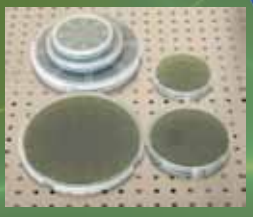
SiC Material Technology

EpiWorld
INTERNATIONAL

4H-SiC





Epitaxial Wafer



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Applications for 4H-SiC Epitaxial Wafers

All types of power devices such as Schottky diodes, MOSFETs, JFETs, BJTs, IGBTs, thyristors, GTOs etc over a wide voltage range for green energy systems such as solar inverters, wind farms, hybrid and electric vehicles and numerous other energy-efficient systems.

Standard Specifications for 4H-SiC Epitaxial Wafers

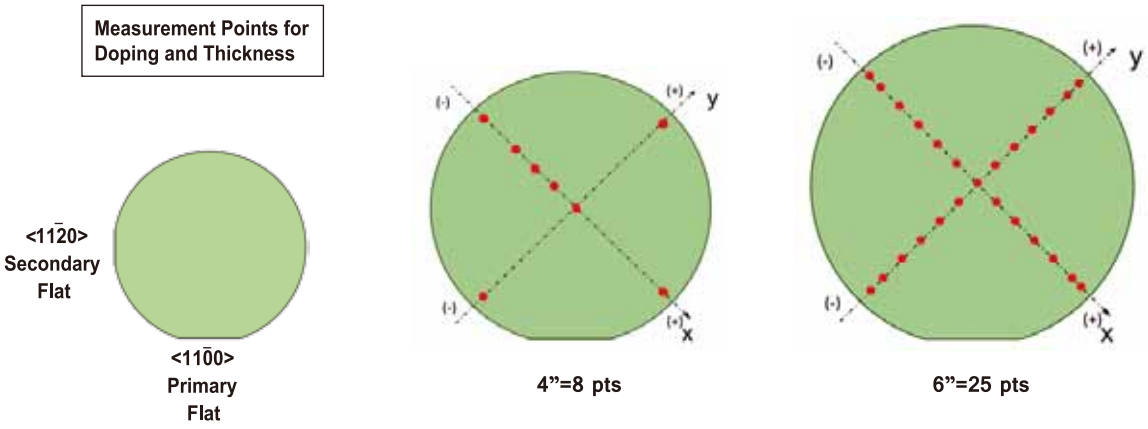
(76.2mm, 100.0mm and 150.0 mm)

Ver 4.0 (2018.8)

Doping		
	n-type	p-type
Dopant	Nitrogen	Aluminum
Net Doping Density	N_D-N_A	N_A-N_D
Silicon Face	9E14 ~ 1E19 cm^{-3}	9E14 ~ 1E19 cm^{-3}
Tolerance	± 15%	± 50%
Uniformity	≤ 10%	≤ 20%
Thickness: 0.2-100 μm		
Tolerance	± 10%	
Uniformity	≤ 5%	

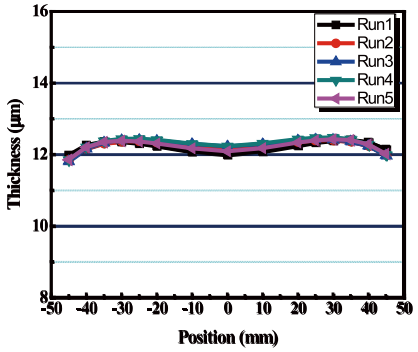
Notes

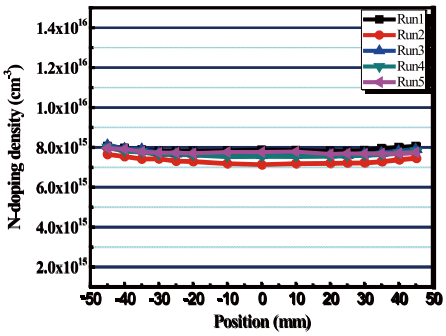
- N-type epi-layers are proceeded by an n-type, 1E18 cm^{-3}, 0.5 μm buffer layer.
- No buffer layer for p-type epitaxial layers.
- The doping and thickness are measeured with 5 mm edge exclusion for 76.2mm, 100.0 mm and 150.0 mm wafers.
  The measeured points for doping and thickness as the figure below.
- Contact Epiworld Sales for specifications on unique epitaxy.



Stability of production process

(Statistics based on multiple growth runs with the same process)





Mean value (μm)	12.26
Sigma/mean	0.24%
(max-min)/(max+min)	0.25%

Mean value (cm^{-3})	7.67E15
Sigma/mean	2.75%
(max-min)/(max+min)	3.68%

Standard Specifications for 4H-SiC Epitaxial Wafers (76.2mm, 100.0mm and 150.0 mm)

Ver 4.0 (2018.8)

Characteristics	Spec Limits	Definitions	Test Methods
Epi Defects*	2mm x 2mm die yield ≥ 95%	Defects only include Triangular defects, downfalls, carrots and comets	**Candela CS920**
Edge Chips	≤ 2 with radius 1.5mm	Areas where material has been unintentionally peeled off from the wafer	**High intensity illumination**
Scratches	≤10 lines total and the total length of these lines should be less than wafer diameter	Grooves or cuts below the surface plane of the wafer having a length-to-width ratio of greater than 5 to 1	
Surface Roughness	< 0.5 nm	**AFM on a 20μm x 20μm scan**	
Backside Cleanliness	100% clean	**None Contamination**	
Thickness	See specification table	Thickness is determined as an average value across the wafer by FTIR	FTIR
Net doping	See specification table	Net doping is determined as an average value across the wafer by MCV	MCV

Notes

* Defect limits apply to entire surface except for edge exclusion area.
-- (3mm for 76.2, 100.0 and 150.0 mm wafers)

INTRODUCTION

EpiWorld International Co., LTD is a privately held company registered in the city of Xiamen, China. We are a joint venture with investors from the United States, Japan and China, equipped with multiple most advanced epitaxial systems for 3”, 4”, and 6” SiC epitaxy, auto defect identification and mapping system in a class-100 cleanroom. Its mission is to be the leading SiC epitaxial service foundry in the global market, providing the highest quality epitaxial wafers with the most competitive price in the shortest delivery time. As a pure play SiC epitaxial service foundry, we provide standard 4H-SiC epitaxial wafers of 3”, 4” and 6” for Schottky diodes, BJTs, JFETs, and MOSFETs over a wide voltage range for green energy systems such as solar inverters, wind farms, PFCs, electric motors and other energy-efficient systems. We also provide customized wafers for IGBTs, GTO thyristors, for R&D development.

Epiworld International is equipped with the latest technologies for the evaluation of surface morphology, film thickness, doping density, TTV, bow, warp, and flatness. We pride ourselves in providing 100% guaranteed products to all customers, big and small. Each and every shipped wafer is under systematic quality inspection thoroughly.