

## 15W

DC-DC converters

The JTD15 series is housed in a 40.64 x 25.4 x 10.2 mm (1.6" x 1" x 0.41") metal case. Featuring a 4:1 input voltage range of 9 to 36VDC or 18 to 72VDC with both single and dual outputs, singles have 3.3, 5, 12 or 15VDC with duals having  $\pm 5$ ,  $\pm 12$  or  $\pm 15$ VDC. Single output models are adjustable  $\pm 10\%$  with a trim resistor.

The JTD15 has regulated outputs and provides 3.0kVDC isolation between input and output, remote on/off, overload & short circuit protection are standard.

Operating temperature range is from  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$ , with derating above  $+70^{\circ}\text{C}$ .



### Features

- ▶ Regulated single outputs 3.3 to 15VDC
- ▶ Regulated dual outputs  $\pm 5$ ,  $\pm 12$  &  $\pm 15$ VDC
- ▶ 4:1 input range
- ▶ Output trim  $\pm 10\%$  for single output models
- ▶ 40.6 x 25.4mm (1.6" x 1") footprint, 10.4mm (0.41") profile
- ▶ 3.0kVDC isolation
- ▶ Remote On/Off
- ▶  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$  operating temperature
- ▶ Full power to  $+70^{\circ}\text{C}$
- ▶ 3 year warranty

### Applications



Healthcare



Home healthcare



Medical Diagnostics

### Dimensions

40.6 x 25.4 x 10.4mm (1.6" x 1.0" x 0.41")

### Models & ratings

| Model number | Input voltage | Output voltage | Output current | Efficiency | Input current <sup>(1)</sup> |           | Maximum capacitive load <sup>(2)</sup> |
|--------------|---------------|----------------|----------------|------------|------------------------------|-----------|--|
|              |               |                |                |            | No load                      | Full load |  |
| JTD1524S3V3  | 9-36VDC       | 3.3VDC         | 3000mA         | 82%        | 10mA                         | 515mA     | 3300 $\mu\text{F}$                     |
| JTD1524S05   |               | 5VDC           | 3000mA         | 85%        | 10mA                         | 755mA     | 3300 $\mu\text{F}$                     |
| JTD1524S12   |               | 12VDC          | 1250mA         | 88%        | 10mA                         | 735mA     | 680 $\mu\text{F}$                      |
| JTD1524S15   |               | 15VDC          | 1000mA         | 89%        | 10mA                         | 725mA     | 470 $\mu\text{F}$                      |
| JTD1524D05   |               | $\pm 5$ VDC    | $\pm 1500$ mA  | 85%        | 10mA                         | 755mA     | $\pm 2200$ $\mu\text{F}$               |
| JTD1524D12   |               | $\pm 12$ VDC   | $\pm 625$ mA   | 88%        | 10mA                         | 735mA     | $\pm 470$ $\mu\text{F}$                |
| JTD1524D15   |               | $\pm 15$ VDC   | $\pm 500$ mA   | 89%        | 15mA                         | 725mA     | $\pm 330$ $\mu\text{F}$                |

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#### Notes:

1. Input currents measured at nominal input voltage.

2. Maximum capacitive load is per output.

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| Model number | Input voltage | Output voltage | Output current | Efficiency | Input current <sup>(1)</sup> |           | Maximum capacitive load <sup>(2)</sup> |
|--------------|---------------|----------------|----------------|------------|------------------------------|-----------|--|
|              |               |                |                |            | No load                      | Full load |  |
| JTD1548S3V3  | 18-75VDC      | 3.3VDC         | 3000mA         | 82%        | 10mA                         | 255mA     | 3300µF                                 |
| JTD1548S05   |               | 5VDC           | 3000mA         | 85%        | 10mA                         | 375mA     | 3300µF                                 |
| JTD1548S12   |               | 12VDC          | 1250mA         | 87%        | 10mA                         | 365mA     | 680µF                                  |
| JTD1548S15   |               | 15VDC          | 1000mA         | 88%        | 10mA                         | 365mA     | 470µF                                  |
| JTD1548D05   |               | ±5VDC          | ±1500mA        | 88%        | 8mA                          | 375mA     | ±2200µF                                |
| JTD1548D12   |               | ±12VDC         | ±625mA         | 90%        | 8mA                          | 375mA     | ±470µF                                 |
| JTD1548D15   |               | ±15VDC         | ±500mA         | 88%        | 10mA                         | 365mA     | ±330µF                                 |

### Notes:

1. Input currents measured at nominal input voltage.

2. Maximum capacitive load is per output.

## Input

| Characteristic                  | Minimum | Typical | Maximum | Units         | Notes & conditions                       |
|---------------------------------|---------|---------|---------|---------------|--|
| Input voltage range             | 9       |         | 36      | VDC           | 24VDC nominal                            |
|                                 | 18      |         | 75      |               | 48VDC nominal                            |
| Inrush reflected ripple current |         | 20      |         | mA pk-pk      | Through 12µH inductor and 47µF capacitor |
| Input surge                     |         |         | 50      | VDC for 100ms | 24VDC nominal                            |
|                                 |         |         | 100     |               | 48VDC nominal                            |

## Output

| Characteristic           | Minimum  | Typical | Maximum | Units    | Notes & conditions  |
|--------------------------|--|---------|---------|----------|---|
| Output voltage           | 3.3  |         | 30      | VDC      | See models & ratings table  |
| Output trim              | ±10  |         |         | %        | Single output only, see application note  |
| Initial set accuracy     |  |         | ±1      | %        | At full load  |
| Minimum load             | 0  |         |         | %        | No minimum load required  |
| Line regulation          |  |         | ±0.5    | %        | From min to max input voltage   |
| Load regulation          |  |         | 0.5/1.0 | %        | From 0% to full load for single/dual output   |
| Cross regulation         |  |         | ±5      | %        | On dual output models, when one output is at 100% load and other is varied from 25% load to full load |
| Start up time            |  | 30      |         | ms       |   |
| Ripple & noise           |  |         | 75/60   | mV pk-pk | Single/dual output, measured using 20MHz bandwidth and 10µF/25VDC MLCC per output                     |
| Overload protection      |  |         | 170     | %        |   |
| Short circuit protection | Continuous, hiccup mode with auto recovery   |         |         |          |   |
| Maximum capacitive load  | See models & ratings table   |         |         |          |   |
| Temperature coefficient  |  |         | 0.02    | %/°C     |   |
| Remote on/off            | Output is on if remote on/off (pin 6) is open or high (3-12VDC)<br>Output turns off if remote on/off (pin 6) is low (<1.2VDC max), e.g. short pin 6 to pin 2 -Vin. |         |         |          |   |

## General

| Characteristic                      | Minimum                             | Typical      | Maximum   | Units                                  | Notes & conditions             |
|-------------------------------------|-------------------------------------|--------------|-----------|--|--------------------------------|
| Efficiency                          |                                     | 85           |           | %                                      | See models & ratings table     |
| Isolation: input to output          | 3000                                |              |           | VDC                                    | 60s Functional                 |
| Isolation: input and output to case | 1600                                |              |           | VDC                                    | 60s                            |
| Switching frequency                 |                                     | 270/330      |           | kHz                                    | 3V3 & 5VDC models/other models |
| Isolation resistance                | 10 <sup>9</sup>                     |              |           | Ω                                      |                                |
| Isolation capacitance               |                                     | 2000         |           | pF                                     |                                |
| Power density                       |                                     |              | 1.34 (22) | W/cm <sup>3</sup> (W/in <sup>3</sup> ) |                                |
| Mean time between failure           | 600                                 |              |           | khrs                                   | MIL-HDBK-217F, +25°C GB        |
| Weight                              |                                     | 29.0 (0.064) |           | g (lb)                                 |                                |
| Solder profile                      |                                     |              | 260       | °C                                     | 1.5mm from case, 10s max       |
| Case material                       | Copper, Base plastic UL94V-0        |              |           |  |                                |
| Potting material                    | Epoxy, UL94V-0 rated                |              |           |  |                                |
| Pin material                        | Brass, Solder coated                |              |           |  |                                |
| Solder profile                      | 260°C max, 1.5mm from case, 10s max |              |           |  |                                |

## Environmental

| Characteristic           | Minimum            | Typical | Maximum | Units | Notes & conditions |
|--------------------------|--------------------|---------|---------|-------|--------------------|
| Operating temperature    | -40                |         | +100    | °C    | See derating curve |
| Storage temperature      | -55                |         | +125    | °C    |                    |
| Case temperature         |                    |         | +105    | °C    |                    |
| Humidity                 |                    |         | 95      | %RH   | Non-condensing     |
| Cooling                  | Natural convection |         |         |       |                    |
| Thermal impedance to air | 12                 |         |         | °C/W  |                    |

## Safety approvals

| Safety agency | Standard                         | Notes & conditions |
|---------------|----------------------------------|--------------------|
| UL            | UL/cUL60950-1, 62368-1           |                    |
| CE            | Meets all applicable directives  |                    |
| UKCA          | Meets all applicable legislation |                    |

## EMC: emissions

| Phenomenon | Standard | Test level | Notes & conditions              |
|------------|----------|------------|---------------------------------|
| Conducted  | EN55032  | Class A    | No external components required |
| Radiated   | EN55032  | Class A    | No external components required |

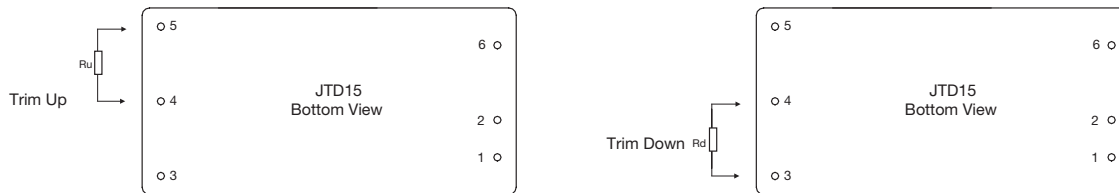
## EMC: immunity

| Phenomenon         | Standard    | Test Level | Criteria | Notes & conditions   |
|--------------------|-------------|------------|----------|--|
| ESD immunity       | EN61000-4-2 | ±6kV       | A        | Contact  |
|                    |             | ±8kV       |          | Air  |
| Radiated immunity  | EN61000-4-3 | 20V/m      | A        |  |
| EFT/Burst          | EN61000-4-4 | 2kV        | A        | Requires 330µF/100VDC electrolytic and 3kW TVS (SMDJ58A for 24VDC input, SMDJ120A for 48VDC input), see application notes. |
| Surge              | EN61000-4-5 | 2kV        | A        | Requires 330µF/100VDC electrolytic and 3kW TVS (SMDJ58A for 24VDC input, SMDJ120A for 48VDC input), see application notes. |
| Conducted immunity | EN61000-4-6 | 10Vrms     | A        |  |
| Magnetic fields    | EN61000-4-8 | 100A/m     | A        |  |

## Application notes

### External output trimming

Output can be externally trimmed by using the method as below, (single output models only)



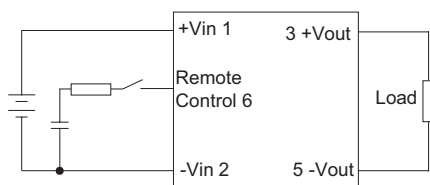
### Trim down resistor values (Rd)

| 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 |
| 3V3DC | 309.0kΩ   | 165.4kΩ   | 105.6kΩ   | 72.9kΩ    | 52.3kΩ    | 38.0kΩ    | 27.6kΩ    | 19.7kΩ    | 13.5kΩ    | 8.40kΩ    |
| 5VDC  | 119.9kΩ   | 77.70kΩ   | 50.50kΩ   | 35.2kΩ    | 25.3kΩ    | 18.4kΩ    | 13.4kΩ    | 9.50kΩ    | 6.40kΩ    | 3.90kΩ    |
| 12VDC | 345.0kΩ   | 138.1kΩ   | 79.90kΩ   | 51.5kΩ    | 34.6kΩ    | 23.4kΩ    | 15.5kΩ    | 9.50kΩ    | 4.90kΩ    | 1.26kΩ    |
| 15VDC | 174.4kΩ   | 91.10kΩ   | 56.60kΩ   | 37.7kΩ    | 25.8kΩ    | 17.6kΩ    | 11.6kΩ    | 7.00kΩ    | 3.50kΩ    | 0.55kΩ    |

### Trim up resistor values (Ru)

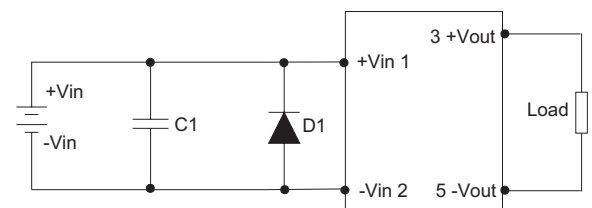
| Model | 1%        | 2%        | 3%        | 4%        | 5%        | 6%        | 7%        | 8%        | 9%        | 10%       |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|       | Voutx0.99 | Voutx0.98 | Voutx0.97 | Voutx0.96 | Voutx0.95 | Voutx0.94 | Voutx0.93 | Voutx0.92 | Voutx0.91 | Voutx0.90 |
| 3V3DC | 537.7kΩ   | 177.1kΩ   | 96.40kΩ   | 60.8kΩ    | 40.8kΩ    | 27.9kΩ    | 19.0kΩ    | 12.4kΩ    | 7.30kΩ    | 3.40kΩ    |
| 5VDC  | 635.2kΩ   | 170.0kΩ   | 92.80kΩ   | 61.1kΩ    | 43.8kΩ    | 32.9kΩ    | 25.4kΩ    | 20.0kΩ    | 15.8kΩ    | 12.5kΩ    |
| 12VDC | 367.4kΩ   | 179.6kΩ   | 113.6kΩ   | 79.9kΩ    | 59.5kΩ    | 45.8kΩ    | 35.9kΩ    | 28.5kΩ    | 22.7kΩ    | 18.1kΩ    |
| 15VDC | 661.5kΩ   | 231.3kΩ   | 134.0kΩ   | 91.0kΩ    | 66.8kΩ    | 51.3kΩ    | 40.4kΩ    | 32.5kΩ    | 26.4kΩ    | 21.5kΩ    |

### Remote on/off



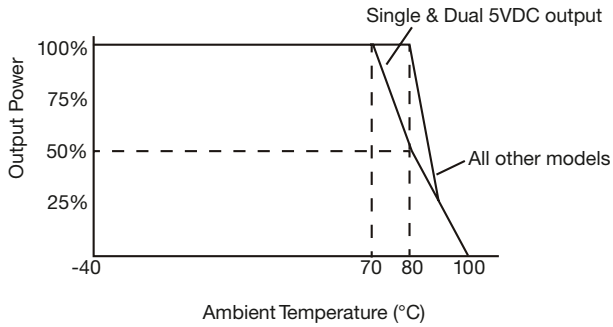
The module is enabled by positive logic. Adding a switch function between the remote control pin 6 and -Vin pin 2.

### EFT surge filter

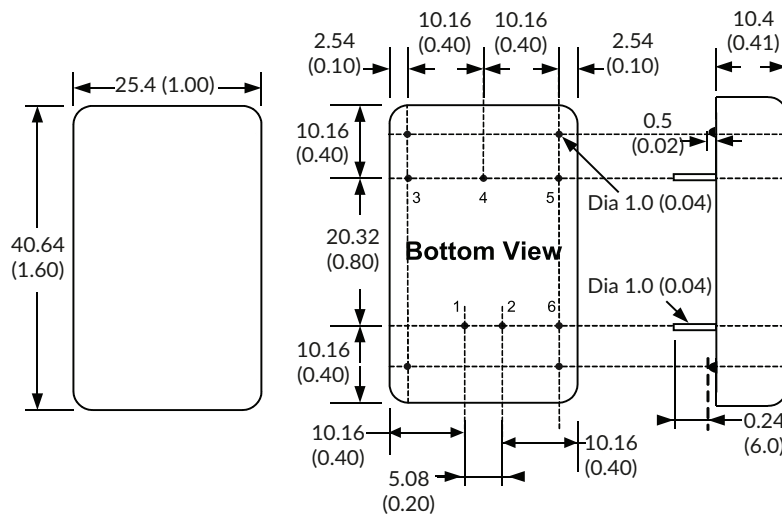


| Model   | C1          | D1             |
|---------|-------------|----------------|
| JTD1524 | 330µF, 100V | TVS, 58V, 3kW  |
| JTD1548 | 330µF, 100V | TVS, 120V, 3kW |

## Derating curve



## Mechanical details



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

### Notes:

- All dimensions are in mm (inches)
- Weight: 29.0 (0.064) g(lb) approx.
- Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
- Pin pitch tolerance: ±0.35 (±0.014)
- Case tolerance: ±0.5 (±0.02)

Specifications subject to change without notice.