

## 20W



Available in two wide (4:1) input ranges for nominal 24VDC & 48VDC, the DTE20 series of encapsulated 20W DC-DC converters are chassis mount as standard or can be ordered with a DIN rail mount (suffix -D).

They have screw terminals for ease of connection and an LED provides clear 'power good' indication. Remote On/Off is standard and when inhibited the standby current is just 3mA. Isolation is 2.5kVDC input/output providing excellent separation between supply and load. The modules are fully protected against input undervoltage, short circuit and overload conditions.

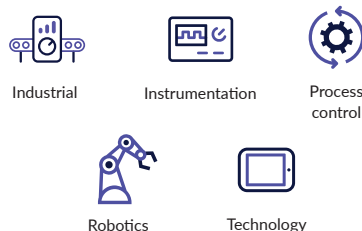
These features, along with a rugged design and wide operating temperature range make the DTE20 series suitable for a variety of commercial and industrial electronics applications.



### Features

- ▶ Regulated single output
- ▶ 4:1 input range
- ▶ Single outputs 5.1 to 48VDC
- ▶ Fully encapsulated chassis mount
- ▶ DIN rail mount option
- ▶ 3.0kVDC isolation
- ▶ EN55032 Class A with no external components
- ▶ Remote On/Off
- ▶ -40°C to +95°C operating temperature
- ▶ Full power to +85°C
- ▶ 3 year warranty

### Applications



### Dimensions

96.0 x 54.0 x 23.3mm (3.78" x 2.13" x 0.92")

### Documentation

For further information click the link or scan the code

→ [xppower.com](http://xppower.com)



### Models & ratings

| Model number <sup>(3)</sup> | Input voltage      | Output voltage | Output current | Input current <sup>(1,4)</sup> |           | Maximum capacitive load <sup>(5)</sup> | Efficiency <sup>(2)</sup> |
|-----------------------------|--------------------|----------------|----------------|--------------------------------|-----------|----------------------------------------|---------------------------|
|                             |                    |                |                | No load                        | Full load |                                        |                           |
| DTE2024S5V1                 | 24VDC<br>(9-36VDC) | 5.1VDC         | 4.0A           | 70mA                           | 0.94A     | 6800µF                                 | 90%                       |
| DTE2024S12                  |                    | 12.0VDC        | 1.67A          |                                | 0.92A     | 1160µF                                 | 91%                       |
| DTE2024S24                  |                    | 24.0VDC        | 0.835A         |                                | 0.92A     | 300µF                                  | 91%                       |
| DTE2024S48                  |                    | 48.0VDC        | 0.42A          |                                | 0.94A     | 75µF                                   | 89%                       |
| DTE2048S5V1                 | 48 V<br>(18-75VDC) | 5.1VDC         | 4.0A           | 35mA                           | 0.47A     | 6800µF                                 | 90%                       |
| DTE2048S12                  |                    | 12.0VDC        | 1.67A          |                                | 0.46A     | 1160µF                                 | 91%                       |
| DTE2048S24                  |                    | 24.0VDC        | 0.835A         |                                | 0.46A     | 300µF                                  | 91%                       |
| DTE2048S48                  |                    | 48.0VDC        | 0.42A          |                                | 0.47A     | 75µF                                   | 89%                       |

#### Notes:

1. Input current measured at nominal input voltage.

2. Typical values.

3. For optional version fitted with DIN Clip add suffix '-D' e.g. DTE2024S24-D.

4. Input current is typically 3mA at nominal input voltage when output is remotely turned off.

## Input

| Characteristic       | Minimum                                          | Typical | Maximum | Units | Notes & conditions      |
|----------------------|--------------------------------------------------|---------|---------|-------|-------------------------|
| Input voltage range  | 9                                                |         | 36      | VDC   | 24VDC nominal           |
|                      | 18                                               |         | 75      |       | 48VDC nominal           |
| Input current        | See models and ratings table                     |         |         |       |                         |
| Input filter         | Pi type                                          |         |         |       |                         |
| Undervoltage lockout | On at >9VDC, Off <7.5VDC                         |         |         |       | 24VDC nominal           |
|                      | On at >18VDC, Off <16.0VDC                       |         |         |       | 48VDC nominal           |
| Input surge          |                                                  |         | 50      | VDC   | 24VDC nominal for 100ms |
|                      |                                                  |         | 100     |       | 48VDC nominal for 100ms |
| Remote on/off        | On: Logic High (3.5-12VDC) or open circuit       |         |         |       |                         |
|                      | Off: Logic Low (<1.2VDC) or short pin 1 to pin 2 |         |         |       |                         |

## Output

| Characteristic           | Minimum                                     | Typical | Maximum | Units       | Notes & conditions                                                     |
|--------------------------|---------------------------------------------|---------|---------|-------------|------------------------------------------------------------------------|
| Output voltage           | 5.1                                         |         | 48      | VDC         | See models and ratings table                                           |
| Initial set accuracy     |                                             | ±1      | ±2      | %           |                                                                        |
| Minimum load             | No minimum load required                    |         |         |             |                                                                        |
| Start up delay           |                                             | 50      |         | ms          |                                                                        |
| Line regulation          |                                             | ±0.5    |         | %           |                                                                        |
| Load regulation          |                                             | 1       |         | %           | 0 - 10% load                                                           |
| Transient response       |                                             |         | 5       | % deviation | Recovery to within 1% in <250µs for a 50% load change at 0.25A/µs rate |
| Ripple & noise           |                                             |         | 100     | mV pk-pk    | 5.1VDC model, 20MHz bandwidth                                          |
|                          |                                             |         | 150     |             | 12VDC & 48VDC models, 20MHz bandwidth                                  |
|                          |                                             |         | 200     |             | 48VDC models, 20MHz bandwidth                                          |
| Short circuit protection | Trip & restart (hiccup mode), auto recovery |         |         |             |                                                                        |
| Overload protection      |                                             | 150     |         | %           | Trip & restart (hiccup mode)                                           |
| Overvoltage protection   |                                             | 120     |         | %           | Zener diode clamp                                                      |
| Temperature coefficient  |                                             |         | 0.02    | %/°C        |                                                                        |

## General

| Characteristic              | Minimum | Typical     | Maximum    | Units                                  | Notes & conditions           |
|-----------------------------|---------|-------------|------------|----------------------------------------|------------------------------|
| Efficiency                  |         | 90          |            | %                                      | See models and ratings table |
| Isolation                   | 2500    |             |            | VDC                                    | For 60s functional           |
| Isolation resistance        | 1000    |             |            | MΩ                                     | At 500VDC                    |
| Input to output capacitance |         |             | 2200       | pF                                     |                              |
| Switching frequency         |         | 285         |            | kHz                                    |                              |
| Power density               |         |             | 0.16 (2.7) | W/cm <sup>3</sup> (W/in <sup>3</sup> ) |                              |
| Mean time between failure   | 750     |             |            | khrs                                   | MIL-HDBK-217F, +25°C GB      |
| Weight                      |         | 107 (0.214) |            | g (lbs)                                |                              |

## Environmental

| Characteristic        | Minimum                                                                                                  | Typical | Maximum | Units | Notes & conditions |
|-----------------------|----------------------------------------------------------------------------------------------------------|---------|---------|-------|--------------------|
| Operating temperature | -40                                                                                                      |         | +95     | °C    | See derating curve |
| Storage temperature   | -50                                                                                                      |         | +125    | °C    |                    |
| Case temperature      |                                                                                                          |         | 95      | °C    |                    |
| Thermal impedance     | 3.9                                                                                                      |         |         | °C/W  | Natural convection |
|                       | 3.3                                                                                                      |         |         |       | 100LFM             |
|                       | 3.1                                                                                                      |         |         |       | 200LFM             |
|                       | 2.5                                                                                                      |         |         |       | 400LFM             |
| Humidity              | 5                                                                                                        |         | 95      | %RH   | Non-condensing     |
| Cooling               | Natural convection                                                                                       |         |         |       |                    |
| Shock                 | ±3 shocks in each plane, total 18 shocks of 30g : 11ms halfsine. Conforms to EN60068-2-27 & EN60068-2-47 |         |         |       |                    |
| Vibration             | 10-500Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6                 |         |         |       |                    |

## Emissions - EMC

| Phenomenon | Standard | Test level | Notes & conditions          |
|------------|----------|------------|-----------------------------|
| Conducted  | EN55032  | Level A    | With no external components |
| Radiated   | EN55032  | Level A    | See application notes       |

## Emissions - Immunity

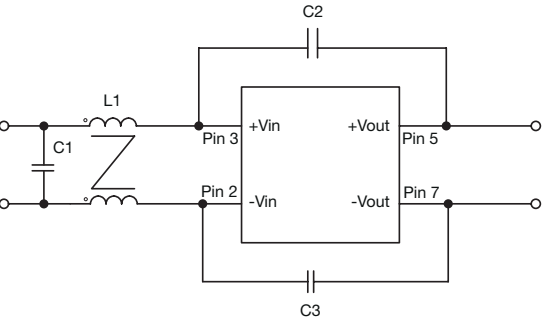
| Phenomenon        | Standard    | Test level                | Criteria | Notes & conditions |
|-------------------|-------------|---------------------------|----------|--------------------|
| Immunity          | EN55035     |                           |          |                    |
| ESD immunity      | EN61000-4-2 | ±4kV contact,<br>±8kV air | A        |                    |
| Radiated immunity | EN61000-4-3 | 10V/m                     | A        |                    |
| EFT/burst         | EN61000-4-4 | 3                         | A        |                    |
| Surge             | EN61000-4-5 | 3                         | A        |                    |
| Conducted         | EN61000-4-6 | 10V/m                     | A        |                    |
| Magnetic fields   | EN61000-4-8 | 30A/m                     | A        |                    |

Safety approvals

| Certification | Standard                         | Notes & conditions |
|---------------|----------------------------------|--------------------|
| UL            | UL/cUL60950-1, UL/cUL62368-1     |                    |
| CB            | IEC60950-1, IEC62368-1           |                    |
| CE            | Meets all applicable directives  |                    |
| UKCA          | Meets all applicable legislation |                    |

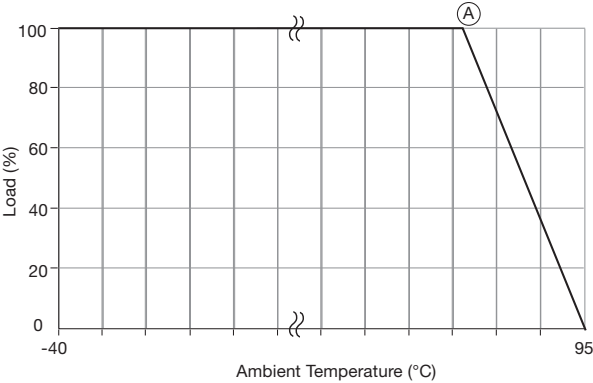
Application notes

Radiated emissions



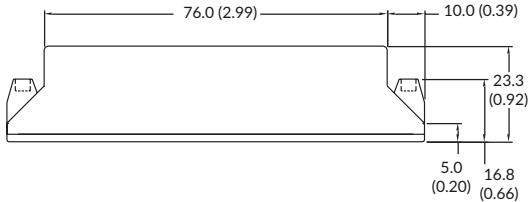
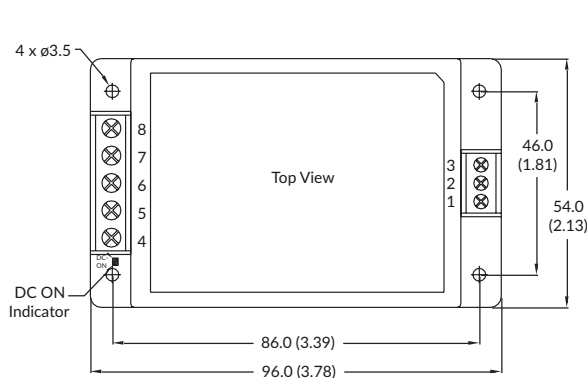
| Model      | L1    | C1           | C2        | C3        |
|------------|-------|--------------|-----------|-----------|
| DTE2024SXX | 120μH | 4.7μF/50VDC  | None      | 220pF/3KV |
| DTE2048SXX | 120μH | 3.3μF/100VDC | 220pF/3KV | 220pF/3KV |

Derating curve for convection cooling

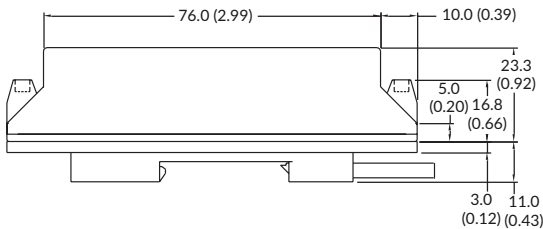


- Ⓐ : 87°C for DTE2024S12, S24  
DTE2048S12, S24  
: 86°C for DTE2024S5V1  
DTE2048S5V1  
: 85°C for DTE2024S48  
DTE2048S48

Mechanical details



-D version



| Pin | Function      |
|-----|---------------|
| 1   | Remote On/Off |
| 2   | -Vin          |
| 3   | +Vin          |
| 4   | No Connection |
| 5   | -Vout         |
| 6   | No Connection |
| 7   | +Vout         |
| 8   | No Connection |

Notes:

- All dimensions in mm (inches).
- Weight: 107g (0.214lbs) approx, -D version: 166g (0.332lbs) approx
- Terminal wire size 1.5mm<sup>2</sup> max
- Screw terminal torque 0.5 to 0.7Nm (4.5 to 6.2lb-in)
- Case tolerance: ±0.5 (±0.02)