

Abstract Submitted
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Transfer of Graphene Layers Grown on SiC Wafers to Other Substrates and Their Integration into Field Effect Transistors SAKULSUK UNARUNOTAI, Department of Chemistry and Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, YUYA MURATA, CESAR CHIALVO, HOON-SIK KIM, SCOTT MACLAREN, NADYA MASON, IVAN PETROV, JOHN ROGERS, University of Illinois at Urbana-Champaign — An approach to produce graphene films by epitaxial growth on silicon carbide substrate is promising, but its current implementation requires the use of SiC as the device substrate. We present a simple method for transferring epitaxial sheets of graphene on SiC to other substrates. The graphene was grown on the (0001) face of 6H-SiC by thermal annealing in a hydrogen atmosphere. Transfer was accomplished using a peeling process with a bilayer film of Gold/polyimide, to yield graphene with square millimeters of coverage on the target substrate. Back gated field-effect transistors fabricated on oxidized silicon substrates with Cr/Au as source-drain electrodes exhibited ambipolar characteristics with hole mobilities of ~ 100 cm²/V-s, and negligible influence of resistance at the contacts. This work was supported by the U.S. DOE, under Award No. DE-FG02-07ER46471, through the Frederick Seitz Materials Research Laboratory at the University of Illinois at Urbana-Champaign.

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