

## HiPoSwitch – WP3

### Virtual prototyping

- Built TCAD platform for the simulations of high-voltage GaN-based power transistors
- Capabilities of simulating both normally-on and normally-off GaN-based devices:
  - Normally-on AlGaN/GaN MISHEMT and normally-off pGaN devices
- Advanced trap models developed and calibrated with experiments:
  - Ad-hoc test structures designed and characterized
  - Different devices with different geometry, field plate configuration and back-side metallization characterized for model benchmark
  - Advanced characterization techniques (WP7) used as input for model calibration
- Developed trap models allow to accurately reproduce both static and dynamic transistor performance:
  - DC transfer and output characteristics
  - Reverse body diode conduction
  - AC capacitance (Ciss, Coss, Crss)
  
- Spice Models:
  - Generated calibrated Spice models for both normally-on and normally-off GaN devices
  - Models distributed to project partners
  
- Thermal Modeling:
  - Investigation of static and dynamic thermal behavior of leadless ThinPaK package for GaN-based devices
  - Investigation of thermal boundary between GaN buffer and Silicon substrate and effect of patterned substrates assessed.