

**Thermal oxidation ( $\mu\text{m}$  vs. minutes)**

0.543 nm

**{111}**

(for (100) picture only)

These are tabs to aid assembly.

**(001)**

**Etch rate in KOH**

44 gm in 100ml  $\text{H}_2\text{O}$  @ 85 C

{100} 1.4  $\mu/\text{min}$

{111} 0.0035

$\text{SiO}_2$  0.0014

$\text{Si}_3\text{N}_4$  not etched

**(111)**

**(101)**

**(111)**

**Resistivity vs. dopant density**

**Etching Si+Boron**

Presence of boron reduces etch rate in KOH and EDP. No dependence below  $10^{19}/\text{cm}^3$ . At  $10^{20}/\text{cm}^3$  reduced by 100 (EDP) reduced by 10-100 (KOH).

**(111)**

Available via anonymous ftp from synergy.icsl.ucla.edu in pub/crystal.i - ksjs

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**(110)**

**(010)**

**Etch rate in EDP**

750 ml Ethylene Diamine

120 gm Pyrocatechol

100 ml water @115C

{100} 0.75  $\mu/\text{min}$

{111} 0.021

$\text{SiO}_2$  0.0002

$\text{Si}_3\text{N}_4$  0.0001

**(110)**

**110**

**(110)**

**(010)**

[100]

[100]

<100>

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

**Single crystal silicon**

${}_{14}\text{Si}^{28.1}$

density: 2.33 gm/cm<sup>3</sup>  
melting point: 1415 °C  
band gap: 1.12 eV  
electron mobility: 1350 cm<sup>2</sup>/Vs  
hole mobility: 480 cm<sup>2</sup>/Vs  
resistivity: 2.5 x 10<sup>5</sup> Ω-cm (intr.)  
relative permittivity: 11.8  
Young's modulus: 1.9x10<sup>11</sup> Pa  
thermal conductivity: 1.57 W/cm °C  
yield strength: 7.0x10<sup>9</sup> Pa

Most of the data comes from "Silicon as a mechanical Material", by Peterson (Proc.IEEE, vol. 70, no. 5, 1982, pp. 420-457). Other data from "VLSI Technology", edited by Sze (McGraw-Hill) and "Solid State Electronic Devices", by Streetman (Prentice-Hall).