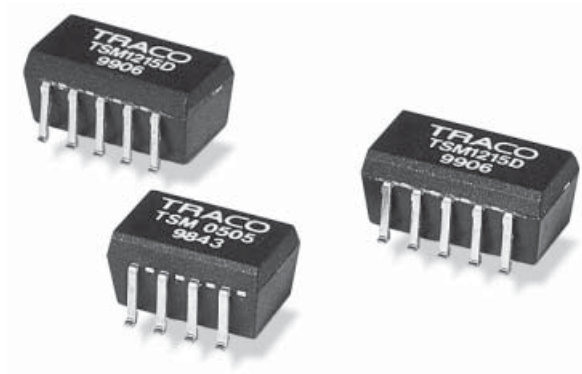


Features

- SMD Package (SOIC-14/18)
- Construction in Lead Frame Technology
- Isolated Single and Dual Output
- I/O-Isolation 1'000 VDC
- High Efficiency
- Operating Temperature -40°C to $+85^{\circ}\text{C}$
- Reflow Solder Temperature up to 230°C
- High Accuracy of Pin Co-Planarity
- Available in Tape and Reel Package
- 3 Year Product Warranty



The TSM series are isolated DC/DC converters with 1W output power implemented in a molded plastic package with a pin accuracy suitable for high volume SMD-production. The devices do not require a special reflow process but can be soldered like standard SMD-components. With their small footprint these converters are the economical solution for point of use power conversion, ground loop elimination, noise reduction and digital interface applications.

Models

Ordercode	Input voltage	Output voltage	Output current max.	Efficiency typ.
TSM 0505S	5 VDC $\pm 10\%$	5 VDC	200 mA	80 %
TSM 0509S		9 VDC	110 mA	78 %
TSM 0512S		12 VDC	80 mA	80 %
TSM 0515S		15 VDC	65 mA	81 %
TSM 0505D		± 5 VDC	± 100 mA	75 %
TSM 0512D		± 12 VDC	± 40 mA	79 %
TSM 0515D		± 15 VDC	± 30 mA	79 %
TSM 1205S	12 VDC $\pm 10\%$	5 VDC	200 mA	81 %
TSM 1209S		9 VDC	110 mA	78 %
TSM 1212S		12 VDC	80 mA	81 %
TSM 1215S		15 VDC	65 mA	82 %
TSM 1205D		± 5 VDC	± 100 mA	75 %
TSM 1212D		± 12 VDC	± 40 mA	80 %
TSM 1215D		± 15 VDC	± 30 mA	80 %

Input Specifications

Input current no load /full load	5 Vin models 12 Vin models	30 mA / 260 mA typ. 15 mA / 110 mA typ.
Surge voltage (1 sec. max.)	5 Vin models 12 Vin models	9 V max. 18 V max.
Reverse voltage protection		0.3 A max.
Reflected input ripple current		can be reduced by ext. 1–2.2 µF polyester film capacitor
Input filter		internal capacitors

Output Specifications

Voltage set accuracy		± 3 %
Voltage balance (dual output models)		± 1 % max.
Regulation	– Input variation – Load variation 20 – 100 %	± 1.2 % / 1 % change Vin ± 10 % max.
Ripple and noise (20 MHz Bandwidth)		120 mVpk-pk max.
Temperature coefficient		± 0.02 % / °C
Short circuit protection		limited 1 sec. max.
Capacitive load	– Single output models – Dual output models	22 µF max. 10 µF max.

General Specifications

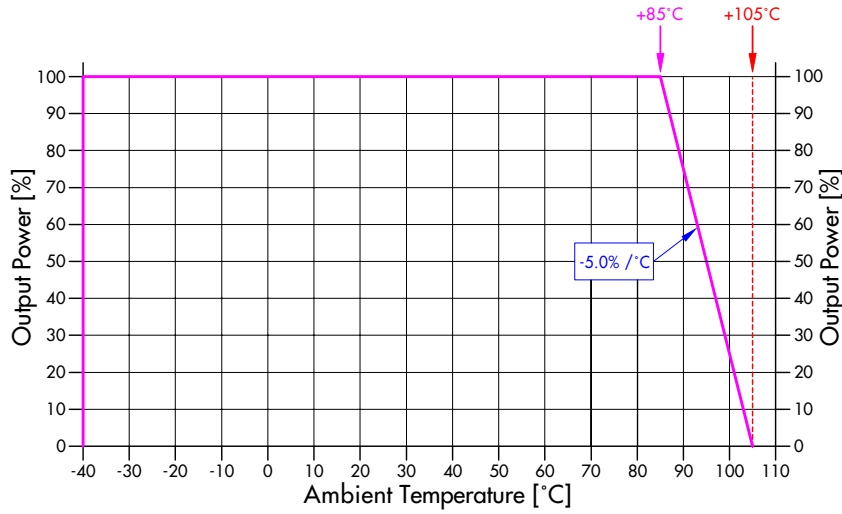
Temperature ranges	– Operating (see also enclosed derating curve) – Storage	– 40 °C ... +85 °C (no derating) – 55 °C ... +125 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>2'000'000 h @ 25 °C
Isolation voltage	Input/Output	1'000 VDC
Isolation capacity	Input/Output	40 pF typ.
Isolation resistance	Input/Output	>1'000 Mohm
Switching frequency		100 kHz typ. (Frequency modulation)
Frequency change over line and load		± 30 %

Physical Specifications

Case material		Epoxy molding compound (flammability to UL 94-V0)
Package weight	– Single output models – Dual output models	1.2 g (0.04 oz) 1.5 g (0.05 oz)
Reflow soldering profile		Peak temp. 230°C (10 sec max.) 185°C for 90 sec max. Convection reflow solder process is recommended

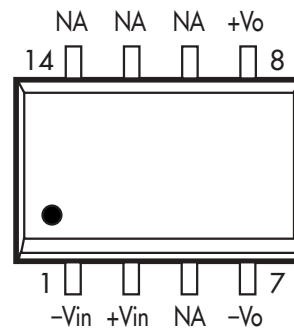
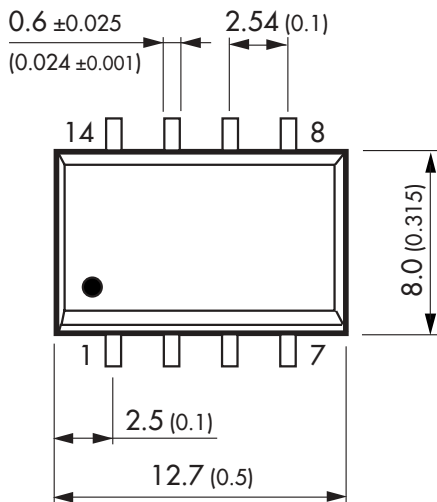
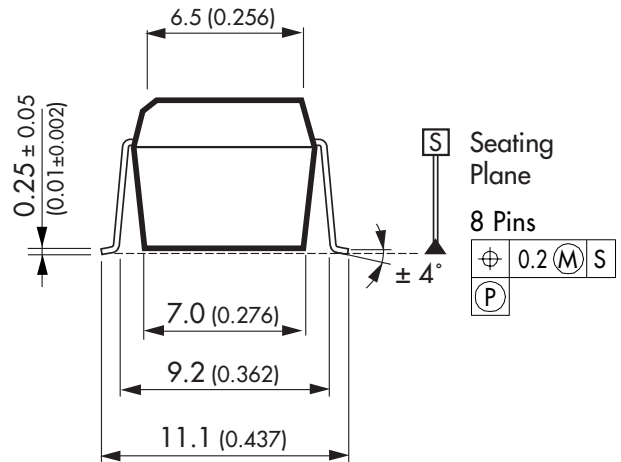
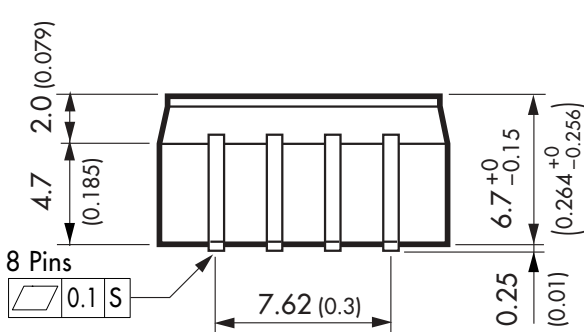
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Derating all TSM Models



Outline Dimensions mm (inches)

TSM Single Output Models



NA = not available for electrical connection

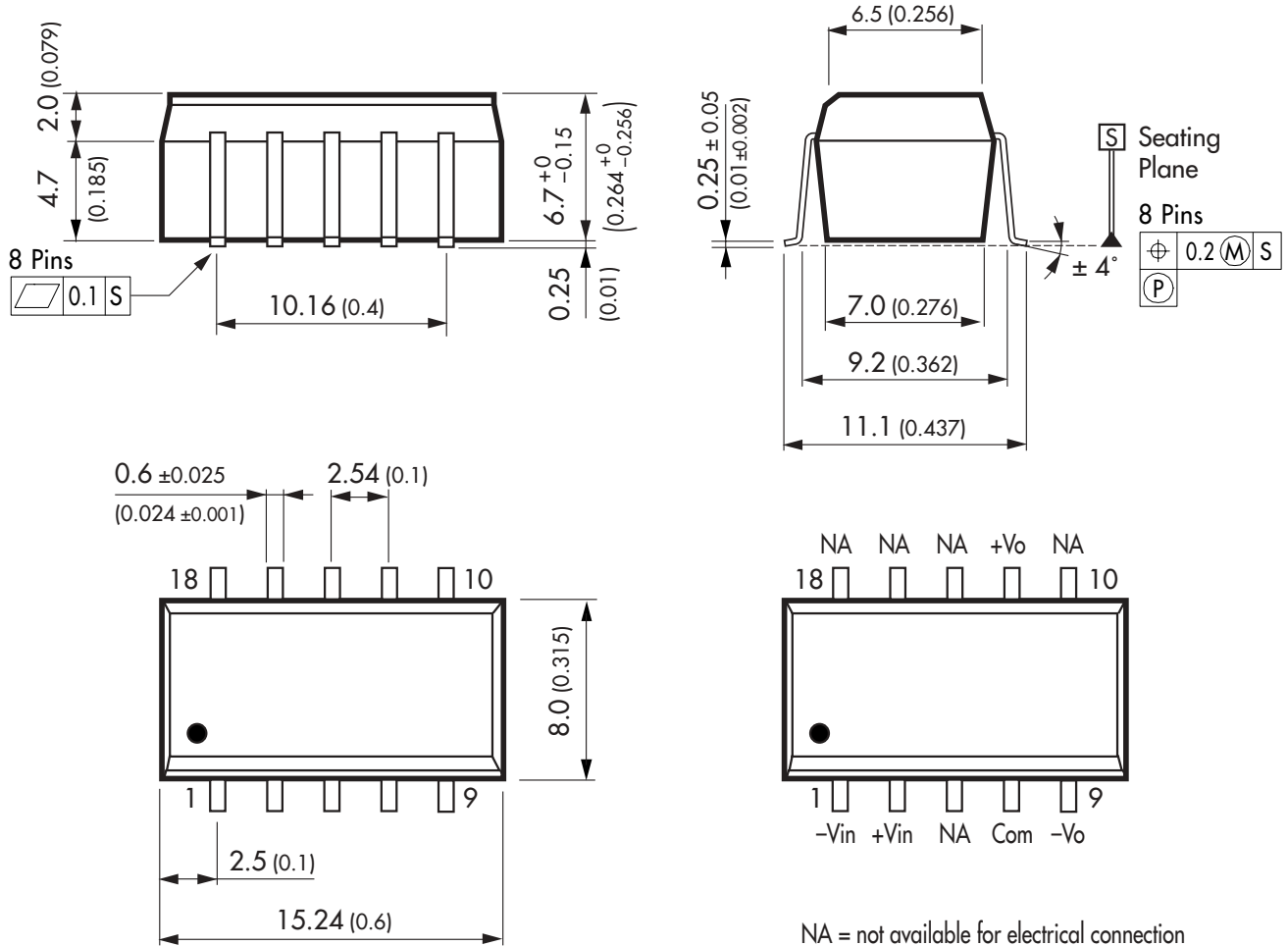
Tolerances: ± 0.25 mm (± 0.01)

Specifications can be changed without notice

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

Outline Dimensions mm (inches)

TSM Dual Output Models



NA = not available for electrical connection

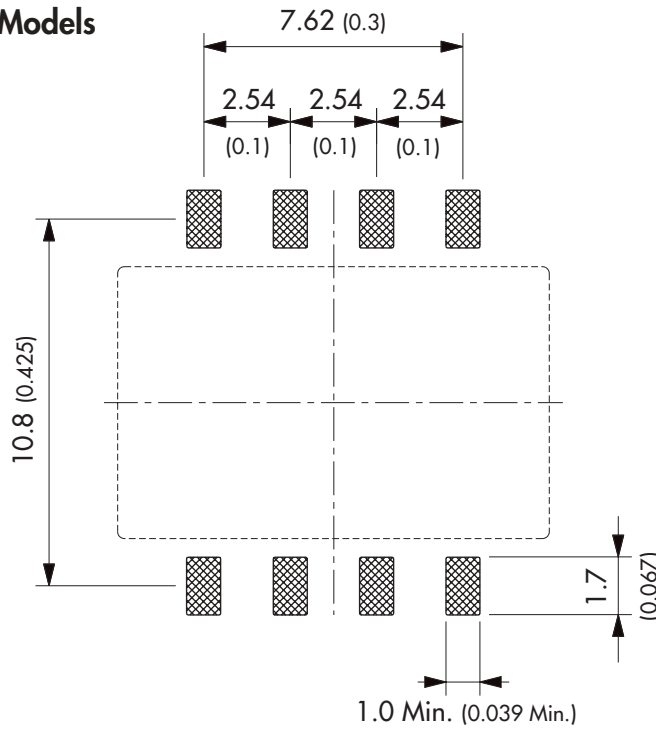
Tolerances: ± 0.25 mm (± 0.01)

Specifications can be changed without notice

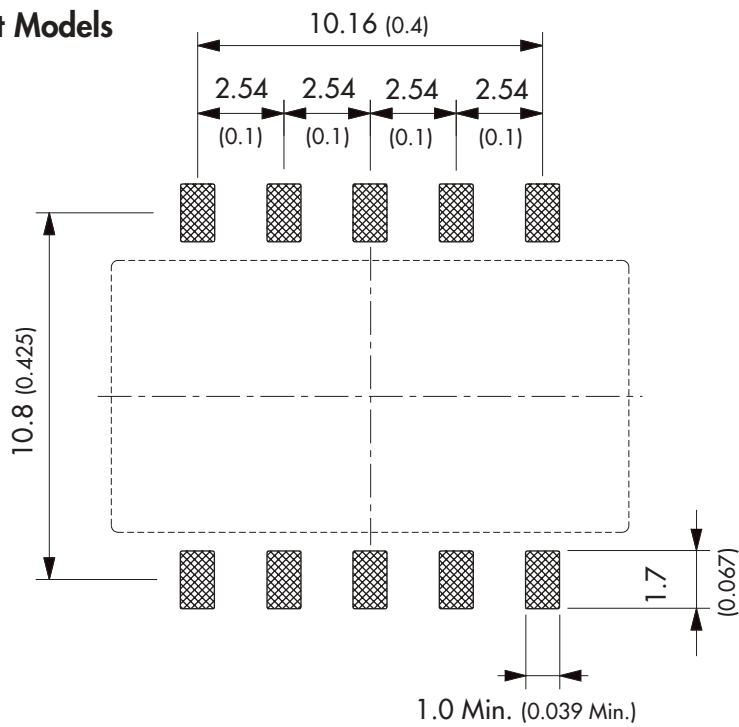
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Solder Pad Dimensions mm (inches)

TSM Single Output Models



TSM Dual Output Models



Specifications can be changed without notice