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Reliable Low Voltage Circuit Design Techniques

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***Abstract*— In this paper, non-conventional circuit design techniques has been reviewed. The techniques discussed are widely used for realizing low voltage low power analog circuits. The discussed techniques in this paper are: Bulk Driven, Floating and Quasi-floating Gate followed by operating of Bulk Driven MOSFET in Floating and Quasi-floating Gate mode. In all the approach, the threshold voltage restriction is removed or reduced from the input signal path thereby reducing the power consumption. However, the adverse effect lies is terms of reduced performance parameters of MOSFET compared to conventional gate driven MOSFET parameters as shown in this paper through simulation results. The comparative analysis of MOSFET parameters results in encouragement of two approaches: Quasi-floating Gate and Bulk Driven Quasi-floating Gate MOSFET. Each of these approaches has its advantage in specific domains. Further in this paper, an Operational Transconductance Amplifier is proposed which use the Bulk Driven Quasi-floating Gate MOSFET technique and the same is amplifier under similar conditions is also realized using Bulk Driven MOSFET so as to highlight the advantage of Bulk Driven Quasi-floating Gate MOSFET over Bulk Driven MOSFET. All the performances metrics are achieved with the help of HSpice simulator using MOSFET models of 180nm technology provided by UMC.**

***Index Terms*— Bulk Driven, Floating gate, Quasi-floating gate, transconductance, low power.**

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