Locating radiation sensitive zones of integrated circuits using an ion-microprobe

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An imaging technique is described which produces micron-resolution maps of the single-event upset sensitive regions of integrated circuits during ion-irradiation. From these “upset images” the identity and size of a circuit's upset-prone components can be directly determined. Utilizing a scanning ion-microprobe, the imaging technique selectively exposes the functional units of an integrated circuit (e.g. transistor drains, gates) and immediately measures the effect of high-energy ion strikes on circuit performance. Such detailed spatial characterization provides a precision diagnostic technique with which the study of single-event upset processes in integrated circuits becomes more efficient.