INSIDIX
NON-DESTRUCTIVE TESTING

DATA SHEET

TDM-IC

TOPOGRAPHY AND DEFORMATION MEASUREMENT

ABSOLUTE 3D CARTOGRAPHY

TDM is a patented tool for warpage analysis under a temperature profile. TDM uses the fringe projection technology (also called projection moiré) for non-contact, full-field acquisition of 3D topographies with a resolution down to 1.5 µm. TDM-IC acquires a full, absolute 3D cartography of devices with dimensions up to 100 mm x 100 mm (field of view up to 75mm x 75 mm). Simultaneously, its powerful heating and cooling capabilities allow for virtually any temperature profile on the sample under test. The integrated software package provides tools for representation of the results as 3D plots, vectors diagrams, isometrics views, and 2D profiles following user-defined profile lines (e.g., diagonal plots).

TABLETOP INSTRUMENT IDEAL FOR LABORATORY USE:

- **Component qualification for reflow profile compatibility**
- **Component curing process optimization**
- **Component characterization following JEDEC 22B112A and IPC/JEDEC J-STD-020D standards**
- **Fast aging test profiles, ON/OFF cycles, etc.**

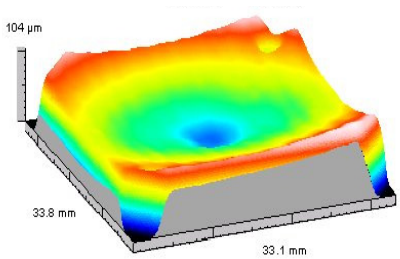
ADVANTAGES:

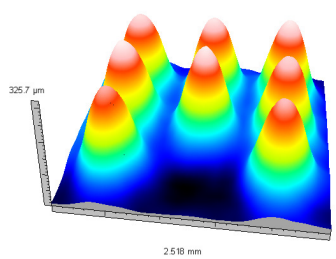
- **Independently controlled top/bottom heater banks for superior temperature uniformity**
- **Ultra high resolution camera for fine feature analysis (e.g., measurement of solder balls/bumps, leads, pins, etc.) and more accurate warpage measurements**

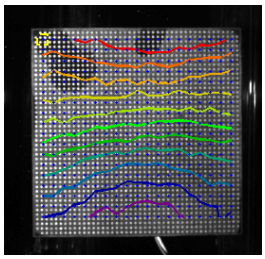
The TDM–IC is the ideal topography and deformation analysis system for warpage measurement on integrated circuits such as BGA, flip chip and PoP devices. The TDM-IC system is equally suitable for the analysis of small assemblies, allowing testing of the thermal behavior of components soldered on a PCB. The TDM-IC is the culmination of INSIDIX-developed technology and research, capable of producing unrivalled thermal performance and high resolution topography, in a handsome tabletop instrument.

DIC (DIGITAL IMAGE CORRELATION) PACKAGE adds CTE and strain measurement capability and helps the user identify potential CTE mismatches between components and PCBs. This valuable option completes the reliability/failure analysis program, allowing for the analysis of potential in-plane deformation issues.

From left to right: BGA warpage; solder ball characterization; y-axis in-plane deformation (using DIC)







INSIDIX
NON-DESTRUCTIVE TESTING

DATA SHEET

TDM-IC

TOPOGRAPHY AND DEFORMATION MEASUREMENT

TECHNICAL DATA

Imaging	Direct sample illumination, non-contact measurement
Maximum sample size	100mm × 100mm
Field of view (x,y)	50 × 50 mm 20 X 20mm (Option) 75 X75 mm (Option)
Depth of view (z)	Up to 25 mm
CCD camera resolution	4 megapixel
Capabilities	Out-of-plane topography analysis: z(x,y) Out-of-plane deformation analysis: Δz(x,y) In-plane deformation analysis: (Δx, Δy)/(x,y) (Option)
Accuracy	+/-3 microns or 3% of measured value, whichever is greater In-plane measurement : 5 x 10^{-5} of length of sample

HEATING AND COOLING

Temperature range	Room temperature to 270°C continuous
Heating method	IR lamps - top and bottom
Heating rate	Up to +3° C/s
Cooling method	Regulated flow of compressed air
Cooling rate	Up to -6° C/s above 120° C

SOFTWARE

Acquisition	TDM-Control (system control & measurement acquisition)
Topography (z) representation	TDM-Warpage (3D topography and warpage visualization): Color cartography, isometric view 3D surface diagrams
In plane (Δx,Δy) representation	Vectors diagrams, strain fields, iso-displacement lines

MECHANICAL

Footprint	85 cm x 75 cm x 65 cm
Weight approx.	140 kg
Utilities	Electricity: 230 VAC, 50 Hz, single phase Compressed air: 6 bar

INSIDIX NON-DESTRUCTIVE TESTING
24 rue du Drac
38180 Seyssins - FRANCE
insidix@insidix.com
www.insidix.com