

Experimental Research on Single Event Effect in SRAMs with Three Different Feature Sizes

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Experimental studies on single-event effects of static random access memories (SRAMs) with different feature sizes were carried out at 100 MeV cyclotron proton accelerator of China Institute of Atomic Energy. Single-event upset (SEU) cross-section curves with different proton energies and different incident angles were obtained for three SRAMs. The effects of incident proton energies and angles on the single-event upsets saturation cross section of SRAM with different feature sizes are analyzed, and the SEU characteristics of 65 nm SRAM are simulated by Monte Carlo method. The results show that increase the incident angle when the incident proton energy is relatively low, the increase of the single-event cross-section is due to the deposition of sufficient energy in more sensitive volumes, while increase the incident angle when the incident proton energy is relatively high, the increase of the single-event cross-section is due to the occurrence of more multiple-cell upsets. Finally, the complete cross section of 65 nm SRAM at different incident angles is obtained and the error rate estimation results are calculated.

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