

Implementation of 4-Bit Direct Charge Transfer Switched Capacitor DAC with Mismatch Shaping Technique

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Abstract : Direct Charge Transfer Switched Capacitor (DCT-SC) DAC is the internal DAC used in Delta-Sigma ($\Delta\Sigma$) DAC which works on Over-Sampling concept. The Switched Capacitor DAC mainly suffers from mismatch among capacitors. Mismatch among capacitors in DAC, causes non linearity between output and input. Dynamic Element Matching (DEM) technique is used to match the capacitors. According to element selection logic there are many types. In this paper, Data Weighted Averaging (DWA) technique is used for mismatch shaping. In this paper, the 4 bit DCT-SC-DAC with DWA-DEM technique is implemented using WINSPICE simulation software in 180nm CMOS technology. DNL for DAC with DWA is ± 0.03 LSB and INL is ± 0.02 LSB.

Keywords : Σ - Δ DAC, DCT-SC-DAC, mismatch shaping, DWA, DEM

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