Leakage Current Minimisation and Power Reduction Techniques using Sub-threshold Design

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Abstract

Low power IC solutions are in great demand with the rapid advancement of handheld devices, wearables, smart cards and radio frequency identification bringing a massive amount of new products to market that all have the same primary need: Powering the device as long as possible between the need to recharge the batteries while at the same time dramatically decreasing the device leakage currents. The use of sub-threshold techniques can be a powerful way to create circuits that consume dramatically less energy than those built using standard design practices. In this research, a SOI device was built to compare their electrical characteristics using Silvaco software. The comparisons were focused on three main electrical characteristics that are threshold voltage, sub-threshold voltage and leakage current. It was found that SOI devices are ideal candidates for low power operation.