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Anomalous Electrical Characteristics of Ion Implanted P<sup>+</sup>-n Junctions

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**Abstract:** Electrical characteristics of three P<sup>+</sup> - n diodes fabricated on high resistivity silicon by ion implantation technique are studied by making capacitance-voltage (C-V), reverse current-voltage (I-V) and dielectric spectroscopy of semiconductor (DSS) measurements. The C-V characteristics show abrupt fall in capacitance, while I-V characteristics show abrupt rise in current at the same voltages as in the C-V characteristics. These abrupt discontinuities are ascribed to the formation of defect clusters in the lightly doped base regions where charge transfer might be taking place by thermally assisted tunneling. Low activation energies obtained in the DSS measurements also point toward the same mechanism.

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