



MicroPower Direct

Miniature SIP, 2W
Regulated, Short Circuit Protected
DC/DC Converters
D200RP Series

Key Features

- Miniature SIP Package
- Short Circuit Protected
- 1.5 MH MTBF
- 2.0W Output Power
- Tight Line/Load Regulation
- **Low Cost**

Electrical Specifications

Specifications typical @ +25°C with 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 | 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 | |
| Input Filter | π (Pi) Filter | | | | |
| Reverse Polarity Input Current | | | | 0.3 | A |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-------------------------|--------------------|------|------|-------|----------|
| Output Voltage Accuracy | | | | ±2.0 | % |
| Line Regulation | For Vin Min to Max | | | ±0.5 | % |
| Load Regulation | Iout = 20% to 100% | | | ±0.5 | % |
| Ripple & Noise (20 MHz) | | | | 75 | mV P - P |
| Output Power Protection | | 120 | | | % |
| Temperature Coefficient | | | | ±0.02 | %/°C |
| Output Short Circuit | Continuous | | | | |

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 | | 60 | | pF |
| Switching Frequency | | | 40 | | kHz |

Environmental

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

Physical

| | |
|--------------------------------|--|
| Case Size (5V & 12V Models) | 1.25 x 0.34 x 0.53 Inches (31.8 x 8.6 x 13.5 mm) |
| Case Material | Non-Conductive Black Plastic |
| Weight (5V & 12V Input Models) | 0.17 Oz (4.8g) |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 1.5 | | | 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.

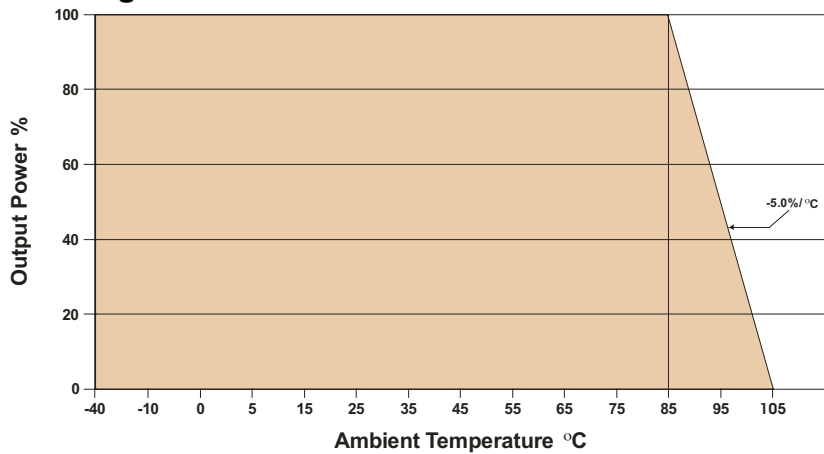
Model Selection Guide

| Model Number | Input | | | | Output | | | 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 | | | | | |
| D201RP | 5 | 4.5 - 5.5 | 606 | 60 | 5.0 | 400.0 | 40.0 | 66 | 1,000 |
| D202RP | 5 | 4.5 - 5.5 | 606 | 60 | 9.0 | 222.0 | 22.0 | 66 | 1,000 |
| D203RP | 5 | 4.5 - 5.5 | 571 | 60 | 12.0 | 167.0 | 17.0 | 70 | 1,000 |
| D204RP | 5 | 4.5 - 5.5 | 571 | 60 | 15.0 | 133.0 | 13.0 | 70 | 1,000 |
| D205RP | 5 | 4.5 - 5.5 | 588 | 60 | 24.0 | 83.0 | 10.0 | 68 | 1,000 |
| D211RP | 12 | 10.8 - 13.2 | 253 | 30 | 5.0 | 400.0 | 40.0 | 66 | 500 |
| D212RP | 12 | 10.8 - 13.2 | 253 | 30 | 9.0 | 222.0 | 22.0 | 66 | 500 |
| D213RP | 12 | 10.8 - 13.2 | 238 | 30 | 12.0 | 167.0 | 17.0 | 70 | 500 |
| D214RP | 12 | 10.8 - 13.2 | 238 | 30 | 15.0 | 133.0 | 13.0 | 70 | 500 |
| D215RP | 12 | 10.8 - 13.2 | 246 | 30 | 24.0 | 83.0 | 10.0 | 68 | 500 |
| D221RP | 24 | 21.6 - 26.4 | 130 | 15 | 5.0 | 400.0 | 40.0 | 64 | 200 |
| D222RP | 24 | 21.6 - 26.4 | 130 | 15 | 9.0 | 222.0 | 22.0 | 64 | 200 |
| D223RP | 24 | 21.6 - 26.4 | 122 | 15 | 12.0 | 167.0 | 17.0 | 68 | 200 |
| D224RP | 24 | 21.6 - 26.4 | 122 | 15 | 15.0 | 133.0 | 13.0 | 68 | 200 |
| D225RP | 24 | 21.6 - 26.4 | 118 | 15 | 24.0 | 83.0 | 10.0 | 70 | 200 |

Notes:

1. These units do not require external components to operate, but the use of an input capacitor (10 µF) may enhance performance in some applications. An output capacitor (4.7 µF to 10 µF) may be used to reduce ripple.

Derating Curve



Capacitive Load

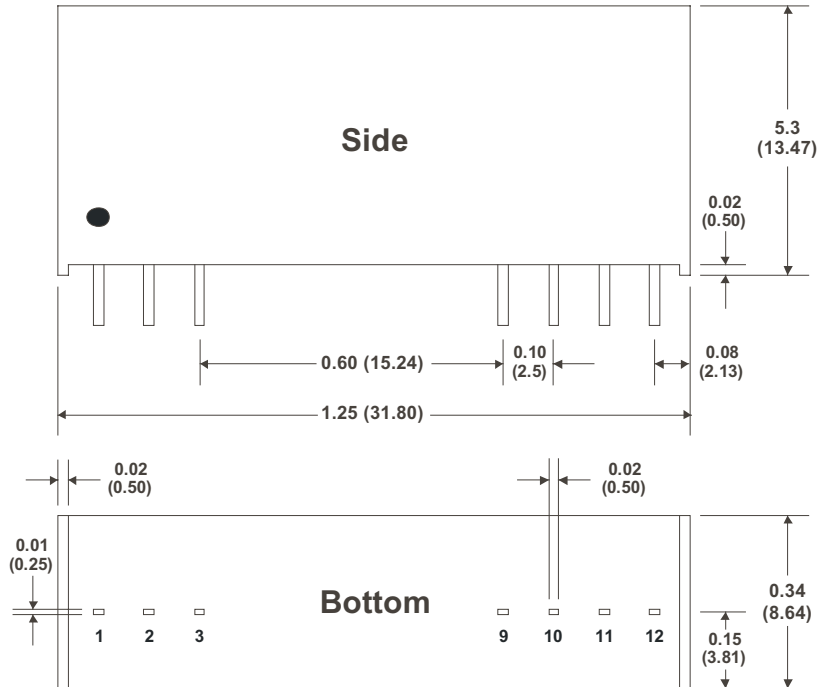
| |
|--------|
| µF Max |
| 470 |

Pin Connections

| Pin | Single |
|-----|--------|
| 1 | +Vin |
| 2 | NC |
| 3 | NC |
| 9 | NC |
| 10 | -Vout |
| 11 | +Vout |
| 12 | -Vin |

NC: No Connection

Mechanical Dimensions



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 side of the unit



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