

Heating Silicon-On-Insulator (SOI) Wafers with a Model 5194 Infrared Line Heater and Model 5209 High Density Infrared Heaters

Application

A research laboratory manufacturing SOI wafers via zone melting recrystallization (ZMR).

Problem

Temperature Requirement - The SOI wafers needed to be heated to temperatures from 600°C to 1200°C in a vacuum or controlled atmosphere.

Mobile Heat Source - The ZMR process required that a line of heat be passed across the top of SOI wafer.

Poor Quality - Existing method of heating the SOI wafers with a laser or heated wire did not always produce quality junctions on the wafer surface.

Solution

Heat - A Model 5194 Infrared Line Heater installed on a traversing mechanism was used to move heat across the top of the SOI wafer. Model 5209 High Density Infrared Heaters applied heat to the bottom of the SOI wafer.

Power Control - A Model 664F Phase Angle SCR Power Controller controlled the power to the Infrared Line Heater and a Model 664F Phase Angle SCR Power Controller controlled the power to the High Density Heaters.

Benefits

Temperatures Achieved - The combination of top and bottom heating enabled the research laboratory to achieve required temperatures.

Improved Quality - The heating process consistently produced quality junctions of the wafer surface.

Precise Temperature Adjustment - The SCR Power Controllers enabled the research laboratory to precisely adjust the heat applied to the wafers.