FEATURES

- Fully encapsulated Plastic Case
- Single-, Dual- and Triple Output Models
- 3 Mounting Versions:
  - PCB Mounting with Solder Pins
  - Chassis Mounting with Screw Terminals
  - DIN-Rail Mounting
- Universal Input 85-264 VAC, 47- 440 Hz
- Protection Class II
- Safety Approval to cUL/UL/IEC/EN 60950-1
- UL508 Approval (Option)
- Over Load and Over Voltage Protection
- 3 Year Product Warranty

PRODUCT OVERVIEW

The MINMAX AQF-30 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 AQF-30 series provide a cost effective solution for many space critical applications in commercial and industrial electronic equipment.

Model Selection Guide

Model Number PCB Mounting (For model with Chassis Mounting, add suffix C)		Output Voltage	Output Current		Input Current 115VAC, 60Hz		Max. capacitive Load	Efficiency (typ.)
			Max.	Peak	@Max. Load	@No Load		@Max. Load
		VDC	mA	mA	mA(typ.)	mA(typ.)	μF	%
AQF-30S05	UL508	**5**	**6000**	---	557	60	8000	78
AQF-30S12	UL508	**12**	**2500**	---	543	60	3900	80
AQF-30S15	UL508	**15**	**2000**	---	543	60	3900	80
AQF-30S24	UL508	**24**	**1250**	---	543	60	1500	80
AQF-30S48	UL508	**48**	**625**	---	543	60	1000	80
AQF-30D12	UL508	**±12**	**±1300**	---	565	60	#1500	80
AQF-30D15	UL508	**±15**	**±1000**	---	543	60	#1500	80
AQF-30D512		***5**	**3000**	4500	572	60	3900	76
		***12**	**1250**	1800			1500	
AQF-30T512		***5**	**3000**	4500	572	60	2200	76
		12	**600**	900			1500	
		-12	**-600**	900			1500	
AQF-30T512A		***5**	**3000**	4500	572	60	2200	76
		12	**1000**	1500			1500	
		-12	**-250**	500			1500	
AQF-30T515		***5**	**3000**	4500	572	60	2200	76
		15	**500**	750			1500	
		-15	**-500**	750			1500	
AQF-30T5312P		***5**	**4500**	6000	588	60	2200	71
		+3.3	**1000**	1500			2200	
		+12	**250**	500			1500	
AQF-30T3512P		***3.3**	**4000**	5300	483	60	2200	71
		+5	**1500**	2000			2200	
		+12	**250**	500			1500	

* Output floating (note 6)

For each output

Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	All Models	85	---	264	VAC
Input Frequency Range		47	---	440	Hz
Input Voltage Range		120	---	370	VDC
Inrush Current (Cold Start at 25℃)	115VAC	---	---	20	A
	230VAC	---	---	40	A

Output Specifications

Parameter		Conditions			Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Single / Dual Output			---	±1.0	±2.0	%
		Dual Positive / Triple Output		Vo1	---	±1.0	±2.0	%
				Vo2&Vo3	---	±3.0	---	%
Line Regulation		Vin=Min. to Max.			---	±0.2	±1.0	%
Load Regulation		Iout=Min. to Max.	Single Output Models		---	±0.5	±1.0	%
			Dual Output Models		---	±2.5	±5.0	%
			Triple Output Models	Vo1	---	±2.5	±5.0	%
				Vo2&Vo3	---	±4.0	---	%
Cross Regulation- Dual / Triple Output Models	Vo1	Measured output Io = 20% to 100% of rated load Other output(s) set at 50% of rated load			---	±2.0	---	%
	Vo2				---	±5.0	---	%
	Vo3				---	±5.0	---	%
Ripple & Noise (20MHz)		3.3V & 5VDC Output Models			---	1.5	1.8	%V_{PP} of Vo
		Other Output Models			---	1.0	1.3	%V_{PP} of Vo
Minimum Load		Single-,Dual-Output Models and Main Output Triple Output Models			---	10	---	%Inom.
		Auxiliary Outputs of Triple Output Models			---	20	---	%Inom.
Over Voltage Protection		Zener diode clamp			---	120	---	% of Vo
Temperature Coefficient					---	±0.02	---	%/℃
Overshoot					---	---	5	% Vout
Current Limitation		Foldback, auto-recovery (long term overload condition may cause damage)			105	---	---	% Inom.
Short Circuit Protection		Hiccup mode, indefinite (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℃, Ground Benign	200,000	---	---	Hours
EMC Emission	Conducted and radiated	EN 55011 class B, EN 55022 class B, FCC part 15 class B			
EMC Immunity according EN61000-6-1	Standard	Specification Requirement			Performance Criteria
	EN61000-4-2	Air ±8KV Cont. ±4KV			B
	EN61000-4-3	80~1000MHz, 10V/m 80% AM, 1KHz modulation			A
	EN61000-4-4	AC port ±2KV DC, SL, TL ±2KV not less than 1 min.			B
	EN61000-4-5	1.2/50uS(8/20μS) AC dif. ±1KV DC ±0.5KV			B
	EN61000-4-6	0.15~80MHz, 10Vrms (functional earth ports included) 80% AM, 1KHz modulation			B
	EN61000-4-8	50Hz/60Hz, 30A/m			A
	EN61000-4-11	30%, 10ms			B
		60%, 100ms, 95%, 5000ms			C
Protection Class II		According IEC/EN 60536			
Safety Approvals		cUL/UL 60950-1,IEC/EN 60950-1 (UL508 for models with order code suffix ICE only)			

Input Fuse

All Models	
Built-in Fuse	3.5A / 250VAC
External Fuse (Recommended)	1.5A Slow – Blow Type

Environmental Specifications

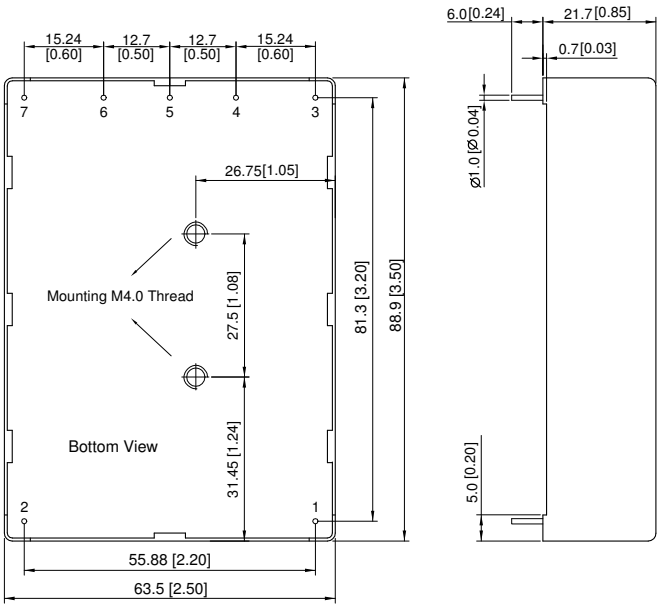
Parameter	Conditions		
Temperature Range (operational)	Ambient	-25℃	+70℃
Power Derating	+50℃ to +70℃		1.125W / ℃
Storage Temperature Range		-40℃	+85℃
Over Temperature Protection	at 90℃ (automatic recovery at 67℃)		
Cooling	Free-Air convection		
Humidity (non condensing)		---	95 % rel. H

Notes

1. All specifications typical at Ta=+25℃, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
2. Ripple & Noise measurement bandwidth is 0~20 MHz
3. 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.
4. Other input and output voltage may be available, please contact factory.
5. Peak current can't be drawn from all output at the same time.
6. Floating (or isolated) output of a power supply that is not connected to any other output.
7. To order the module with chassis mount package, please add a **suffix C** (e.g. AQF-30S05C).
8. To order the module with UL508 safety, please add a **suffix ICE** (e.g. AQF-30S05ICE).
9. Part number for DIN-Rail mounting bracket: **AC-DIN-02**
10. Specifications are subject to change without notice

Package Specifications PCB Mounting

Mechanical Dimensions



Pin Connections

Pin	Single	Dual (D12,D15)	Dual (D512)	Triple	Triple (T5312P,T3512P)
1	AC(N) – AC Neutral				
2	AC(L) – AC Line				
3	+Vout	+Vout	+Vout2	+Vout2	+Vout2
4	No Pin		+Vout1	+Vout1	+Vout1
5	-Vout	Common	-Vout2	Com. 2/3	Com. 2/3
6	No Pin		-Vout1	-Vout1	-Vout1
7	NC	-Vout	NC	-Vout3	+Vout3

NC: No Connection

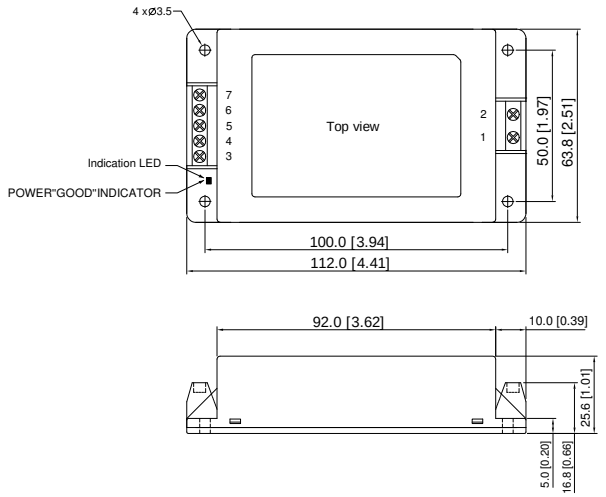
- All dimensions in mm (inches)
- Tolerance: ±0.5 (±0.02)
- Pin diameter ∅ 1.0 ±0.1 (0.04±0.004)

Physical Characteristics

Case Size	:	88.9x63.5x21.7mm (3.50x2.50x0.85 inches)
Case Material	:	Plastic resin + Fiberglass (flammability to UL 94V-0 rated)
Pin Material	:	Copper Alloy with Gold Plate Over Nickel Subplate
Weight	:	177g

Package Specifications Chassis Mounting (order code suffix C)

Mechanical Dimensions



Connections

Terminal	Single	Dual (D12,D15)	Dual (D512)	Triple	Triple (T5312P,T3512P)
1	AC(N) – AC Neutral				
2	AC(L) – AC Line				
3	+Vout	+Vout	+Vout2	+Vout2	+Vout2
4	NC		+Vout1	+Vout1	+Vout1
5	-Vout	Common	-Vout2	Com. 2/3	Com. 2/3
6	NC		-Vout1	-Vout1	-Vout1
7	NC	-Vout	NC	-Vout3	+Vout3

NC: No Connection

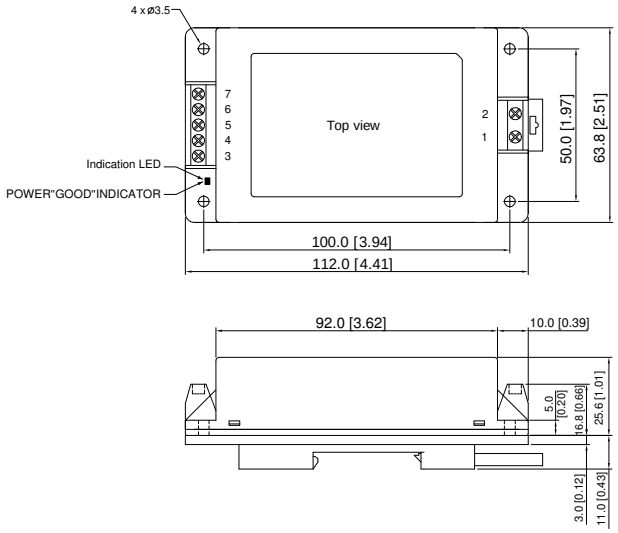
- All dimensions in mm (inches)
- Tolerance: X.X±0.5 (X.XX±0.02)
  X.XX±0.25 (X.XXX±0.01)
- Pin pitch tolerance: ±0.25 (0.01)

Physical Characteristics

Case Size	:	112.0x63.8x25.6mm (4.41x2.51x1.01 inches)
Case Material	:	Plastic resin + Fiberglass (flammability to UL 94V-0 rated)
Weight	:	191g

Package Specifications with DIN Rail Mounting Bracket (order code AC-DIN-02)

Mechanical Dimensions



Physical Characteristics

Case Size	:	112.0x63.8x25.6mm (4.41x2.51x1.01 inches)
Case Material	:	Plastic resin + Fiberglass (flammability to UL 94V-0 rated)
Weight	:	245g

DIN-Rail Mounting Kit