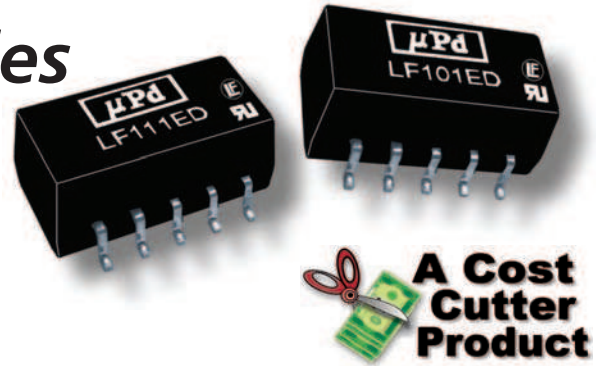


LF100ED Series

Lowest Cost, Dual Output Ultra-Miniature 1W SMT DC/DC Converters



Key Features:

- 1W Output Power
- Ultra-Miniature SMT Case
- UL Approved (File E245422)
- Dual Outputs
- Low 0.29" Profile
- 1,000 VDC Isolation
- >3.5 MHour MTBF
- 3.3V, 5V, & 12V Inputs
- **LOWEST COST!**



Tape/Reel Available

MicroPower Direct

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Suite D
Stoughton, MA 02072
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerelectronics.com
W: www.micropowerelectronics.com



Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------------|---------------|------|------|------|-------|
| Input Voltage Range | 3.3 VDC Input | 3.0 | 3.3 | 3.6 | VDC |
| | 5 VDC Input | 4.5 | 5.0 | 5.5 | |
| | 12 VDC Input | 10.8 | 12.0 | 13.2 | |
| Reverse Polarity Input Current | | | | 1.0 | A |
| Input Filter | Capacitor | | | | |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|---------------------------|------|------|-------|----------|
| Output Voltage Accuracy | | | ±3.0 | | % |
| Output Voltage Balance | Balanced Loads | | ±1.0 | | % |
| Line Regulation | For Vin Change of 1% | | | ±1.2 | % |
| Load Regulation (Note 1) | See Model Selection Guide | | | | |
| Ripple & Noise (20 MHz) (Note 2) | | | 50 | 75 | mV P - P |
| Temperature Coefficient | | | | ±0.03 | %/°C |
| Output Short Circuit | Momentary (0.5 Sec.) | | | | |

General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------|-------------|-------|------|------|-------|
| Isolation Voltage | 60 Seconds | 1,000 | | | VDC |
| Isolation Resistance | 500 VDC | 1,000 | | | MΩ |
| Isolation Capacitance | 100 kHz, 1V | | 70 | | pF |
| Switching Frequency | | | 100 | | kHz |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------|------|------|------|-------|
| Operating Temperature Range | Ambient | -40 | +25 | +85 | °C |
| Storage Temperature Range | | -55 | | +125 | °C |
| Cooling | Free Air Convection | | | | |
| Humidity | RH, Non-condensing | | | 95 | % |

Physical

| | | | | | |
|---------------|--|--|--|--|--|
| Case Size | 0.60 x 0.29 x 0.24 Inches (15.24 x 7.5 x 6.0 mm) | | | | |
| Case Material | Non-Conductive Black Plastic (UL94-V0) | | | | |
| Weight | 0.05 Oz (1.5g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 3.5 | | | MHours |
| Safety Standards | UL 1950, EN 60950, IEC 60950 | | | | |
| Safety Approvals | UL, cUL; File No. E245422 | | | | |

Absolute Maximum Ratings

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|-----------------------------|------|------|-------|-------|
| Input Voltage Surge (1 Sec) | 3.3 VDC Input | -0.7 | | 7.0 | VDC |
| | 5 VDC Input | -0.7 | | 7.0 | |
| | 12 VDC Input | -0.7 | | 15.0 | |
| Lead Temperature | 1.5 mm From Case For 10 Sec | | | 260.0 | °C |
| Internal Power Dissipation | All Models | | | 450 | mW |

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

Model Selection Guide

| Model Number | Input | | | | Output | | | Load Regulation (% Max) | Efficiency (% Typ) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|---------------|-------------------|-------------------|-------------------------|--------------------|----------------------------|
| | Voltage (VDC) | | Current (mA) | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | |
| LF101ED | 5 | 4.5 - 5.5 | 277 | 30 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 72 | 500 |
| LF102ED | 5 | 4.5 - 5.5 | 250 | 30 | ±9.0 | ±56.0 | ±6.0 | 8.0 | 75 | 500 |
| LF103ED | 5 | 4.5 - 5.5 | 256 | 30 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 78 | 500 |
| LF104ED | 5 | 4.5 - 5.5 | 253 | 30 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 79 | 500 |
| LF111ED | 12 | 10.8 - 13.2 | 112 | 15 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 74 | 200 |
| LF112ED | 12 | 10.8 - 13.2 | 110 | 15 | ±9.0 | ±56.0 | ±6.0 | 8.0 | 76 | 200 |
| LF113ED | 12 | 10.8 - 13.2 | 105 | 15 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 78 | 200 |
| LF114ED | 12 | 10.8 - 13.2 | 104 | 15 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 79 | 200 |
| LF151ED | 3.3 | 3.0 - 3.6 | 452 | 55 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 67 | 750 |
| LF152ED | 3.3 | 3.0 - 3.6 | 445 | 55 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 68 | 750 |
| LF153ED | 3.3 | 3.0 - 3.6 | 432 | 55 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 70 | 750 |

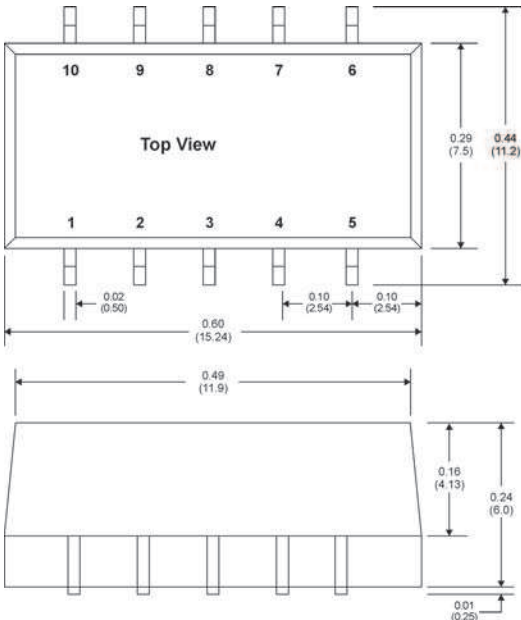
Notes:

- Output load regulation is specified for a load change of 20% to 100%.
- When measuring output ripple, it is recommended that an external 0.33 μF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
- During operation, care must be taken not to exceed the specified input range of the unit or to allow the output load to drop below the specified minimum (10% of full load). Operating the unit under either of these conditions could cause damage to the unit.
- These converters are specified for operation without external components. However, in some applications the addition of input/output capacitors will enhance stability and reduce output ripple. Recommended capacitor values are:

| Vin | Input Capacitor | Vout | Output Capacitor |
|--------|-----------------|--------|------------------|
| 5 VDC | 4.7 μF | 5 VDC | 4.7 μF |
| 12 VDC | 2.2 μF | 9 VDC | 2.2 μF |
| 24 VDC | 1.0 μF | 12 VDC | 1.0 μF |
| | | 15 VDC | 0.47 μF |

For applications requiring very low output noise levels, a simple LC filter should be effective.
 5. It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

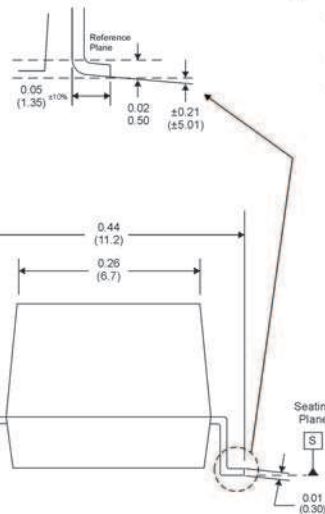
Mechanical Dimensions



Pin Connections

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | -Vin | 6 | NC |
| 2 | +Vin | 7 | +Vout |
| 3 | NC | 8 | NC |
| 4 | Common | 9 | NC |
| 5 | -Vout | 10 | NC |

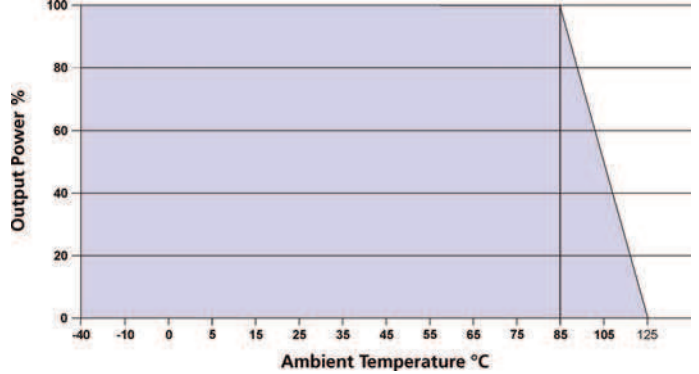
NC = No Connection



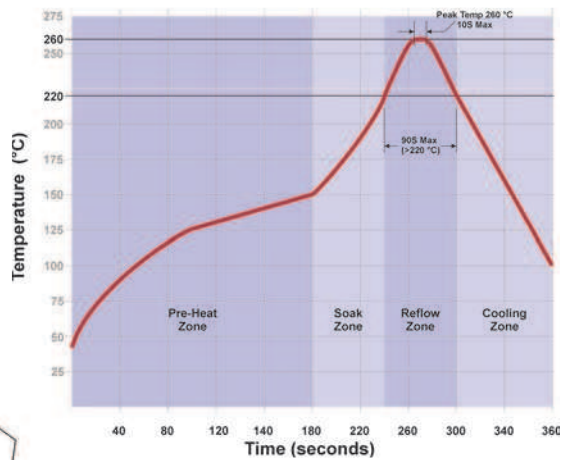
Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)
- Pin 1 is marked by a "dot" or indentation on the unit

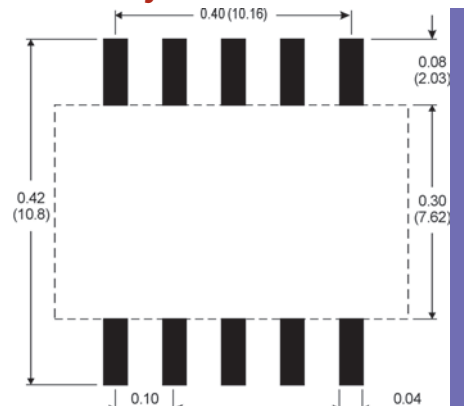
Derating Curve



Recommended Solder Profile



Board Layout



MicroPower Direct

www.micropowerdirect.com