

DESCRIPTION FOR THE GENERAL PUBLIC

Wide-bandgap semiconductors are used in the development of electronic devices, among others in transistor technology or in optoelectronics. In the field of high-power and high-frequency devices one of the most promising candidates is gallium nitride. In comparison with SiC (silicon carbide)-based devices those based on GaN (gallium nitride) are characterized by the ability to work under higher temperatures, power densities, frequencies and voltages, moreover, they also exhibit higher radiation resistance. These advantages have motivated researchers to commence research concerning gallium nitride. Ion implantation method is a technique commonly applied for doping where the goal is to increase the conductivity. Alternatively, works are carried out on its application to manufacture planar semiconductor devices through the isolation of device active regions. Advantages of ion-isolation method over a conventional mesa-etching technique are evident: reduced gate leakage current, higher cutoff frequency of the transistor. The method itself is characterised by a high control in selection of implantation parameters (ion species, dose and energy) which in combination with current lithographic techniques gives huge potential in modifying properties of the material.