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## Reduced Graphene Oxide Field-Effect Transistor for Temperature and Infrared Sensing

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We fabricated reduced graphene oxide field-effect transistor (RGO-FET) on glass for highly sensitive temperature and IR detection. The device has the channels of RGO responsive to physical stimuli such as temperature and IR. The RGO sensing layers are fabricated from exfoliated graphene oxide sheets that are deposited to form a thin continuous network by electrostatic assembly. These graphene oxide networks are reduced toward reduce graphene oxide by exposure to a hydrazine hydrate vapor. To improve performance and eliminate interferences from oxygen and water vapor absorption to electrical properties of RGO-FET, the sensor devices were encapsulated by the tetratetracontane layer after annealing treatment. The device with encapsulation layer showed lower hysteresis, improved stability, and better repeatability. The temperature response of RGO-FET is examined by measuring changing the temperature, the device exhibited the high sensitivity and repeatability even with the temperature interval of 1 K. We also demonstrated that our devices have capability of IR sensing.

**Keywords:** RGO-FET, Sensor, Temperature, IR