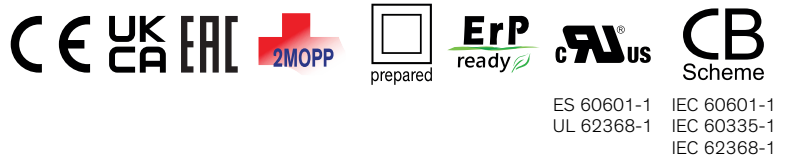
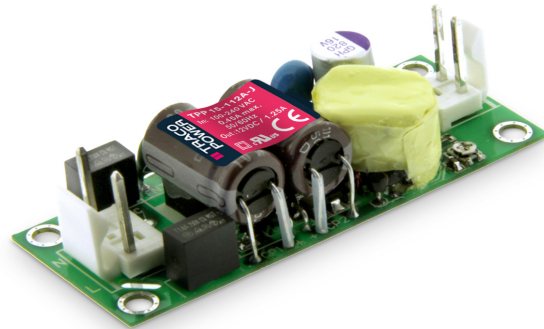


- High power density power supply (open frame)
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2 x MOPP
- Low leakage current <75 μ A rated for BF applications
- EMC compliance to IEC 60601-1-2 4th edition
- Risk management process according to ISO 14971 incl. risk management file
- Acceptance criteria for electronic assemblies acc. to IPC-A-610 Level 3
- Protection class I and II
- Operating up to 5000 m altitude
- Ready to meet ErP directive, no load power consumption <75 mW
- 5-year product warranty



The TPP 15A-J AC/DC power supplies feature a reinforced double I/O isolation system according to medical safety standards IEC/EN/ES 60601-1 3rd edition for 2 x MOPP approved for an operating altitude of 5000 m. The earth leakage current is below 75 μ A what makes the units suitable for BF (body floating) applications. The excellent efficiency of up to 89% offers a high power density in the packaging format 1.0" x 2.6". The full load operating temperature range covers -40°C to +60°C while it goes up to 85°C with 50% load derating. The units operate in compliance to the medical EMC emission and immunity levels according to latest standard IEC 60601-1-2 4th edition.

Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Efficiency typ.
TPP 15-103A-J	13.2 W	3.3 VDC (2.97 - 3.63 VDC)	4'000 mA	84 %
TPP 15-105A-J	15 W	5 VDC (4.5 - 5.5 VDC)	3'000 mA	86 %
TPP 15-109A-J		9 VDC (8.1 - 9.9 VDC)	1'670 mA	86 %
TPP 15-112A-J		12 VDC (10.8 - 13.2 VDC)	1'250 mA	87 %
TPP 15-115A-J		15 VDC (13.5 - 16.5 VDC)	1'000 mA	87 %
TPP 15-124A-J		24 VDC (21.6 - 26.4 VDC)	625 mA	88 %
TPP 15-136A-J		36 VDC (32.4 - 39.6 VDC)	417 mA	88 %
TPP 15-148A-J		48 VDC (43.2 - 52.8 VDC)	313 mA	89 %

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 Certified Range: 120 - 370 VDC Polarity: +DC: L / -DC: N (When operating with DC input voltage an external fuse T 1.0 A / 400 VDC is needed. Allowed types: Littlefuse 477 series, Cooper Bussmann type S505H-1-R, Bel Fuse type OADK)
Input Frequency		Operational Range: 47 - 440 Hz Certified: 50/60 Hz
Input Current	- Full Load & Vin = 230 VAC	300 mA max.
	- Full Load & Vin = 115 VAC	450 mA max.
Power Consumption	- No load & Vin = 230 VAC	75 mW max. (Ready to meet ErP directive)
	- No load & Vin = 115 VAC	75 mW max.
Input Inrush Current	- At 230 VAC	40 A max.
	- At 115 VAC	25 A max.
Input Protection		T 1.6 A / 250 VAC (Internal Fuse in L & N)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

Output Specifications

Output Voltage Adjustment		±10% (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. (3.3 and 5 VDC model)
		0.5% max. (other output models)
Ripple and Noise (20 MHz Bandwidth)	3.3 VDC model:	40 mVp-p typ. (w/ 10 µF X5R)
	5 VDC model:	40 mVp-p typ. (w/ 10 µF X5R)
	9 VDC model:	70 mVp-p typ. (w/ 10 µF X5R)
	12 VDC model:	70 mVp-p typ. (w/ 10 µF X5R)
	15 VDC model:	70 mVp-p typ. (w/ 10 µF X5R)
	24 VDC model:	100 mVp-p typ. (w/ 10 µF X5R)
	36 VDC model:	100 mVp-p typ. (w/ 10 µF X5R)
	48 VDC model:	140 mVp-p typ. (w/ 1 µF X7R)
Capacitive Load	3.3 VDC model:	6'000 µF max.
	5 VDC model:	4'000 µF max.
	9 VDC model:	1'860 µF max.
	12 VDC model:	1'200 µF max.
	15 VDC model:	820 µF max.
	24 VDC model:	470 µF max.
	36 VDC model:	220 µF max.
48 VDC model:	150 µF max.	
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- At 115 VAC	8 ms min.
Start-up Time	- At 230 VAC	500 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		120 - 200% of Iout max.
		145% typ. of Iout max.
Overvoltage Protection		125 - 140% of Vout nom.
Transient Response	- Response Deviation	8% max. (75% to 100% Load Step)
	- Response Time	500 µs typ. (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

Safety Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Household	EN 60335-1 IEC 60335-1
	- Medical Equipment	EN 60601-1 IEC 60601-1 ANSI/AAMI ES 60601-1 2 x MOPP (Means Of Patient Protection)
	- Power Transformers	IEC 61558-1 IEC 61558-2-16
	- Certification Documents	www.tracopower.com/overview/tpp15a-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 60601-1-2 edition 4 (Medical Devices) EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter) FCC Part 18 class B (internal filter)
	- Radiated Emissions	EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter) FCC Part 18 class B (internal filter)
	- Harmonic Current Emissions	EN 61000-3-2, class A
	- Voltage Fluctuations & Flicker	EN 61000-3-3
EMS Immunity	- Electrostatic Discharge	EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 60601-1-2 edition 4 (Medical Devices) EN 55014-2 (Household Appliances Tools) Air: EN 61000-4-2, ± 15 kV, perf. criteria A Contact: EN 61000-4-2, ± 8 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A 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
	- RF Electromagnetic Field	EN 61000-4-6, 20 Vrms, perf. criteria A
	- EFT (Burst) / Surge	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A 230 VAC / 50 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 1 period, perf. criteria A >95%, 1 period, perf. criteria A >95%, 250 periods, perf. criteria A
	- Conducted RF Disturbances	115 VAC / 60 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 1 period, perf. criteria A >95%, 1 period, perf. criteria A >95%, 250 periods, perf. criteria A
	- PF Magnetic Field	
	- Voltage Dips & Interruptions	

General Specifications

Relative Humidity	95% max. (non condensing)
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Temperature Ranges	- Operating Temperature - Storage Temperature	-40°C to +85°C -40°C to +85°C
Power Derating	- High Temperature - Low Input Voltage	Depending on model 4 %/V below 90 VAC
		See application note: www.tracopower.com/overview/tpp15a-j
Cooling System		Natural convection (20 LFM)
Altitude During Operation		5'000 m max.
Switching Frequency		75 - 95 kHz (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		250 VAC
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	4'000 VAC 1'500 VAC 1'500 VAC
Creepage	- Input to Output	8 mm min.
Clearance	- Input to Output	8 mm min.
Isolation Resistance	- Input to Output, 500 VDC	100 MΩ min.
Leakage Current (at 264 VAC)	- Touch Current	75 μA max.
Reliability	- Calculated MTBF	3'100'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration - Mechanical Shock	IEC 60068-2-6 IEC 60068-2-27
Housing Type		Open Frame
Mounting Type		Chassis Mount
Connection Type		Pin Connector
Weight		19 g
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: 7a, 7c-l (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) d5500e59-00dd-4c77-8513-a5dd131142d8

Supporting Documents

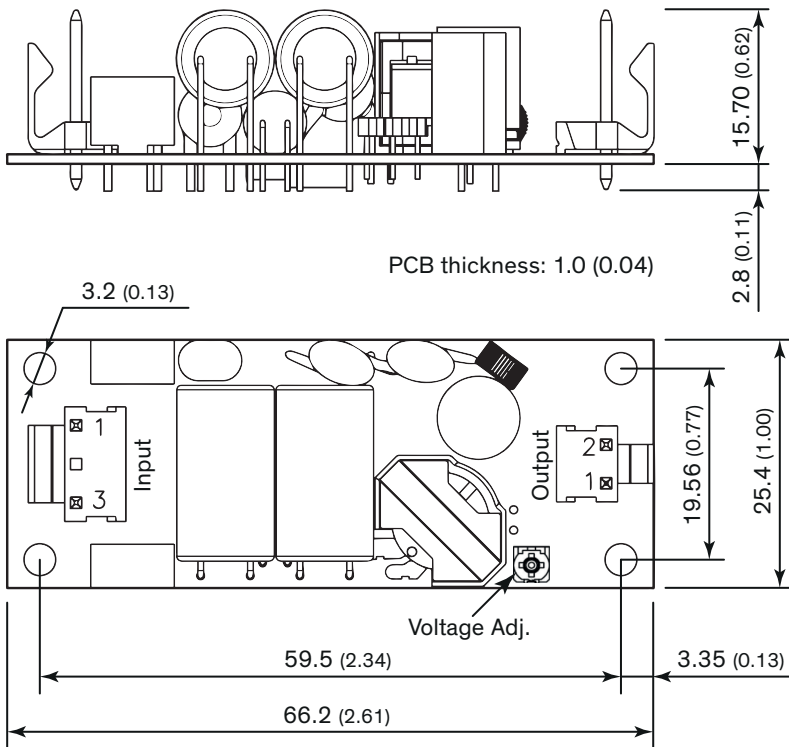
Overview Link (for additional Documents)

www.tracopower.com/overview/tpp15a-j

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

Outline Dimensions

12, 15, 24, 36, and 48 VDC models - without heatsink



Pin connectors			
Input		Output	
Pin	Function	Pin	Function
1	Line	1	-Vout
3	Neutral	2	+Vout

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

Output: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-2N

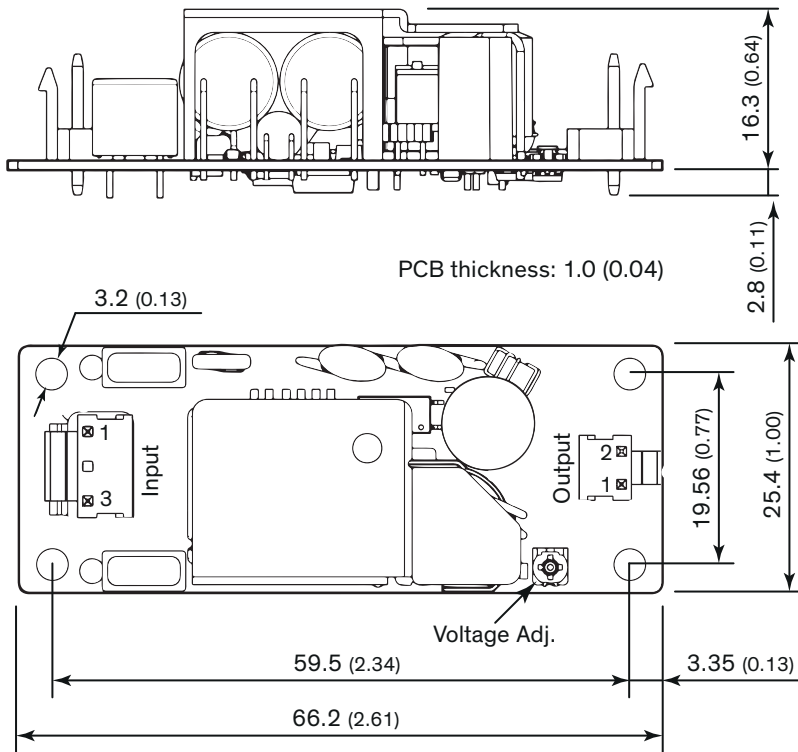
Dimension in mm (inch)

Tolerances: x.x ±0.50 (±0.02)

x.xx ±0.25 (±0.01)

Mounting screw locked torque: max. 5.0 kgfcm / 0.49 Nm

3.3, 5, and 9 VDC models - with heatsink



Pin connectors			
Input		Output	
Pin	Function	Pin	Function
1	Line	1	-Vout
3	Neutral	2	+Vout

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

Output: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-2N

Dimension in mm (inch)

Tolerances: x.x ±0.50 (±0.02)

x.xx ±0.25 (±0.01)

Mounting screw locked torque: max. 5.0 kgfcm / 0.49 Nm