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Bias Temperature Instability for Devices and Circuits. Editors: Grasser, Tibor (Ed.) Free Preview. Enables readers to understand and model negative bias temperature instability, with an emphasis on dynamics; Includes coverage of DC vs. AC stress, duty factor dependence and bias dependence ... On-Chip Silicon Odometers for Circuit Aging ...

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Introduction. This book provides a single-source reference to one of the more challenging reliability issues plaguing modern semiconductor technologies, negative bias temperature instability. Readers will benefit from state-of-the art coverage of research in topics such as time dependent defect spectroscopy, anomalous defect behavior, stochastic modeling with additional metastable states, multiphonon theory, compact modeling with RC ladders and implications on device reliability and lifetime.

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Bias temperature instability (BTI) is one of the most critical device degradation mechanisms in conventional poly-Si/SiON and MG/HK CMOS technologies and is characterized with a variety of...

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Bias temperature instability in digital CMOS circuits 4.1. BTI induced RO circuit degradation. More frequently, RO circuits are used to study BTI and HCI in CMOS circuits by... 4.2. Decoupling BTI and HCI component in RO circuit degradation. The key to distinguish between HCI and BTI degradation... ..

*Bias temperature instability in scaled CMOS technologies ...*

1. Introduction. Negative Bias Temperature Instability (NBTI) is a key reliability issue in MOSFETs. It is of immediate concern in p-channel MOS devices, since they almost always operate with negative gate-to-source voltage; however, the very same mechanism affects also n-MOS transistors when biased in the accumulation regime, i.e. with a negative bias applied to the gate too.

*NEGATIVE BIAS TEMPERATURE INSTABILITY*

Negative-bias temperature instability (NBTI) is a key reliability issue in MOSFETs, a type of transistor aging. NBTI manifests as an increase in the threshold voltage and consequent decrease in drain current and transconductance of a MOSFET. The degradation is often approximated by a power-law dependence on time.

*Negative-bias temperature instability - Wikipedia*

Negative bias temperature instability occurs mainly in p-channel MOS devices. Either negative gate voltages or elevated temperatures can

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produce NBTI, but a stronger and faster effect is produced by their combined action. Oxide electric fields typically below 6 MV/cm Stress temperatures: 100 - 250°C Drain current, transconductance, and "off" current decrease Absolute threshold voltage increase.

## *Negative Bias Temperature Instability (NBTI)*

3.3 Negative Bias Temperature Instability. NBTI happens to PMOS devices under negative gate voltages at elevated temperatures. The degradation of device performance, mainly manifested as the absolute threshold voltage  $V_{th}$  increase and mobility, transconductance and drain current  $I_{dsat}$  decrease, is a big reliability concern for today's ultrathin gate oxide devices [42].

## *Negative-Bias Temperature Instability - an overview ...*

The main part of this work concentrates on negative bias temperature instability (NBTI). NBTI causes degradation of MOS structures at elevated temperatures and negative gate voltages. An elaborate investigation of literature from the first report to the recent understanding of this degradation mechanism is presented.

## *Modeling and Simulation of Negative Bias Temperature ...*

Bias Temperature Instability for Devices and Circuits. This book provides a single-source reference to one of the more challenging reliability issues plaguing modern semiconductor technologies, negative bias temperature instability. Readers will benefit from state-of-the-art coverage of research in topics such as time dependent defect spectroscopy, anomalous defect behavior, stochastic modeling with additional metastable states, multiphonon theory, compact modeling with RC ladders and ...

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## *Bias Temperature Instability for Devices and Circuits ...*

- A bandgap reference generator is a temperature-independent bias generating circuit.
- The bandgap reference generator balances the  $V_{BE}$  dependence on temperature, to result in a voltage or current nearly independent of temperature. The most basic current mirror topologies are: In this mirror, the bandgap reference generator produces current  $I$

## *Bias Circuits for RF Amplifiers*

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