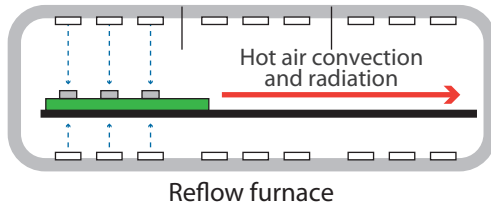# Predicting Temperature Changes and Chip Standing Phenomenon for a Printed Board During Reflow Process

HeatDesigner and SC/Tetra used to analyze the reflow process for a printed board assembly
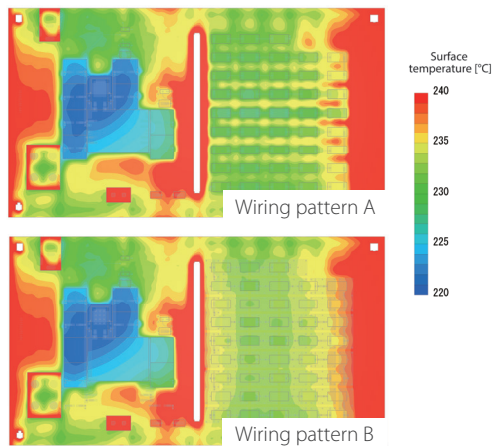
Simulating Temperature Changes on a Printed Board During Reflow Process Using HeatDesigner
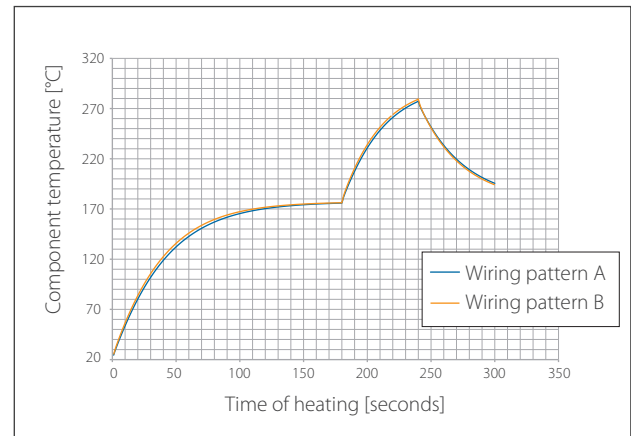
Analysis model

Reflow furnace

A transient thermal fluid analysis is conducted, simulating hot air convection, radiation and heating within the reflow furnace
Wiring patterns, component allocations, and material changes can be evaluated.

Analysis results

Wiring pattern A

Wiring pattern B

Surface temperature [°C]

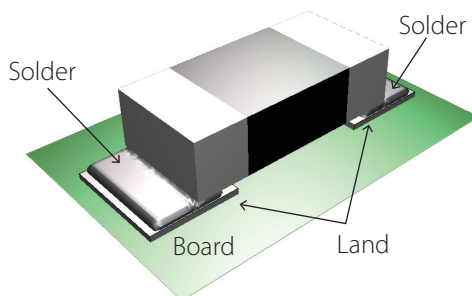Temperature distribution on printed board after 200 seconds

Chip resistor temperature changes as function of time

▶▶ Printed board temperature is affected by wiring patterns and component allocation.

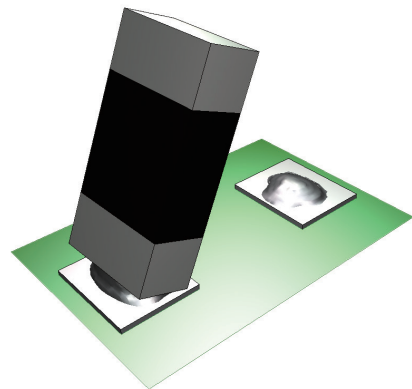## Simulating Chip Standing Phenomenon Using SC/Tetra

Analysis model

Solder

Solder

Board

Land

Chip resistor (0402 size)

Time dependent behavior of molten solder is analyzed using the VOF (Volume Of Fluid) method. If the solder is misaligned, the chip resistor can translate and rotate due to the force from the molten solder.

Analysis results

Notes

Analysis results show the occurrence of the chip standing phenomenon (known as Manhattan phenomenon), due to the force generated by the solder acting on the chip resistor. The effects of soldering time, amount of solder, and positions of the chip resistor can be evaluated using the simulation.