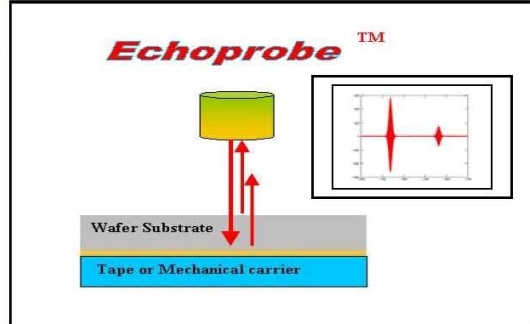


# FSM 413-200 Wafer Thickness Mapper

**Non Contact Wafer Thickness Metrology for ultra thin background or chemically etched wafers. Measures patterned, bumped wafers on tapes or bonded on carriers, for stacked die and MEMS applications.**

## UNIQUE ADVANTAGES

The FSM 413 Echoprobe™ sensor uses patent pending infrared (IR) interferometric technique, which provides a direct and accurate map of thick to ultra-thin wafers measurement of substrate thickness, and thickness variation (TTV). Several materials transparent in IR beam, such as Si, GaAs, InP, SiC, Glass, Quartz and many polymers are readily measured with standard spatial resolution of 60 microns spot, (smaller spot sizes are available). Using a Single probe system, substrate thickness of conventional wafers with patterns, tapes, bumps or bonded wafers mounted on carriers can be determined with high precision and accuracy. When configured as a Dual probe system, the FSM413 also provides measurements of total thickness of the wafer, including substrate thickness and the patterned height thickness. Options are available to measure wafer warp, trench depth and via holes, including high aspect ratio trenches and vias in MEMS type applications. Various specialized MEMS applications including membrane metrology and Bump Height metrology are also available.

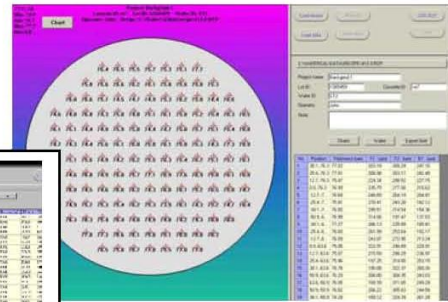
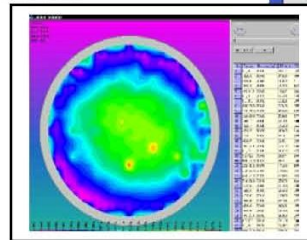


Echoprobe™ technology provides direct and accurate measurements of substrate thickness in ultra thin (<100µm) wafers or thinned substrate within a bonded structure



## FSM 413-200

Semi automated Wafer Thickness Mapper (Up to 200 mm). 413-300 for 300mm wafer, also available



## Specifications

**Technique:** Non-contact IR interferometry. Single or Dual Probes available  
**Wafer size:** 50, 75, 100, 200, 300 mm available. Customized wafer sizes also available  
**Substrate:** Si, GaAs, InP, Quartz, Glass, SiC, Sapphire \*  
**Thickness range:** 30 to 780 µm for Single Probe measurement  
 Up to 3 mm for Dual Probe (Total thickness) measurement  
**Wafer Loading:** Manual  
**Measurement Mode:** Semi automated with precision x-y stage  
**Resolution (Display) :** 0.01 µm  
**Repeatability:** 0.1 µm (1 sigma) in Single Probe\*\* Mode  
 0.8 µm (1 sigma) in Dual Probe\*\* Mode  
**Accuracy:** 0.5 µm (1 sigma) \*\*  
**Measurement Points:** Programmable  
**Substrate Thickness Results:** TTV, Mean, Maximum, Minimum, StDev, 2D and 3D Color Maps

### OPTIONS

**Warp Measurement range:** Contact FSM for details  
**Warp Repeatability:** Contact FSM for details  
**Surface Roughness:** RMS range of 20 – 1000 Å  
**Trench Depth Measurements:** Contact FSM for details  
**Polyimide Film and Epoxy Thickness Measurements:** Contact FSM for details

**Bump Height Metrology:** Contact FSM for details  
**Dimensions (Main Equipment):** 413-200: 26"(W) x 36"(D) x 56"(H)  
 413-300: 32"(W) x 46"(D) x 66"(H)

**Weight (Gross):** 500 lbs  
**Power:** 110 or 220VAC, 50/60 Hz, Single Phase, 3 wire  
**Vacuum Required:** 100 mm Hg

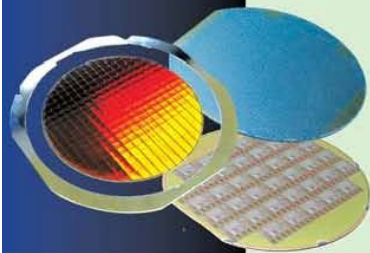
\* Surface must be smooth (generally roughness < 0.1 µm, RMS)  
 \*\* On 150 µm thick unpatterned double sided polished undoped Si wafer

## OTHER APPLICATIONS

**Trench Depth Measurements**  
**Surface Roughness**  
**Thin Film Thickness Measurements**  
**Epoxy Thickness Measurements**  
**Warp Measurements**  
**Bump Height Metrology**



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# ***Echoprobe***

## **Ultra Thin Wafers Thickness Metrology**

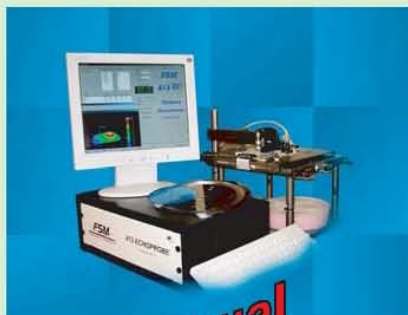
### ***Measures & Maps TTV***

- Ultra thin wafers ( < 100  $\mu\text{m}$  )
- Bumped wafers
- Wafers with tapes
- Wafers on Dicing frames
- Warped wafers

### ***FSM 413 Series***



***Semi auto***



***Manual***



***Fully auto***



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