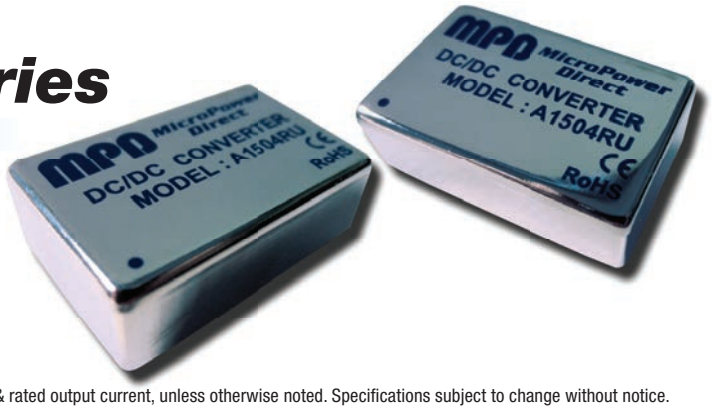
# A1500RU Series

# 4:1 Input Range, 15W Single & Dual Output DC/DC Converters




## Key Features:

- 15W Output Power
- 4:1 Input Voltage Range
- Compact DIP Case
- 1,600 VDC I/O Isolation
- Meets EN 55022 “A”
- Single & Dual Outputs
- 37.5 W/IN³ Power Density
- Industry Standard Pin-Out

RoHS

## 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 | 24 VDC Input | 9.0 | 24.0 | 36.0 | VDC |
| | 48 VDC Input | 18.0 | 48.0 | 75.0 | |
| Input Filter | π (Pi) Filter (Meets EN 55022 Class “A”) | | | | |
| Input Reflected Ripple Current | | | 20.0 | | mA P - P |

**Output**

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Output Voltage Accuracy | | | ±1.0 | | % |
| Line Regulation, $V_{IN}$ = Min to Max | Single Output | | | ±0.2 | % |
| | Dual Output | | | ±0.5 | |
| Load Regulation, $I_{OUT}$ = 0% to 100% | Single Output | | | ±0.5 | % |
| | Dual Output | | | ±1.0 | |
| Cross Regulation, Dual Output | See Note 1 | | | ±5.0 | % |
| Ripple & Noise (20 MHz) | See Note 2 | | | 60 | mV P - P |
| Output Power Protection | | | 150 | | % $I_{OUT}$ |
| Transient Recovery Time, See Note 3 | 25% Load Step Change | | 250 | | μSec |
| Transient Response Deviation | | | ±3.0 | | % |
| Temperature Coefficient | | | ±0.02 | | %/°C |
| Output Short Circuit Protection | Continuous (Autorecovery) | | | | |

**General**

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Isolation Voltage (Input/Output) | 3 Seconds | 1,600 | | | VDC |
| Isolation Voltage (Case/Input, Output) | 3 Seconds | 1,600 | | | |
| Isolation Resistance | 500 VDC | 1,000 | | | MΩ |
| Isolation Capacitance | 100 kHz/1V | | 2,000 | | pF |
| Switching Frequency | | 250 | | 330 | kHz |

**EMI Characteristics**

| Parameter | Standard | Level |
|---|---|---|
| Radiated Emissions | EN 55022 | Class A |
| Conducted Emissions | EN 55022 | Class A |
| ESD | EN 61000-4-2 | Criteria B |
| RS | EN 61000-4-3 | Criteria A |
| EFT, See Note 4 | EN 61000-4-4 | Criteria B |
| Surge, See Note 4 | EN 61000-4-5 | Criteria B |
| CS | EN 61000-4-6 | Criteria A |
| PFMF | EN 61000-4-8 | Criteria A |

**Environmental**

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Operating Temperature Range | Ambient | -40 | | +85 | °C |
| Operating Temperature Range | Case | | | +105 | °C |
| Storage Temperature Range | | -40 | | +125 | °C |
| Cooling | Free Air Convection | | | | |
| Humidity | RH, Non-condensing | | 95 | | % |

**Physical**

| | |
|---|---|
| Case Size | 1.25 x 0.80 x 0.40 Inches (31.8 x 20.3 x 10.2 mm) |
| Case Material | Metal with Non-Conductive Base (UL94V-0) |
| Weight | 0.705 Oz (20g) |

**Reliability Specifications**

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 410 | | | 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 | | | 260 | °C |

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

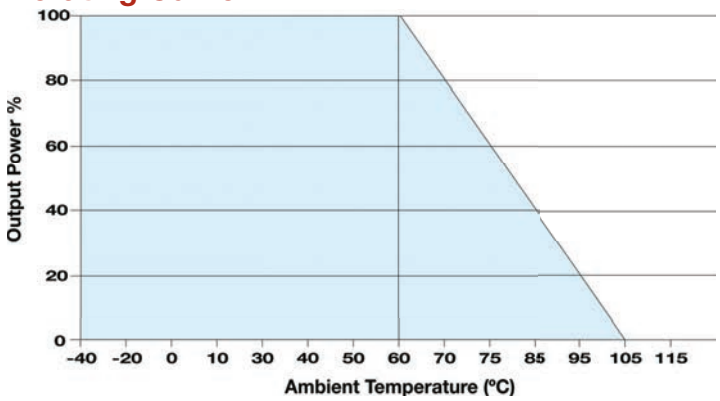


| Model Number | Input | | | | Output | | | Over Voltage Protection (VDC) | Max Capacitive Load (µF Max) | Efficiency (%, Typ) | Fuse Rating Slow-Blow (mA) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Voltage (VDC) | | Current (mA) | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | | |
| A1501RU | 24 | 9.0 - 36.0 | 647 | 10 | 3.3 | 4,000 | 0.0 | 3.9 | 4,700 | 87 | 3,000 |
| A1502RU | 24 | 9.0 - 36.0 | 732 | 10 | 5.1 | 3,000 | 0.0 | 6.2 | 3,300 | 89 | 3,000 |
| A1503RU | 24 | 9.0 - 36.0 | 710 | 10 | 12.0 | 1,250 | 0.0 | 15.0 | 600 | 90 | 3,000 |
| A1504RU | 24 | 9.0 - 36.0 | 710 | 10 | 15.0 | 1,000 | 0.0 | 18.0 | 400 | 90 | 3,000 |
| A1505RU | 24 | 9.0 - 36.0 | 744 | 10 | ±5.0 | ±1,500 | ±0.0 | ±6.2 | ±1,500 | 86 | 3,000 |
| A1506RU | 24 | 9.0 - 36.0 | 718 | 10 | ±12.0 | ±625 | ±0.0 | ±15.0 | ±288 | 89 | 3,000 |
| A1507RU | 24 | 9.0 - 36.0 | 710 | 10 | ±15.0 | ±500 | ±0.0 | ±18.0 | ±200 | 90 | 3,000 |
| A1511RU | 48 | 18.0 - 75.0 | 327 | 5 | 3.3 | 4,000 | 0.0 | 3.9 | 4,700 | 86 | 1,500 |
| A1512RU | 48 | 18.0 - 75.0 | 370 | 5 | 5.1 | 3,000 | 0.0 | 6.2 | 3,300 | 88 | 1,500 |
| A1513RU | 48 | 18.0 - 75.0 | 355 | 5 | 12.0 | 1,250 | 0.0 | 15.0 | 600 | 90 | 1,500 |
| A1514RU | 48 | 18.0 - 75.0 | 359 | 5 | 15.0 | 1,000 | 0.0 | 18.0 | 400 | 89 | 1,500 |
| A1515RU | 48 | 18.0 - 75.0 | 372 | 5 | ±5.0 | ±1,500 | ±0.0 | ±6.2 | ±1,500 | 86 | 1,500 |
| A1516RU | 48 | 18.0 - 75.0 | 359 | 5 | ±12.0 | ±625 | ±0.0 | ±15.0 | ±288 | 89 | 1,500 |
| A1517RU | 48 | 18.0 - 75.0 | 355 | 5 | ±15.0 | ±500 | ±0.0 | ±18.0 | ±200 | 90 | 1,500 |

**Notes:**

1. When measuring cross regulation, the load on one output is varied from 25% to 100% while the other output is held at 100%.
2. When measuring output ripple, it is recommended that an external 1.0 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. For noise sensitive applications, the use of 3.3 µF capacitors will reduce the output ripple.
3. Transient recovery is measured to within a 1% error band for a load step change of 75% to 50% to 25%.
4. To meet the requirements of EN 61000-4-4 and EN 61000-4-5, an external filter capacitor is required. It is recommended that a 680 µF/100V (or two 330 µF/100V capacitors connected in parallel) be used.
5. Operation at no-load will not damage these units. However, they may not meet all specifications.
6. 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.
7. 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 | 3.0 | 12 or Open | VDC |
| Supply Off | 0.0 | 1.2 | VDC |
| Standby Input Current | 5 mA Typical | | |
| Control Common | Referenced to Neg. Input (pin 2,3) | | |

## Pin Connections

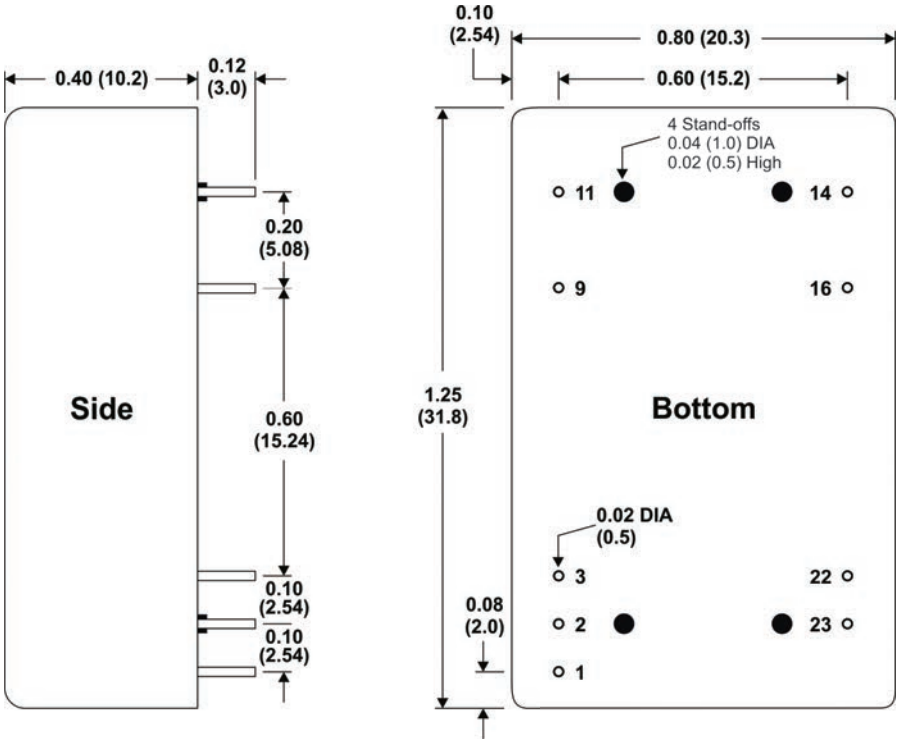
| Pin | Single | Dual |
|---|---|---|
| 1 | Remote On/Off | Remote On/Off |
| 2 | -VIN | -VIN |
| 3 | -VIN | -VIN |
| 9 | No Pin | Common |
| 11 | NC | -VOUT |
| 14 | +VOUT | +VOUT |
| 16 | -VOUT | Common |
| 22 | +VIN | +VIN |
| 23 | +VIN | +VIN |

NC: No Connection

**Mechanical Notes:**

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

## Mechanical Dimensions

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