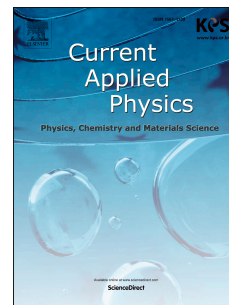


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# Efficient implementation of multiple drive-in steps in thermal diffusion of phosphorus for PERC solar cells

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## ABSTRACT

N-type phosphorus diffusion in silicon using phosphorus oxychloride,  $\text{POCl}_3$ , has been widely used in the production of p-type silicon solar cells. The thermal diffusion process in a furnace generally involves two steps: pre-deposition and drive-in. The phosphorous doping by thermal diffusion often shows high surface concentrations, leading to an increase in charge recombination, which should be inhibited in order to fabricate high efficiency silicon solar cells. In this study, we investigate the influence of 3 drive-in steps at sequentially increasing temperatures during the  $\text{POCl}_3$  diffusion on the emitter performance. As a result, it was found that the kink region was made shorter while maintaining surface concentration for a good metal contact without losing its

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