
Processes for Utilizing Laser Machined Metallized Polyimide for Electronic Circuit Applications

ACA evaluation

Repairable Chip on Board (COB)

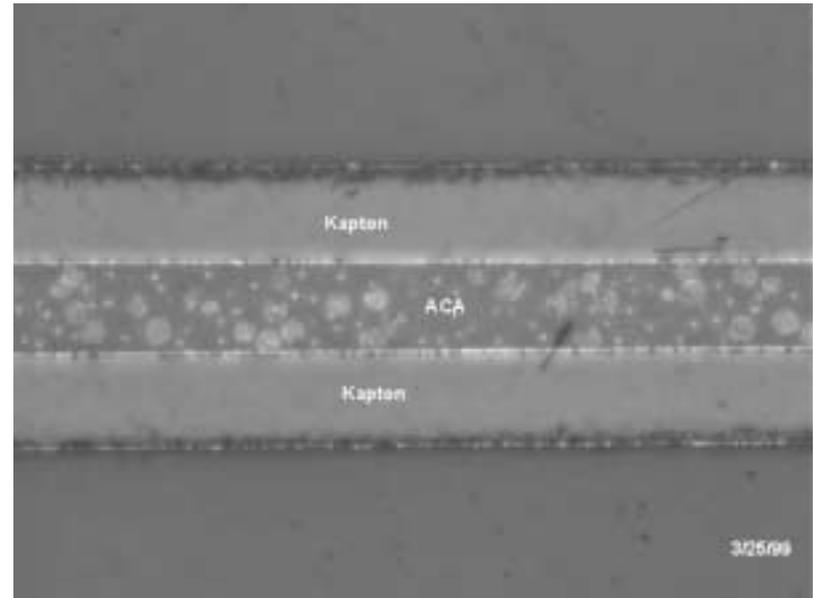
Conformal Coating Remove

Outline

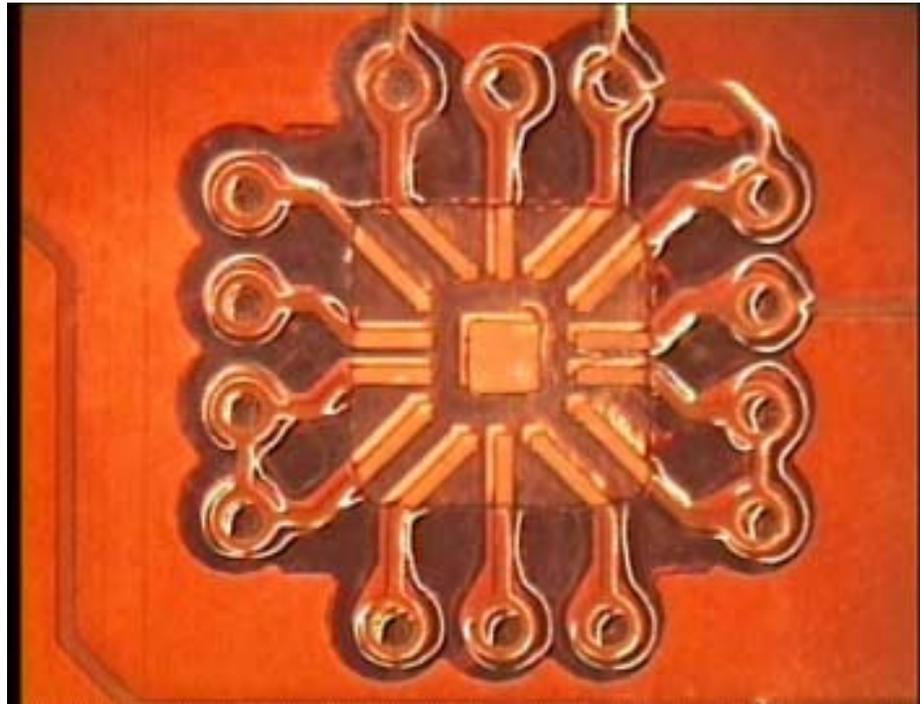
- 1Q: ACA evaluation
- 2Q: Reparable chip on board (COB)
 - Inquiry of materials
- 3Q: Test set up and test evaluation
 - Wirebonding and glob top process
 - Temp. cycles: -55C to 125C for 10 cycles
- 4Q: Laser cut die and rebonding
 - Wirebonding on 2nd layer
 - DPA of glob top and die interface

Anisotropic Conductive Adhesive (ACA) Evaluation

- Kapton to Kapton connection with ACA
- Test Plans
 - Electrical testing
 - Peel strength
- Cross-sectioning
 - reveals gold balls within ACA connected between top kapton through bottom kapton which makes conducting path

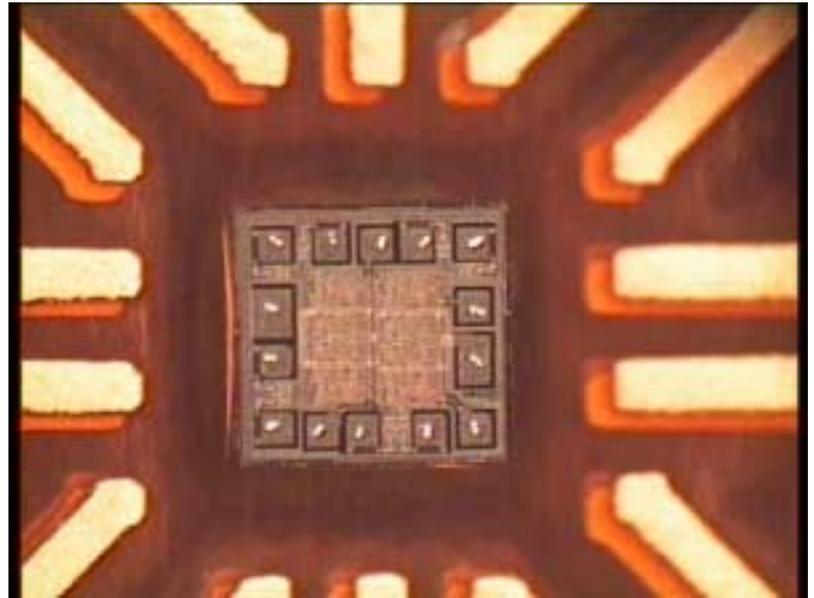


Repairable COB



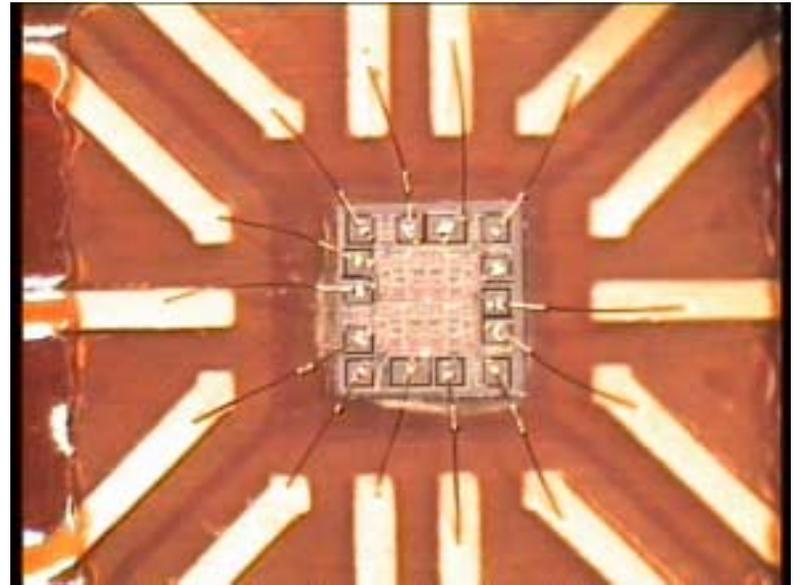
Die Attach Process

- Board : Rigid-flex
 - Republic Technology
 - allows 3 repairs
- Die: 74HC00
 - NAND Gate from TI
- Die attach: 84-1LMI
 - silver filled conductive epoxy from Ablestik
 - cured in the oven at 125 degree C for 2 hours

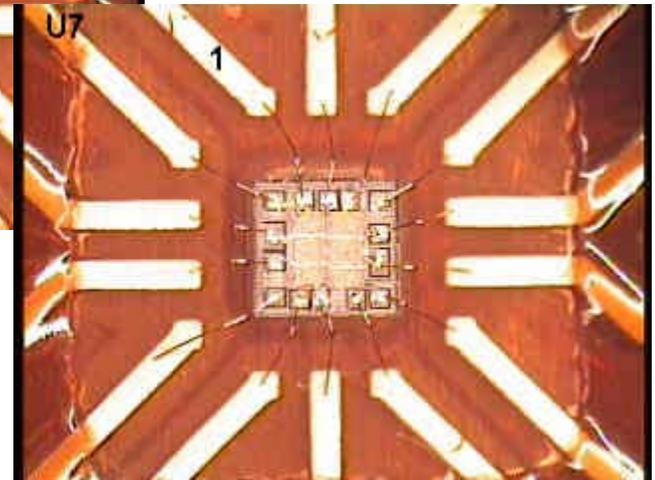
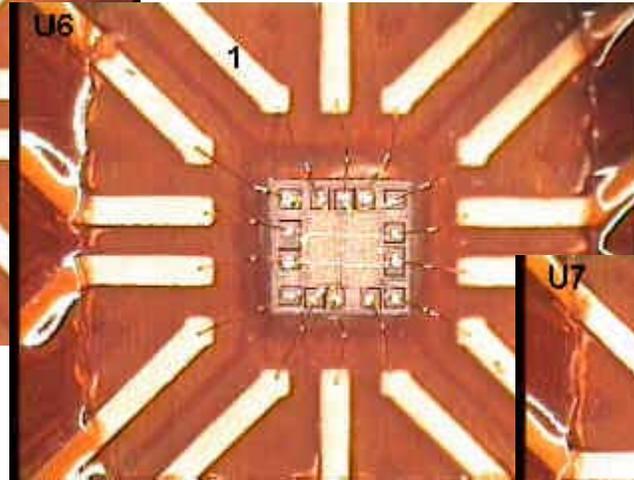
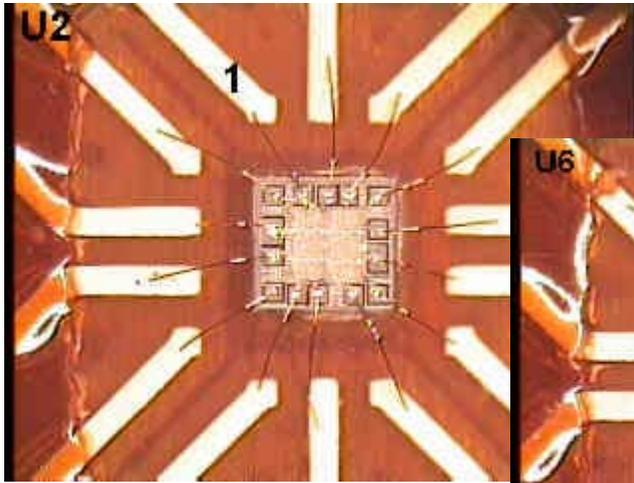


Wire Bonding Process

- Cleaning
 - plasma cleaning with argon gas
- Wire Bonding
 - 1 mil gold wire
 - wedge bond
- 5 Boards has been wire bonded

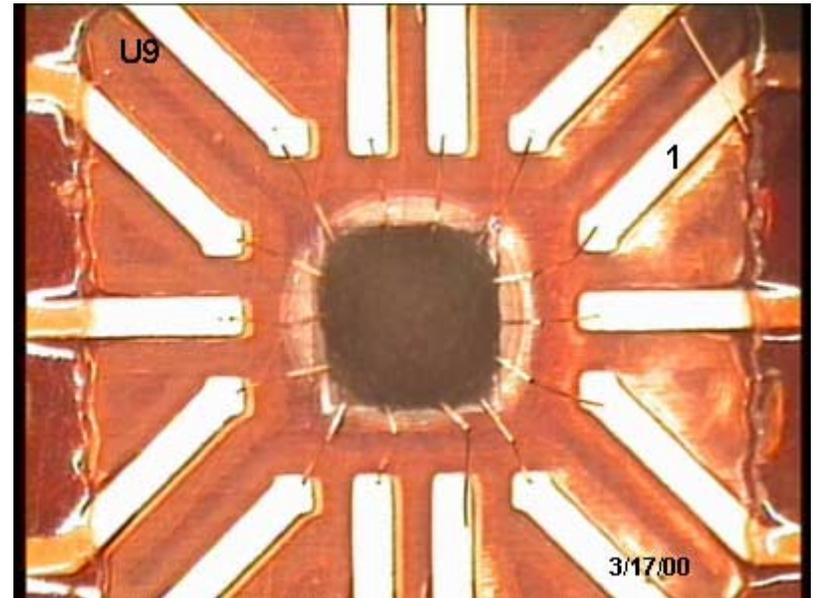


Wire Bonds

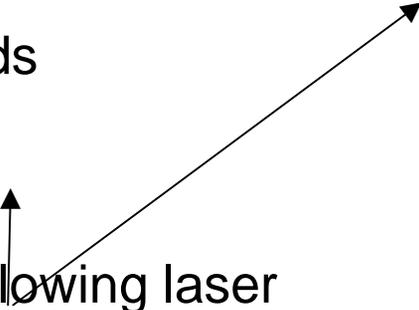


Glob Top

- Glob top materials
 - Thermosett: ME430
 - Dexter: hysol-FP4323
 - Dexter: hysol-EO1059
- Manually applied
 - glob top on a die
 - encapsulate the die and the wires



Test Plans

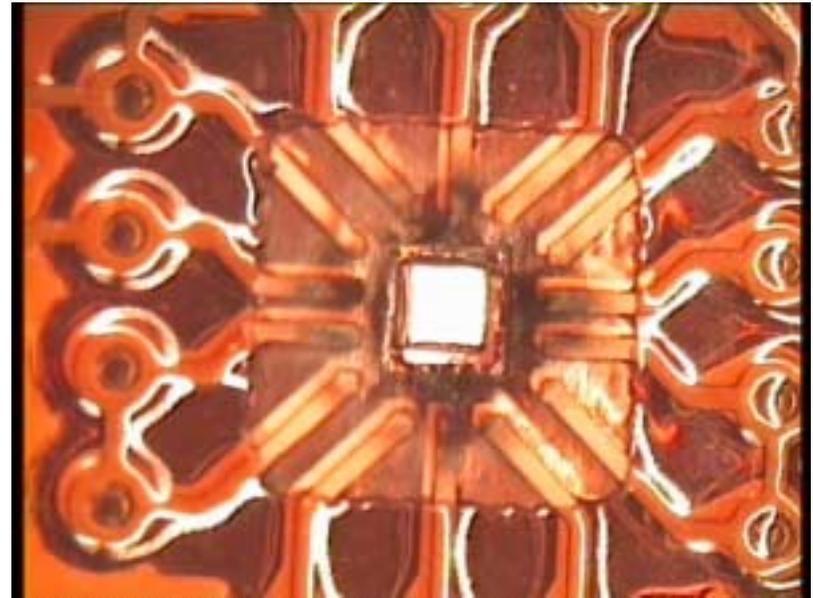
- Temperature cycles per MIL-STD-883, TM1010, Vacuum 10^{-5} torr
 - from -55C to 125C for 20 cycles
 - bare boards
 - Repeat following laser machining and repopulating sites
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- Temperature cycles per MIL-STD-883, TM1010, Vacuum 10^{-5} torr
 - from -55C to 125C for 20 cycles
 - evaluate glob top and die interface
 - evaluate glob top and wire interface

Destructive Physical Analysis (DPA) Result

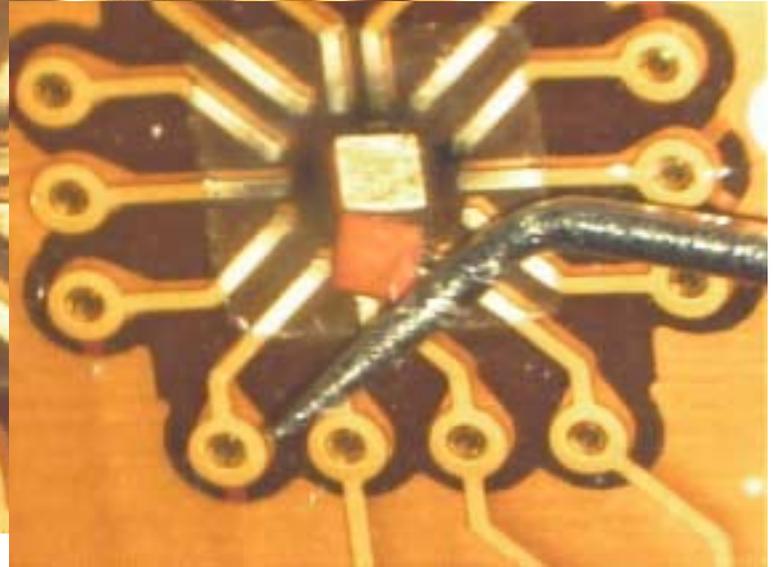
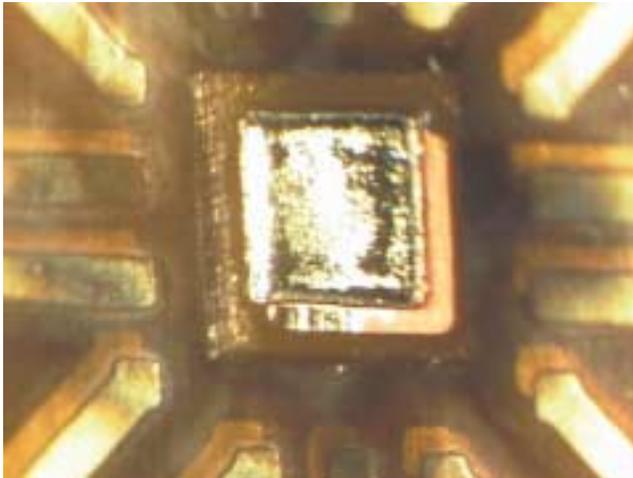
- Destructive Physical Analysis (DPA) [Planned]
 - cross-sectioning
 - SEM images of any defect

Laser Cutting Process

- UV Laser machining
 - several different number of pulses used.
 - Lowest and highest worked
 - looking at other factors which determine success such as registration



After Laser Cut around the Die Area



April 12, 2000

Q2 status

