

I1000RU Series

Ultra-Miniature 10W Wide 4:1 Input Range DC/DC Converters



Key Features:

- 10W Output Power
- 4:1 Input Range
- Ultra- Miniature Case
- Remote On/Off Control
- 1,500 VDC Isolation
- >350 kHour MTBF
- Standard Pin-Out



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 | |
| Start-Up Voltage | 24 VDC Input | | | 9.0 | VDC |
| | 48 VDC Input | | | 18.0 | |
| Under Voltage Shutdown | 24 VDC Input | | | 8.5 | VDC |
| | 48 VDC Input | | | 17.0 | |
| Input Filter | π (Pi) Filter, Meets EN55022 Class A | | | | |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-------------------------------------|-------------------------------|------|-------|-------|----------|
| Output Voltage Accuracy | | | ±1.0 | ±2.0 | % |
| Output Voltage Balance | Dual Output , Balanced Loads | | ±1.0 | ±2.0 | % |
| Line Regulation | Vin = Min to Max | | ±0.3 | ±1.0 | % |
| Load Regulation | Iout = 15% to 100% | | ±0.5 | ±1.2 | % |
| Ripple & Noise (20 MHz), See Note 1 | | | 60 | 100 | mV P - P |
| | Over Line, Load & Temperature | | | 150 | |
| Transient Recovery Time, See Note 2 | | | 300 | 600 | µSec |
| Transient Response Deviation | 25% Load Step Change | | ±3.0 | ±6.0 | % |
| Output Power Protection | | 110 | 150 | | % |
| 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 | | 1,500 | | pF |
| Switching Frequency | | | 450 | | kHz |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------|------|------|------|-------|
| Operating Temperature Range | Ambient | -40 | +25 | +80 | °C |
| Operating Temperature Range | Case | | | +100 | °C |
| Storage Temperature Range | | -50 | | +125 | °C |
| Cooling | Free Air Convection | | | | |
| Derating | See Curve | | | | |
| Humidity | RH, Non-condensing | | | 95 | % |

Physical

| | | | | | |
|---------------|--|--|--|--|--|
| Case Size | 1.00 x 1.00 x 0.40 Inches (25.4 x 25.4 x 10.16 mm) | | | | |
| Case Material | Six-Sided Shielded Aluminum With Non-Conductive Base (UL94-V0) | | | | |
| Weight | 0.52 Oz (15g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 350 | | | 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 Number | Input | | | | Output | | | Efficiency (% Typ) | Capacitive Load (μ F Max) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|---------------|-------------------|-------------------|--------------------|--------------------------------|----------------------------|
| | Voltage (VDC) | | Current (mA) | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | |
| I1001RU | 24 | 9.0 - 36.0 | 352 | 30 | 3.3 | 2,200 | 330 | 86 | 560 | 1,000 |
| I1002RU | 24 | 9.0 - 36.0 | 496 | 30 | 5.0 | 2,000 | 300 | 84 | 560 | 1,000 |
| I1003RU | 24 | 9.0 - 36.0 | 483 | 30 | 12.0 | 830 | 125 | 86 | 150 | 1,000 |
| I1004RU | 24 | 9.0 - 36.0 | 474 | 30 | 15.0 | 660 | 100 | 87 | 150 | 1,000 |
| I1005RU | 24 | 9.0 - 36.0 | 496 | 30 | \pm 5.0 | \pm 1,000 | \pm 150 | 84 | \pm 220 | 1,000 |
| I1006RU | 24 | 9.0 - 36.0 | 477 | 30 | \pm 12.0 | \pm 410 | \pm 61 | 86 | \pm 100 | 1,000 |
| I1007RU | 24 | 9.0 - 36.0 | 474 | 30 | \pm 15.0 | \pm 330 | \pm 50 | 87 | \pm 100 | 1,000 |
| I1011RU | 48 | 18.0 - 75.0 | 180 | 20 | 3.3 | 2,200 | 330 | 85 | 560 | 500 |
| I1012RU | 48 | 18.0 - 75.0 | 248 | 20 | 5.0 | 2,000 | 300 | 84 | 560 | 500 |
| I1013RU | 48 | 18.0 - 75.0 | 241 | 20 | 12.0 | 830 | 125 | 86 | 150 | 500 |
| I1014RU | 48 | 18.0 - 75.0 | 237 | 20 | 15.0 | 660 | 100 | 87 | 150 | 500 |
| I1015RU | 48 | 18.0 - 75.0 | 248 | 20 | \pm 5.0 | \pm 1,000 | \pm 150 | 84 | \pm 220 | 500 |
| I1016RU | 48 | 18.0 - 75.0 | 238 | 20 | \pm 12.0 | \pm 410 | \pm 61 | 86 | \pm 100 | 500 |
| I1017RU | 48 | 18.0 - 75.0 | 237 | 20 | \pm 15.0 | \pm 330 | \pm 50 | 87 | \pm 100 | 500 |

Notes:

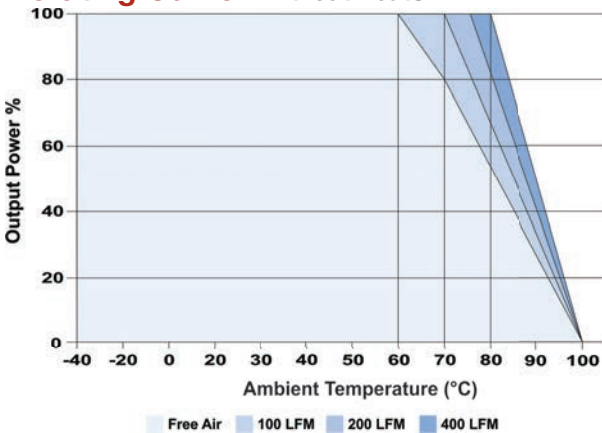
- Output ripple is measured with a 0.47 μ F ceramic capacitor connected across the outputs.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- Operation at no-load will not damage the unit, but they may not meet all specifications.
- The On/Off Control input (Pin 3) is referenced to -Vin (Pin 2). If it is not used, the control pin should be left open. If the pin is shorted to -Vin, the unit will turn off.
- 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.

| | Min | Max |
|-------------------|---------|---------|
| On | 2.5 VDC | 50 VDC |
| Off | 0.0 VDC | 1.0 VDC |
| In. Current (on) | | 0.5 mA |
| In. Current (off) | | -0.5 mA |

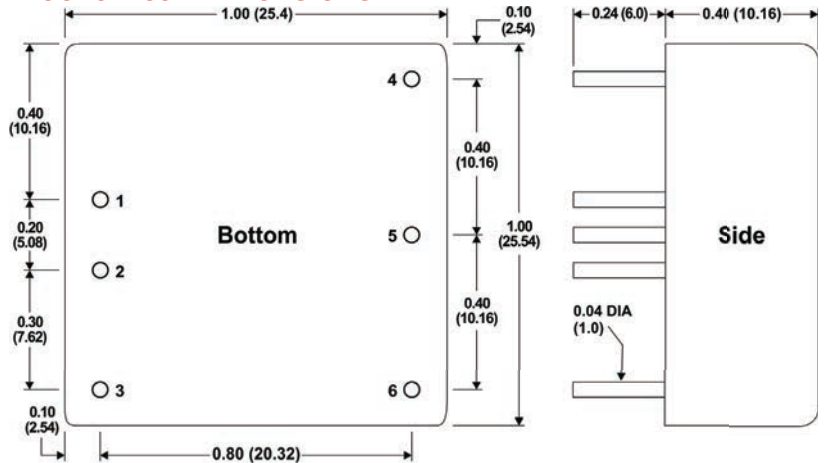
Pin Connections

| Pin | Single | Dual | Pin | Single | Dual |
|-----|---------------|------|-----|--------|--------|
| 1 | +Vin | +Vin | 4 | +Vout | +Vout |
| 2 | -Vin | -Vin | 5 | No Pin | Common |
| 3 | Remote ON/OFF | | 6 | -Vout | -Vout |

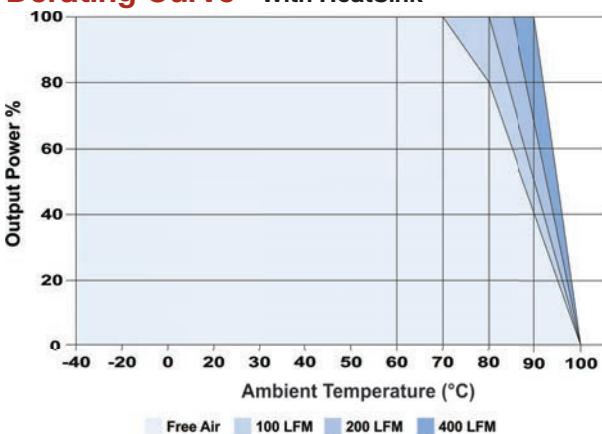
Derating Curve - Without HeatSink



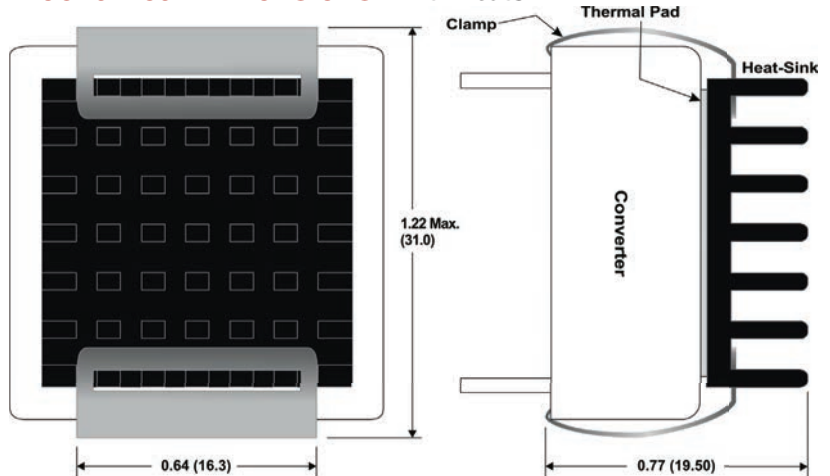
Mechanical Dimensions



Derating Curve - With HeatSink



Mechanical Dimensions - With HeatSink



Notes:

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



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