

# 源漏不对称的石墨烯场效应管特性研究

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**摘要:** 石墨烯场效应管 (GFET) 在栅极和源/漏电极之间存在的不对称的未被栅极覆盖的区域, 会引起栅、源和栅、漏电极之间的串联电阻不相等, 这将对 GFET 的性能产生影响. 首次测试了源漏不对称 GFET 在互换源、漏电极的情况下的输出特性、转移特性和跨导, 并采用带源极负反馈电阻的共源极电路模型和石墨烯沟道总电阻计算公式, 分析了源漏不对称对器件特性的影响机理. 为研制 GFET 及其他的纳米结构材料晶体管提供了有益的参考.

**关键词:** 石墨烯场效应管; 源漏不对称; un-gated 区域; 串联电阻

## Study on the Characteristics of Graphene Field-Effect Transistors With Asymmetry Source and Drain

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**Abstract:** There are asymmetric un-gated regions that give rise to unequal access resistances between the gate and the source/drain (S/D) electrodes in the graphene field effect transistor (GFET), which has a certain effect on the performance of the GFET. For the first time, in this paper, when the source and drain electrodes exchanged, the output characteristics, transfer characteristics and transconductance of the asymmetric GFET are measured respectively. The influence mechanism resulting from the asymmetry Source and Drain is analyzed by using the common source circuit model with source negative feedback resistor and the total resistance equation of graphene channel. It provides a useful reference for preparation and testing of GFETs and other nanostructured material transistors.

**Key words:** graphene field-effect transistors (GFETs); asymmetrical source drain; un-gated region; access resistance

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