

- Very high 5200 VDC I/O-isolation (5700 Vpk)
- Unregulated device
- Dedicated for IGBT applications
- Operating temperature range  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$
- 3-year product warranty



The TMV-2HI series is a range of 2 Watt non regulated Dc/DC-converters with very high I/O-isolation of 5700 Vpk. They come in a compact SIP-7 package.

### Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMV 2-0503SHI	4.5 - 5.5 VDC (5 VDC nom.)	3.3 VDC	500 mA			74 %
TMV 2-0505SHI		5 VDC	400 mA			80 %
TMV 2-0509SHI		9 VDC	222 mA			81 %
TMV 2-0512SHI		12 VDC	168 mA			82 %
TMV 2-0515SHI		15 VDC	132 mA			79 %
TMV 2-0505DHI		+5 VDC	200 mA	-5 VDC	200 mA	78 %
TMV 2-0509DHI		+9 VDC	112 mA	-9 VDC	112 mA	80 %
TMV 2-0512DHI		+12 VDC	84 mA	-12 VDC	84 mA	80 %
TMV 2-0515DHI		+15 VDC	66 mA	-15 VDC	66 mA	79 %
TMV 2-05159HI		+15 VDC	66 mA	-9 VDC	110 mA	80 %
TMV 2-1203SHI		10.8 - 13.2 VDC (12 VDC nom.)	3.3 VDC	500 mA		
TMV 2-1205SHI	5 VDC		400 mA			79 %
TMV 2-1209SHI	9 VDC		222 mA			81 %
TMV 2-1212SHI	12 VDC		168 mA			83 %
TMV 2-1215SHI	15 VDC		132 mA			82 %
TMV 2-1205DHI	+5 VDC		200 mA	-5 VDC	200 mA	79 %
TMV 2-1209DHI	+9 VDC		112 mA	-9 VDC	112 mA	81 %
TMV 2-1212DHI	+12 VDC		84 mA	-12 VDC	84 mA	82 %
TMV 2-1215DHI	+15 VDC		66 mA	-15 VDC	66 mA	83 %
TMV 2-12159HI	+15 VDC		66 mA	-9 VDC	110 mA	81 %
TMV 2-1503SHI	13.5 - 16.5 VDC (15 VDC nom.)		3.3 VDC	500 mA		
TMV 2-1505SHI		5 VDC	400 mA			79 %
TMV 2-1509SHI		9 VDC	222 mA			83 %
TMV 2-1512SHI		12 VDC	168 mA			83 %
TMV 2-1515SHI		15 VDC	132 mA			85 %
TMV 2-1505DHI		+5 VDC	200 mA	-5 VDC	200 mA	81 %
TMV 2-1509DHI		+9 VDC	112 mA	-9 VDC	112 mA	84 %
TMV 2-1512DHI		+12 VDC	84 mA	-12 VDC	84 mA	82 %
TMV 2-1515DHI		+15 VDC	66 mA	-15 VDC	66 mA	82 %
TMV 2-15159HI		+15 VDC	66 mA	-9 VDC	110 mA	83 %
TMV 2-2403SHI		21.6 - 26.4 VDC (24 VDC nom.)	3.3 VDC	500 mA		
TMV 2-2405SHI	5 VDC		400 mA			77 %
TMV 2-2409SHI	9 VDC		222 mA			81 %
TMV 2-2412SHI	12 VDC		168 mA			82 %
TMV 2-2415SHI	15 VDC		132 mA			82 %
TMV 2-2405DHI	+5 VDC		200 mA	-5 VDC	200 mA	77 %
TMV 2-2409DHI	+9 VDC		112 mA	-9 VDC	112 mA	81 %
TMV 2-2412DHI	+12 VDC		84 mA	-12 VDC	84 mA	81 %
TMV 2-2415DHI	+15 VDC		66 mA	-15 VDC	66 mA	80 %
TMV 2-24159HI	+15 VDC		66 mA	-9 VDC	110 mA	81 %

## Input Specifications

Input Current	- At no load	5 Vin models: <b>35 mA typ.</b> 12 Vin models: <b>17 mA typ.</b> 15 Vin models: <b>16 mA typ.</b> 24 Vin models: <b>12 mA typ.</b>
	- At full load	5 Vin models: <b>500 mA typ.</b> 12 Vin models: <b>205 mA typ.</b> 15 Vin models: <b>160 mA typ.</b> 24 Vin models: <b>105 mA typ.</b>
Surge Voltage		5 Vin models: <b>9 VDC max.</b> (1 s max.) 12 Vin models: <b>18 VDC max.</b> (1 s max.) 15 Vin models: <b>20 VDC max.</b> (1 s max.) 24 Vin models: <b>30 VDC max.</b> (1 s max.)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Capacitor

## Output Specifications

Voltage Set Accuracy		<b>±5% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	single output models: <b>1.2% max.</b>
	- Load Variation (20 - 100%)	single output models: <b>20% max.</b> (3.3 Vout models) <b>15% max.</b> (5 & ±5 Vout models) <b>10% max.</b> (other models)
	- Voltage Balance (symmetrical load)	dual output models: <b>1% max.</b>
Ripple and Noise	- 20 MHz Bandwidth	<b>100 mVp-p max.</b>
Capacitive Load	- single output	3.3 Vout models: <b>1'650 µF max.</b> 5 Vout models: <b>940 µF max.</b> 9 Vout models: <b>940 µF max.</b> 12 Vout models: <b>440 µF max.</b> 15 Vout models: <b>440 µF max.</b>
	- dual output	5 / -5 Vout models: <b>440 / 440 µF max.</b> 9 / -9 Vout models: <b>440 / 440 µF max.</b> 12 / -12 Vout models: <b>200 / 200 µF max.</b> 15 / -15 Vout models: <b>200 / 200 µF max.</b> 15 / -9 Vout models: <b>200 / 440 µF max.</b>
Minimum Load		<b>2 % of Iout max.</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Short Circuit Protection		Continuous, Automatic recovery

## Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmv2hi">www.tracopower.com/overview/tmv2hi</a>
Pollution Degree		PD 2

## General Specifications

Relative Humidity		<b>95% max.</b> (non condensing)
Temperature Ranges	- Operating Temperature	<b>-40°C to +85°C</b>
	- Case Temperature	<b>+95°C max.</b>
	- Storage Temperature	<b>-55°C to +125°C</b>

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

Power Derating	- High Temperature	6.7 %/K above 80°C
Cooling System		Natural convection (20 LFM)
Altitude During Operation		6'000 m max.
Switching Frequency		100 kHz min. (PFM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	5'200 VDC
	- Input to Output, 1 s	5'700 VDC
Isolation Resistance	- Input to Output, 500 VDC	10'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	7 pF typ.
Common Mode Transient Immunity		15 kV/μs min.
Reliability	- Calculated MTBF	1'110'000 h (MIL-HDBK-217F, ground benign)
Housing Material		Non-conductive Plastic (UL94 V-0 rated)
Potting Material		Silicone (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
Soldering Profile		Wave Soldering 260°C / 10 s max.
Connection Type		THD (Through-Hole Device)
Weight		2.4 g
Environmental Compliance	- REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-I

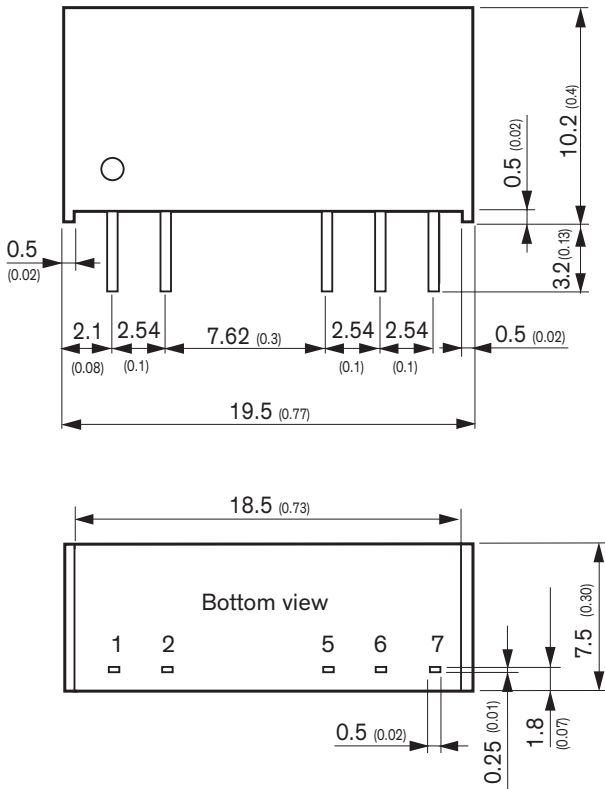
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmv2hi](http://www.tracopower.com/overview/tmv2hi)

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

**Outline Dimensions**



Pinout		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
5	-Vout	-Vout
6	No pin	Common
7	+Vout	+Vout