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Study of gamma irradiated p-type silicon diodes with different resistivities

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We report on results of the irradiation bulk damage study in gamma irradiated standard float zone p-type silicon diodes. The study includes three types of diodes with different resistivities by CNM, HPK and IFX manufactures. The diodes were irradiated by Cobalt-60 gamma source up to 3.66 MGy in approximate charged particle equilibrium and then annealed for 80 minutes at 60°C. Electrical properties of diodes are characterized by measuring IV and CV curves of each diode before and after irradiation and annealing. During all the measurements we were able to separate surface and bulk currents by contacting the guard ring of each diode. The measurements of n-in-p type diodes show increasing linear-looking dependence of leakage current and decreasing linear-looking dependence of full depletion voltage and effective doping concentration on TID.

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