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[218] Direct measurements of contact resistance in MoS₂-based thin film transistors via Kelvin probe force microscopy

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This study aims at direct imaging of contact resistance in MoS₂-based thin film transistors (TFTs). Exfoliated single-crystal flakes of MoS₂ have been used in a bottom-contact TFT configuration. Pyrimidine-containing self-assembled monolayers (SAMs) were employed to tune the work function of gold electrodes. Kelvin probe force microscopy measurements were carried out during operation of the devices in order to directly image potential drops across the channel and to study the influence of different SAM treatments on the contact resistance. By independently imaging potential drops at both carrier injection and extraction points, we demonstrate asymmetry of contact resistances in MoS₂-based TFTs, as well as their non-linear and bias-dependent behavior.

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