1. Troubleshooting in Power Electronics
   From System to Chip Level

   1. Your situation
      - Zero-hour failures after launched volume production
      - Products with life-time problems
      - Products with sporadic or difficult to detect failures
      - Unclear destroyed or fragmented returns
      - Problems with sub-supplier systems & components
      - Financial conflicts that require an independent technical advice

   2. Our service
      - On Site Measurements
        - Test & Measurement in target application
        - Get an inside view and better understanding of the application
      - System context analysis
        - Understand & consider peripherals
        - Identify of application specific differences
        - Study of environmental dependencies
        - Check system to subsystem interface impact
        - System and subsystem simulation
      - Failure Analysis (destructive and non-destructive)
        - System – Circuit – Layout – Component Reviews
        - Optical, thermal, ultrasonic, x-ray, REM inspection
        - Disassembling from electromechanical system level down to smallest subcomponents, demolding, micrograph polished sections
**Your Benefit**

- Large expert team with many years of industrial background
- Independent system related point of view
- Regardless of manufacturer → objective
- In-house experts in many disciplines
- Modern and well-equipped laboratories with a wide range of analysis devices

**Testing & Service - Some Examples**

- Long term system check with data-logging
- Electrical performance under applied stress: temperature, humidity, overvoltage, overcurrent, ESD, burst, RF-radiation, partial discharge
- Electrical behavior under critical conditions as power-up, power-down, brown out, ...
- Characteristic curves of electrical components with state of art curve tracer
- Contamination check - chemical spectral analysis
- 3D surface analysis with ultrasonic scanning SAM
- Short circuit / overload detection with standard thermography
- Short circuit, ESD-damage, oxid damage, edge termination defects, avalanche breakdown detection of IGBT’s, MOSFET’s, diodes, resistors with Lock-In thermography
- Static electrical characterization
- Dynamic electrical characterization of power modules / systems up to 10 kV / 100kA
- Active power cycling
- Passive temperature cycling

Switching behavior check on power semiconductors

Chip-level Lock-In Thermography, supersonic analysis solder thickness

Thermography gate-driver, x-ray transformer