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

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(57) **ABSTRACT**

A method of fabricating a graphene-based solid-state device, the method including: disposing a graphene layer on a substrate; depositing a sacrificial layer on the graphene layer, the sacrificial layer being made of a non-polymeric dielectric material; patterning the graphene layer by defining at least one channel region, wherein the patterning is done by applying a lithographic process followed by an etching process using a resist layer, thus obtaining a patterned graphene layer protected against contamination from the resist layer by the sacrificial layer; patterning on the graphene layer a geometry of at least one metallic contact to be deposited; depositing the metallic contact on the graphene layer. A graphene-based solid-state device includes: a substrate; a graphene layer disposed thereon and defining at least one graphene channel; the graphene layer protected by a sacrificial layer made of a non-polymeric dielectric material; at least one metallic contact in contact with the graphene channel.

