

# Abstracts

## RF circuit performance degradation due to soft breakdown and hot carrier effect in 0.18 $\mu\text{m}$ CMOS technology

Qiang Li, Jinlong Zhang, Wei Li, J.S. Yuan, Yuan Chen and A.S. Oates. "RF circuit performance degradation due to soft breakdown and hot carrier effect in 0.18  $\mu\text{m}$  CMOS technology." *2001 Radio Frequency Integrated Circuits (RFIC) Symposium 01. (2001 [RFIC]): 139-142.*

A systematic study of RF circuit performance degradation subject to soft oxide breakdown (SBD) and hot carrier (HC) stress is demonstrated. Device parameters before and after stress are extracted from the experimental data of 0.18  $\mu\text{m}$  CMOS technology. The effects of SBD and HC degradations on  $f_{\text{sub T}}$ ,  $f_{\text{sub max}}$ , third-order interception point and the four noise parameters ( $F_{\text{min}}$ ,  $R_{\text{n}}$ ,  $G_{\text{opt}}$  and  $B_{\text{opt}}$ ) of an RF device have been studied. Since the figures of merit for the RF circuit characterization are gain, noise figure, linearity and input matching, the RF low noise amplifier (LNA) performance drift is evaluated for these features. The predicted degradation trend from our experimental and simulation results can help design reliable CMOS RFICs.

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