A Multi-Phase Charge-Recycling Technique for Low-Power TFT LCD Column Driver

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ABSTRACT

To reduce the power consumption of the TFT-LCD column driver, a novel multi-phase charge-recycling technique that doesn't require any external capacitor for charge conservation is proposed. Based on this method, the voltage swing is reduced to \((1/2n + 1/4)V_{SWING}\), where \(n\) is the number of data lines in one group. If \(n\) is larger, voltage swing will become smaller in order to achieve lower power consumption goal. Comparing with original circuit (without any charge-recycling) and charge sharing one, the proposed method can reduce the power consumption about 65.7% ~ 13.3% respectively for \(n=8\).

Keywords: Charge-Recycling; Low-Power; LCD Driver; Column Driver

