

**CARRIER TRANSPORT AND I-V CHARACTERISTIC OF
Au/Si SILICIDES USING OPEN PHOTOACOUSTIC CELL
AND FOUR POINT-PROBE TECHNIQUES**

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ABSTRACT

The carrier transport properties of Au/Si samples annealed at three temperatures (i.e. 100°C, 363 °C and 800°C) were investigated using open photoacoustic cell (OPC) technique. A gold film of 45 nm was deposited on the silicon substrate and annealed in air environment. We observed that Au_{8.1}Si_{1.9} silicide and Au₇Si(622) silicide were formed at both 363°C and 800°C annealing temperature. Obviously the Au_{8.1}Si_{1.9} silicide was observed in all Au/p-Si system. The result indicates that the recombination process increases with the formation of Au₇Si silicide. From the analysis of photoacoustic phase fitting and four point probe techniques, surface recombination velocity of gold silicide was found increase with the increasing annealing temperature. However, the band-to-band recombination lifetime decreased as annealing temperature increased. The I-V characteristic shows the Schottky curves for the annealing temperature of 363°C and 800°C. This behavior is due to the formation of Au₇Si(622) silicide clusters.

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