ABSTRACT

The present work reports the successful growth of gallium nitride thin film on silicon substrate using dense plasma focus device. The analysis is performed utilizing X-ray diffractometer (XRD) scanning electron microscopy (SEM) and Ellipsometric analysis. XRD results show the formation of gallium nitrides for all exposure conditions. The formation of nitride phases and emergence of oxide peaks have strong dependence on various number of focus shots. Lower focus shots (1 and 3) in current investigation exhibits presence of nitrides whereas for higher number of focus shots (5 and 7) oxides are dominant. SEM micrographs showed that for low no of focus shots the GaN film surface is rough and mesh type microstructure are observed by increasing number of focus shots the transformation of rough to smooth surface is observed. Ellipsometric analysis exhibits that the optical band gap of the deposited films is improved by increasing no of focus shots.