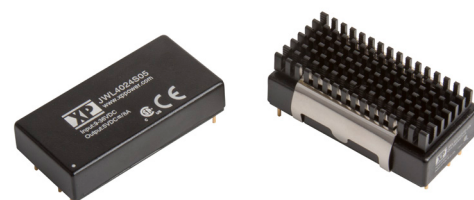


The 40W JWL40 series is housed in a 50.8 x 25.4 x 11.0mm (2" x 1" x 0.43") metal cased package. Featuring a 4:1 input voltage range of 9 to 36VDC for nominal 24VDC or 18 to 75VDC for a nominal 48VDC, ideal for many applications that demand multiple input voltages or where the input voltage varies widely.

Single output models provide 3.3, 5, 12, 15 or 24VDC and dual outputs of  $\pm 12$ VDC, or  $\pm 15$ VDC that can be configured as a single 30VDC. The JWL40 has a regulated output and provides 1.5kVDC isolation between input and output. Remote on/off is standard.

Operating temperature range is from -40°C to +105°C, with derating above +40°C. An optional heatsink (suffix -HK) extends the full power operating temperature when fitted.



### Features

- ▶ Regulated single outputs 3.3 to 24VDC
- ▶ Regulated dual outputs  $\pm 12$  &  $\pm 15$ VDC
- ▶ 4:1 input range
- ▶ 50.8 x 25.4mm (2" x 1") footprint, 11.0mm profile
- ▶ 1.5kVDC isolation
- ▶ Remote On/Off
- ▶ Optional Heatsink
- ▶ -40°C to +105°C operating temperature
- ▶ Full power to +40°C
- ▶ 3 year warranty

### Applications



### Dimensions

#### JWL40 (24V output)

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

#### JWL40 (All other models)

50.8 x 25.4 x 10.2mm (2.00 x 1.00 x 0.40")

### Models & ratings

| Model number <sup>(4)</sup> | Input voltage | Output voltage | Output current | Efficiency | Input current <sup>(1,2)</sup> |           | Overvoltage Protection | Maximum capacitive load <sup>(3)</sup> |
|-----------------------------|---------------|----------------|----------------|------------|--------------------------------|-----------|------------------------|----------------------------------------|
|                             |               |                |                |            | No load                        | Full load |                        |                                        |
| JWL4024S3V3                 | 9-36VDC       | 3V3VDC         | 8.00A          | 89%        | 90mA                           | 1.24A     | 3.9VDC                 | 21000 $\mu$ F                          |
| JWL4024S05                  |               | 5.0VDC         | 8.00A          | 90%        | 90mA                           | 1.85A     | 6.2VDC                 | 13600 $\mu$ F                          |
| JWL4024S12                  |               | 12.0VDC        | 3.33A          | 89%        | 95mA                           | 1.87A     | 15.0VDC                | 2400 $\mu$ F                           |
| JWL4024S15                  |               | 15.0VDC        | 2.67A          | 89%        | 105mA                          | 1.87A     | 18.0VDC                | 1500 $\mu$ F                           |
| JWL4024S24                  |               | 24.0VDC        | 1.67A          | 91%        | 115mA                          | 1.84A     | 30VDC                  | 600 $\mu$ F                            |
| JWL4024D12                  |               | $\pm 12.0$ VDC | $\pm 1.67$ A   | 88%        | 65mA                           | 1.89A     | $\pm 15.0$ VDC         | $\pm 1200$ $\mu$ F                     |
| JWL4024D15                  |               | $\pm 15.0$ VDC | $\pm 1.33$ A   | 88%        | 65mA                           | 1.89A     | $\pm 18.0$ VDC         | $\pm 750$ $\mu$ F                      |

Continued on page 2

#### Notes:

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

## Models & ratings

| Model number <sup>(4)</sup> | Input voltage | Output voltage | Output current | Efficiency | Input current <sup>(1,2)</sup> |           | Overvoltage Protection | Maximum capacitive load <sup>(3)</sup> |
|-----------------------------|---------------|----------------|----------------|------------|--------------------------------|-----------|------------------------|----------------------------------------|
|                             |               |                |                |            | No load                        | Full load |                        |                                        |
| JWL4048S3V3                 | 18-75VDC      | 3V3VDC         | 8.00A          | 89%        | 55mA                           | 0.62A     | 3.9VDC                 | 21000μF                                |
| JWL4048S05                  |               | 5.0VDC         | 8.00A          | 90%        | 55mA                           | 0.93A     | 6.2VDC                 | 13600μF                                |
| JWL4048S12                  |               | 12.0VDC        | 3.33A          | 90%        | 69mA                           | 0.93A     | 15.0VDC                | 2400μF                                 |
| JWL4048S15                  |               | 15.0VDC        | 2.67A          | 90%        | 65mA                           | 0.93A     | 18.0VDC                | 1500μF                                 |
| JWL4048S24                  |               | 24.0VDC        | 1.67A          | 91%        | 75mA                           | 0.92A     | 30VDC                  | 600μF                                  |
| JWL4048D12                  |               | ±12.0VDC       | ±1.67A         | 88%        | 45mA                           | 0.95A     | ±15.0VDC               | ±1200μF                                |
| JWL4048D15                  |               | ±15.0VDC       | ±1.33A         | 88%        | 45mA                           | 0.95A     | ±18.0VDC               | ±750μF                                 |

### Notes:

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

## Input

| Characteristic      | Minimum                                                                                      | Typical | Maximum | Units | Notes & conditions    |
|---------------------|----------------------------------------------------------------------------------------------|---------|---------|-------|-----------------------|
| Input voltage range | 9                                                                                            |         | 36      | VDC   | 24VDC nominal         |
|                     | 18                                                                                           |         | 75      |       | 48VDC nominal         |
| Input filter        | Internal Pi type                                                                             |         |         |       |                       |
| Input surge         |                                                                                              |         | 50      | VDC   | 24VDC models (for 1s) |
|                     |                                                                                              |         | 100     |       | 48VDC models (for 1s) |
| Remote On/Off       | ON: Logic high (3.5-12 V) or open circuit<br>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                                                           |         | 30        | VDC         | See models and ratings table                                                                  |
| Output voltage trim      |                                                               |         | ±10       | %           | See application notes                                                                         |
| Initial set accuracy     |                                                               |         | ±1        | %           | At full load                                                                                  |
| Output voltage balance   |                                                               |         | ±2        | %           | For dual output with balanced loads                                                           |
| Minimum load             | 0                                                             |         |           | A           | No minimum load required                                                                      |
| Line regulation          |                                                               |         | ±0.5      | %           | From minimum to maximum input at full load                                                    |
| Load regulation          |                                                               |         | ±0.5/±1.0 | %           | Single/dual output, from 0 to full load                                                       |
| Cross regulation         |                                                               |         | ±5        | %           | On dual output models when one load is varied between 25% and 100% and other is fixed at 100% |
| Transient Response       |                                                               | 3       | 5         | % deviation | Recovery within 1% in less than 250μs for a 25% load change.                                  |
| Ripple & noise           |                                                               |         | 100/150   | mV pk-pk    | 3.3 & 5VDC output / other models. 20MHz bandwidth. Measured using 0.47μF ceramic capacitor.   |
| Short circuit protection | Continuous trip and restart (hiccup mode), with auto recovery |         |           |             |                                                                                               |
| Maximum capacitive load  | See models and ratings table                                  |         |           |             |                                                                                               |
| Temperature coefficient  |                                                               |         | 0.02      | %/ °C       |                                                                                               |
| Overload protection      |                                                               | 150     |           | %           |                                                                                               |

## General

| Characteristic             | Minimum         | Typical      | Maximum     | Units                                  | Notes & conditions         |
|----------------------------|-----------------|--------------|-------------|----------------------------------------|----------------------------|
| Efficiency                 |                 | 90           |             | %                                      | See models & ratings table |
| Isolation: input to output | 1500/1800       |              |             | VDC                                    | 60s/1s functional          |
| Isolation capacitance      |                 |              | 1500        | pF                                     |                            |
| Isolation resistance       | 10 <sup>9</sup> |              |             | Ω                                      | At 500VDC                  |
| Switching frequency        |                 | 285          |             | kHz                                    |                            |
| Power density              |                 |              | 3.05 (50.0) | W/cm <sup>3</sup> (W/in <sup>3</sup> ) |                            |
| Mean time between failure  |                 | 320          |             | khrs                                   | MIL-HDBK-217F, +25°C GB    |
| Weight                     |                 | 30.0 (0.066) |             | g (lb)                                 |                            |

## 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    |                           |
| Cooling                  | Natural convection |         |         |       |                           |
| Humidity                 |                    |         | 95      | %     | RH, non condensing        |
| Thermal impedance to air |                    |         | 12/10   | °C/W  | No heatsink/with heatsink |

## Safety approvals

| Safety agency | Standard                         | Notes & conditions     |
|---------------|----------------------------------|------------------------|
| UL            | UL60950-1, UL62368-1             | Information technology |
| CE            | Meets all applicable directives  |                        |
| UKCA          | Meets all applicable legislation |                        |

## Emissions - EMC

| Phenomenon | Standard | Test level | Notes & conditions   |
|------------|----------|------------|----------------------|
| Conducted  | EN55022  | Class A    | See application note |

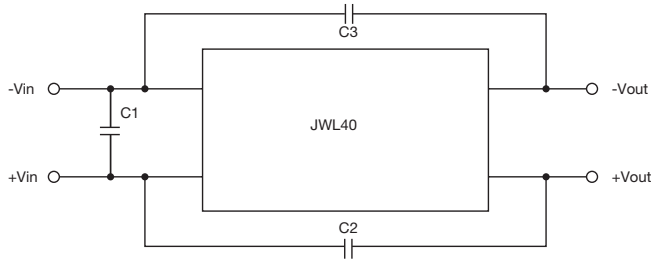
## Immunity - EMC

| Phenomenon         | Standard    | Test level | Criteria | Notes & conditions                                                 |
|--------------------|-------------|------------|----------|--------------------------------------------------------------------|
| ESD immunity       | EN61000-4-2 | ±6kV/±8kV  | A        | Air discharge/contact discharge                                    |
| Radiated immunity  | EN61000-4-3 | 10V/m      | A        |                                                                    |
| EFT/burst          | EN61000-4-4 | ±2kV       | A        | With external capacitor, suggested part is CHEMI-CON KY 220μF/100V |
| Surge              | EN61000-4-5 | ±1kV       | A        | With external capacitor, suggested part is CHEMI-CON KY 220μF/100V |
| Conducted immunity | EN61000-4-6 | 10Vrms     | A        |                                                                    |

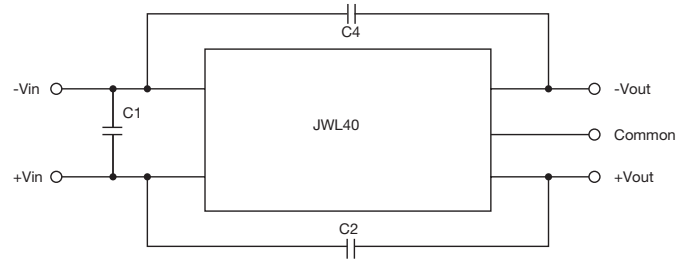
## Application notes

### EMI filter for conducted emissions

#### Single output

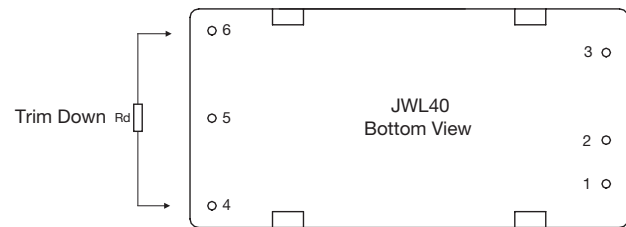
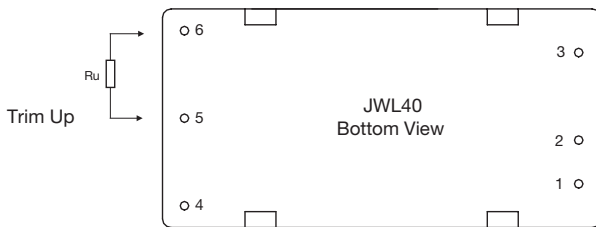


#### Dual output



| Class         | Model | C1                  | C2                   | C3                   | C4                   |
|---------------|-------|---------------------|----------------------|----------------------|----------------------|
| Single output | 24VDC | 4.7μF/50V 1812 MLCC | 1000pF/2kV 1808 MLCC | 1000pF/2kV 1808 MLCC | None                 |
|               | 48VDC | 2.2μF/50V 1812 MLCC | 1000pF/2kV 1808 MLCC | 1000pF/2kV 1808 MLCC |                      |
| Dual output   | 24VDC | 4.7μF/50V 1812 MLCC | 1000pF/2kV 1808 MLCC | None                 | 1000pF/2kV 1808 MLCC |
|               | 48VDC | 2.2μF/50V 1812 MLCC | 1000pF/2kV 1808 MLCC |                      | 1000pF/2kV 1808 MLCC |

### External output trimming



### Trim down resistor values (Rd)

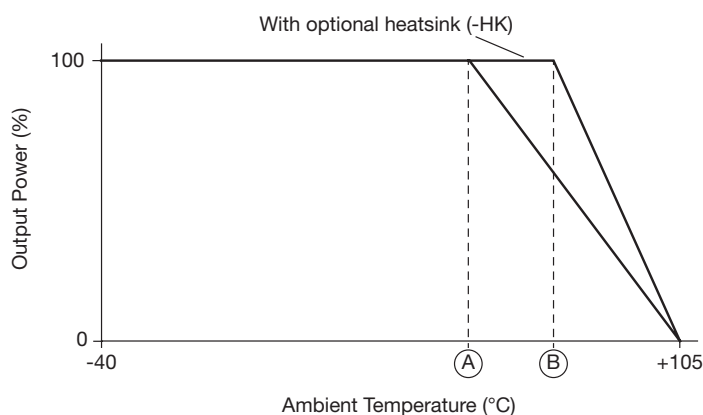
| Model | 1%        | 2%        | 3%        | 4%        | 5%        | 6%        | 7%        | 8%        | 9%        | 10%       |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|       | Voutx0.99 | Voutx0.98 | Voutx0.97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

### Trim up resistor values (Ru)

| Model | 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   | 60.84kΩ   | 27.40kΩ   | 16.25kΩ   | 10.68kΩ   | 7.34kΩ    | 5.11kΩ    | 3.51kΩ    | 2.32kΩ    | 1.39kΩ    | 0.65kΩ    |
| 5V    | 106.87kΩ  | 47.76kΩ   | 28.06kΩ   | 18.21kΩ   | 12.30kΩ   | 8.36kΩ    | 5.55kΩ    | 3.44kΩ    | 1.79kΩ    | 0.48kΩ    |
| 12V   | 351.00kΩ  | 157.50kΩ  | 93.00kΩ   | 60.75kΩ   | 41.40kΩ   | 28.50kΩ   | 19.29kΩ   | 12.37kΩ   | 7.00kΩ    | 2.70kΩ    |
| 15V   | 422.77kΩ  | 189.89kΩ  | 112.26kΩ  | 73.44kΩ   | 50.15kΩ   | 34.63kΩ   | 23.54kΩ   | 15.22kΩ   | 8.75kΩ    | 3.58kΩ    |
| 24V   | 243.70kΩ  | 108.50kΩ  | 63.43kΩ   | 40.90kΩ   | 27.38kΩ   | 18.37kΩ   | 11.93kΩ   | 7.10kΩ    | 3.34kΩ    | 0.34kΩ    |

## Application notes

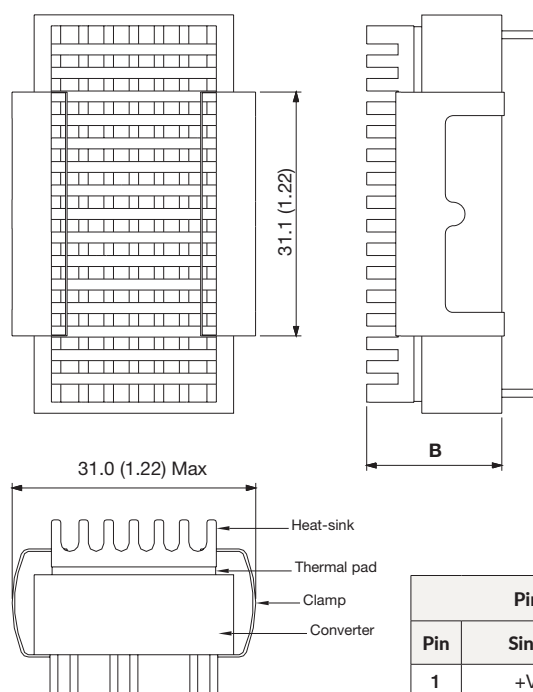
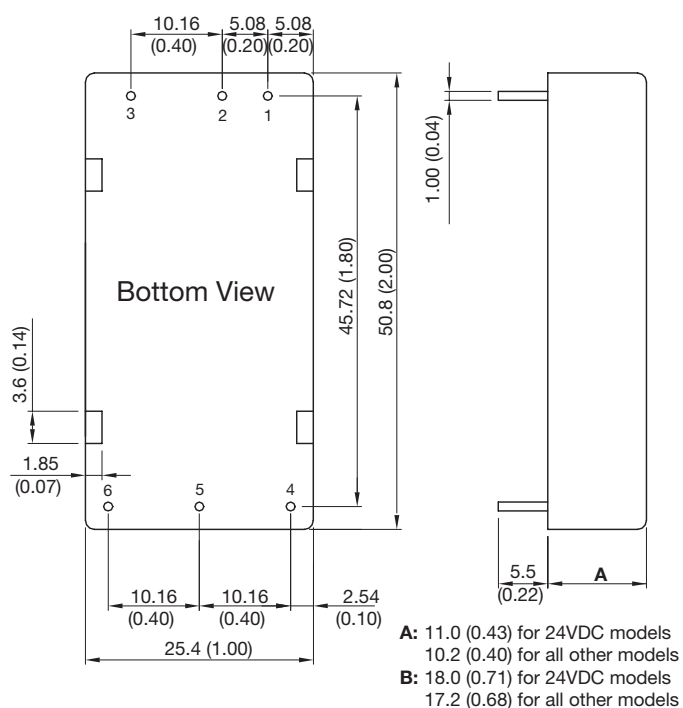
### Derating curve



| Models - JWL40             | Max Ambient Temperature |                   |
|----------------------------|-------------------------|-------------------|
|                            | No Heatsink (A)         | With Heatsink (B) |
| 24S3V3, 48S3V3             | +66°C                   | +73°C             |
| 24S05, 48S05, 48S12, 48S15 | +51°C                   | +61°C             |
| 24S12, 24S15               | +45°C                   | +57°C             |
| 24S24, 48S24               | +57°C                   | +66°C             |
| 24D12, 24D15, 48D12, 48D15 | +40°C                   | +52°C             |

## Mechanical details

### Optional Heatsink (-HK)



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

### Notes:

- All dimensions are in mm (inches).
- Weight: 30.0g (0.066lb) approx

- Tolerance: x.x (x.xx) =  $\pm 0.5$  ( $\pm 0.02$ ). x.xx (x.xxx) =  $\pm 0.25$  ( $\pm 0.01$ )
- Pin tolerance:  $\pm 0.05$  ( $\pm 0.002$ )

Specifications subject to change without notice.  
notice.