

Studies of diffused phosphorus emitters: saturation current, surface recombination velocity, and quantum efficiency

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Abstract:

The surface recombination velocity s for silicon surfaces passivated with thermal oxide was experimentally determined as a function of surface phosphorus concentration for a variety of oxidation, anneal, and surface conditions. This was accomplished by measuring the emitter saturation current density $J_{0\text{e}}$ of transparent diffusions for which the $J_{0\text{e}}$ is strongly dependent on s . At the lowest doping levels, the value of s was confirmed by measurements of s on substrates with uniform phosphorus doping. The impact of these measurements on solar cell design is discussed.< >

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