

Abstract Submitted
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Polarization modulated diode effect in a ferroelectric tunnel capacitor with semiconducting BiFeO₃ barrier¹ GUOLEI LIU, SHUMIN HE, SHISHOU KANG, YANXUE CHEN, SHISHEN YAN, LIANGMO MEI, School of Physics and State Key Laboratory of Crystal Materials, Shandong University — Polarization modulated diode effect was investigated in a ferroelectric tunnel capacitor with semiconducting BiFeO₃ barrier, which was grown on a conductive Nb-SrTiO₃(001) substrate by oxygen plasma assisted molecular beam epitaxy. Switchable diode effect with a good rectifying property and large bipolar resistance switching observed. The on/off resistance ratio is larger than two orders of magnitude. The tunneling resistance was found to be dominated by the Schottky contact forming at BiFeO₃/Nb-SrTiO₃ interface, in the regime of Fowler-Nordheim tunneling across the Schottky-like barrier. The switchable diode effect was attributed to the Schottky barrier variations upon polarization reversal. The width variation of depletion layer was estimated about 8nm, which is comparable with the 25nm-thick BiFeO₃ barrier.

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