

### FEATURES

- PCB Mounting
- Package dimension: 27.0x36.5x17.1mm
- Universal Input range 85-264 VAC, 47-440 Hz
- Over Load and Over Voltage Protection
- EMI meets EN55032 Class B and EMS compliance to EN61000-4
- UL/IEC/EN 60950-1 Certified , CE Marked
- 3kVAC Isolation , Protection Class II level
- Lead free, RoHs Compliant
- 3 Years Product Warranty



The AA04S/D series , isolated fully encapsulated 4W AC/DC power module with 3kVAC isolation. With Universal input voltage 85-264VAC and International safety approvals, these power modules are ideal for applications in commercial and industrial electronic equipment. These isolated AC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. With creative design technology and optimization of component placement, these converters possess outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions.

### Model List

Model Number	Output Voltage		Output Current	Input Current	Max. capacitive Load	Efficiency (typ.)
			Max.	@Max. Load		@Max. Load
	VDC	mA	mA(typ.)	μF	%	
AA04S0300A	3.3		1200	82	1200	70
AA04S0500A	5		800	82	800	72
AA04S0900A	9		444	77	440	75
AA04S1200A	12		333	76	330	76
AA04S1500A	15		267	76	260	76
AA04S2400A	24		167	76	160	77
AA04D0305A	Vout1	+5	600	72	5600	72
	Vout2	+3.3	150		4700	
AA04D0512A	Vout1	+12	250	72	330	75
	Vout2	+5	120		4700	
AA04D1212A	±12		±166	76	* 330	77
AA04D1515A	±15		±133	76	* 260	77

\* For each output

### Input Characteristics

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 Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	Single and Dual Output Models	---	±1.0	±2.0	%	
	AA04D0305A & AA04D0512A	---	±2.0	±5.0	%	
Line Regulation	Single and Dual Output Models	---	±0.5	±1.0	%	
	AA04D0305A & AA04D0512A	Vout1	---	±0.5	±1.0	%
		Vout2	---	±1.0	±3.0	%
Load Regulation	3.3VDC Output Model	---	±1.0	±1.5	%	
	5~24VDC and Dual Output Models	---	±0.5	±1.0	%	
	AA04D0305A & AA04D0512A	Vout1	---	±0.5	±1.0	%
		Vout2	---	±2.5	±5.0	%
Ripple & Noise (20MHz)	3.3V & 5VDC Output Models	---	100	150	mV <sub>P-P</sub>	
	Other Output Models	---	0.8	1.0	%V <sub>PP</sub> 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	%/°C	
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 Characteristics

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°C, Ground Benign	---	330,000	---	Hours
EMC Emission	Conducted and radiated	EN 55032 class B, FCC part 15 class B			
EMC Immunity	Standard	Specification Requirement			Performance Criteria
	EN61000-4-2	Air ±8KV Cont. ±4KV			B
	EN61000-4-3	10V/m			A
	EN61000-4-4	±2KV			B
	EN61000-4-5	±1KV			B
	EN61000-4-6	10Vrms			B
	EN61000-4-8	30A/m			A
EN61000-4-11	Dips: 30%, 10ms			B	
	Interruptions: >95%, 5000ms			C	
Protection Class II		According IEC/EN 60536			
Safety Approvals		cUL/UL 60950-1, IEC/EN 60950-1			

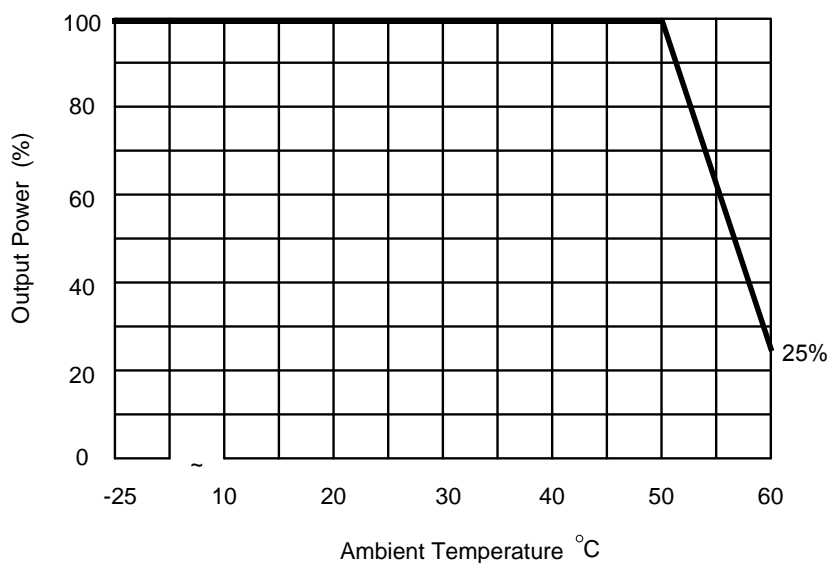
## Recommended Input Fuse

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

## Environmental Specifications

Parameter	Conditions	Min.	Typ.	Max.
Temperature Range (operational)	Ambient	-25°C	---	+60°C
Storage Temperature Range		-40°C	---	+85°C
Thermal Shutdown	Shutdown, Internal IC Junction Temperature	---	142°C	---
	Automatic Recovery, Internal IC Junction Temperature	---	67°C	---
Cooling	Free-Air convection			
Humidity (non condensing)		---	---	95%

## Power Derating Curve

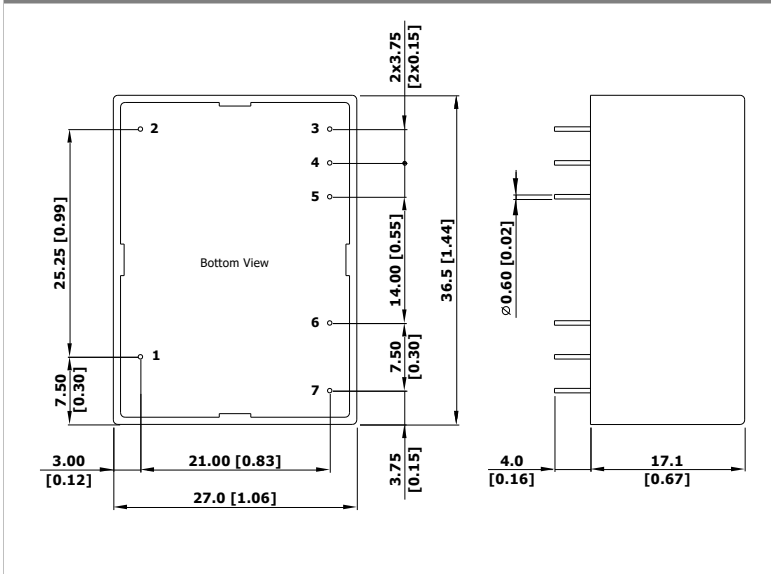


## Notes

- 1 All specifications typical at  $T_a=+25^{\circ}\text{C}$ , 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 Suggest to protect the module by a slow blow fuse at the input line .
- 5 Specifications are subject to change without notice

## Mechanical Drawing

### Mechanical Dimensions



### Pin Connections

Pin	Single Output	Dual Output ±12 / ±15	AA04D0305A AA04D0512A
1			NC
2			NC
3	+Vout	+Vout	+Vout1
4	-Vout	Common	Common
5	NP	-Vout	+Vout2
6			AC(N)
7			AC(L)

- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.01$ )
- ▶ Pin diameter  $\leftrightarrow 0.6 \pm 0.1$  ( $0.02 \pm 0.004$ )

## Physical Outline

Case Size	: 36.5x27.0x17.1mm (1.44x1.06x0.67 inches)
Case Material	: Plastic resin (flammability to UL 94V-0 rated)
Pin Material	: Copper Alloy with Gold Plate Over Nickel Subplate
Weight	: 30g

## Part Numbering System

A	A	04	D	12	12	A
Product type	Family series	Watt	Number of Outputs	Output Voltage		Option Code
AC/DC Power Module	Industrial application	04 - 4W	S - Single	03 - 3.3V	00 - not applicable	A - PCB Mount
			D - Dual	05 - 5V	05 - 5V	
				09 - 9V	12 - 12V	
				12 - 12V	15 - 15V	
				15 - 15V		
				24 - 24V		

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## WARRANTY

Delta offers a three(3) years limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

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