ascatron

SiC EPITAXY SERVICE

Complete range of SiC Epitaxy

- From R&D epi material to prototype development and pre-volume production
- Flexible specification
- Multi-layer structures
- Epitaxially grown pn-junctions
- Support device design

Key Parameters	
Wafer size	76, 100, 150 mm
Polytype	4H, 6H, 3C
n-doping	$10^{14} – 10^{19}$ cm^{-3}
p-doping	$10^{14} – 10^{20}$ cm^{-3}
V-doping	semi-insulating
Ge-doping	resistivity control
Thickness	0.1 - 250 µm

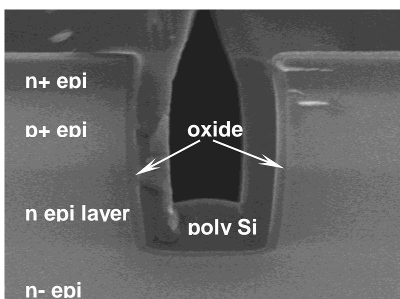
SiC Epitaxy Equipment

Single wafer epitaxy	LPE PE106, Aixtron VP508
Multi wafer epitaxy *	Aixtron VP2400
Surface polishing *	Surface grinding, back-grinding, polishing and CMP
Characterization *	FTIR, CV, Microscope, Candela defect mapping, AFM, SEM

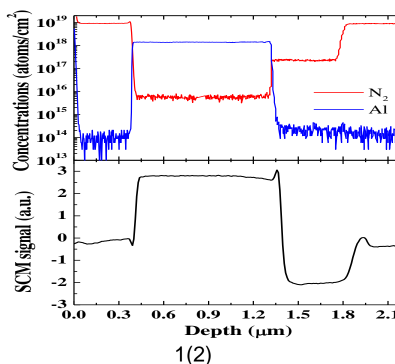
* Available through cooperation with NORSTEL, Sweden

3DSiC®: In process & regrowth epitaxy, multi-layer structures

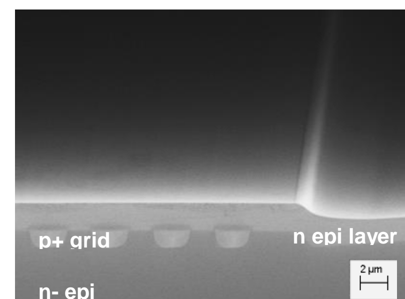
Trench MOSFET



Multi-Layer



Buried Grid



State of the art SiC epitaxy technology

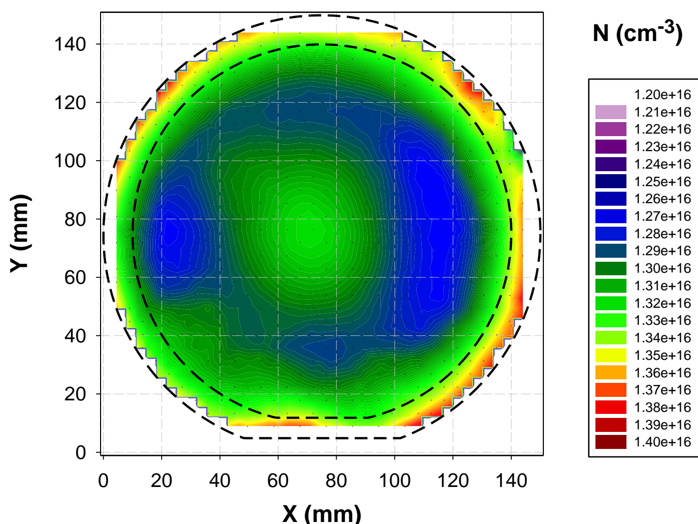
Record low defect density through efficient buffer layer technology

- Prevent nucleation of crystalline defects at growth start
- BPD to TED conversion rate > 99.8%
  ⇨ < 1 BPD per cm^2
- Enables bipolar SiC device technology

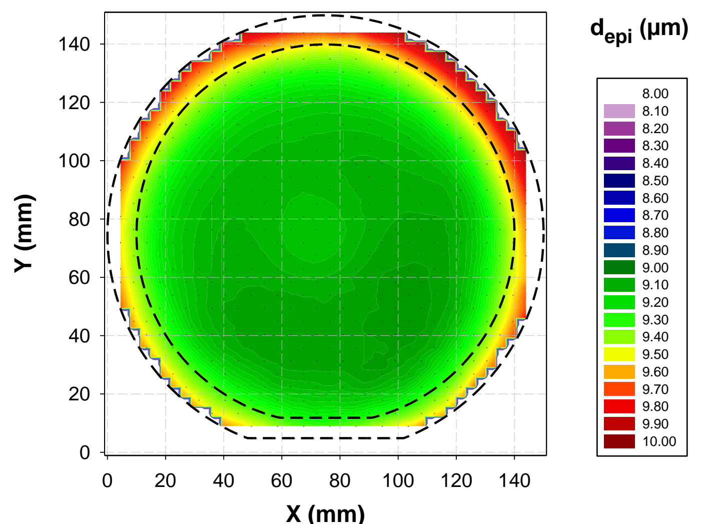
250µm thick layer
1 downfall, 1 triangle, 1 carrot defect
⇒ 0.012 defects / cm^2

Best in class layer homogeneity with LPE PE106

- Adjustable lateral gas flows
- High Growth rate of 40µm/h using TCS as silicon precursor
- Thick layer growth up to 250µm thickness and more
- Low doping concentrations of ~$1 \cdot 10^{14}/cm^3$
- Enables >15kV SiC device technology



	150 mm diameter	140 mm diameter	130 mm diameter
#points	408	371	320
MEAN N (cm-3)	1.31E+16	1.30E+16	1.30E+16
StdDev/Mean (%)	2.0	1.8	1.4



	150 mm diameter	140 mm diameter	130 mm diameter
#points	408	371	320
MEAN d epi (µm)	9.23	9.19	9.15
StdDev/Mean (%)	2.1	1.7	1.1