

FEATURES

- ◆ Efficiency up to 83%
- ◆ SMD Package with Industry Standard Pinout
- ◆ Isolation Voltage 1500VDC
- ◆ 2:1 Wide Input Range
- ◆ Low ripple and noise
- ◆ Short Circuit Protection
- ◆ Temperature Performance -40°C to +71°C
- ◆ CSA60950-1 Safety Approval
- ◆ > 1MHours MTBF
- ◆ Lead free, RoHs Compliant
- ◆ 3 Years Product Warranty



The SE03S/D series are miniature, SMD Package, isolated 3W DC/DC converters with 1,500VDC isolation. The SE03S/D series features fully regulated output and ultra wide 2:1 input voltage ranges. It offers short circuit protection and allows a wide operating temperature range of -40°C to +71°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 | | Reflected Ripple Current mA(typ.) | Max. capacitive Load uF | Efficiency (typ.) @Max. Load % |
|--------------|------------------------------|-----------------------|----------------|------------|------------------------|----------------------|--------------------------------------|----------------------------|--------------------------------------|
| | | | Max. mA | Min. mA | @Max. Load mA(typ.) | @No Load mA(typ.) | | | |
| | | | | | | | | | |
| SE03S1203A | 12 (9 ~ 18) | 3.3 | 700 | 70 | 257 | 20 | 25 | 4700 | 75 |
| SE03S1205A | | 5 | 600 | 60 | 316 | | | | 79 |
| SE03S1212A | | 12 | 250 | 25 | 305 | | | | 82 |
| SE03S1215A | | 15 | 200 | 20 | 305 | | | | 82 |
| SE03D1205A | | ±5 | ±300 | ±30 | 321 | | | 180* | 78 |
| SE03D1212A | | ±12 | ±125 | ±12.5 | 309 | | | | 81 |
| SE03D1215A | | ±15 | ±100 | ±10 | 309 | | | | 81 |
| SE03S2403A | 24 (18 ~ 36) | 3.3 | 700 | 70 | 127 | 5 | 15 | 4700 | 76 |
| SE03S2405A | | 5 | 600 | 60 | 156 | | | | 80 |
| SE03S2412A | | 12 | 250 | 25 | 151 | | | | 83 |
| SE03S2415A | | 15 | 200 | 20 | 151 | | | | 83 |
| SE03D2405A | | ±5 | ±300 | ±30 | 158 | | | 180* | 79 |
| SE03D2412A | | ±12 | ±125 | ±12.5 | 152 | | | | 82 |
| SE03D2415A | | ±15 | ±100 | ±10 | 152 | | | | 82 |
| SE03S4803A | 48 (36 ~ 75) | 3.3 | 700 | 70 | 63 | 3 | 10 | 4700 | 76 |
| SE03S4805A | | 5 | 600 | 60 | 78 | | | | 80 |
| SE03S4812A | | 12 | 250 | 25 | 75 | | | | 83 |
| SE03S4815A | | 15 | 200 | 20 | 75 | | | | 83 |
| SE03D4805A | | ±5 | ±300 | ±30 | 79 | | | 180* | 79 |
| SE03D4812A | | ±12 | ±125 | ±12.5 | 76 | | | | 82 |
| SE03D4815A | | ±15 | ±100 | ±10 | 76 | | | | 82 |

* For each output

Input Characteristics

| Parameter | Model | Min. | Typ. | Max. | Unit |
|-----------------------------------|------------------|-----------|------|------|------|
| Input Surge Voltage (1 sec. max.) | 12V Input Models | -0.7 | --- | 25 | VDC |
| | 24V Input Models | -0.7 | --- | 50 | |
| | 48V Input Models | -0.7 | --- | 100 | |
| Start-Up Voltage | 12V Input Models | 4.5 | 6 | 8 | |
| | 24V Input Models | 8 | 12 | 18 | |
| | 48V Input Models | 16 | 24 | 36 | |
| Under Voltage Shutdown | 12V Input Models | --- | --- | 8 | |
| | 24V Input Models | --- | --- | 16 | |
| | 48V Input Models | --- | --- | 32 | |
| Reverse Polarity Input Current | All Models | --- | --- | 0.5 | A |
| Short Circuit Input Power | | --- | --- | 1500 | mW |
| Input Filter | | Pi Filter | | | |
| Internal Power Dissipation | | --- | --- | 2500 | mW |

Output Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|-----------------------------|------------|-------|-------|-------------------|
| Output Voltage Accuracy | | --- | ±0.5 | ±1.0 | % |
| Output Voltage Balance | Dual Output, Balanced Loads | --- | ±0.5 | ±2.0 | % |
| Line Regulation | Vin=Min. to Max. | --- | ±0.1 | ±0.3 | % |
| Load Regulation | Io=10% to 100% | --- | ±0.3 | ±1.0 | % |
| Ripple & Noise (20MHz) | | --- | 50 | 75 | mV _{P-P} |
| Ripple & Noise (20MHz) | Over Line, Load & Temp. | --- | --- | 100 | mV _{P-P} |
| Ripple & Noise (20MHz) | | --- | --- | 10 | mV rms |
| Transient Recovery Time | 25% Load Step Change | --- | 200 | 500 | uS |
| Transient Response Deviation | | --- | ±2 | ±6 | % |
| Temperature Coefficient | | --- | ±0.01 | ±0.02 | %/°C |
| Short Circuit Protection | | Continuous | | | |

General Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|-----------------------------------|-----------|------|------|-------|
| I/O Isolation Voltage (rated) | 60 Seconds | 1500 | --- | --- | VDC |
| I/O Isolation Resistance | 500 VDC | 1000 | --- | --- | MΩ |
| I/O Isolation Capacitance | 100KHz, 1V | --- | 65 | 100 | pF |
| Switching Frequency | | --- | 300 | --- | KHz |
| MTBF (calculated) | MIL-HDBK-217F@25°C, Ground Benign | 1,000,000 | --- | --- | Hours |
| Moisture Sensitivity Level (MSL) | IPC/JEDEC J-STD-020D | Level 2 | | | |

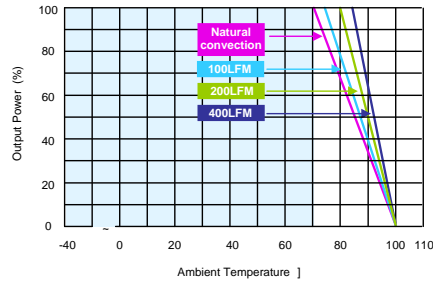
Recommended Input Fuse

| 12V Input Models | 24V Input Models | 48V Input Models |
|----------------------|----------------------|----------------------|
| 750mA Slow-Blow Type | 350mA 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.) | | --- | 260 | °C |

Power Derating Curve

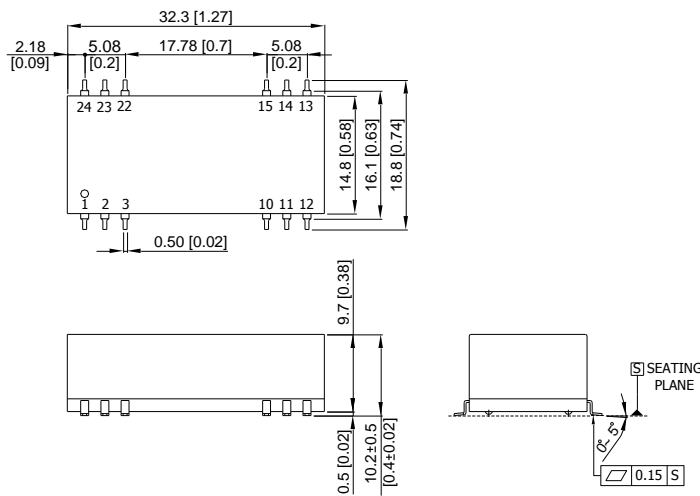


Notes

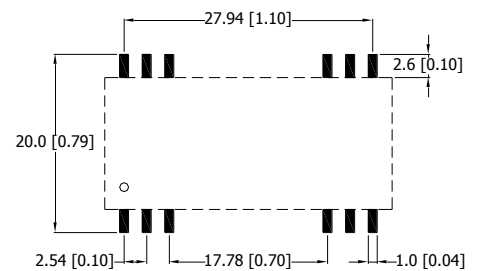
- 1 Specifications typical at $T_a = +25^\circ\text{C}$, resistive load, nominal input voltage and rated output current unless otherwise noted.
- 2 Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
- 3 Ripple & Noise measurement bandwidth is 0-20MHz.
- 4 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.
- 5 All DC/DC converters should be externally fused at the front end for protection.
- 6 Specifications subject to change without notice.
- 7 It is not recommended to use water-washing process on SMT units.

Mechanical Drawing

Mechanical Dimensions



Connecting Pin Patterns



- ▶ All dimensions in mm (inches)
- ▶ Tolerance: $X.X \pm 0.25$ ($X.XX \pm 0.01$)
 $X.XX \pm 0.13$ ($X.XXX \pm 0.005$)
- ▶ Pins ± 0.05 (± 0.002)

Pin Connections

| Pin | Single Output | Dual Output |
|------------|---------------|-------------|
| 1,2 | -Vin | -Vin |
| 3,11,14,22 | NC | NC |
| 10 | NC | Common |
| 12 | NC | -Vout |
| 13 | +Vout | +Vout |
| 15 | -Vout | Common |
| 23,24 | +Vin | +Vin |

NC : No Connection

Physical Characteristics

| | |
|---------------|---|
| Case Size | : 32.3x14.8x10.2mm (1.27x0.58x0.4 Inches) |
| Case Material | : Non-Conductive Black Plastic |
| | : (flammability to UL 94V-0 rated) |
| Weight | : 8.8g |



| Part Numbering System | | | | | | |
|-----------------------|---------------|-------|-------------------|---------------|----------------|--------------------|
| S | E | 03 | S | 12 | 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 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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