# ARTESYN ERM SERIES

20 Watts




Advanced Energy's Artesyn ERM20W series of high performance 20 watt isolated DC-DC converter modules are designed specifically for railway applications. There are 3 input versions available; 9 - 36Vin, 18-75Vin and 40-160Vin input that complies with the EN61368-1 and EN 50155 safety standards and EMI standard EN50121-302 for electronic equipment used on railway rolling stock. There is a choice of four single output models, offering single output voltages of 5 V, 12 V, 15 V or 24 V, and dual +/-12 and +/-15 versions.

**DATA SHEET**

**Total Power:**

20 Watts

**Input Voltage:**

12 V, 24 V, 48 V, 72 V or 110 V

**# of Outputs:**

Single, Dual

## SPECIAL FEATURES

- Encapsulated
- Wide 4:1 input range
- 1" x 2" DIP package
- 3000 Vac rms I/O isolation
- Single and dual output
- OCP, OVP, OTP Protection
- Remote On/Off
- High efficiency - 88%
- Fire protection meets EN45545-2
- Railway EMC standard EN50121-3-2

## SAFETY

- UL/cUL/IEC/EN 62368-1 (60950-1) Safety Approval & CE Marking

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## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| **Input** | |
| Input range | 9 to 36 Vdc; 18 to 75 Vdc; 40 to 160 Vdc |
| Efficiency[2] | 88% @ 24 Vo |
| **Output** | |
| Voltage tolerance | ±1.0% |
| Line regulation | ±0.2% |
| Load regulation | Single output: ±0.5%; Dual output 1±.0% |
| Noise/ripple | 150 mV |
| OCP and S/C protection | Hiccup |
| Overvoltage protection | Latched |
| Switching frequency | 320 KHz |
| Temperature co-efficient | ±0.02 /°C |
| **Isolation** | |
| I/O isolation | 3000 Vac rms min. |
| Insulation resistance | 1000 Mohm |
| Insulation capacitance | 1500 pF |

## ENVIRONMENTAL SPECIFICATIONS

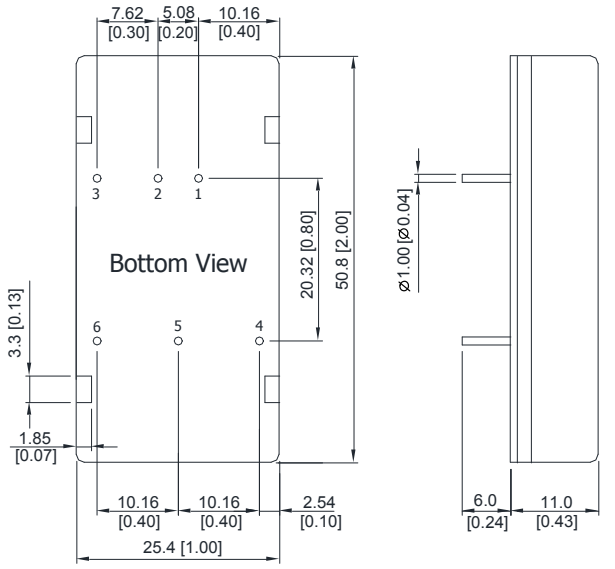
| | |
|---|---|
| **Operating ambient temperature range** | -40 °C to +85 °C (with derating) |
| **Storage temperature** | -50 °C to +125 °C |
| **Humidity** | 5% to 95% (non-condensing) |

## ORDERING INFORMATION

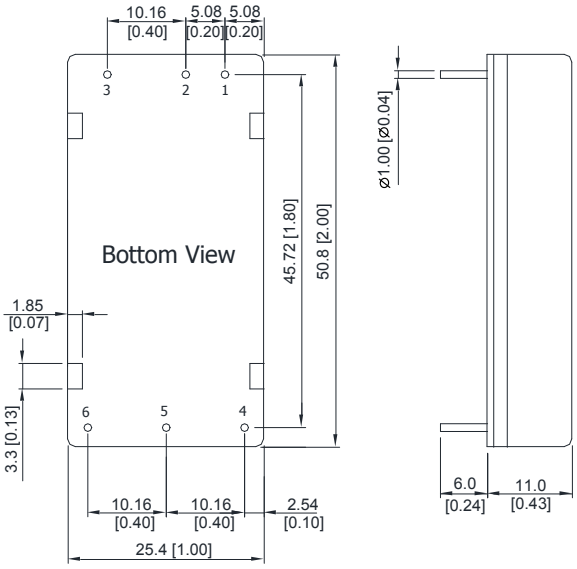
| Model Number | Input Voltage | Output | Efficiency @ Max Load | Max Power |
|---|---|---|---|---|
| ERM04A18 | 9 - 36 Vin | 5 V @ 4 A | 87% | 20 W |
| ERM01B18 | 9 - 36 Vin | 12 V @ 1.67 A | 87% | 20 W |
| ERM01C18 | 9 - 36 Vin | 15 V @ 1.33 A | 87% | 20 W |
| ERM01H18 | 9 - 36 Vin | 24 V @ 0.833 A | 87% | 20 W |
| ERM01BB18 | 9 - 36 Vin | ±12 V @ 0.833 A | 86% | 20 W |
| ERM01CC18 | 9 -36 Vin | ±15 V @ 0.667 A | 86% | 20 W |
| ERM04A36 | 18 - 75 Vin | 5 V @ 4 A | 87% | 20 W |
| ERM01B36 | 18 - 75 Vin | 12 V @ 1.67 A | 88% | 20 W |
| ERM01C36 | 18 - 75 Vin | 15 V @ 1.33 A | 88% | 20 W |
| ERM01H36 | 18 - 75 Vin | 24 V @ 0.833 A | 88% | 20 W |
| ERM01BB36 | 18 - 75 Vin | ±12 V @ 0.833 A | 87% | 20 W |
| ERM01CC36 | 18 - 75 Vin | ±15 V @ 0.667 A | 87% | 20 W |
| ERM04A110 | 40 - 160 Vin | 5 V @ 4 A | 84% | 20 W |
| ERM01B110 | 40 - 160 Vin | 12 V @ 1.67 A | 86% | 20 W |
| ERM01C110 | 40 - 160 Vin | 15 V @ 1.33 A | 86% | 20 W |
| ERM01H110 | 40 - 160 Vin | 24 V @ 0.833 A | 86% | 20 W |
| ERM01BB110 | 40 - 160 Vin | ±12 V @ 0.833 A | 86% | 20 W |
| ERM01CC110 | 40 -160 Vin | ±15 V @ 0.667 A | 86% | 20 W |
| ERM04A18B | 9 - 36 Vin | 5 V @ 4 A | 85% | 20 W |
| ERM01B18B | 9 - 36 Vin | 12 V @ 1.67 A | 87% | 20 W |
| ERM01C18B | 9 - 36 Vin | 15 V @ 1.33 A | 87% | 20 W |
| ERM01H18B | 9 - 36 Vin | 24 V @ 0.833 A | 87% | 20 W |
| ERM01BB18B | 9 - 36 Vin | ±12 V @ 0.833 A | 86% | 20 W |
| ERM01CC18B | 9 -36 Vin | ±15 V @ 0.667 A | 86% | 20 W |
| ERM04A36B | 18 - 75 Vin | 5 V @ 4 A | 85% | 20 W |
| ERM01B36B | 18 - 75 Vin | 12 V @ 1.67 A | 88% | 20 W |
| ERM01C36B | 18 - 75 Vin | 15 V @ 1.33 A | 88% | 20 W |
| ERM01H36B | 18 - 75 Vin | 24 V @ 0.833 A | 88% | 20 W |
| ERM01BB36B | 18 - 75 Vin | ±12 V @ 0.833 A | 87% | 20 W |
| ERM01CC36B | 18 - 75 Vin | ±15 V @ 0.667 A | 87% | 20 W |
| ERM04A110B | 40 - 160 Vin | 5 V @ 4 A | 83% | 20 W |
| ERM01B110B | 40 - 160 Vin | 12 V @ 1.67 A | 86% | 20 W |
| ERM01C110B | 40 - 160 Vin | 15 V @ 1.33 A | 86% | 20 W |
| ERM01H110B | 40 - 160 Vin | 24 V @ 0.833 A | 85% | 20 W |
| ERM01BB110B | 40 - 160 Vin | ±12 V @ 0.833 A | 86% | 20 W |
| ERM01CC110B | 40 -160 Vin | ±15 V @ 0.667 A | 86% | 20 W |

## MECHANICAL DRAWINGS

### ERMxxxxx Models




### ERMxxxxxB Models




| Pin Connectors - ERMxxxxx Models | | |
|---|---|---|
| **Pin No.** | **Single Output** | **Dual Output** |
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | Remote On/Off | Remote On/Off |
| 4 | +Vout | +Vout |
| 5 | Trim | Common |
| 6 | -Vout | -Vout |

| Pin Connectors - ERMxxxxxB Models | | |
|---|---|---|
| **Pin No.** | **Single Output** | **Dual Output** |
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | Remote On/Off | Remote On/Off |
| 4 | +Vout | +Vout |
| 5 | -Vout | Common |
| 6 | Trim | -Vout |

T: 11.0 mm (0.43 inch) for 24 V Output Models
T: 10.2 mm (0.40 inch) for Other Output Models

- All dimensions in mm (inches)
- Tolerance: X.X±0.75 (X.XX±0.03)
  X.XX±0.25 ( X.XXX±0.01)
- Pin diameter Ø 1.0 ±0.05 (0.04±0.002)

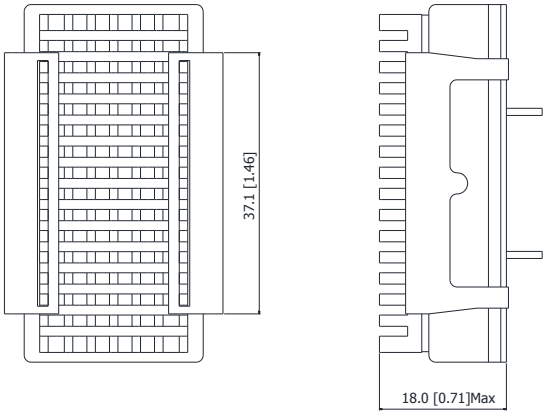
## PHYSICAL CHARACTERISTICS

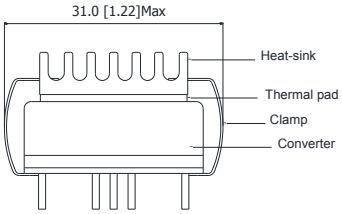
| | |
|---|---|
| **Case Size** | 50.8 x 25.4 x 11 mm (2.0 x 1.0 x 0.43 inches) |
| **Case Material** | Red copper, powder coating |
| **Base Material** | FR4 PCB (flammability to UL 94V-0 rated) |
| **Insulated Frame Material** | Non-conductive black plastic (flammability to UL 94V-0 rated) |
| **Pin Material** | Tinned copper |
| **Potting Material** | Epoxy (flammability to UL 94V-0 rated) |
| **Weight** | 40.5 g |

To order the converter with heatsink, please add a suffix –HS (ERM00B110-HS) to order code.

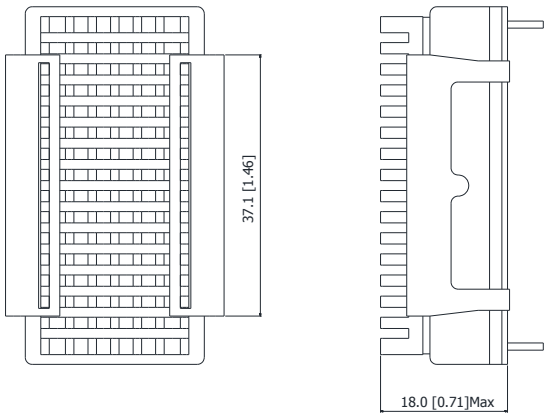
## MECHANICAL DRAWINGS

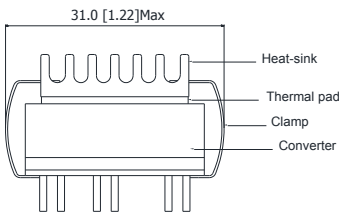
### Heatsink for ERMxxxxx Models (Option - HS)




### Heatsink for ERMxxxxxB Models (Option - HS)




The advantages of adding a heatsink are:

1. To help heat dissipation and increase the stability and reliability of DC/DC converters at high operating temperature atmosphere.
2. To upgrade the operating temperature of DC/DC converters, please refer to Derating Curve.

## PHYSICAL CHARACTERISTICS

| | |
|---|---|
| **Heatsink Material** | Aluminum |
| **Finish** | Black Anodized Coating |
| **Weight** | 9 g |

***Notes:***

1. All specifications are subject to change without notice. Mechanical drawings are for reference only.
2. Warranty: 3 years
3. Label and logo appearance may vary from what is shown on mechanical drawings.

## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

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