

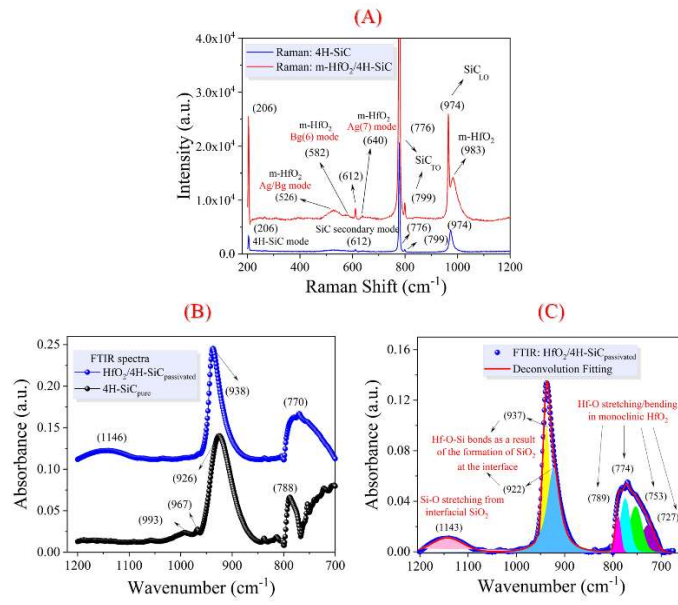


Fig.1: (A) Raman spectra of the 4H-SiC substrate and the HfO₂/passivation layer/4H-SiC structure, confirming the monoclinic HfO₂ phase. (B) FTIR spectra of the deposited structure and pure 4H-SiC substrate. (C) Deconvolution of the FTIR spectrum highlighting Hf-O and interfacial Si-O-Si vibrational modes.

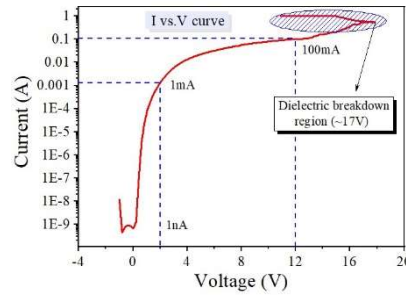


Fig. 2: Current-voltage (I-V) characteristics of the HfO₂/passivation layer/4H-SiC MOS capacitor under positive bias stress until dielectric breakdown at ~17 V

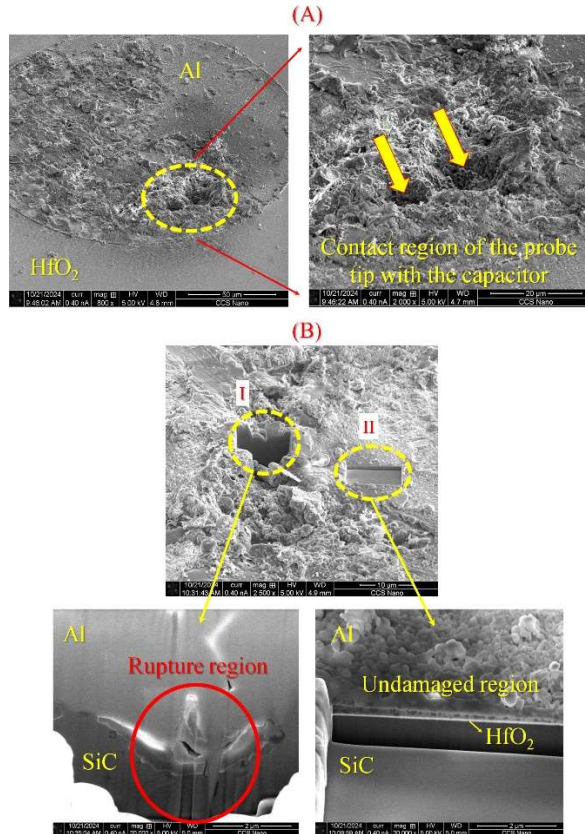


Fig.3: SEM/FIB analysis of the dielectric breakdown region in the HfO₂ MOS capacitor. (A) Top-view SEM images showing localized damage at the probe contact region. (B) Cross-sectional SEM images of the damaged and undamaged regions, revealing localized dielectric failure and preserved surrounding interface structure.