



**THE DATASHEET OF
SC02D1212A**





FEATURES

- Efficiency up to 82%
- SMD Package with Industry Standard Pinout
- Package size :
 - Single Output
12.7 x 9.3 x 8.9 mm (0.5"x 0.37"x 0.35")
 - Dual Outputs
15.3 x 9.3 x 8.9 mm (0.6"x 0.37"x 0.35")
- Isolation Voltage 1000 VDC
- Operating Temperature Range -40° to +85°C
- Low ripple and noise
- Lead free, RoHs Compliant
- 3 Years Product Warranty

The SC02S/D series are miniature, SMD Package, isolated 2W 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. 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 | 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.) | | | % |
| SC02S0505A | 5 (4.5 ~ 5.5) | 5 | 400 | 8 | 519 | 60 | 11 | 47 | 77 |
| SC02S0512A | | 12 | 165 | 3 | 488 | | 11 | 10 | 81 |
| SC02D0505A | | ±5 | ±200 | ±4 | 519 | | 12 | 10* | 77 |
| SC02D0512A | | ±12 | ±83 | ±1.5 | 504 | | 7 | 4.7* | 79 |
| SC02D0515A | | ±15 | ±66 | ±1 | 501 | | 7 | 4.7* | 79 |
| SC02S1205A | 12 (10.8 ~ 13.2) | 5 | 400 | 8 | 213 | 30 | 8 | 47 | 78 |
| SC02S1212A | | 12 | 165 | 3 | 201 | | 6 | 10 | 82 |
| SC02D1212A | | ±12 | ±83 | ±1.5 | 202 | | 5 | 4.7* | 82 |
| SC02D1215A | | ±15 | ±66 | ±1 | 201 | | 5 | 4.7* | 82 |
| SC02S2405A | | 5 | 400 | 8 | 106 | | 15 | 8 | 47 |
| SC02S2412A | 12 | 165 | 3 | 101 | 5 | 10 | | 81 | |
| SC02D2412A | ±12 | ±83 | ±1.5 | 102 | 5 | 4.7* | | 81 | |
| SC02D2415A | ±15 | ±66 | ±1 | 100 | 5 | 4.7* | | 82 | |

* For each output

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 | VDC |
| | 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 | | --- | --- | 650 | mW |

Output Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|-----------------------------|---------------------------|-------|-------|-------------------|
| Output Voltage Accuracy | | --- | ±1.5 | ±4.0 | % |
| Output Voltage Balance | Dual Output, Balanced Loads | --- | ±0.1 | ±1.0 | % |
| Line Regulation | For Vin Change of 1% | --- | ±1.2 | ±1.5 | % |
| Load Regulation | Io=20% to 100% | See Model Selection Guide | | | |
| Ripple & Noise (20MHz) | | --- | 100 | 120 | 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

| 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 | --- | 60 | 100 | pF |
| Switching Frequency | | 50 | 100 | 120 | 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 | | | |

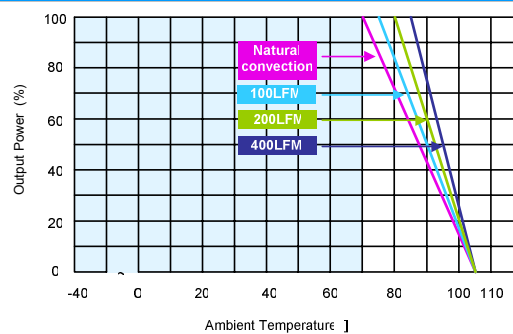
Recommended Input Fuse

| 5V Input Models | 12V Input Models | 24V Input Models |
|-----------------------|----------------------|----------------------|
| 1000mA Slow-Blow Type | 500mA Slow-Blow Type | 200mA 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.) | | --- | 300 | °C |

Power Derating Curve

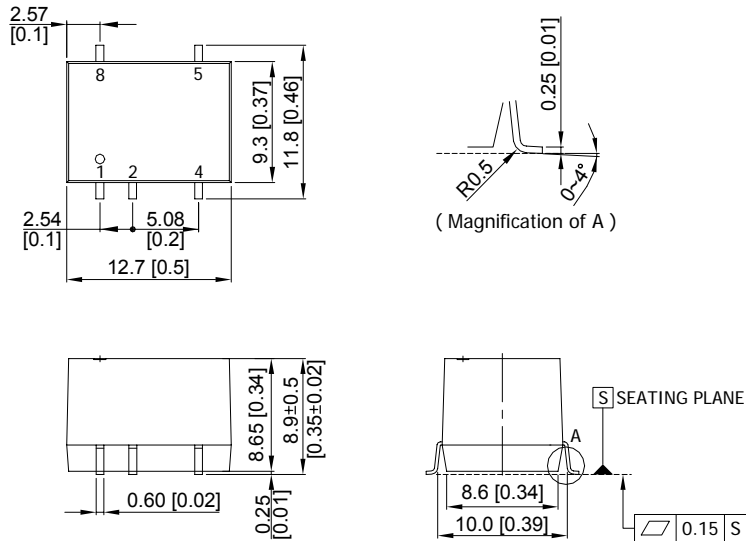


Notes

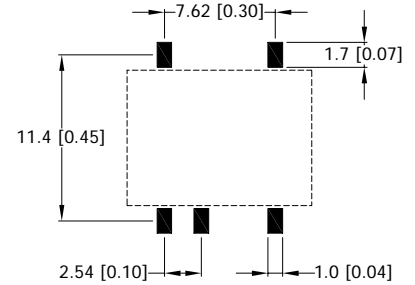
- Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
- Ripple & Noise measurement bandwidth is 0-20MHz.
- These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions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

Mechanical Drawing I

Mechanical Dimensions (Single Output)

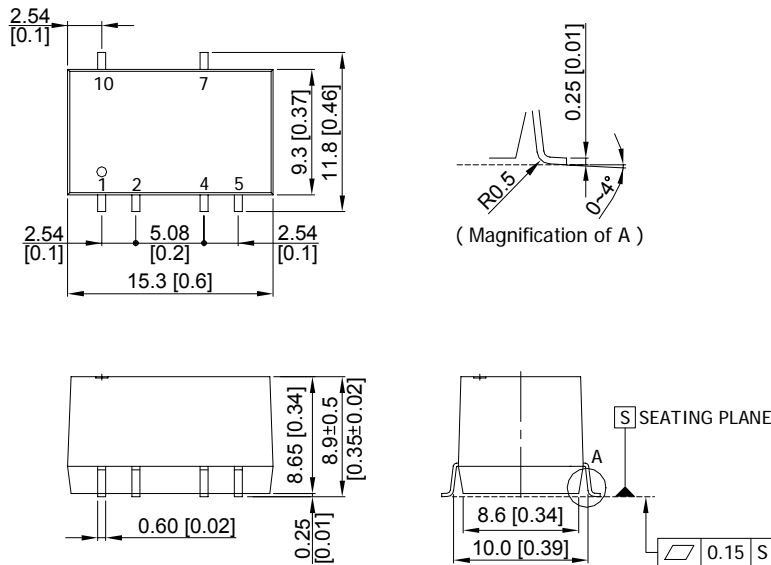


Connecting Pin Patterns

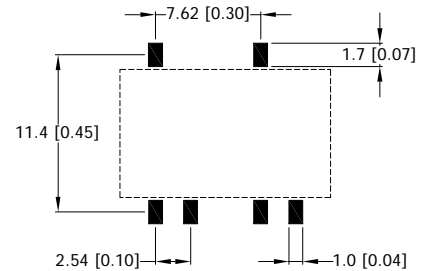


Mechanical Drawing II

Mechanical Dimensions (Dual Output)



Connecting Pin Patterns



- ▶ 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)

Pin Connections

| Pin | Single Output | Dual Output |
|-----|---------------|-------------|
| 1 | -Vin | -Vin |
| 2 | +Vin | +Vin |
| 4 | -Vout | Common |
| 5 | +Vout | -Vout |
| 7 | No Pin | +Vout |
| 8 | N/A | No Pin |
| 10 | No Pin | NA |

N/A : Not Available for Electrical Connection

Physical Outline

| | |
|---------------------------|--|
| Case Size (Single Output) | : 12.7x9.3x8.65mm (0.50x0.37x0.34 Inches) |
| Case Size (Dual Output) | : 15.3x9.3x8.65mm (0.60x0.37x0.34 Inches) |
| Case Material | : Molding (flammability to UL 94V-0 rated) |
| Weight (Single Output) | : 1.5g |
| Weight (Dual Output) | : 2.2g |



| Part Numbering System | | | | | | |
|-----------------------|---------------|-------|-------------------|---------------|----------------|--------------------|
| S | C | 02 | 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 | |
| S-SMD | | 03:3W | | 12:12V | 12:12V | |
| | | 04:4W | | 24: 24V | 15: 15V | |
| | | 06:6W | | 48:48V | 24: 24V | |



WARRANTY

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

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