



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 | % |
| 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 | | |
| PA01S2415A | 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 _{p-p} |
| Ripple & Noise (20MHz) | Over Line, Load & Temp. | --- | --- | 200 | mV _{p-p} |
| 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 |

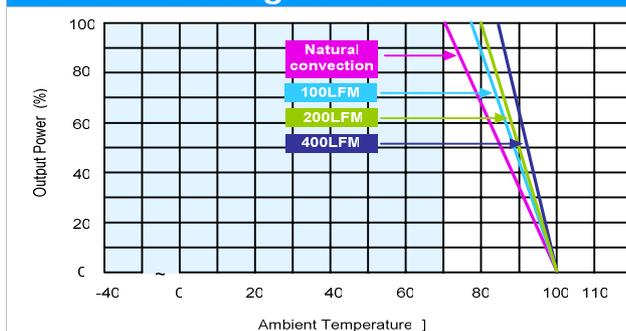
Recommended Outside Input Fuse

| 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 |

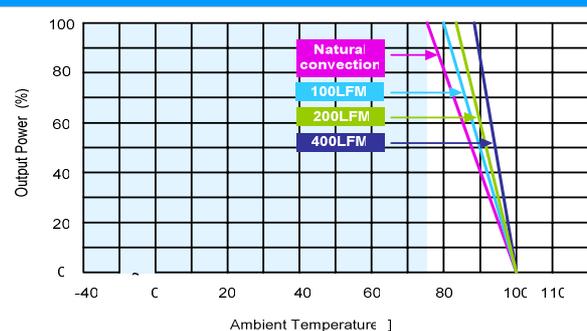
Environmental Specifications

| 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)

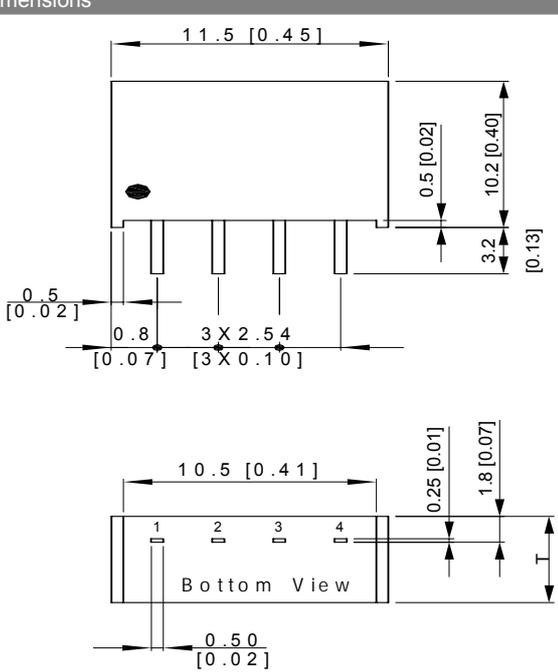


(All Other Output)

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&5V&12V Input Models</p> <p>T: 7.1mm(0.28 inch) for 24V Input Models</p> | |
| | | <ul style="list-style-type: none"> ➤ All dimensions in mm (inches) ➤ Tolerance: X.X±0.25 (X.XX±0.01) X.XX±0.13 (X.XXX±0.005) ➤ Pins ±0.05(±0.002) | |

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.

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