

초크랄스키 실리콘 단결정 성장시 단결정 성장 시뮬레이션을 이용한
dynamic heat-flux 특성에 관한 연구
Dynamic Heat-Flow Characteristics in Czochralski Silicon-Ingots
Growth by Numerical Simulation

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A diameter of silicon wafer has been increased to 300mm to meet the industrial demands. Furthermore, the device manufacturers demand 450mm diameter silicon ingots as the minimum feature size of C-MOSFET becomes less than 45nm. Many process parameters have an influence on the quality of Czochralski grown single crystal. For predicting its quality, it is useful that we observe the temperature gradient in the solid-melt interface of silicon(G) and the difference of temperature gradient between center and edge(ΔG), varying the rotation rate of crystal or crucible, relative melt level to heater and the gap between heat insulator and melt. Therefore, our object is in making statistical data and optimizing ΔG by these parameters for each diameter. In this study, we researched the characteristics of dynamic heat flux for 200, 300 and 450mm diameter silicon ingots which are used commercially by the method of numerical simulation.

*This work was financially supported by Korea Ministry of Science & Technology through the NRL program.