

# IC Failure Analysis Lab

*High Quality FA and Reliability Testing Company*

1719 South Grand Ave  
Santa Ana, CA 92705-4808

**Tel:** 949-329-0340

**Website:** [www.ICFailureAnalysis.com](http://www.ICFailureAnalysis.com)

## ***Failure Analysis Report***

F.A. Reference Number:	<b>ICFA 0001</b>
Alternate Reference Number:	N/A
Requester:	Andy Chuang
Device Number:	1040 (TSSOP 20)
Quantity:	1
Date:	Sep 10, 2008
Analyst:	F. Ma
Report By:	L. Young
Reviewed By:	David Johnson

## **Description**

One [REDACTED]1040 device was submitted to IC Failure Analysis Lab for competitive analysis. The request was to measure the die, analog, digital and RF blocks sizes. Identify the process technology used including number of layers, process geometry, number of metal layers and the metal composition.

### *Device Information*

Part Number	Lot Number	Date Code	Package
[REDACTED]1040	[REDACTED]74224	074101	TSSOP 20

## **Summary**

Package Information	
Package Type	SOP20
Package Size (L / W)	6.58mm/4.26
Pins Numbers	20
Package Thickness	0.90mm
Pin Size (L / W)	0.9547mm/0.2048mm
Die Information	
Process	0.25um 1 Poly & 4 Metals
Die Size (X / Y)	W/O scribe line 1839um/2646um With scribe lien 1938um/2744um
Pad Size (L / W)	84.14um/73.36um
Gold Ball Diameter	52.50um
Die Thickness	0.2508mm

## **Analysis**

### External Visual Examination:

Top and Bottom optical photos of the submitted board and device were taken (Reference figures 1, 2 and 3).

Die Measurements:

The device was decapsulated and die surface geometries were measured (Reference figures 4, 5, 6, 7, 8 and 9)

Cross-Section Analysis:

The die was cross-sectioned and various aspects of the die were measured (Reference figures 10 to 20).

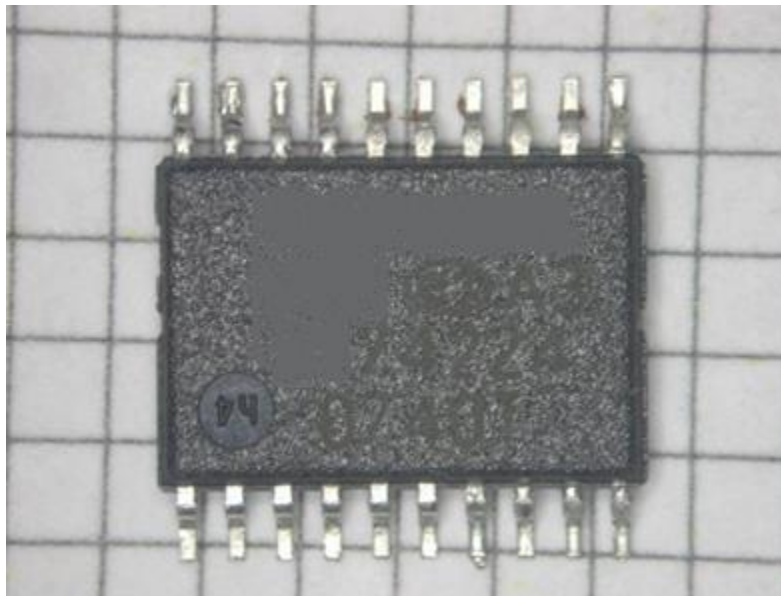


Figure 1: Top side of sample

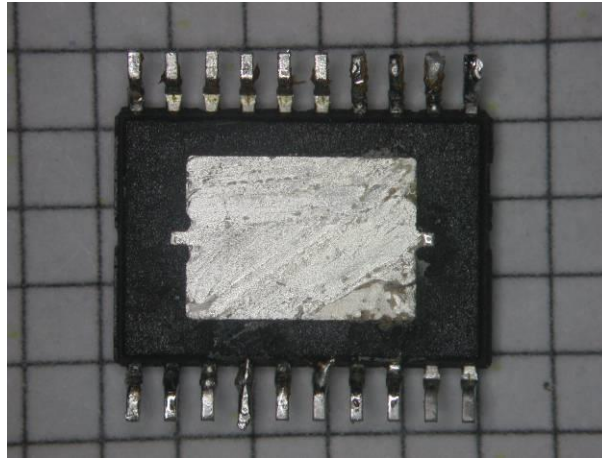


Figure 2: Back side of the sample

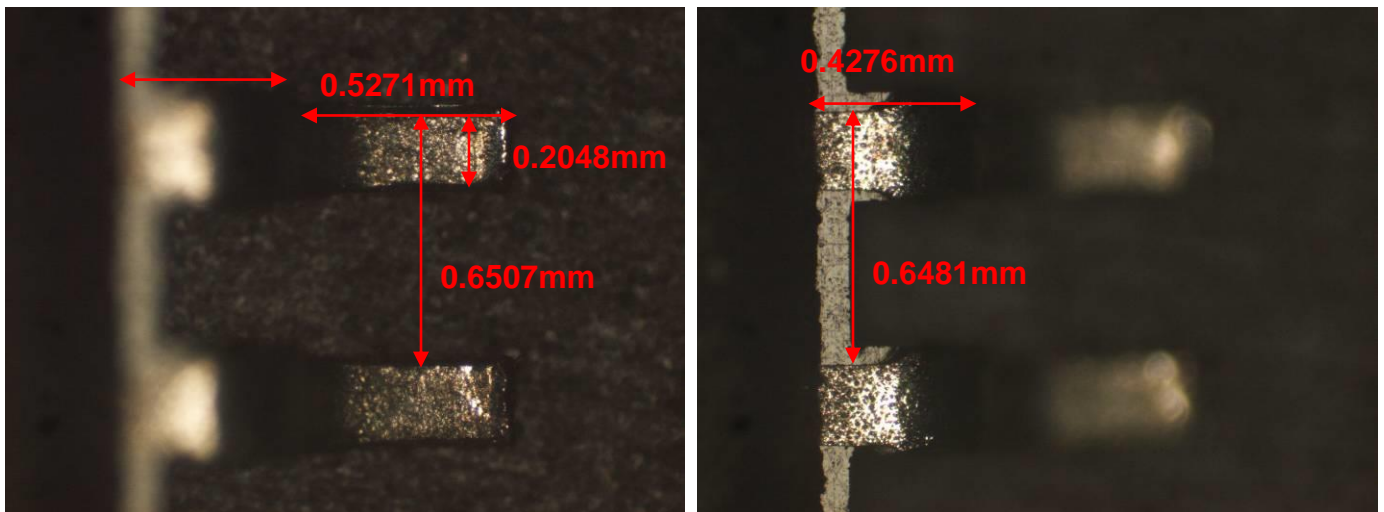


Figure 3: Lead size and pitch measurements

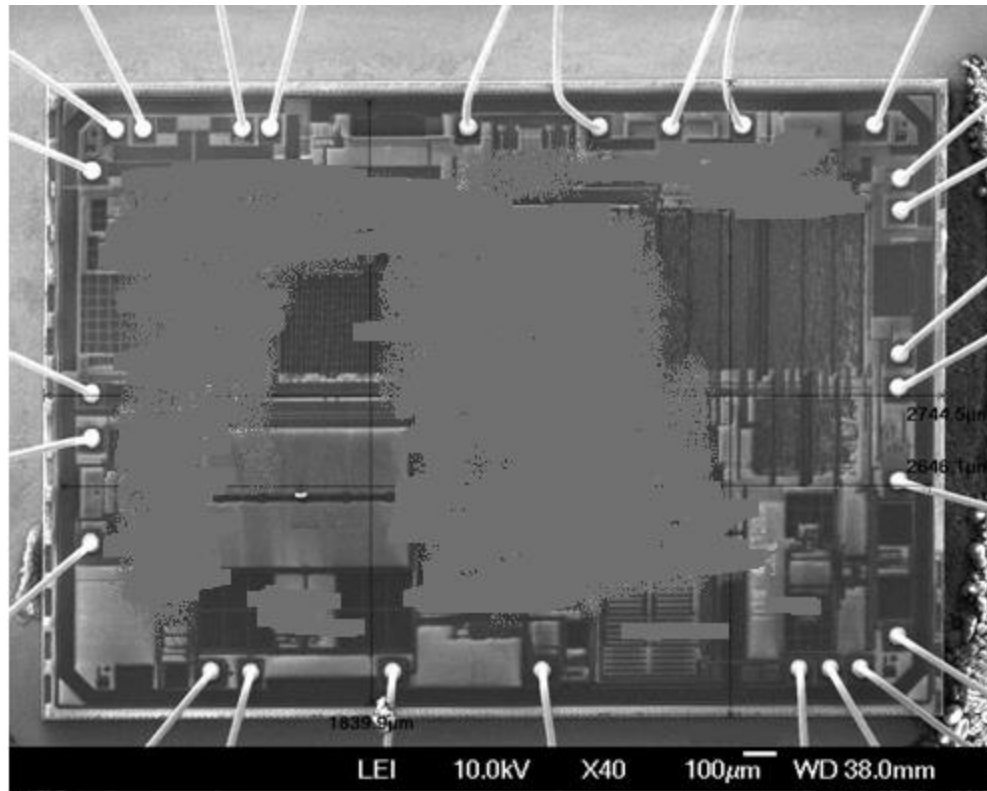


Figure 4: Die surface measurement – *Image is edited*

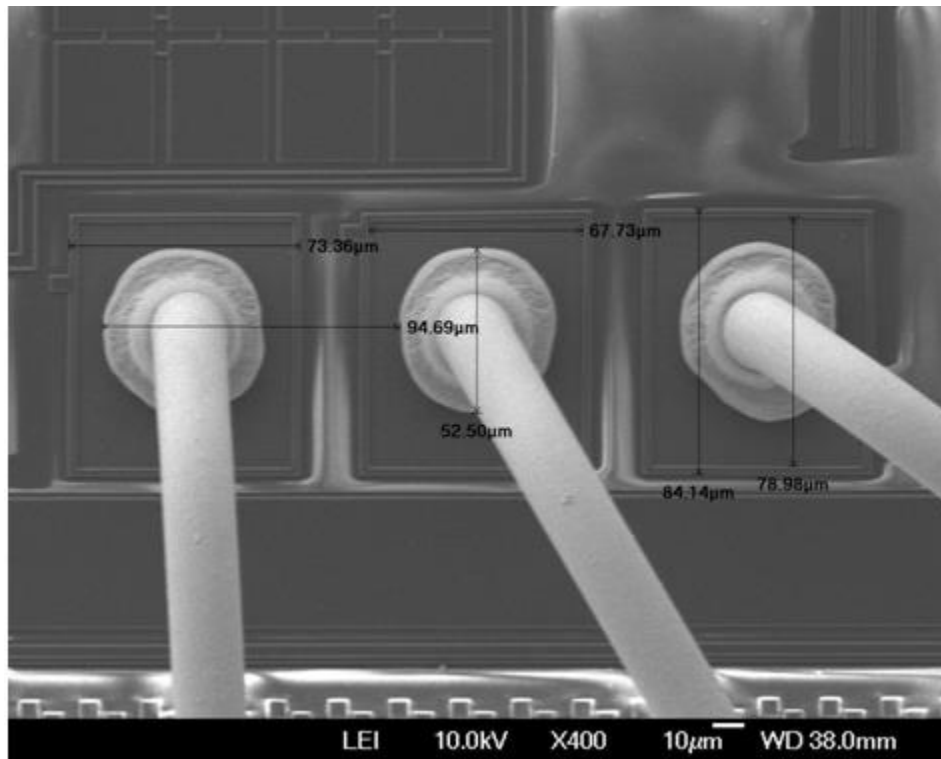


Figure 5: Pad and bonding area measurements

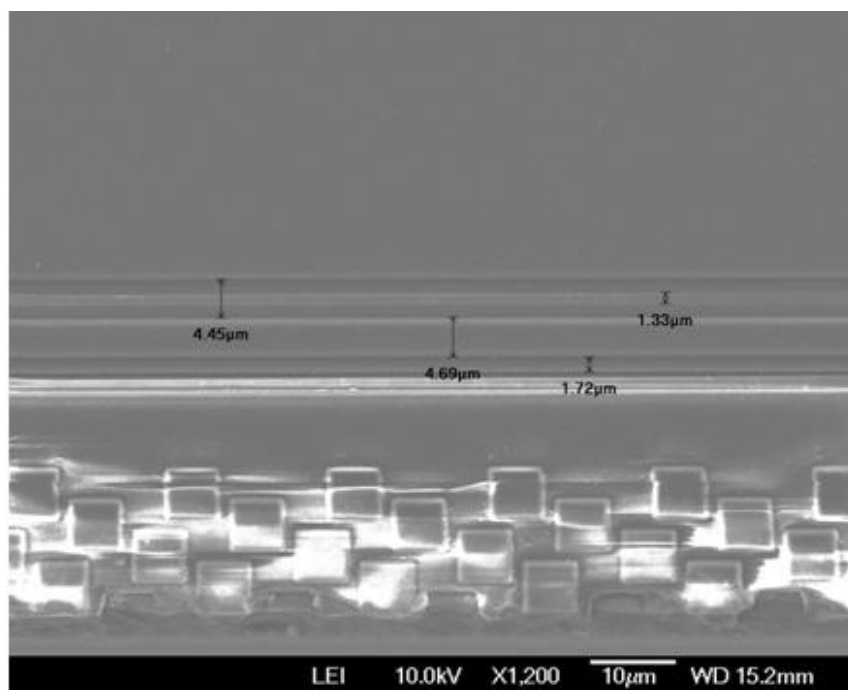


Figure 6: Seal ring measurements

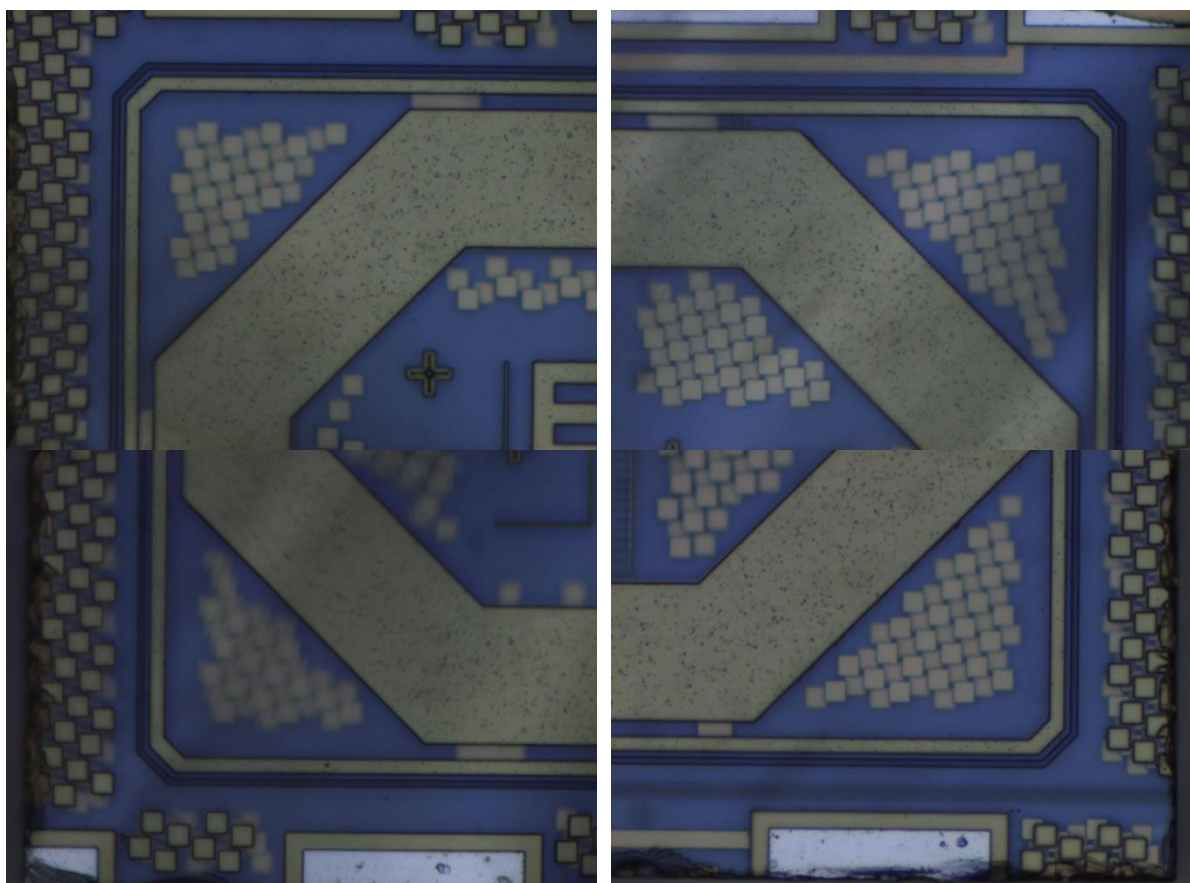




Figure 7: Die corners

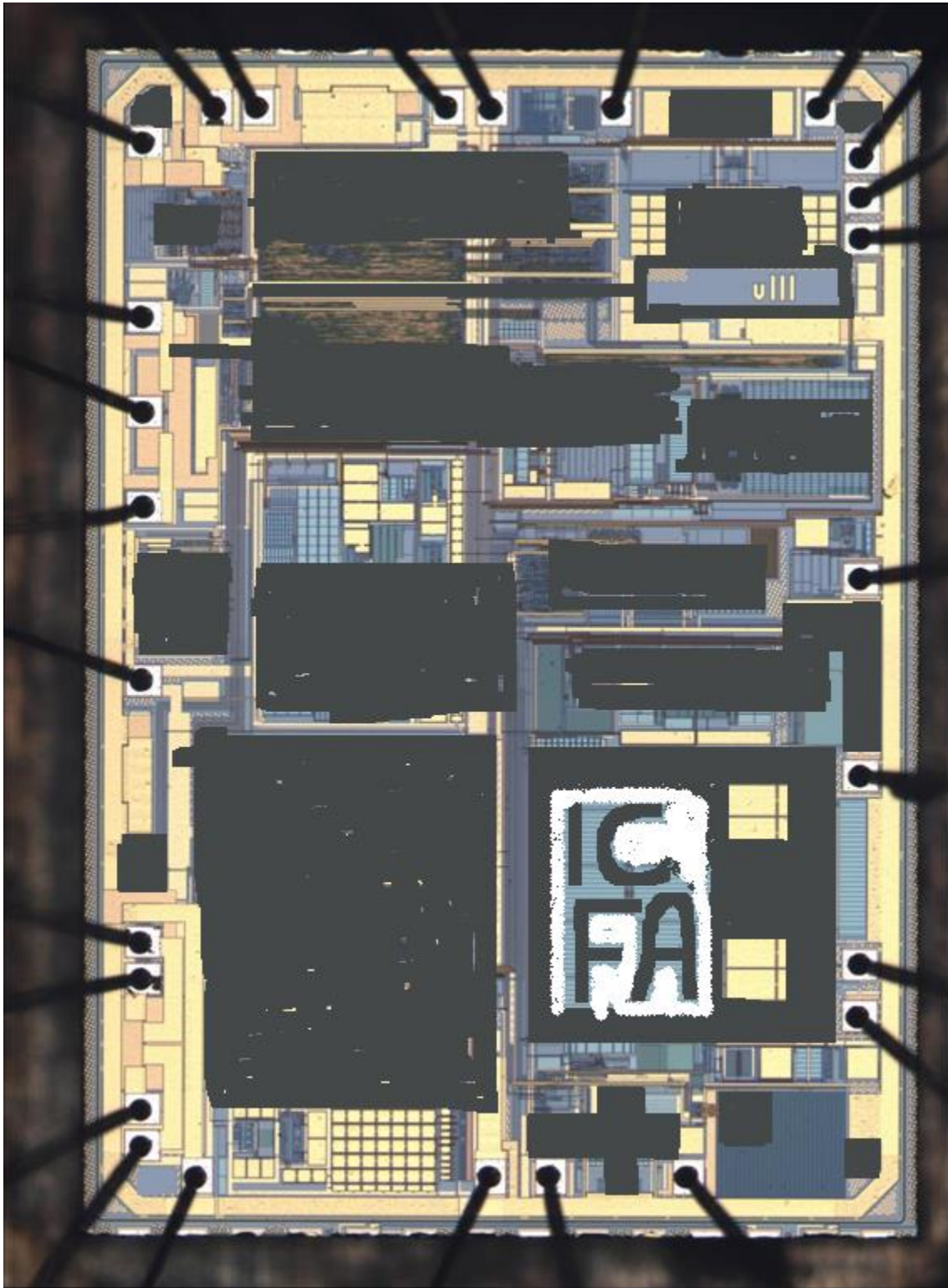


Figure 8: Die outline - *Image is edited*



Figure 9: Die marking

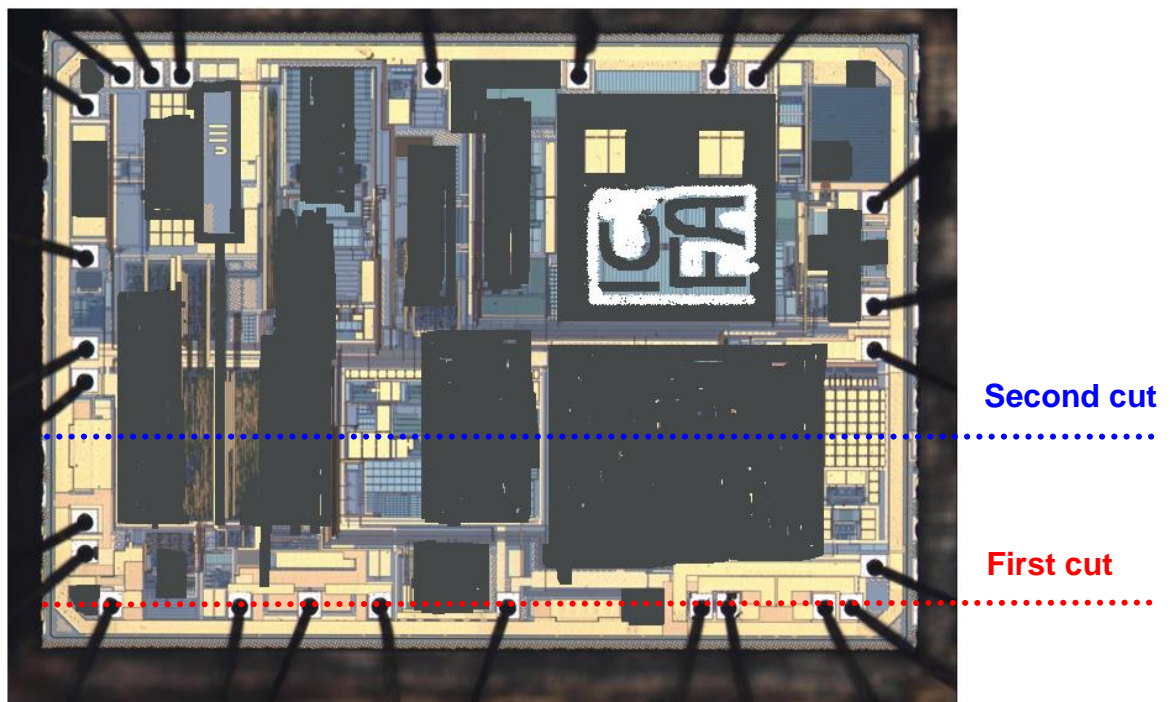


Figure 10: Cross-section locations



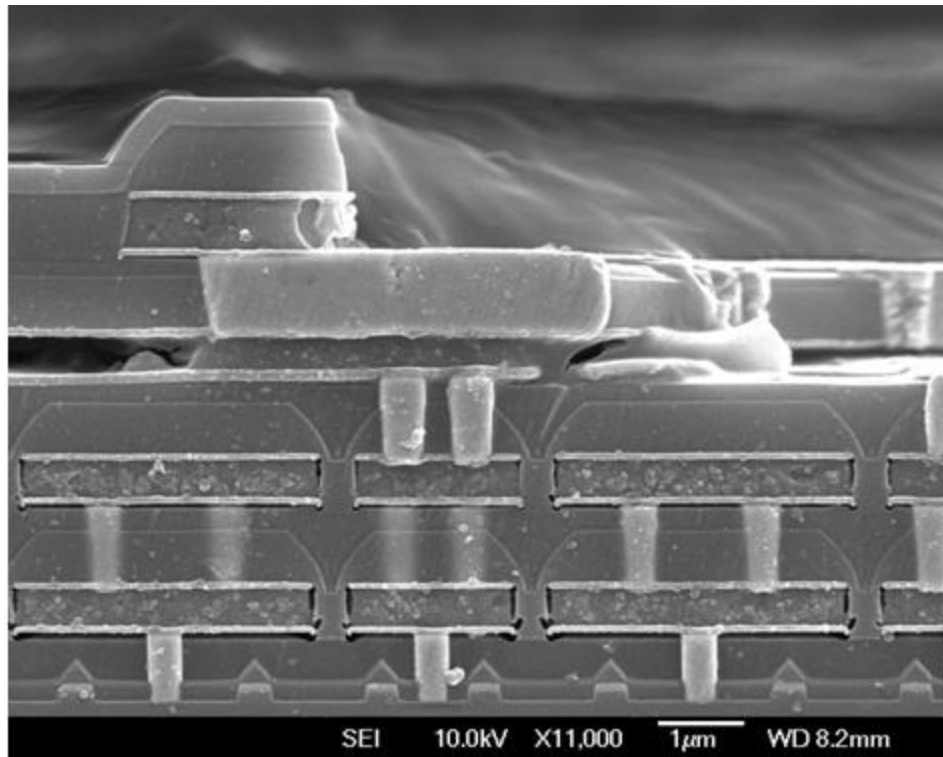


Figure 11: First cross-section

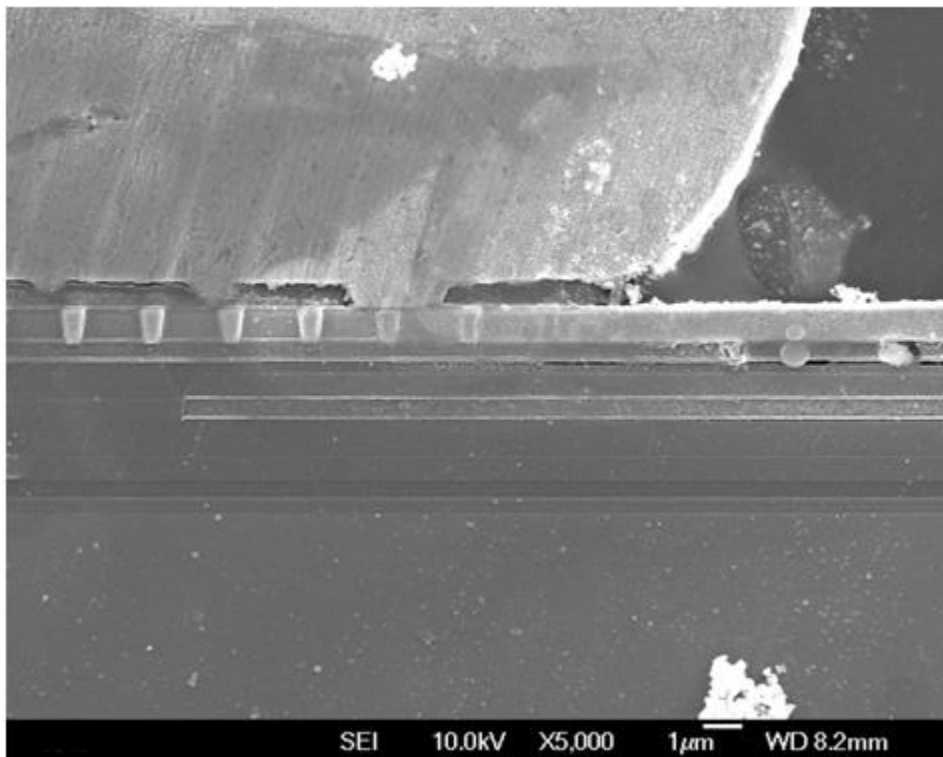


Figure 12: First cross-section - pad

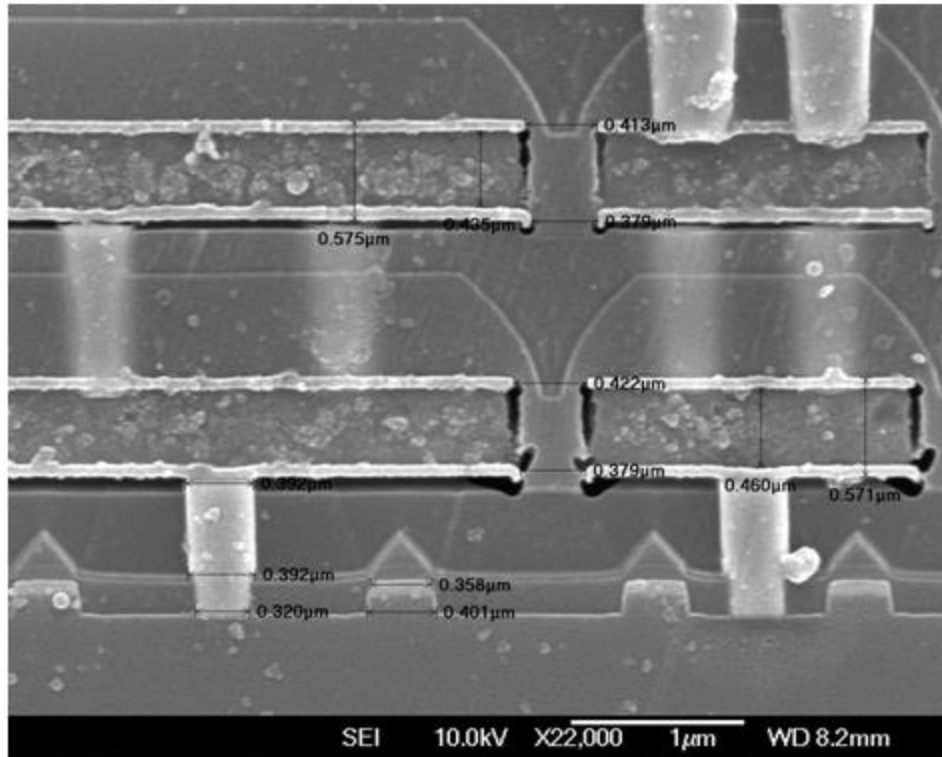


Figure 13: First cross-section - poly, contacts and metals -1 & 2

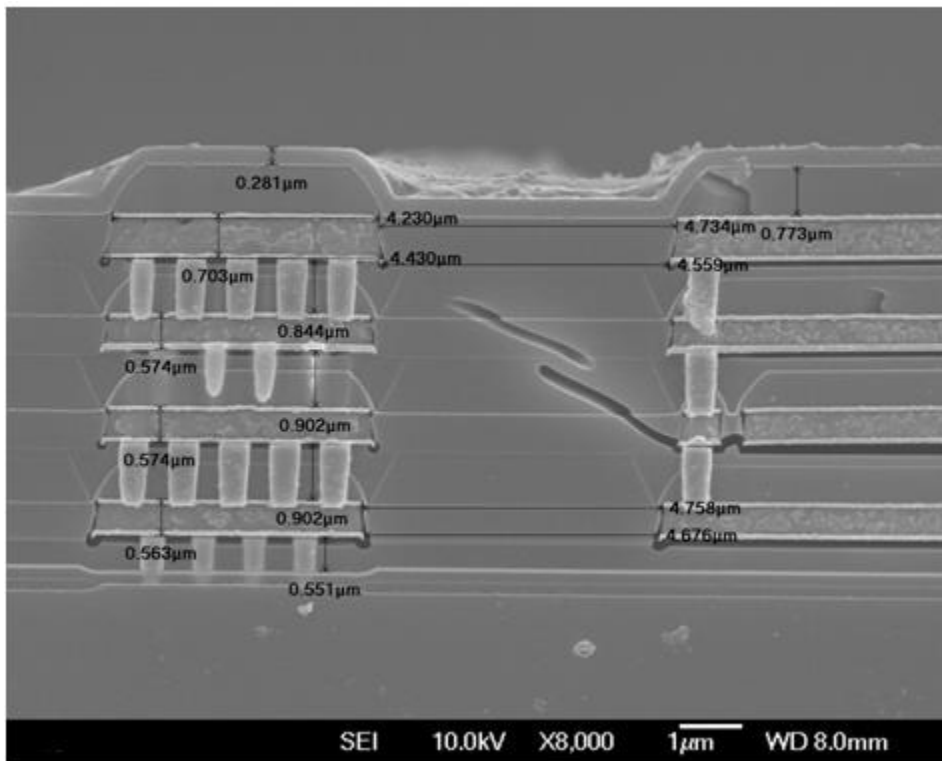


Figure 14: Seal ring and 4 metal lines measurements

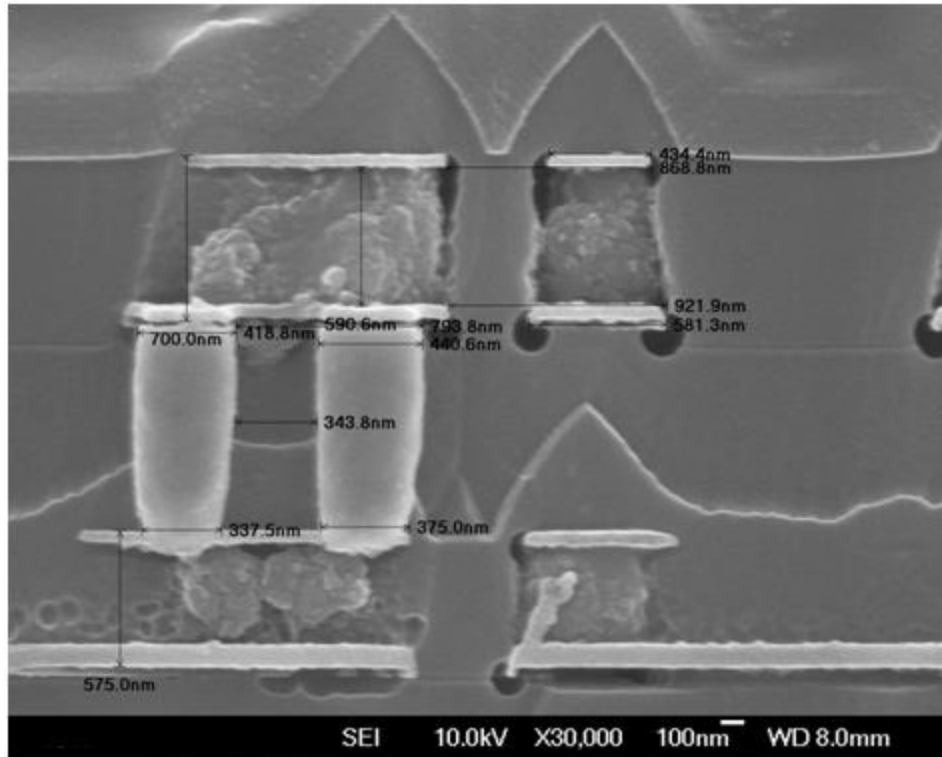


Figure 15: Top metal and top VIA measurements

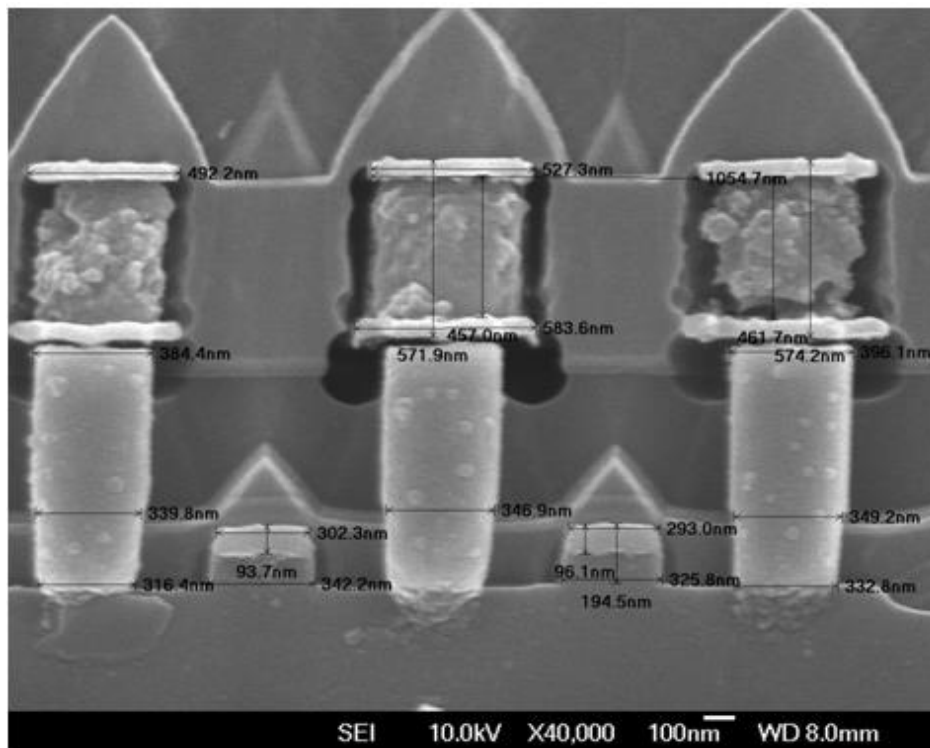


Figure 16: Top metal-1, contacts and poly measurements

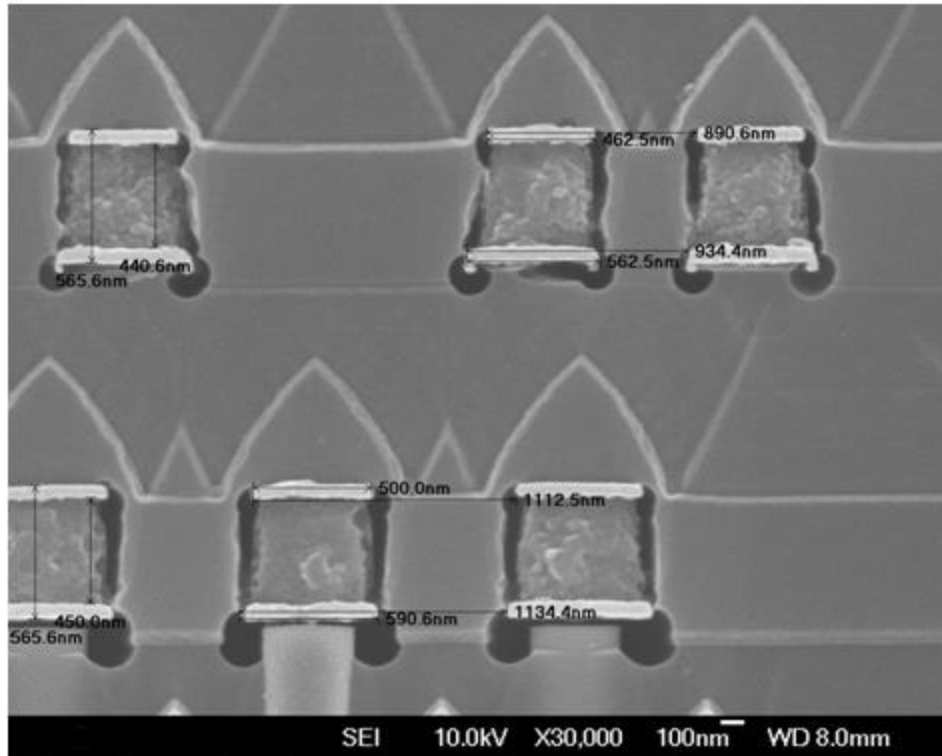


Figure 17: Metal-1 and metal-2 measurements

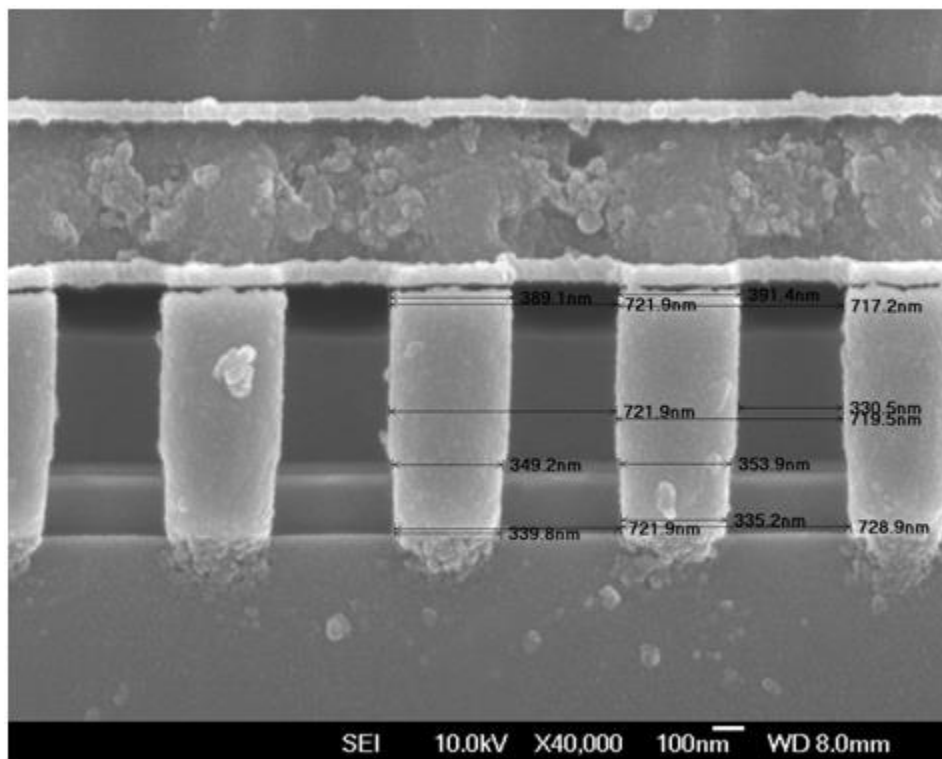


Figure 18: Contacts and contacts pitch measurements



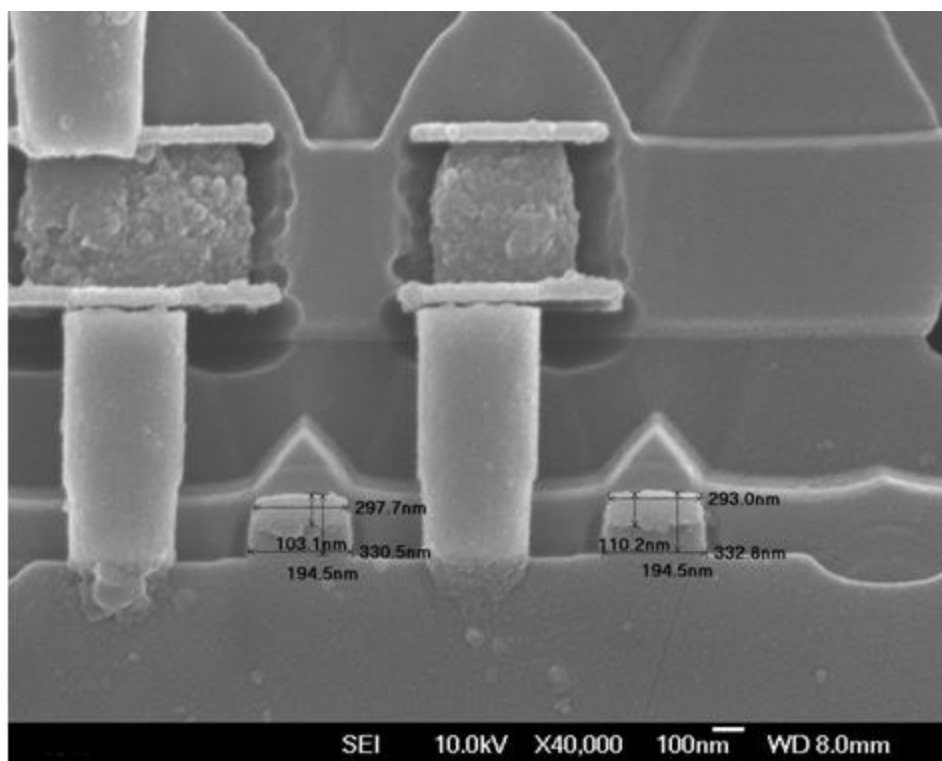


Figure 19: Top poly measurements

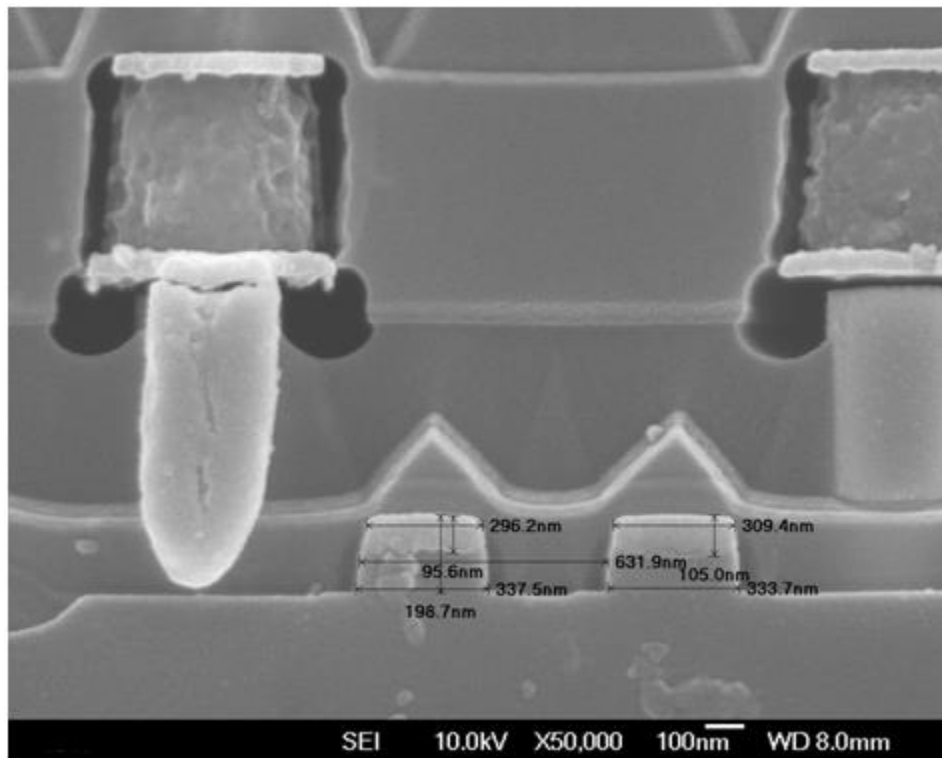


Figure 20: Top poly measurements