



## TEST CHIP DESIGN IZM-ASSID MULTI-PROJECT WAFER TC3

TC3 is a universal test chip layout which can be used for technology development and electrical characterization. The designs used are targeted for a wide range of topics in the area of 3D integration, high density interconnects, HF applications, and interconnects.

Each reticle contains sub-chips of 12.5 x 11.5 mm size. Eight sub chip variations are placed in each reticle:

### Chip 1: HF structures

- Customer-specific HF test structures on front side and backside of wafer
- Daisy chains
- TSV Kelvin test structures
- Vertical coil structures

### Chip 2: Cavity structures

- Large cavity
- Test structures to determine lithography process window within cavity

### Chip 3: High density layout

- Experimental design for multi-layer high density redistribution layer
- Up to 4 wiring levels at 10  $\mu\text{m}$  pitch
- (front side only)

### Chip 4: Thermal studies

- Coils for inductive heating of TSV
- Analysis of TSV damage due to heating

### Chip 5: HF structures

- Coils and transmission lines of various geometries in 4 RDL layers

### Chip 6: Flip chip bonding

- Contains bond pad array of 10 mm x 10 mm size
- Design allows electrical localization of failing connections for subsequent failure analysis

### Chip 7: Daisy chains

- TSV daisy chains of various designs using 10  $\mu\text{m}$  TSV diameter
- Via daisy chain of various designs, via sizes from 3  $\mu\text{m}$  to 10  $\mu\text{m}$

### Chip 8: Comb structures

- Comb structures to characterize k-value and leakage characteristics of RDL materials

### Fraunhofer Institute for Reliability and Microintegration IZM

Center „All Silicon System Integration  
Dresden – ASSID“

Ringstr. 12

D-01468 Moritzburg, Germany

[www.izm.fraunhofer.de/ASSID](http://www.izm.fraunhofer.de/ASSID)

### Technical Support

Dr.-Ing. Manuela Junghaehnel

Phone: +49 (0) 351 795572-18

[manuela.junghaehnel@izm.fraunhofer.de](mailto:manuela.junghaehnel@izm.fraunhofer.de)

### Contact Marketing

Georg Weigelt

Phone +49 (0) 30 46403-279

[georg.weigelt@izm.fraunhofer.de](mailto:georg.weigelt@izm.fraunhofer.de)

[www.izm.fraunhofer.de](http://www.izm.fraunhofer.de)

