

50 Watts

- Regulated Single Output
- Wide 4:1 Input Range
- 2" x 1" Package
- 1.5kVDC Input to Output Isolation
- Operating Temperature -40°C to +105°C
- Full Power to +69°C
- ITE Safety Approvals
- Remote On/Off and Output Trim
- High Power Density
- Optional Heatsink
- 6-Sided Metal Case
- 3 Year Warranty



Dimensions:

JWL50:

2.00 x 1.00 x 0.43" (50.8 x 25.4 x 11.0 mm)

The JWL50 series offers high efficiency power conversion in a compact, industry standard format. Features include remote on/off, trim function and over temperature protection.

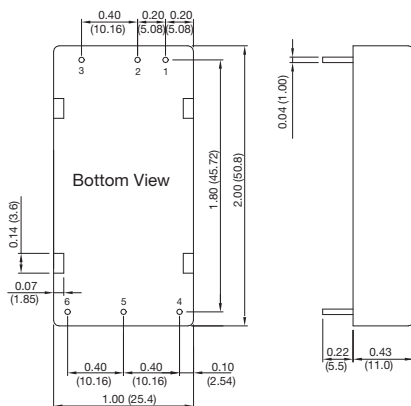
Models & Ratings

| Input voltage | Output voltage | Output current | Input current ^(1,2) | | Overvoltage Protection | Maximum capacitive load ⁽³⁾ | Efficiency | Model number ⁽⁴⁾ |
|-----------------|----------------|----------------|--------------------------------|-----------|------------------------|--|------------|-----------------------------|
| | | | No load | Full load | | | | |
| 24V (9-36V) | 3V3 | 10.00 A | 80 mA | 1.53 A | 3.9 V | 26000 µF | 90% | JWL5024S3V3 |
| | 5 V | 10.00 A | 60 mA | 2.29 A | 6.2 V | 17000 µF | 91% | JWL5024S05 |
| | 12 V | 4.17 A | 80 mA | 2.27 A | 15.0 V | 3000 µF | 92% | JWL5024S12 |
| | 15 V | 3.33 A | 80 mA | 2.26 A | 18.0 V | 2000 µF | 92% | JWL5024S15 |
| | 24 V | 2.08 A | 80 mA | 2.29 A | 30 V | 750 µF | 91% | JWL5024S24 |
| 24V (18-75V) | 3V3 | 10.00 A | 40 mA | 0.76 A | 3.9 V | 26000 µF | 90% | JWL5048S3V3 |
| | 5 V | 10.00 A | 30 mA | 1.15 A | 6.2 V | 17000 µF | 91% | JWL5048S05 |
| | 12 V | 4.17 A | 60 mA | 1.13 A | 15.0 V | 3000 µF | 92% | JWL5048S12 |
| | 15 V | 3.33 A | 60 mA | 1.13 A | 18.0 V | 2000 µF | 92% | JWL5048S15 |
| | 24 V | 2.08 A | 50 mA | 1.14 A | 30 V | 750 µF | 91% | JWL5048S24 |

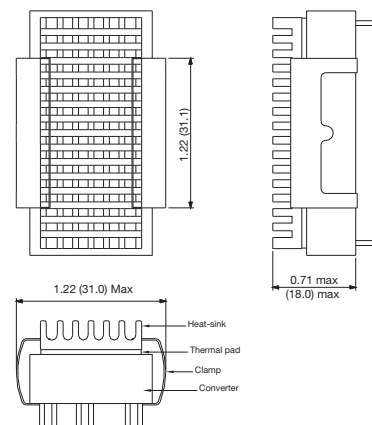
Notes

1. Input currents measured at nominal input voltage.
2. Input current is typically 2.5 mA at nominal input voltage when output is turned off using remote on/off.
3. Add suffix "-HK" for optional heatsink.

Mechanical Details



Optional Heatsink (-HK)



Pin Connections

| Pin | Single |
|-----|---------------|
| 1 | +Vin |
| 2 | -Vin |
| 3 | Remote On/Off |
| 4 | +Vout |
| 5 | -Vout |
| 6 | Trim |

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.074 lbs (34.0g) approx.
3. Tolerance: X.XX±0.01 (X.X±0.25)
X.XXX±0.005 (X.XX±0.13)
4. Pin Tolerance: ±0.002 (±0.05)

Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|---------------------|--|---------|---------|-------------|--------------------|
| Input Voltage Range | 9 | | 36 | VDC | 24 V nominal |
| | 18 | | 75 | VDC | 48 V nominal |
| Input Filter | Internal Pi type | | | | |
| Input Surge | | | 50 | VDC for 1 s | 24 V models |
| | | | 100 | | 48 V models |
| Remote On/Off | ON: Logic high (3.5-12 V) or open circuit OFF: Logic low (<1.2 V) or short pin 2 to pin 3 | | | | |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------|---|---------|---------|-------------|--|
| Output Voltage | 3.3 | | 24 | VDC | See Models and Ratings table |
| Initial Set Accuracy | | | ±1.0 | % | At full load |
| Output Trim | | | ±10 | % | See Application Notes |
| Minimum Load | 0 | | | A | No minimum load required |
| Line Regulation | | | ±0.5 | % | From minimum to maximum input at full load |
| Load Regulation | | | ±0.5 | % | From 0 to full load |
| Transient Response | | 3 | 5 | % deviation | Recovery within 1% in less than 250 µs for a 25% load change. |
| Ripple & Noise | | | 100/150 | mV pk-pk | 3.3 & 5V output / other models. 20 MHz bandwidth. Measured using 1µF MLCC & 10µF tantalum capacitor. |
| Overload Protection | | 150 | | % | |
| Short Circuit Protection | Continuous trip & restart (hiccup mode), with auto recovery | | | | |
| Maximum Capacitive Load | | | | | See Models and Ratings table |
| Temperature Coefficient | | | 0.02 | %/°C | |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|----------------------------|--|--------------|---------|-------------------|------------------------------|
| Efficiency | | 90 | | % | See Models and Ratings table |
| Isolation: Input to Output | 1500 | | | VDC | 60 s functional |
| Isolation Resistance | 10 ⁹ | | | Ω | At 500 VDC |
| Isolation Capacitance | | | 2200 | pF | |
| Switching Frequency | | 285 | | kHz | |
| Power Density | | | 58 | W/in ³ | |
| Mean Time Between Failure | | 230 | | kHrs | MIL-HDBK-217F, +25 °C GB |
| Case Material | Black anodised aluminium with plastic base UL94V-0 rated | | | | |
| Potting Material | Epoxy UL94V-0 rated | | | | |
| Pin Material | Gold plated with copper alloy and nickel base | | | | |
| Solder Profile | Max 260 °C 1.5mm from case 10s | | | | |
| Weight | | 0.074 (34.0) | | lb (g) | |

Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------|---------|---------|----------|-------|-------------------------------|
| Operating Temperature | -40 | | +105 | °C | See Derating Curve. |
| Storage Temperature | -50 | | +125 | °C | |
| Case Temperature | | | +105 | °C | |
| Humidity | | | 95 | %RH | Non-condensing |
| Cooling | | | | | Natural convection |
| Thermal impedance to air | | | 12.1/9.8 | °C/W | No heatsink / with heatsink |
| Altitude | | | 6000 | m | Operating. Storage to 10,000m |

EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & Conditions |
|------------|----------|------------|-----------------------|
| Conducted | EN55032 | Class A | See Application Notes |

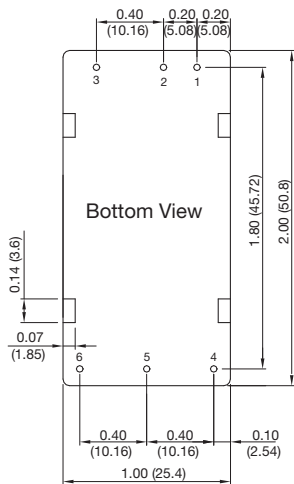
EMC: Immunity

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|------------|-------------|------------------------------------|----------|--|
| ESD | EN61000-4-2 | ±8 kV air discharge, ±6 kV contact | A | |
| Radiated | EN61000-4-3 | 10 V/m | A | |
| EFT/Burst | EN61000-4-4 | ±2 kV | A | With external capacitor, suggested part is CHEMI-CON KY 220µF/100V |
| Surge | EN61000-4-5 | ±1 kV | A | With external capacitor, suggested part is CHEMI-CON KY 220µF/100V |
| Conducted | EN61000-4-6 | 10 V rms | A | |

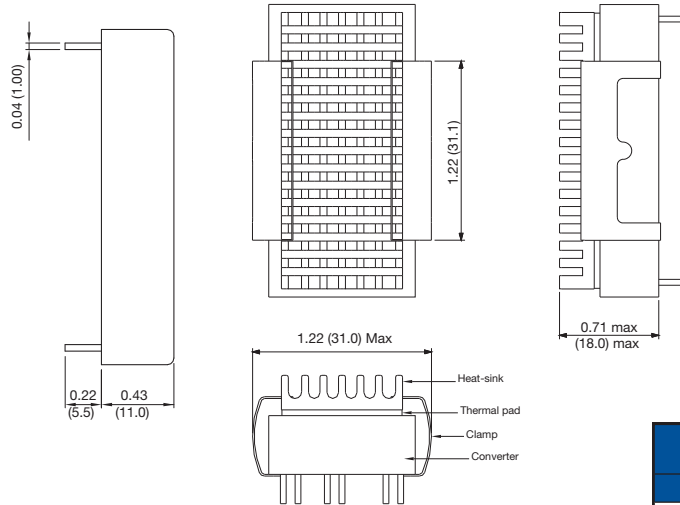
Safety Approvals

| Safety Agency | Safety Standard | Notes & Conditions |
|---------------|----------------------------------|------------------------|
| UL | UL60950-1, UL62368-1 | Information Technology |
| CE | Meets all applicable directives | |
| UKCA | Meets all applicable legislation | |

Mechanical Details



Optional Heatsink (-HK)



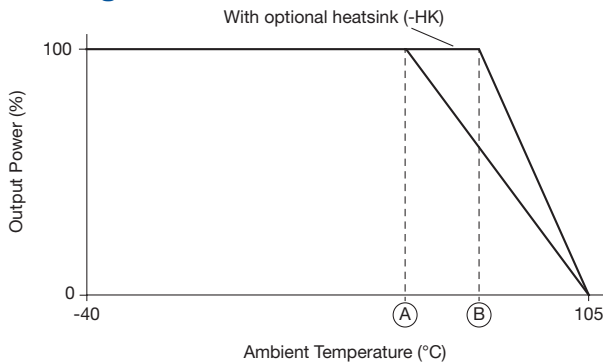
Notes

- All dimensions are in inches (mm)
- Weight: 0.074 lbs (34.0g) approx.
- Tolerance: X.XX±0.01 (X.X±0.25)
X.XXX±0.005 (X.XX±0.13)
- Pin Tolerance: ±0.002 (±0.05)

| Pin Connections | |
|-----------------|---------------|
| Pin | Single |
| 1 | +Vin |
| 2 | -Vin |
| 3 | Remote On/Off |
| 4 | +Vout |
| 5 | -Vout |
| 6 | Trim |

Application Notes

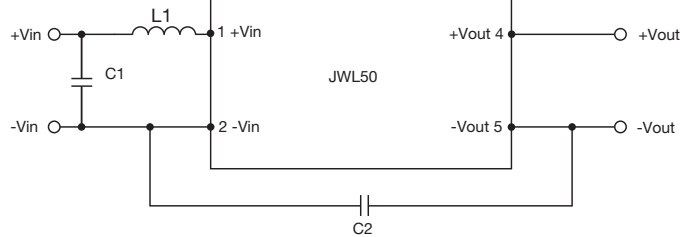
Derating Curve



| Models - JWL50 | Max Ambient Temperature | |
|-------------------------------|-------------------------|-------------------|
| | No Heatsink (A) | With Heatsink (B) |
| 24S3V3, 48S3V3 | 61°C | 69°C |
| 24S12, 24S15 48S12, 48S15 | 53°C | 62°C |
| 24S05, 24S24, 48S05, 48S24 | 46°C | 57°C |

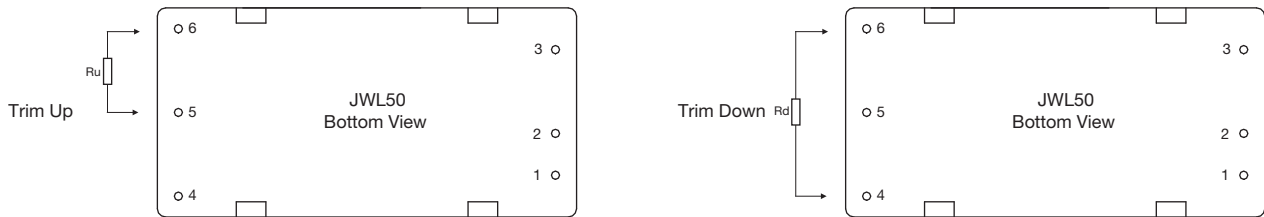
Application Notes

EMI Filter for Conducted Emissions



| Class | Model | C1 | C2 | L1 |
|---------|-------|--------------------------------|-----------------------|-------------|
| Class A | 24V | 10 μ F/50V 1210 X7S MLCC | 1000 pF/2kV 1206 MLCC | 1.5 μ H |
| | 48V | 3.3 μ F/100V 1210 X7S MLCC | 1000 pF/2kV 1206 MLCC | 6.8 μ H |

External Output Trimming



Trim Down Resistor Values (Rd)

| Models | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Voutx0.99 | Voutx0.98 | Voutx0.97 | Voutx0.96 | Voutx0.95 | Voutx0.94 | Voutx0.93 | Voutx0.92 | Voutx0.91 | Voutx0.90 |
| 3V3 | 72.61 k | 32.55 k | 19.20 k | 12.52 k | 8.51 k | 5.84 k | 3.94 k | 2.51 k | 1.39 k | 0.50 k |
| 5V | 138.88 k | 62.41 k | 36.92 k | 24.18 k | 16.53 k | 11.44 k | 7.79 k | 5.06 k | 2.94 k | 1.24 k |
| 12V | 413.55 k | 184.55 k | 108.22 k | 70.05 k | 47.15 k | 31.88 k | 20.98 k | 12.80 k | 6.44 k | 1.35 k |
| 15V | 530.73 k | 238.61 k | 141.24 k | 92.56 k | 63.35 k | 43.87 k | 29.96 k | 19.53 k | 11.41 k | 4.92 k |
| 24V | 333.39 k | 148.80 k | 87.26 k | 56.50 k | 38.04 k | 25.73 k | 16.94 k | 10.35 k | 5.22 k | 1.12 k |

Trim Up Resistor Values (Ru)

| Models | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Voutx1.01 | Voutx1.02 | Voutx1.03 | Voutx1.04 | Voutx1.05 | Voutx1.06 | Voutx1.07 | Voutx1.08 | Voutx1.09 | Voutx1.10 |
| 3V3 | 60.84 k | 27.40 k | 16.25 k | 10.68 k | 7.34 k | 5.11 k | 3.51 k | 2.32 k | 1.39 k | 0.65 k |
| 5V | 106.87 k | 47.76 k | 28.06 k | 18.21 k | 12.30 k | 8.36 k | 5.55 k | 3.44 k | 1.79 k | 0.48 k |
| 12V | 351.00 k | 157.50 k | 93.00 k | 60.75 k | 41.40 k | 28.50 k | 19.29 k | 12.37 k | 7.00 k | 2.70 k |
| 15V | 422.77 k | 189.89 k | 112.26 k | 73.44 k | 50.15 k | 34.63 k | 23.54 k | 15.22 k | 8.75 k | 3.58 k |
| 24V | 243.70 k | 108.50 k | 63.43 k | 40.90 k | 27.38 k | 18.37 k | 11.93 k | 7.10 k | 3.34 k | 0.34 k |

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