4 Inch High Purity Semi-insulating SiC Substrate

SUBSTRATE PROPERTY	Production Grade	Research Grade	Dummy Grade
Crystal Parameters			
Polytype	4H		
Orientation	(0001) 0°± 0.2°		
FWHM	≤45arcsec	≤60arcsec	≤100arcsec
Electrical Parameters			
Type	HPSI		
Resistivity	≥1E10ohm·cm	100% area＞1E5ohm·cm	70% area＞1E5ohm·cm
Mechanical Parameters			
Diameter	100.0 mm ＋ 0.0/- 0.5 mm		
Thickness	500.0 μm ± 25.0 μm		
Primary flat Orientation	[1-100] ± 5°		
Primary flat length	32.5 ± 1.5mm		
Secondary Flat Orientation	硅面，顺时针方向与主参考面成90±5°90° CW from primary flat ±5°, siliconface up		
Secondary Flat Length	18.0 mm ± 2.0 mm		
TTV/BOW/WARP	≤5 μm /'≤ 35 μm/'≤ 45 μm		
Surface Roughness	Polish Ra≤0.2 nm（5μm*5μm）		
Structure			
Micropipe Density	≤1ea/cm^2	≤5ea/cm^2	≤10ea/cm^2
Carbon Density	≤1ea/cm^2	NA	NA
Hexagonal void	None	NA	NA
Metal impurities	≤5E12atoms/cm^2	≤5E12atoms/cm^2	NA
Surface Quality			
Surface Finish	Si-face CMP		
Back Finish	C-face CMP		
Particles	≤60（尺寸size≥0.3μm）	NA	NA
Scratches	≤2,Total Length≤Diameter (front) ≤5,Total Length≤2*Diameter (back)	Total Length≤ 2*Diameter(Front)	NA
Laser Mark	Back side1mm (from top edge)		

4 Inch N-type SiC Substrate

SUBSTRATE PROPERTY	Production Grade	Dummy Grade
Crystal Parameters		
Polytype	4H	
Orientation	4°toward<11-20>±0.15º	
Electrical Parameters		
Dopant	n-type Nitrogen	
Resistivity	0.015~0.025ohm·cm	0.015~0.028ohm·cm
Mechanical Parameters		
Diameter	100.0 mm ＋ 0.0/- 0.5 mm	
Thickness	350.0 μm ± 25.0 μm	
Primary flat Orientation	[1-100] ± 5°	
Primary flat length	32.5 ± 1.5mm	
Secondary Flat Orientation	硅面，顺时针方向与主参考面成90±5°90° CW from primary flat ±5°, siliconface up	
Secondary Flat Length	18.0 mm ± 2.0 mm	
TTV/BOW/WARP	≤5 μm /'≤ 35 μm/'≤ 45 μm	
Surface Roughness	Polish Ra≤0.2 nm（5μm*5μm）	
Structure		
Micropipe Density	≤0.2ea/cm^2	≤10ea/cm^2
BPD	≤1500ea/cm^2	NA
TSD	≤300ea/cm^2	NA
Metal impurities	≤5E10atoms/cm^2	NA
Surface Quality		
Surface Finish	Si-face CMP	
Back Finish	C-face CMP	
Particles	≤60（尺寸size≥0.3μm）	NA
Scratches	≤2,Total Length≤Diameter (front) ≤5,Total Length≤2*Diameter (back)	NA
Laser Mark	Back side1mm (from top edge)	

6 Inch High Purity Semi-insulating SiC Substrate

SUBSTRATE PROPERTY	Production Grade	Research Grade	Dummy Grade
Crystal Parameters			
Polytype	4H		
Orientation	(0001) 0°± 0.25°		
FWHM	≤45arcsec	≤60arcsec	≤100arcsec
Electrical Parameters			
Type	HPSI		
Resistivity	≥1E8ohm·cm	100% area＞ 1E5ohm·cm	70% area＞1E5ohm·cm
Mechanical Parameters			
Diameter	150±0.2mm		
Thickness	500.0 μm ± 25.0 μm		
Notch Orientation	[1-100] ± 5°		
Notch Depth	1~1.25mm		
TTV/BOW/WARP	≤5 μm /'≤ 35 μm/'≤ 45 μm		
Surface Roughness	Polish Ra≤0.2 nm（5μm*5μm）		
Structure			
Micropipe Density	≤1ea/cm^2	≤5ea/cm^2	≤10ea/cm^2
Carbon Density	≤1ea/cm^2	NA	NA
Hexagonal void	None	NA	NA
Metal impurities	≤5E12atoms/cm^2	≤5E12atoms/cm^2	NA
Surface Quality			
Surface Finish	Si-face CMP		
Back Finish	C-face CMP		
Particles	≤60（尺寸size≥0.3μm）	NA	NA
Scratches	≤5,Total Length≤Diameter (front) ≤5,Total Length≤2*Diameter (back)	Total Length≤ 2*Diameter(Front)	NA
Laser Mark	Back side SEMI font，on the right of NOTCH		

6 Inch N-type SiC Substrate

SUBSTRATE PROPERTY	Production Grade	Dummy Grade
Crystal Parameters		
Polytype	4H	
Orientation	4°toward<11-20>±0.15º	
Electrical Parameters		
Dopant	n-type Nitrogen	
Resistivity	0.015~0.025ohm·cm	0.015~0.028ohm·cm
Mechanical Parameters		
Diameter	150.0 mm ±0.2mm	
Thickness	350.0 μm ± 25.0 μm	
Primary flat Orientation	[1-100] ± 5°	
Primary flat length	47.5 ± 1.5mm	
Secondary Flat Orientation	None	
TTV/BOW/WARP	≤5 μm /'≤ 35 μm/'≤ 45 μm	
Surface Roughness	Polish Ra≤0.2 nm（5μm*5μm）	
Structure		
Micropipe Density	≤0.2ea/cm^2	≤10ea/cm^2
BPD	≤1500ea/cm^2	NA
TSD	≤300ea/cm^2	NA
Metal impurities	≤5E10atoms/cm^2	NA
Surface Quality		
Surface Finish	Si-face CMP	
Back Finish	C-face CMP	
Particles	≤60（尺寸size≥0.3μm）	NA
Scratches	≤5,Total Length≤Diameter (front) ≤5,Total Length≤2*Diameter (back)	NA
Laser Mark	Back side1mm (from top edge)	

8 Inch High Purity Semi-insulating SiC Substrate

SUBSTRATE PROPERTY	Production Grade	Dummy Grade
Crystal Parameters		
Polytype	4H	
Orientation	<0001>0±0.25º	
FWHM	≤45arcsec	≤100arcsec
Electrical Parameters		
Dopant	≤100arcsec	
Resistivity	≥1E8ohm·cm	70% area＞1E5ohm·cm
Mechanical Parameters		
Diameter	200.0 mm ±0.2mm	
Thickness	500.0 μm ± 25.0 μm	
Notch Orientation	[1-100] ± 5°	
Notch Depth	1~1.5 mm	
TTV/BOW/WARP	≤10 μm /'≤ 35 μm/'≤ 45 μm	
Surface Roughness	Polish Ra≤0.2 nm（5μm*5μm）(front side) Polish Ra≤5 nm（5μm*5μm）(back side)	
Structure		
Micropipe Density	≤1ea/cm^2	≤10ea/cm^2
Carbon inclusions density	≤2ea/cm^2	NA
Metal impurities	≤5E12atoms/cm^2	NA
Surface Quality		
Surface Finish	Si-face CMP	
Back Finish	C-face CMP	
Particles	≤100（尺寸size≥0.3μm）	NA
Scratches	≤5,Total Length≤Diameter (front) ≤5,Total Length≤2*Diameter (back)	NA
Laser Mark	Semi standard on the top of Notch	