

- Industry standard pinout
- Unregulated device
- I/O isolation voltage 3000 VDC
- Operating temperature range $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$
- Efficiency up to 81 %
- 3-years product warranty



The TMV series are miniature, isolated 1 W DC/DC-converters with high isolation in a single-in-line package (SIP). Requiring only 1.2 cm² board space they offer the ideal solution in many space critical applications for board level power distribution. The use of SMD-technology makes it possible to offer a product with high performance at low cost

Models						
Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TMV 0505S	4.5 - 5.5 VDC (5 VDC nom.)	5 VDC	200 mA			71 %
TMV 0509S		9 VDC	110 mA			76 %
TMV 0512S		12 VDC	84 mA			78 %
TMV 0515S		15 VDC	67 mA			78 %
TMV 0505D		+5 VDC	100 mA	-5 VDC	100 mA	72 %
TMV 0512D		+12 VDC	42 mA	-12 VDC	42 mA	78 %
TMV 0515D		+15 VDC	34 mA	-15 VDC	34 mA	79 %
TMV 1205S	10.8 - 13.2 VDC (12 VDC nom.)	5 VDC	200 mA			73 %
TMV 1212S		12 VDC	84 mA			80 %
TMV 1215S		15 VDC	67 mA			80 %
TMV 1205D		+5 VDC	100 mA	-5 VDC	100 mA	74 %
TMV 1212D		+12 VDC	42 mA	-12 VDC	42 mA	81 %
TMV 1215D		+15 VDC	34 mA	-15 VDC	34 mA	81 %
TMV 2405S	21.6 - 26.4 VDC (24 VDC nom.)	5 VDC	200 mA			71 %
TMV 2412S		12 VDC	84 mA			78 %
TMV 2415S		15 VDC	67 mA			79 %
TMV 2405D		+5 VDC	100 mA	-5 VDC	100 mA	72 %
TMV 2412D		+12 VDC	42 mA	-12 VDC	42 mA	79 %
TMV 2415D		+15 VDC	34 mA	-15 VDC	34 mA	80 %

Input Specifications

Input Current	- At no load	5 Vin models: 30 mA typ. 12 Vin models: 12 mA typ. 24 Vin models: 7 mA typ.
	- At full load	5 Vin models: 270 mA typ. 12 Vin models: 110 mA typ. 24 Vin models: 55 mA typ.
Surge Voltage		5 Vin models: 9 VDC max. (1 s max.) 12 Vin models: 18 VDC max. (1 s max.) 24 Vin models: 30 VDC max. (1 s max.)
Recommended Input Fuse		5 Vin models: 500 mA (slow blow) 12 Vin models: 200 mA (slow blow) 24 Vin models: 100 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Capacitor

Output Specifications

Voltage Set Accuracy		±3% max.
Regulation	- Input Variation (1% Vin step)	single output models: 1.5% max. dual output models: 1.5% max.
	- Load Variation - Voltage Balance (symmetrical load)	See application note: www.tracopower.com/overview/tmv dual output models: 1% max.
Ripple and Noise	- 20 MHz Bandwidth	65 mVp-p typ. 100 mVp-p max. (To further reduce Ripple and Noise, a capacitor with 1.0 µF X7R is recommended.)
Capacitive Load	- single output	5 Vout models: 220 µF max. 9 Vout models: 220 µF max. 12 Vout models: 220 µF max. 15 Vout models: 220 µF max.
	- dual output	5 / -5 Vout models: 100 / 100 µF max. 12 / -12 Vout models: 100 / 100 µF max. 15 / -15 Vout models: 100 / 100 µF max.
Minimum Load		2 % of Iout max. (Operation at lower load will not damage the converter, but it may not meet all specifications)
Temperature Coefficient		±0.02 %/K max.
Start-up Time		230 ms max.
Short Circuit Protection		Limited 0.5 s max., Automatic recovery

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class A (with external filter)
	- Radiated Emissions	EN 55032 class A (with external filter)
	External filter proposal:	www.tracopower.com/overview/tmv

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +85°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-50°C to +125°C
Power Derating	- High Temperature	4 %/K above 75°C (5 & ±5 Vout models) 4 %/K above 80°C (other Vout models)
	Cooling System	Natural convection (20 LFM)

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

Switching Frequency		70 - 120 kHz (PFM) 100 kHz typ. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	3'000 VDC
Isolation Resistance	- Input to Output, 500 VDC	10'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	60 pF typ. 100 pF max.
Reliability	- Calculated MTBF	2'000'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Allowed (hermetical product)
	See Cleaning Guideline:	www.tracopower.com/info/cleaning.pdf
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Base Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Nickel-Iron (Alloy 42)
Pin Foundation Plating		Nickel (1 μm min.)
Pin Surface Plating		Tin (3 - 5 μm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP7
Soldering Profile		Wave Soldering 260°C / 10 s max.
Weight	5 Vin models: 12 Vin models: 24 Vin models:	2.2 g 2.2 g 2.6 g
Thermal Impedance		61.2 K/W
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: 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tmv

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