AC/DC Industrial Power Supply

TPI 50A-J Series, 50 Watt

- **50 Watt open frame power supplies in a 3" x 1.5" package**
- **Compact and cost efficient design**
- **Peak power function up to 140%**
- **I/O reinforced isolation 3000 VAC**
- **Operating temperature range –40°C to +85°C**
- **No load input power <0.3W (acc. ErP directive)**
- **High efficiency up to 93%**
- **Internal EN 55032 class B filter**
- **Protection class II prepared**
- **3-year product warranty**

UL 62368-1 IEC 62368-1

The TPI 50A-J is a 50 Watt AC/DC open frame power supplies series with a 3000 VAC reinforced isolation system. Our TPI line specifically focuses on providing cost efficient industrial power supplies in compact designs. This series offers a peak power function which enables the unit to deliver up to 140% of the rated power for up to 5 seconds. Excellent efficiency of up to 93% allows a compact design and an operating temperature range (natural convection) of –40°C to +60°C without derating, while going up to +85°C with either load derating or forced cooling. They are designed to meet the ErP directive (< 0.3 W no load power consumption) and come with an EMC characteristics dedicated for applications in industrial/automation and test & measurement fields. High reliability is provided by use of industrial high-quality grade components and an excellent thermal management. It makes the TPI 50A-J an ideal solution for any demanding industrial devices or space critical applications.

Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TPI 50-105A-J	40 W	5 VDC (4.5 - 5.5 VDC)	8'000 mA	11'200 mA	91 %
TPI 50-112A-J	50 W	12 VDC (9.6 - 13.2 VDC)	4'170 mA	5'835 mA	93 %
TPI 50-115A-J		15 VDC (12.0 - 16.5 VDC)	3'340 mA	4'670 mA	93 %
TPI 50-124A-J		24 VDC (19.2 - 26.4 VDC)	2'085 mA	2'920 mA	93 %
TPI 50-136A-J		36 VDC (28.8 - 39.6 VDC)	1'390 mA	1'945 mA	92 %
TPI 50-148A-J		48 VDC (38.4 - 52.8 VDC)	1'045 mA	1'460 mA	92 %
TPI 50-153A-J		53 VDC (42.4 - 58.3 VDC)	950 mA	1'325 mA	92 %

Options

on demand (backorder with MOQ non stocking item)	- Optional model with 7.5 VDC and 6'670 mA - Optional model with 9 VDC and 5'560 mA - Optional model with 18 VDC and 2'780 mA

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:	+DC: L / –DC: N
Input Frequency		Operational Range:	47 - 440 Hz
		Certified:	50/60 Hz
Power Consumption	- No load & Vin = 230 VAC		150 mW max. (Ready to meet ErP directive)
	- No load & Vin = 115 VAC		150 mW max.
Input Current	- Full load & Vin = 230 VAC		800 mA max.
	- Full load & Vin = 115 VAC		1'300 mA max.
Input Inrush Current	- At 230 VAC		60 A max.
	- At 115 VAC		35 A max.
Input Protection			T 3.15 A / 250 VAC
Recommended Input Fuse			(The need of an external fuse has to be assessed in the final application.)

Output Specifications

Output Voltage Adjustment			±10% (5, 7.5, 9 Vout models) –20% to +10% (other models) (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy			±1% max.
Regulation	- Input Variation (Vmin - Vmax)		0.2% max.
	- Load Variation (0 - 100%)		0.7% max.
Boost Power			Output Current peak: See model table Peak power time: 5 s max. Peak power duty cycle: 20% max. Average operation power: 70% of full load (detailed description see application note)
Ripple and Noise (20 MHz Bandwidth)		5 VDC model:	100 mVp-p max. (w/ 10 µF)
		7.5 VDC model:	100 mVp-p max. (w/ 10 µF)
		9 VDC model:	100 mVp-p max. (w/ 10 µF)
		12 VDC model:	120 mVp-p max. (w/ 10 µF)
		15 VDC model:	120 mVp-p max. (w/ 10 µF)
		18 VDC model:	120 mVp-p max. (w/ 10 µF)
		24 VDC model:	120 mVp-p max. (w/ 1 µF)
		36 VDC model:	120 mVp-p max. (w/ 1 µF)
		48 VDC model:	150 mVp-p max. (w/ 0.1 µF)
		53 VDC model:	150 mVp-p max. (w/ 0.1 µF)
		5 VDC model:	75 mVp-p typ. (w/ 10 µF)
		7.5 VDC model:	75 mVp-p typ. (w/ 10 µF)
		9 VDC model:	75 mVp-p typ. (w/ 10 µF)
		12 VDC model:	100 mVp-p typ. (w/ 10 µF)
		15 VDC model:	100 mVp-p typ. (w/ 10 µF)
		18 VDC model:	100 mVp-p typ. (w/ 10 µF)
		24 VDC model:	100 mVp-p typ. (w/ 1 µF)
		36 VDC model:	100 mVp-p typ. (w/ 1 µF)
		48 VDC model:	100 mVp-p typ. (w/ 0.1 µF)
		53 VDC model:	100 mVp-p typ. (w/ 0.1 µF)

All specifications valid at 230 VAC, resistive full load and +25°C after warm-up time, unless otherwise stated.

Capacitive Load	5 VDC model:	16'000 µF max.
	7.5 VDC model:	8'900 µF max.
	9 VDC model:	6'200 µF max.
	12 VDC model:	3'500 µF max.
	15 VDC model:	2'300 µF max.
	18 VDC model:	1'600 µF max.
	24 VDC model:	870 µF max.
	36 VDC model:	390 µF max.
	48 VDC model:	220 µF max.
	53 VDC model:	180 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- At 230 VAC	50 ms min.
	- At 115 VAC	12 ms min.
Start-up Time	- At 230 VAC	600 ms max.
	- At 115 VAC	800 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		165% typ. of Iout max.
Overvoltage Protection		115 - 135% of Vout nom.
Transient Response	- Response Deviation	3% max. (50% to 75% Load Step at 2.5 A/µs)
	- Response Time	300 µs typ. (50% to 75% Load Step at 2.5 A/µs)

Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tpi50a-j
Protection Class		Class I & II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (internal filter) FCC 47 Part 15 class B (internal filter)
	- Radiated Emissions	EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (internal filter) FCC 47 Part 15 class B (internal filter)
	- Harmonic Current Emissions	EN 61000-3-2, class A
	- Voltage Fluctuations & Flicker	EN 61000-3-3

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EMS (Immunity)			EN 55024 (IT Equipment) EN 55035 (Multimedia)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 20 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
		L to PE:	EN 61000-4-5, ±2 kV, perf. criteria A
	- Conducted RF Disturbances		EN 61000-4-6, 20 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous:	EN 61000-4-8, 10 A/m, perf. criteria A
		1 s:	EN 61000-4-8, 1000 A/m, perf. criteria A
	- Voltage Dips & Interruptions	230 VAC / 50 Hz:	EN 61000-4-11
		115 VAC / 60 Hz:	EN 61000-4-11
			30%, 25 periods, perf. criteria A >95%, 0.5 periods, perf. criteria A >95%, 250 periods, perf. criteria B
EMC / Environmental	- Certification Documents		www.tracopower.com/overview/tpi50a-j

General Specifications

Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +85°C
	- Storage Temperature		–40°C to +85°C (Minimum start-up temperature: -30°C)
Power Derating	- High Temperature		2.8 %/K above 60°C (230 VAC models) 2.3 %/K above 55°C (115 VAC models)
	- Low Input Voltage		4 %/V below 90 VAC
		See application note:	www.tracopower.com/overview/tpi50a-j
Cooling System			Natural convection (20 LFM)
Altitude During Operation			5'000 m max.
Regulator Topology			Flyback Converter
Switching Frequency			70 - 135 kHz (PWM) 100 kHz typ. (PWM)
Insulation System			Reinforced Insulation
Working Voltage (rated)			250 VAC
Isolation Test Voltage	- Input to Output, 60 s		3'000 VAC
	- Input to Case or PE, 60 s		2'000 VAC
	- Output to Case or PE, 60 s		2'000 VAC
Creepage	- Input to Output		6 mm min.
	- Input to Case or PE		3 mm min.
	- Output to Case or PE		3 mm min.
Clearance	- Input to Output		6 mm min.
	- Input to Case or PE		3 mm min.
	- Output to Case or PE		3 mm min.
Isolation Resistance	- Input to Output, 500 VDC		100 MΩ min.
Leakage Current	- Touch Current		300 µA max.
Reliability	- Calculated MTBF		1'487'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration		IEC 60068-2-6 5 g, 3 axis, sine sweep, 3x30 min, 5-500 Hz
	- Mechanical Shock		IEC 60068-2-27 50 g, 3 axis, 11 ms
	- Thermal Shock		MIL-STD-810F -40 to +85°C, 72 cycles, 30 min each
Housing Type			Open Frame
Mounting Type			Chassis Mount
Connection Type			Pin Connector
Weight			78 g

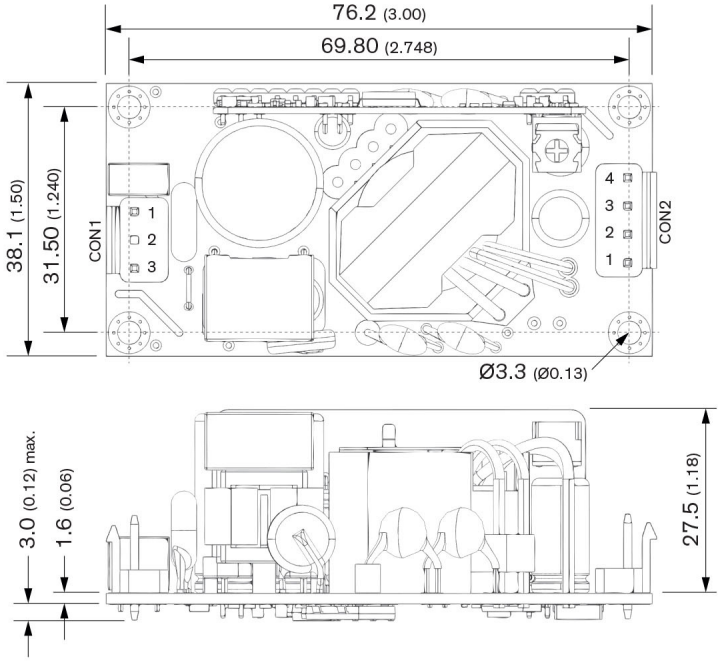
All specifications valid at 230 VAC, resistive full load and +25°C after warm-up time, unless otherwise stated.

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: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	4b9702d2-088d-48dd-ad0e-19a216477a3a

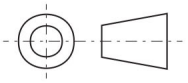
Additional Information

Supporting Documents	www.tracopower.com/overview/tpi50a-j
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

Outline Dimensions



Dimensions in mm (inch)
Tolerances: x.x ±0.5 (x.xx ±0.02)
x.xx ±0.25 (x.xxx ±0.010)
Screw lock torque: Max. 0.49 Nm (5.0 kgfcm)



Pin connectors

Input (CON1)		**Output** (CON2)	
Pin	**Function**	**Pin**	**Function**
1	Line	**1,2**	–Vout
3	Neutral	**3,4**	+Vout

CON1: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-3N

CON2: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-4N