

Abstract

In this work, we propose a simple and fast method to estimate the radiation-induced traps in P and N-MOS transistors independently. This method is based on standard current-voltage and Charge Pumping (I(V)-CP) to separate the radiation-induced border-traps (N_{bt}) and true interface-traps (N_{it}), where the radiation-induced oxide-traps (N_{ot}) are extracted classically by measuring the threshold voltage (V_{th}) or Mid-Gap (V_{mg}) voltage shift. The charge pumping (CP) curves are measured using the rise and fall saw-tooth signal for N- and P-MOS transistors respectively, to minimize the border-trap estimation error caused by the difference in the energy band gap scanned by standard I(V) and CP techniques. Emphasis is made on critical comparison between the radiation induced N_{bt} extracted using I(V)-CP and classical method such as OTCP and DTBT. According to experimental data, the I(V)-CP method is more accurate than OTCP and DTBT methods, since it is more sensitive than OTCP method for the extraction of border traps and it can give all kinds of traps for P and N-MOS transistors separately.