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The effects of electron irradiation and thermal dependence measurements on 4*H*-SiC Schottky diode

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- Sabuhi Ganiyev (1)
- M. Azim Khairi (1)
- D. Ahmad Fauzi (1)
- Yusof Abdullah (2)
- N. F. Hasbullah (1) Email author (nfadzlinh@iium.edu.my)

1. Department of Electrical and Computer Engineering, International Islamic University, Kuala Lumpur, Malaysia
2. Industrial Technology Division, Agency Nuclear Malaysia, Kuala Lumpur, Malaysia

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Abstract

In this paper the effects of high energy (3.0 MeV) electrons irradiation over a dose ranges from 6 to 15 MGy at elevated temperatures 298 to 448 K on the current-voltage characteristics of 4*H*-SiC Schottky diodes were investigated. The experiment results show that after irradiation with 3.0 MeV forward bias current of the tested diodes decreased, while reverse bias current increased. The degradation of ideality factor, n, saturation current, I_s, and barrier height, Φ_b, were not noticeable after the irradiation. However, the series resistance, R_s, has increased significantly with increasing radiation dose. In addition, temperature dependence current-voltage measurements, were conducted for temperature in the range of 298 to 448 K. The Schottky barrier height, saturation current, and series resistance, are found to be temperature dependent, while ideality factor remained constant.

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