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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Semiconductor devices - Hot carrier test on metal-oxide
semiconductor (MOS) transistors**

半导体器件 金属氧化物半导体（MOS）晶体管的热载流子试验

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is equivalent to IEC 62416:2010 "Hot carrier test for MOS transistors in semiconductor devices".

This document adds two chapters. "Normative References" and "Terms and Definitions". The following minimal editorial changes were made to this document.

--- In order to coordinate with the existing standards, the name of the standard is changed to "Thermal Carrier Experiment.

1 Scope

This document describes a hot carrier test method for NMOS and PMOS transistors at the wafer level. The purpose of this test is to determine the Whether the individual transistors in the process meet the required lifetime of hot carrier injection effects.

2 Normative references

This document has no normative references.

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Symbols and abbreviations

The following symbols and abbreviations apply to this document.

(C)MOS. Complementary MOS. $g_m(\mu A/V)$. transconductance of MOS transistor.
 $g_{m,max}(\mu A/V)$. Maximum transconductance of MOS transistor. $g_{m,max}(MOST)$.
 $g_{m,max}(L=W)$ of square MOS transistor. $I_b(\mu A)$. substrate current of MOS transistor.
 $I_{ds}(\mu A)$. drain-source current of MOS transistor.

$I_{ds,sat}(\mu A)$. saturated drain-source current when $V_{gs} = V_{ds} = V_{ds,use_max}$; measured without changing the source and drain during stress.

$I_{ds,sat_forward}$ is measured, and $I_{ds,sat_reverse}$ is measured under the condition of changing the positions of the source and drain. $I_g(nA)$. Gate current of MOS transistor.
 $L(\mu m)$. The length of the gate of a MOS transistor. $L(MOST)$. The length of a square MOS transistor ($L=W$).

$L_{eff}(\mu m)$. The effective electrical channel length of a MOS transistor. For a given channel length L , L_{eff} is determined by the large square MOS transistor. $g_{m,max}$ is determined ($W=L$ much greater than $L_{nominal}$). $L_{nominal}(\mu m)$. The minimum length allowed by process design rules. MOS. Metal Oxide Semiconductor. NMOS. n-channel MOS transistor. PMOS. p-channel MOS transistor. $\tau(s)$. Lifetime of MOS transistor. $V_{bs}(V)$. Body-source voltage of MOS transistor. $V_{ds}(V)$. drain-source voltage of MOS transistor. $V_{gs}(V)$. Gate-source voltage of MOS transistor.