

3D SURFACE METROLOGY
SYSTEMS FOR RESEARCH
AND PRODUCTION

FRT THE ART OF
METROLOGY™

MicroProf® TL

Optical Metrology under Thermal Load



MEASURING TASKS

Roughness	Step Height	Profile	Waviness	3D Map	Thickness
Warp	Slope	Topography	Flatness	Vias / TSV	Bumps
Co-planarity	Bow	...			

STANDARD CONFIGURATION

Characteristics

- > temperature control 10°C/ -80°C to 400°C
- > fast heating- and cooling rate
- > homogeneous temperature distribution on surfaces
- > FRT topography sensor(s)
- > CWM deformation sensor
- > housing in modern industrial design
- > stable granite construction with excellent damping properties

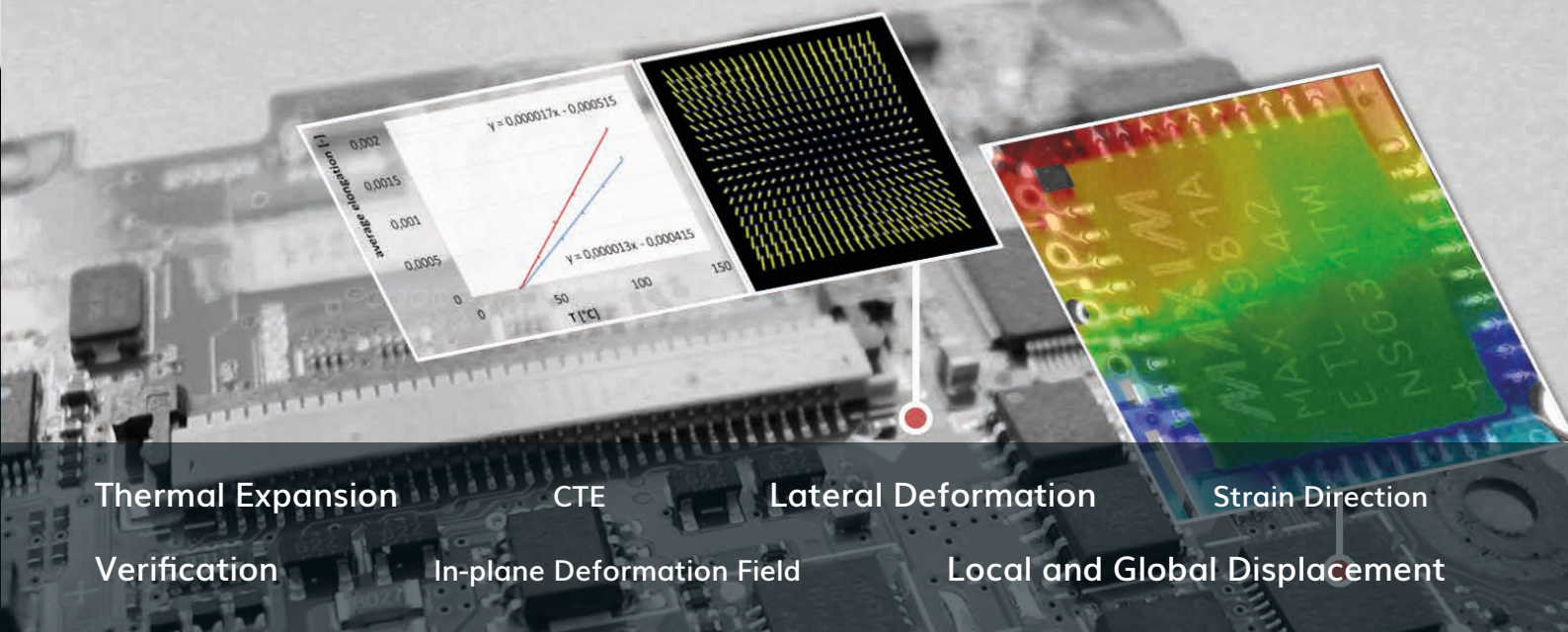
Applications

- > FRT Acquire Automation XT
- > PCB-design and simulation
- > 3D-IC, MEMS, wafer stacking
- > failure analysis

The **MicroProf® TL** is the latest family member of the **MicroProf® TL** Series. Like any other **MicroProf®**, the 'TL' (Thermal Load) is an optical surface measurement tool for fully-automatic 3D surface measurements for several applications. In difference to its family members, the TL features a Thermo Unit - a fully-integrated heating and cooling stage - as well as a microDAC 2D deformation sensor by CWM. By these means, **MicroProf® TL** can be used to characterize lateral and vertical deformation of samples under thermal load. This can be used to determine the behavior of components under 'working condition' or to simulate various process steps. For the relevant measurement process random terminal cycles can be configured by an easy recipe creation.

In combination with the FRT software Acquire Automation XT the **MicroProf® TL** is able to run fully-automatic temperature profiles. In the recipe, the user can set target temperatures, temperature ramps and dwell time that will be used during process. Set points can be defined where topography and deformation measurements take place within the heating/cooling process. Permanent temperature logging is available, optionally, a second temperature probe can be added in order to monitor the temperature at special locations on the sample.



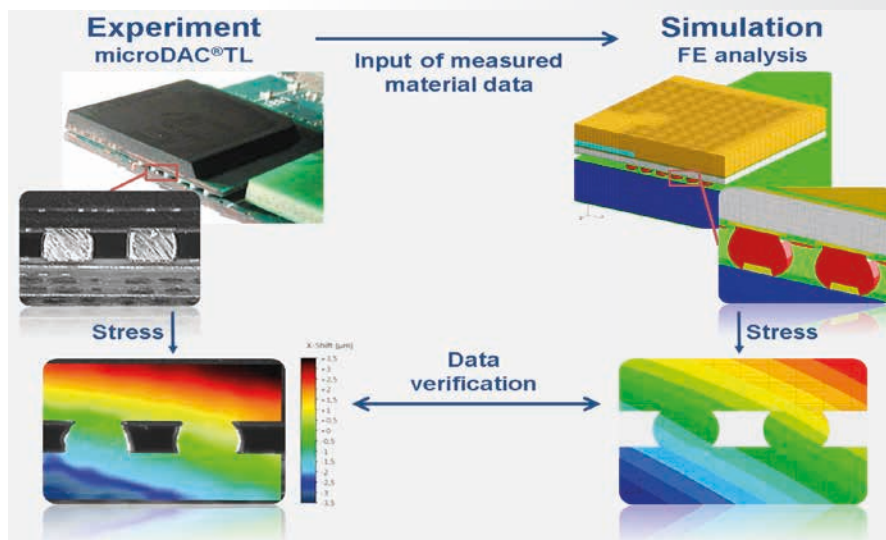
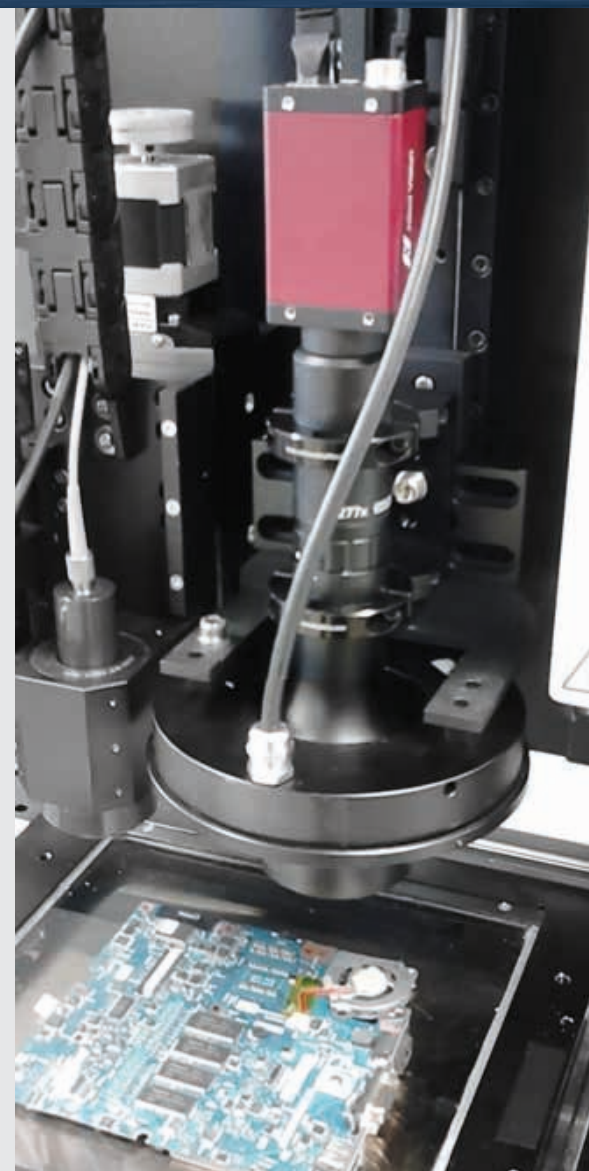


ADD-ON SYSTEM MICRODAC®TL FOR IN-PLANE MEASUREMENTS

Additional to out-of-plane measurements (warpage) microDAC®TL allows the investigation of in-plane displacements from single electrical components up to complete assemblies. With the high-precision camera setup global and local deformation fields can be measured with an accuracy up to 50 nm.

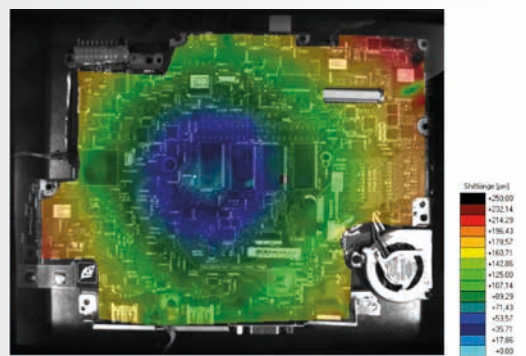
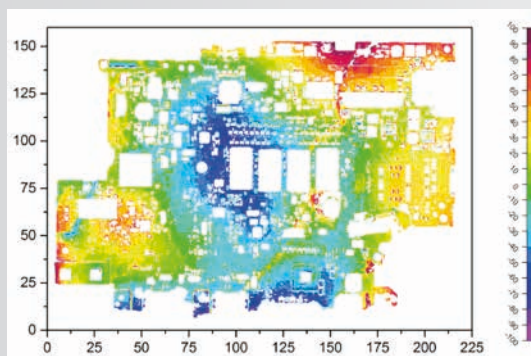
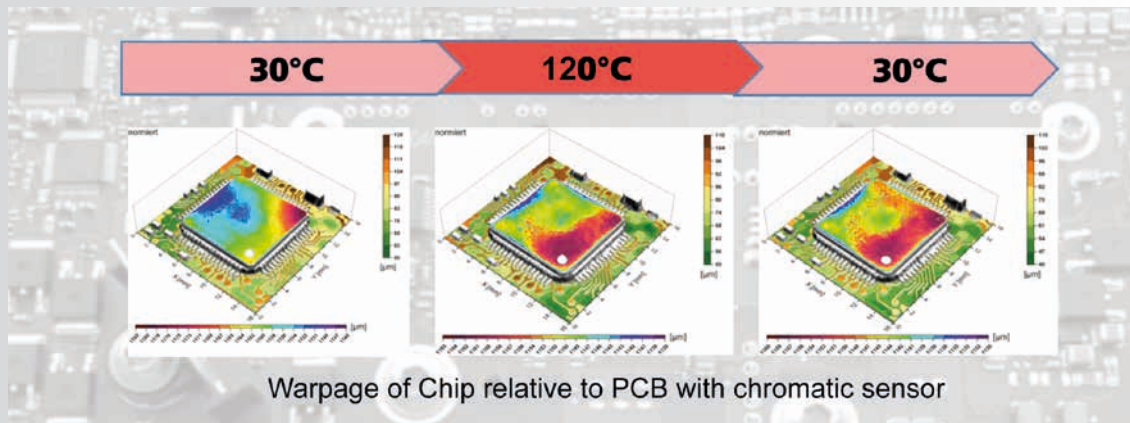
Area of application is the detection of weak points of electronic assemblies during internal or external load, like for example temperature driven deformations or distortions by mounting.

Especially, in conjunction with the numerical simulation the system is very beneficial. Both, thermo-mechanical material data (CTE) can be determined as input for the simulation as well as the simulation results can be verified by means of the deformations.



Chemnitzer
Werkstoffmechanik GmbH
www.cwm-chemnitz.de

TOPOGRAPHY MEASUREMENT OF AN IC COMPONENT:



SOFTWARE

- > FRT Acquire
- > FRT Acquire Automation XT
- > FRT Mark III
- > CWM VEDDAC control
- > CWM VEDDAC

Optional:

- > SECS/GEM interface

HARDWARE

- > CWM: In-plane deformation tool microDAC®TL
- > FRT topography sensors
- > FRT Thermo Unit

Questions? Talk to an expert!

Germany

FRT GmbH
 +49 2204 84-2430
 +49 2204 84-2431
 info@frt-gmbh.com

Asia / Pacific

FRT Shanghai Co., Ltd.
 +86 21 3876 0907
 +86 21 3876 0917
 info@frt-china.cn

America

FRT of America, LLC (West)
 +1 408 261 2632
 +1 408 261 1173
 info@frtofamerica.com

FRT Distributors: <http://www.frt-gmbh.com/en/locations-and-distributors.aspx>

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