

# Epitaxial silicon transition zone measurements by spreading resistance profiling (SRP) and Fourier transform infrared (FTIR) reflectometry

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## Abstract

Silicon epitaxy is an essential building block in the manufacturing of complementary metal-oxide semiconductor (CMOS) devices. Accurate determination of epitaxial layer thickness is indispensable for a uniform and reproducible process. In this paper, we compare thickness values of the transition zone in silicon epitaxial wafers obtained by two of Semilab's production-compatible electrical and optical characterization techniques: Fourier-transform infrared (FTIR) reflectometry and spreading resistance profiling (SRP). We demonstrate a high correlation between transition zone thicknesses obtained from the optical modelling of FTIR reflectance spectra and SRP profiles. The dependance of transition zone thickness change on the high-temperature annealing steps is also examined. FTIR reflectometry thus offers a quick, contactless alternative for obtaining structural parameters of an epitaxial layer, and these values can be well matched to those given by SRP.

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