SCIPP/UCSC

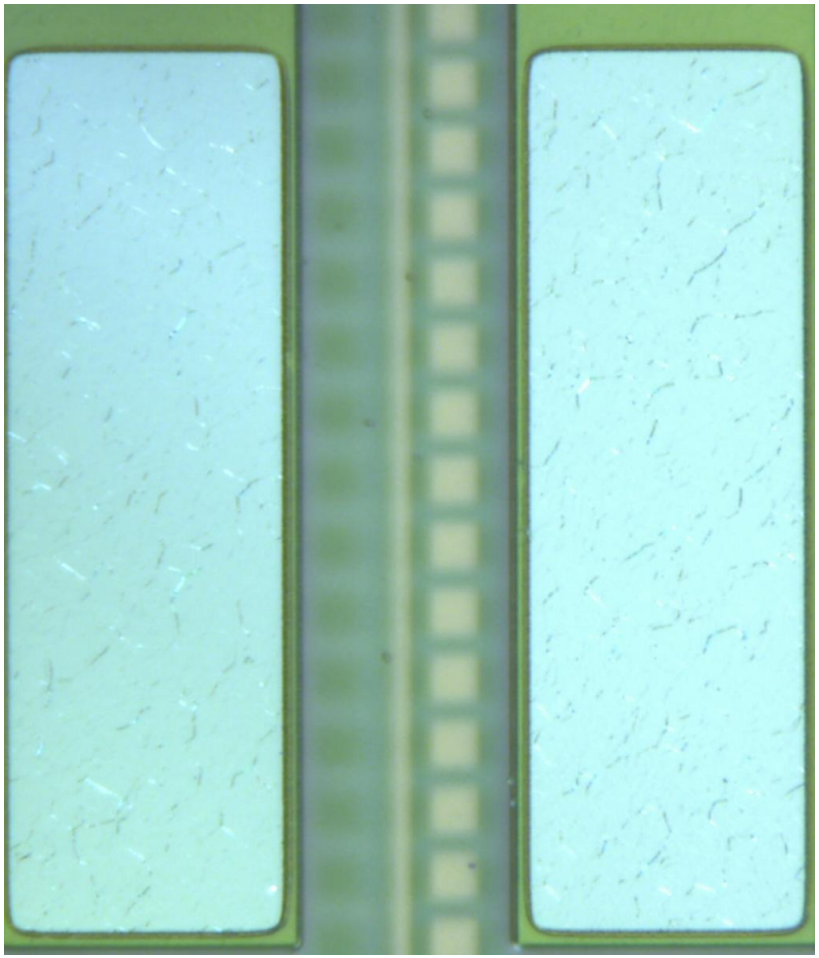
Forest Martinez-McKinney

ABC 130 Initial Bonding Trail

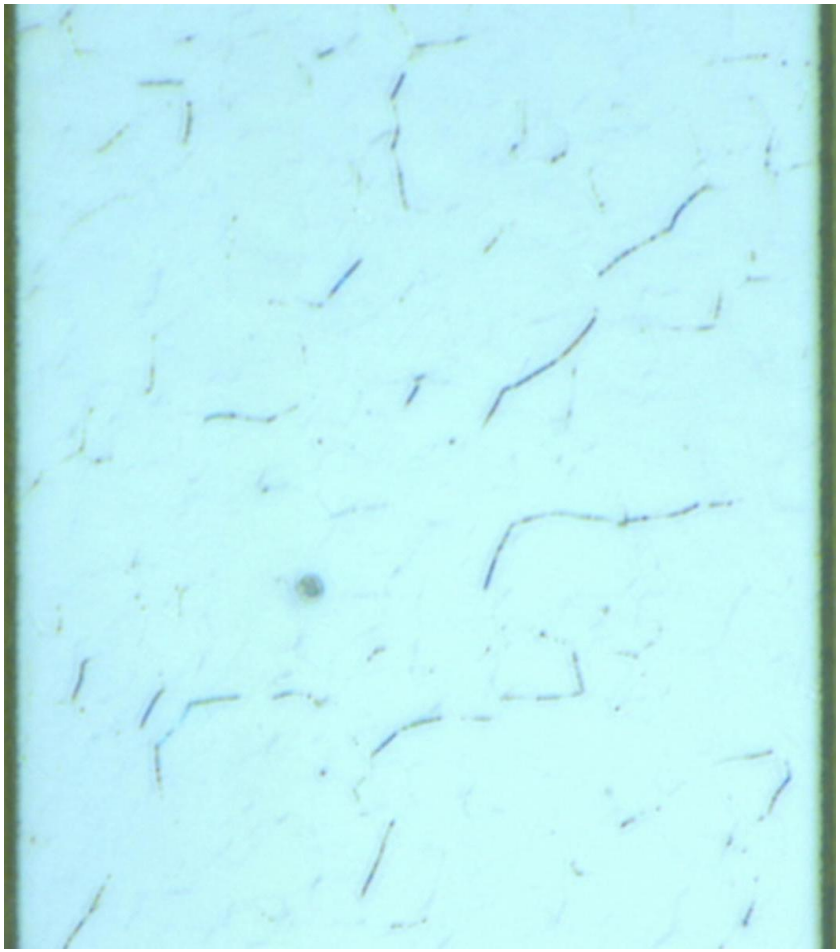
- Bonding Setup and Geometry
- Metal Appearance
- Visual Appearance
- Initial results
- More testing to come

Metal Appearance

1000X

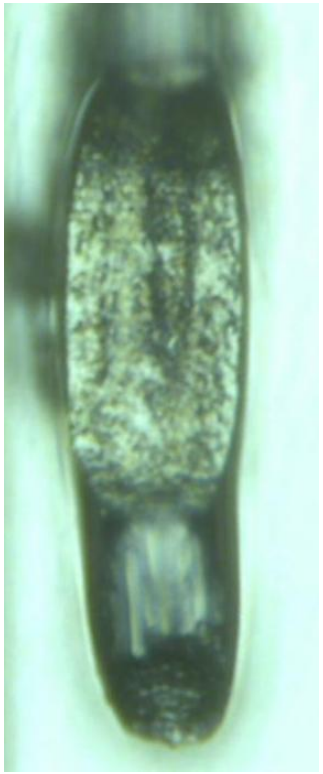


3000X



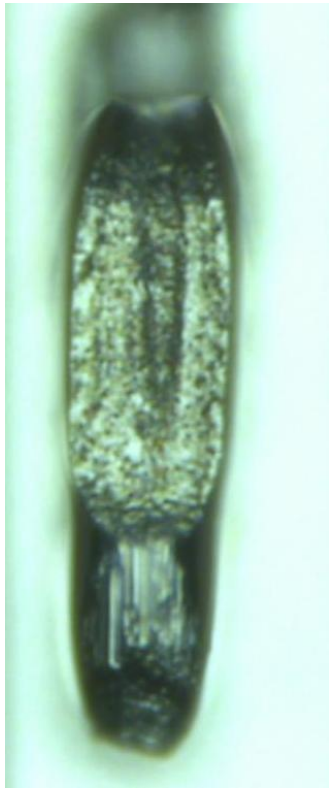
Visual Appearance of Bonds

Source 1

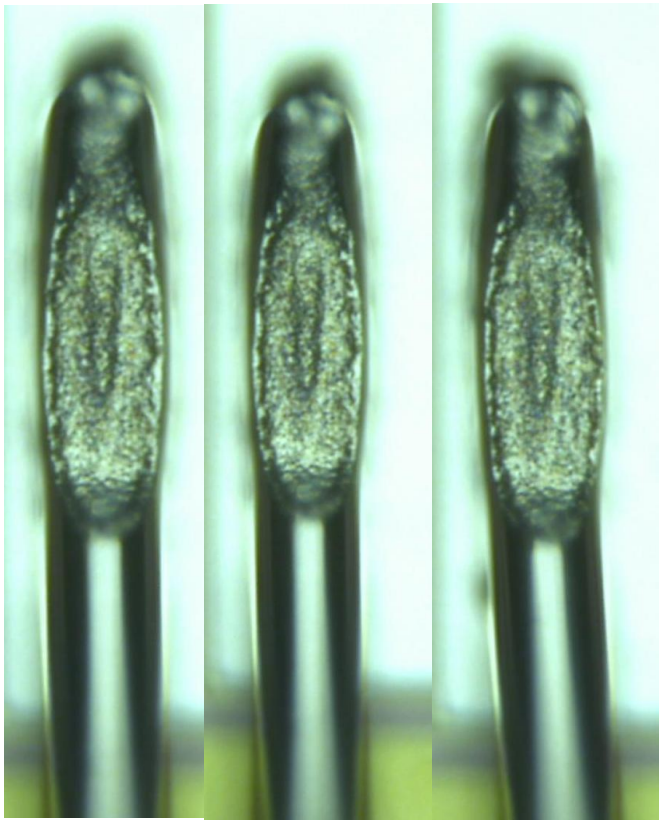


Source 2

Source 3

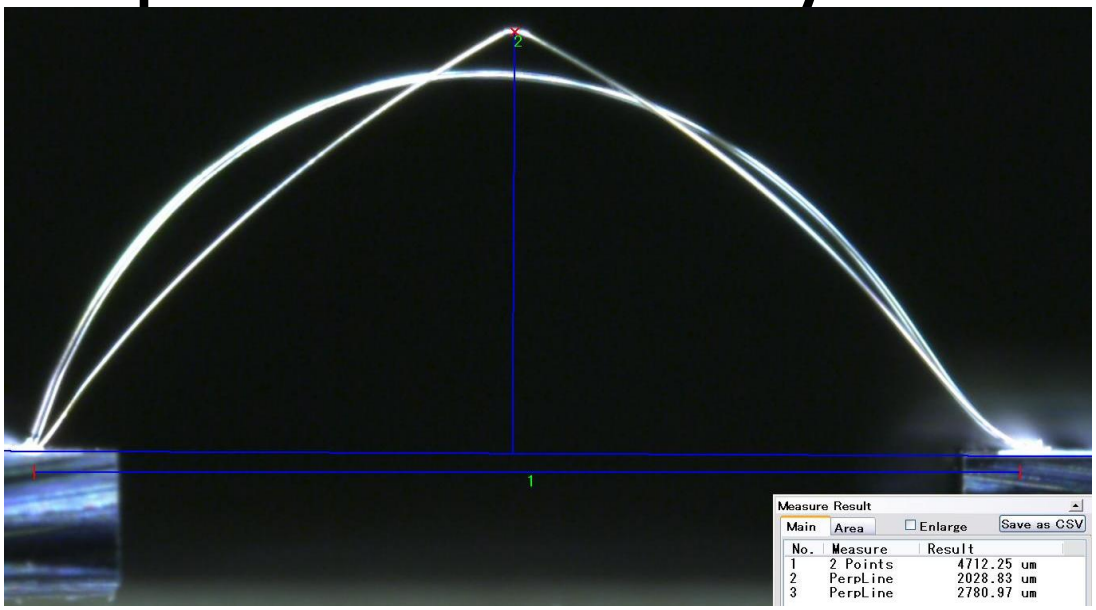


Destination 1, 2, & 3

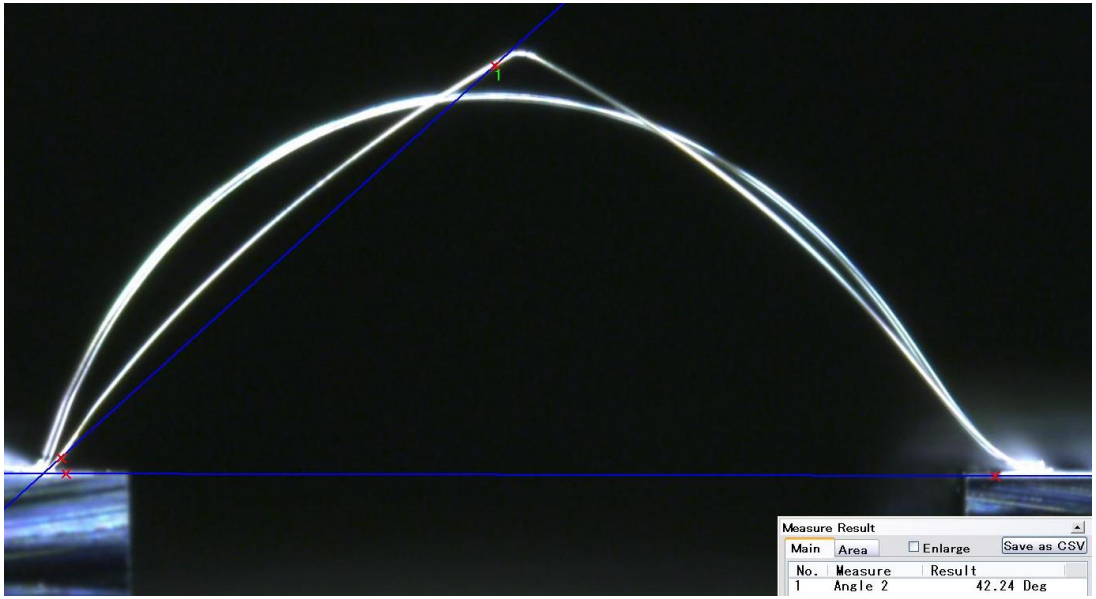


Bonding Setup and Geometry

Distance from Bonds = 4712um
Height = 2028um



Measured Angle = 42.23 degrees



Initial results

Bond pull strength (20 by hand):

Lowest = 11.5g

Highest = 15g

Average = 14.18g

Standard Deviation = 0.95g

Calculated wire tension from average bond pull force and measured angle of 42degrees = 10.6g

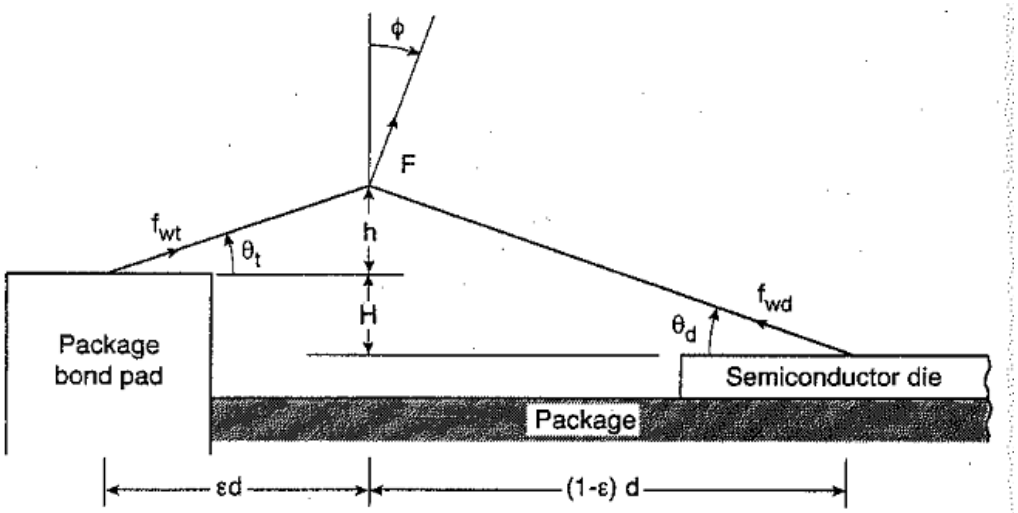


Figure T-1 Geometric variables for wire-bond pull test in the plane of the bond loop, as used in Eqs. (T-1) to (T-4) [T-6].

$$f_{wt} = f_{wd} = \frac{F}{2}\sqrt{1+\left(\frac{d}{2h}\right)^2} = \frac{F}{2\sin\theta} \qquad \text{(T-3)}$$

where $\theta_t = \theta_d = \theta$. Note that, in general, for bonds of a given strength, larger values of h/d will result in higher pull force, F, values.

G. Harmen: Wire Bonding in Microelectronics

Conclusions:

- Initial bond quality is good
- More work to be done on parameters to refine the source angle to match Bonding on Module
- More Work on Welding Parameters to reduce standard deviations