Graphene integration at wafer scale

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Abstract

Graphene has shown to have a great potential to be applied in electronics, optoelectronics and photonics. However, key to the commercial success of graphene in these applications is the availability of industrially scalable manufacturing and integration processes. Since a disruptive replacement of existing technology is unlikely at this stage, graphene should be compatible with conventional semiconductor manufacturing technology [1]. Many multifunctional working prototypes have been demonstrated using CVD graphene. Depending on the type of application and the function of the graphene in the device, the integration scenario could vary from front to back-end. However, all the integration scenarios will require a scalable, uniform and high-quality graphene. Therefore, uniformity, high charge carrier mobility and controlled doping at wafer scale are the focus from the industrial manufacturing point of view. In addition, there are many other factors that have to be taken into consideration during the fabrication of graphene devices at wafer scale [2] including contact resistance [3], encapsulation [4,5], type of substrate, device uniformity, etc. During this talk I will cover challenges related to the graphene production and device fabrication at wafer scale.

References


