

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Graphite based Schottky diodes formed semiconducting substrates TODD SCHUMANN, SEFAATTIN TONGAY, ARTHUR HEBARD, University of Florida — We demonstrate the formation of semimetal graphite/semiconductor Schottky barriers where the semiconductor is either silicon (Si), gallium arsenide (GaAs) or 4H-silicon carbide (4H-SiC). The fabrication can be as easy as allowing a dab of graphite paint to air dry on any one of the investigated semiconductors. Near room temperature, the forward-bias diode characteristics are well described by thermionic emission, and the extracted barrier heights, which are confirmed by capacitance voltage measurements, roughly follow the Schottky-Mott relation. Since the outermost layer of the graphite electrode is a single graphene sheet, we expect that graphene/semiconductor barriers will manifest similar behavior.

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Date submitted: 08 Dec 2009

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