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Interface-Phenomena in 3C-SiC Heteroepitaxy on Silicon

By Philip Hens

Shaker Verlag Aug 2011, 2011. Taschenbuch. Book Condition: Neu. 208x146x12 mm. Neuware - Silicon carbide as a wide bandgap semiconductor material is by now widely introduced in the power device market. Its superior performance in terms of power density, high switching frequency and breakdown voltage leads to an advantage in efficiency and in the power to weight ratio of modules compared to silicon. All the devices on the market until now rely on the use of hexagonal polytypes. These show the highest bandgap and can be produced in high quality for the high-volume market by physical vapor transport technology. The only cubic polytype 3C cannot be used for high quality devices as the production is very difficult and the available material is still very defect rich. On the other hand this polytype has special properties concerning isotropic values (e.g. mobility) and the possibility to form a rather good interface to oxides as required for MOS devices. Nowadays, there are two main technologies used for the production of cubic silicon carbide. Both rely on the heteroepitaxial growth of 3C thin films on either hexagonal silicon carbide or on silicon substrates. The growth on hexagonal substrates provides a better quality but silicon...


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