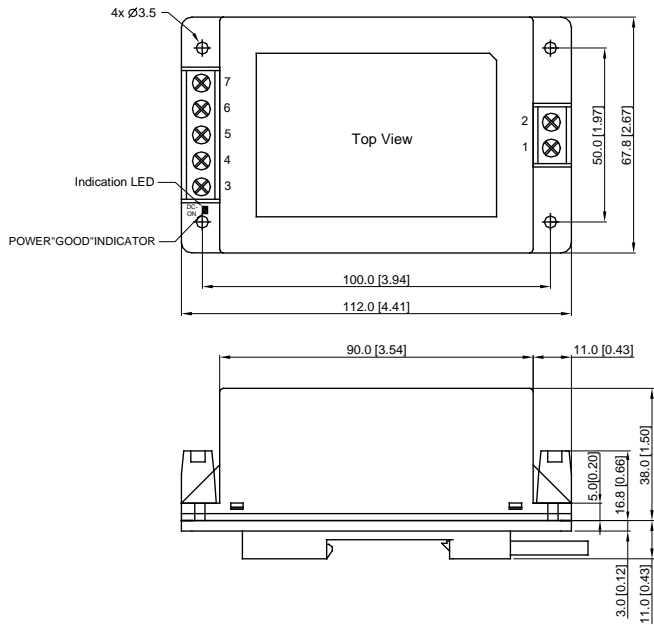
All dimensions in mm (inches)  
Tolerance:  $\pm 1.0$  ( $\pm 0.04$ )

**Physical Characteristics**

Case Size	: 112.0x67.8x38.0mm (4.41x2.67x1.50 inches)
Case Material	: Plastic resin (flammability to UL 94V-0 rated)
Weight	: 357g

**Package Specifications with DIN Rail Mounting Bracket**

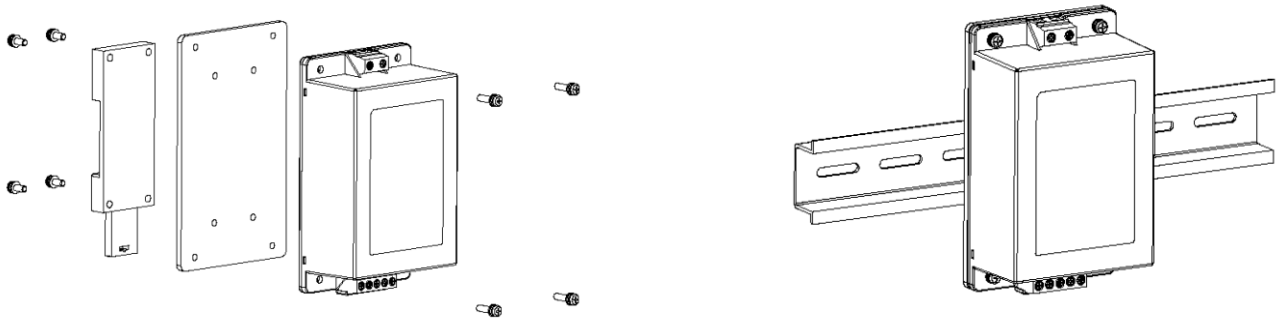
Mechanical Dimensions



**Physical Characteristics**

Case Size	: 112.0x67.8x38.0mm (4.41x2.67x1.50 inches)
Case Material	: Plastic resin (flammability to UL 94V-0 rated)
Weight	: 410g

**DIN-Rail Mounting Bracket (Order Code for Kit : AC-DIN-02)**



**Order Code Table**

PCB Mounting	Chassis Mounting	PCB Mounting With UL508	Chassis Mounting With UL508	With DIN Rail Mounting by two Order Code		Chassis Mounting with UL508 & DIN Rail Mounting by two Order Code	
AZF-60S051	AZF-60S051C	AZF-60S051CICE	AZF-60S051CICE	AZF-60S051C	AC-DIN-02	AZF-60S051CICE	AC-DIN-02
AZF-60S12	AZF-60S12C	AZF-60S12CICE	AZF-60S12CICE	AZF-60S12C	AC-DIN-02	AZF-60S12CICE	AC-DIN-02
AZF-60S15	AZF-60S15C	AZF-60S15CICE	AZF-60S15CICE	AZF-60S15C	AC-DIN-02	AZF-60S15CICE	AC-DIN-02
AZF-60S24	AZF-60S24C	AZF-60S24CICE	AZF-60S24CICE	AZF-60S24C	AC-DIN-02	AZF-60S24CICE	AC-DIN-02
AZF-60S36	AZF-60S36C	AZF-60S36CICE	AZF-60S36CICE	AZF-60S36C	AC-DIN-02	AZF-60S36CICE	AC-DIN-02
AZF-60S48	AZF-60S48C	AZF-60S48CICE	AZF-60S48CICE	AZF-60S48C	AC-DIN-02	AZF-60S48CICE	AC-DIN-02