

HiPoSwitch – WP6 Highlights

200mm GaN-on-Si development

- Process development for AlGaN/GaN HEMT structures on 150 mm and 200 mm Si substrates using 8x150 mm / 5x200 mm production type Planetary[®] MOCVD reactors.
- Successful process transfer from 150 mm to 200 mm Si substrates in Close Coupled Showerhead (CCS) reactors at EpiGaN resulting in same quality of the epilayers in terms of crystal quality, thickness uniformity, surface morphology and electrical behaviour.

High throughput epitaxial growth systems

- Start-up of two new CCS MOCVD reactors at EpiGaN.
- Modelling assisted design of new 200 mm susceptor for EpiGaN CCS reactor.
- Modelling assisted design of new 5x200 mm susceptor for Planetary[®] reactor.
- New penta injector which allows almost independent tuning of TMAI and TMGa depletion on 200 mm wafers.
- Multi-step reactive gas etching process developed to reset the system between runs to avoid Mg carry over and to enable full process automation.

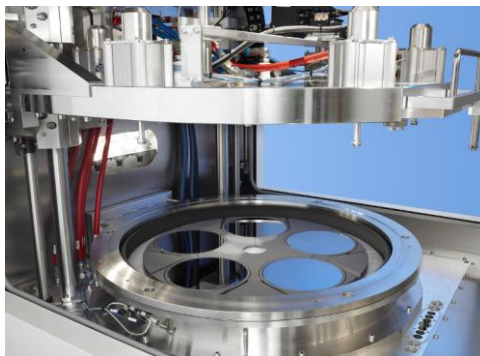


Figure 1: MOCVD Planetary[®] reactor G5+ in 5x200 mm configuration.

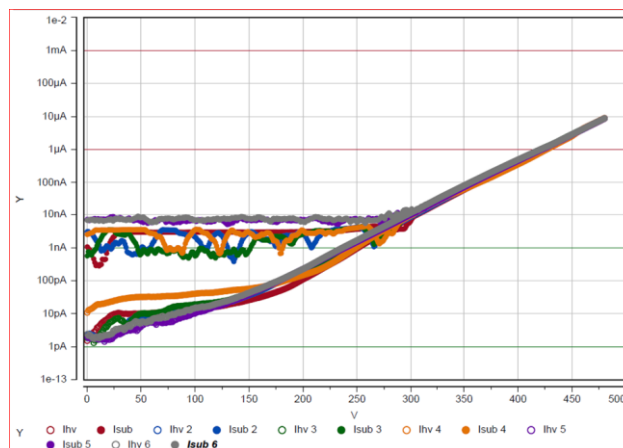


Figure 2: Breakdown measurements with substrate grounded on 200mm GaN on Si for the 3.1um thick buffer. At 1uA, a voltage of 430V is reached