SiC EPITAXY SERVICE

ascatron

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, 150mm
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
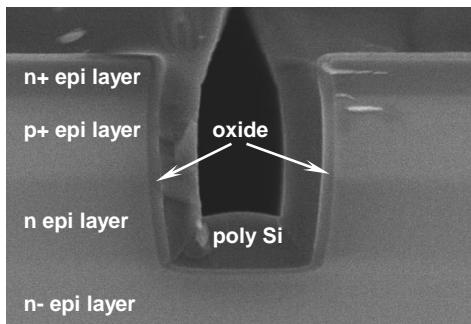
SiC EPITAXY EQUIPMENT
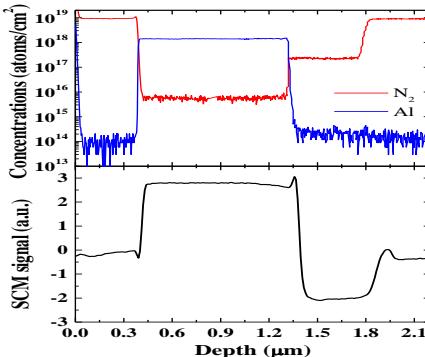

| Single wafer epitaxy	LPE PE106, Aixtron VP508
Multi wafer epitaxy *	Aixtron VP2400
Surface polishing *	Surface grinding, back-grinding, polishing and CMP
Characterization *	FTIR, CV, Microscope, Candela defect mapping, AFM, SEM

* Available through cooperation with NORSTEL, Sweden

Trench MOSFET

n+ epi layer
p+ epi layer
oxide
n epi layer
poly Si
n- epi layer

Multi-Layer

Buried Grid

p+ grid
n epi layer
n- epi layer
2 µm
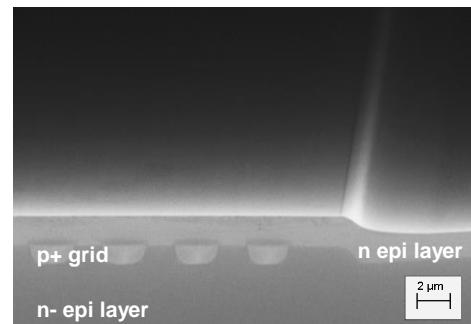
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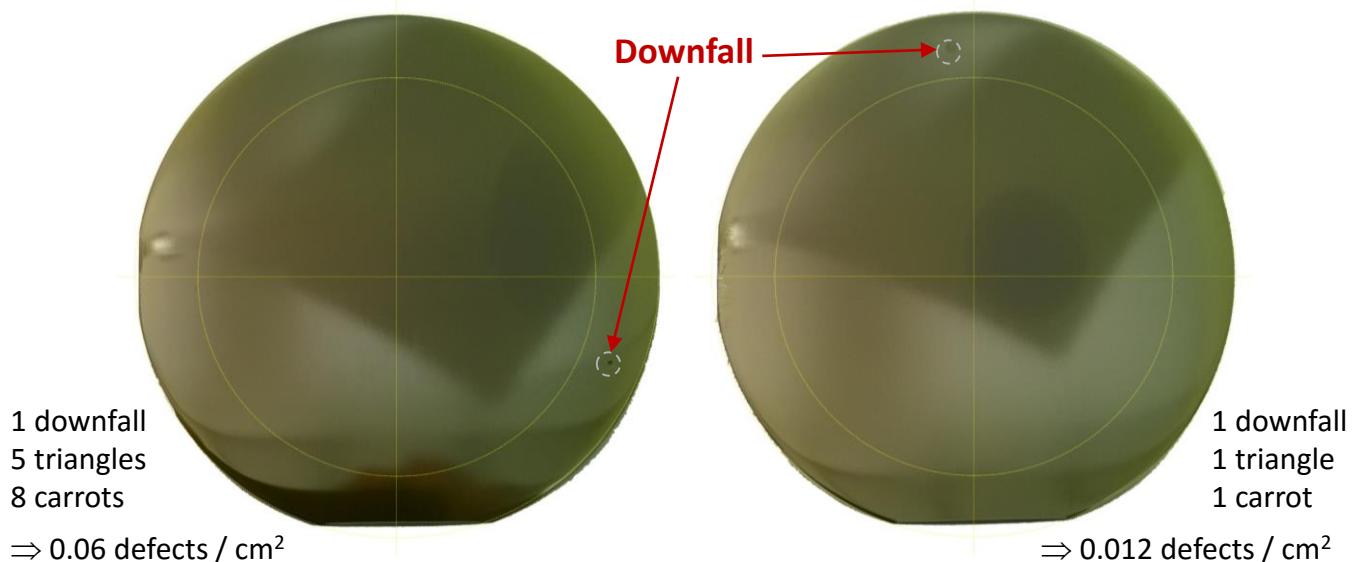
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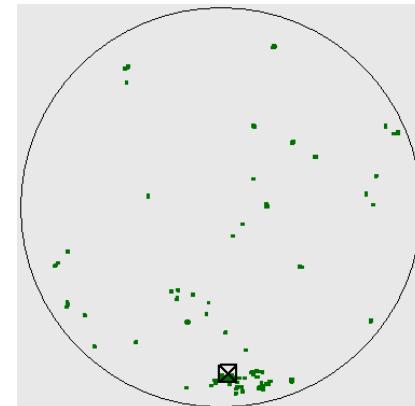
## RECORD LOW DEFECT DENSITY FOR 250µm THICK LAYERS

Downfall

1 downfall
5 triangles
8 carrots

$\Rightarrow$ 0.06 defects / cm^2

1 downfall
1 triangle
1 carrot

$\Rightarrow$ 0.012 defects / cm^2
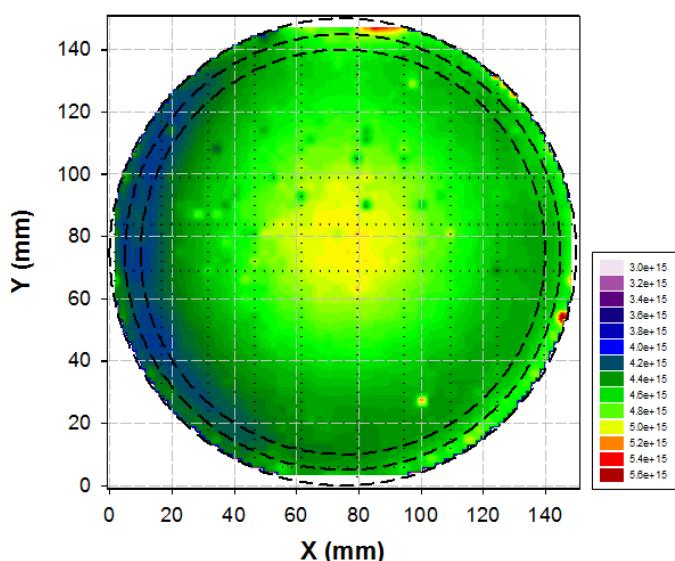
EFFICIENT BUFFER LAYER TECHNOLOGY

- Prevent nucleation of crystalline defects at growth start

- BPD to TED conversion rate > 99.8%
  $\Rightarrow$ < 1 BPD per cm^2

- Enables bipolar SiC device technology
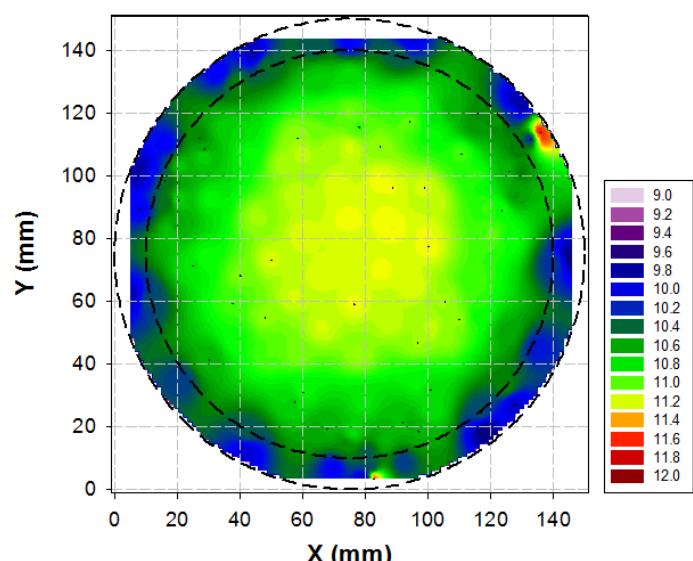
Courtesy of KLA-Tencor, Candela CS920

BPD: 0 , Split BPD: 92

BEST IN CLASS LAYER HOMOGENEITY WITH LPE PE106

	150 mm diameter	140 mm diameter	130 mm diameter
#points	1890	1709	1470
MEAN N (cm-3)	4.46E+15	4.45E+15	4.46E+15
StdDev/Mean (%)	4.2	4.0	4.1

	150 mm diameter	140 mm diameter	130 mm diameter
#points	134	119	100
MEAN d epi (µm)	10.72	10.79	10.89
StdDev/Mean (%)	4.1	3.1	2.3