

# NanoSIMS Analysis of Cross-Section for SiC-MOSFET

The NanoSIMS 50L can provide the highest lateral resolution among secondary ion mass spectrometers and can simultaneously achieve high sensitivity and high mass resolution. Here, we introduce examples of measuring cross-section of SiC-MOSFET using NanoSIMS.

## What is NanoSIMS ?

### **I**maging & Depth Profiling

- High lateral resolution
- High transmission
- High mass resolution using magnetic sector



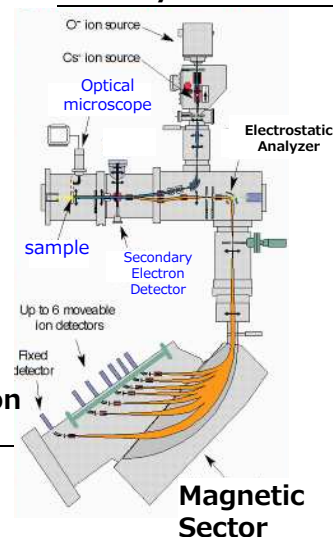
Courtesy: AMETEK

### **N**anoSIMS 50L

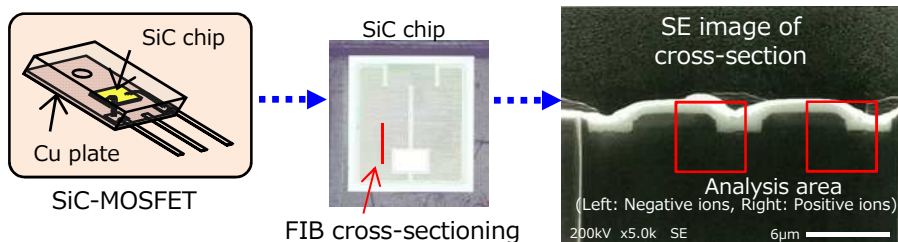
- Primary ion :  $\text{Cs}^+$ ,  $\text{O}^-$
- Minimum beam size : 50 nm
- Detection limit : ppm~
- Mass analyzer : double focusing mass spectrometer
- Number of ions detected : 7
- Analysis depth : 10 nm~ several 100 nm

### Multicollection system

### Primary Ion Source

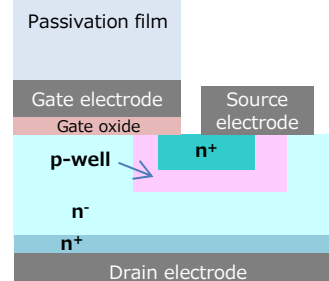


## Cross-sectioning of SiC-MOSFET by FIB

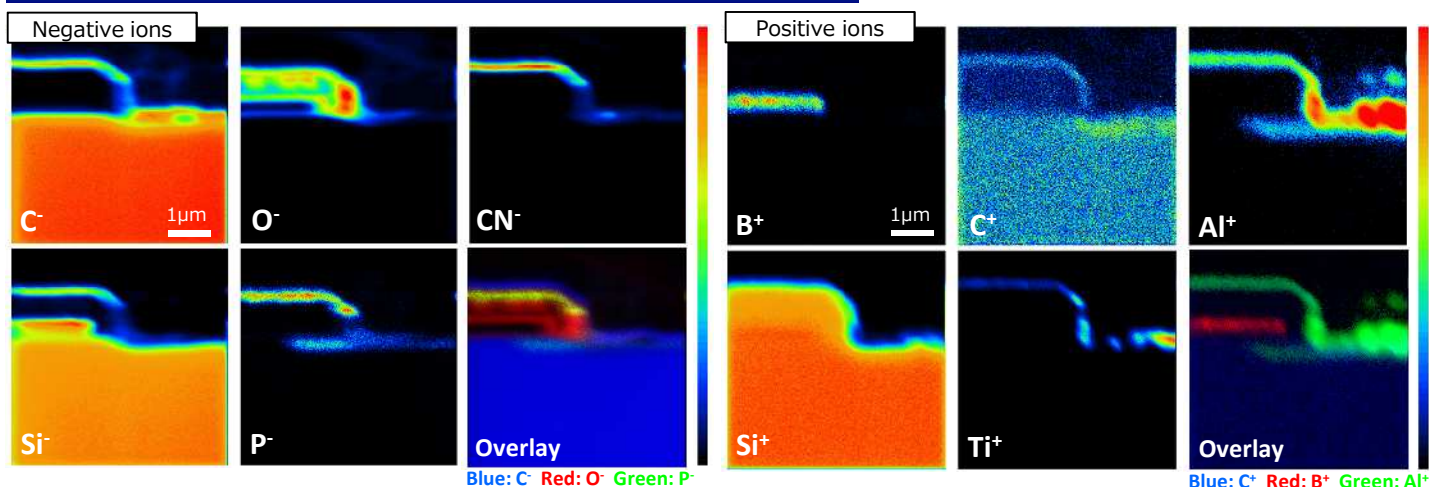


A cross-section of SiC-MOSFET was prepared by FIB, after wet-etching of resins and electrodes on the SiC chip.

### Schematic diagram of SiC-MOSFET



## Elemental analysis of SiC-MOSFET by NanoSIMS



P, Al, and B were detected at  $\text{n}^+$  of source region, p-well, and gate electrode, respectively. Outermost layer of the passivation film is expected to be PSG.

Dopant distribution of SiC-MOSFET can be evaluated by NanoSIMS.