

## 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  $7.1 \times 10^{-8}$  and  $1.8 \times 10^{-7}$  at  $\pm 2$  V. The dielectric constant and effective oxide charges are 5.6 and  $-5.3 \times 10^{10}$  C/cm<sup>2</sup>, respectively. The hysteresis offset of hysteresis loop is merely 0.09 V.

**Keywords :** liquid phase deposition, SiON, GaAs, PMA, (NH<sub>4</sub>)<sub>2</sub>S

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