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Electrical Characteristics of Si Doped with Sb by Laser Annealing

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Abstract: Laser induced diffusion of antimony in silicon was obtained using a Nd:YAG pulsed laser. The irradiation of antimony-coated silicon by laser beam allowed melting and diffusion of antimony inside the silicon. Diodes were fabricated. Laser beam energy and substrate temperature played a major role in electrical sheet conductivity I-V, and C-V characteristics of the fabricated diodes. High laser energy reduced the electrical sheet conductivity and dominated the recombination current due to the generation-recombination process and trapping centers. On the other hand, the diffusion current dominated for diodes fabricated under heating conditions of the sample during laser irradiation. The C-V measurements of fabricated diodes revealed that the junction were of abrupt type.

Key Words: Laser annealing, LID doping, Silicon devices, Sb dopants

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