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TRACO POWER

AC/DC Power Supply

TMM 40 Series, 40 Watt

- **Fully encapsulated low profile plastic casing in PCB version**
- **2 x MOPP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition**
- **IT and industrial safety according to IEC/EN/UL 62368-1**
- **Ready to meet ErP directive <0.3 W no load power consumption**
- **–40°C start-up temperature**
- **Safety class II prepared**
- **Protection against over-temperature, overload and short circuit**
- **3-year product warranty**



UL 508 ES 60601-1 IEC 60601-1 UL 62368-1 IEC 62368-1

The TMM 40 Series of fully encapsulated 40 Watt AC/DC power supply modules feature a reinforced/double I/O isolation system according to latest medical safety standards 60601-3 3rd edition for 2 x MOPP (Means Of Patient Protection).
The high efficiency and the use of highest grade components make the units suitable for an operating temperature range of –40°C to +60°C without load derating. EMI/EMC characteristics and the safety approval package qualify these modules not only for medical devices but also for demanding applications in transportation systems and for equipment in industrial an commercial environment.

Models

Order Code	Output Power	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	
TMM 40105	40 W	5 VDC	8'000 mA			81 %
TMM 40112		12 VDC	3'330 mA			84 %
TMM 40115		15 VDC	2'660 mA			85 %
TMM 40124		24 VDC	1'660 mA			84 %
TMM 40212		+12 VDC	1'660 mA	–12 VDC	1'660 mA	84 %
TMM 40215		+15 VDC	1'330 mA	–15 VDC	1'330 mA	85 %

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Input Specifications

Input Voltage	- AC Range	Operational Range:	85 - 264 VAC (Full Range)
		Rated Range:	100 - 240 VAC (Full Range)
	- DC Range	Operational Range:	120 - 370 VDC (Designed for, no certification)
		Polarity:	irrelevant
Input Frequency		Operational Range:	47 - 440 Hz
		Certified:	50/60 Hz
Input Current	- Full Load & Vin = 230 VAC	5 VDC model:	430 mA max.
		12 VDC model:	415 mA max.
		15 VDC model:	410 mA max.
		24 VDC model:	415 mA max.
		12 / -12 VDC model:	415 mA max.
		15 / -15 VDC model:	410 mA max.
	- Full Load & Vin = 115 VAC	5 VDC model:	720 mA max.
		12 VDC model:	690 mA max.
		15 VDC model:	680 mA max.
		24 VDC model:	690 mA max.
		12 / -12 VDC model:	690 mA max.
		15 / -15 VDC model:	680 mA max.
Power Consumption	- No load & Vin = 230 VAC		750 mW max.
	- No load & Vin = 115 VAC		300 mW max.
Input Inrush Current	- At 230 VAC		60 A max.
	- At 115 VAC		30 A max.
Input Protection			T 2 A / 250 VAC (Internal Fuse in L & N)
Recommended Input Fuse			3'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)

Output Specifications

Voltage Set Accuracy			±2% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	0.5% max.
		dual output models:	0.5% max.
	- Load Variation (0 - 100%)	single output models:	1% max.
		dual output models:	2% max. (Output 1)
			2% max. (Output 2)
Ripple and Noise (20 MHz Bandwidth)	- single output	5 VDC model:	90 mVp-p max.
		12 VDC model:	155 mVp-p max.
		15 VDC model:	195 mVp-p max.
		24 VDC model:	310 mVp-p max.
	- dual output	12 / -12 VDC model:	155 / 155 mVp-p max.
		15 / -15 VDC model:	195 / 195 mVp-p max.
	- single output	5 VDC model:	80 mVp-p typ.
		12 VDC model:	120 mVp-p typ.
		15 VDC model:	150 mVp-p typ.
		24 VDC model:	240 mVp-p typ.
	- dual output	12 / -12 VDC model:	120 / 120 mVp-p typ.
		15 / -15 VDC model:	150 / 150 mVp-p typ.
Capacitive Load	- single output	5 VDC model:	8'000 µF max.
		12 VDC model:	3'900 µF max.
		15 VDC model:	3'900 µF max.
		24 VDC model:	680 µF max.
	- dual output	12 / -12 VDC model:	1'500 / 1'500 µF max.
		15 / -15 VDC model:	1'000 / 1'000 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.

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

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Hold-up Time	- At 230 VAC	50 ms min.
	- At 115 VAC	10 ms min.
Start-up Overshoot Voltage		5% max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		105% min. of Iout max.
Overvoltage Protection		120% typ. of Vout nom. (By Zener diode)

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
	- Industrial Control Equipment	UL 508
	- Medical Equipment	EN 60601-1 IEC 60601-1 ANSI/AAMI ES 60601-1 CSA-C22.2, No 60601-1 2 x MOPP (Means Of Patient Protection)
	- Certification Documents	www.tracopower.com/overview/tmm40
Protection Class		Class I & II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

EMC Specifications

EMI Emissions			EN 61000-6-3 (Generic Residential) EN 61000-6-4 (Generic Industrial)
	- Conducted Emissions		EN 55011 class B (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter)
	- Radiated Emissions		EN 55011 class B (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter)
EMS Immunity			EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 61000-6-1 (Generic Residential) EN 61000-6-2 (Generic Industrial) EN 60601-1-2 edition 4 (Medical Devices)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±15 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±8 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ±2 kV, perf. criteria A
		L to L:	EN 61000-4-5, ±1 kV, perf. criteria A
	- 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 >95%, 1 period, perf. criteria A >95%, 250 periods, perf. criteria B

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +80°C
	- Storage Temperature	–40°C to +95°C

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Power Derating	- High Temperature		3.75 %/K above 60°C
		See application note:	www.tracopower.com/overview/tmm40
Over Temperature Protection Switch Off	- Protection Mode		142°C typ. (Automatic recovery at 67°C typ.)
	- Measurement Point		Internal IC temperature
Cooling System			Natural convection (20 LFM)
Altitude During Operation			5'000 m max.
Switching Frequency			130 kHz typ. (PWM)
Insulation System			Reinforced Insulation
Working Voltage (rated)			240 VAC
Isolation Test Voltage	- Input to Output, 60 s		4'000 VAC
Isolation Resistance	- Input to Output, 500 VDC		1'000 MΩ min.
Leakage Current	- Touch Current		100 µA max.
Reliability	- Calculated MTBF		200'000 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)
Pin Material			Copper Alloy (C6801)
Pin Foundation Plating			Nickel (2 - 4 µm)
Pin Surface Plating			Tin (3 - 5 µm), matte
Housing Type			Plastic Case
Mounting Type			PCB Mount
Connection Type			THD (Through-Hole Device)
Soldering Profile			Wave Soldering 260°C / 10 s
Weight			310 g
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).)
	- SCIP Reference Number		fadb5307-b3f5-476e-a12d-7e37a33a0fc8

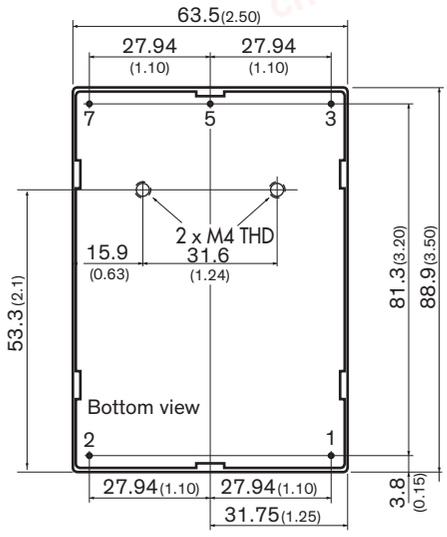
Supporting Documents

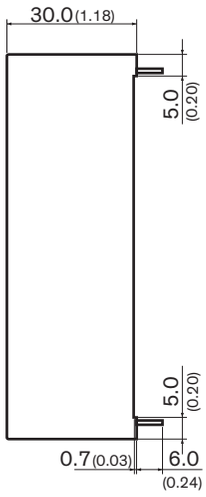
Overview Link (for additional Documents)	www.tracopower.com/overview/tmm40

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Outline Dimensions





Dimensions in mm (inch)
Tolerances ±0.5 (±0.02)
Pin Ø 1.0 ±0.1 (0.04 ±0.004)
Pin pich tolerances ±0.25 (±0.01)

Pinout		
Pin	**Single Output**	**Dual Output**
1	AC (N)	AC (N)
2	AC (L)	AC (L)
3	+Vout	+Vout
5	–Vout	Common
7	NC	–Vout

NC: Not connected

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