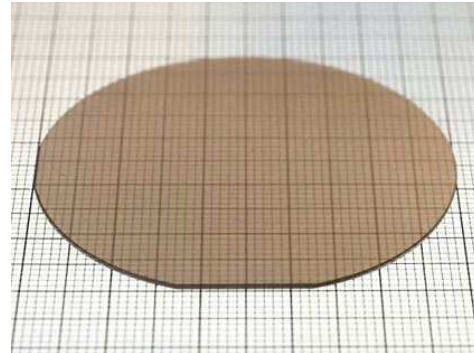


# Highest quality bulk n-type GaN substrates suitable for HB LEDs, LDs

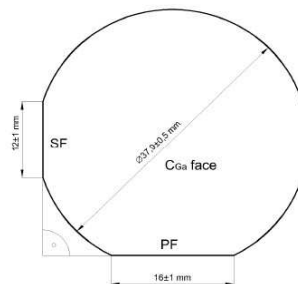


bulk GaN substrate, 2", 500um thick

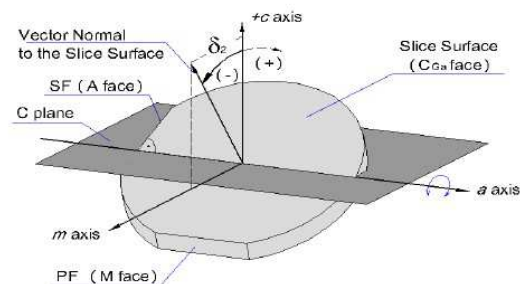
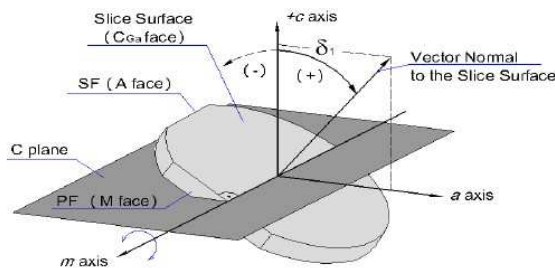
## C-plane freestanding GaN n-type (0001)

- Thickness 350 $\mu\text{m} \pm 75\mu\text{m}$  (1-inch)
- Thickness 500 $\mu\text{m} \pm 50\mu\text{m}$  (1.8-inch; 2-inch)
- Electron concentration  $\sim 1 \cdot 10^{19} / \text{cm}^3$
- Primary Flat (PF) 16( $\pm 1$ ) mm
- Secondary Flat (SF) 8( $\pm 1$ ) mm
- Etch Pit Density (EPD)  $< 5 \cdot 10^4 / \text{cm}^2$
- Bow 0( $\pm 20$ )  $\mu\text{m}$
- Total Thickness Variation (TTV)  $\leq 60 \mu\text{m}$
- FWHM of X-ray rocking curve  $\sim 20$  arcsec
- Macrodefects – none (1-inch; 1.8-inch)
- Macrodefects  $\leq 4$  per wafer (2-inch)
- Resistivity  $\sim 10^{-3} \Omega \cdot \text{cm}$  (for CC  $\sim 1 \cdot 10^{19} / \text{cm}^3$ )
- Mobility  $\sim 150 \text{cm}^2 / \text{V} \cdot \text{s}$  (for CC  $\sim 1 \cdot 10^{19} / \text{cm}^3$ )
- Dimension: 1", 1.8" (45.4 $\pm 0.5$ mm), 2" (50.4 $\pm 0.6$ mm)

Substrate shape



- Off C-plane miscut: angles  $\delta_1 = 0^\circ (\pm 0.20^\circ)$ ,  $\delta_2 = \pm 0.3^\circ (\pm 0.20^\circ)$ .



- Surface preparation – if epi-ready (RMS  $< 0.5 \text{nm}$ )
- Please enquire on Seen Semiconductors' epitaxy services on freestanding GaN substrates
- Lead time – 2 months