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标题: Coaxial nanowire resonant tunneling diodes from non-polar AlN/GaN on silicon
作者: Carnevale, SD (Carnevale, S. D.); Marginean, C (Marginean, C.); Phillips, PJ (Phillips, P. J.); Kent, TF (Kent, T. F.); Sarwar, ATMG (Sarwar, A. T. M. G.); Mills, MJ (Mills, M. J.); Myers, RC (Myers, R. C.)
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摘要: Resonant tunneling diodes are formed using AlN/GaN core-shell nanowire heterostructures grown by plasma assisted molecular beam epitaxy on n-Si(111) substrates. By using a coaxial geometry, these devices take advantage of non-polar (m-plane) nanowire sidewalls. Device modeling predicts non-polar orientation should enhance resonant tunneling compared to a polar structure, and that AlN double barriers will lead to higher peak-to-valley current ratios compared to AlGaN barriers. Electrical measurements of ensembles of nanowires show negative differential resistance appearing only at cryogenic temperature. Individual nanowire measurements show negative differential resistance at room temperature with peak current density of 5 x 10(5) A/cm(2). (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.3701586]
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地址: [Carnevale, S. D.; Phillips, P. J.; Kent, T. F.; Mills, M. J.; Myers, R. C.] Ohio State Univ, Dept Mat Sci & Engn, Columbus, OH 43210 USA
[Marginean, C.; Myers, R. C.] Ohio State Univ, Dept Phys, Columbus, OH 43210 USA
[Sarwar, A. T. M. G.; Myers, R. C.] Ohio State Univ, Dept Elect & Comp Engn, Columbus, OH 43210 USA
通讯作者地址: Myers, RC (通讯作者),Ohio State Univ, Dept Mat Sci & Engn, 116 W 19Th Ave, Columbus, OH 43210 USA
电子邮件地址: myers.1079@osu.edu
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