

- Fully encapsulated power supplies in plastic casing for PCB mount
- Fully regulated outputs
- 3000 VAC I/O-isolation
- High efficiency up to 90%
- Universal input range 90 to 264 VAC
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  max.
- Safety class II prepared
- Short circuit over power and over voltage limitation
- 3-year product warranty



TMG 50 Series AC/DC power modules come in fully encapsulated plastic package. They are ultra-compact, energy-efficient and cost/performance optimised for prevailing market requirements. The high efficiency and the use of high grade components make these modules suitable for an operating temperature range of  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ . The modules are protected against short-circuit and over voltage. EMI/EMC characteristics and the safety approval package qualify them for demanding applications in equipment for industrial or commercial environments.

Models				
Order Code	Output Power	Output Voltage		Efficiency
	max.	nom.	max.	
TMG 50105	40 W	5 VDC	8'000 mA	86 %
TMG 50112		12 VDC	4'167 mA	90 %
TMG 50115	50 W	15 VDC	3'333 mA	87 %
TMG 50124		24 VDC	2'083 mA	88 %
TMG 50148		48 VDC	1'040 mA	89 %

### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>90 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>120 - 370 VDC</b> (Designed for, no certification) Polarity: <b>irrelevant</b>
Input Frequency		Operational Range: <b>47 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>1'000 mW max.</b>
	- No load & Vin = 115 VAC	<b>1'000 mW max.</b>
Input Current	- Full load & Vin = 230 VAC	<b>600 mA max.</b>
	- Full load & Vin = 115 VAC	<b>1'000 mA max.</b>
Input Inrush Current	- At 230 VAC	<b>60 A max.</b>
	- At 115 VAC	<b>40 A max.</b> (For the 7 & 15 W models an external Thermistor has to be integrated in the circuit at the converter input L in series. Thermistor recommendation: 10R / 15z)
Recommended Input Fuse		<b>3'150 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Voltage Set Accuracy		<b>±2% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>1% max.</b>
	- Load Variation (0 - 100%)	<b>1% max.</b>
Ripple and Noise (20 MHz Bandwidth)	5 VDC model:	<b>120 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	12 VDC model:	<b>120 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	15 VDC model:	<b>150 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	24 VDC model:	<b>240 mVp-p max.</b> (w/ 0.1 µF    47 µF)
	48 VDC model:	<b>480 mVp-p max.</b> (w/ 0.1 µF    47 µF)
Capacitive Load	5 VDC model:	<b>10'000 µF max.</b>
	12 VDC model:	<b>3'500 µF max.</b>
	15 VDC model:	<b>3'000 µF max.</b>
	24 VDC model:	<b>2'200 µF max.</b>
	48 VDC model:	<b>330 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>50 ms min.</b>
	- At 115 VAC	<b>10 ms min.</b>
Start-up Time	- At 230 VAC	<b>250 ms max.</b>
	- At 115 VAC	<b>400 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>200 - 258% of Iout max.</b>
Overvoltage Protection		<b>105 - 145% of Vout nom.</b> (By Zener diode)
Transient Response	- Response Deviation	<b>2% max.</b> (75% to 100% Load Step)
	- Response Time	<b>500 µs typ.</b> (75% to 100% Load Step)

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

## Safety Specifications

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/tmg50">www.tracopower.com/overview/tmg50</a>
Protection Class		Class I & II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

## EMC Specifications

EMI (Emissions)	- Conducted Emissions - Radiated Emissions	EN 55032 class B (internal filter) EN 55032 class B (internal filter)
EMS (Immunity)	- Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge  - Conducted RF Disturbances - PF Magnetic Field - Voltage Dips & Interruptions	EN 55024 (IT Equipment) EN 55035 (Multimedia) Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A Ext. input component: Use an external Varistor at the converter input (in parallel). Recommendation: 14S471K EN 61000-4-6, 10 Vrms, perf. criteria A Continuous: EN 61000-4-8, 30 A/m, perf. criteria A 230 VAC / 50 Hz: 30%, 25 periods, perf. criteria A >95%, 0.5 periods, perf. criteria A 115 VAC / 60 Hz: 30%, 25 periods, perf. criteria A >95%, 0.5 periods, perf. criteria A
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tmg50">www.tracopower.com/overview/tmg50</a>

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Storage Temperature	-40°C to +70°C -40°C to +85°C
Power Derating	- High Temperature - Low Input Voltage	3.75 %/K above 50°C 2 %/V below 100 VAC
		See application note: <a href="http://www.tracopower.com/overview/tmg50">www.tracopower.com/overview/tmg50</a>
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Switching Frequency		60 - 70 kHz (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		310 VAC
Isolation Test Voltage	- Input to Output, 60 s	3'000 VAC
Creepage	- Input to Output	4.8 mm min.
Clearance	- Input to Output	4 mm min.
Leakage Current (at 240 VAC)	- Earth Leakage Current	250 $\mu$ A max.
Reliability	- Calculated MTBF	300'000 h (MIL-HDBK-21 7F, ground benign)
Washing Process		Not allowed
Housing Material		Plastic resin (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated) (Hermetical sealed structure, dust-proof only non water-proof)
Pin Material		Brass
Pin Surface Plating		Tin (120 $\mu$ m min.), matte

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

Housing Type	Plastic Case
Mounting Type	PCB Mount
Connection Type	THD (Through-Hole Device)
Soldering Profile	Lead-Free Wave Soldering 270°C / 3 s max.
Weight	166 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 (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) - SCIP Reference Number 58f7f381-03c9-497c-a95d-1d76a1f7827f

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmg50](http://www.tracopower.com/overview/tmg50)

### Outline Dimensions

