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Abstract
Based on the market analysis, the TFT-LCD (Thin Film Transistor Liquid Crystal Display) has been applied in many consumer products. The market requirement result in many factories invests in producing the TFT-LCD. Because the driver IC is the most important component in the TFT-LCD, to develop a high performance driver IC has become a research topic. In this thesis, a digital source driver applicable to the color TFT-LCD (Thin Film Transistor Liquid Crystal Display) panel is presented. This mixed-signal circuit consists of three parts: the data controller, the non-linear DAC and the output buffer. In order to adjust the non-linear brightness characteristics of the TFT-LCD panels, a new non-linear DAC to facilitate the -correction is proposed. The non-linear DAC contains only (2p+2q) resistances and switches can up to p+q levels. For the output buffer, a high performance rail-to-rail output driver is designed for the high capacitive loads. This driver is implemented by the TSMC 1P4M 0.35um technology. The results of post layout simulation show that this circuit can be operated at the speed of 70MHz with 3.3V power supply. Thus it is applicable to the TFT-LCD panels with the VGA, SVGA, and XVGA standards.
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