

ML100D Series

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



Electrical Specifications

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

Key Features:

- 1W Output Power
- Ultra-Miniature SMT Case
- 1,500 VDC Isolation
- 5V, 12, & 24V Inputs
- -40°C to +85°C Operation
- 9 Standard Models
- 2.0 MH MTBF Minimum
- Available on Tape/Reel



Input

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------------|--------------|------|------|------|-------|
| Input Voltage Range | 5 VDC Input | 4.5 | 5.0 | 5.5 | VDC |
| | 12 VDC Input | 10.8 | 12.0 | 13.2 | |
| | 24 VDC Input | 21.6 | 24.0 | 26.4 | |
| Reverse Polarity Input Current | | | | 0.3 | A |
| Input Filter | Capacitor | | | | |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------------|------|-------|-------|----------|
| Output Voltage Accuracy | | | ±5.0 | | % |
| Output Voltage Balance | Balanced Loads | | ±0.1 | ±1.0 | % |
| Line Regulation | For Vin Change of 1% | | ±1.2 | ±1.5 | % |
| Load Regulation, See Note 1 | See Model Selection Guide | | | | |
| Ripple & Noise (20 MHz) | See Note 2 | | 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 |
| Output Short Circuit | Momentary (0.5 Sec.) | | | | |

General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------|-------------|-------|------|------|-------|
| Isolation Voltage | 60 Seconds | 1,500 | | | VDC |
| Isolation Resistance | 500 VDC | 1,000 | | | MΩ |
| Isolation Capacitance | 100 kHz, 1V | | 40 | 100 | pF |
| Switching Frequency | | 50 | 100 | 140 | kHz |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------|------|------|------|-------|
| Operating Temperature Range | Ambient | -40 | +25 | +85 | °C |
| Operating Temperature Range | Case | | | +90 | °C |
| Storage Temperature Range | | -50 | | +125 | °C |
| Cooling | Free Air Convection | | | | |
| Humidity | RH, Non-condensing | | | 95 | % |

Physical

| | | | | | |
|---------------|---|--|--|--|--|
| Case Size | 0.64 x 0.43 x 0.27 Inches (16.24 x 11.0 x 7.0 mm) | | | | |
| Case Material | Molding (UL94-V0) | | | | |
| Weight | 0.07 Oz (2.0g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 2.0 | | | MHours |

Absolute Maximum Ratings

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|------------------------------|------|------|------|-------|
| Input Voltage Surge (1 Sec) | 5 VDC Input | -0.7 | | 9.0 | VDC |
| | 12 VDC Input | -0.7 | | 18.0 | |
| | 24 VDC Input | -0.7 | | 30.0 | |
| Lead Temperature | 1.5 mm From Case For 10 Sec. | | | 260 | °C |
| Internal Power Dissipation | All Models | | | 450 | mW |

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

MicroPower Direct

292 Page Street
Suite D
Stoughton, MA 02072
USA

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



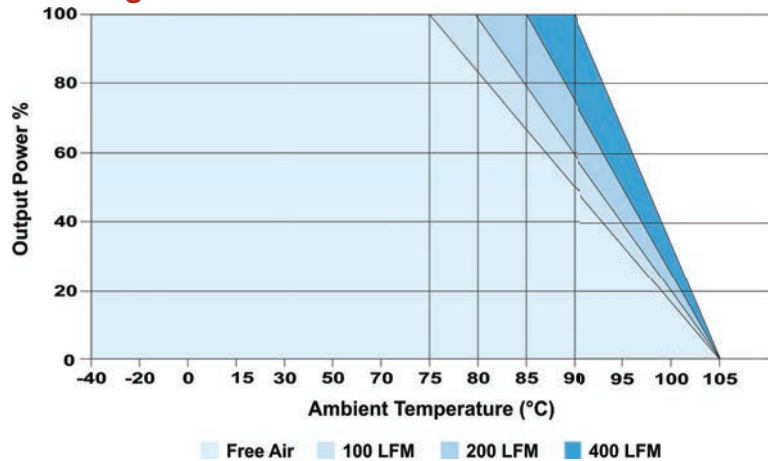
www.micropowerdirect.com

| Model Number | Input | | | | Output | | | Load Regulation (% Max) | Efficiency (% Typ) | Output Capacitive Load (μF , Max) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|---------------|-------------------|-------------------|-------------------------|--------------------|---|----------------------------|
| | Voltage (VDC) | | Current (mA) | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | | |
| ML105D-05 | 5 | 4.5 - 5.5 | 270 | 30 | ± 5.0 | ± 100 | ± 2.0 | 10 | 74 | 33 | 500 |
| ML105D-12 | 5 | 4.5 - 5.5 | 259 | 30 | ± 12.0 | ± 42 | ± 0.8 | 8 | 78 | 33 | 500 |
| ML105D-15 | 5 | 4.5 - 5.5 | 254 | 30 | ± 15.0 | ± 33 | ± 0.7 | 7 | 78 | 33 | 500 |
| ML112D-05 | 12 | 10.8 - 13.2 | 113 | 15 | ± 5.0 | ± 100 | ± 2.0 | 8 | 74 | 33 | 200 |
| ML112D-12 | 12 | 10.8 - 13.2 | 108 | 15 | ± 12.0 | ± 42 | ± 0.8 | 5 | 78 | 33 | 200 |
| ML112D-15 | 12 | 10.8 - 13.2 | 104 | 15 | ± 15.0 | ± 33 | ± 0.7 | 5 | 79 | 33 | 200 |
| ML124D-05 | 24 | 21.6 - 26.4 | 57 | 9 | ± 5.0 | ± 100 | ± 2.0 | 8 | 73 | 33 | 100 |
| ML124D-12 | 24 | 21.6 - 26.4 | 54 | 9 | ± 12.0 | ± 42 | ± 0.8 | 5 | 78 | 33 | 100 |
| ML124D-15 | 24 | 21.6 - 26.4 | 53 | 9 | ± 15.0 | ± 33 | ± 0.7 | 5 | 78 | 33 | 100 |

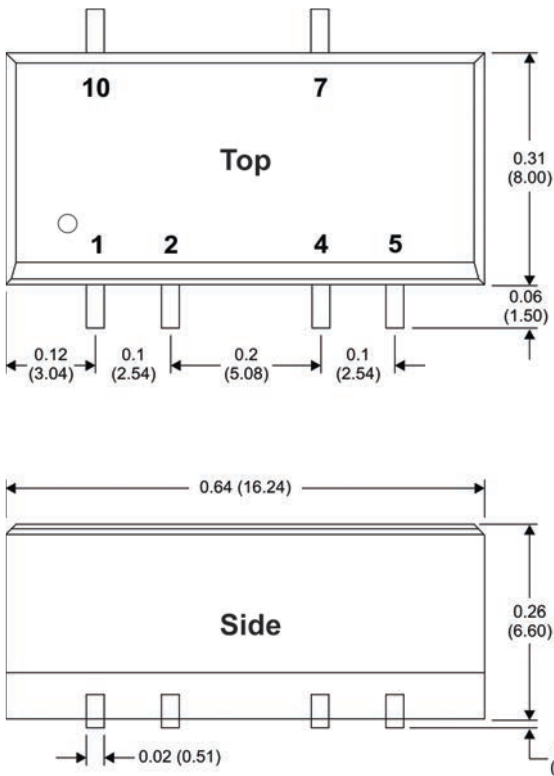
Notes:

- Load regulation is measured for an output change of 20% to 100%.
- When measuring output ripple, it is recommended that an external 0.33 μF ceramic capacitor be placed from each output to the common pin. For noise sensitive applications, the use of 3.3 μF capacitors will reduce the output ripple.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- The converter should be connected to a low ac-impedance source. An input source with a highly inductive impedance may affect the stability of the converter. In applications where the converter output loading is high and input power is supplied over long lines, it may be necessary to use a capacitor on the input to insure start-up. In this case, it is recommended that a low ESR (ESR 1.0Ω at 100 kHz) capacitor be mounted close to the converter. For 5V input units a 2.2 μF is recommended; a 1.0 μF for 12V input units; and for 24V input models, a 0.47 μF .
- Units may be connected to provide a 10 VDC, 24 VDC or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common.
- It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

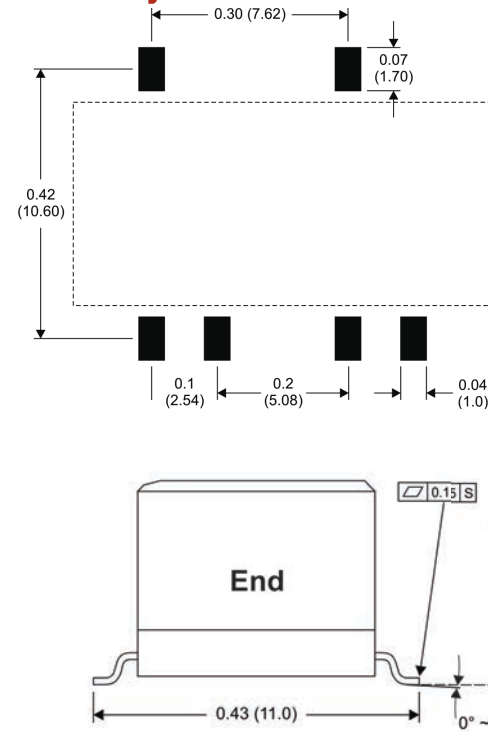
Derating Curve



Mechanical Dimensions



Board Layout



Pin Connections

| Pin | Description |
|-----|-------------|
| 1 | -Vin |
| 2 | +Vin |
| 3 | No Pin |
| 4 | Common |
| 5 | -Vout |
| 6 | No Pin |
| 7 | +Vout |
| 8 | No Pin |
| 9 | No Pin |
| 10 | NA |

NA = Not for electrical connection



MicroPower Direct
We Power Your Success - For Less!

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