TRACO POWER

DC/DC Medical Converter

THM 60WI Series, 60 Watt

- **Wide 4:1 input voltage 60 W DC/DC converter in a compact 2.3 x 1.45 ” plastic case**
- **I/O isolation 5000 VAC rated for 250 VAC working voltage**
- **Certification according to IEC/EN/ES 60601-1 edition 3.2 for 2 x MOPP**
- **Risk management process according to ISO 14971**
- **Acceptance criteria for electronic assemblies acc. to IPC-A-610 Level 3**
- **Low leakage current <4.5 µA**
- **Operating temperature range: -40 to +75°C**
- **EMC compliance according to IEC 60601-1-2 4th edition**
- **Operating up to 5000m altitude**
- **5-year product warranty**

2MOPP

Scheme

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

The THM 60WI series is a range of medical 60 Watt DC/DC converters in a compact 2.3” x 1.45” plastic package and with wide 4:1 input voltage range. They provide a reinforced isolation system (5000 VAC) and a very low leakage current of less than 4.5 µA. With a high efficiency of up to 92% and highest-grade components the converters can reliably operate in an ambient temperature range of –40°C up to +75°C with derating. For more demanding applications regarding temperature, Traco also offers a special heatsink which will greatly increase the thermal capabilities for natural convection conditions. The units are approved according to IEC/EN/ES 60601-1 edition 3.2 for 2 x MOPP as well as IEC/EN/UL 62368-1 and come along with an ISO 14971 risk management file. Design and production conform to the quality management system ISO 13485. The THM 60WI constitutes a reliable solution not only for medical equipment but also for demanding ranges of application such as control & measurement and transportation.

Models

Order Code	Input Voltage Range	Output 1 Vnom	Output 1 Imax	Output 2 Vnom	Output 2 Imax	Efficiency typ.
THM 60-2411WI	9 - 36 VDC (24 VDC nom.)	5.1 VDC	12'000 mA			90 %
THM 60-2412WI		12 VDC	5'000 mA			92 %
THM 60-2413WI		15 VDC	4'000 mA			90 %
THM 60-2415WI		24 VDC	2'500 mA			89 %
THM 60-2422WI		+12 VDC	2'500 mA	–12 VDC	2'500 mA	89 %
THM 60-2423WI		+15 VDC	2'000 mA	–15 VDC	2'000 mA	90 %
THM 60-4811WI	18 - 75 VDC (48 VDC nom.)	5.1 VDC	12'000 mA			90 %
THM 60-4812WI		12 VDC	5'000 mA			92 %
THM 60-4813WI		15 VDC	4'000 mA			93 %
THM 60-4815WI		24 VDC	2'500 mA			90 %
THM 60-4822WI		+12 VDC	2'500 mA	–12 VDC	2'500 mA	90 %
THM 60-4823WI		+15 VDC	2'000 mA	–15 VDC	2'000 mA	90 %

Options

THM-HS1	- Optional Heat Sink: www.tracopower.com/overview/thm-hs1

Downloaded from Arrow.com.

Input Specifications

Input Current	- At no load	24 Vin models:	15 mA typ.
		48 Vin models:	12 mA typ.
Surge Voltage		24 Vin models:	50 VDC max. (3 s max.)
		48 Vin models:	100 VDC max. (3 s max.)
Under Voltage Lockout		24 Vin models:	7.8 VDC min. / 8 VDC typ. / 8.6 VDC max.
		48 Vin models:	15.8 VDC min. / 16 VDC typ. / 17.4 VDC max.
Recommended Input Fuse		24 Vin models:	10'000 mA (fast acting)
		48 Vin models:	6'300 mA (slow blow)
			(The need of an external fuse has to be assessed in the final application.)
Input Filter			Internal Pi-Type

Output Specifications

Output Voltage Adjustment			±10% (5.1 & 12 Vout models)
			−10% to +20% (other models)
			(single output models only)
			(By external trim resistor)
		See application note:	www.tracopower.com/overview/thm60wi
			Output power must not exceed rated power!
Voltage Set Accuracy			±1% max.
Regulation	- Input Variation (Vmin - Vmax)	single output models:	0.2% max.
		dual output models:	0.5% max.
	- Load Variation (0 - 100%)	single output models:	0.2% max.
		dual output models:	1% max. (Output 1)
			1% max. (Output 2)
	- Cross Regulation (25% / 100% asym. load)	dual output models:	5% max.
Ripple and Noise (20 MHz Bandwidth)	- single output	5.1 Vout models:	75 mVp-p typ. (w/ 10 µF, 25 V, X7R)
		12 Vout models:	100 mVp-p typ. (w/ 10 µF, 25 V, X7R)
		15 Vout models:	100 mVp-p typ. (w/ 10 µF, 25 V, X7R)
		24 Vout models:	150 mVp-p typ. (w/ 4.7 µF, 50 V, X7R)
	- dual output	12 / -12 Vout models:	100 / 100 mVp-p typ. (w/ 10 µF, 25 V, X7R)
		15 / -15 Vout models:	100 / 100 mVp-p typ. (w/ 10 µF, 25 V, X7R)
Capacitive Load	- single output	5.1 Vout models:	17'000 µF max.
		12 Vout models:	3'000 µF max.
		15 Vout models:	1'900 µF max.
		24 Vout models:	730 µF max.
	- dual output	12 / -12 Vout models:	1'500 / 1'500 µF max.
		15 / -15 Vout models:	940 / 940 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			30 ms typ. / 60 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			195% max. of Iout max.
			150% typ. of Iout max.
Overvoltage Protection			130% typ. of Vout nom. (15 and 24 Vout models)
			120% typ. of Vout nom. (5.1, 12, ±12 and ±15 Vout models)
Transient Response	- Response Time		250 µs typ. (25% Load Step)

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

Downloaded from Arrow.com.

Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Medical Equipment	EN 60601-1 IEC 60601-1 ANSI/AAMI ES 60601-1 2 x MOPP (Means Of Patient Protection)
	- Certification Documents	www.tracopower.com/overview/thm60wi
Pollution Degree		PD 2

EMC Specifications

EMI (Emissions)		EN 60601-1-2 edition 4 (Medical Devices)
	- Conducted Emissions	EN 55011 class A (with external filter) EN 55011 class B (with external filter) EN 55032 class A (with external filter) EN 55032 class B (with external filter) FCC 47 Part 15 class A (with external filter) FCC 47 Part 15 class B (with external filter) FCC 47 Part 18 class A (with external filter) FCC 47 Part 18 class B (with external filter)
	- Radiated Emissions	EN 55011 class A (with external filter) EN 55011 class B (with external filter) EN 55032 class A (with external filter) EN 55032 class B (with external filter) FCC 47 Part 15 class A (with external filter) FCC 47 Part 15 class B (with external filter) FCC 47 Part 18 class A (with external filter) FCC 47 Part 18 class B (with external filter)
	External filter proposal:	www.tracopower.com/overview/thm60wi
EMS (Immunity)		EN 60601-1-2 edition 4 (Medical Devices) EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- 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 EN 61000-4-5, ±2 kV, perf. criteria A
	Ext. input component:	24 Vin models: 2 x 220 µF, 100 V || TVS SMDJ58A 48 Vin models: 2 x 220 µF, 100 V || TVS SMDJ120A
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field — Continuous:	EN 61000-4-8, 100 A/m, perf. criteria A
	1 s:	EN 61000-4-8, 1000 A/m, perf. criteria A
EMC / Environmental	- Certification Documents	www.tracopower.com/overview/thm60wi

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	−40°C to +75°C
	- Case Temperature	+105°C max.
	- Storage Temperature	−55°C to +125°C
Power Derating	- High Temperature	Depending on model
	See application note:	www.tracopower.com/overview/thm60wi
Over Temperature Protection Switch Off	- Protection Mode	108°C min. / 115°C typ. / 125°C max. (Automatic recovery at 100°C typ.)
	- Measurement Point	Case

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

Downloaded from Arrow.com.

Cooling System		Natural convection (20 LFM)
Sense Function		10% max. of Vout nom. (If sense function is not used, sense pins must be connected to corresponding polarity output pins.)
Remote Control	- Voltage Controlled Remote (passive = on) - Off Idle Input Current - Remote Pin Input Current	On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 3 mA typ. -0.5 to 0.5 mA
Altitude During Operation		5'000 m max.
Regulator Topology		Flyback Converter
Switching Frequency		225 - 275 kHz (PWM) 250 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		250 VAC
Isolation Test Voltage	- Input to Output, 60 s - Input to Output, 1 s	5'000 VAC 10'000 VDC
Creepage	- Input to Output	8 mm min.
Clearance	- Input to Output	8 mm min.
Isolation Resistance	- Input to Output, 500 VDC	10'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	40 pF typ.
Leakage Current	- Touch Current	4.5 µA max. (at 264 VAC / 60 Hz)
Reliability	- Calculated MTBF	1'064'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration - Mechanical Shock - Thermal Shock	MIL-STD-810F MIL-STD-810F MIL-STD-810F
Housing Material		Non-conductive Plastic (UL 94 V-0 rated)
Base Material		Non-conductive Plastic (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Pin Material		Copper
Pin Foundation Plating		Nickel (2 - 3 µm)
Pin Surface Plating		Tin (3 - 5 µm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		Quarter-Brick
Soldering Profile		Lead-Free Wave Soldering 260°C / 6 s max.
Weight		51 g
Thermal Impedance	- Case to Ambient	9.7 K/W typ. 5.5 K/W typ. (with Heat Sink)
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) def32d06-c714-4d68-8ada-db1c2c331fea

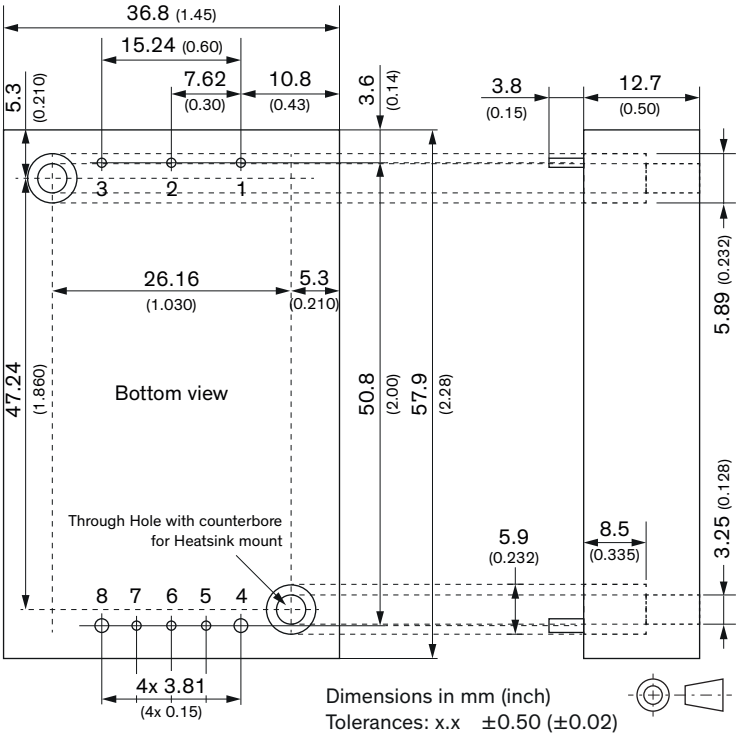
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Downloaded from Arrow.com.

Additional Information

Supporting Documents	www.tracopower.com/overview/thm60wi
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

Outline Dimensions



Pin (4, 8): Ø1.5 (Ø0.06)
Pin (other): Ø1.0 (Ø0.04)

Dimensions in mm (inch)
Tolerances: x.x ±0.50 (±0.02)
x.xx ±0.25 (±0.01)
Pin dimension tolerances ±0.1 (0.004)

Pinout

Pin	Single	Dual
1	–Vin (GND)	–Vin (GND)
2	Remote On/Off	Remote On/Off
3	+Vin (Vcc)	+Vin (Vcc)
4	–Vout	–Vout
5	–Sense	–Sense
6	Trim	Common
7	+Sense	+Sense
8	+Vout	+Vout

© Copyright 2025 Traco Electronic AG

Downloaded from Arrow.com.