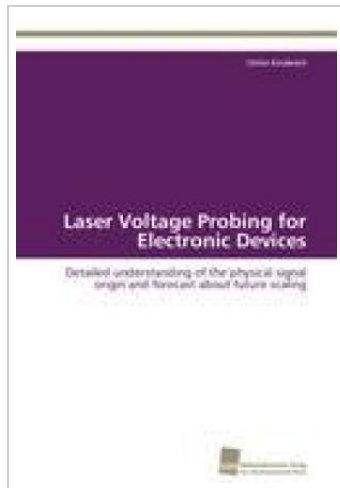



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Laser Voltage Probing for Electronic Devices

By Ulrike Kindereit

Südwestdeutscher Verlag Für Hochschulschriften AG Co. KG Mai 2014, 2014. Taschenbuch. Book Condition: Neu. 222x152x23 mm. This item is printed on demand - Print on Demand Neuware - The ongoing integration density increase changes the demands on failure analysis methods for ICs drastically. Laser Voltage Probing (LVP) is an all-optical laser-based technique that acquires waveforms through the silicon backside. Although widely used in failure analysis labs, the knowledge about LVP signal origin is still very low. A detailed investigation of the signal origin is presented, using a modified LVP setup, which employed a 1319 or 1064 nm CW laser. Three new measurement methods were introduced, extracting frequency-information with a spectrum analyzer in opposition to the standard time-domain waveform acquisition with an oscilloscope. Signal-to-voltage correlations and modulation amplitude and sign maps were performed for a broad spectrum of MOSFETs: from 10 μm (to study signal sources) to 65 nm gates (effects on structures with decreased dimensions). These low-noise frequency-domain measurement methods enabled very short signal acquisition times (seconds to minutes). A concise model, describing the interaction of laser light and device activity, was built, explaining the signal sources and enabling the forecast of signal levels for future technologies and scaling. 176...



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