FEATURES

- Ultra-compact Dimensions: 36.5x27x17.1 mm (1.44x1.06x0.67")
- Fully encapsulated Module with Solder Pins for PCB Mounting
- Universal Input 85-264 VAC, 47-440 Hz
- Eco Design, compliant to Energy Star specification and ErP Directive 2009/125/EC
- Single and Dual Output Models
- Protection Class II
- Safety Approval to cUL/UL/IEC/EN 60950-1
- Over Load and Over Voltage Protection
- 3 Year Product Warranty

PRODUCT OVERVIEW

The MINMAX ABF-04 series is a new range of fully encapsulated AC/DC power supply modules. They are designed for direct PCB mounting with solder pins. The product features EMI-filter to EN55022, class B and EMS compliance to the EN 61000-4 standard.

Universal input voltage 85-264VAC and International safety approvals qualifies these power modules for applications in products with worldwide markets.

The ABF-04 series provide a cost effective solution for many space critical applications in commercial and industrial electronic equipment.

Model Selection Guide

Model Number	Output Voltage	Output Current	Input Current	Max. capacitive Load	Efficiency (typ.)
		Max.	@Max. Load		@Max. Load
	VDC	mA	mA(typ.)	µF	%
ABF-04S03	**3.3**	**1200**	82	1200	70
ABF-04S05	**5**	**800**	82	800	72
ABF-04S09	**9**	**444**	77	440	75
ABF-04S12	**12**	**333**	76	330	76
ABF-04S15	**15**	**267**	76	260	76
ABF-04S24	**24**	**167**	76	160	77
ABF-04D53	**+5**	**600**	72	5600	72
	+3.3	**150**		4700	
ABF-04D125	**+12**	**250**	72	330	75
	+5	**120**		4700	
ABF-04D12	**±12**	**±166**	76	# 330	77
ABF-04D15	**±15**	**±133**	76	# 260	77

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
No-Load Power Consumption		---	---	0.3	W
Inrush Current (Cold Start at 25°C)	115VAC	---	---	15	A
	230VAC	---	---	25	A

Output Specifications

Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Single and Dual Output Models		---	±1.0	±2.0	%
	ABF-04D53 & ABF-04D125		---	±2.0	±5.0	%
Line Regulation	Single and Dual Output Models		---	±0.5	±1.0	%
	ABF-04D53 & ABF-04D125	Vo1	---	±0.5	±1.0	%
		Vo2	---	±1.0	±3.0	%
Load Regulation	3.3VDC Output Model		---	±1.0	±1.5	%
	5~24VDC and Dual Output Models		---	±0.5	±1.0	%
	ABF-04D53 & ABF-04D125	Vo1	---	±0.5	±1.0	%
		Vo2	---	±2.5	±5.0	%
Ripple & Noise	0-20 MHz Bandwidth	3.3V & 5VDC Output Models	---	100	150	mV_{P-P}
		Other Output Models	---	0.8	1.0	$\%V_{PP}$ of Vo
Minimum Load	Single Output and Dual +/- Output Models		No min. Load required	---	---	%Inom.
	Dual +/+ Output Models		---	25	---	%Inom.
Over Voltage Protection	Zener diode clamp		---	120	---	% of Vo
Temperature Coefficient			---	±0.01	±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	---	---	VAC
I/O Isolation Resistance	500 VDC	100	---	---	MΩ
Switching Frequency		---	130	---	KHz
Hold-up Time		---	20	---	ms
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	330,000	---	---	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	1.2/50μS(8/20μS) AC dif. ±1KV DC ±0.5KV			B
	EN61000-4-6	0.15~80MHz, 10Vrms (functional earth ports included)			B
		80% AM, 1KHz modulation			
	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			

Input Fuse

All Models	
External Fuse (Recommended)	1A Slow – Blow Type

Environmental Specifications

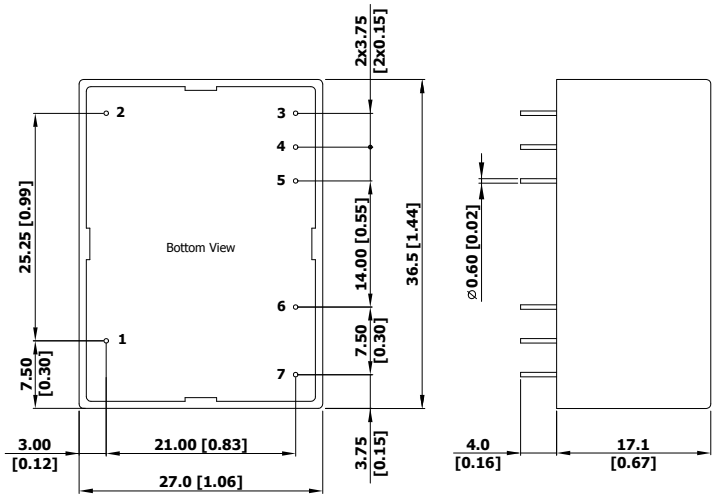
Parameter	Conditions		
Temperature Range (operational)	Ambient	-25℃	+60℃
Power Derating	+50℃ to +60℃		0.3W / ℃
Storage Temperature Range		-40℃	+85℃
Over Temperature Protection	at 90℃ (automatic recovery at 67℃)		
Cooling	Free-Air convection		
Humidity (non condensing)		---	95 % rel. H

Notes

1. All specifications typical at Ta=+25°C, resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
2. 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.
3. We recommend to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltage may be available, please contact factory
5. Specifications are subject to change without notice

Package Specifications

Mechanical Dimensions



Pin Connections

Pin	Single Output	D12/D15	D53/D125
1	NC		
2	NC		
3	+Vout	+Vout	+Vout1
4	-Vout	Common	Common
5	No Pin	-Vout	+Vout2
6	AC(N)		
7	AC(L)		

- All dimensions in mm (inches)
- Tolerance: ±0.5 (±0.01)
- Pin diameter ∅ 0.6 ±0.1 (0.02±0.004)

Physical Characteristics

Case Size	:	36.5x27.0x17.1mm (1.44x1.06x0.67 inches)
Case Material	:	Plastic resin + Fiberglass (flammability to UL 94V-0 rated)
Pin Material	:	Copper Alloy with Gold Plate Over Nickel Subplate
Weight	:	26g