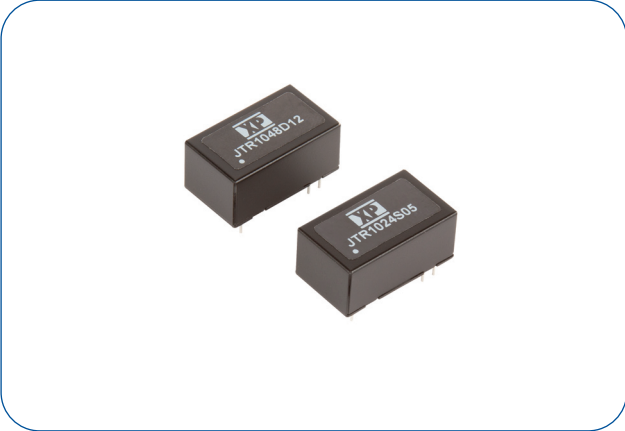


### 10 Watts

- Regulated single outputs from 3.3 to 30VDC, dual outputs  $\pm 12$  &  $\pm 15$ VDC
- Wide 4:1 DC input range 9 to 36 or 18 to 75VDC
- DIP16 metal case
- Output voltage trim  $\pm 10\%$  (single output models)
- High efficiency up to 87%
- IEC/UL/cUL 62368-1 safety approvals (pending)
- Complies with EN55032 class A with no external components
- $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  operating temperature
- Full power to  $+70^{\circ}\text{C}$
- MTBF >500 khrs (MIL-HDBK-217F,  $+25^{\circ}\text{C}$  GB)
- 3 year warranty



#### Dimensions:

**JTR10:**  
0.94 x 0.54 x 0.41" (23.8 x 13.7 x 10.3 mm)

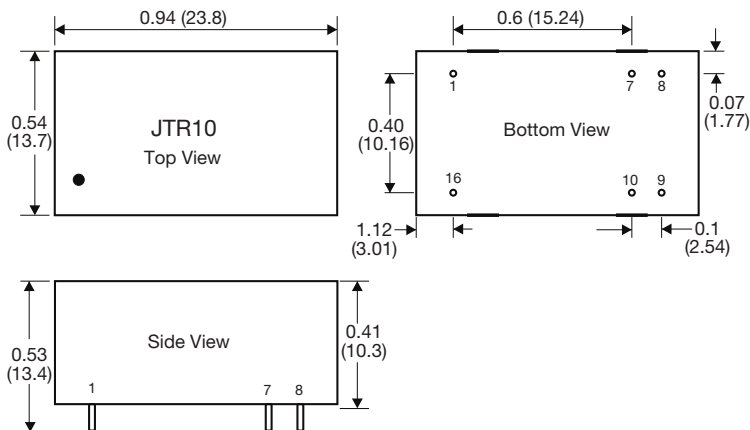
### Models & Ratings

| Input voltage  | Output voltage  | Output current (full load) | Input current <sup>(1)</sup> |           | Max. Capacitive Load    | Efficiency | Model number       |
|----------------|-----------------|----------------------------|------------------------------|-----------|-------------------------|------------|--------------------|
|                |                 |                            | No load                      | Full load |                         |            |                    |
| 24V<br>(9-36V) | 3.3 V           | 2700 mA                    | 10 mA                        | 464 mA    | 2600 $\mu\text{F}$      | 80%        | JTR1024S3V3        |
|                | 5.0 V           | 2000 mA                    |                              | 502 mA    | 1300 $\mu\text{F}$      | 83%        | JTR1024S05         |
|                | 12.0 V          | 833 mA                     |                              | 479 mA    | 560 $\mu\text{F}$       | 87%        | JTR1024S12         |
|                | 15.0 V          | 666 mA                     |                              | 479 mA    | 560 $\mu\text{F}$       | 87%        | JTR1024S15         |
|                | 24.0 V          | 416 mA                     |                              | 479 mA    | 330 $\mu\text{F}$       | 87%        | JTR1024S24         |
|                | $\pm 12.0$ V    | $\pm 416$ mA               |                              | 478 mA    | $\pm 390$ $\mu\text{F}$ | 87%        | JTR1024D12         |
|                | $\pm 15.0$ V    | $\pm 333$ mA               |                              | 478 mA    | $\pm 220$ $\mu\text{F}$ | 87%        | JTR1024D15         |
|                | 48V<br>(18-75V) | 3.3 V                      |                              | 2700 mA   | 7 mA                    | 232 mA     | 2600 $\mu\text{F}$ |
| 5.0 V          | 2000 mA         | 251 mA                     | 1300 $\mu\text{F}$           | 83%       |                         | JTR1048S05 |                    |
| 12.0 V         | 833 mA          | 239 mA                     | 560 $\mu\text{F}$            | 87%       |                         | JTR1048S12 |                    |
| 15.0 V         | 666 mA          | 239 mA                     | 560 $\mu\text{F}$            | 88%       |                         | JTR1048S15 |                    |
| 24.0 V         | 416 mA          | 239 mA                     | 330 $\mu\text{F}$            | 87%       |                         | JTR1048S24 |                    |
| $\pm 12.0$ V   | $\pm 416$ mA    | 239 mA                     | $\pm 390$ $\mu\text{F}$      | 87%       |                         | JTR1048D12 |                    |
| $\pm 15.0$ V   | $\pm 333$ mA    | 239 mA                     | $\pm 220$ $\mu\text{F}$      | 87%       |                         | JTR1048D15 |                    |

1. Input currents measured at nominal input voltage.

2. Standard tube quantity: 20

### Mechanical Details



| Pin Connections |               |               |
|-----------------|---------------|---------------|
| Pin             | Single        | Dual          |
| 1               | -Vin          | -Vin          |
| 7               | Trim          | No Connection |
| 8               | No Connection | Common        |
| 9               | +Vout         | +Vout         |
| 10              | -Vout         | -Vout         |
| 16              | +Vin          | +Vin          |

#### Notes

1. All dimensions are in inches (mm)
2. Weight: 0.0022 lbs (10 g) approx.
3. Tolerance: X.XX $\pm$ 0.01 (X.X $\pm$ 0.25), X.XXX $\pm$ 0.005 (X.XX $\pm$ 0.13)

4. Pin Diameter: 0.02 (0.5)
5. Pin Tolerance:  $\pm 0.002$  ( $\pm 0.05$ )

### Input

| Characteristic       | Minimum                     | Typical | Maximum | Units | Notes & Conditions         |
|----------------------|-----------------------------|---------|---------|-------|----------------------------|
| Input Voltage Range  | 9.0                         |         | 36      | VDC   | 24 V nominal               |
|                      | 18.0                        |         | 75      | VDC   | 48 V nominal               |
| Input Filter         | Internal Pi type            |         |         |       |                            |
| Undervoltage Lockout | ON at 8.8 V, OFF at 7.0 V   |         |         |       | 24 V models                |
|                      | ON at 17.8 V, OFF at 16.0 V |         |         |       | 48 V models                |
| Input Surge          |                             |         | 50      | VDC   | 24 V models for 100 ms max |
|                      |                             |         | 100     |       | 48 V models for 100 ms max |

### Output

| Characteristic           | Minimum | Typical | Maximum | Units       | Notes & Conditions   |
|--------------------------|---------|---------|---------|-------------|--|
| Output Voltage           | 3.3     |         | 30      | VDC         | See Models and Ratings table   |
| Initial Set Accuracy     |         |         | ±1.0    | %           | At full load   |
| Output Voltage Balance   |         |         | ±1.0    | %           | For dual output with balanced loads  |
| Minimum Load             |         |         |         |             | No minimum load required   |
| Line Regulation          |         |         | ±0.5    | %           | From minimum to maximum input at full load   |
| Load Regulation          |         |         | ±1.0    | %           | From 0 to full load  |
| Cross Regulation         |         |         | ±5.0    | %           | 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 250 μs for a 25% load change.  |
| Ripple & Noise           |         |         | 60      | mV pk-pk    | 3V3, 5 V output models: 20 MHz bandwidth. Measured using 1 μF ceramic capacitor and 10 μF electrolytic capacitor |
|                          |         |         | 80      |             | Other models: 20 MHz bandwidth. Measured using 1 μF ceramic capacitor and 10 μF electrolytic capacitor           |
| Overload Protection      |         | 160     |         | %           |  |
| 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                 |  | 87          |         | %                 | See Models and Ratings table |
| Isolation: Input to Output | 1500   |             |         | VDC               | 60 s functional              |
| Isolation Resistance       | 10 <sup>9</sup>  |             |         | Ω                 | At 500 VDC                   |
| Isolation Capacitance      |  | 1500        |         | pF                |                              |
| Switching Frequency        |  | 370         |         | kHz               |                              |
| Case Material              | Black coated copper with non conductive plastic base UL94V-0 rated |             |         |                   |                              |
| Potting Material           | Epoxy UL94V-0  |             |         |                   |                              |
| Pin Material               | Brass, solder coated   |             |         |                   |                              |
| Solder Profile             | 260 °C max. 1.5mm from case 10s maximum.                           |             |         |                   |                              |
| Power Density              |  |             | 48      | W/in <sup>3</sup> |                              |
| Mean Time Between Failure  | 500  |             |         | KHrs              | MIL-HDBK-217F, +25 °C GB     |
| Weight                     |  | 0.0022 (10) |         | lb (g)            |                              |

### Environmental

| Characteristic        | Minimum            | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|--------------------|---------|---------|-------|--------------------|
| Operating Temperature | -40                |         | +85     | °C    | See Derating Curve |
| Storage Temperature   | -55                |         | +125    | °C    |                    |
| Case Temperature      |                    |         | +105    | °C    |                    |
| Humidity              |                    |         | 95      | %RH   | Non-condensing     |
| Cooling               | Natural convection |         |         |       |                    |

### Safety Approvals

| Safety Agency | Safety Standard | Notes & Conditions      |
|---------------|-----------------|-------------------------|
| UL            | UL/cUL62368-1   | Information Technology. |

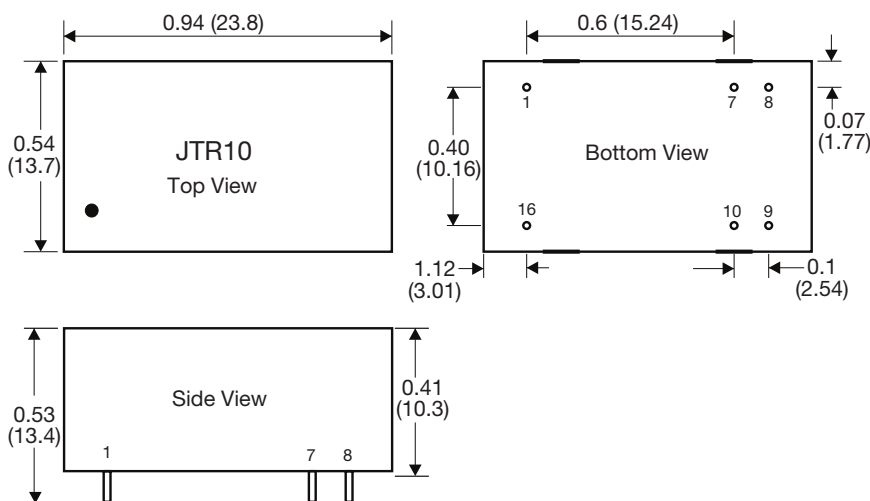
### EMC: Emissions

| Phenomenon           | Standard | Test Level | Notes & Conditions  |
|----------------------|----------|------------|---|
| Conducted & Radiated | EN55032  | Class A    | No external components required. See application notes for Class B. |

### 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 | 20 V/m                             | A        |  |
| EFT/Burst       | EN61000-4-4 | ±2 kV                              | A        | With external capacitor and TVS. See applications notes. |
| Surge           | EN61000-4-5 | ±1 kV                              | A        | With external capacitor and TVS. See applications notes. |
| Conducted       | EN61000-4-6 | 10 V rms                           | A        |  |
| Magnetic Fields | EN61000-4-8 | 100 A/m                            | A        |  |

### Mechanical Details



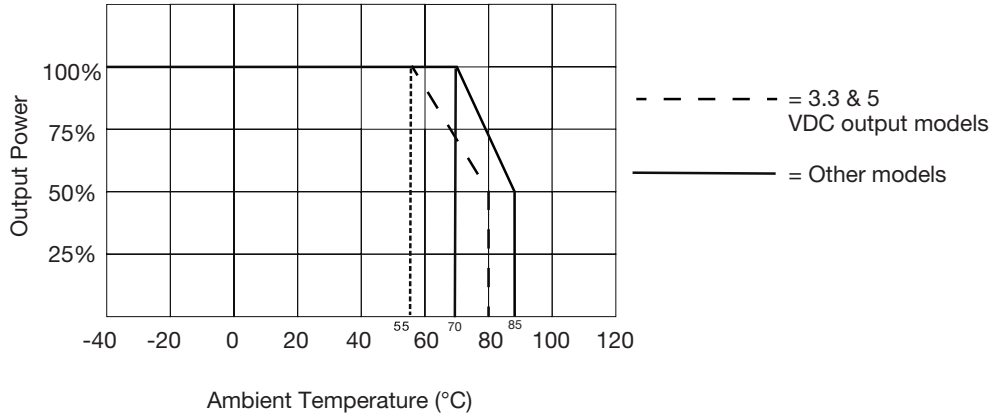
| Pin | Single        | Dual          |
|-----|---------------|---------------|
| 1   | -Vin          | -Vin          |
| 7   | Trim          | No Connection |
| 8   | No Connection | Common        |
| 9   | +Vout         | +Vout         |
| 10  | -Vout         | -Vout         |
| 16  | +Vin          | +Vin          |

#### Notes

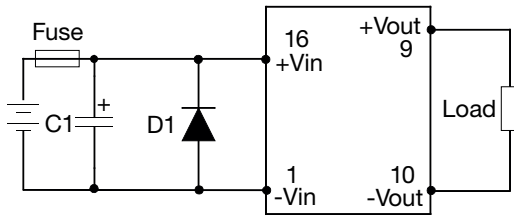
- All dimensions are in inches (mm)
- Weight: 0.0022 lbs (10 g) approx.
- Tolerance: X.XX±0.01 (X.X±0.25)  
X.XXX±0.005 (X.XX±0.13)
- Pin Diameter: 0.02 (0.5)
- Pin Tolerance: ±0.002 (±0.05)

### Application Notes

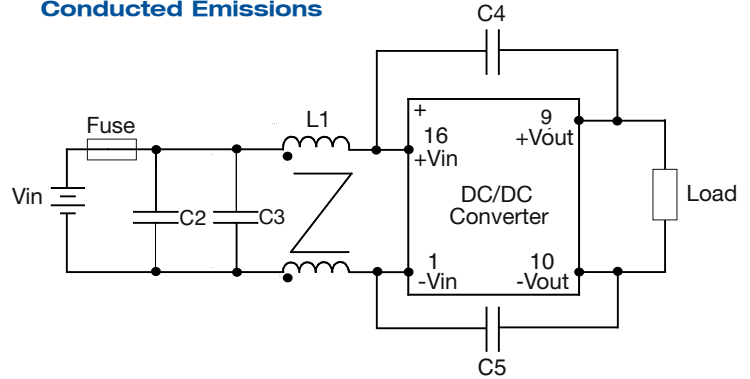
#### Derating Curve



#### EFT & Surge



#### Input Filter to meet Class B Conducted Emissions

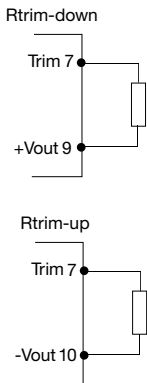


| Model   | C1   | D1                | C2                    | C3                    | L1                       | C4                   | C5                   |
|---------|--|-------------------|-----------------------|-----------------------|--------------------------|----------------------|----------------------|
| JTR1024 | Nippon-chemi-con<br>KY series<br>220µF, 100V | TVS,<br>58V, 3kW  | 1206,<br>10µF / 50V   | Not fitted            | LFD648075<br>52µH-3.14A  | 1206,<br>100pF / 2kV | 1206,<br>100pF / 2kV |
| JTR1048 | Nippon-chemi-con<br>KY series<br>220µF, 100V | TVS,<br>120V, 3kW | 1206,<br>2.2µF / 100V | 1206,<br>2.2µF / 100V | LFD648075<br>175µH-1.76A | 1206,<br>100pF / 2kV | 1206,<br>100pF / 2kV |

Select fuse rating based on application input current.

#### Output Trim

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



| Trim Down % | Nominal Vout | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9    | 10   |
|-------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Rd kΩ       | 3V3          | 194.3 | 116.4 | 80.2  | 59    | 45.6  | 36    | 29    | 23.5  | 19.2 | 15.6 |
|             | 5            | 217.2 | 101.8 | 63.3  | 44    | 32.6  | 24.9  | 19.4  | 15.2  | 12   | 9.5  |
|             | 12           | 1812  | 759   | 458.3 | 315.8 | 232.8 | 178.3 | 140   | 111.3 | 89.2 | 71.7 |
|             | 15           | 1765  | 738.5 | 445   | 306   | 225   | 172   | 134.5 | 106.6 | 85   | 67.9 |
|             | 24           | 1191  | 532   | 325.2 | 224   | 164   | 124.3 | 96    | 75    | 58.6 | 45.5 |
| Trim Up %   | Nominal Vout | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9    | 10   |
| Ru kΩ       | 3V3          | 1178  | 237.3 | 127.2 | 84.6  | 62    | 47.9  | 38.3  | 31.4  | 26.1 | 22   |
|             | 5            | 442.3 | 217.8 | 142.3 | 105.5 | 83    | 68    | 57.3  | 49.3  | 43.1 | 38.1 |
|             | 12           | 923.4 | 479.9 | 312.4 | 224.7 | 170.7 | 134.1 | 107.8 | 87.8  | 72.1 | 59.6 |
|             | 15           | 957.2 | 496.7 | 324   | 233.5 | 177.8 | 140.1 | 112.9 | 92.3  | 76.1 | 63.2 |
|             | 24           | 726.5 | 353.5 | 222.4 | 155.5 | 114.8 | 87.6  | 68    | 53.3  | 41.8 | 32.6 |