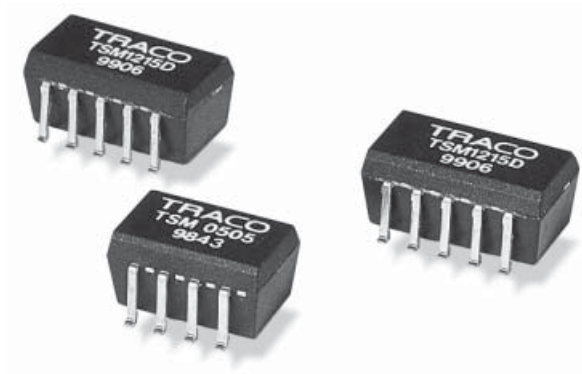


### Features

- 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  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Reflow Solder Temperature up to  $230^{\circ}\text{C}$
- 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		$\pm 5$ VDC	$\pm 100$ mA	75 %
TSM 0512D		$\pm 12$ VDC	$\pm 40$ mA	79 %
TSM 0515D		$\pm 15$ VDC	$\pm 30$ 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		$\pm 5$ VDC	$\pm 100$ mA	75 %
TSM 1212D		$\pm 12$ VDC	$\pm 40$ mA	80 %
TSM 1215D		$\pm 15$ VDC	$\pm 30$ 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

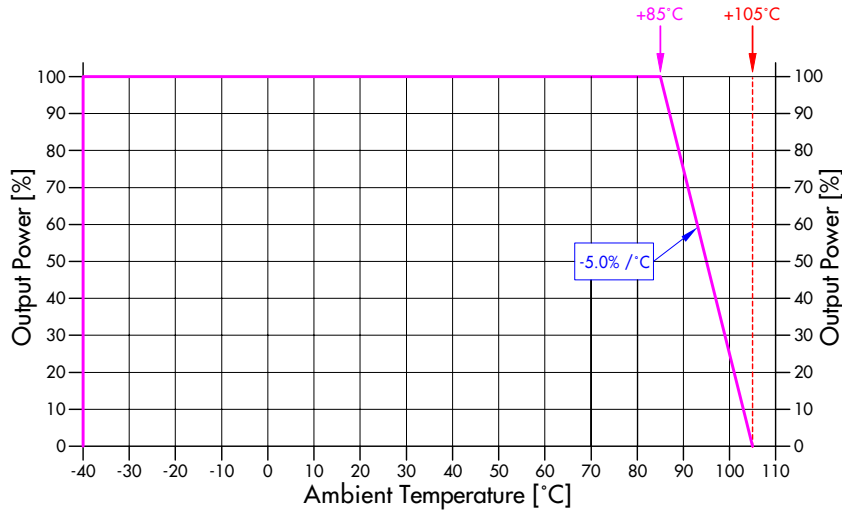
Temperature ranges	– Operating (see also enclosed derating curve) – Storage	– 40 °C ... +85 °C (no derating) – 55 °C ... +125 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>2'000'000 h @ 25 °C
Isolation voltage	Input/Output	1'000 VDC
Isolation capacity	Input/Output	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

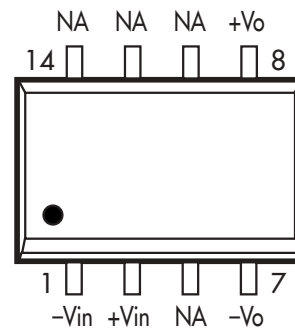
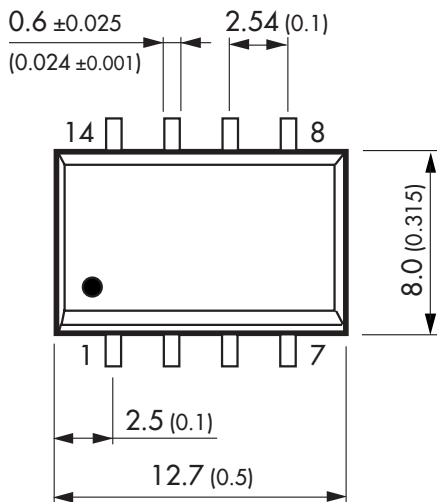
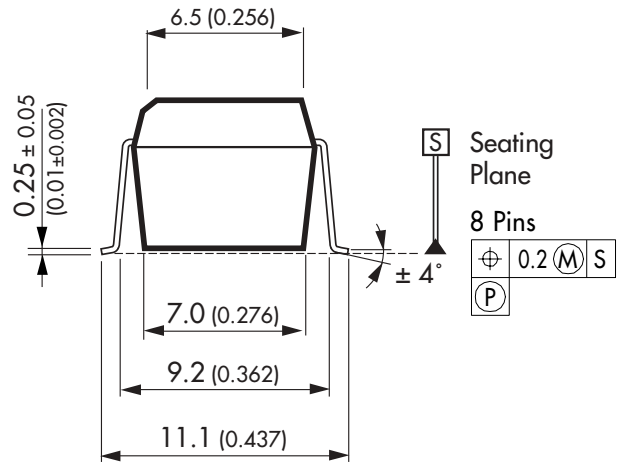
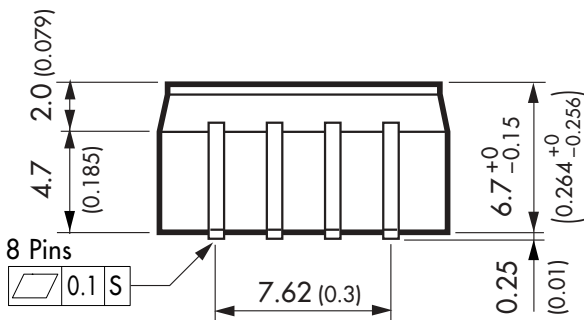
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Derating all TSM Models**



**Outline Dimensions mm (inches)**

**TSM Single Output Models**



NA = not available for electrical connection

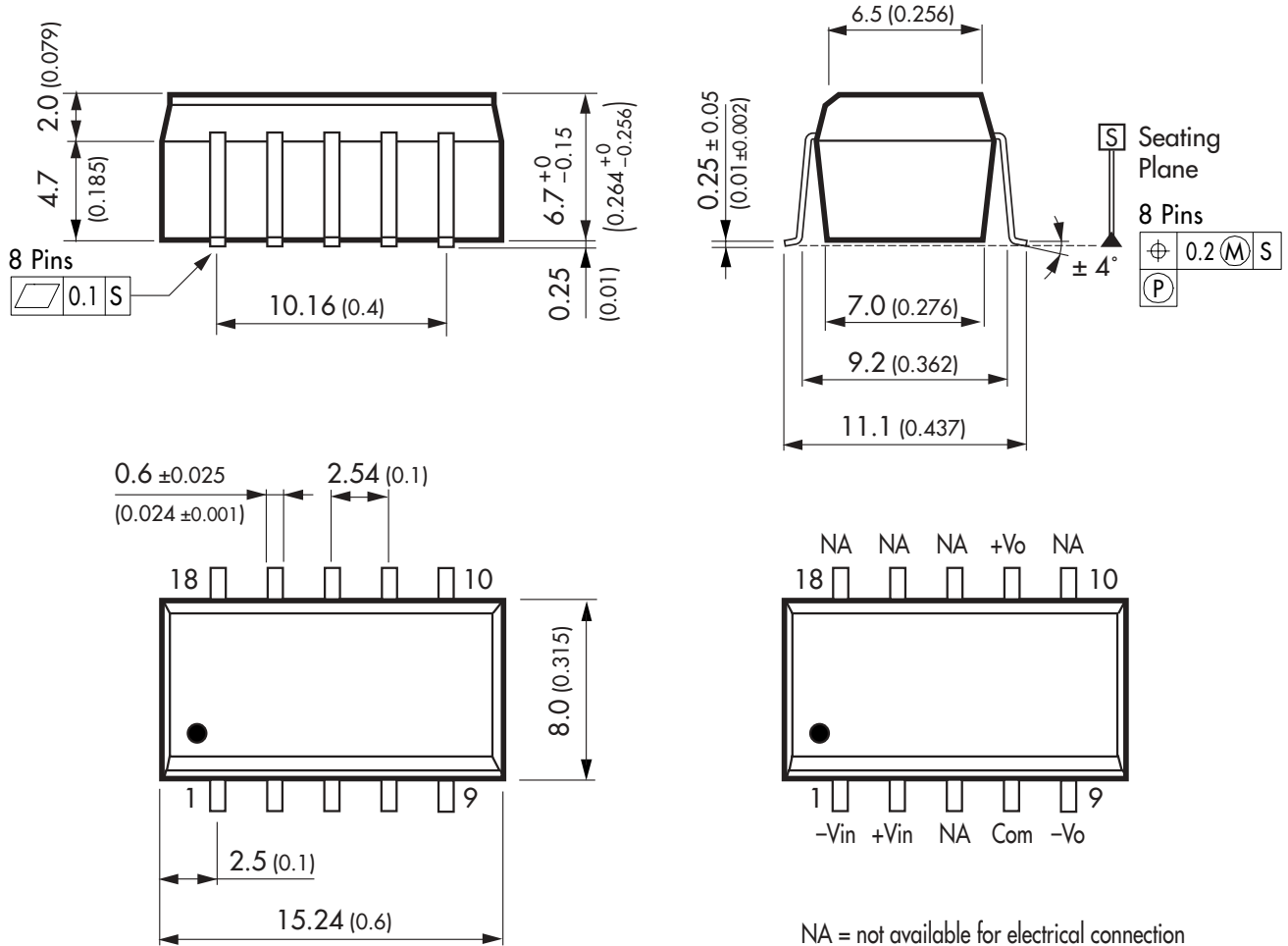
Tolerances: ± 0.25 mm (± 0.01)

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

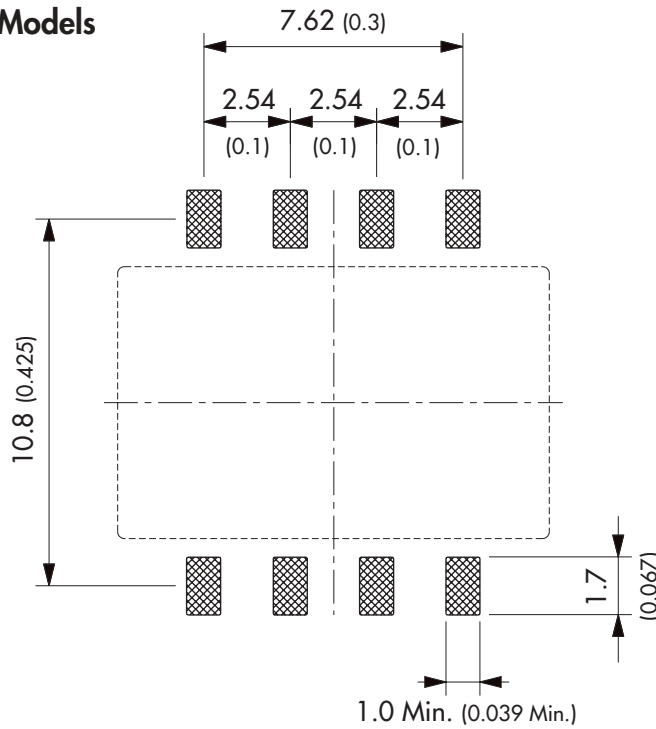
Tolerances: ± 0.25 mm (± 0.01)

Specifications can be changed without notice

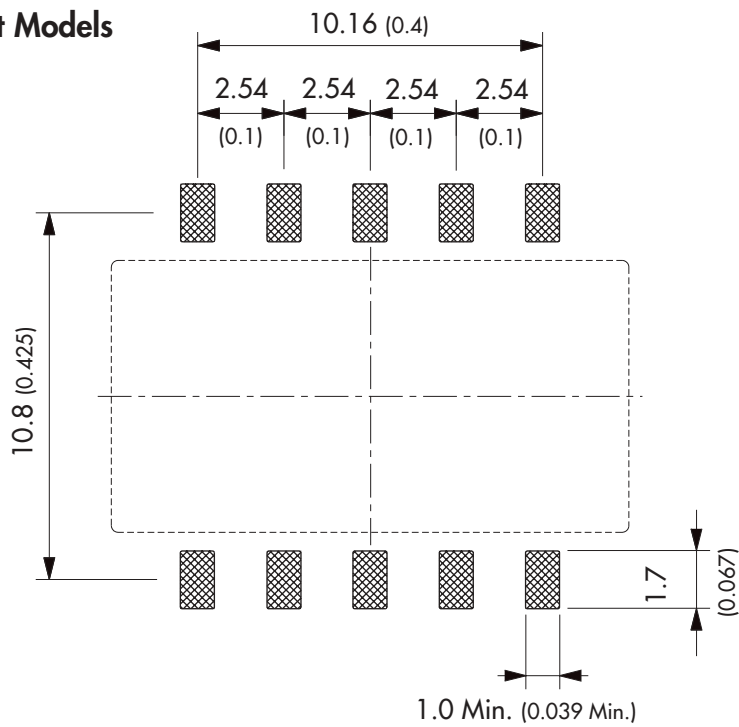
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Solder Pad Dimensions mm (inches)**

**TSM Single Output Models**



**TSM Dual Output Models**



Specifications can be changed without notice