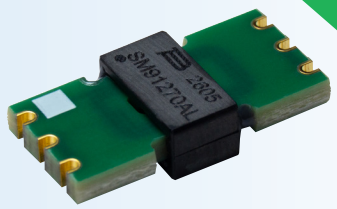
BOURNS®

AUTOMOTIVE GRADE

SM91270AL

Power Planar Transformer



*RoHS & AEC-Q200 COMPLIANT

Features

- Reinforced insulation for a working voltage up to 850 VDC
- Hi-Pot: 6000 VDC, 1 mA, 60 s
- Design construction: IEC 60664-1 & IEC 62368-1, UL 62368-1 & IEC 62477-1
- Creepage distance >9 mm
- Clearance distance >9 mm
- Designed for UCC25800, MPQ18913 and MAX25256 transformer drivers
- Overvoltage Category II, Pollution Degree 2, up to 5 km above sea level, Material Group I (CTI ≥ 600)
- AEC-Q200 compliant
- RoHS compliant*

Applications

- Automotive traction inverter and motor control
- Automotive on-board charger (OBC), DC-DC converter
- GaN, IGBT and SiC gate transformer driver bias supply
- UPS and solar inverters
- EV charging station, DC fast charging station
- Industrial motors, elevators and escalators

Sustainability

- Small size reduces material use
- Eco-logistics-friendly packing
- High efficiency, low power loss
- Energy-saving low-power design
- Corrosion-resistant for longevity
- ISO 14001, low-impact energy

Product Overview

The Model SM91270AL was developed for use with the TI Model UCC25800 and MPS Model MPQ18913 for LLC applications, and Maxim Model MAX25256 for full bridge. The full automation of manufacturing produces a high quality and cost-effective transformer. The Model SM91270AL is a low-profile component (less than 3.5 mm height above PCB) with no base design structure. This planar transformer offers a working voltage of up to 850 VDC of reinforced insulation and a Hi-Pot isolation voltage of up to 6000 VDC with an extended operating temperature range of -40 to +125 °C. The maximum output power is up to 5.4 W in a small package.

Electrical Specifications @ 25 °C

Specification	Value
Primary Inductance (1 V @ 100 kHz) L (1-2, 3)	27.5 µH min.
Leakage Inductance (1 V @ 100 kHz) L (1-2, 3 with Pin 4, 5, 6 Shorted)	1.2 µH max.
Volt Second on Primary (1-2, 3)	13.5 Vµs
Capacitance (1 V @ 100 kHz) (Pri-Sec)	3.0 pF typ.
DCR (1-2, 3) (6-4, 5)	0.9 ohms max.
Turns Ratio (1-2, 3) : (6-4, 5)	1 : 1 ±3 %
Hi-pot (Pri-Sec) (1 mA, 60 s)	6.0 kV DC
Working Voltage	850 VDC
Operating Temperature	-40 °C to +125 °C
Storage Temperature	-25 °C to +85 °C
Partial Discharge Level	1200 V
Clearance/Creepage Distance of Primary to Secondary	9.0 mm min.
Moisture Sensitivity Level	1
ESD Classification (HBM)	N/A

How to Order

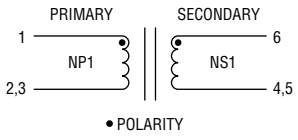
SM91270 A L - E

- Model
- AEC-Q200 Compliancy Designator
- RoHS Compliancy Designator
- Packaging
  - E = 800 pcs. per 13-inch Reel

Packaging Specifications

Packaging	Pieces per 13-inch Reel
Tape & Reel	800

Electrical Schematic



Contact Information

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* RoHS Directive 2015/863, Mar 31, 2015 and Annex.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.

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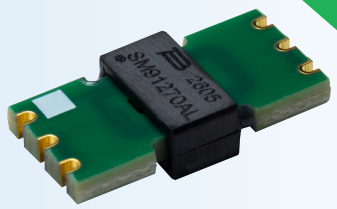

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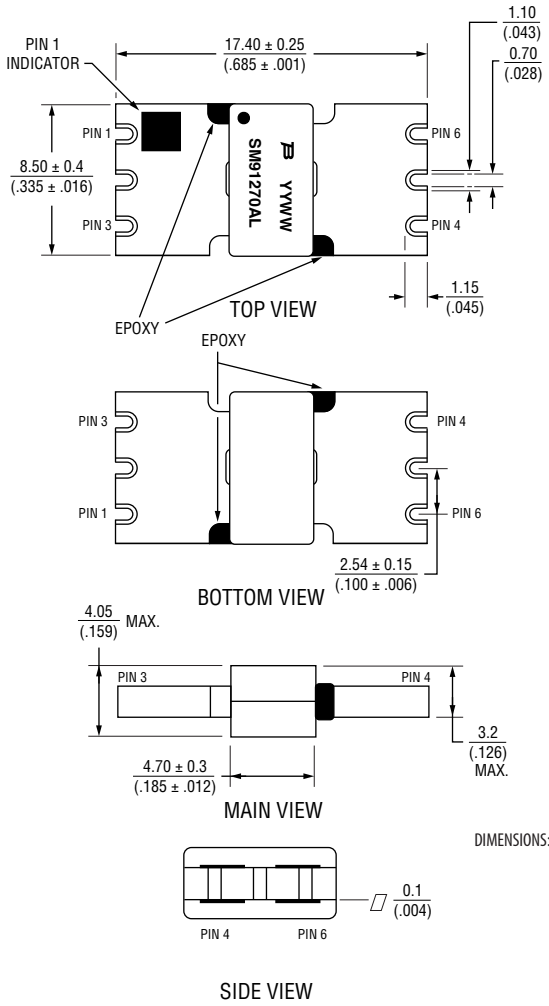
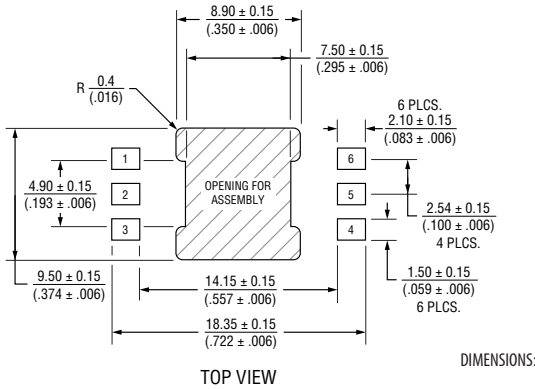
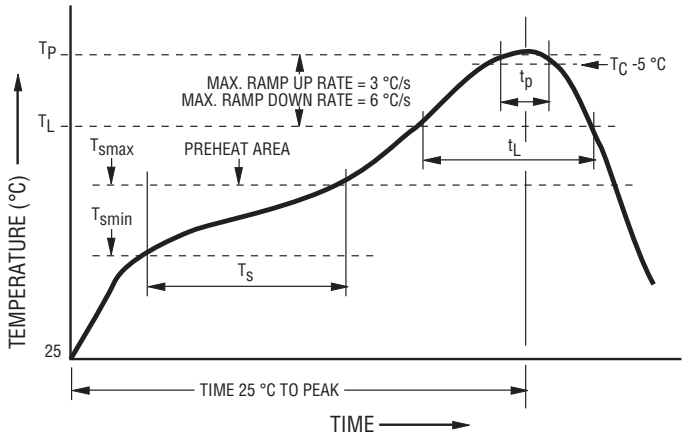
Product Dimensions



Recommended Layout



Solder Profile



Profile Feature	Pb-Free Assembly
Preheat / Soak: Temperature Min. (T_{smin}) Temperature Max. (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	 150 °C 200 °C 60~120 seconds
Ramp Up Rate (T_L to T_p)	3 °C / second max.
Liquidus Temperature (T_L) Time (t_L) maintained above T_L	217 °C 60~150 seconds
Peak Package Body Temperature (T_p)	$T_p \leq T_c$ (see table below)
Time (t_p)* within 5 °C of the specified classification temperature (T_c)	< 30 seconds
Ramp Down Rate (T_p to T_L)	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

Pb-Free Process Classification Temperatures (T_c)

Package Thickness	Volume mm³ < 350	Volume mm³ 350 - 2000	Volume mm³ > 2000
< 1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
> 2.5 mm	250 °C	245 °C	245 °C

NOTE:
The product has been tested under this reflow condition. Deviations from this, especially higher temperatures for longer duration, could impact performance.

Refer to IPC/JEDEC J-STD-020

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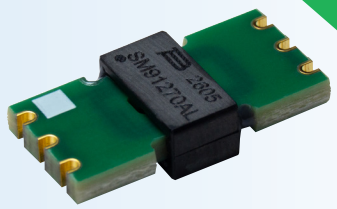

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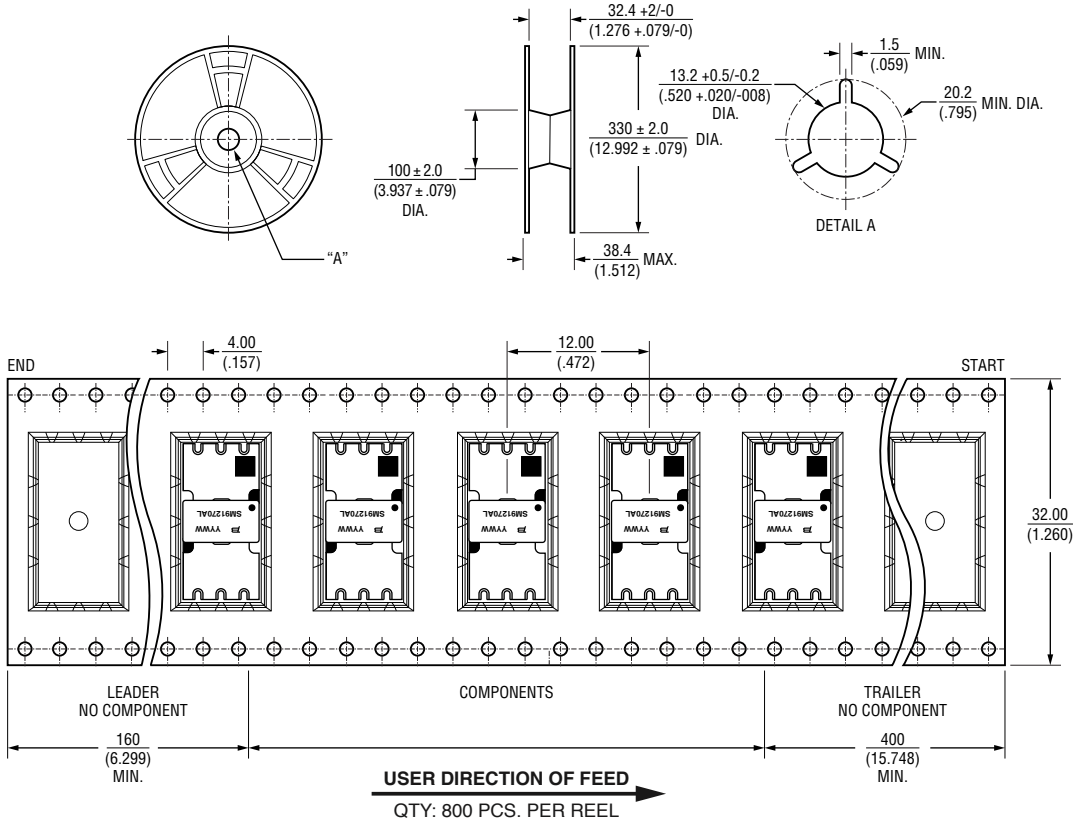
Packaging Specifications

Specifications and tolerances comply with EIA-481 requirements.



DIMENSIONS: MM / (INCHES)

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