

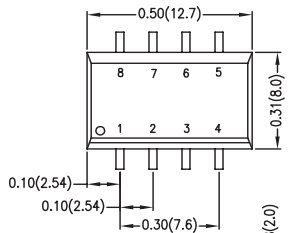
- Efficiency up to 82%
- 1000VDC Isolation
- MTBF > 2,000,000 Hours
- RoHS Compliant



1 Watt SMA Single Series



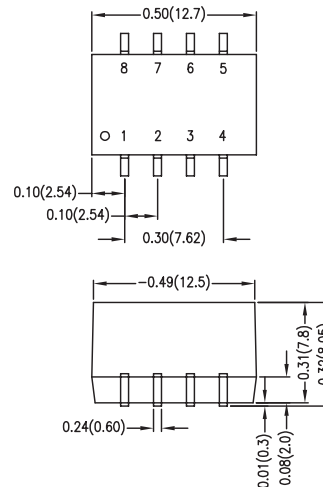
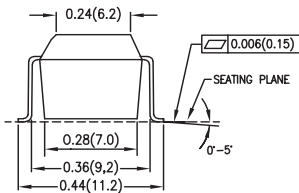
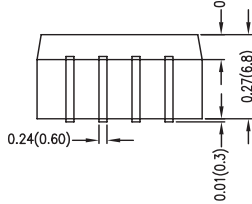
| Model Number | Voltage | | | Current | | | | Load Regulation | Input Overvoltage (1000ms) | Efficiency | Capacitive Load |
|--------------|------------|-------------|--------|----------------|-----------------|----------|----------|-----------------|----------------------------|--------------------|------------------------|
| | Input | | Output | Input | | Output | | | | | |
| | Nom. (VDC) | Range (VDC) | (VDC) | @ No Load (mA) | @ Max Load (mA) | Min (mA) | Max (mA) | % (Max) | Max (VDC) | @ Max Load (% Typ) | Max (Dual each output) |
| SMA1F5S3R3 | 5 | 4.5 - 5.5 | 3.3 | 30 | 264 | 6 | 300 | 10 | 9 | 75 | 33 μ F |
| SMA1F5S5 | 5 | 4.5 - 5.5 | 5 | 30 | 250 | 4 | 200 | 10 | 9 | 80 | 33 μ F |
| SMA1F5S9 | 5 | 4.5 - 5.5 | 9 | 30 | 254 | 2 | 110 | 10 | 9 | 78 | 33 μ F |
| SMA1F5S12 | 5 | 4.5 - 5.5 | 12 | 30 | 252 | 1.5 | 84 | 8 | 9 | 80 | 33 μ F |
| SMA1F5S15 | 5 | 4.5 - 5.5 | 15 | 30 | 248 | 1 | 67 | 7 | 9 | 81 | 33 μ F |
| SMA1F12S3R3 | 12 | 10.8 - 13.2 | 3.3 | 15 | 110 | 6 | 300 | 8 | 18 | 75 | 33 μ F |
| SMA1F12S5 | 12 | 10.8 - 13.2 | 5 | 15 | 103 | 4 | 200 | 8 | 18 | 81 | 33 μ F |
| SMA1F12S9 | 12 | 10.8 - 13.2 | 9 | 15 | 106 | 2 | 110 | 8 | 18 | 78 | 33 μ F |
| SMA1F12S12 | 12 | 10.8 - 13.2 | 12 | 15 | 104 | 1.5 | 84 | 5 | 18 | 81 | 33 μ F |
| SMA1F12S15 | 12 | 10.8 - 13.2 | 15 | 15 | 102 | 1 | 67 | 5 | 18 | 82 | 33 μ F |
| SMA1F24S3R3 | 24 | 21.6 - 26.4 | 3.3 | 8 | 57 | 6 | 300 | 8 | 30 | 73 | 33 μ F |
| SMA1F24S5 | 24 | 21.6 - 26.4 | 5 | 8 | 53 | 4 | 200 | 8 | 30 | 79 | 33 μ F |
| SMA1F24S9 | 24 | 21.6 - 26.4 | 9 | 8 | 54 | 2 | 110 | 8 | 30 | 77 | 33 μ F |
| SMA1F24S12 | 24 | 21.6 - 26.4 | 12 | 8 | 53 | 1.5 | 84 | 5 | 30 | 80 | 33 μ F |
| SMA1F24S15 | 24 | 21.6 - 26.4 | 15 | 8 | 52 | 1 | 67 | 5 | 30 | 80 | 33 μ F |



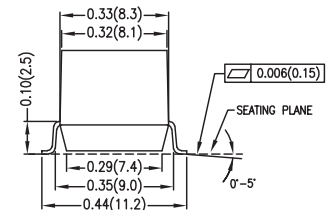
5V and 12V Input

Dimensions are inches (mm) unless noted

| | |
|-------------------|------------------------|
| Tolerance: Inches | Millimeters |
| X.XX \pm 0.01 | X.X \pm 0.25 |
| X.XXX \pm 0.005 | X.XX \pm 0.13 |
| Pin | \pm 0.002 \pm 0.05 |



24V Input



| Pin Connections (NC) Not Connected | |
|------------------------------------|--------|
| Pin | Single |
| 1 | -Vin |
| 2 | +Vin |
| 3 | NC |
| 4 | -Vout |
| 5 | +Vout |
| 6 | NC |
| 7 | NC |
| 8 | NC |

See Model Selection Table for Model Specific Parameters

| Input Parameters | Min | Typ | Max | Units |
|---|--|--|-------|---------|
| Reverse Polarity Input Current | | | 0.3 | A |
| Switching Frequency | 50 | 100 | 140 | kHz |
| Input Filter | Internal Capacitor | | | |
| Output Parameters | Min | Typ | Max | Units |
| Output Voltage Accuracy | | ±1.0 | ±3.0 | % |
| Load Regulation I _o = 20% to 100% | See Model Selection Guide | | | % |
| Line Regulation for Vin Change of 1% | | ±1.2 | ±1.5 | % |
| Ripple & Noise (20MHz) | | 60 | 120 | mV P-P |
| Ripple & Noise (20 MHz) Over Line, Load & Temp | | | 150 | mV P-P |
| Ripple & Noise (20 MHz) | | | 15 | mV RMS |
| Temperature Coefficient | | ±0.01 | ±0.02 | % / °C |
| Short Circuit Protection | 0.5 Second Max | | | |
| General Specifications | Min | Typ | Max | Units |
| Isolation Voltage, 60 seconds | 1000 | | | VDC |
| Isolation Resistance 500VDC | 1000 | | | Mohms |
| Isolation Capacitance, 100kHz, 1V | | 40 | 100 | pF |
| Operating Temperature (Ambient) | -40 | | +85 | °C |
| Storage Temperature | -40 | | +125 | °C |
| Humidity | | | 95 | % |
| MTBF MIL-HDBK-217F @25°C, Ground Benign | 2000 | | | K Hours |
| Moisture Sensitivity Level (MLS) Temperature | IPC/JEDEC J-STD-20 LEVEL 3 | | | |
| Leadfree Reflow Solder Process | IPC/JEDEC J-STD-020C peak temp. 245°C/10 sec. | | | |
| Cooling | Free-Air Convection | | | |
| Case Size | 5V & 12V | 0.50 x 0.31 x 0.27 inches 12.7 x 8.0 x 6.8 mm | | |
| | 24V | 0.50 x 0.33 x 0.31 inches 12.7 x 8.3 x 7.8 mm | | |
| Case Material | Moulding (UL94V-0) | | | |
| Weight | 5V & 12V | 1.5g | | |
| | 24V | 1.8g | | |

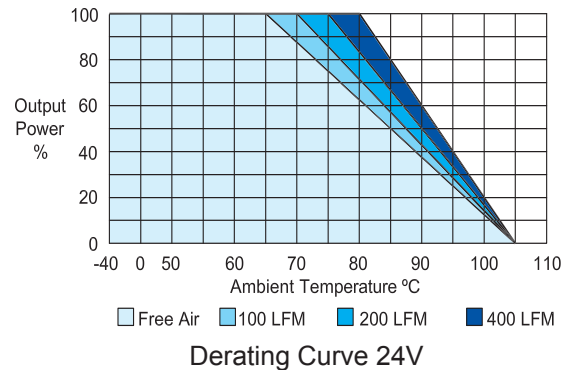
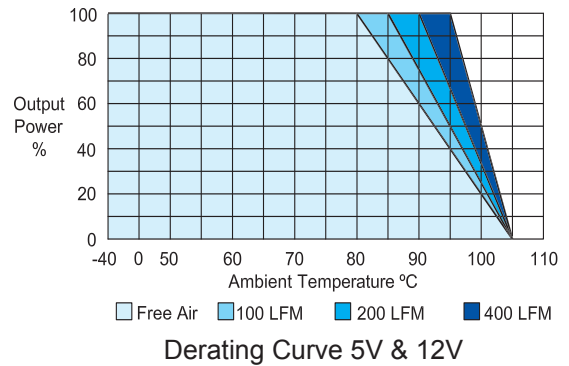
The converter is encapsulated in a low thermal resistance molding compound that has excellent resistance/electrical characteristics over a wide temperature range and in high humidity environments. The molding compound material is rated to UL94V-0 flammability specifications. Leads are tin plated for improved solderability.

| Input Fuse Selection Table | |
|----------------------------|------------------|
| 5V Input | 500 mA Slow-Blow |
| 12V Input | 200 mA Slow-Blow |
| 24V Input | 100 mA Slow-Blow |

External fusing should be used for system protection due to a catastrophic failure. See ConTech website for Fusing Application Notes to determine the correct fuse.

Notes:

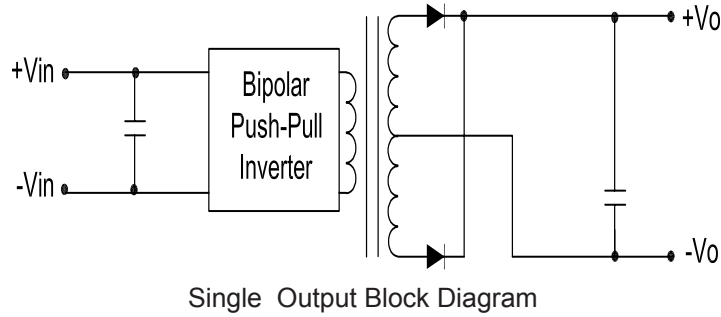
- Specifications typical at Ta=+25°C, resistive load, nominal input voltage, full rated output current unless otherwise noted.
- ConTech power converters require a minimum output loading to maintain specified regulation. Operation under no-load conditions will not damage these modules; however, they may not meet all specifications listed.
- The series has a limitation of a maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time.
- When measuring peak-to-peak output noise, use a Cout 0.33µF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Position the load between 2" and 2.5" from the converter.
- Water washability - ConTech DC/DC converters are designed to withstand most solder/wash processes. Careful attention should be used when assessing the applicability in your specific manufacturing process. Converters are not hermetically sealed.
- See ConTech website for Definition of Terms, Application Notes, and Test Setups and Parameters. www.ConTech-us.com/appnotes.html.
- Specifications subject to change without notice.
- See ConTech website www.ConTech.com/pdf/RoHS.pdf for RoHS Statement.



To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 90°C.

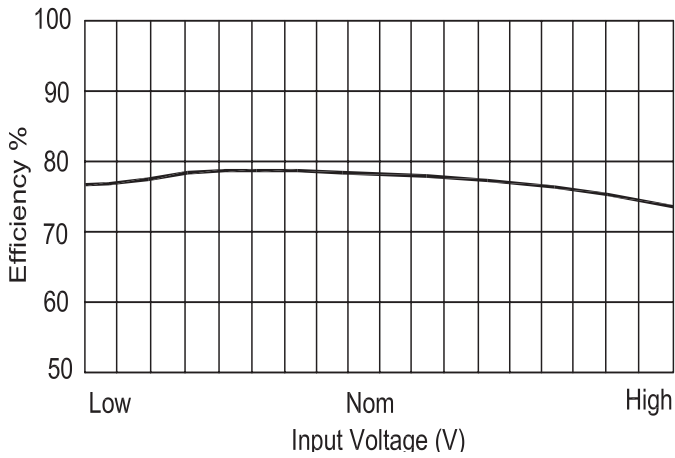


Block Diagrams

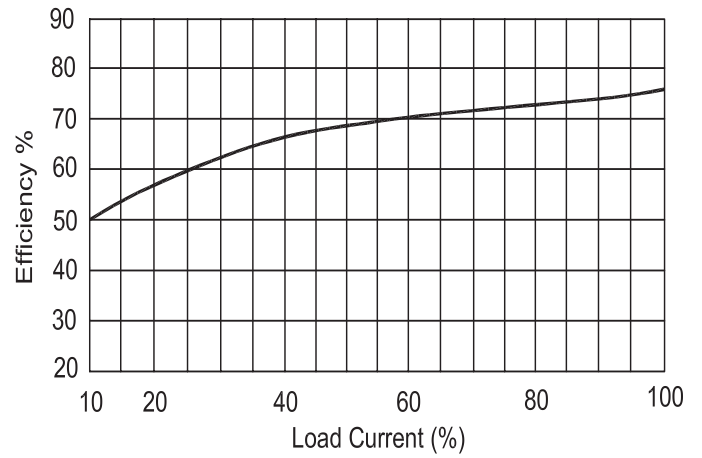


Efficiency Curves

Single Output

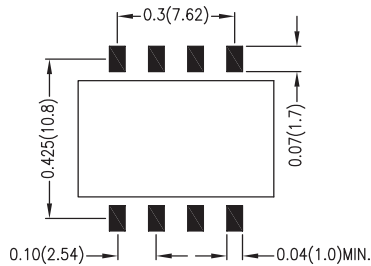


Efficiency vs Input Voltage



Efficiency vs Output Load

SMD Footprint



Dimensions are inches (mm) unless noted

| Tolerance: | Inches | Millimeters |
|------------|--------------|-------------|
| | X.XX ±0.01 | X.X ±0.25 |
| | X.XXX ±0.005 | X.XX ±0.13 |
| Pin | ±0.002 | ±0.05 |