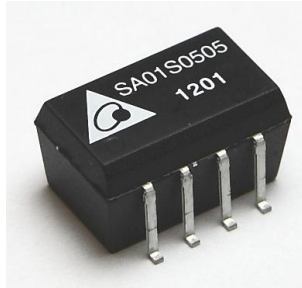




**THE DATASHEET OF
SA01S2409A**





FEATURES

- Efficiency up to 82%
- SMD Package with Industry Standard Pinout
- Moisture sensitivity level (MSL) 3
- Operating Temperature Range -40° to +85°C
- Low ripple and noise
- Isolation Voltage 1000 VDC
- Lead free, RoHs Compliant
- >2 MHours MTBF
- 3 Years Product Warranty



The SA01S series are miniature, SMD 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) VDC | Output Voltage VDC | Output Current | | Input Current | | Load Regulation % (max.) | Max. capacitive Load uF | Efficiency (typ.) | | | |
|--------------|------------------------------|-----------------------|----------------|------|---------------|----------|-----------------------------|----------------------------|-------------------|--|--|----|
| | | | Max. | Min. | @Max. Load | @No Load | | | @Max. Load | | | |
| | | | mA | mA | mA(typ.) | mA(typ.) | | | % | | | |
| SA01S0503A | 5 (4.5 ~ 5.5) | 3.3 | 300 | 6 | 264 | 30 | 10 | 33 | 75 | | | |
| SA01S0503ATR | | | | | | | | | | | | |
| SA01S0505A | | 5 | 200 | 4 | 250 | | | | | | | 80 |
| SA01S0505ATR | | | | | | | | | | | | |
| SA01S0509A | | 9 | 110 | 2 | 254 | | | | | | | 78 |
| SA01S0509ATR | | | | | | | | | | | | |
| SA01S0512A | | 12 | 84 | 1.5 | 252 | | | | | | | 80 |
| SA01S0512ATR | | | | | | | | | | | | |
| SA01S0515A | | 15 | 67 | 1 | 248 | | | | | | | 81 |
| SA01S0515ATR | | | | | | | | | | | | |
| SA01S1203A | 12 (10.8 ~ 13.2) | 3.3 | 300 | 6 | 110 | 15 | 8 | 33 | 75 | | | |
| SA01S1203ATR | | | | | | | | | | | | |
| SA01S1205A | | 5 | 200 | 4 | 103 | | | | | | | 81 |
| SA01S1205ATR | | | | | | | | | | | | |
| SA01S1209A | | 9 | 110 | 2 | 106 | | | | | | | 78 |
| SA01S1209ATR | | | | | | | | | | | | |
| SA01S1212A | | 12 | 84 | 1.5 | 104 | | | | | | | 81 |
| SA01S1212ATR | | | | | | | | | | | | |
| SA01S1215A | | 15 | 67 | 1 | 102 | | | | | | | 82 |
| SA01S1215ATR | | | | | | | | | | | | |
| SA01S2403A | 24 (21.6 ~ 26.4) | 3.3 | 300 | 6 | 57 | 8 | 8 | 33 | 73 | | | |
| SA01S2403ATR | | | | | | | | | | | | |
| SA01S2405A | | 5 | 200 | 4 | 53 | | | | | | | 79 |
| SA01S2405ATR | | | | | | | | | | | | |
| SA01S2409A | | 9 | 110 | 2 | 54 | | | | | | | 77 |
| SA01S2409ATR | | | | | | | | | | | | |
| SA01S2412A | | 12 | 84 | 1.5 | 53 | | | | | | | 80 |
| SA01S2412ATR | | | | | | | | | | | | |
| SA01S2415A | | 15 | 67 | 1 | 52 | | | | | | | 80 |
| SA01S2415ATR | | | | | | | | | | | | |



Input Characteristics

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

Output Characteristics

| Parameter | 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 Selection Guide | | | |
| Ripple & Noise (20MHz) | | --- | 60 | 120 | mV _{p-p} |
| Ripple & Noise (20MHz) | Over Line, Load & Temp. | --- | --- | 150 | 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

| Parameter | 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 | --- | 40 | 100 | pF |
| Switching Frequency | | 50 | 100 | 140 | KHz |
| MTBF (calculated) | MIL-HDBK-217F@25°C, Ground Benign | 2,000,000 | --- | --- | Hours |
| Moisture Sensitivity Level (MSL) | IPC/JEDEC J-STD-020D | Level 3 | | | |

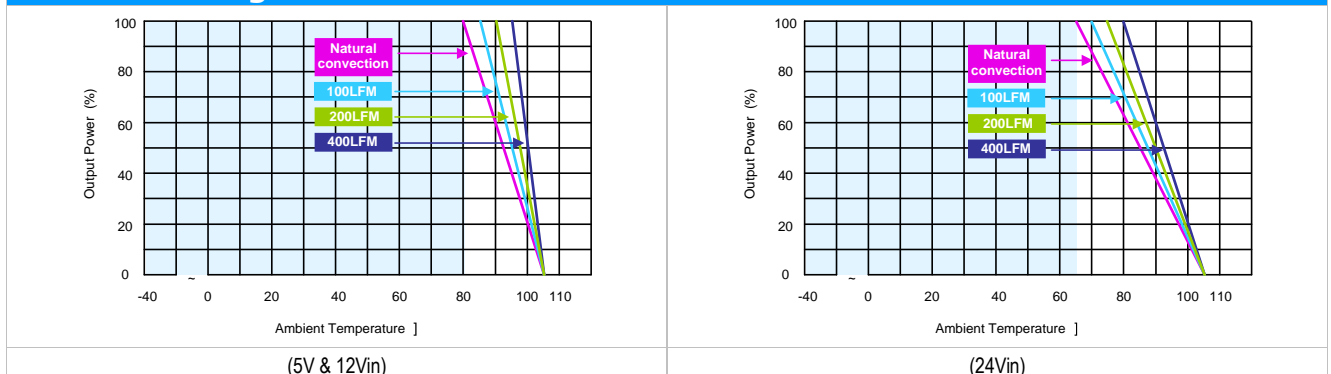
Recommended Input Fuse

| 5V Input Models | 12V Input Models | 24V Input Models |
|----------------------|----------------------|----------------------|
| 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



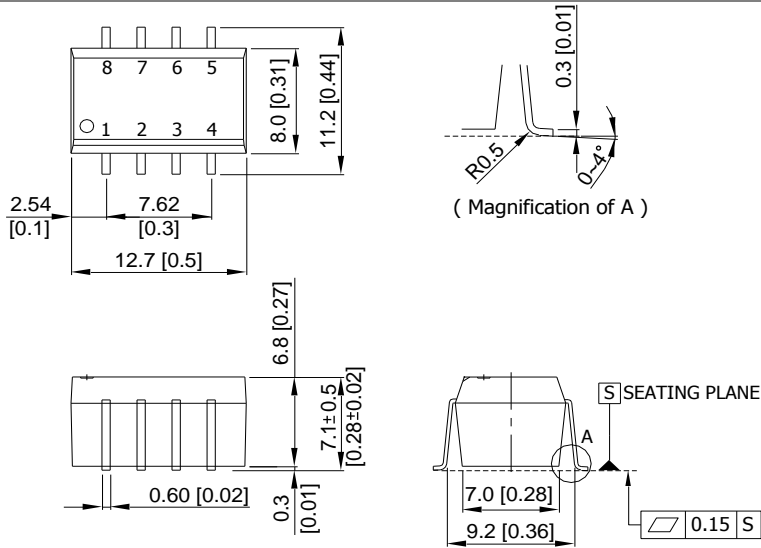


Notes

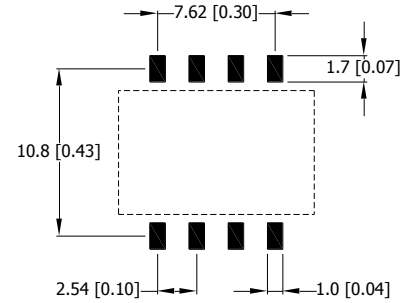
- 1 Specifications typical at $T_a=+25^{\circ}\text{C}$, resistive load, nominal input voltage and rated output current unless otherwise noted.
- 2 Ripple & Noise measurement bandwidth is 0-20MHz.
- 3 These power converters require a minimum output loading to maintain specified regulation, operation 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 subject to change without notice.

Mechanical Drawing

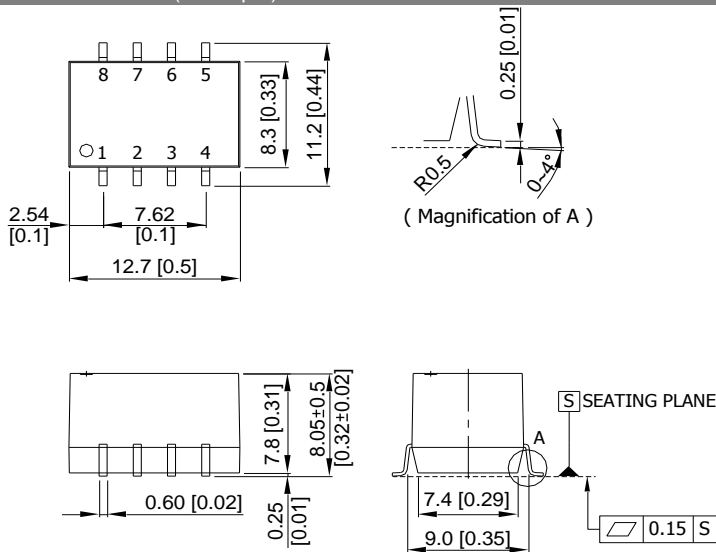
Mechanical Dimensions (5V & 12V Input)



Connecting Pin Patterns



Mechanical Dimensions (24V Input)



Pin Connections

| Pin | Function |
|-----|----------|
| 1 | -Vin |
| 2 | +Vin |
| 3 | NA |
| 4 | -Vout |
| 5 | +Vout |
| 6 | NA |
| 7 | NA |
| 8 | NA |

NA : Not Available for Electrical Connection

- ▶ 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)

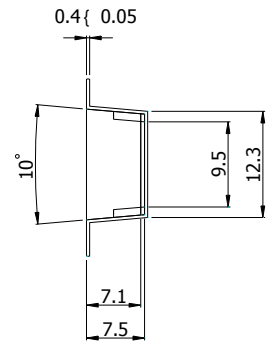
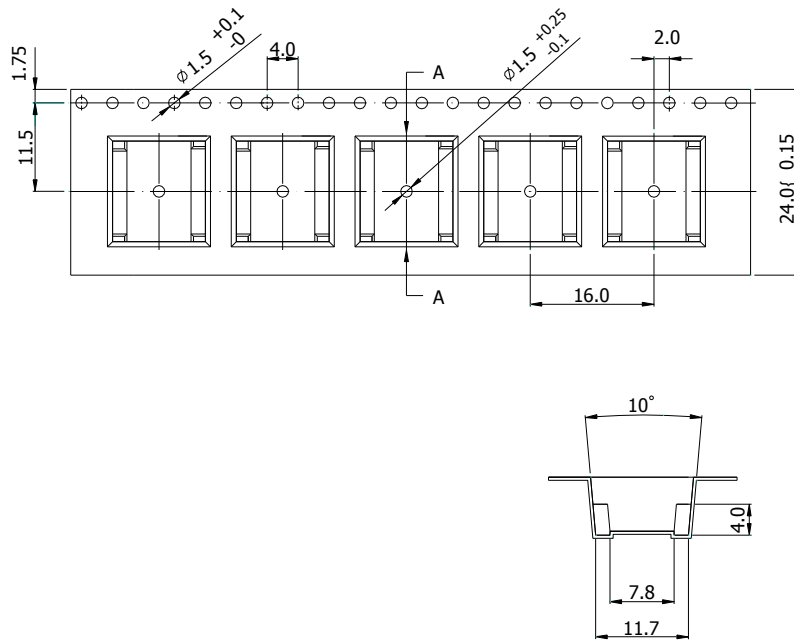
Physical Outline

| | |
|--------------------------|--|
| Case Size (5V&12V Input) | : 12.7x8.0x6.8mm (0.50x0.31x0.27 Inches) |
| Case Size (24V Input) | : 12.7x8.3x7.8mm (0.50x0.33x0.31 Inches) |
| Case Material | : Molding (flammability to UL 94V-0 rated) |

| | |
|-----------------------|--------|
| Weight (5V&12V Input) | : 1.5g |
| Weight (24V Input) | : 1.8g |

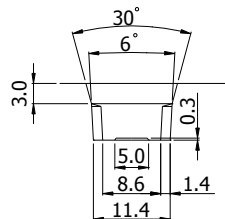
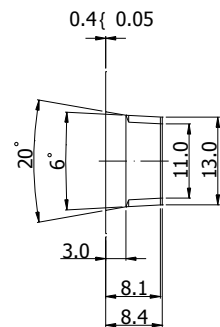
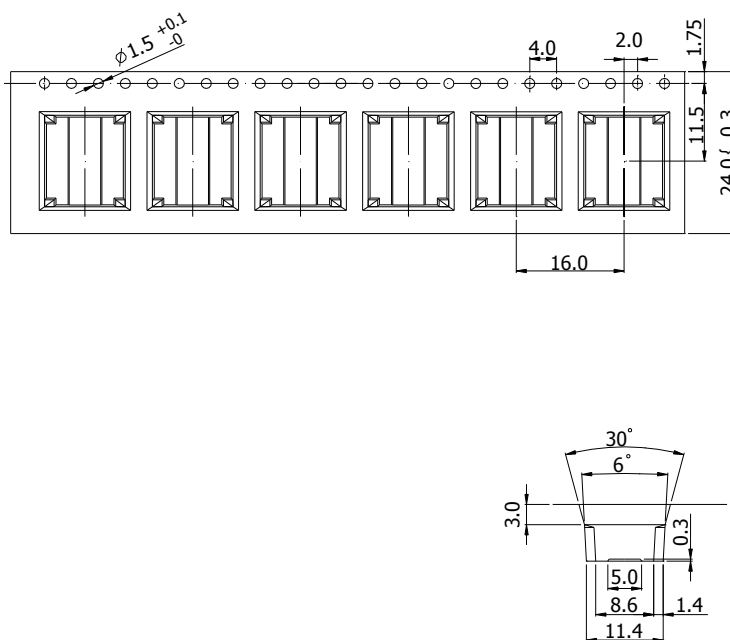
Reel Taping Package

Tape(5V & 12V Input)



SECTION A-A

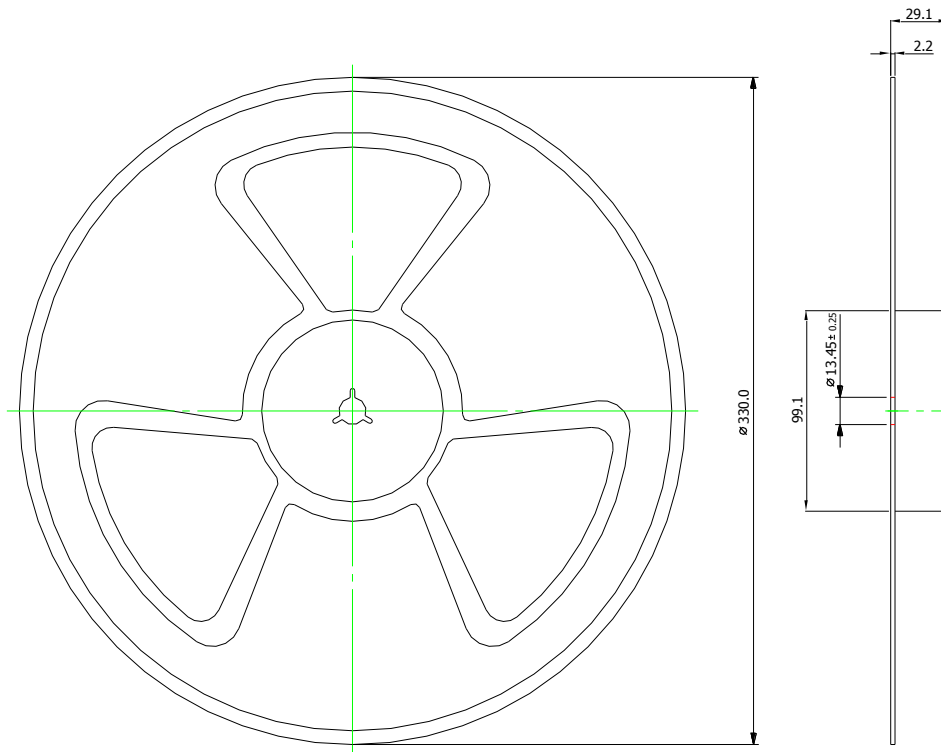
Tape(24V Input)



- ▶ All dimensions in mm
- ▶ Tolerance: ± 0.1

Reel Taping Package

Packaging Specifications



- ▶ All dimensions in mm
- ▶ Tolerance: ± 0.1

Part Numbering System

| S | A | 01 | S | 05 | 05 | 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 | ATR - Std. Functions with Tape and Reel |
| 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.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View SA01S2409A on WIN SOURCE](#)
-  [Delta Electronics Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management