

Electrical Characteristics of SiON/GaAs MOS Capacitor with Various Passivations

Authors : Ming-Kwei Lee, Chih-Feng Yen

Abstract : The electrical characteristics of liquid phase deposited silicon oxynitride film on ammonium sulfide treated p-type (100) gallium arsenide substrate were investigated. Hydrofluosilicic acid, ammonia and boric acid aqueous solutions were used as precursors. The electrical characteristics of silicon oxynitride film are much improved on gallium arsenide substrate with ammonium sulfide treatment. With post-metallization annealing, hydrogen ions can further passivate defects in SiON/GaAs film and interface. The leakage currents can reach 7.1×10^{-8} and 1.8×10^{-7} at ± 2 V. The dielectric constant and effective oxide charges are 5.6 and -5.3×10^{10} C/cm², respectively. The hysteresis offset of hysteresis loop is merely 0.09 V.

Keywords : liquid phase deposition, SiON, GaAs, PMA, (NH₄)₂S

Conference Title : ICMME 2015 : International Conference on Metallurgical and Materials Engineering

Conference Location : Tokyo, Japan

Conference Dates : May 28-29, 2015