TCAD Demonstration Files for SiC-JBS Simulation
**SiC-JBS Simulation**

- Template files for simulation of Silicon Carbide Junction Barrier Schottky (SiC-JBS) diodes provided

- Structure generation from Crosslight/CSUPREM

- I-V Simulation from Crosslight/APSYS
  - Forward I-V Characteristics
  - Reverse current/Blocking voltage
  - 0-175C temperature range
**Wide bandgap modeling issues**

- Low intrinsic carrier concentration often leads to convergence issues
- Common solutions artificially increase intrinsic concentration
  - Optical stimulation
  - Thermal stimulation
- These result in inaccurate simulations of reverse characteristics since the artificial thermal or optical currents can be comparable to the actual reverse currents
- Code implementation in Crosslight/APSYS overcomes these difficulties without artificial stimulation
Typical SiC-JBS Structure

Advanced Physical Models

- Temperature dependent Caughey-Thomas mobility model calibrated for SiC
- Chynoweth impact ionization
- Trap assisted tunneling
Proper model calibration of Crosslight/APSYS produces excellent agreement to experiment over a wide temperature range for both forward and reverse simulations.
Additional information

For additional information on the demonstration files or calibration please contact Gary Dolny at gary.dolny.us@ieee.org