

Features

- ◆ Small SMD package with standard footprint
- ◆ I/O isolation voltage 1500 VDC
- ◆ Single and dual output models
- ◆ Input voltage 5, 12 and 24 VDC
- ◆ High efficiency up to 80 %
- ◆ Operating temperature range -40 to +85°C
- ◆ High accuracy of pin co-planarity
- ◆ Qualified for leadfree reflow solder process according IPC/JEDEC J-STD-020D
- ◆ Available in tape and reel package
- ◆ 3-year product warranty



With their small footprint these 2 Watt DC/DC converters are an ideal and economical solution for many applications where an isolated voltage is required. Typical applications are ground loop elimination, noise reduction, voltage isolation in digital interfaces and voltage conversion in distributed power systems. With a new package design these converters are qualified for the higher temperatures requested by lead-free reflow solder processes. For automated SMD production lines the devices can be supplied in standard tape and reel package.

Models

| Ordercode | Input voltage | Output voltage | Output current max. | Efficiency typ. |
|-------------|---------------------------------|----------------|---------------------|-----------------|
| TES 2-0510H | 5 VDC ±10% (5 VDC nominal) | 3.3 VDC | 500 mA | 70 % |
| TES 2-0511H | | 5 VDC | 400 mA | 73 % |
| TES 2-0512H | | 12 VDC | 165 mA | 77 % |
| TES 2-0521H | | ±5 VDC | ±200 mA | 74 % |
| TES 2-0522H | | ±12 VDC | ±83 mA | 76 % |
| TES 2-0523H | | ±15 VDC | ±66 mA | 76 % |
| TES 2-1210H | 12 VDC ±10% (12 VDC nominal) | 3.3 VDC | 500 mA | 72 % |
| TES 2-1211H | | 5 VDC | 400 mA | 75 % |
| TES 2-1212H | | 12 VDC | 165 mA | 79 % |
| TES 2-1222H | | ±12 VDC | ±83 mA | 80 % |
| TES 2-1223H | | ±15 VDC | ±66 mA | 80 % |
| TES 2-2410H | 24 VDC ±10% (24 VDC nominal) | 3.3 VDC | 500 mA | 72 % |
| TES 2-2411H | | 5 VDC | 400 mA | 75 % |
| TES 2-2412H | | 12 VDC | 165 mA | 79 % |
| TES 2-2422H | | ±12 VDC | ±83 mA | 79 % |
| TES 2-2423H | | ±15 VDC | ±66 mA | 79 % |

Input Specifications

| | |
|-----------------------------------|--|
| Input current no load / full load | 5 Vin; 3.3 VDC model: 60 mA / 470 mA typ. 5 Vin; other models: 60 mA / 540 mA typ. 12 Vin; 3.3 VDC model: 30 mA / 190 mA typ. 12 Vin; other models: 30 mA / 210 mA typ. 24 Vin; 3.3 VDC model: 15 mA / 95 mA typ. 24 Vin; other models: 15 mA / 110 mA typ. |
| Surge voltage (1 sec. max.) | 5 Vin models: 9 V max. 12 Vin models: 18 V max. 24 Vin models: 30 V max. |
| Reverse voltage protection | 0.3 A max. |
| Input filter | internal capacitor |

Output Specifications

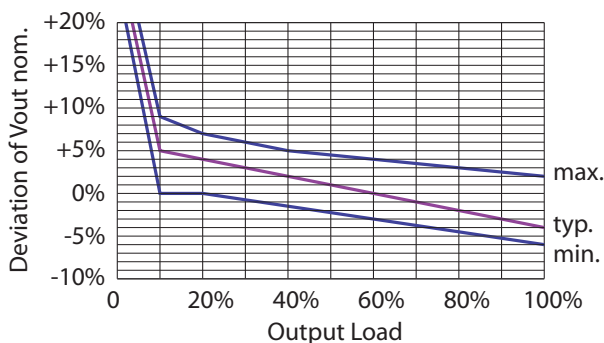
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| Voltage set accuracy | see graphs below |
| Voltage balance (dual output models, balanced load) | 1 % max. |
| Regulation - Input variation - Load variation | 1.2 % / 1 % change Vin see graphs below |
| Ripple and noise (20 MHz Bandwidth) | 120 mVpp max. |
| Temperature coefficient | ±0.02 %/K max. |
| Short circuit protection | limited 0.5 sec. max. |
| Capacitive load | 3.3 & 5.0 VDC models: 47 µF max. 12 & ±5 VDC models: 10 µF max. (each output) ±12 & ±15 VDC models: 4.7 µF max. (each output) |

General Specifications

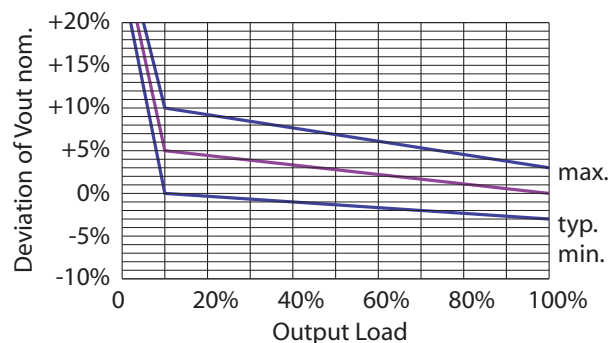
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| Temperature ranges - Operating - Storage - Case | -40°C to +85°C -40°C to +125°C 95°C max. |
| Derating (convection cooling) | 4 %/K above 75°C |
| Humidity (non condensing) | 95 % rel. H max. |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) | >2'000'000 h |
| Isolation voltage (60 sec) | 1500 VDC |
| Isolation capacitance (100 kHz, 1 V) | 60 pF typ. |
| Isolation resistance (500 VDC) | >10 Gohm |
| Switching frequency | 50 to 120 kHz (depending on load) |

Output voltage variation dependent on load (at nominal input voltage)

3.3 & 5.0 VDC models:



other models:



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

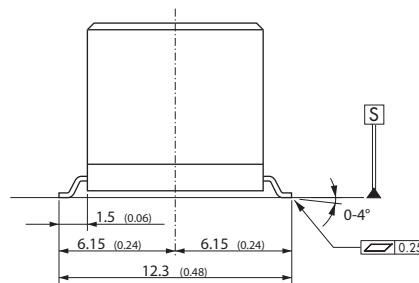
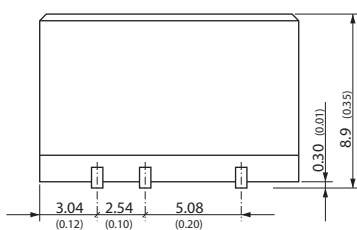
Physical Specifications

| | | |
|----------------------------------|--|-------------------------------------|
| Casing material | plastic (UL94V-0 rated) | |
| Weight | single output models: 1.5 g (0.05 oz) | dual output models: 2.2 g (0.08 oz) |
| Lead-free reflow solder process | as per J-STD-020D.1 (to find at: www.jedec.org - free registration required) | |
| Moisture sensitivity level (MSL) | level 2 as per J-STD-033B.1 (to find at: www.jedec.org - free registration required) | |
| Washing process | www.tracopower.com/products/smd-wash.pdf | |
| Packaging | www.tracopower.com/products/tes2h-pack.pdf | |
| Environmental compliance | - Reach - RoHS www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU | |

Application note: www.tracopower.com/products/tes2h-application.pdf

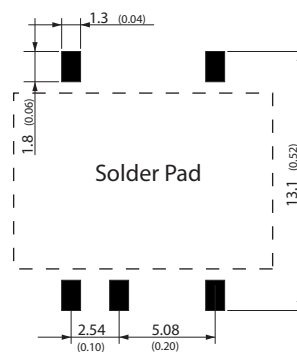
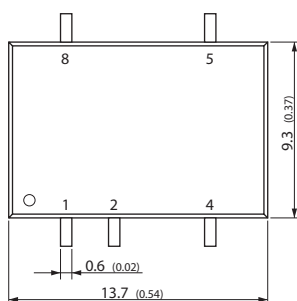
Outline Dimensions

Single Output Models



| Pin-Out | |
|---------|------------|
| Pin | Single |
| 1 | -Vin (GND) |
| 2 | +Vin (Vcc) |
| 4 | -Vout |
| 5 | +Vout |
| 8 | No con. |

No con. = Pin to be isolated from circuitry

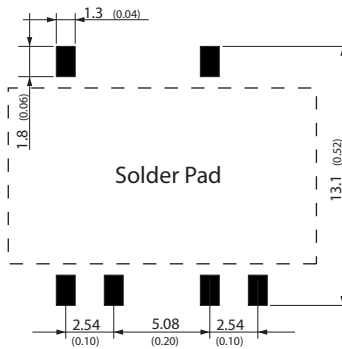
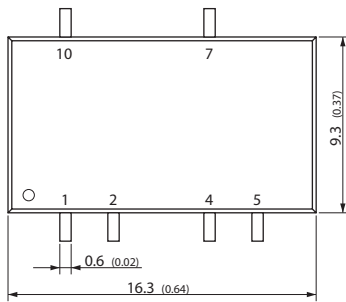
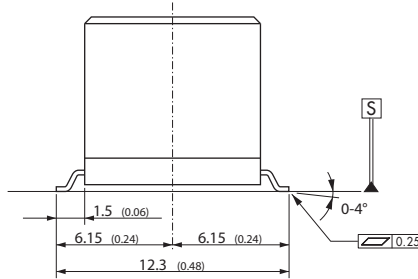
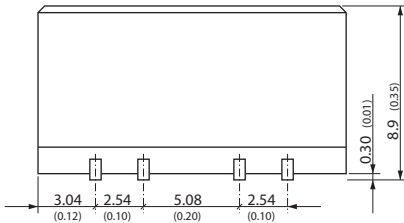


Dimensions in [mm], () = Inch
 Pin pitch tolerances: ±0.13 (±0.005)
 Other tolerances: ±0.25 (±0.01)

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

Outline Dimensions

Dual Output Models



Pin-Out

| Pin | Dual |
|-----|------------|
| 1 | -Vin (GND) |
| 2 | +Vin (Vcc) |
| 4 | Common |
| 5 | -Vout |
| 7 | +Vout |
| 10 | No con. |

No con. = Pin to be isolated from circuitry

Dimensions in [mm], () = Inch
Pin pitch tolerances: ± 0.13 (± 0.005)
Other 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

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