# RBT10W series

## 1.0A

DC-DC converters

The RBT10W series of non-isolated switching regulators provide an output current up to 1A, operating from a wide DC input range.

Featuring a compact SIP3 design, the RBT10W series offers output voltages from 1.8VDC to 15VDC, high efficiency, industrial safety approvals and a wide operating temperature range, ideal for industrial, instrumentation and technology applications.


### Features

- Non isolated switching regulator
- Output current up to 1A
- Regulated single outputs from 1.8V to 15VDC
- Wide 4.75V to 36VDC input range
- Compact SIP3 package
- Pin compatible with 78 series regulators
- High efficiency, up to 94%
- EN62368-1 safety approval
- Continuous short circuit protection
- -40°C to +90°C operating temperature
- 3 year warranty

### Applications

Industrial

Instrumentation

Robotics

Technology

### Dimensions

11.6 x 7.6 x 10.2mm (0.46” x 0.30” x 0.40”)

### More resources

Click the link or scan the code

xppower.com

### Models & ratings

| Model number | Input voltage | Output voltage | Output current | Ripple & Noise | Efficiency[2] | | Maximum capacitive load |
|---|---|---|---|---|---|---|---|
| | | | | | Min Vin | Max Vin | |
| RBT10W24S1V8 | 4.75-26VDC | 1.8VDC | 1000mA | 50mVp-p[1] | 84.0% | 74.0% | 470µF |
| RBT10W24S3V3 | 4.75-36VDC | 3.3VDC | 1000mA | 70mVp-p | 89.0% | 80.5% | 470µF |
| RBT10W24S05 | 6.5-36VDC | 5.0VDC | 1000mA | 70mVp-p | 92.0% | 84.0% | 470µF |
| RBT10W24S6V5 | 8-36VDC | 6.5VDC | 1000mA | 90mVp-p | 93.5% | 87.0% | 470µF |
| RBT10W24S12 | 15-36VDC | 12.0VDC | 1000mA | 120mVp-p | 94.0% | 90.5% | 470µF |
| RBT10W24S15 | 18-36VDC | 15.0VDC | 1000mA | 120mVp-p | 94.5% | 91.5% | 330µF |

**Notes:**

1. At 26VDC input voltage, loading is 0.5%, ripple & noise will be 100mVp-p max
2. Typical value at full load

## Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Input voltage range | 4.75 | 12.0/24.0 | 36.0 | VDC | See models & ratings table, typical input voltage for 1.8VDC / others |
| Input filter | Internal capacitors | | | | |
| No load input current | | 20 | | mA | |

## Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Output voltage | 1.8 | | 15 | VDC | See models & ratings table |
| Initial set accuracy | -3 | | +3 | % | Full load |
| Minimum load | | | | | No minimum load required |
| Line regulation | | ±0.2 | ±0.4 | % | Minimum to maximum input voltage at full load |
| Load regulation | | ±0.4 | ±0.6 | % | 10% to full load. |
| Ripple & noise | | | 120 | mV pk-pk | Measured with 20MHz bandwidth, see models & ratings table |
| Transient response | | | ±2 | % | For 25% load change, recovery in 100µs |
| Short circuit protection | Continuous, with autorecovery | | | | |
| Maximum capacitive load | See models & ratings table | | | | |
| Temperature coefficient | | ±0.02 | | %/ °C | Full load |

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## General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Efficiency | | | | | See models & ratings table |
| Isolation: input to output | | | | | Non isolated |
| Switching frequency | | 500 | | kHz | Full load |
| Mean time between failure | 3300 | 8000 | | kHrs | MIL-HDBK-217F, +25°C GB |
| Weight | | 1.9 (0.004) | | g (lb) | |
| Case material | Black plastic, flame retardant UL94V-0 | | | | |
| Pin material | Phospher bronze | | | | |
| Solder profile | IPC/JEDEC J-STD-020D.1 | | | | |
| Water wash | Non-soaking water wash with de-ionised water. Dry thoroughly. | | | | |
| Potting material | Epoxy UL94V-0 rated | | | | |

## Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---|---|---|---|---|---|
| Operating temperature | -40 | | +90 | °C | See derating curve |
| Storage temperature | -55 | | +125 | °C | |
| Maximum case temperature | | | +110 | °C | |
| Humidity | | | 95 | %RH | Non-condensing |
| Cooling | Natural convection | | | | |

## Safety approvals

| Safety Agency | Standard | Notes & Conditions |
|---|---|---|
| EN | EN62368-1 | |
| CE | Meets all applicable directives | |
| UKCA | Meets all applicable legislation | |

## EMC: emissions

| Phenomenon | Standard | Test level | Notes & conditions |
|---|---|---|---|
| Conducted | EN55032 | Class A/B | See application notes |
| Radiated | EN55032 | Class A/B | See application notes |

## EMC: immunity

| Phenomenon | Standard | Test level | Criteria | Notes & conditions |
|---|---|---|---|---|
| ESD immunity | EN61000-4-2 | 3 | A | ±6kV contact, ±8kV air discharge |
| Radiated | EN61000-4-3 | 10V/m | A | |
| EFT/burst | EN61000-4-4 | 3 | A | ±2kV (line to line) External components required, see application notes |
| Surges | EN61000-4-5 | 3 | A | ±2kV (line to line) External components required, see application notes |
| Conducted | EN61000-4-6 | 10V | A | |
| Magnetic field | EN61000-4-8 | 10A/m | A | |

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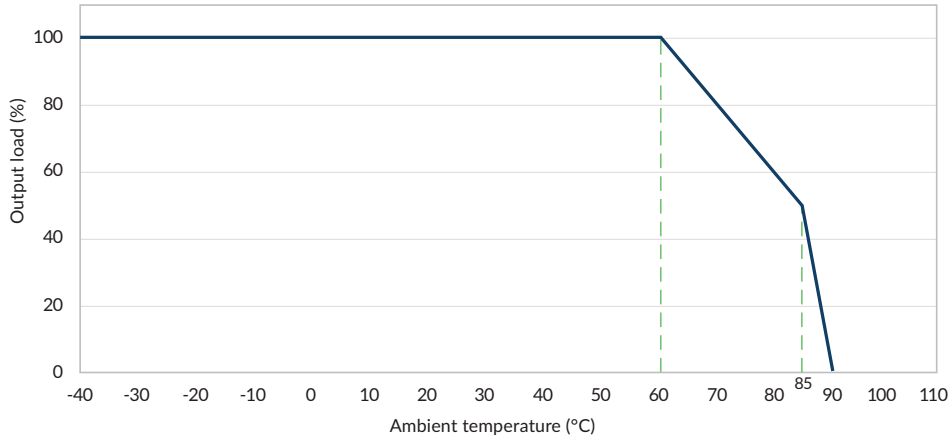
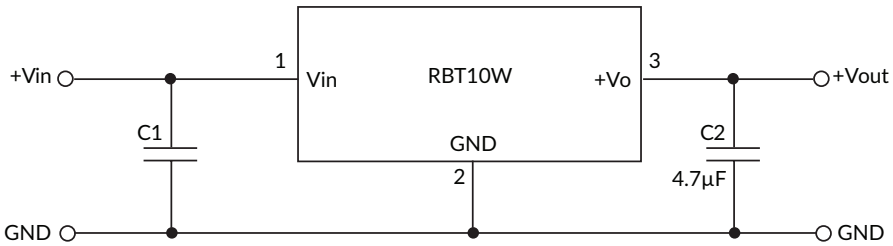
## Application notes

### Derating curve (nominal input voltage)

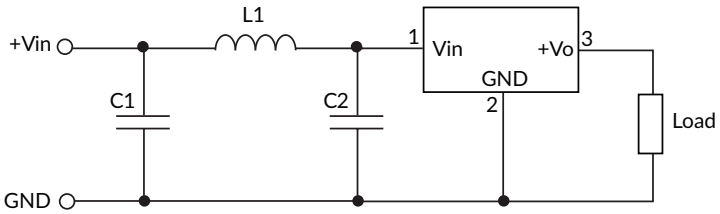



### Typical application



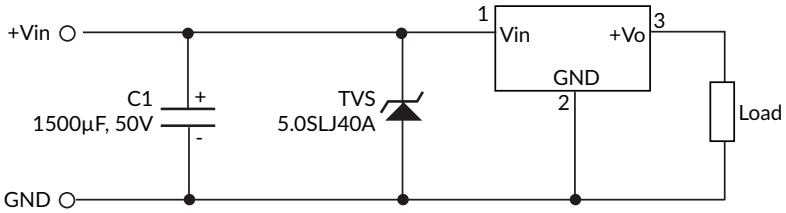

C1 is optional. To reduce input voltage spike, value is between 4.7µF to 10µF

### EMI (Class A/B) compliance circuit

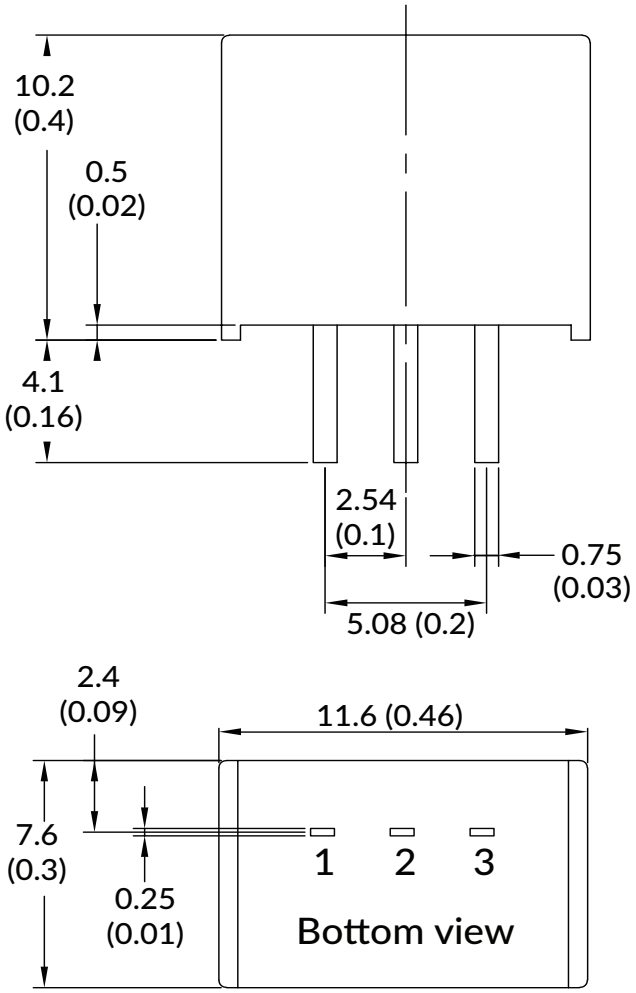



| EMI | L1 | C1 | C2 |
|---|---|---|---|
| Class A | 4.7µH | 4.7µF/50V | - |
| Class B | 10µH | 10µH/50V | 4.7µF/50V |

### EFT & surge external components



## Mechanical details




| Pin connections | |
|---|---|
| **Pin** | **Function** |
| 1 | +vin |
| 2 | GND |
| 3 | +Vout |

**Notes:**

1. All dimensions are in mm (inches)
2. Weight: 1.9g (0.004lbs) typical
3. Pin diameter: 0.05 ±0.1 (0.02 ±0.004)
   Pin diameter tolerance: ±0.1 (±0.004)
4. Pin pitch tolerance: ±0.25 (±0.01)
5. Case tolerance: ±0.5 (±0.02)