

# 4" (100mm) SiC Epitaxial Wafer

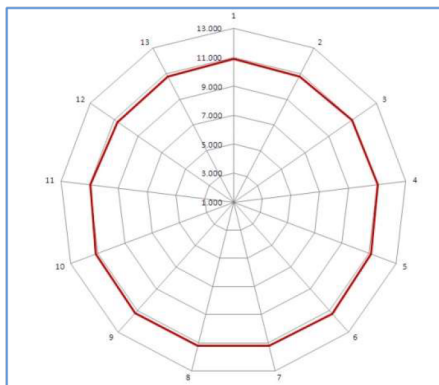


## 4" (100 mm) SiC Epitaxial Wafer Version 100/03/2020

Items	N-type Specification	Typical	P-type Specification	Typical
Diameter	4" (100 mm)	—	4" (100 mm)	—
Poly-type	4H	—	4H	—
Surface	(0001) Silicon-face	—	(0001) Silicon-face	—
Off-orientation toward $\langle 11\bar{2}0 \rangle$	4 deg-off	—	4 deg-off	—
Conductivity	n-type	—	p-type	—
Dopant	Nitrogen	—	Aluminum	—
Carrier Concentration	$2E15-3E16 \text{ cm}^{-3}$	—	$2E15-3E16 \text{ cm}^{-3}$	—
Tolerance	$\pm 15\%$		$\pm 50\%$	
Uniformity	$< 8\%$	$< 5\%$	$< 20\%$	
Thickness Range	0.5-30 $\mu\text{m}$	—	0.5-30 $\mu\text{m}$	—
Tolerance	$\pm 10\%$	$\pm 5\%$	$\pm 10\%$	$\pm 5\%$
Uniformity	$< 4\%$	$< 2\%$	$< 5\%$	$< 2\%$

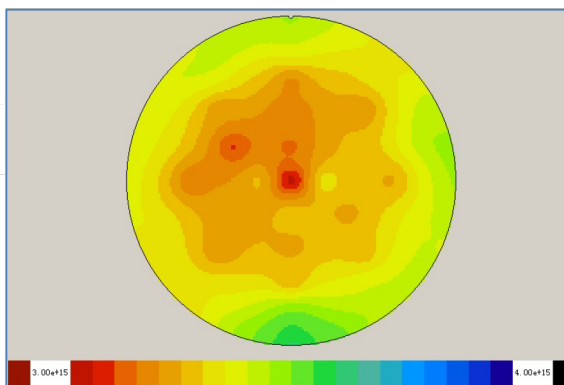
Notes:

- N-type epi layers  $< 30$  microns are preceded by n-type,  $1E18 \text{ cm}^{-3}$ , 0.5  $\mu\text{m}$  buffer layer
- N-type doping is determined as an average value across the wafer (17 points) using Hg probe CV
- Thickness is determined as an average value across the wafer (17 points) using FTIR
- Uniformity: standard deviation(  $\sigma$  )/average



**Thickness Map**

Thickness=11.73  $\mu\text{m}$   
Uni=1.18%



**Dopant Map**

Dopant:  $3.27E15 \text{ cm}^{-3}$   
Uni: 3.17%

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## Surface Defects & Roughness

Items	Definition	Specification	Typical
Surface Defect	The sum of discrete microscopic defects counted in specified area. These include but not limited to triangles, downfall, comets and carrots.	$<1.0 \text{ cm}^{-2}$	$<0.8 \text{ cm}^{-2}$
Surface Roughness	Roughness are scanned by AFM (atomic force microscope) on a $10 \mu\text{m} \times 10 \mu\text{m}$ area.	$\leq 1.0 \text{ nm}$	$\leq 0.5 \text{ nm}$
Scratches	Grooves or cuts below the surface plane of the wafer having a length-to-width ratio of greater than 5 to 1.	$<1 \times \text{wafer diameter}$	
Usable area	2 mm x 2 mm area in whole wafer without surface defects	$\geq 95\%$	$\geq 98\%$

Note:

- Defect limit applies to whole surface except for 3 mm edge exclusion area in 100 mm dia. wafer.
- Defect caused by substrate quality with additional CMP treatment not applicable for substrate provided by customer  
Example: scratches, surface defects, usable area step bunching, different polytype
- **For ultra high thickness above 30  $\mu\text{m}$  or any special epitaxy requests, please Contact our Sales, local representatives or via [enquiry@sicty.com](mailto:enquiry@sicty.com)**



**Roughness Map**

RMS=0.22 nm