

Episil-Precision releases new 8-inch GaN-on-Si epiwafers

With proven record of 6-inch GaN-on-Si epiwafers in volume production, Epi unveils its new 8-inch GaN-on-Si epitaxy technology for power application.

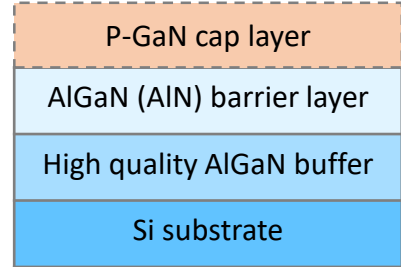
By adopting unique buffer layer design for stress engineering, low strain and low warpage in GaN epiwafers can be achieved. This helps reducing wafer crack happening in device process.

Furthermore, good uniformity control of 2DEG barrier thickness and Al-content will result in excellent GaN HFET performance throughout the whole wafer.

New 8-inch GaN-on-Si epitaxy technology is suitable for D-mode and E-mode HFET.

Please contact epi.sales@epi.episil.com for details.

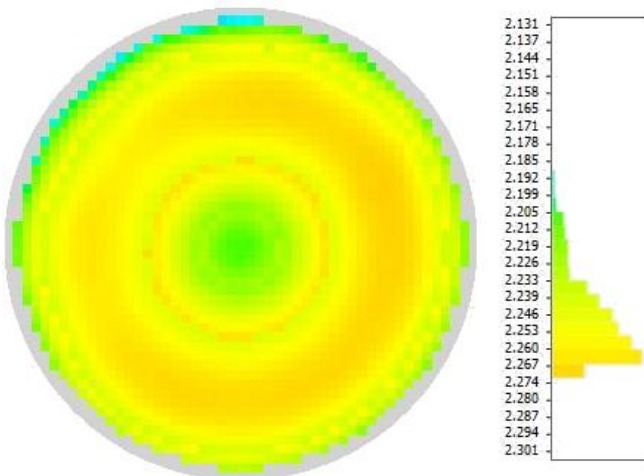
Structure



Hall measurement data

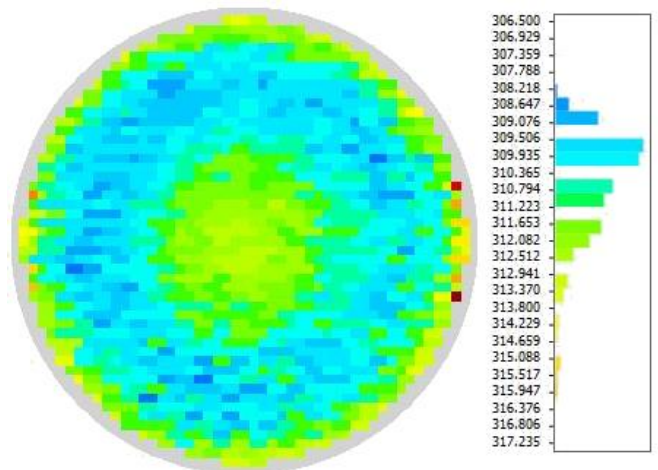
Carrier density (cm ⁻²)	Carrier mobility (cm ² /Vs)
>5x10 ¹²	>1500

Total thickness mapping



- Mean thickness: 2.2um
- σ /avg: 0.72% (3mm EE)

Barrier Al% mapping



- Mean Al concentration: 31.4%
- σ /avg: 0.40% (3mm EE)

Specification

8" GaN-on-Si Epiwafer

ITEMS		SPEC	Typical	Metrology
Total thickness (μm)	Available	1~5.5	2.2	EpiTT in-situ reflectance
	σ /avg	$\leq 5\%$	1.5 %	EpiTT in-situ reflectance
P-GaN thickness (nm)	Available	5~150	60	XRR
	σ /avg	$\leq 6\%$	2.5 %	XRR
AlGaN barrier thickness (nm)	Available	10~30	25	XRR
	σ /avg	$\leq 6\%$	2 %	XRR
Barrier Al(%)	Available	10~30	20	PL
	σ /avg	$\leq 6\%$	1 %	PL
GaN FWHM (arcsec)	002	≤ 800	680	XRD
	102	≤ 1500	1300	XRD
Warp(μm)		≤ 100	60	ADE 9000
Crack @ Radius 0~97mm (3mm EE)		Free	Free	Spot Light, Inspection by Eye
Particle (Size $>0.5\mu\text{m}$)		≤ 3000	1500	KLA CS920
Peeling		Free	Free	Spot Light, Inspection by Eye
Roughness (Ra, nm)	pGaN surface	≤ 1	0.5	AFM
2DEG Density(cm^{-2})		$\geq 5\text{E}+12$	$7\text{E}+12$	Hall
2DEG Mobility(cm^2/Vs)		≥ 1500	1700	Hall
SIMS	Mg conc.(cm^{-3})	$\geq 3\text{E}+19$	$4\text{E}+19$	SIMS (by monitor wafer)

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