## Graphene-on-Silicon Technology to Advance Power Semiconductor Devices

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Graphene-on-Silicon process technology has been developed in MIMOS Wafer FAB since 2015 to improve the performance of power semiconductor devices. MIMOS, have discovered that direct deposition of graphene layers as a heat spreader on silicon substrate could reduce the junction temperature in Schottky rectifier device hence improving safe operating area (SOA) of the power device. The development of graphene heat spreader in power semiconductor devices could improve its performance and create more efficient power supplies for a range of applications. Reduced graphene oxide (rGO) layer has been used in this study. Multiple layers of rGO flakes that are overlapped and interconnected are deposited on silicon surface with trench array structures to form the Schottky contact. Prototype of Graphene-on-Silicon Schottky Diode developed by MIMOS showed the leakage current improved by two-orders of magnitude when tested under high operating temperature (>80°C) with comparison to the conventional metal silicide (Titanium Silicide and Cobalt Silicide). With this success, MIMOS extends its graphene study by developing Graphene-on-Silicon process technology platform for fabrication of power semiconductor devices i.e. Schottky Diodes, Power MOSFETs. The aim is to advance the existing power semiconductor process platform by using nanotechnology.