In this paper, a thorough investigation of the application possibilities of the oxide-trap charge-pumping (OTCP) extraction method to evaluate the radiation-induced traps in short lightly doped drain (LDD) transistors is conducted. We have successfully demonstrated that the OTCP is able to determine all kind of traps induced by radiation in short LDD transistors. First, we have presented a methodical approach to take out the LDD effect from CP curves, leaving only the effective channel-length CP. Second, we have extracted the radiation-induced interface, oxide, and border traps for LDD-NMOSFET and LDD-PMOSFET with varied gate length and fixed gate width. Finally, we have performed a comparison between OTCP and subthreshold slop (STS), midgap (MG), dual-transistor CP (DTCP), and DT border trap (DTBT). OTCP method shows perfect agreement with all methods regarding oxide-trap (??N ot) extraction versus gate length. However, it does not correlate with STS and MG for interface trap (??N it) , because the latter methods overestimate ??N it by sensing border trap (??Nbt) as an interface trap. We have observed the same behaviors in the narrow LDD transistors. The OTCP method estimates ??N ot for N- and P-MOSFET separately, while DTCP and DTBT give average density for whole N- and P-MOS devices. Unlike DTCP and DTBT, OTCP can be applied on a single transistor using a single-measurement technique