STRAINED SILICON

ABSTRACT**:** As we already know, Siliconisanatural*,* semi*-*metal element, extremelyversatile material with applications ranging from semiconductors and electronic devicestoglass fabricationprocesses.Here wepresent to you a breed of it, called the strained silicon. It is a layer in which the Si atoms are stretched beyond their normal inter-atomic distances. This is achieved by spreading a silicon layer over Silicon Germanium layer which results in the alignment of the Si atoms according to the Si-Ge crystal with wider spaces in between them. With this stretched silicon layer the movement of electrons comparatively becomes faster and easier when used in transistors. Thus, better mobility, results in better chip performance and lower energy consumption. The use of the strained silicon should boost performance in future generations of CMOS silicon transistors without the need to radically scale transistor dimensions**.** It has better mobility, resulting in better chip performance and lower energy consumption. The electrons due to more inter-atomic spaces can move 70% faster allowing strained silicon transistors to switch 35% faster. Thus this speed up in the electron flow finds its use in the chips. It can be applied at a basic level and is not difficult to use.

Applications:

### Fabrication technique of ultrathin and relaxed SiGe buffer layers with high Ge fraction for sub-100 nm strained silicon-on-insulator MOSFETs.

### Performance enhanced transistors for future generation transistors.

### Use of strained silicon for insulator wafers with the Smart Cut TM technology.

### Advancement of 45nm logic technology with high-k+ metal gate transistors.