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TRACO POWER

DC/DC Converter

TMDC 06 Series, 6 Watt

- **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**



UL 62368-1 IEC 62368-1

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 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
TMDC 06-2411	9 - 36 VDC (24 VDC nom.)	5.1 VDC	1'200 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	–12 VDC	250 mA	84 %
TMDC 06-2423		+15 VDC	200 mA	–15 VDC	200 mA	85 %
TMDC 06-2425		+24 VDC	125 mA	–24 VDC	125 mA	84 %
TMDC 06-4811	18 - 75 VDC (48 VDC nom.)	5.1 VDC	1'200 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	–12 VDC	250 mA	85 %
TMDC 06-4823		+15 VDC	200 mA	–15 VDC	200 mA	85 %
TMDC 06-4825		+24 VDC	125 mA	–24 VDC	125 mA	84 %

Options

TMDC-MK1	- Optional DIN-Rail Mounting Kit: www.tracopower.com/products/tmdc-mk1.pdf

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Input Specifications

Input Current	- At no load	24 Vin models:	10 mA typ.
		48 Vin models:	8 mA typ.
	- At full load	24 Vin models:	300 mA typ.
		48 Vin models:	150 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (1 s max.)
		48 Vin models:	100 VDC max. (1 s max.)
Under Voltage Lockout		24 Vin models:	8 VDC typ.
		48 Vin models:	16 VDC typ.
Recommended Input Fuse			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type

Output Specifications

Voltage Set Accuracy			±2% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	0.5% max.
		dual output models:	0.5% max.
	- Load Variation (0 - 100%)	single output models:	0.5% max.
		dual output models:	0.5% max. (Output 1)
			0.5% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models:	2% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models:	5% max.
Ripple and Noise (20 MHz Bandwidth)	- single output	5.1 Vout models:	75 mVp-p typ.
		12 Vout models:	75 mVp-p typ.
		15 Vout models:	75 mVp-p typ.
		24 Vout models:	180 mVp-p typ.
		48 Vout models:	180 mVp-p typ.
	- dual output	12 / -12 Vout models:	75 / 75 mVp-p typ.
		15 / -15 Vout models:	75 / 75 mVp-p typ.
		24 / -24 Vout models:	180 / 180 mVp-p typ.
Capacitive Load	- single output	5.1 Vout models:	680 µF max.
		12 Vout models:	330 µF max.
		15 Vout models:	330 µF max.
		24 Vout models:	150 µF max.
		48 Vout models:	68 µF max.
	- dual output	12 / -12 Vout models:	150 / 150 µF max.
		15 / -15 Vout models:	150 / 150 µF max.
		24 / -24 Vout models:	68 / 68 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			30 ms typ.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Transient Response	- Response Deviation		5% max. (75% to 100% Load Step)
	- Response Time		500 µs typ. (75% to 100% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tmdc06
Pollution Degree		PD 3

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

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EMC Specifications

EMI Emissions	- Conducted Emissions		EN 55032 class A (internal filter)
			FCC Part 15 class A (internal filter)
	- Radiated Emissions		EN 55032 class A (internal filter)
			FCC Part 15 class A (internal filter)
EMS Immunity			EN 55035 (Multimedia)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ±2 kV, perf. criteria A
			EN 61000-4-5, ±2 kV, perf. criteria A
	- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous:	EN 61000-4-8, 100 A/m, perf. criteria A

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +93°C
	- Case Temperature		+105°C max.
	- Storage Temperature		–50°C to +125°C
Power Derating	- High Temperature		4 %/K above 80°C
		See application note:	www.tracopower.com/overview/tmdc06
Cooling System			Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote		On: 3.5 to 12 VDC or open circuit
			Off: 0 to 1.2 VDC or short circuit
			Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current		2.5 mA typ.
	- Remote Pin Input Current		-0.5 to 0.5 mA
Altitude During Operation			5'000 m max.
Switching Frequency			370 kHz typ. (PWM)
Insulation System			Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s		3'000 VDC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		2'200 pF typ.
Reliability	- Calculated MTBF		4'167'000 h (MIL-HDBK-217F, ground benign)
Housing Material			Plastic resin (UL 94 V-0 rated)
Potting Material			Silicone (UL 94 V-0 rated)
Housing Type			Plastic Case
Mounting Type			Chassis Mount
Connection Type			Screw Terminal
Weight			49 g
Thermal Impedance	- Case to Ambient		3.1 K/W typ.
Environmental Compliance	- REACH Declaration		www.tracopower.com/info/reach-declaration.pdf
			REACH SVHC list compliant
			REACH Annex XVII compliant
	- RoHS Declaration		www.tracopower.com/info/rohs-declaration.pdf
			Exemptions: 6c, 7a
			(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number		39791a09-18a4-4f76-8de3-29063549d7b8

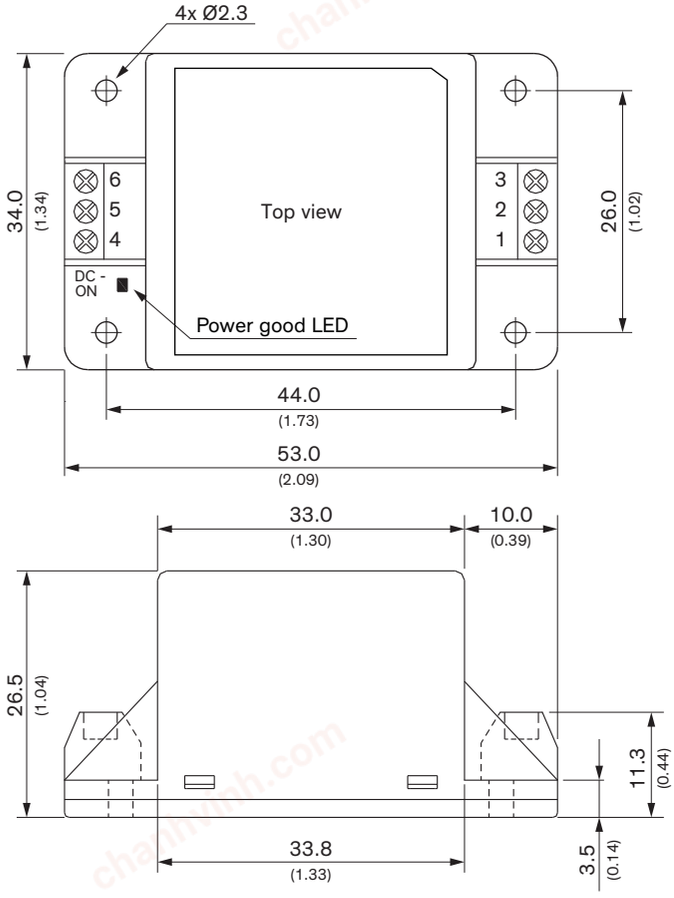
Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tmdc06

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Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ±0.5 (±0.02)
x.xx ±0.25 (±0.01)

Pinout		
Pin*	**Single Output**	**Dual Output**
1	Remote	Remote
2	–Vin (GND)	–Vin (GND)
3	+Vin (Vcc)	+Vin (Vcc)
4	–Vout	–Vout
5	NC	Common
6	+Vout	+Vout

NC: Not connected
* Wires 1.5 mm^2 max.

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