



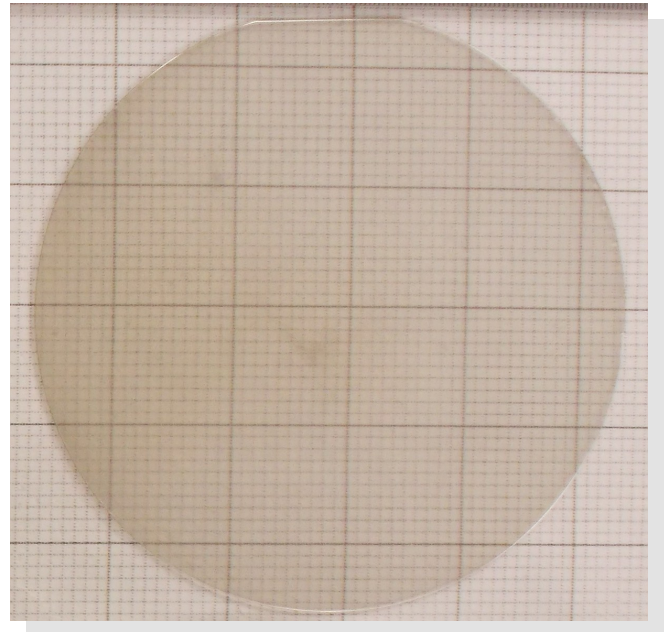
## GaN Substrates: 2" Bulk N-face GaN

Kyma's bulk GaN substrates improve device epitaxy by reducing dislocation density by 1000x and doubling thermal conductivity when compared to other non-native substrates. N-type substrates offer benefits for vertical devices as well as reduced contact resistance for all devices. Key advantages:

- Ultra-low on-resistance as well as decreased parasitic resistance for vertical power devices
- Low vertical resistance and the mitigation of current crowding effects for light emitting diodes (LEDs)

Orientation\*: c-axis (00.1)  $\pm 1^\circ$   
Conduction Type: N-type  
Resistivity:  $< 0.05 \text{ Ohm-cm}$   
Front Surface Finish (N-face): Epi-ready, RMS  $< 1\text{nm}$   
Back Surface Finish (Ga-face): Optical Finish  
Edge Exclusion: 3mm  
Dislocation Density:  $\leq 1 \times 10^7 / \text{cm}^2$  (by CL)

Size:  $50.8\text{mm} \pm 1\text{mm}$   
Available Thickness:  $250\mu\text{m} \pm 50\mu\text{m}$   
Carrier Concentration:  $> 5 \times 10^{17} / \text{cm}^3$



Grade:	Prime	Production	Research
Macro Defect Density ( $> 5000\mu\text{m}^2$ ):	$\leq 3 \text{ cm}^{-2}$	$\leq 5 \text{ cm}^{-2}$	$\leq 10 \text{ cm}^{-2}$