



### FEATURES

- Efficiency up to 80%
- SIP Package with Industry Standard Pinout
- Package Dimension:  
3.3V&5V & 12V Models:  
11.5 x6.1 x10.2mm (0.45" x0.24" x0.40")  
24V Models,:  
11.5 x7.1 x10.2mm (0.45" x0.28" x0.40")
- Isolation Voltage 1000VDC
- Operating Temperature range - 40°C to +85°C
- Lead free ,RoHs Compliant
- >2 MHours MTBF
- 3 Years Product Warranty

The PA01S series are miniature, SIP Package, isolated 1W DC/DC converters with 1,000VDC isolation. It offers short circuit protection and allows a wide operating temperature range of -40°C to +85°C. These isolated DC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc.

### Model List

Model Number	Input Voltage (Range)	Output Voltage	Output Current		Input Current		Load Regulation	Maxcapacitive Load	Efficiency (typ.)
			Max.	Min.	@Max. Load	@No Load			
	VDC	VDC	mA	mA	mA(typ.)	mA(typ.)	% (max.)	uF	@Max. Load
PA01S0303A	3.3	3.3	260	6	351	35	14	33	74
PA01S0305A	(2.97 ~ 3.63)	5	200	4	394		14		77
PA01S0503A	5 (4.5 ~ 5.5)	3.3	260	6	238	30	11	33	72
PA01S0505A		5	200	4	290		11		69
PA01S0509A		9	110	2	260		8		76
PA01S0512A		12	84	1.5	262		7		77
PA01S0515A		15	67	1	258		6		78
PA01S1205A		12 (10.8 ~ 13.2)	5	200	4		117		13
PA01S1209A	9		110	2	107	5	77		
PA01S1212A	12		84	1.5	106	5	79		
PA01S1215A	15		67	1	105	4	80		
PA01S2405A	24 (21.6 ~ 26.4)	5	200	4	60	7	8	33	70
PA01S2409A		9	110	2	54		5		76
PA01S2412A		12	84	1.5	53		4		79
PA01S2415A		15	67	1	53		4		79

### Input Characteristics

Item	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	3.3V Input Models	2.97	3.3	3.63	VDC
	5V Input Models	4.5	5	5.5	
	12V Input Models	10.8	12	13.2	
	24V Input Models	21.6	24	26.4	
Input Surge Voltage (1 sec. max.)	3.3V Input Models	-0.7	---	6	VDC
	5V Input Models	-0.7	---	9	
	12V Input Models	-0.7	---	18	
	24V Input Models	-0.7	---	30	
Reverse Polarity Input Current	All Models	---	---	0.3	A
Input Filter		Internal Capacitor			
Internal Power Dissipation		---	---	450	mW

## Output Characteristics

Item	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	±1.0	±3.0	%
Line Regulation	For Vin Change of 1%	---	±1.2	±1.5	%
Load Regulation	Io=20% to 100%	See Model -List			
Ripple & Noise (20MHz)		---	100	150	mV <sub>p-p</sub>
Ripple & Noise (20MHz)	Over Line, Load & Temp.	---	---	200	mV <sub>p-p</sub>
Ripple & Noise (20MHz)		---	---	15	mV rms
Temperature Coefficient		---	±0.01	±0.02	%/°C
Short Circuit Protection		0.5 Second Max.			

## General Characteristics

Item	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	1000	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V	---	60	100	pF
Switching Frequency		50	90	110	KHz
MTBF (calculated)	@25°C, Ground Benign	2,000,000	-----	-----	Hours

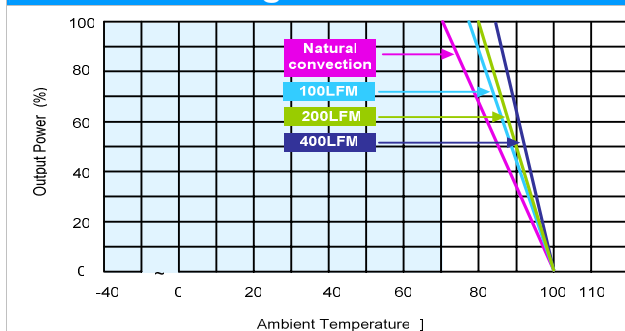
## Recommended Outside Input Fuse

3.3V Input Models	5V Input Models	12V Input Models	24V Input Models
800mA Slow-Blow Type	500mA Slow-Blow Type	200mA Slow-Blow Type	100mA Slow-Blow Type

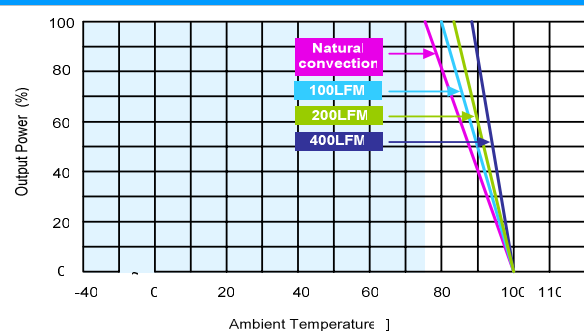
## Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature Range (with Derating)	Ambient	-40	+85	°C
Case Temperature		---	+90	°C
Storage Temperature Range		-50	+125	°C
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	°C

## Power Derating Curve



(5V Output Only)

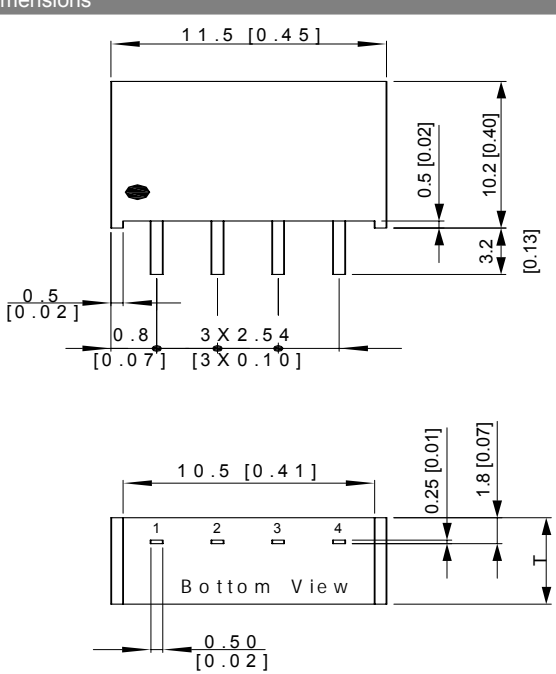


(All Other Output)

## Notes

- 1 Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
- 2 Ripple & Noise measurement bandwidth is 0-20MHz.
- 3 These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
- 4 All DC/DC converters should be externally fused at the front end for protection.
- 5 Specifications are subject to change without notice.

## Mechanical Drawing

Mechanical Dimensions		Pin Connections	
		Pin	Function
		1	-Vin
		2	+Vin
		3	-Vout
		4	+Vout
		<p>T: 6.1mm(0.24 inch) for 3.3V&amp;5V&amp;12V Input Models</p> <p>T: 7.1mm(0.28 inch) for 24V Input Models</p>	
		<ul style="list-style-type: none"> <li>➤ All dimensions in mm (inches)</li> <li>➤ Tolerance: X.X±0.25 (X.XX±0.01) X.XX±0.13 ( X.XXX±0.005)</li> <li>➤ Pins ±0.05(±0.002)</li> </ul>	

## Physical Outline

CaseSize(3.3V,5V,12V Input)	:	11.5x6.1x10.2mm (0.45x0.24x0.40 Inches)
Case Size(24V Input)	:	11.5x7.1x10.2mm (0.45x0.28x0.40 Inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Weight(3.3V,5V, 12V Input)	:	1.3g
Weight(24V Input)	:	1.7g

## Part Numbering System

P	A	01	S	03	03	A
Form factor	Family series	Watt	Number of Outputs	Input Voltage	Output Voltage	Option Code
D-DIP	A~Z	01:1W	S - Single	03:3.3V	03:3.3V	A - Std. Functions
P-SIP		02:2W	D- Dual	05: 5V	05: 5V	
S-SMD		03:3W		12:12V	12:12V	
		04:4W		24: 24V	15: 15V	
		06:6W		48:48V	24: 24V	

## 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.

Information furnished by Delta is believed to be accurate and reliable. However, no responsibility is assumed by Delta for its use, nor for any infringements of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Delta. Delta reserves the right to revise these specifications at any time, without notice.