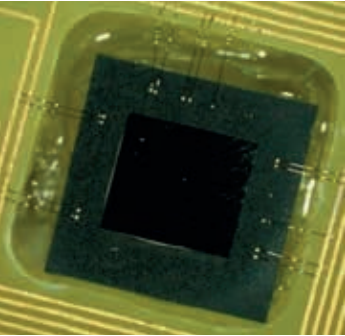




# FAILURE LOCALIZATION SERVICES

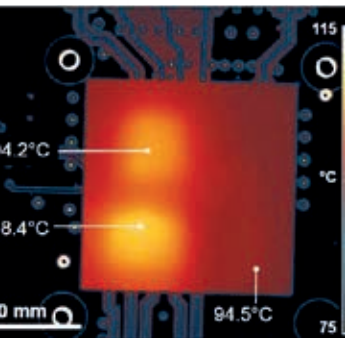
- (3D) LOCK-IN THERMOGRAPHY (LIT)
- PHOTON EMISSION MICROSCOPY (PEM/EMMI)
- OPTICAL BEAM INDUCED RESISTANCE CHANGE (OBIRCH)
- SEM AND FIB VOLTAGE CONTRAST
- ATOMIC FORCE MICROSCOPY (AFM)
- BACK- AND FRONT SIDE ANALYSIS

# FAILURE LOCALIZATION SERVICES



## ADVANCED SAMPLE PREPARATION

- Front- and back side sample preparation
- Laser-, Mechanical-, Chemical- and Microwave Induced Plasma decapsulation
- Mechanical micro polishing of samples
- Wire bonding on package- and die level
- Die extraction for re-bonding
- Advanced electrical setup (multiple signals and IV)



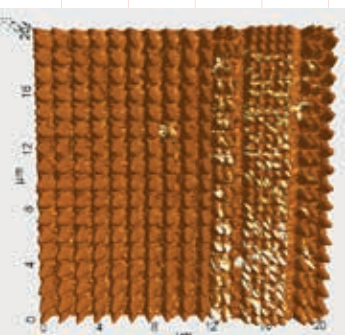
## (3D) LOCK-IN THERMOGRAPHY (LIT)

- Lock-In mode for  $>1\mu\text{W}$  spot detection
- Thermal mapping with an accuracy of  $1^\circ\text{C}$
- 3D LIT defect depth information (Z-axis)
- 200 mm thermal chuck for front- and back side analysis
- Non-destructive package level failure localization
- Capable of detecting low-Ohmic and resistive defects



## PHOTON EMISSION/OBIRCH MICROSCOPY (EMMI/OBIRCH)

- Up to 6 probe needles for front-side/back-side connections
- Focused on the front-end of line (EMMI) and back-end of line (OBIRCH)
- OBIRCH Thermal laser stimulation of metal interconnections
- Seebeck Effect Imaging (SEI) for open connections
- The IC is in active electrical failing mode during the analysis
- Comparison between a failing and reference device



## PASSIVE VOLTAGE CONTRAST / ATOMIC FORCE MICROSCOPY (AFM)

- Atomic Force Microscopy:
  - Conductive AFM (C-AFM)
  - $100\ \mu\text{m} \times 100\ \mu\text{m}$  XY scan area, 0.05 nm resolution
  - I/V curve measurement
- Passive Voltage Contrast (PVC):
  - Detection of leakage at substrate level