METHODS FOR ELIMINATION OF ARSENIC BASED DEFECTS

ABSTRACT

Methods of preparing conductive regions such as source/drain regions for silicidation procedures, has been developed. The methods feature removal of native oxide as well as removal of deposited arsenic based defects from conductive surfaces prior to deposition of a metal component of subsequently formed metal silicide regions. Arsenic ions implanted for N type source/drain regions are also implanted into insulator regions such as insulator filled shallow trench isolation regions. A hydrofluoric acid cycle used as a component of the pre-silicidation preparation procedure can release arsenic from the shallow trench isolation regions in the form of arsenic based defects, which in turn can re-deposit on the surface of source/drain region. Methods include wet etch procedures featuring hydrofluoric acid and hydrogen peroxide, as well as spin dry and dry etch procedures both employed post hydrofluoric acid treatment to remove re-deposited arsenic based defects.

FIG. 4