Contribution ID: **478** Type: **Oral Presentation**

Stability of high temperature operating Ru-SiC Schottky diodes using 6H-SiC as a substrate, and nickel as an ohmic contact

Friday, 13 July 2012 08:40 (20 minutes)

Abstract content
   (Max 300 words)

High temperature operating Ru-SiC Schottky diodes were successfully fabricated for the first time by using electron beam deposition of ruthenium on the n-type bulk-grown 6H-SiC samples. The nickel back ohmic contact was deposited on the SiC samples by resistive evaporation technique. The Schottky diodes showed excellent rectifying behaviour up to an annealing temperature of 900 deg;C. The Ru-SiC Schottky diode samples were annealed isochronally in argon at temperatures ranging from 100 -1000 deg;C. After each annealing temperature, full IV and CV characterisation was done. The Schottky barrier height (SBH) obtained through IV characteristics, and CV characteristics increased from 0.58 eV, and 1.83 eV respectively for the as-deposited sample to 0.86 eV, and 4.12 eV for the sample annealed at 900 deg;C. The ideality factor and reverse saturation current ranged from 1.047, and 1.22x10⁻⁵ A respectively for the as deposited to 3.05, and 3.85x10⁻¹¹ A for the sample annealed at 900 deg;C. The SBH obtained from IV characterisation showed some slight variation at various annealing temperatures. The Schottky diodes showed very good linear CV characteristics and excellent forward IV characteristics with a forward voltage drop of 1.5 V up to an annealing temperature of 900 deg;C, and then degraded after this temperature.

Apply to be
 consider for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD)?

PhD

Main supervisor (name and email)
and his / her institution

Prof Chris Theron, University of Pretoria
chris.theron@up.ac.za

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Primary author: Mr MUNTHALI, Kinnock Vundawaka (University of Pretoria and Polytechnic of Namibia)

Presenter: Mr MUNTHALI, Kinnock Vundawaka (University of Pretoria and Polytechnic of Namibia)

Session Classification: Applied Physics Forum

Track Classification: Track F - Applied Physics