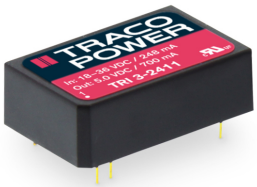
TRACO POWER

DC/DC Converter

TRI 3 Series, 3.5 Watt

- **Reinforced I/O-isolation 7071 VDC rated for 1000 VAC working voltage**
- **Ultra-high isolation peak voltage 9000 VDC (1s)**
- **Common Mode Transient Immunity (dv/dt) 15 kV/µs**
- **Operating temperature range -40 to +90°C**
- **Low no-load power consumption 96 – 192 mW**
- **Internal EN 55032 class A filter**
- **High efficiency up to 87%**
- **2:1 input voltage range: 4.5-9, 9-18, 18-36, 36-75 VDC**
- **Protection against overload, overvoltage and short circuit**
- **3-year product warranty**



UL 62368-1 IEC 62368-1

The new TRI 3 is a high isolation, regulated 3.5 Watt DC/DC converter series which comes in a compact DIP-24 package. The core characteristic of the TRI 3 series is a sophisticated reinforced isolation system which is able to withstand high test voltages (9000 VDC for 1s and 7071 VDC for 60s) and working voltages (1000 VACrms). Complementing this isolation characteristic is a high Common Mode Transient Immunity of 15 kV/µs. The new design allows to fully integrate an EN 55032 class A filter and greatly reduces the no-load power consumption. High efficiencies up to 87% allow safe operation from –40°C to +90°C without derating. All models have a wide 2:1 input voltage range and precisely regulated, isolated output voltages. With the latest IT safety certifications (IEC/EN/UL 62368-1) the TRI 3 series is the perfect choice for many demanding applications in the industrial, transportation and instrumentation sectors.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency
		Vnom	Imax	Vnom	Imax	typ.
TRI 3-0511	4.5 - 9 VDC (5 VDC nom.)	5 VDC	700 mA			82 %
TRI 3-0512		12 VDC	290 mA			83 %
TRI 3-0513		15 VDC	235 mA			84 %
TRI 3-0515		24 VDC	146 mA			83 %
TRI 3-0522		+12 VDC	145 mA	–12 VDC	145 mA	84 %
TRI 3-0523		+15 VDC	115 mA	–15 VDC	115 mA	84 %
TRI 3-1211	9 - 18 VDC (12 VDC nom.)	5 VDC	700 mA			82 %
TRI 3-1212		12 VDC	290 mA			86 %
TRI 3-1213		15 VDC	235 mA			87 %
TRI 3-1215		24 VDC	146 mA			86 %
TRI 3-1222		+12 VDC	145 mA	–12 VDC	145 mA	87 %
TRI 3-1223		+15 VDC	115 mA	–15 VDC	115 mA	87 %
TRI 3-2411	18 - 36 VDC (24 VDC nom.)	5 VDC	700 mA			82 %
TRI 3-2412		12 VDC	290 mA			85 %
TRI 3-2413		15 VDC	235 mA			87 %
TRI 3-2415		24 VDC	146 mA			86 %
TRI 3-2422		+12 VDC	145 mA	–12 VDC	145 mA	87 %
TRI 3-2423		+15 VDC	115 mA	–15 VDC	115 mA	86 %
TRI 3-4811	36 - 75 VDC (48 VDC nom.)	5 VDC	700 mA			82 %
TRI 3-4812		12 VDC	290 mA			85 %
TRI 3-4813		15 VDC	235 mA			85 %
TRI 3-4815		24 VDC	146 mA			83 %
TRI 3-4822		+12 VDC	145 mA	–12 VDC	145 mA	84 %
TRI 3-4823		+15 VDC	115 mA	–15 VDC	115 mA	84 %

Input Specifications

Input Current	- at no load	5 Vin models:	20 mA typ.
		12 Vin models:	8 mA typ.
		24 Vin models:	6 mA typ.
		48 Vin models:	4 mA typ.
	- at full load	5 Vin models:	838 mA typ.
		12 Vin models:	339 mA typ.
		24 Vin models:	170 mA typ.
		48 Vin models:	87 mA typ.
Surge Voltage		5 Vin models:	15 VDC max. (1 s max.)
		12 Vin models:	25 VDC max. (1 s max.)
		24 Vin models:	50 VDC max. (1 s max.)
		48 Vin models:	100 VDC max. (1 s max.)
Under Voltage Lockout		5 Vin models:	4 VDC typ.
		12 Vin models:	8 VDC typ.
		24 Vin models:	16 VDC typ.
		48 Vin models:	34 VDC typ.
Input Filter			Internal Pi-Type

Output Specifications

Voltage Set Accuracy			±1% 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:	0.5% max.
		dual output models:	0.5% max. (Output 1)
			0.5% max. (Output 2)
	- Cross Regulation (symmetrical load)	dual output models:	2% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models:	5% max.
Ripple and Noise	- 20 MHz Bandwidth		70 mVp-p max. (with 1 µF MLCC)
Capacitive Load	- single output	5 Vout models:	750 µF max.
		12 Vout models:	130 µF max.
		15 Vout models:	100 µF max.
		24 Vout models:	39 µF max.
	- dual output	12 / -12 Vout models:	75 / 75 µF max.
		15 / -15 Vout models:	56 / 56 µF max.
Minimum Load			Not required
Start-up Time			30 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Overvoltage Protection			125% typ. of Vout nom.
Transient Response	- Response Deviation		5% max. (75% to 100% Load Step)
	- Response Time		300 µs typ. (75% to 100% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 62368-1
		IEC 62368-1
		UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tri3
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

EMC Specifications

EMC Emissions	- Conducted Emissions	EN 55032 class A (internal filter) EN 55032 class B (with external filter) FCC Part 15, class A
	- Radiated Emissions	EN 55032 class A (with external filter)
	- External Filter Proposal	www.tracopower.com/overview/tri3
EMC Immunity		EN 55024 (IT Equipment)
	- Electrostatic Discharge	Air: EN 61000-4-2, ±15 kV, perf. criteria A Contact: EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst)	EN 61000-4-4, ±2 kV, perf. criteria A
	- Surge	EN 61000-4-5, ±2 kV, perf. criteria A
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	EN 61000-4-8, 100 A/m, perf. criteria A

General Specifications

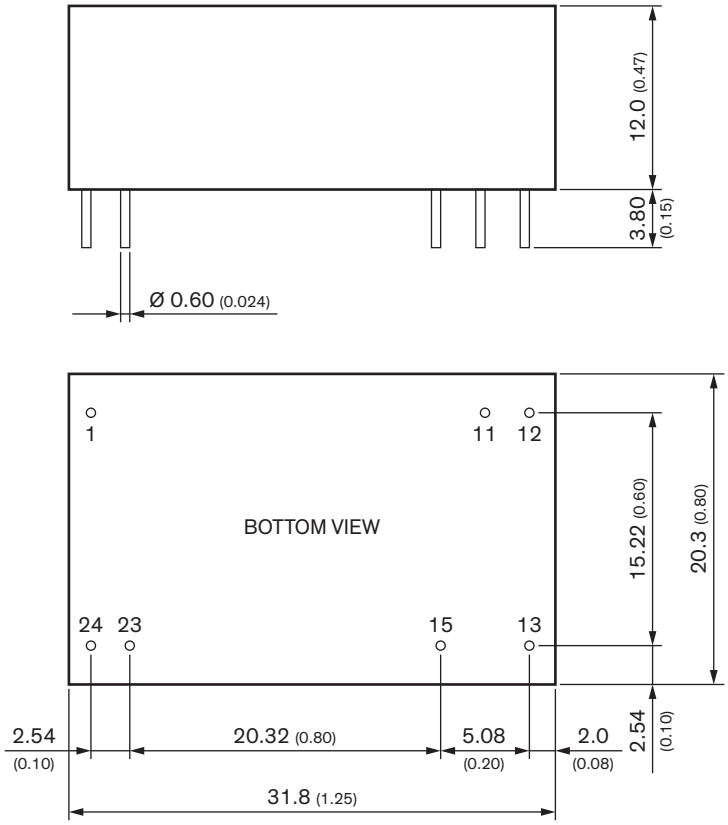
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	–40°C to +96°C
	- Case Temperature	+105°C max.
	- Storage Temperature	–40°C to +125°C
Power Derating	- High Temperature	8.3 %/K above 90°C
Cooling System		Natural convection (20 LFM)
Altitude During Operation		5'000 m max.
Switching Frequency		330 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		1'000 VAC
Isolation Test Voltage	- Input to Output, 60 s	7'071 VDC
	- Input to Output, 1 s	9'000 VDC
Isolation Resistance	- Input to Output, 500 VDC	10'000 MOhm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	40 pF max.
Common Mode Transient Immunity		15 kV/µs min.
Reliability	- Calculated MTBF	5'815'000 h (MIL-HDBK-217F, ground benign)
Housing Material		Plastic (UL 94V-0 rated)
Pin Material		Tinned Copper
Soldering Profile		Wave Soldering (1.5mm from casing) 260°C / 10 s
Connection Type		THD (Through-Hole Device)
Weight		15.5 g
Environmental Compliance	- Reach	www.tracopower.com/info/reach-declaration.pdf
	- RoHS	www.tracopower.com/info/rohs-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)	www.tracopower.com/overview/tri3

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

Outline Dimensions



Dimensions in mm (inch)
Tolerances ±0.5 (±0.02)
Pin Ø 0.5 ±0.05 (0.02 ±0.002)

Pinout		
Pin	**Single Output**	**Dual Output**
1	+Vin (Vcc)	+Vin (Vcc)
11	No pin	Common
12	–Vout	No pin
13	+Vout	–Vout
15	No pin	+Vout
23	–Vin (GND)	–Vin (GND)
24	–Vin (GND)	–Vin (GND)

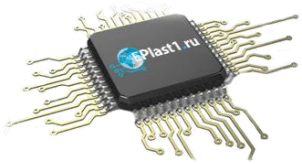
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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