



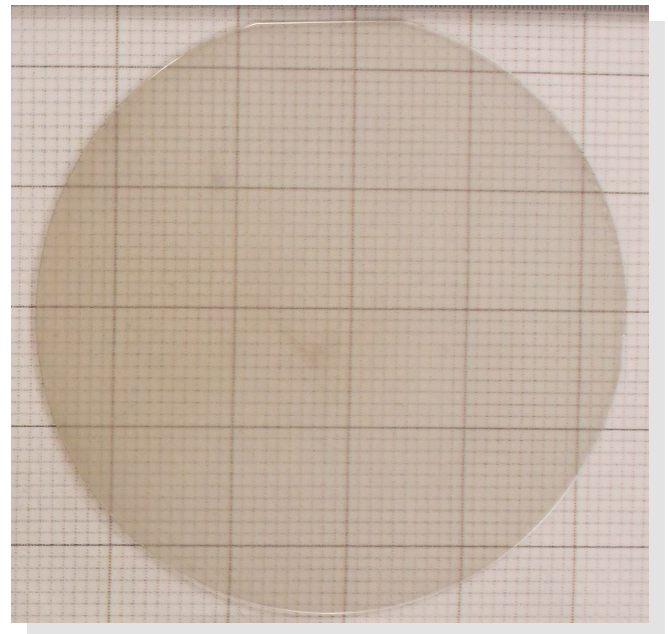
## GaN Substrates: 2” Bulk Ga-face GaN

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 Ohm-cm  
Front Surface Finish (Ga-face): Epi-ready, RMS <1nm  
Back Surface Finish (N-face): Optical Finish  
Edge Exclusion: 3mm  
Dislocation Density:  $\leq 1 \times 10^7 / \text{cm}^2$  (by CL)

Size: 50.8mm  $\pm 1$ 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 $\mu\text{m}^2$ ): | $\leq 3 \text{ cm}^{-2}$ | $\leq 5 \text{ cm}^{-2}$ | $\leq 10 \text{ cm}^{-2}$ |