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(54) **GRAPHENE DEVICE AND METHOD OF
FABRICATING A GRAPHENE DEVICE**

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ABSTRACT

A method of fabricating a graphene-based solid-state device includes: disposing a graphene layer on a substrate; depositing a first layer of a sacrificial material on the graphene layer, the first layer made of a first oxide dielectric material; patterning the graphene layer by defining at least one channel region, applying a lithographic process followed by etching; depositing a second layer of a sacrificial material on the stacked structure, the second layer made of a second oxide dielectric material different from the first. The selectivity to at least one etchant of the first oxide dielectric material is different from the selectivity to at least one etchant of the second. Also included is defining contact areas on which metal is deposited; etching away portions of the sacrificial material layers, defining hollow portions through which graphene areas are exposed; and in a single deposition stage, applying metal depositions on defined contact areas.

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