

A600ERU Series

Single & Dual Output, 6W Ultra-Wide Input Range DC/DC Converters



Key Features:

- 6W Output Power
- 4:1 Input Voltage Range
- 1,500 VDC Isolation
- -40°C to +85°C Temp Range
- Compact DIP Case
- Single & Dual Outputs
- 1.0 MH MTBF
- Industry Standard Pin-Out
- **Low, Low Cost**



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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 Voltage Range, See Note 1 | 24 VDC Input | 9.0 | 24.0 | 36.0 | VDC |
| | 48 VDC Input | 18.0 | 48.0 | 72.0 | |
| Input Filter | Capacitors | | | | |
| Reverse Polarity Input Current | | | | 1.0 | A |
| Short Circuit Input Power | | | | 2,500 | mW |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-------------------------|-----------------------------|------|-------|-------|----------|
| Output Voltage Accuracy | See Note 2 | | ±1.0 | ±3.0 | % |
| Output Voltage Balance | Dual Output, Balanced Loads | | ±3.0 | | % |
| Line Regulation | Vin = Min to Max | | ±0.2 | ±0.5 | % |
| Load Regulation | See Note 3 | | ±0.5 | ±1.0 | % |
| Noise (20 Hz - 300 kHz) | See Note 4 | | 30 | 50 | mV P - P |
| Ripple (DC - 20 MHz) | | | 100 | 300 | mV P - P |
| Output Power Protection | | 120 | | | % |
| Temperature Coefficient | | | ±0.01 | ±0.02 | %/°C |
| Output Short Circuit | Continuous | | | | |

General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|----------------------|---------------|-------|------|------|-------|
| Isolation Voltage | 60 Seconds | 1,500 | | | VDC |
| Isolation Resistance | 500 VDC | 1,000 | | | MΩ |
| Switching Frequency | Single Output | | 300 | | kHz |
| | Dual Output | | 250 | | |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------|------|------|------|-------|
| Operating Temperature Range | Ambient | -40 | | +85 | °C |
| Storage Temperature Range | | -55 | | +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 | 0.49 Oz (14g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------|---------------------------------|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 1.0 | | | MHours |

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 | °C |
| Internal Power Dissipation | All Models | | | 2,500 | mW |

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) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|------------------------------------|---------------|-------------------|-------------------|--------------------|----------------------------|
| | Voltage (VDC) | | Current (mA) | | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | |
| A601ERU | 24 | 9.0 - 36.0 | 278 | 20 | 10 | 3.3 | 1,500 | 150.0 | 75 | 1,500 |
| A602ERU | 24 | 9.0 - 36.0 | 312 | 20 | 10 | 5.0 | 1,200 | 120.0 | 80 | 1,500 |
| A603ERU | 24 | 9.0 - 36.0 | 304 | 20 | 10 | 12.0 | 500 | 50.0 | 82 | 1,500 |
| A604ERU | 24 | 9.0 - 36.0 | 304 | 20 | 10 | 15.0 | 400 | 40.0 | 82 | 1,500 |
| A605ERU | 24 | 9.0 - 36.0 | 301 | 20 | 10 | 24.0 | 250 | 25.0 | 83 | 1,500 |
| A606ERU | 24 | 9.0 - 36.0 | 312 | 20 | 10 | ±5.0 | ±600 | ±60.0 | 80 | 1,500 |
| A607ERU | 24 | 9.0 - 36.0 | 304 | 20 | 10 | ±12.0 | ±250 | ±25.0 | 82 | 1,500 |
| A608ERU | 24 | 9.0 - 36.0 | 298 | 20 | 10 | ±15.0 | ±200 | ±20.0 | 84 | 1,500 |
| A609ERU | 24 | 9.0 - 36.0 | 294 | 20 | 10 | ±24.0 | ±125 | ±13.0 | 85 | 1,500 |
| A611ERU | 48 | 18.0 - 72.0 | 137 | 10 | 10 | 3.3 | 1,500 | 150.0 | 76 | 750 |
| A612ERU | 48 | 18.0 - 72.0 | 156 | 10 | 10 | 5.0 | 1,200 | 120.0 | 80 | 750 |
| A613ERU | 48 | 18.0 - 72.0 | 152 | 10 | 10 | 12.0 | 500 | 50.0 | 82 | 750 |
| A614ERU | 48 | 18.0 - 72.0 | 147 | 10 | 10 | 15.0 | 400 | 40.0 | 85 | 750 |
| A616ERU | 48 | 18.0 - 72.0 | 156 | 10 | 10 | ±5.0 | ±600 | ±60.0 | 80 | 750 |
| A617ERU | 48 | 18.0 - 72.0 | 152 | 10 | 10 | ±12.0 | ±250 | ±25.0 | 82 | 750 |
| A618ERU | 48 | 18.0 - 72.0 | 149 | 10 | 10 | ±15.0 | ±200 | ±20.0 | 84 | 750 |

Notes:

- Exceeding the input range by a significant margin may damage the units. For 24V input the input voltage should not exceed 40V; for 48V models it should not exceed 80V.
- Output accuracy for the negative output of dual output units is typically ±3% (±5% max.).
- Output load regulation is specified for a load change of 10% to 100%. For 3.3V output units, the load regulation is ±1.5% max.
- When measuring output ripple, it is recommended that an external 0.33 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 units should not be operated with a load under the specified minimum. Operation at no-load will increase ripple significantly and may cause damage to the unit.
- 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:

| Vin | Input Capacitor | Vout | Output Capacitor |
|--------|-----------------|---------|------------------|
| 24 VDC | 100 μF | 3.3 VDC | 100 μF |
| 48 VDC | 100 μF | 5 VDC | 100 μF |
| | | 12 VDC | 100 μF |
| | | 15 VDC | 47 μF |
| | | 24 VDC | 47 μF |

For applications requiring very low output noise levels, a simple LC filter should be effective.

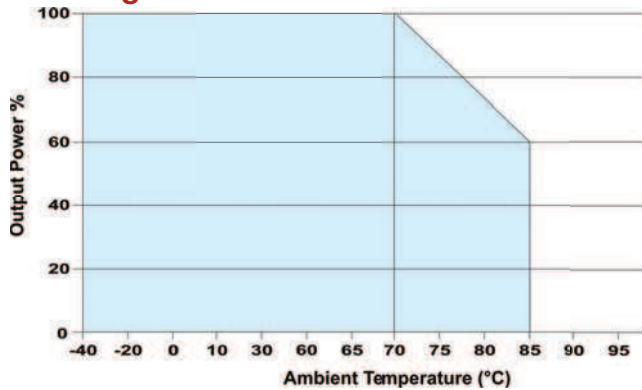
- It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

Pin Connections

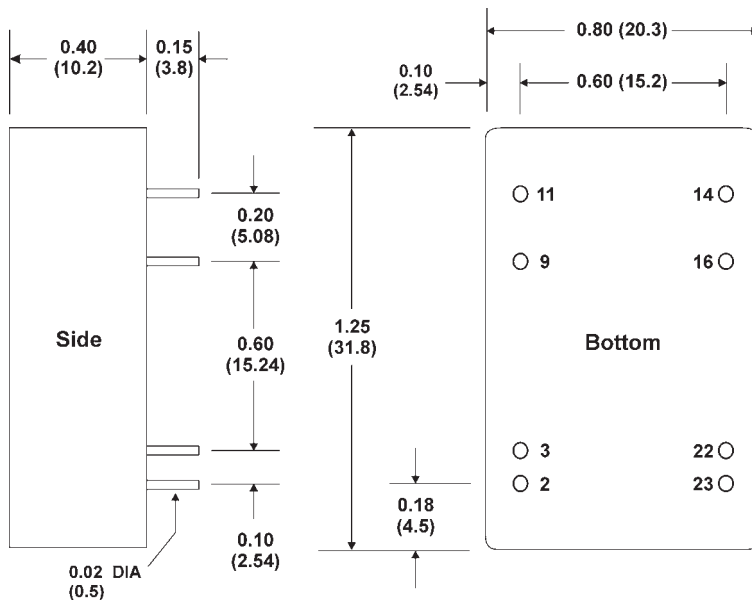
| Pin | Single | Dual |
|--------|--------|--------|
| 2, 3 | -Vin | -Vin |
| 9 | No Pin | Common |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Common |
| 22, 23 | +Vin | +Vin |

NC: No Connection

Derating Curve



Mechanical Dimensions



Mechanical Notes:

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



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