

Graphene Wafer Scale Integration

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Graphene and other two-dimensional materials (2DM) have allowed prototyping devices with exceptional performances and potentially huge impact in electronics, photonics and sensor technology.[1,2] The next big challenge is the wafer-scale integration of 2DM, as success in real-world applications it requires not only outstanding performance at the single-device level but also, large-scale fabrication processes.[3] This abstract presents the successful integration of graphene fabrication technology on 150 mm silicon wafer platform as a needed unit for a new graphene imager product, including graphene growth and transfer, patterning, contacting and encapsulation. Statistics on graphene-on-wafer quality metrics show that the as-developed foundry process delivers good batch-to-batch reproducibility and high device yield. This technology development is promising for introduction of high-performing graphene-on-wafer at competitive cost, accelerating innovation for advanced 2DM-based electronics, and eventually creating a new imager product category. This work is funded by the European Union's Horizon 2020 research and innovation program G-Imager under grant agreement No. 820591.

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