

- Fully encapsulated power supplies in plastic casing for PCB mount
- Fully regulated outputs
- 4000 VAC I/O-isolation
- High efficiency up to 85%
- 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



UL 62368-1 IEC 62368-1

TMG 15 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  $+70^{\circ}\text{C}$ . Together with very low no-load power consumption they are suitable for applications conforming with the ErP directive. 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 max.	Output Voltage nom.	Output Current max.	Efficiency typ.
TMG 15105	13.5 W	5 VDC	2'700 mA	80 %
TMG 15112	15 W	12 VDC	1'250 mA	84 %
TMG 15115		15 VDC	1'000 mA	84 %
TMG 15124		24 VDC	625 mA	85 %

## 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>+DC: N / -DC: L</b>
Input Frequency		Operational Range: <b>47 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Input Current	- Full Load & Vin = 230 VAC	<b>220 mA max.</b>
	- Full Load & Vin = 115 VAC	<b>340 mA max.</b>
Power Consumption	- No load & Vin = 230 VAC	<b>100 mW max.</b> (Ready to meet ErP directive)
	- No load & Vin = 115 VAC	<b>100 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>45 A max.</b>
	- At 115 VAC	<b>25 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>2'000 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>0.5% max.</b>
	- Load Variation (10 - 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)
Capacitive Load	5 VDC model:	<b>7'000 µF max.</b>
	12 VDC model:	<b>1'500 µF max.</b>
	15 VDC model:	<b>1'000 µF max.</b>
	24 VDC model:	<b>470 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.05 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>35 ms min.</b>
	- At 115 VAC	<b>4 ms min.</b>
Start-up Time	- At 230 VAC	<b>100 ms max.</b>
	- At 115 VAC	<b>120 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>164 - 228% 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)

## 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/tmg15">www.tracopower.com/overview/tmg15</a>
Protection Class		<b>Class I &amp; II</b> (Prepared): <b>Reinforced Insulation</b>

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

Pollution Degree	PD 2
Over Voltage Category	OVC II

## EMC Specifications

EMI Emissions	- Conducted Emissions	EN 55032 class B (internal filter)
	- Radiated Emissions	EN 55032 class B (internal filter)
EMS Immunity		EN 55024 (IT Equipment)
		EN 55035 (Multimedia)
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A
		Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ 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
	- 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
	- Voltage Dips & Interruptions	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

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C
	- Storage Temperature	-40°C to +85°C
Power Derating	- High Temperature	3 %/K above 50°C (12-24 VDC models)
		2.2 %/K above 40°C (5 VDC model or <115 VAC input)
	- Low Input Voltage	2 %/V below 100 VAC
	See application note: <a href="http://www.tracopower.com/overview/tmg15">www.tracopower.com/overview/tmg15</a>	
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Switching Frequency		40 - 140 kHz (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		256 VAC
Isolation Test Voltage	- Input to Output, 60 s	4'000 VAC
Creepage	- Input to Output	5 mm min.
Clearance	- Input to Output	4 mm min.
Leakage Current (at 240 VAC)	- Earth Leakage Current	250 $\mu$ A max.
Reliability	- Calculated MTBF	450'000 h (MIL-HDBK-217F, 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
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Weight		40 g

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

Environmental Compliance    - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

REACH SVHC list compliant

REACH Annex XVII compliant

[www.tracopower.com/info/rohs-declaration.pdf](http://www.tracopower.com/info/rohs-declaration.pdf)

Exemptions: 7c-I

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (Q5A rule).

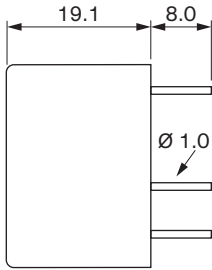
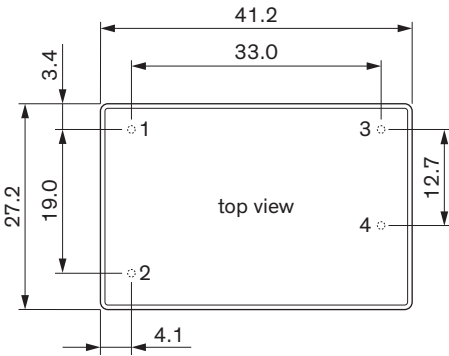
The SCIP number is provided on request.)

**Supporting Documents**

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmg15](http://www.tracopower.com/overview/tmg15)

**Outline Dimensions**



Dimensions in mm  
 Tolerances  $\pm 0.5$  mm  
 Pin tolerances  $\pm 0.1$  mm

Pinout	
Pin	Function
1	AC IN (L)
2	AC IN (N)
3	-Vout
4	+Vout