TRACO POWER

DC/DC Converter

TMDC 60 Series, 60 Watt

- **Fully encapsulated low profile plastic case**
- **Ultra wide 4:1 input voltage range**
- **Operating temperature range –40°C to +85°C**
- **I/O isolation 2500 VDC**
- **Excellent efficiency up to 92 %**
- **Input filter to meet EN 55022, class A**
- **Optional DIN-Rail mount adapter**
- **Power good LED indicator**
- **Remote on/off function**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

The TMDC 60 Series is a range of encapsulated high performance DC/DC converter modules with ultra wide input voltage ranges. With a very high efficiency of up to 92% and the use of highest grade components these 60 W converters can be operated in an ambient temperature range of -40°C up to 70°C with full load and up to 85°C with 50% load reduction. The EMC immunity is aligned for industrial applications and DIN-rail mount adapters are available as option. Remote On/Off function and power good LED indicator makes this unit to a practical and reliable DC source for any application - Fit and forget!

Models

Order Code	Input Voltage Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TMDC 60-2411	9 - 36 VDC (24 VDC nom.)	5.1 VDC	12'000 mA	90 %
TMDC 60-2412		12 VDC	5'000 mA	91 %
TMDC 60-2415		24 VDC	2'500 mA	91 %
TMDC 60-2418		48 VDC	1'250 mA	91 %
TMDC 60-4811	18 - 75 VDC (48 VDC nom.)	5.1 VDC	12'000 mA	91 %
TMDC 60-4812		12 VDC	5'000 mA	92 %
TMDC 60-4815		24 VDC	2'500 mA	91 %
TMDC 60-4818		48 VDC	1'250 mA	91 %

Options

TMP-MK2	- Optional DIN-Rail Mounting Kit: www.tracopower.com/overview/tmp-mk2

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Input Specifications

Input Current	- At no load	24 Vin models:	100 mA typ.
		48 Vin models:	50 mA typ.
	- At full load	24 Vin models:	2'770 mA typ.
		48 Vin models:	1'380 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (100 ms max.)
		48 Vin models:	100 VDC max. (100 ms max.)
Under Voltage Lockout		24 Vin models:	7.5 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)		1.5% max.
	- Load Variation (0 - 100%)		1% max.
Ripple and Noise (20 MHz Bandwidth)		5.1 Vout models:	100 mVp-p max.
		12 Vout models:	150 mVp-p max.
		24 Vout models:	150 mVp-p max.
		48 Vout models:	200 mVp-p max.
Capacitive Load		5.1 Vout models:	20'400 µF max.
		12 Vout models:	3'540 µF max.
		24 Vout models:	890 µF max.
		48 Vout models:	220 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			50 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Overvoltage Protection			120% typ. of Vout nom. (By Zener diode)
Transient Response	- Response Deviation		5% max. (75% to 100% Load Step)
	- Response Time		250 µs typ. (75% to 100% Load Step)

Safety Specifications

Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	www.tracopower.com/tmdc60-safety-cert/
Energy Source	- Output, acc. to 62368-1	ES1
Power Source	- Output, acc. to 62368-1	PS3
Pollution Degree		PD 2
Over Voltage Category		Not mains connected

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)			EN 61000-6-4 (Generic Industrial)
			EN 61204-3 (Low Voltage Power Supplies)
	- Conducted Emissions		EN 55032 class A (internal filter)
			FCC 47 Part 15 class A (internal filter)
	- Radiated Emissions		EN 55032 class A (with external filter)
			FCC 47 Part 15 class A (with external filter)
		External filter proposal:	www.tracopower.com/tmdc60-emc-filter/
EMS (Immunity)			EN 55024 (IT Equipment)
			EN 55035 (Multimedia)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±4 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, 30 A/m, perf. criteria A
EMC / Environmental	- Certification Documents		www.tracopower.com/tmdc60-emc-cert/

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +85°C
	- Approved Ambient Temp.	60950-1:	+60°C max.
	- Case Temperature		+95°C max.
	- Storage Temperature		–50°C to +125°C
Power Derating	- High Temperature		3.3 %/K above 70°C (average)
		See application note:	www.tracopower.com/tmdc60-cc/
Cooling System			Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)		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		3 mA typ.
	- Remote Pin Input Current		-0.5 to 0.5 mA
Altitude During Operation			6'000 m max.
Switching Frequency			210 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 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		3'000 pF max.
Reliability	- Calculated MTBF		242'029 h (MIL-HDBK-217F, ground benign)
Housing Material			Plastic (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			300 g
Thermal Impedance	- Case to Ambient		3.5 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: 6(c), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number		b8ea32d4-bc4d-4c30-88d6-db58d43308cc

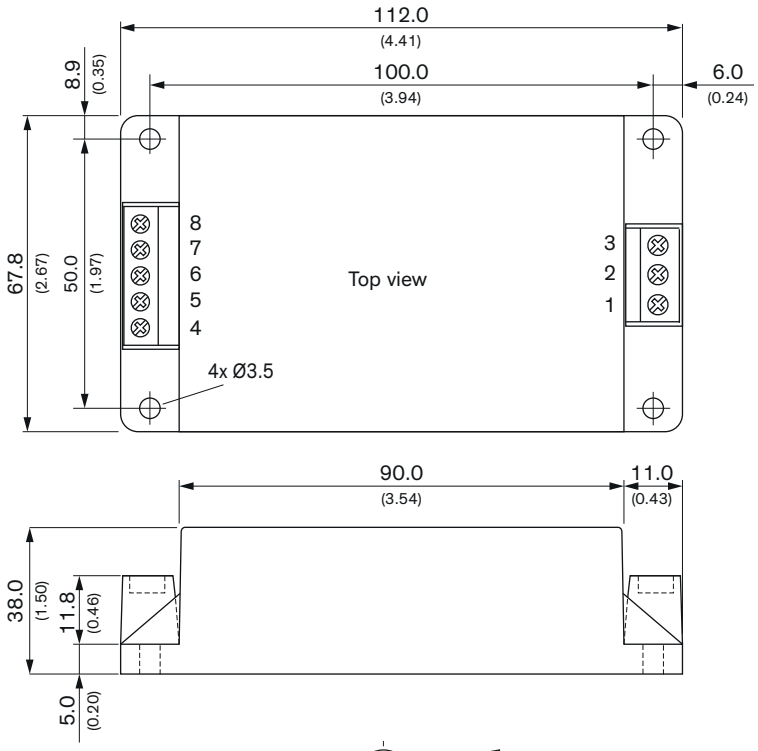
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Additional Information

Supporting Documents	www.tracopower.com/overview/tmdc60
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf
Service Portal	www.tracoserviceportal.com

Outline Dimensions



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

Mounting screw locked torque: 0.49 Nm (5.0 kgfcm)

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

NC: Not connected

Terminal screw locked torque: 0.5 Nm max.

Wire dimension: 1.5 mm^2 max.

Note: The size of the wires has to be assessed in the final application.

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