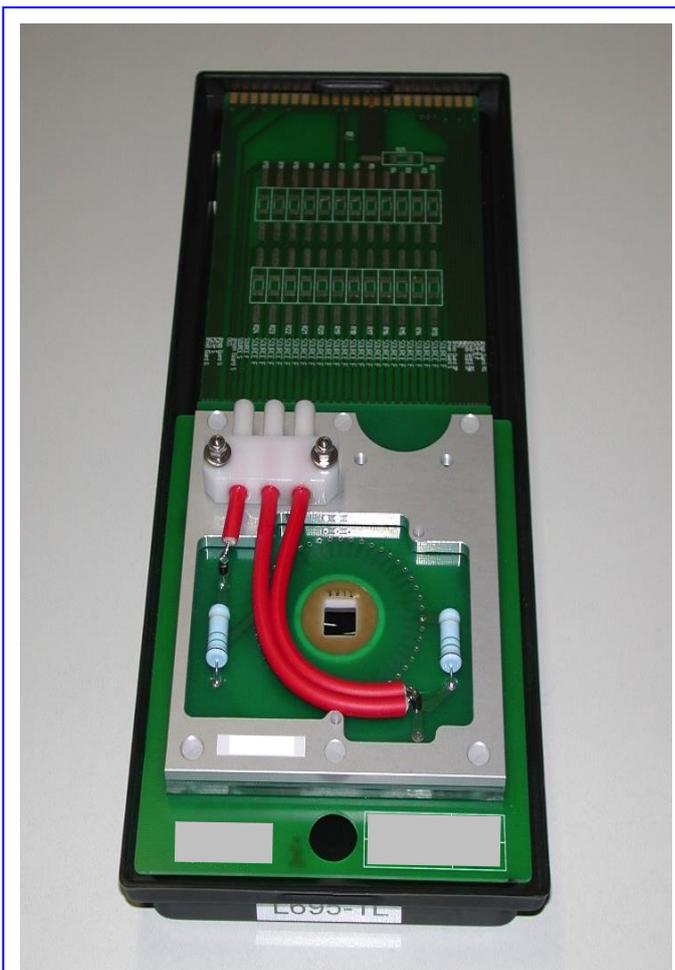


"High Voltage – High Current" Probe Cards for Power Semiconductors

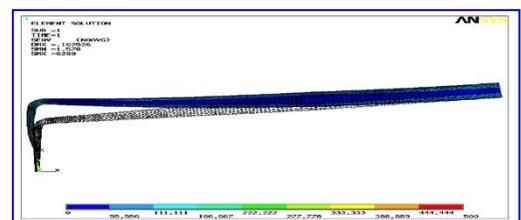
Wafer test of power semiconductor poses some quite specific challenges as test currents of more than 100 Amps and test voltages exceeding 10 Kilovolts. Besides rather "classical" devices fabricated in Silicon technology, as examples being rectifier diodes, IGBTs and Power MOSFETS, new upcoming devices in e.g. SiC and GaN technology with their inherent capability for shrinking chip sizes pose even bigger challenges for high voltage and high current test at wafer level.

Both for high volume mass production as well as the early lab test stages of chip development, T.I.P.S. has solutions to meet these challenges.

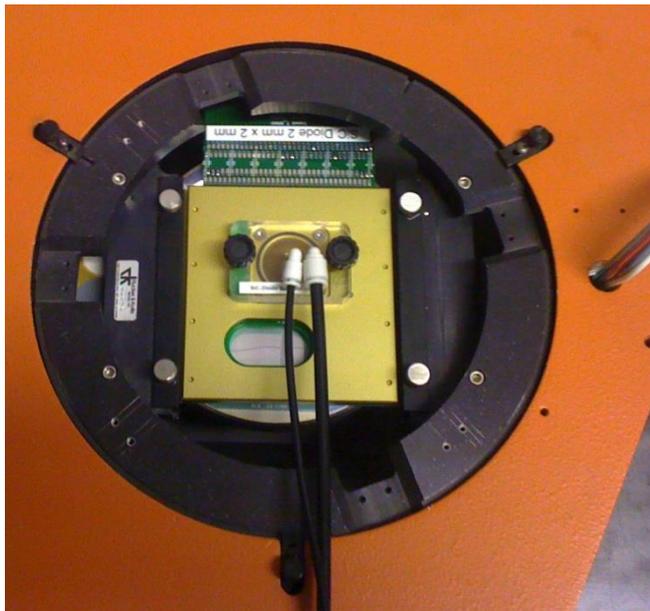


10 kV High Voltage Probe Card

- **"Luftpolster"** probe card: testing under compressed air atmosphere to avoid high voltage flashovers during wafer test
- **"SmartClamp / MicroClamp"** current limiter technology: Protecting probes and D.U.T. from damage due to current overload, safely distributes highest currents over several probes to the chip
- **"NoScrub"** and **"ShortScrub"** probe geometries allow minimal scrub mark sizes over active silicon yet maintaining excellent contact properties.

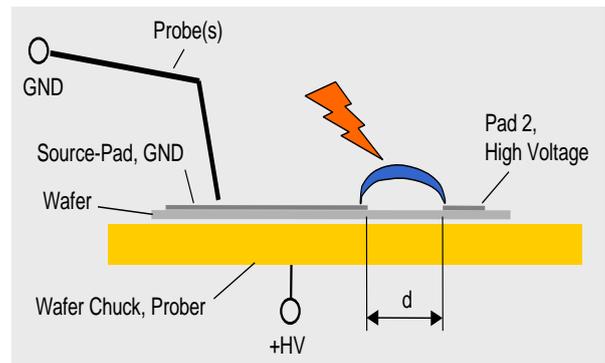


"Luftpolster" – High Voltage Probe Cards

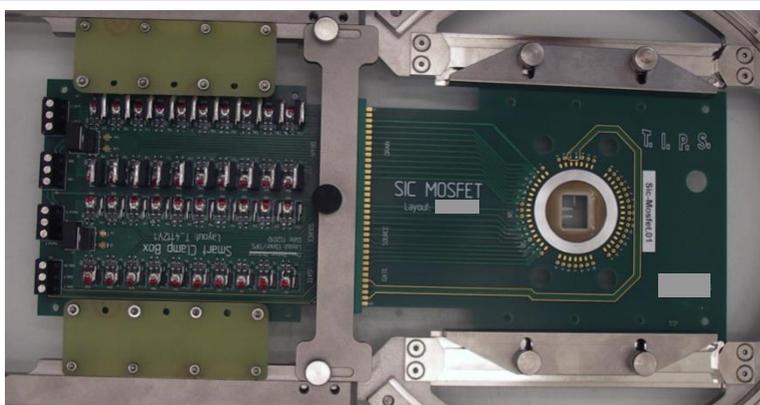


Prober set up for SiC high voltage diode test

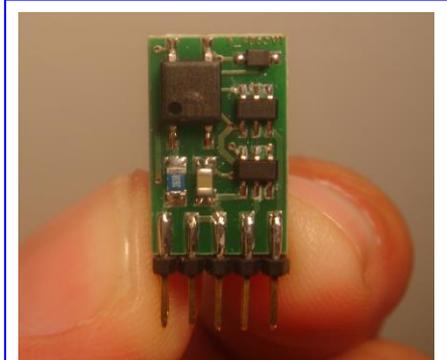
Combining well-proven and robust cantilever probe card technology with a chip-scale pressure chamber allows suppression of high-voltage arcing by testing under compressed air atmosphere.



"SmartClamp, MicroClamp" – High Current Probes Protection



"SmartClamp" protected 100 A probe card for SiC MOSFET



"MicroClamp"
Probe card protection module

"SmartClamp" and "MicroClamp" technology provides "plug-in" current limiters that will prevent damage to probes due to excessive current loads. These often arise due to imbalanced currents in bussed probes arrangements, sometimes they occur due to defective DUTs, or unexpected behaviour of power supplies in semiconductor test equipment. The SmartClamp/MicroClamp modules can be implemented into existing or newly designed test circuitry without influencing the test path electrically within nominal probe currents. Only in overcurrent situations they will clamp probe currents to safe values.