In this paper, we have presented a new methodology to take out the local oxidation of silicon (LOCOS) and lightly doped drain (LDD) subdiffusion effects from charge -pumping (CP) curves, leaving only the CP current of the effective channel, in narrow - and short-channel MOSFET transistors. First, we have clarified the contribution of LDD-subdiffusion and LOCOS regions to the CP characteristics by studying the spatial distributions of CP threshold and flatband voltages. We have shown that the maximum CP current is the contribution of pumped current in the effective-channel, LOCOS, and LDD-subdiffusion regions. Second, we have successfully used the oxide-trap CP (OTCP) to extract the radiation-induced oxide trap (??N ot) and interface trap (??N it) in effective short- and narrow-channel transistors. Finally, we have performed a comparison between the OTCP and the capacitance -versus-voltage method