SAW characteristics of AlN films sputtered on SiC buffer layer for harsh environment applications

Si-Hong Hoang, Gwi-Sang Chung
School of Electrical Eng., University of Ulsan

Abstract: This paper describes the frequency response of two-port surface acoustic wave (SAW) resonator made of 002-poly crystalline aluminum nitride (AlN) thin film on 111-poly 3C-SiC buffer layer. In there, Polycrystalline AlN thin films were deposited on polycrystalline 3C-SiC buffer layer by pulsed reactive magnetron sputtering system, the polycrystalline 3C-SiC was grown on SiO2/Si sample by CVD. The obtained results such as the temperature coefficient of frequency (TCF) of the device is about from 15.9 to 18.5 ppm/°C, the change in resonance frequency is approximately linear (30–150°C), which resonance frequency of AlN/3C-SiC structure has high temperature stability. The characteristics of AlN thin films grown on 3C-SiC buffer layer are also evaluated by using the XRD, and AFM images.

Key Words: SAW, SiC, AlN