# Analytical Probabilistic Model of Manufacturing Process Induced Variation in Weak Inversion MOSFET

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*Abstract*— **In this research, the analytical probabilistic model of the drain current of the weak inversion MOSFET affected by the variation in manufacturing process has been derived. The proposed model is highly generic as it is applicable not only to the leakage current but to with arbitrary gate to source voltage. Moreover, it has been verified at nanometer level i.e. 65 nm level by using the BSIM4 based reference obtained from Monte-Carlo simulations along with the Kolmogorov-Smirnoff test and has been found to be very accurate. Hence, this research gives a knowledge extension to the semiconductor based integrated/microelectronic circuit technology area which is necessary for the analysis and design of analog/mixed signal circuits and system for signal processing.**