

# The Probabilistic Modeling of Random Variation in FGMOSFET

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*Abstract*— The probabilistic modeling of the random variation in drain current of the Floating-Gate MOSFET (FGMOSFET) has been performed in this research. Major physical level causes of random variations such as random dopant fluctuation and line edge roughness have been taken into account. The result has been found to be very efficient since it can accurately fit the probabilistic distributions of normalized random drain current variations of the candidate FGMOSFETs obtained by using the Monte-Carlo SPICE simulation based on BSIM3v3 at 0.25 $\mu$ m level with very high level of confidence. By using such result, many beneficial parameters can be formulated and the probabilistic modeling of the variation in FGMOSFET based circuit is possible. So, the result obtained from this modeling has been found to be beneficial the statistical/variability aware analysis/designing of any FGMOSFET circuit and system.