

## 4 Watts

- Compact size
- 90-264VAC Input, 47-440Hz
- Single and dual outputs
- Encapsulated PCB mount
- -40 to +70°C Operation
- EN55022 Level B conducted & radiated
- 3 Year warranty



The AMA04 series of compact, encapsulated AC-DC power modules are PCB mount and have low emissions, meeting EN55022 level B for both conducted and radiated noise. They have a wide temperature range from -40 to +70°C and offer low no-load power consumption of <0.3W. Outputs are available from 3.3 to 24V, with all models guaranteed by a FIDUS 3 year warranty.

Dimensions:

1.46 x 1.08 x 0.69" (37.0 x 27.5 x 17.5mm)

## Models & Ratings

Model Number	Output Power	Output 1		Output 2		Efficiency
		Voltage	Current	Voltage	Current	
AMA0403	3.96W	3.3V	1.2A			69%
AMA0405	4W	5V	0.8A			73%
AMA0408	4W	8V	0.5A			73%
AMA0409	4W	9V	0.44A			75%
AMA0412	4W	12V	0.33A			77%
AMA0414	4W	14V	0.29A			78%
AMA0415	4W	15V	0.27A			76%
AMA0424	4W	24V	0.17A			78%
AMA04D01	3.5W	5V	0.6A	3.3V	0.15A	73%
AMA04D02	3.6W	8V	0.38A	5V	0.12A	76%
AMA04D03	3.6W	12V	0.25A	5V	0.12A	77%

## Key specifications

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
AC Input range	90		264	VAC	No derating
Operating temperature	-40		70	°C	See derating curve and Environmental notes
Efficiency	69		77	%	
Dimensions	1.46 x 1.08 x 0.69" (37.0 x 27.5 x 17.5mm)				
EMC	EN55022 Level B Conducted and Radiated. EN61000-3 and EN61000-4, harmonics, flicker, Surge, EFT, ESD, conducted and radiated,				
Safety	IEC60950-1, UL60950-1, CSA22.2 No 234 as per cUL, CE				

## Input

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Input voltage	90		264	VAC	
	120		370	VDC	DC fuse required
Input frequency	47		440	Hz	
Power factor					EN61000-3-2 class A compliant
Input current			110	mA rms	At 115VAC
Inrush current		15/25		A	115/230VAC cold start at 25°C
No load input power			0.3	W	
Earth leakage current					Class II construction, no earth
Input protection	3.15A slow blow fuse required				

## Output

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Output voltage	3.3		24	VDC	See Model & Ratings table
Set point accuracy	Singles: All outputs $\pm 2\%$			%	
	Duals: V1 $\pm 2\%$ , V2 $\pm 5\%$				
Line regulation	Singles: All outputs $\pm 0.2\%$			%	Low line to High line
	Duals: V1 $\pm 0.2\%$ , V2 $\pm 3\%$				
Load regulation	Singles: 3.3-9V outputs $\pm 1\%$ , 12-24V outputs $\pm 0.5\%$			%	0 to 100% for single outputs. 25 to 100% for dual outputs
	Duals: V1 $\pm 0.5\%$ , V2 $\pm 5\%$				
Minimum load	25			%	
Transient response			4	%	For a 25% load change, recovery to within 1% in less than 500 $\mu$ S.
Ripple & Noise	Singles: 3.3-5V: <250, 8-9V: <200, 12-14V: <150, 15-24V: <100			mV pk-pk	All models measured with 0.1 $\mu$ F ceramic and 47 $\mu$ F electrolytic. 20 MHz bandwidth.
	Duals: D01: <200, D02: <150, D03: <100				
Hold up time	15			mS	
Overload protection	135		266	%	
Short circuit protection					Trip and restart. Automatic recovery

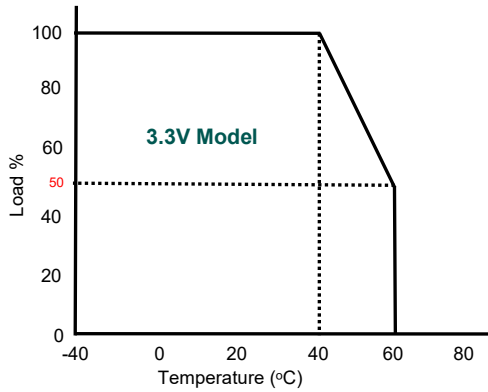
## General

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	69		77	%	See Model & Ratings table
Isolation	3000			VAC	Input to output
Switching frequency	46		66	KHz	
Power density			3.7	W/in <sup>3</sup>	
MTBF		>450		KHrs	As per MIL-HDBK-217F, 25°C GB
Weight		26		g	

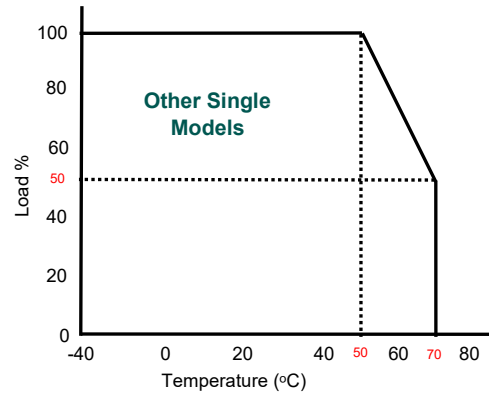
## Environmental

Parameter	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating temperature	-40		70	°C	3.3V version: derate from 100% power at 40°C to 40% at 60°C All other models: derate linearly from 100% power at 50°C to 40% load at 70°C Dual output models: -25°C to 70°C
Storage temperature	-40		85	°C	
Cooling					Convection cooled
Temperature coefficient			$\pm 0.02$	%/°C	
Humidity			95	%	Non condensing

Derating curve



Derating curve



## EMC: Emissions

	Standard	Test level	Criteria	Notes & Conditions
Conducted	EN55022	B		
Radiated	EN55022	B		
Harmonic current	EN61000-3-2	Class A		
Voltage flicker	EN61000-3-3			

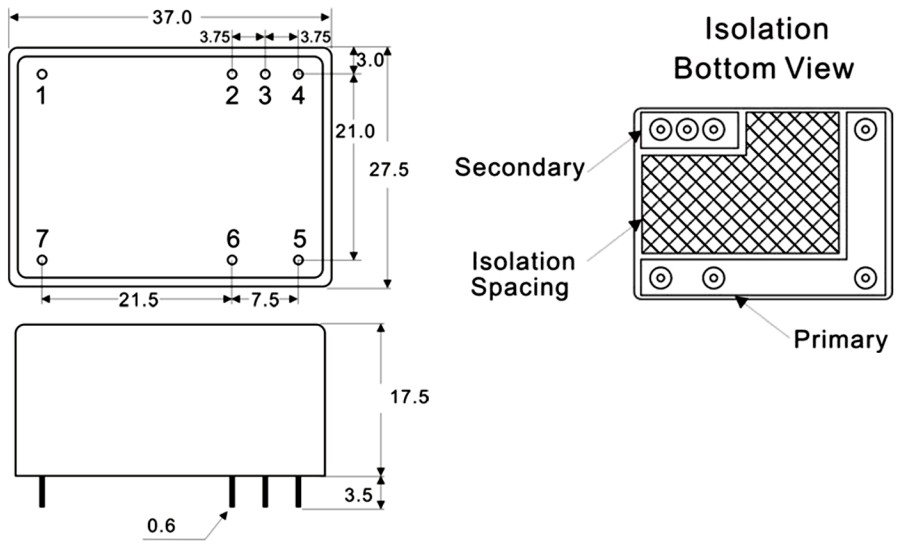
## EMC: Immunity

	Standard	Test level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±4kV contact, ±8kV air	A	
Radiated	EN61000-4-3	3V/m	A	
EFT	EN61000-4-4	3	A	
Surges	EN61000-4-5	Installation Class 3	A	
Conducted	EN61000-4-6	3Vrms	A	
Magnetic Fields	EN61000-4-8	1A/m	A	

## Safety Approvals

	Safety standard	Notes & Conditions
UL	UL60950-1, CSA 22.2 No 234 as per cUL	
CB	IEC60950-1	
CE		2011/65/EU RoHS Directive and 2014/35/EU Low voltage directive
Equipment protection class		Class II

## Mechanical Details



Pin Connections		
Pin	Single	Dual
1	NC	NC
2	+Vout	+V1
3	GND	COM
4	NC	+V2
5	AC IN (L)	AC IN (L)
6	AC IN (N)	AC IN (N)
7	NC	NC

### Dimension notes

- All dimensions shown in millimetres
- Pin diameter  $0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )
- Case tolerance  $\pm 0.5$  ( $\pm 0.002$ )