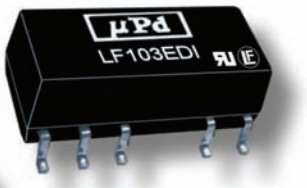
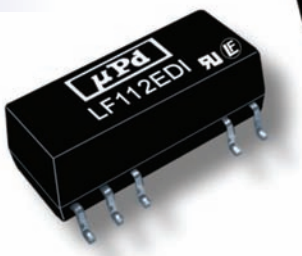
# LF100EDI Series

# Low Cost, Dual Output High Isolation 1W SMT DC/DC Converters





## Key Features:

- 1W Output Power
- 3,000 VDC Isolation
- Ultra-Miniature SMT Case
- UL Approved (File E245422)
- Dual Outputs
- Low 0.24" Profile
- >3.5 MHour MTBF
- 3.3, 5V, & 12V Inputs
- ***LOWEST COST!***

c UL us

RoHS

Tape/Reel Available

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## 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 | | | ±0.01 | ±0.02 | %/°C |
| Output Short Circuit | Momentary (0.5 Sec.) | | | | |

### General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Isolation Voltage | 60 Seconds | 3,000 | | | VDC |
| Isolation Resistance | 500 VDC | 1,000 | | | MΩ |
| Isolation Capacitance | 100 kHz, 1V | | 70 | | pF |
| Switching Frequency | | 100 | 150 | 200 | 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 | | | | | | |
| LF101EDI | 5 | 4.5 - 5.5 | 294 | 30 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 68 | 500 |
| LF102EDI | 5 | 4.5 - 5.5 | 277 | 30 | ±9.0 | ±56.0 | ±6.0 | 8.0 | 72 | 500 |
| LF103EDI | 5 | 4.5 - 5.5 | 270 | 30 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 74 | 500 |
| LF104EDI | 5 | 4.5 - 5.5 | 270 | 30 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 74 | 500 |
| LF111EDI | 12 | 10.8 - 13.2 | 121 | 15 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 69 | 200 |
| LF112EDI | 12 | 10.8 - 13.2 | 116 | 15 | ±9.0 | ±56.0 | ±6.0 | 8.0 | 72 | 200 |
| LF113EDI | 12 | 10.8 - 13.2 | 113 | 15 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 74 | 200 |
| LF114EDI | 12 | 10.8 - 13.2 | 113 | 15 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 75 | 200 |
| LF151EDI | 3.3 | 3.0 - 3.6 | 452 | 55 | ±5.0 | ±100.0 | ±10.0 | 12.0 | 67 | 750 |
| LF152EDI | 3.3 | 3.0 - 3.6 | 445 | 55 | ±12.0 | ±42.0 | ±5.0 | 8.5 | 68 | 750 |
| LF153EDI | 3.3 | 3.0 - 3.6 | 432 | 55 | ±15.0 | ±33.0 | ±4.0 | 7.0 | 70 | 750 |

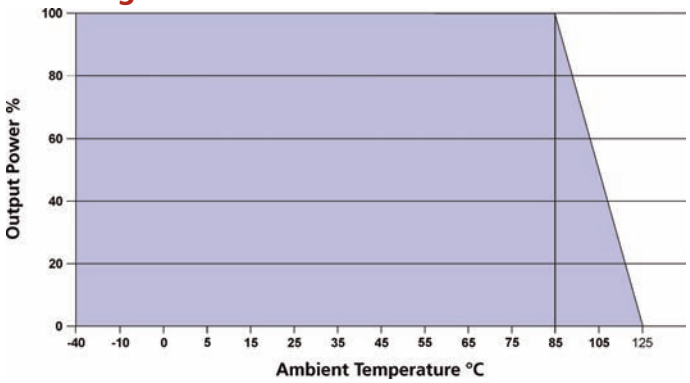
**Notes:**

1. Output load regulation is specified for a load change of 10% to 100%.
2. 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.
3. 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.
4. 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 |
|---|---|---|---|
| 3.3 VDC | 10.0 µF | 5 VDC | 4.7 µF |
| 5 VDC | 4.7 µF | 9 VDC | 2.2 µF |
| 12 VDC | 2.2 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.

## Derating Curve

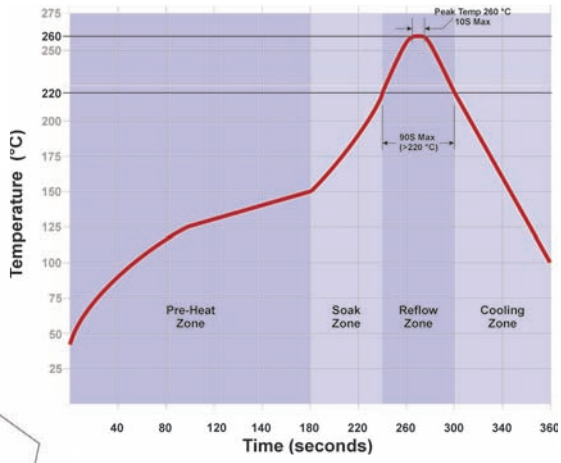



## Pin Connections

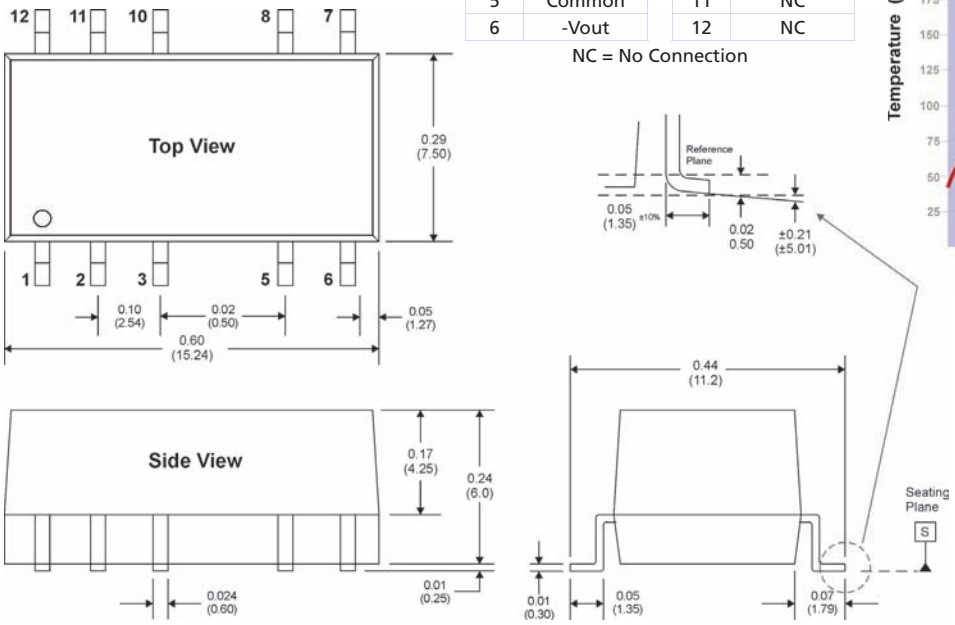
| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | -Vin | 7 | NC |
| 2 | +Vin | 8 | +Vout |
| 3 | NC | 10 | NC |
| 5 | Common | 11 | NC |
| 6 | -Vout | 12 | NC |

NC = No Connection

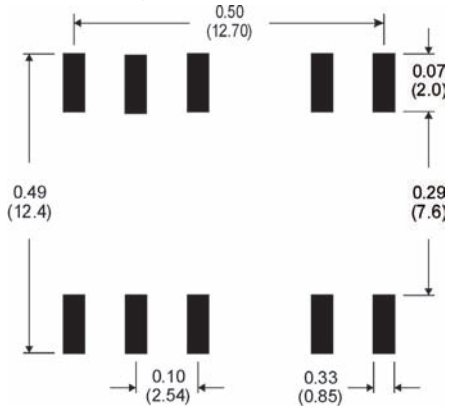
## Recommended Solder Profile




## Mechanical Dimensions




## Board Layout




**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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