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Title

Free-charge carrier profile of iso- and aniso-type Si homojunctions determined by terahertz and mid-infrared ellipsometry

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Abstract

We present an optical, non-destructive, non-contact method of determining the silicon homojunction epilayer free-charge carrier concentration profile and thickness by means of combined terahertz (0.2-1 THz) and mid-infrared (10-50 THz) spectroscopic ellipsometry investigation. A dual homojunction iso- and aniso-type silicon sample is investigated. Application of analytical models for iso-type and aniso-type homojunctions results in an excellent match between calculated and experimental data. Best-match model calculated parameters are found to be consistent with electrical spreading resistance epilayer thickness and resistivity values. [All rights reserved Elsevier]. (18 References).