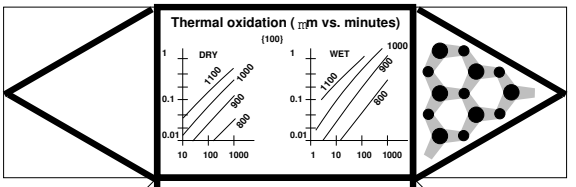
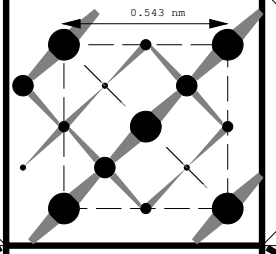
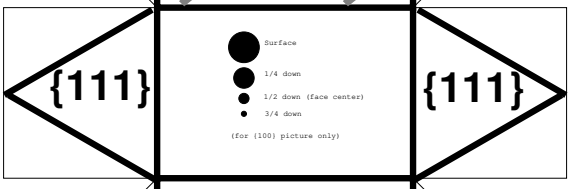


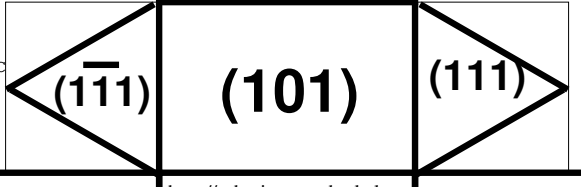


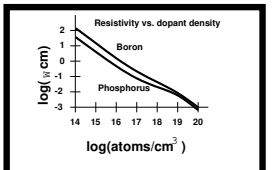


(001)

Etch rate in KOH

44 gm in 100ml H O@ 85 C
{100} 1.4
{111} 0.003
SiO_2 0.0014
Si_3N_4 not etched
μm/min





Etching Si+Boron
Presence of boron reduces etch rate in KOH and EDP.
No dependence below 10^{19} /cm³. At 10^{20} /cm³ reduced by 100 (EDP) reduced by 10-100 (KOH).

(0̄10)

(01̄1)

http://robotics.eecs.berkeley.edu/~pister/crystal.ps

(100)

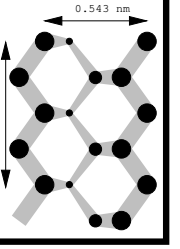
pister@eecs.berkeley.edu
(pister@ee.ucla.edu, 1/26/93)

(011)

[100]

(010)

[100]



Etch rate in EDP

750 ml Ethylene Diamine
120 gm Pyrocatechol
100 ml water @ 115 C
{100} 0.75
{111} 0.021
SiO_2 0.0002
Si_3N_4 0.0001
μm/min

110

<100>

(abc) specific plane
{abc} equivalent plane
[abc] specific direction
<abc> equivalent directions

Single crystal silicon

$_{14}Si^{28.1}$

density: 2.33 gm/cm³
melting point: 1415 C
band gap: 1.12 eV
electron mobility: 1350 cm²/Vs
hole mobility: 480 cm²/Vs
resistivity: 2.5 x 10³ Ω-cm (intr.)
relative permitivity: 11.8
Young's modulus: 1.9x10¹¹ Pa
thermal conductivity: 1.57 W/cm C
yield strength: 7.0x10⁹ Pa

The idea for the shape came from a similar paper model that I saw once. I don't know who made that one. Perhaps Monsanto?
Most of the data comes from "Silicon as a mechanical Material", by Peterson (Proc.IEEE, v70n5, 1982, pp.420-457).
Other data from "VLSI Technology", edited by Sze (McGraw-Hill) and "Solid State Electronic Devices", by Streetman (Prentice-Hall).

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