

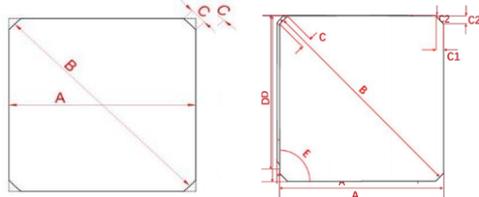
P型M11L单晶硅片产品规格书

P-Type Monocrystalline Wafer Specification



项目 (Property)	标准 (Specification)	检测方法 (Inspection Method)
材料特性 Material Properties		
生长方式 Growth Method	直拉法 CZ	
掺杂剂 Dopant	镓 Gallium	硅材料测试仪 (Silicon material tester (ASTM F43))
表面晶像 Surface Orientation	$< 100 > \pm 3^\circ$	X射线衍射仪 (X-ray Diffraction Method (ASTM F26-1987))
位错密度 Etch pit Density/ Dislocation Density	$\leq 500\text{pcs}/\text{cm}^2$	择优化学腐蚀法 (Preferential Etch Techniques (ASTM F47-88))
切割方式 Cutting Method	电镀金刚线切割 DW	
电学特性 Electrical Properties		
电阻率 Resistivity	$0.40 \sim 1.10 \Omega \cdot \text{cm}$	硅材料测试仪 SSRPT (Silicon material tester (ASTM F43))
少子寿命 Minority Carrier Lifetime	$\geq 70 \mu\text{s}$	微波光电导衰减法 BCT-400 Semilab μ -PCD (ASTM F28-90)
间隙氧含量 Oxygen Concentration [Oi]	$\leq 7.5 \times 10^{17} \text{atoms}/\text{cm}^3$ (Top)	傅里叶变换红外光谱仪 (FTIR (ASTM F121-83))
替位碳含量 Carbon Concentration [Cs]	$\leq 5.0 \times 10^{16} \text{atoms}/\text{cm}^3$ (Bottom)	傅里叶变换红外光谱仪 (FTIR (ASTM F121-83))
几何尺寸 Geometry		
直线条的垂直度 Angle Between Adjacent Sides	$90^\circ \pm 0.15^\circ$	硅片自动检测设备 (Wafer Inspection System)
厚度 Thickness	$120 \sim 150 \mu\text{m}$ 硅片平均厚度 (Average Thickness): $+20 \mu\text{m} / -10 \mu\text{m}$	硅片自动检测设备 (Wafer Inspection System)
总厚度变化 TTV (Total Thickness Variation)	$\leq 30 \mu\text{m}$	硅片自动检测设备 (Wafer Inspection System)
表面质量 Appearance		
隐裂/裂痕 Micro Cracks	无	硅片自动检测设备 (Wafer Inspection System)
缺口 Chip	不可有 Not Allowed	硅片自动检测设备 (Wafer Inspection System)
穿孔 Holes	不可有 Not Allowed	硅片自动检测设备 (Wafer Inspection System)
线痕 Saw Marks	$\leq 10 \mu\text{m}$	硅片自动检测设备 (Wafer Inspection System)
翘曲度 Warp	$\leq 50 \mu\text{m}$	硅片自动检测设备 (Wafer Inspection System)
黑芯/黑角	无	硅片自动检测设备 (Wafer Inspection System)

硅片尺寸示意图
Wafer Size Pattern



边距 (Wafer Side Length) A: $182.2 \pm 0.15\text{mm}$
 边距 (Wafer Side Length) D: $191.6 \pm 0.15\text{mm}$
 对角线 (Wafer Side Length) B: $256 \pm 0.25\text{mm}$
 弧长投影 (Arc Length Projection) C: $1.91 \pm 0.7\text{mm}$