ABSTRACT

The change of effective minority carrier lifetime with UV irradiation of deliberately contaminated and thermally oxidized silicon wafers have been investigated with the laser-microwave photo-conductive decay (LM-PCD) technique. In the contaminated wafers, it has been found that the effective lifetime increases after a specific accumulative UV irradiation time called " threshold time ". With UV irradiation, a rapid lifetime enhancement have been observed for the wafers oxidized at 700 °C and 900 °C while for wafers oxidized at 1000 °C, the lifetime decreases. A model is proposed which employs a combination of surface defect interconversion and band-bending during the UV irradiation to explain the observed phenomena.