

# IC ASSEMBLY AT MTTC

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PLANAR DEVICES (DIODES, MOSFET, BIPOLARS), RELEASED MEMS PACKAGES, AND MANY OTHER APPLICATIONS...

# INTRODUCTION OF NEW MTTC CAPABILITIES

- ☐ IC assembly and electrical characterization of discrete packages.
- ☐ From basic IC design to electrical characterization of assembled packages
- ☐ Over 20 years of experience in the field of wafer processing and wire bonding
- ☐ Bring your own IC or completely fabricate it in our fab and be assembled
- ☐ Technical support available before you start, during and after your project
- ☐ Educationally-motivated and industry-quality oriented

Become an experienced and successful candidate for working in Industry!

## TEACHING, TRAINING, AND LTD PRODUCTION SERVICES

ACQUIRE PRACTICAL SKILLS SOUGHT IN INDUSTRY RELATED JOBS

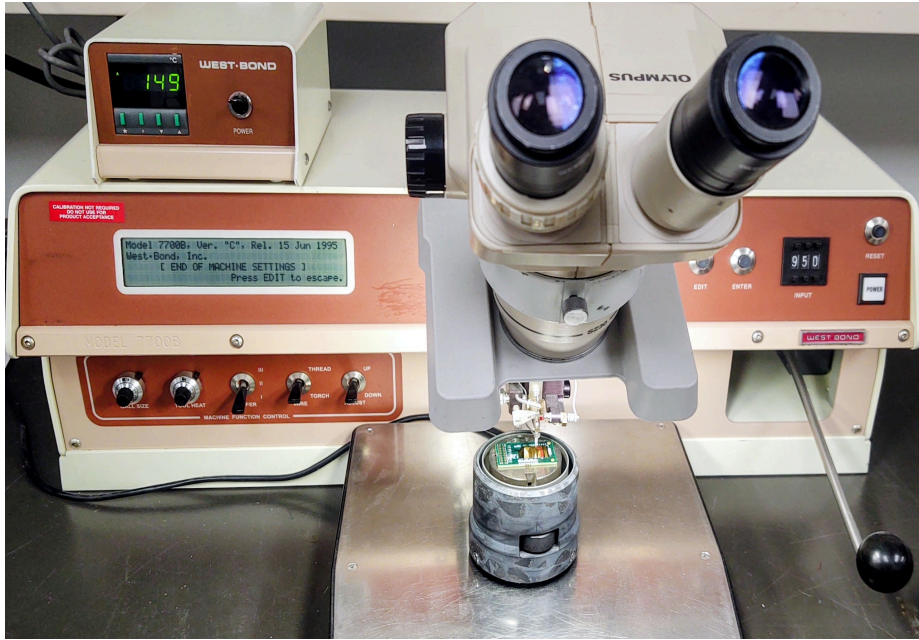


# VARIETY OF WIRE BONDRERS

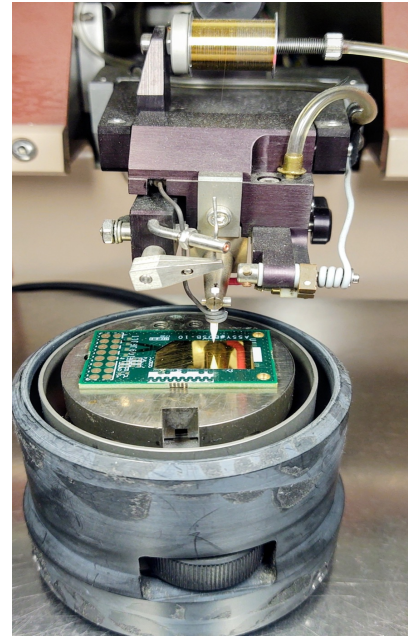
- ☐ Fine ball-wedge wire bonding
- ☐ Fine-medium wedge-wedge wire bonding
- ☐ Heavy wedge-wedge wire bonding
- ☐ Aluminum and Gold bonding wire available
- ☐ Wire sizes from 25-um to 150-um diameter
- ☐ Ribbon bonding capability for low inductance IC applications
- ☐ Loop height and step back control capability
- ☐ Equipment available for fully manual or semiautomatic wire bonding

## BALL, WEDGE, AND RIBBON ULTRASONIC BONDING

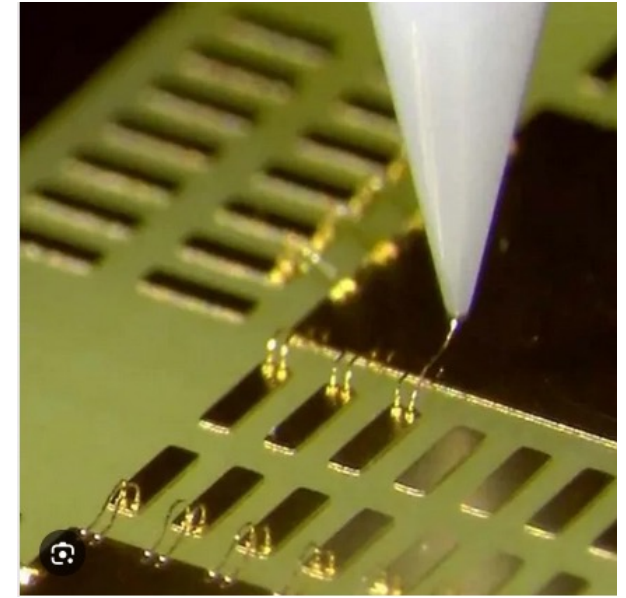
SELECT THE RIGHT CHOICE FOR YOUR APPLICATION!



Gold ball-wedge wire bonder for 1-2 mil diameter wire. Memory storage capability for frequently used recipes.



Heated (150 oC) sample holder with mechanical clamp, 360o thumb-rotation & height adjustment platform



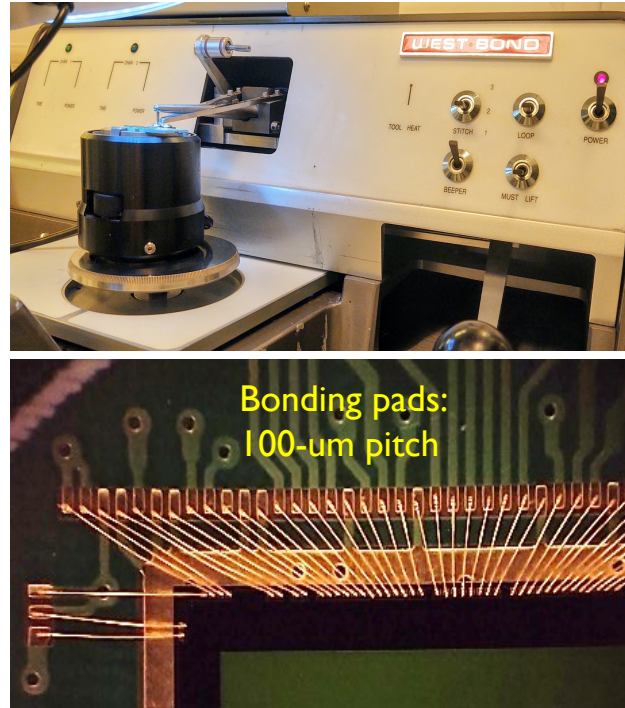
Sample of ball-wedge fine wire bonding

# WEST-BOND MODEL 7700B (PROGRAMMABLE)

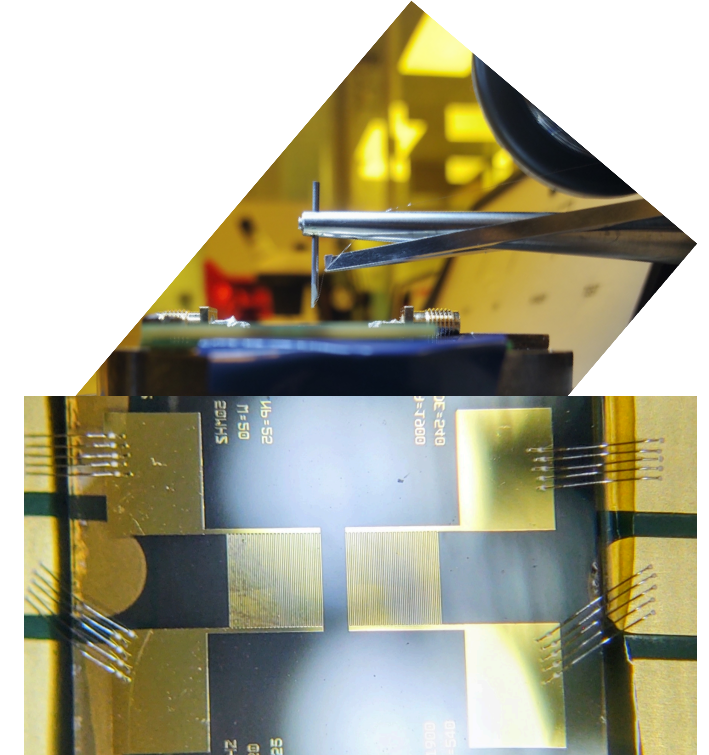




Gold and Aluminum wedge to wedge wire bonder for 1-3 mil diam wire.  
Modifiable for Ribbon bonding Capability



Heated (150 oC) sample holder with mechanical clamp, 360o thumb-rotation & height adjustment platform



- Deep access bonding tools available
- Flexibility for long length bonding wires.
- 1-3 stitches mode capability

# WEST-BOND 7400A (FULLY MANUAL)



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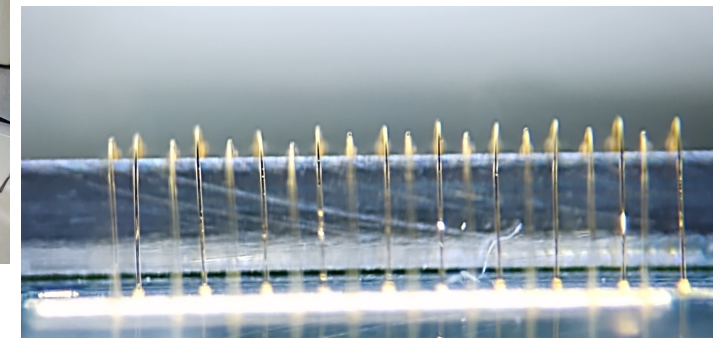
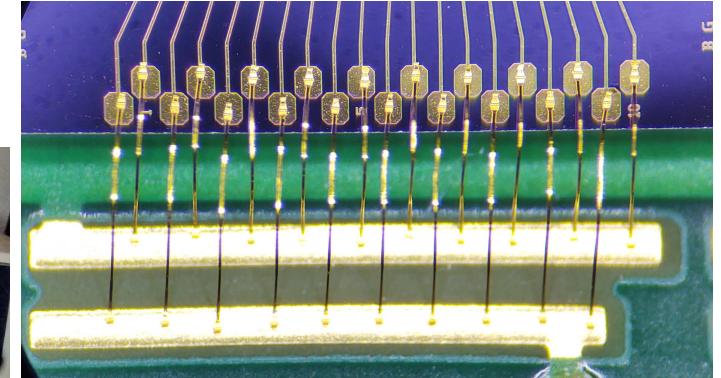




Gold and Aluminum wedge to wedge wire bonder with Loop shape and Step back reproducibility



- Motorized table for wire-loop control
- Heated 4" work holder & mechanical clamp
- 360° Rotation for work sample



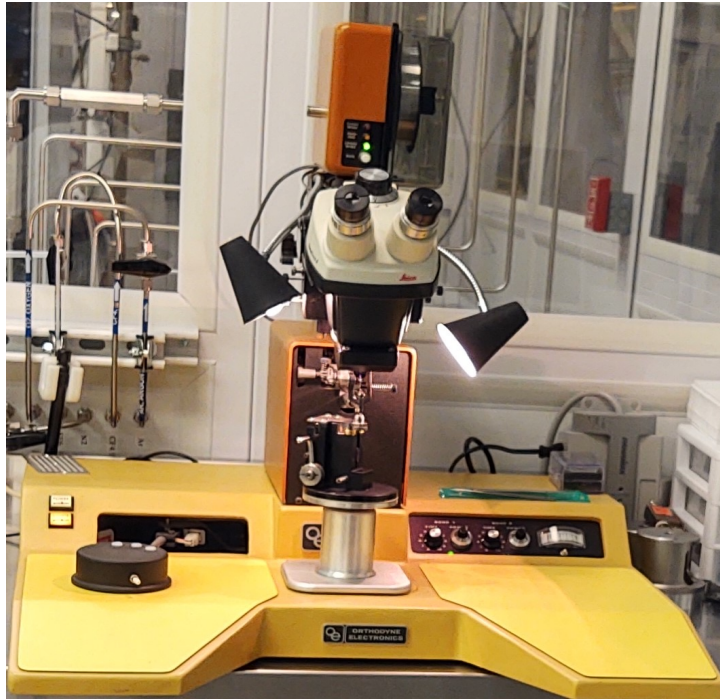
Top and side view sample of 1-mil Gold wire looping consistency

# K&S MODEL 4526 (WIRE LOOP SHAPE CONTROL)

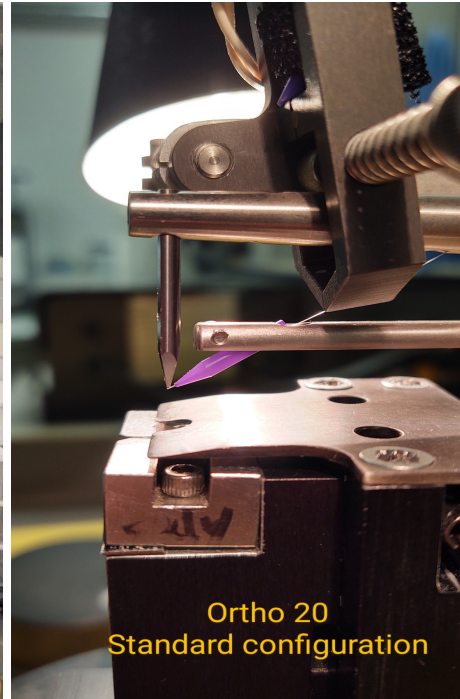


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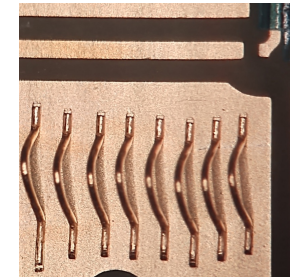
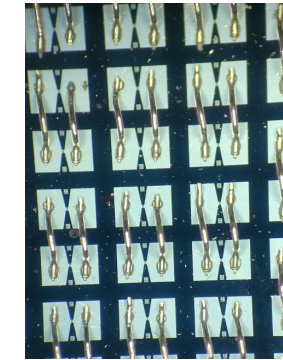
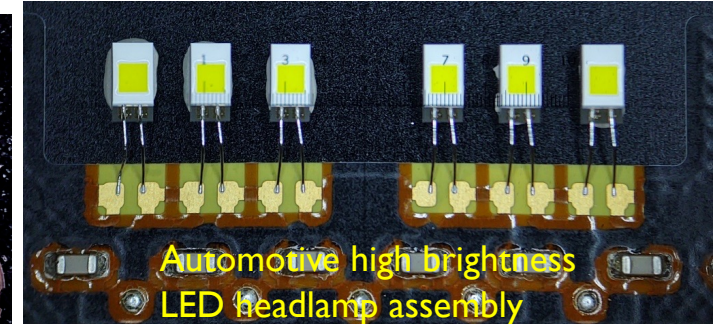




Heavy Gold and Aluminum wedge-wedge (4-10 mil) wire bonder with Loop-shape and Step-back control



- 360° Rotating pedestal
- Ideal for small PCBs and discrete IC packages
- Practical wire bonder for High Power devices



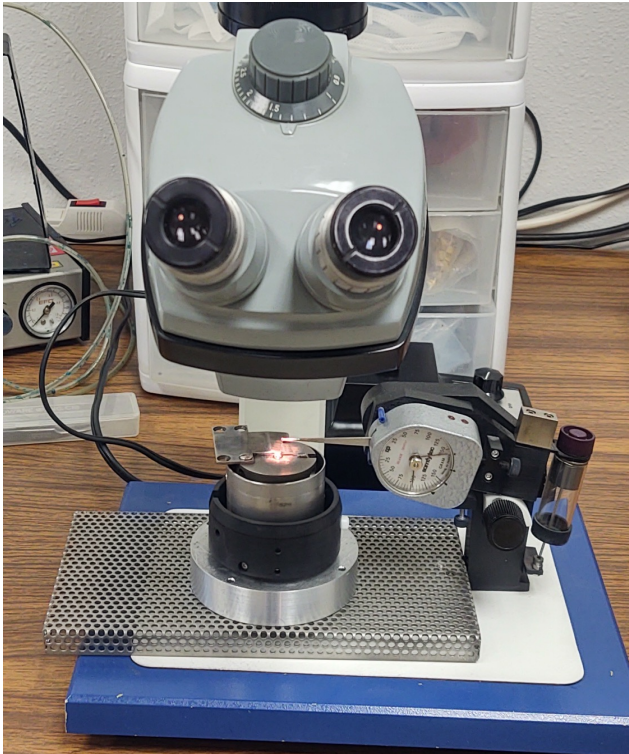
Samples of heavy (5-mil) Al and Au wire bonding consistency for High-Power IC applications

## ORTHODYNE MODEL 20 (SEMI-AUTOMATIC)

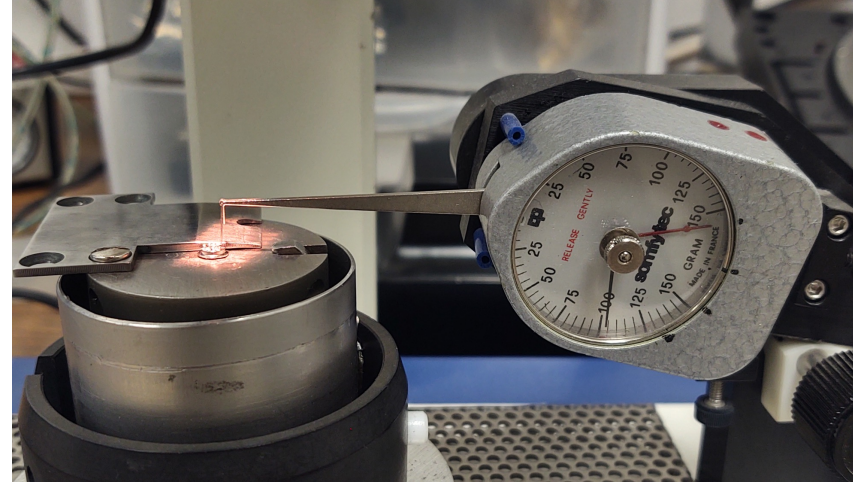


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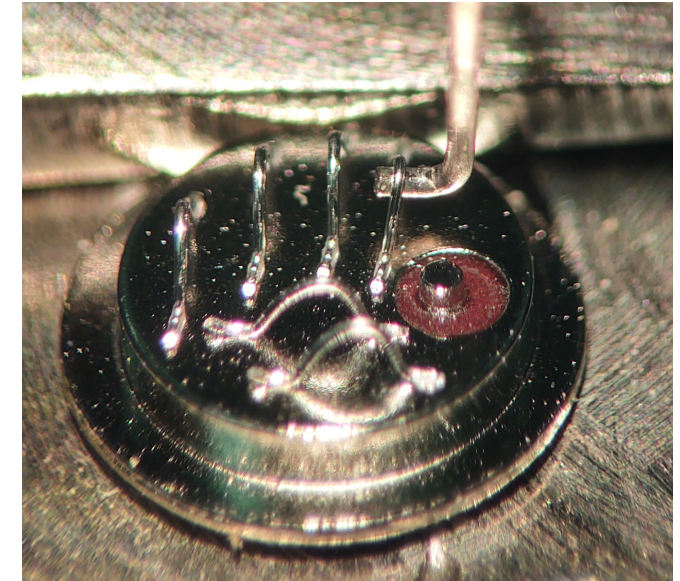




Pull test station for evaluating  
adhesion strength of wire bonds  
to IC and package



Dynamometers available for fine (<10 g) and  
heavy (<250 g) wire bonding pull testing.  
Get statistical results for reliability assurance



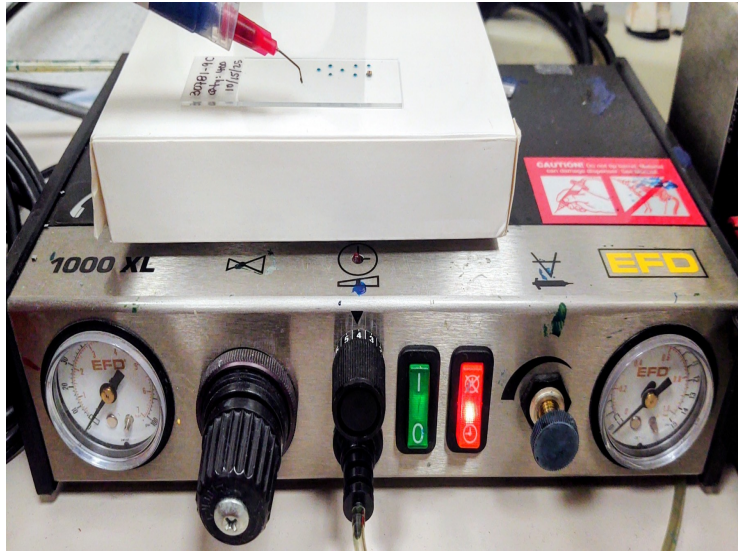
Sample of a "J" hook pull testing to  
failure a heavy (5-mil) Al wire bonded  
to a TO46 package.

## WIRE BONDING EVALUATION



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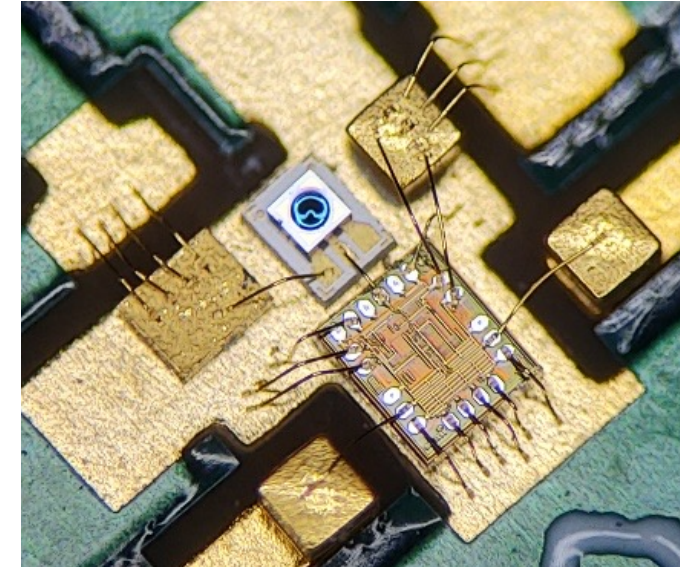




Pneumatic control availability to consistently dispense the right amount of epoxy to attach chip to package



Sample of production chips epoxy-attached to TO46 packages



Sample of a tiny Photonic die and SM-capacitors attached and wire bonded with 1-mil Au wire to a PCB

## DIE ATTACHMENT TO PACKAGE



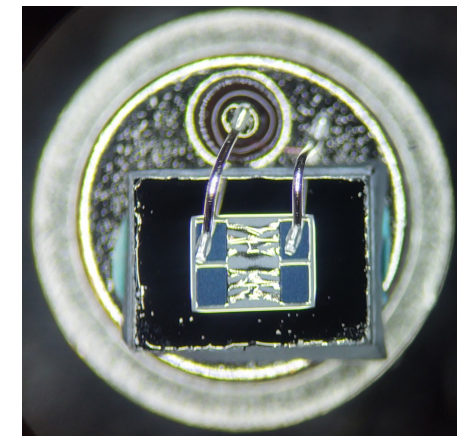
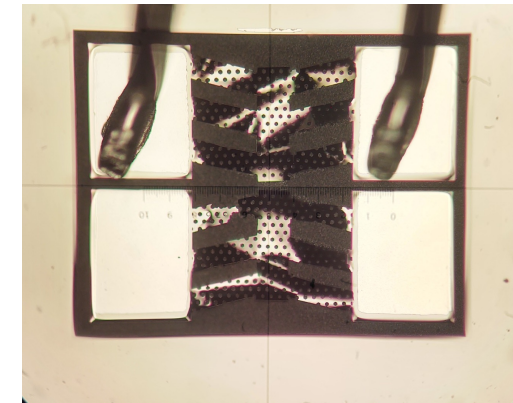
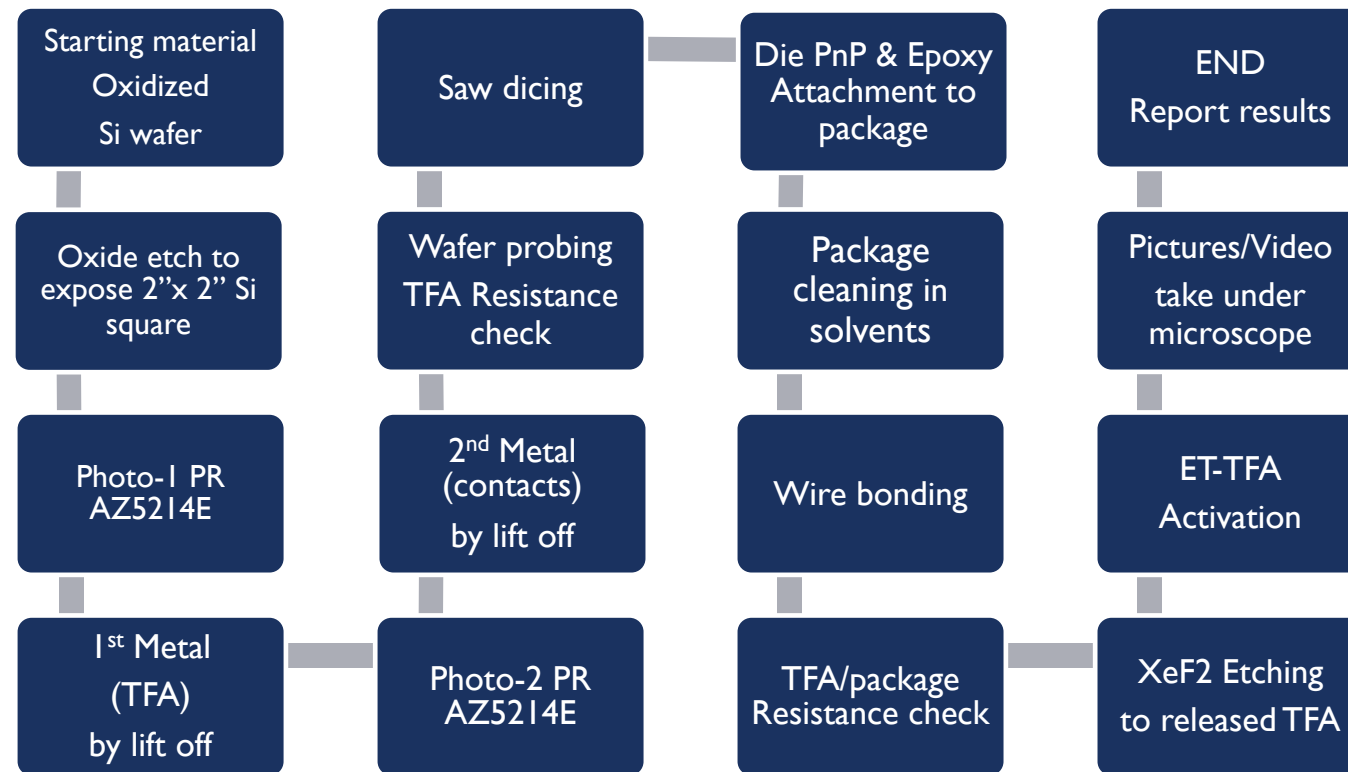
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## EXAMPLE:

# PROCESSING AND ASSEMBLY OF RELEASED MEMS PROTOTYPE – STUDENT PROJECT



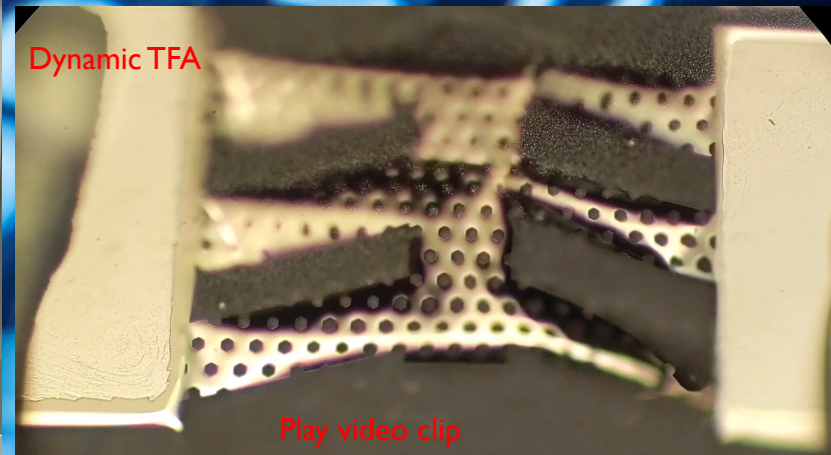
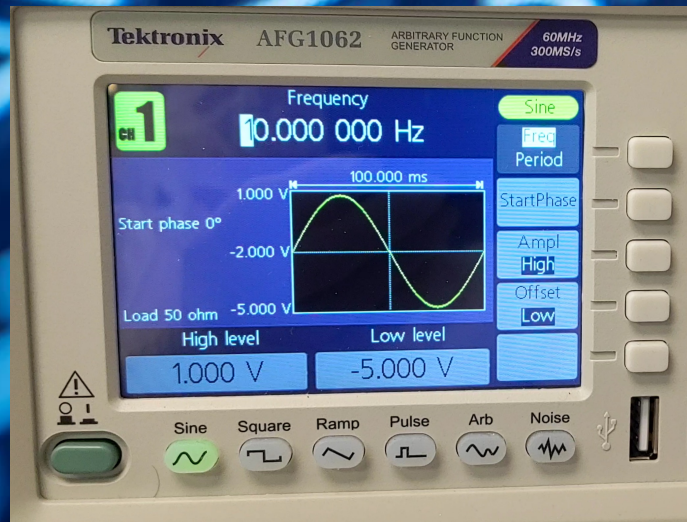
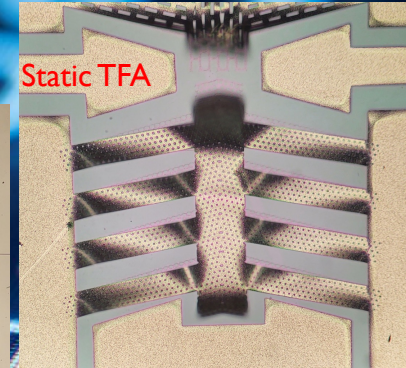
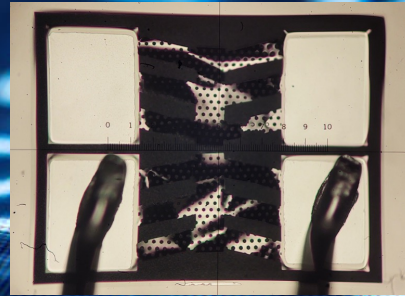
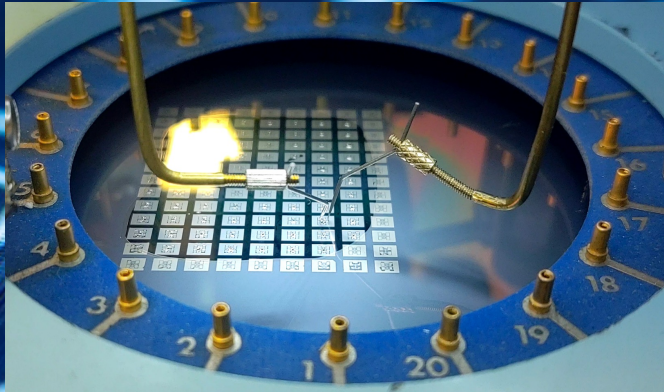
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# ELECTRICAL TESTING OF WIRE BONDED THIN FILM ELECTRO- MECHANICAL ACTUATOR

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### Bernardo Martinez-Tovar

- Holds a PhD in electrical Engineering from UNM-CHTM
- Joined MTTC as a Research Engineer in 2023
- Has 25+ years experience in the discrete IC manufacturing area
- His particular areas of interest cover the applications of Semiconductor devices used in the energetic materials industry: Oil and Gas, Automotive, Aerospace & Defense, among others.
- Currently teaching students and working with them in the clean room at MTTC
- Always motivated by new ideas that are focused on practical applications of IC, MEMS, and other semiconductor-related products.

## CONTACT INFORMATION

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