

Silicon Carbide Single Crystal Bulk Growth and Wafer Fabrication Process Technology for 4" Diameter Substrates

RF technology is the backbone of telecommunications and radar for navigation and safety system across commercial and military aviation, air traffic control, aircraft to satellite communications, space exploration and more. Wide bandgap semiconductors such as SiC, GaN and AlN show superior material properties which allow operation at high switching speed, high voltage, high current density and high temperature. Among these, SiC present the better trade-off between characteristics and commercial availability of the wafers and maturity of their technological processes. SiC substrate possesses higher thermal conductivity, better lattice match between SiC and GaN.

These wafers can be produced with n-type and semi-insulating characteristics as per the requirements. N-type SiC wafer is an ideal substrate material for making high power, high temperature and anti-radiation devices which has got significant applications in electric vehicles, photovoltaic power generation, power transmission etc.

Solid State Physics Laboratory (SSPL), Delhi has developed single crystal bulk growth and wafer fabrication process technology to produce 4" diameter silicon carbide substrates. The proposed technology includes semi-insulating as well as N-type SiC substrates.