

B1500ERU Series

Ultra-Wide Input 15W Single & Dual Output DC/DC Converters



Key Features:

- 15W Output Power
- 4:1 Input Voltage Range
- 1,500 VDC Isolation
- Compact 1 x 2 Inch Case
- Single & Dual Outputs
- Remote ON/OFF
- Industry Standard Pin-Out



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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 Start Voltage | 24 VDC Input | | 8.8 | 9.0 | VDC |
| | 48 VDC Input | | 17.8 | 18.0 | |
| Input Filter | π (Pi) Filter | | | | |
| Start-Up Time | | | 10 | | mS |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|------------------------------|------|-------|-------|----------|
| Output Voltage Accuracy | | | ±1.0 | ±2.0 | % |
| Output Voltage Balance | Dual Output , Balanced Loads | | ±0.5 | | % |
| Line Regulation | Vin = Min to Max | | ±0.2 | ±0.5 | % |
| Load Regulation | Iout = 10% to 100% | | ±0.5 | ±1.0 | % |
| Cross Regulation | | | | ±5.0 | % |
| Ripple & Noise (20 MHz) (Note 1) | | 55 | 75 | 150 | mV P - P |
| Output Power Protection | | 120 | | 150 | % |
| Transient Recovery Time (Note 2) | 25% Load Step Change | | 200 | 300 | μSec |
| Transient Response Deviation | | | ±3.0 | ±5.0 | % |
| Temperature Coefficient | | | ±0.01 | ±0.02 | %/°C |
| Output Short Circuit | Continuous (Autorecovery) | | | | |

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 | | 1,000 | | pF |
| Switching Frequency | | | 300 | | kHz |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|--|------|------|------|-------|
| Operating Temperature Range | Ambient | -40 | +25 | +85 | °C |
| Storage Temperature Range | | -55 | | +105 | °C |
| Cooling | Free Air Convection (See Curves on Page 2) | | | | |
| Humidity | RH, Non-condensing | | | 95 | % |
| RFI | Six-Side Shielded Metal Case | | | | |

Physical

| | | | | | |
|---------------|---|--|--|--|--|
| Case Size | 2.0 x 1.0 x 0.43 Inches (50.8 x 25.4 x 11.0 mm) | | | | |
| Case Material | Metal with Non-Conductive Base | | | | |
| Weight | 1.13 Oz (32g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 700 | | | kHours |

Absolute Maximum Ratings

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|-----------------------------|------|------|-------|-------|
| Input Voltage Surge (1 Sec) | 24 VDC Input | -0.7 | | 50.0 | VDC |
| | 48 VDC Input | -0.7 | | 100.0 | |
| Lead Temperature | 1.5 mm From Case For 10 Sec | | | 300.0 | °C |

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

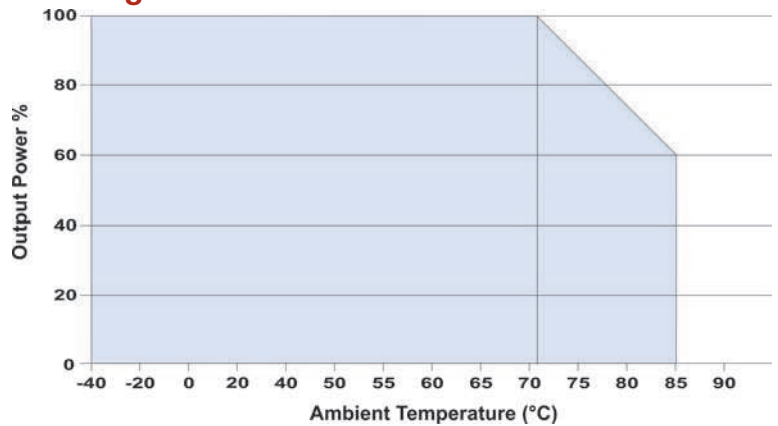
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| Model Number | Input | | | | Reflected Ripple Current (mA, Typ) | Output | | | Efficiency (% , Typ) | Capacitive Load (µF Max) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|------------------------------------|---------------|-------------------|-------------------|----------------------|--------------------------|----------------------------|
| | Voltage (VDC) | | Current (mA) | | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | | |
| B1501ERU | 24 | 9.0 - 36.0 | 528 | 25 | 40 | 3.3 | 4,000 | 400.0 | 78 | 10,200 | 2,500 |
| B1502ERU | 24 | 9.0 - 36.0 | 762 | 25 | 40 | 5.0 | 3,000 | 300.0 | 82 | 4,020 | 2,500 |
| B1503ERU | 24 | 9.0 - 36.0 | 744 | 25 | 40 | 12.0 | 1,250 | 125.0 | 84 | 1,035 | 2,500 |
| B1504ERU | 24 | 9.0 - 36.0 | 744 | 25 | 40 | 15.0 | 1,000 | 100.0 | 84 | 705 | 2,500 |
| B1505ERU | 24 | 9.0 - 36.0 | 762 | 25 | 40 | ±5.0 | ±1,500 | ±150.0 | 82 | ±1,020 | 2,500 |
| B1506ERU | 24 | 9.0 - 36.0 | 735 | 25 | 40 | ±12.0 | ±625 | ±62.5 | 85 | ±495 | 2,500 |
| B1507ERU | 24 | 9.0 - 36.0 | 735 | 25 | 40 | ±15.0 | ±500 | ±50.0 | 85 | ±165 | 2,500 |
| B1511ERU | 48 | 18.0 - 75.0 | 264 | 15 | 30 | 3.3 | 4,000 | 400.0 | 78 | 10,200 | 1,250 |
| B1512ERU | 48 | 18.0 - 75.0 | 381 | 15 | 30 | 5.0 | 3,000 | 300.0 | 82 | 4,020 | 1,250 |
| B1513ERU | 48 | 18.0 - 75.0 | 372 | 15 | 30 | 12.0 | 1,250 | 125.0 | 84 | 1,035 | 1,250 |
| B1514ERU | 48 | 18.0 - 75.0 | 372 | 15 | 30 | 15.0 | 1,000 | 100.0 | 84 | 705 | 1,250 |
| B1515ERU | 48 | 18.0 - 75.0 | 381 | 15 | 30 | ±5.0 | ±1,500 | ±150.0 | 82 | ±1,020 | 1,250 |
| B1516ERU | 48 | 18.0 - 75.0 | 368 | 15 | 30 | ±12.0 | ±625 | ±62.5 | 85 | ±495 | 1,250 |
| B1517ERU | 48 | 18.0 - 75.0 | 368 | 15 | 30 | ±15.0 | ±500 | ±50.0 | 85 | ±165 | 1,250 |

Notes:

- When measuring output ripple, it is recommended that an external 4.7 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.
- 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 100 µF for C_{IN} and 100 - 220 µF for C_{OUT}.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- The maximum control current at the on/off pin (pin 6) during a logic high is 50 µA. The maximum control current to the on/off pin at logic low (-0.7V to 0.8V) is 1 mA. If the on/off pin is left open, the unit operates. If it is grounded, the unit will shut off.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- Dual output 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



Remote ON/OFF

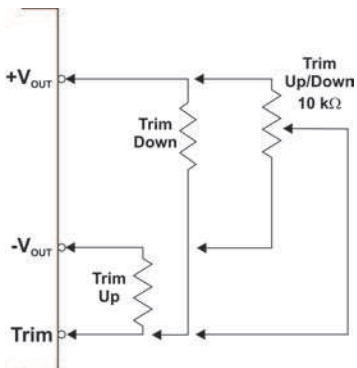
| Parameter | Min | Max | Units |
|------------|------|--------------|-------|
| Supply On | 3.5 | 12.0 or Open | VDC |
| Supply Off | Grnd | 1.2 | VDC |

Control Common Referenced to Gnd

Remote ON/OFF Notes:

- Maximum sink current at the on/off pin (pin 6) during a logic low is 100 µA.
- Maximum allowable leakage current of a switch connected to the on/off terminal (Pin 6) at logic high (2.5V to 100V) is 5 µA.

External Trim

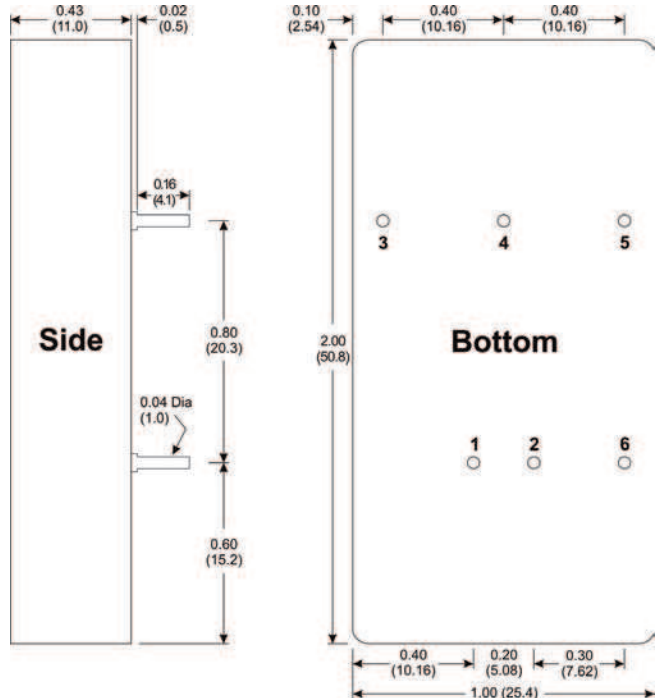


A simple external circuit may be used to adjust the converter output (single output models only). To adjust the output DOWN, connect a 5%, 3W resistor between the plus output pin and the Vout trim pin. To adjust the output UP, connect a 5%, 3W resistor between the minus output pin and the Vout trim pin.

For UP/Down trimming capability, connect a 10 kW potentiometer between the plus and minus outputs with the wiper arm connected to the Vout trim pin.

The trim range is ±10%.

Mechanical Dimensions



Pin Connections

| Pin | Single | Dual | Pin | Single | Dual |
|-----|--------|-------|-----|--------|--------|
| 1 | +Vin | +Vin | 4 | Trim | Comm. |
| 2 | -Vin | -Vin | 5 | -Vout | -Vout |
| 3 | +Vout | +Vout | 6 | ON/OFF | ON/OFF |

Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)



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