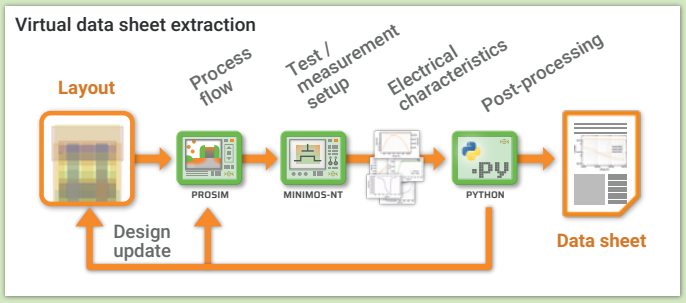
GLOBAL TCAD SOLUTIONS

Power Devices

Si • SiC, GaN • Novel Wide Band-Gap Materials

- **Trench-MOSFET**
- **Diodes**
- **IGBT (Super-Junction)**
- **LDMOS**

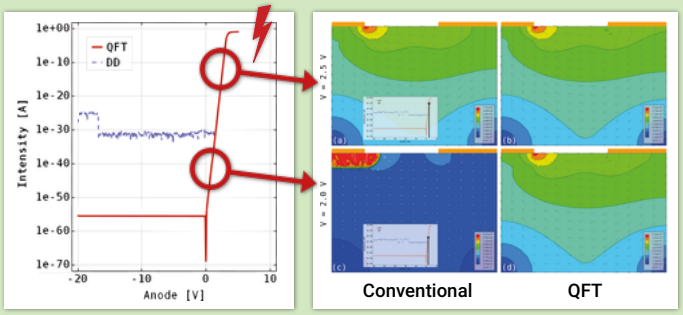
Example: SGT (Split-Gate Trench) MOSFET – Virtual Data Sheet Extraction



- Fully automated extraction of all important data sheet parameters: V_{th}, R_{on}, SS, V_{bd}, C_{iss}, C_{oss}, C_{rss}, I_{rr}, Q_{rr}, Q_{gd}, t_{on}, t_{off}
- Process simulation and emulation
- Device simulation, I_dV_g, I_dV_d, CV_s, break-down
- Mixed-mode: switching analysis, body-diode reverse-recovery
- Parameter variation in design and process

PROSIM MINIMOS-NT PYTHON

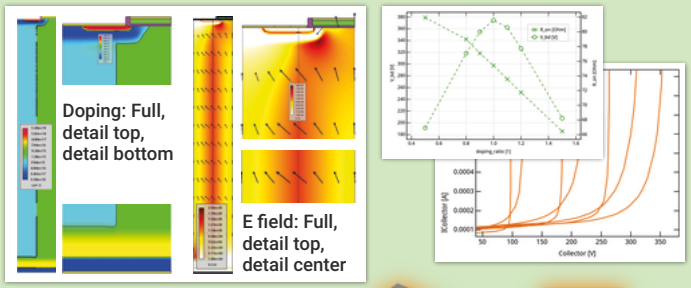
Example: Wide Band-Gap Materials: SiC, GaN – QFT (Quasi-Fermi Transport)



- Advanced solution technique for DD model system in low-carrier concentration regime
- Device: Reverse-biased SiC Diode (also available as Schottky-Barrier-Diode)
- Robust and computationally efficient
- Fully integrated in MinimosNT
- No numerical precision enhancement needed

MINIMOS-NT MATERIALS

Example: IGBT: TCAD – Investigate non-measurable Quantities



- All important characteristics in one flow
- E-field distribution across super-junction
- Fully interoperable with process simulation
- DOE: Influence of SJ doping mismatch on IGBT performance (R_{ON}, V_{BD})
- Fully automated TCAD workflow

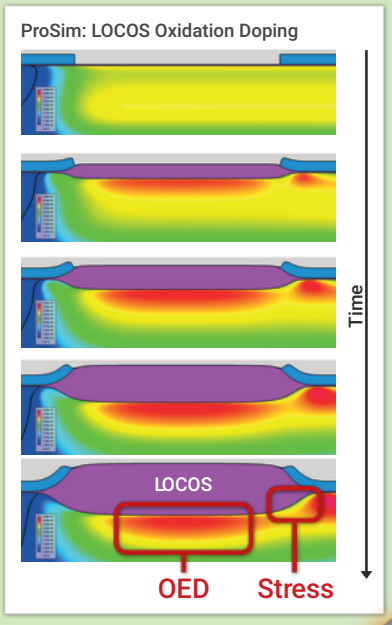
PROSIM DOE

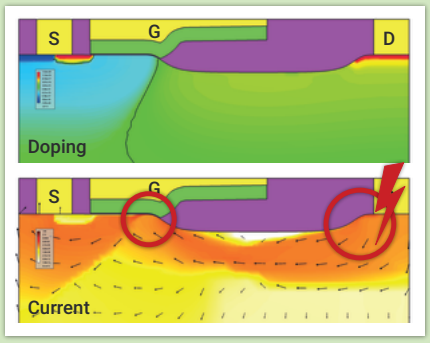
Read more, find tutorials and examples at globaltcad.com/power

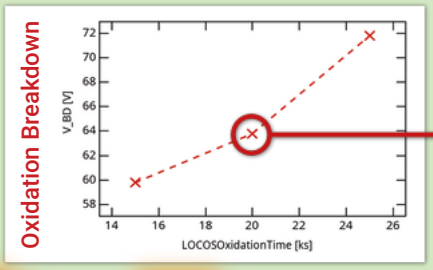
Predictions based on physics.

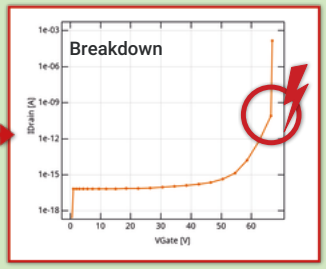
• RF Devices / LDMOS

Example: LDMOS LOCOS Oxidation – Process Simulation









Detailed process flow simulation:

- Automated process to device simulation meshing
- Oxidation-enhanced diffusion, detailed stress modeling
- Realistic LOCOS shape and diffusion profile
- Impact on break-down characteristics

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MINIMOS-NT

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GLOBAL TCAD SOLUTIONS

Global TCAD Solutions GmbH (GTS) was founded in 2008 as a research-driven European TCAD creator and supplier.

With its staff of active scientists (150+ publications) and highly experienced software engineers, GTS maintains a leading role in TCAD innovation. GTS' company mission is to make the latest scientific research available for industrial use: Via GTS products and via consulting and research projects, taking an active role in collaborations with academic as well as industry partners.

GTS provides powerful solutions based on models well-founded in physics, assisting clients to create and optimize outstanding devices and designs.

Choose from the GTS Product Portfolio

GTS Cell Designer (CD) allows various approaches to design-technology co-optimization (DTCO): Create simulation-ready 3D logic cell models solely based on layout & technology information, or emulate the process. Quickly screen technology options, analyze device/circuit-level implications of your design choices, process variations, variability (LER, RDD, mask misalign, etc.)

GTS Nano Device Simulator (NDS) is based on the direct solution of the sub-band Boltzmann transport equation (SBTE), and includes detailed scattering and tunneling models. These predictive physical models allow to explore and exploit device physics at the nano scale, such as crystal orientation, strain, and material composition. Get a well-optimized device design even before going to silicon – reducing both cost and time to market.

GTS Framework is a full 2D/3D TCAD suite including outstanding classical and quantum-mechanical device and circuit simulators, tools for reliability and variability analysis as well as a powerful job server for grid computing; all with a consistent, easy-to-use 3-level (graphical/tree/text-file) interface.

GTS JOB SERVER · DOE · OPTIMIZATION · RELIABILITY · VARIABILITY · MATERIALS · SDK · MIXED MODE

LAYOUT · STRUCTURE · PROEMU · PROSIM · MINIMOS-NT · VSP · VMC · VSHE · 3rd PARTY · VISION · PYTHON

Global TCAD Solutions GmbH (GTS)
Bösendorferstraße 1 / 12
1010 Vienna
Austria, Europe
globaltcad.com

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