

Technical Data Sheet (TDS) – Silicon Wafers

1. Product Overview

Silicon wafers used in semiconductor, MEMS, photonics, and microfabrication applications. Technical specifications ensure product suitability for high-precision research and manufacturing environments.

2. Material Properties

Crystal Type: Monocrystalline Silicon
Growth Method: CZ or FZ
Lattice Orientation: $\langle 100 \rangle$ / $\langle 111 \rangle$ / $\langle 110 \rangle$
Conductivity Type: P-type, N-type, or Intrinsic
Dopants: Boron, Phosphorus, Arsenic

3. Mechanical Specifications

Diameter Options: 100mm / 150mm / 200mm / 300mm
Thickness: Custom depending on diameter
TTV, Bow, and Warp depend on grade and polishing

4. Electrical Specifications

Resistivity Range: From $<0.001 \text{ } \Omega\cdot\text{cm}$ to $>10,000 \text{ } \Omega\cdot\text{cm}$
Carrier Concentration: Dependent on dopant
Mobility & Lifetime: Varies by material grade

5. Surface Characteristics

Surface Finish: SSP, DSP, Oxide, Nitride, Etched
Roughness: RMS values depend on polish level
Particles: Controlled per SEMI/MEMS requirements

6. Thermal & Optical Properties

Thermal Conductivity: $\sim 150 \text{ W/mK}$ (varies slightly with dopant)
CTE: $\sim 2.6 \times 10^{-6} / \text{K}$
Bandgap: $\sim 1.12 \text{ eV}$ at 300K

7. Standards & Compliance

SEMI M1, M2, M56 Compliance
ASTM F723, F728
RoHS / REACH Compliant

ECCN: EAR99

8. Packaging

Wafers packed in cleanroom-compatible cassettes with anti-static liners, labeled for full traceability.

9. Notes

Custom specifications available upon request.

Parameter	Typical Value	Units
Thermal Conductivity	150	W/mK
Bandgap (300K)	1.12	eV
CTE	2.6e-6	/K
Density	2.33	g/cm ³
Dielectric Constant	11.7	—