



Jerzy Ruzylo

SEMICONDUCTOR GLOSSARY

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An Introduction to Semiconductor Terminology

Jerzy Ruzyllo

**Penn State University
University Park, Pennsylvania**

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access time time needed for the bit of information to go to and return from the memory cell.

memory cell

accumulation condition of semiconductor surface in MOS devices in which concentration of majority carriers is higher than concentration of dopant atoms.

depletion, inversion

activation energy defines reaction kinetics of the process; amount of energy required to initiate the reaction; expressed in units of eV.

active Si layer Si layer on top of the buried oxide (BOX) in SOI substrates; “active” because transistors are built into it; as opposed to Si substrate (Si underneath BOX) which is there to provide mechanical support only.

BOX, fully depleted SOI, SOI.

ADC Analog to Digital Converter.

adhesion ability of materials to stick (adhere) to each other.

adhesion promoter

adhesion promoter material used to improve adhesion of materials; typically understood as a material improving adhesion of photoresist to the wafer surface in the lithographic processes.

HMDS

adsorption binding between foreign molecules and the solid occurring only on the solid surface; specie is attached to the solid surface by weak physical forces (van der Waals force).

Desorption, van der Waals force

AFM see *Atomic Force Microscopy*.

afterglow plasma see *remote plasma*.

Boltzmann constant, k 1.38×10^{-23} J/K

Boltzmann transport equation fundamental relationship describing transport of free carriers in semiconductors.

bonded SOI SOI substrates formed by bonding two silicon wafers with oxidized surfaces; following bonding one wafer is polished down to the desired thickness of active layer with interface oxide becoming a buried oxide, alternative approach: cleaved SOI.
cleaved SOI, SIMOX

boron element from the IIIrd group of periodic table acting as an acceptor (p-type dopant) in silicon; the only p-type dopant broadly used in silicon device manufacturing.
acceptor

boron penetration term usually refers to penetration of the gate oxide by boron from heavily p-doped poly-Si gate contact in PMOS part of the CMOS cell; at elevated temperature boron from the contact readily segregates into the adjacent oxide causing reliability problems.
ONO, segregation coefficient

bottom anti-reflective coating a layer deposited on the back surface of the wafer to prevent reflection from the bottom surface of radiation passing through the wafer; in advanced photo-lithography used to enhance control of critical dimensions (CD) by suppressing standing waves effects and reflective notching.
anti-reflective coating

bottom-up processing way of building functional structures on semiconductor substrates which relies on self-assembly of molecules and self-patterning taking place at the surface of the substrate.
top-down processing

boundary layer a layer in contact with solid surfaces immersed in gaseous or liquid medium; within boundary layer characteristics of the medium are different than in its bulk.

BOX see *buried oxide*.

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