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(54) Title: **NON-UNIFORM MINORITY CARRIER LIFETIME DISTRIBUTIONS IN HIGH PERFORMANCE SILICON POWER DEVICES**

(57) Abstract

A process for heat-treating a single crystal silicon segment to influence the profile of minority carrier recombination centers in the segment. The segment has a front surface, a back surface, and a central plane between the front and back surfaces. In the process, the segment is subjected to a heat-treatment to form crystal lattice vacancies, the vacancies being formed in the bulk of the silicon. The segment is then cooled from the temperature of said heat treatment at a rate which allows some, but not all, of the crystal lattice vacancies to diffuse to the front surface to produce a segment having a vacancy concentration profile in which the peak density is at or near the central plane with the concentration generally decreasing in the direction of the front surface of the segment. Platinum atoms are then in-diffused into the silicon matrix such that the resulting platinum concentration profile is substantially related to the concentration profile of the crystal lattice vacancies.

