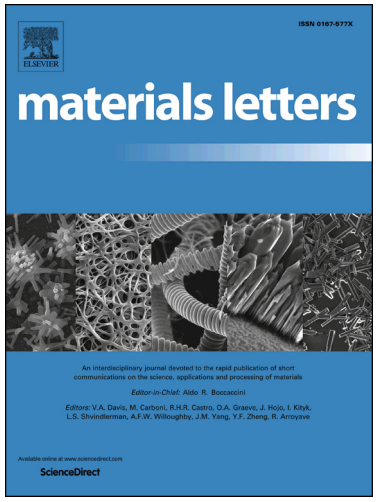

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Carrier Transport Mechanism of Al Contacts on n-type 4H-SiC

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Abstract

We investigated the carrier transport mechanism at Al/n-type 4H-SiC contacts. As-deposited Al exhibited the good ohmic behavior, while the thermal annealing leads the significant degradation of contact properties, i.e., the specific contact resistance was 3.97×10^{-3}, 4.1×10^{-2}, and 0.153 Ωcm^2 for the as-deposited, 200 and 400^{o}C-annealed condition, respectively. The ohmic mechanism of as-deposited contact could be explained by field emission model, yielding a tunneling parameter of 0.44 eV, i.e., the ohmic behavior is due to the tunneling through the thin barrier. The degradation of ohmic contact after thermal annealing caused by the formation of oxide layer between the Al and SiC.

Keywords: SiC, contacts, transport mechanism, non-alloying, electrical properties

[§]These two authors contributed equally to this work.