

- Fully encapsulated low profile plastic case
- Ultra wide 4:1 input voltage range
- Operating temperature range  $-40^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$
- I/O isolation 2500 VDC
- Excellent efficiency up to 91 %
- Input filter to meet EN 55022, class A
- Optional DIN-Rail mount adapter
- No minimum load required
- Power good LED indicator and remote on/off function
- 3-year product warranty



The TMDC 20 Series is a range of encapsulated high performance DC/DC converter modules. With a very high efficiency of up to 91% and the use of highest grade components these 20 W converters are made for a reliable operation in the temperature range of  $-40^{\circ}\text{C}$  up to  $90^{\circ}\text{C}$ . They come in chassis mount version with screw terminal block. The 8 models have a wide 4:1 input voltage range and a tight output voltage regulation. They do not need a minimum load and offer a high efficiency also at low load conditions. They feature a remote control input and a green power good LED which indicates the presence of the output voltage. Protection against overload and short circuit are standard features of these converters. EMC characteristics and safety certifications are aligned for the operation in industrial environment.

### Models

| Order Code   | Input Voltage Range          | Output Voltage nom. | Output Current max. | Efficiency typ. |
|--------------|------------------------------|---------------------|---------------------|-----------------|
| TMDC 20-2411 | 9 - 36 VDC<br>(24 VDC nom.)  | 5.1 VDC             | 4'000 mA            | 90 %            |
| TMDC 20-2412 |                              | 12 VDC              | 1'670 mA            | 91 %            |
| TMDC 20-2415 |                              | 24 VDC              | 835 mA              | 91 %            |
| TMDC 20-2418 |                              | 48 VDC              | 420 mA              | 89 %            |
| TMDC 20-4811 | 18 - 75 VDC<br>(48 VDC nom.) | 5.1 VDC             | 4'000 mA            | 90 %            |
| TMDC 20-4812 |                              | 12 VDC              | 1'670 mA            | 91 %            |
| TMDC 20-4815 |                              | 24 VDC              | 835 mA              | 91 %            |
| TMDC 20-4818 |                              | 48 VDC              | 420 mA              | 89 %            |

### Options

|         |  |
|---------|--|
| TMP-MK1 | - Optional DIN-Rail Mounting Kit: <a href="http://www.tracopower.com/products/tmp-mk1.pdf">www.tracopower.com/products/tmp-mk1.pdf</a> |
|---------|--|

### Input Specifications

|                        |                |   |
|------------------------|----------------|---|
| Input Current          | - At no load   | 24 Vin models: <b>70 mA typ.</b><br>48 Vin models: <b>35 mA typ.</b>                                |
|                        | - At full load | 24 Vin models: <b>931 mA typ.</b><br>48 Vin models: <b>466 mA typ.</b>                              |
| Surge Voltage          |                | 24 Vin models: <b>50 VDC max.</b> (100 ms max.)<br>48 Vin models: <b>100 VDC max.</b> (100 ms max.) |
| Under Voltage Lockout  |                | 24 Vin models: <b>7.5 VDC typ.</b><br>48 Vin models: <b>16 VDC typ.</b>                             |
| Recommended Input Fuse |                | (The need of an external fuse has to be assessed in the final application.)                         |
| Input Filter           |                | <b>Internal Pi-Type</b>   |

### Output Specifications

|  |                                 |  |
|--|---------------------------------|--|
| Voltage Set Accuracy                   |                                 | <b>±2% max.</b>                            |
| Regulation                             | - Input Variation (Vmin - Vmax) | <b>0.5% max.</b>                           |
|  | - Load Variation (0 - 100%)     | <b>0.5% max.</b>                           |
| Ripple and Noise<br>(20 MHz Bandwidth) | 5.1 Vout models:                | <b>100 mVp-p max.</b>                      |
|  | 12 Vout models:                 | <b>150 mVp-p max.</b>                      |
|  | 24 Vout models:                 | <b>150 mVp-p max.</b>                      |
|  | 48 Vout models:                 | <b>200 mVp-p max.</b>                      |
| Capacitive Load                        | 5.1 Vout models:                | <b>6'800 µF max.</b>                       |
|  | 12 Vout models:                 | <b>1'160 µF max.</b>                       |
|  | 24 Vout models:                 | <b>300 µF max.</b>                         |
|  | 48 Vout models:                 | <b>75 µF max.</b>                          |
| Minimum Load                           |                                 | <b>Not required</b>                        |
| Temperature Coefficient                |                                 | <b>±0.02 %/K max.</b>                      |
| Start-up Time                          |                                 | <b>30 ms max.</b>                          |
| Short Circuit Protection               |                                 | <b>Continuous, Automatic recovery</b>      |
| Output Current Limitation              |                                 | <b>150% typ. of Iout max.</b>              |
| Overvoltage Protection                 |                                 | <b>120% typ. of Vout nom.</b>              |
|  |                                 | (By Zener diode)                           |
| Transient Response                     | - Response Deviation            | <b>5% max.</b> (75% to 100% Load Step)     |
|  | - Response Time                 | <b>250 µs typ.</b> (75% to 100% Load Step) |

### Safety Specifications

|                  |                             |  |
|------------------|-----------------------------|--|
| Safety Standards | - IT / Multimedia Equipment | <b>CSA-C22.2, No 60950-1</b><br><b>EN 60950-1</b><br><b>IEC 60950-1</b><br><b>UL 60950-1</b> |
|                  | - Certification Documents   | <a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>   |
| Pollution Degree |                             | <b>PD 2</b>  |

### EMC Specifications

|               |                           |   |
|---------------|---------------------------|---|
| EMI Emissions | - Conducted Emissions     | <b>EN 61000-6-4</b> (Generic Industrial)<br><b>EN 61204-3</b> (Low Voltage Power Supplies)<br><b>EN 55032 class A</b> (internal filter)<br><b>FCC Part 15 class A</b> (internal filter) |
|               | - Radiated Emissions      | <b>EN 55032 class A</b> (with external filter)<br><b>FCC Part 15 class A</b> (with external filter)   |
|               | External filter proposal: | <a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>  |

All specifications valid at nominal voltage, full load and +25°C after warm-up time unless otherwise stated.

|              |  |  |
|--------------|--|--|
| EMS Immunity | <ul style="list-style-type: none"> <li>- Electrostatic Discharge</li> <li>- RF Electromagnetic Field</li> <li>- EFT (Burst) / Surge</li> <li>- Conducted RF Disturbances</li> <li>- PF Magnetic Field</li> </ul> | EN 55024 (IT Equipment)<br>Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A<br>Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A<br>EN 61000-4-3, 10 V/m, perf. criteria A<br>EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>EN 61000-4-5, $\pm 2$ kV, perf. criteria A<br>EN 61000-4-6, 10 Vrms, perf. criteria A<br>Continuous: EN 61000-4-8, 30 A/m, perf. criteria A |
|--------------|--|--|

## General Specifications

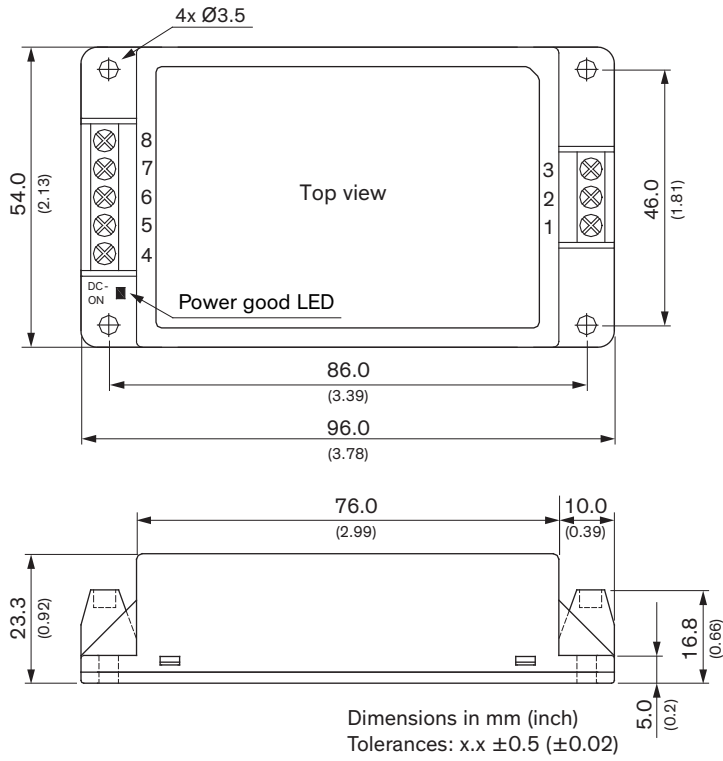
|                           |   |  |
|---------------------------|---|--|
| Relative Humidity         |   | 95% max. (non condensing)  |
| Temperature Ranges        | <ul style="list-style-type: none"> <li>- Operating Temperature</li> <li>- Case Temperature</li> <li>- Storage Temperature</li> </ul>                | -40°C to +90°C<br>+95°C max.<br>-50°C to +125°C  |
| Power Derating            | - High Temperature  | 10 %/K above 85°C  |
| Cooling System            |   | Natural convection (20 LFM)  |
| Remote Control            | <ul style="list-style-type: none"> <li>- Voltage Controlled Remote</li> <li>- Off Idle Input Current</li> <li>- Remote Pin Input Current</li> </ul> | On: 3.5 to 12 VDC or open circuit<br>Off: 0 to 1.2 VDC or short circuit<br>3 mA typ.<br>-0.5 to 0.5 mA   |
| Altitude During Operation |   | 2'000 m max.   |
| Switching Frequency       |   | 285 kHz typ. (PWM)   |
| Insulation System         |   | Functional Insulation  |
| Isolation Test Voltage    | - Input to Output, 60 s   | 2'500 VDC  |
| Isolation Resistance      | - Input to Output, 500 VDC  | 1'000 M $\Omega$ min.  |
| Isolation Capacitance     | - Input to Output, 100 kHz, 1 V   | 2'200 pF max.  |
| Reliability               | - Calculated MTBF   | 775'200 h (MIL-HDBK-217F, ground benign)   |
| Housing Material          |   | Plastic resin (UL 94 V-0 rated)  |
| Connection Type           |   | Screw Terminal   |
| Weight                    |   | 107 g  |
| Thermal Impedance         |   | 3.9 K/W  |
| Environmental Compliance  | <ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>   | <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br><a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> |

## Supporting Documents

|  |  |
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| Overview Link (for additional Documents) | <a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a> |
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**Outline Dimensions**



| Pinout |            |
|--------|------------|
| Pin    | Function   |
| 1      | Remote     |
| 2      | -Vin (GND) |
| 3      | +Vin (Vcc) |
| 4      | NC         |
| 5      | -Vout      |
| 6      | NC         |
| 7      | +Vout      |
| 8      | NC         |

NC: Not Connected