

- Fully encapsulated chassis mount modules
- Harsh industrial EMC capabilities: Integrated filters for emission (EN 55032) & immunity (EN 55035)
- Ultra wide 4:1 input voltage range: 9-36 and 18-75 VDC
- Operating temperature range -40 to +80 °C without derating
- I/O-isolation 3'000 VDC
- Protection against overload, undervoltage and short circuit
- DC-OK (LED) and Remote On/Off function
- IEC/EN/UL 62368-1 safety approvals
- 3-year product warranty



The TMDC 06 series (6 Watt) is the latest additions to Traco Power's existing TMDC line of Industrial DC/DC off-board modules. Equipped with integrated filters which limit conducted and radiated emissions (EN 55032 class A) but also increase the modules EMC immunity (EN 55035), this series is suitable for many harsh industrial applications which require increased EMC and isolation (3000 VDC I/O-isolation) capabilities.

The modules come in fully encapsulated 2.09" x 1.34" x 1.04" plastic package and feature a temperature range from -40° to 80°C without derating.

All models have an ultra wide 4:1 input voltage range from either 9-36 VDC or 18-75 VDC and fully regulated outputs. Latest IT safety certifications (UL 62368-1) and DC-OK and remote on/off functions complete the package to provide an ideal solution for many harsh industrial applications.

Models				
Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TMDC 06-2411	9 – 36 VDC (24 VDC nominal)	5.1 VDC	1200 mA	81 %
TMDC 06-2412		12 VDC	500 mA	84 %
TMDC 06-2413		15 VDC	400 mA	84 %
TMDC 06-2415		24 VDC	250 mA	85 %
TMDC 06-2418		48 VDC	125 mA	83 %
TMDC 06-2422		±12 VDC	±250 mA	84 %
TMDC 06-2423		±15 VDC	±200 mA	85 %
TMDC 06-2425		±24 VDC	±125 mA	84 %
TMDC 06-4811	18 – 75 VDC (48 VDC nominal)	5.1 VDC	1200 mA	80 %
TMDC 06-4812		12 VDC	500 mA	84 %
TMDC 06-4813		15 VDC	400 mA	84 %
TMDC 06-4815		24 VDC	250 mA	85 %
TMDC 06-4818		48 VDC	125 mA	83 %
TMDC 06-4822		±12 VDC	±250 mA	85 %
TMDC 06-4823		±15 VDC	±200 mA	85 %
TMDC 06-4825		±24 VDC	±125 mA	84 %

## Input Specifications

Input current no load	24 Vin models: 10 mA typ. 48 Vin models: 8 mA typ.
Surge voltage (1 s max.)	24 Vin models: -0.7 to 50 V max. 48 Vin models: -0.7 to 100 V max.
Start-up voltage	24 Vin models: 9 VDC (or lower) 48 Vin models: 18 VDC (or lower)
Startup time	30 ms typ.
Under voltage shut down	24 Vin models: 8 VDC typ. 48 Vin models: 16 VDC typ.
Input filter	Internal Pi Type
EMC emissions	- Conducted / Radiated input suppression EN 55032, class A (internal filter)
EMC immunity	EN 55035 - ESD (electrostatic discharge) EN 61000-4-2, air $\pm 8$ kV, perf. criteria A EN 61000-4-2, contact $\pm 6$ kV, perf. criteria A - Radiated immunity EN 61000-4-3, 10 V/m, perf. criteria A - Fast transient / burst immunity EN 61000-4-4, $\pm 2$ kV, perf. criteria A - Surge immunity EN 61000-4-5, $\pm 2$ kV perf. criteria A - Conducted immunity EN 61000-4-6, 10 Vrms, perf. criteria A - Magnetic field immunity EN 61000-4-8, 100 A/m, perf. criteria A

## Output Specifications

Voltage set accuracy	$\pm 2\%$ max.
Output voltage adjustment range	$\pm 10\%$ (single output models only)
Regulation	- Input variation (Vin min. to max.) 0.5% max. - Load variation (0 - 100%) 0.5% max. - Cross regulation (balanced load) dual output: 2.0% max. - Cross regulation (asym. load 25/100%) dual output: 5.0% max.
Temperature coefficient	$\pm 0.02\%$ /K max.
Minimum load	not required
Ripple and noise (20 MHz Bandwidth)	( $\pm$ )24 & 48 VDC models: 180 mVp-p typ. other output models: 75 mVp-p typ.
Transient response	- Recovery time (25% load step change) 500 $\mu$ s max. - Response Deviation (25% load step change) $\pm 5\%$ max.
Over current limitation	at 150% typ. of Iout rated
Short-circuit protection	Hiccup mode 0.3 Hz typ., automatic recovery
Capacitive load	- Single output 5,1 VDC models: 680 $\mu$ F max. 12 VDC models: 330 $\mu$ F max. 15 VDC models: 330 $\mu$ F max. 24 VDC models: 150 $\mu$ F max. 24 VDC models: 68 $\mu$ F max. - Dual output $\pm 12$ VDC models: 150 $\mu$ F max. (each output) $\pm 15$ VDC models: 150 $\mu$ F max. (each output) $\pm 24$ VDC models: 68 $\mu$ F max. (each output)

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

## General Specifications

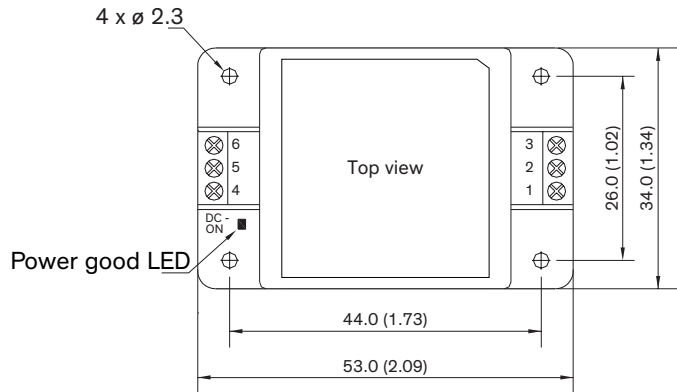
Temperature ranges	<ul style="list-style-type: none"> <li>– Operating (at 20 LFM)</li> <li>– Case temperature</li> <li>– Storage temperature</li> </ul>	–40°C to +92.5°C +105°C max. –50°C to +125°C
Derating		4 %/K above 80°C
Cooling		Natural convection (20 LFM)
Thermal impedance		3.1 K/W (at 20 LFM)
Humidity (non condensing)		95 % rel H max.
Isolation voltage	– Input to Output, 60 s	3000 VDC
Isolation resistance	– Input to Output, 500 VDC	1 GOhm min.
Isolation capacitance	– Input to Output, 100 kHz / 1 V	2200 pF max.
Altitude during operation		5000 m
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		4'100'000 h
Switching frequency		370 kHz typ.
Remote On/Off	<ul style="list-style-type: none"> <li>– Off idle current</li> <li>– Remote pin input current</li> </ul>	Off: short circuit or 0 – 1.2 VDC (referred to -Vin pin) On: open circuit or 3.5 – 12 VDC (referred to -Vin pin) 2.5 mA typ. ±0.5 mA max.
Safety standards	<ul style="list-style-type: none"> <li>– CB report</li> <li>– Certification documents</li> </ul>	IEC/EN/UL 62368-1 <a href="http://www.tracopower.com/overview/tmdc06">www.tracopower.com/overview/tmdc06</a>
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> RoHS directive 2011/65/EU

## Physical Specifications

Casing material		plastic resin (UL 94V-0 rated)
Package weight		49 g
Soldering temperature		max. 260°C / 10 s

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

**Outline Dimensions**



Pinout		
Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin (GND)	-Vin (GND)
3	+Vin (Vcc)	+Vin (Vcc)
4	-Vout	-Vout
5	NC	Common
6	+Vout	+Vout

Dimensions in [mm], ( ) = Inch  
 Tolerances  $\pm 0.5$  ( $\pm 0.02$ )  
 $\pm 0.25$  ( $\pm 0.01$ )

