Elemental and Crystal Orientation Analysis of SiC MOSFET — High-sensitivity EDX, Transmission EBSD —

This slide introduces an example of using SEM-related equipments, EDX detectors and transmission EBSD to analyze the cross-section structure of SiC MOSFET (commercially available power devices). In these SEM-based analysis, the spatial resolution of high-precision EDX and Transmission EBSD can reach about 100nm and 20nm respectively.

High-sensitivity EDX analysis of the cross-section

After FIB treatment of the cross-section of the power device, elemental analysis can be performed using high-sensitivity EDX detector from tilting angle. Our high-sensitivity EDX detector can retain high count rate of characteristic X-ray even at low accelerating voltage and high spatial resolution. In this case, the detector can analyze structures at about 100nm through elemental mapping.

Transmission EBSD analysis of the cross-section film

The thin section is sliced by FIB and its crystal orientation is estimated by TEM and transmission EBSD. It is usually difficult to cover all crystal orientation using TEM electron diffraction analysis. However by using transmission EBSD, we can even analyze refined crystal orientation of poly-Si through mapping.