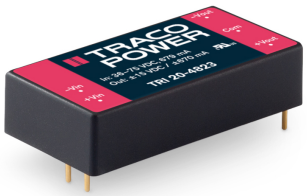
TRACO POWER

DC/DC Converter

TRI 20 Series, 20 Watt

- **Reinforced I/O-isolation 5940 VDC rated for 1000 VAC working voltage**
- **Ultra-high isolation peak voltage 8000 VDC (1s)**
- **Common Mode Transient Immunity (dv/dt) 15 kV/µs**
- **Operating temperature range -40 to +76°C**
- **Low no-load power consumption 240 – 480 mW**
- **Internal EN 55032 class A filter**
- **High efficiency up to 90%**
- **2:1 input voltage range: 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 20 is a high isolation, regulated 20 Watt DC/DC converter series which comes in a compact 2"x1" package. The core characteristic of the TRI 20 series is a sophisticated reinforced isolation system which is able to withstand high test voltages (8000 VDC for 1s and 5940 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 90% allow safe operation from –40°C to +55°C without derating and up to +76°C with 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 20 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 20-1211	9 - 18 VDC (12 VDC nom.)	5.1 VDC	4'000 mA			85 %
TRI 20-1212		12 VDC	1'670 mA			88 %
TRI 20-1213		15 VDC	1'333 mA			88 %
TRI 20-1215		24 VDC	840 mA			89 %
TRI 20-1222		+12 VDC	840 mA	–12 VDC	840 mA	89 %
TRI 20-1223		+15 VDC	670 mA	–15 VDC	670 mA	89 %
TRI 20-2411	18 - 36 VDC (24 VDC nom.)	5.1 VDC	4'000 mA			87 %
TRI 20-2412		12 VDC	1'670 mA			88 %
TRI 20-2413		15 VDC	1'333 mA			89 %
TRI 20-2415		24 VDC	840 mA			90 %
TRI 20-2422		+12 VDC	840 mA	–12 VDC	840 mA	90 %
TRI 20-2423		+15 VDC	670 mA	–15 VDC	670 mA	90 %
TRI 20-4811	36 - 75 VDC (48 VDC nom.)	5.1 VDC	4'000 mA			87 %
TRI 20-4812		12 VDC	1'670 mA			88 %
TRI 20-4813		15 VDC	1'333 mA			90 %
TRI 20-4815		24 VDC	840 mA			89 %
TRI 20-4822		+12 VDC	840 mA	–12 VDC	840 mA	89 %
TRI 20-4823		+15 VDC	670 mA	–15 VDC	670 mA	90 %

Input Specifications

Input Current	- At no load	12 Vin models:	20 mA typ.
		24 Vin models:	15 mA typ.
		48 Vin models:	10 mA typ.
	- At full load	12 Vin models:	1'910 mA typ.
		24 Vin models:	945 mA typ.
		48 Vin models:	475 mA typ.
Surge Voltage		12 Vin models:	25 VDC max. (100 ms max.)
		24 Vin models:	50 VDC max. (100 ms max.)
		48 Vin models:	100 VDC max. (100 ms max.)
Under Voltage Lockout		12 Vin models:	7.5 VDC typ.
		24 Vin models:	15 VDC typ.
		48 Vin models:	33 VDC typ.
Reflected Ripple Current		12 Vin models:	100 mAp-p typ.
		24 Vin models:	50 mAp-p typ.
		48 Vin models:	30 mAp-p 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:	1% max. (Output 1)
			1% max. (Output 2)
	- Cross Regulation (symmetrical load)	dual output models:	2% max.
Ripple and Noise (20 MHz Bandwidth)	- single output	5.1 Vout models:	50 mVp-p typ. (with 4.7 µF MLCC)
		12 Vout models:	100 mVp-p typ. (with 4.7 µF MLCC)
		15 Vout models:	100 mVp-p typ. (with 4.7 µF MLCC)
		24 Vout models:	150 mVp-p typ. (with 4.7 µF MLCC)
	- dual output	12 / -12 Vout models:	100 / mVp-p typ. (with 4.7 µF MLCC)
		15 / -15 Vout models:	100 / mVp-p typ. (with 4.7 µF MLCC)
Capacitive Load	- single output	5.1 Vout models:	6'800 µF max.
		12 Vout models:	1'160 µF max.
		15 Vout models:	750 µF max.
		24 Vout models:	295 µF max.
	- dual output	12 / -12 Vout models:	590 / 590 µF max.
		15 / -15 Vout models:	380 / 380 µF max.
Minimum Load			Not required
Temperature Coefficient			±0.02 %/K max.
Start-up Time			30 ms max.
Short Circuit Protection			Continuous, Automatic recovery
Output Current Limitation			150% typ. of Iout max.
Overvoltage Protection			120% 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/tri20
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

EMC Specifications

EMI 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 (internal filter)
			FCC Part 15, class A
		External filter proposal:	www.tracopower.com/overview/tri20
EMS Immunity			EN 55024 (IT Equipment)
	- 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, ±1 kV, perf. criteria A
		Ext. input component:	12 & 24 Vin models: KY 560 µF // V15P8-M3
			48 Vin models: KY 560 µF // V15P10
	- 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

General Specifications

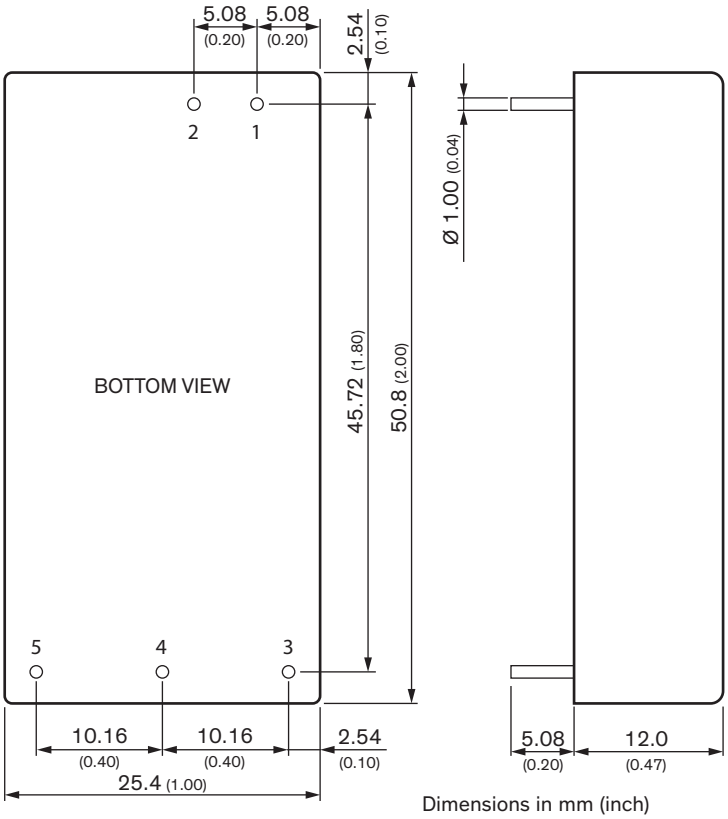
Relative Humidity			95% max. (non condensing)
Temperature Ranges	- Operating Temperature		–40°C to +76°C
	- Case Temperature		+95°C max.
	- Storage Temperature		–50°C to +125°C
Power Derating	- High Temperature	See application note:	www.tracopower.com/overview/tri20
Cooling System			Natural convection (20 LFM)
Altitude During Operation			4'000 m max.
Switching Frequency			285 kHz typ. (PWM)
Insulation System			Reinforced Insulation
Working Voltage (rated)			1'000 VAC
Isolation Test Voltage	- Input to Output, 60 s		4'200 VAC
	- Input to Output, 1 s		8'000 VDC
Isolation Resistance	- Input to Output, 500 VDC		10'000 MOhm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V		80 pF max.
Common Mode Transient Immunity			15 kV/µs min.
Reliability	- Calculated MTBF		1'087'000 h (MIL-HDBK-217F, ground benign)
Housing Material			Non-conductive Plastic (UL94 V-0 rated)
Pin Material			Tinned Copper
Soldering Profile			Wave Soldering (1.5mm from casing)
			260°C / 10 s max.
Connection Type			THD (Through-Hole Device)
Weight			30 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/tri20

All specifications valid at nominal 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)
2	–Vin (GND)	–Vin (GND)
3	+Vout	+Vout
4	No pin	Common
5	–Vout	–Vout

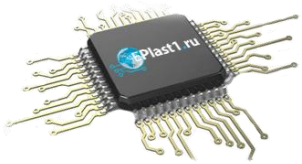
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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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