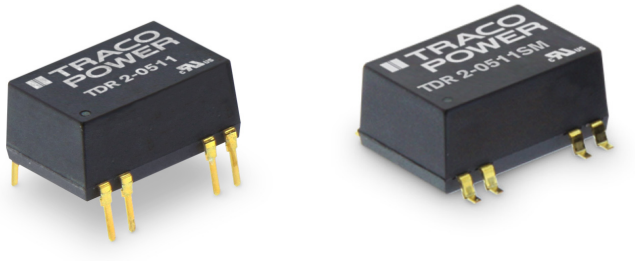
DC/DC Converters

TDR 2 Series, 2 Watt

UL 60950-1

Features

- Compact design in SMD or DIP package
- Wide 2:1 input voltage range
- Fully regulated outputs
- Low ripple and noise
- No minimum load required
- Temperature range –40°C to +85°C without derating
- I/O isolation 1600 VDC
- Continuous short-circuit protection
- Remote On/Off control
- Fully RoHS compliant
- 3-year product warranty



The TDR-2 series is a family of compact 2 W dc/dc-converters with 2:1 input voltage ranges and tightly regulated output voltages even under no load conditions. The product is available in SMD-package or in DIP-package. They work with high efficiency over the full load range and come with a remote On/Off input.
The usability in temperature ranges of up to 85°C without power derating, continuous short circuit protection and excellent immunity against environmental influences make these converters very reliable.
A TDR-2 converter is the ideal solution for space critical high end applications in communication equipment, instrumentation and industrial electronics.

Models

Order code DIP models	Order code SMD models	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TDR 2-0511	TDR 2-0511SM	4.5 – 9.0 VDC (5 VDC nominal)	5.0 VDC	400 mA	80 %
TDR 2-0512	TDR 2-0512SM		12 VDC	167 mA	81 %
TDR 2-0513	TDR 2-0513SM		15 VDC	134 mA	83 %
TDR 2-0522	TDR 2-0522SM		±12 VDC	±83 mA	81 %
TDR 2-0523	TDR 2-0523SM		±15 VDC	±67 mA	82 %
TDR 2-1211	TDR 2-1211SM	9 – 18 VDC (12 VDC nominal)	5.0 VDC	400 mA	81 %
TDR 2-1212	TDR 2-1212SM		12 VDC	167 mA	81 %
TDR 2-1213	TDR 2-1213SM		15 VDC	134 mA	84 %
TDR 2-1222	TDR 2-1222SM		±12 VDC	±83 mA	83 %
TDR 2-1223	TDR 2-1223SM		±15 VDC	±67 mA	82 %
TDR 2-2411	TDR 2-2411SM	18 – 36 VDC (24 VDC nominal)	5.0 VDC	400 mA	81 %
TDR 2-2412	TDR 2-2412SM		12 VDC	167 mA	84 %
TDR 2-2413	TDR 2-2413SM		15 VDC	134 mA	84 %
TDR 2-2422	TDR 2-2422SM		±12 VDC	±83 mA	84 %
TDR 2-2423	TDR 2-2423SM		±15 VDC	±67 mA	84 %
TDR 2-4811	TDR 2-4811SM	36 – 75 VDC (48 VDC nominal)	5.0 VDC	400 mA	81 %
TDR 2-4812	TDR 2-4812SM		12 VDC	167 mA	82 %
TDR 2-4813	TDR 2-4813SM		15 VDC	134 mA	82 %
TDR 2-4822	TDR 2-4822SM		±12 VDC	±83 mA	83 %
TDR 2-4823	TDR 2-4823SM		±15 VDC	±67 mA	83 %

Input Specifications

Input current at no load (nominal input voltage)		5 Vin models:	40 mA typ.
		12 Vin models:	20 mA typ.
		24 Vin models:	10 mA typ.
		48 Vin models:	7 mA typ.
Input current at full load (nominal input voltage)		5 Vin models:	520 mA typ.
		12 Vin models:	215 mA typ.
		24 Vin models:	105 mA typ.
		48 Vin models:	55 mA typ.
Surge voltage (1 s max.)		5 Vin models:	15 V max.
		12 Vin models:	25 V max.
		24 Vin models:	50 V max.
		48 Vin models:	100 V max.
EMC emissions	– Application note for filter class A/B proposal		EN 55032 class A/B (with external components) www.tracopower.com/overview/tdr2
ESD (electrostatic discharge)			EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
Radiated immunity			EN 61000-4-3 10 V/m, perf. criteria A
Fast transient / Surge	(with external input capacitor e.g. Nippon chemi-con KY 220 µF, 100 V, ESR 48 mOhm)		EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±1 kV perf. criteria A
Conducted immunity			EN 61000-4-6, 10 Vrms, perf. criteria A
Power frequency magnetic field			EN 61000-4-8, 1000 A/m, perf. criteria A
Reflected ripple current (measured with input filter according class A)		5 Vin models:	80 mAp-p typ.
		12 Vin models:	40 mAp-p typ.
		24 Vin models:	30 mAp-p typ.
		48 Vin models:	20 mAp-p typ.

Output Specifications

Voltage set accuracy			±1 % max
Regulation	– Input variation (Vin min. to Vin max.)		0.2 % max.
	– Load variation (0 – 100 %)	single output models:	1.0 % max.
		dual output models:	1.0 % max. balanced load
	– Load variation (10 – 90 %)	single output models:	0.5 % max.
		dual output models:	0.8 % max. balanced load
	– Load cross regulation (25 / 100 %)		5.0 % max. (dual output models)
Minimum load			0 % of rated max. load
Temperature coefficient			±0.02 %/K max.
Ripple and noise (20 MHz bandwidth)			30 mVp-p typ.
Start up time (constant resistive load)	– Power On		5 ms typ.
	– Remote On		5 ms typ.
Transient response setting time (25 % load step change)			250 µs typ.
Short circuit protection			continuous, automatic recovery
Capacitive load		5 VDC models:	1680 µF max.
		12 VDC models:	820 µF max.
		15 VDC models:	680 µF max.
		±12 VDC models:	470 µF max. (each output)
		±15 VDC models:	330 µF max. (each output)

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

General Specifications

Temperature ranges	– Operating – Storage – Case temperature	–40°C to +85°C (with no derating) –55°C to +125°C +100°C max.
Humidity (non condensing)		5 – 95 % rel. H max.
Thermal shock		acc. MIL-STD-810F
Vibration		acc. MIL-STD-810F
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		>7.1 Mio h
Isolation voltage (60 s)	– Input/Output	1600 VDC
Isolation capacitance	– Input/Output	50 pF max.
Isolation resistance	– Input/Output (500 VDC)	>1 GOhm
Safety approvals	– UL/cUL 60950-1 – Certification documents	www.ul.com -> certifications -> File: e188913 www.tracopower.com/overview/tdr2
Switching frequency		0.1 to 1.3 MHz
Remote On/Off	– On: – Off: – Off stand by input current	open or high impedance 2...4 mA current applied via 1kOhm resistor 2.5 mA max.
Environmental compliance	– Reach – RoHS	www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU

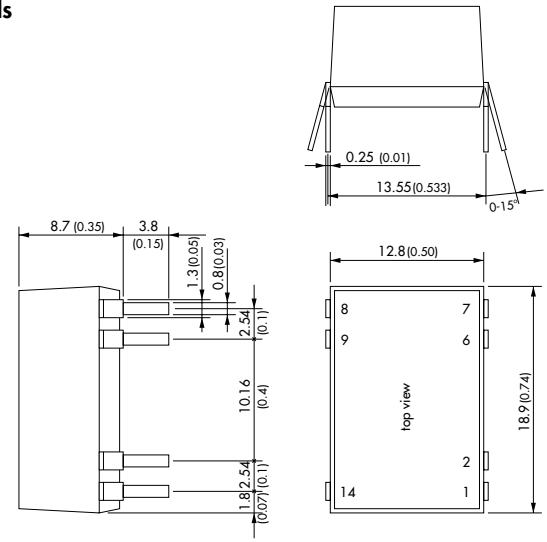
Pysical Specifications

Casing material		non-conductive plastic (UL94V-0 rated)
Package weight		4.5 g (0.16 oz)
Soldering profile (for DIP models)		265°C / 10 s max. (wave soldering)
Lead-free reflow solder process (for SMD models)		J-STD-020D
Moisture sensivity level (for SMD models)		J-STD-033C level 2a
Packaging	– Tube – Tape & Reel (only SMD models, add suffix –TR)	10 pcs packing unit 200 pcs packing unit

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

Outline Dimensions

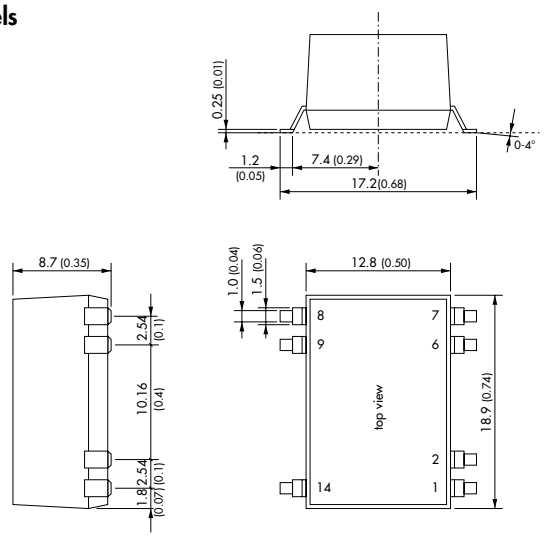
DIP-Models



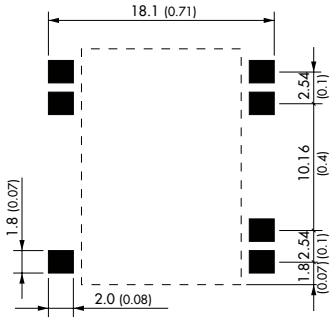
Pin-Out		
Pin	**Single**	**Dual**
1	–Vin (GND)	–Vin (GND)
2	Remote On/Off	Remote On/Off
6	NC	Common
7	NC	–Vout
8	+Vout	+Vout
9	–Vout	Common
14	+Vin (Vcc)	+Vin (Vcc)

NC = not to connect

SMD-Models



Recommended Solder Pad Dimension:



Dimensions in [mm], () = Inch
Tolerances: ±0.5 (±0.02)
Pin pich tolerances: ±0.25 (±0.01)

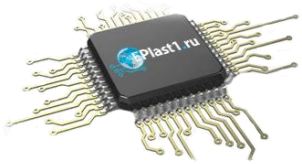
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.