



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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### Features

- ◆ 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 (functional)
- ◆ Excellent efficiency up to 92 %
- ◆ Input filter to meet EN 55032, class A
- ◆ Optional DIN-Rail mount adapter
- ◆ No minimum load required
- ◆ Input polarity protection
- ◆ Power good LED indicator
- ◆ Remote On/Off
- ◆ 3-year product warranty



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. Input polarity protection 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	Output current max.	Efficiency
TMDC 60-2411	9 – 36 VDC (nominal 24 VDC)	5.1 VDC	12'000 mA	90 %
TMDC 60-2412		12 VDC	5'000 mA	91 %
TMDC 60-2415		24 VDC	2500 mA	91 %
TMDC 60-2418		48 VDC	1250 mA	91 %
TMDC 60-4811	18 – 75 VDC (nominal 48 VDC)	5.1 VDC	12'000 mA	91 %
TMDC 60-4812		12 VDC	5'000 mA	92 %
TMDC 60-4815		24 VDC	2500 mA	91 %
TMDC 60-4818		48 VDC	1250 mA	91 %

### Input Specifications

Input current at no load (nominal input voltage)	- 24 Vin	5.1 & 12 VDC models: 100 mA typ. 24 VDC models: 110 mA typ. 48 VDC models: 60 mA typ.
	- 48 Vin	5.1 VDC models: 40 mA typ. 12 & 24 VDC models: 60 mA typ. 48 VDC models: 50 mA typ.
Surge voltage (100 msec. max.)		24 Vin models: 50 V max. 48 Vin models: 100 V max.
Start up time		50 ms max.
Start-up voltage		24 Vin models: 9 VDC max. 48 Vin models: 18 VDC max.
Under voltage lockout		24 Vin models: 7.5 VDC typ. 48 Vin models: 16 VDC typ.
EMI Conducted		EN 55032 class A, FCC part 15 class A without external components
EMI Radiated		EN 55032 class A, FCC part 15 class A with external components
EMC immunity	- ESD (electrostatic discharge)	EN 55024 EN 61000-4-2, air ±8 kV, contact ±4 kV, perf. criteria A
	- Radiated immunity	EN 61000-4-3, 10 V/m, perf. criteria A
	- Fast transient / surge	EN 61000-4-4, ±2 kV, perf. criteria A
	- Conducted immunity	EN 61000-4-5, ±2 kV, perf. criteria A
	- Magnetic field immunity	EN 61000-4-6, 10 Vrms, perf. criteria A
		EN 61000-4-8, 30 A/m, perf. criteria A

### Output Specifications

Voltage set accuracy		±2.0 % max.
Regulation	- Input variation Vin min. to Vin max.	1.5 % max.
	- Load variation 0 – 100 %	1.0 % max.
Minimum load		not required
Temperature coefficient		±0.02 %/K
Ripple and noise (20 MHz Bandwidth)	5.1 VDC models:	100 mVpk-pk. typ.
	12 & 24 VDC models:	150 mVpk-pk typ.
	48 VDC models:	200 mVpk-pk. typ.
Transient response (alignment to 1% at load step change 75% to 100% )	- Recovery time	250 µs typ.
	- Deviation	±5 % max.
Over voltage protection		120 % of Vout (Zener diode clamp)
Output current limitation		at 150 % of Iout max.
Short circuit protection		hiccup mode, automatic recovery
Capacitive load	5.1 VDC models:	20'400 µF max.
	12.0 VDC models:	3'540 µF max.
	24.0 VDC models:	890 µF max.
	48.0 VDC models:	220 µF max.

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

### General Specifications

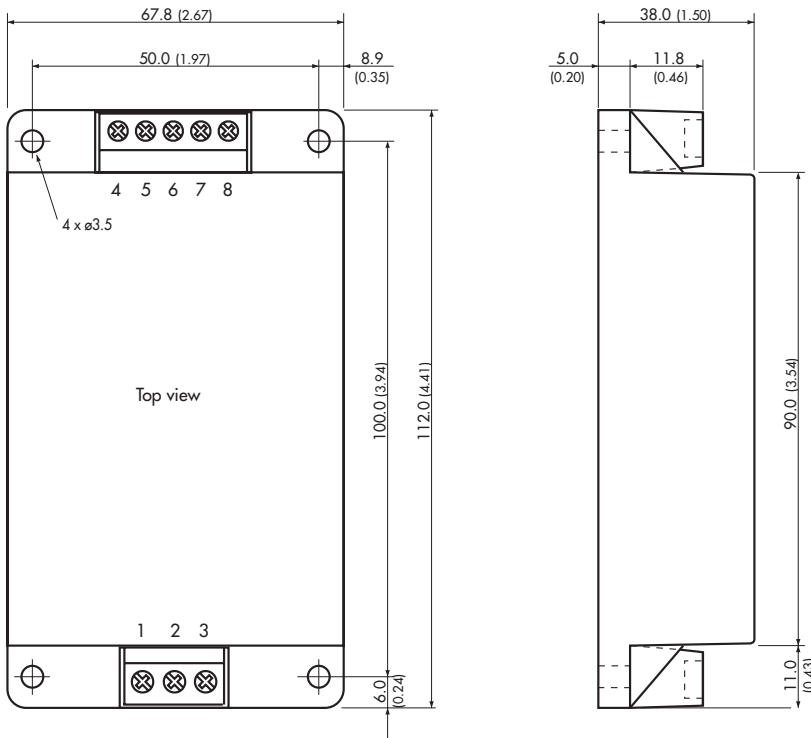
Temperature ranges	<ul style="list-style-type: none"> <li>- Operating ambient with natural convection (20 LFM)</li> <li>- IEC/EN/UL60950-1 approved ambient</li> <li>- Case temperature</li> <li>- Storage</li> </ul>	-40°C to +85°C (see load derating) +60°C max. (without derating) +95°C max. -50°C to +125°C
Load derating (with natural convection 20 LFM)		3.3 %/K above +70°C
Thermal impedance	- Natural convection 20 LFM	3.5 K/W
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		242'029 h
Isolation voltage (60 sec.)	- Input/Output	2500 VDC
Isolation capacitance	- Input/Output	3000 pF max. (100 kHz, 1 V)
Isolation resistance	- Input/Output	>1000 Mohm (500 VDC)
Altitude during operation		2'000 m max.
Switching frequency		210 kHz typ.
Remote On/Off	<ul style="list-style-type: none"> <li>- On:</li> <li>- Off:</li> <li>- Off idle current:</li> </ul>	3.5 to 12 VDC to on terminal 1 or open circuit. 0 to +1.2 VDC on terminal 1 reference to -Vin 3 mA typ.
Safety standards	<ul style="list-style-type: none"> <li>- CB test report</li> <li>- UL test certificat</li> <li>- Certification documents</li> </ul>	UL/cUL 60950-1 2nd edition, IEC 60950-1:2005 (2nd edition)+Am1:2009 +Am2:2013, EN 60950-1:2006+A11:2009+A1: 2010+A12:2011+A2:2013 UL/cUL 60950-1 2nd edition, CSA C22.2 No. 60950-1-07, 2nd Ed. <a href="http://www.tracopower.com/overview/tmdc60">www.tracopower.com/overview/tmdc60</a>

### Physical Specifications

Casing material		plastic resin (UL 94V-0 rated)
Weight		300 g (10.57 oz)
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach declaration</li> <li>- RoHS</li> </ul>	<a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> directive 2011/65/EU

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

**Outline Dimensions**

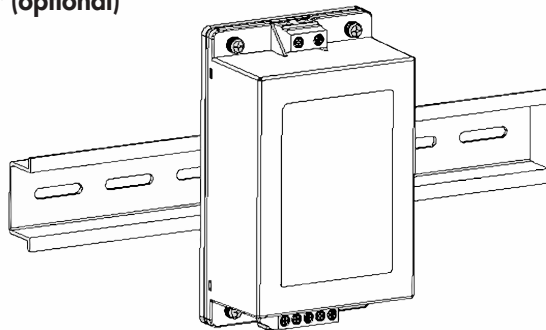


**Terminal connection**

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

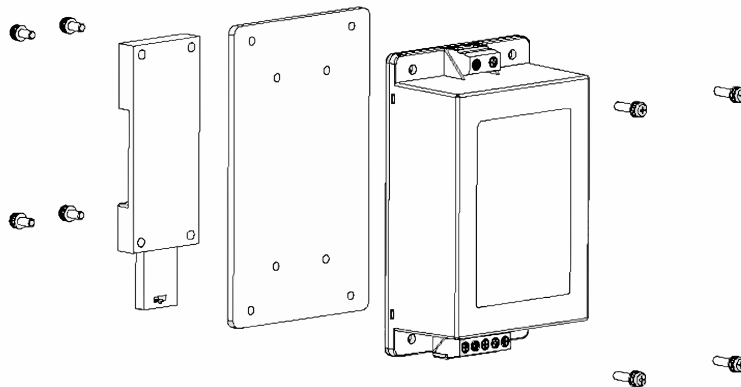
Dimensions in [mm], ( ) = Inch  
 Terminals: Wires 1.5mm<sup>2</sup> max.  
 Recommended tightening torque:  
 0.5 to 0.7 Nm (4.5 to 6.2 lb.in.)  
 Case tolerances: ±0.25 (±0.01)

**DIN-Rail mount adapter (optional)**



**Order code: TMP-MK2**

**Weight: 59 g (2.08 oz) without converter**



Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)