

A Case Study in Support of the Captive Fabrication Facility

Gerhard S. Schoenthal, Thomas W. Crowe,

Jeffrey L. Hesler, and Stephen H. Jones

Virginia Diodes, Inc., 979 2nd St. SE, Suite 309, Charlottesville, VA 22901

Phone: (434) 297-3257 Fax: (434) 297-3258 Email: Schoenthal@vadiodes.com

Introduction

Conventional wisdom and a large body of data suggest that a captive fabrication facility is not a cost effective or technically sound business decision. This paper will present the contrarian viewpoint that there is a rationale for a niche, captive fabrication facility. Motivating factors like the nature, quantity, variety, and cycle time of the product will be presented. The operational challenges and decisions - including facility and tooling, metrics, and other engineering consideration - that have been made over a decade will support this alternate model and justify the vertical integration of semiconductor device fabrication in a mm-wave and THz test and measurement company.

Purpose

The intent of this paper to show the following:

1. Outline a business and technology case for the captive fab.
2. Present Virginia Diodes, Inc.'s case study on how such a fab has been successful for 10 years.
3. Discuss how a niche fab adds value to a small, vertically integrated test and measurement company.

What specific results were obtained?

The challenges and operational decisions that are pertinent to such an endeavor will be discussed, including:

1. The size and form of facilities and tools that are required.
2. How a smart combination of statistical and engineering decisions

are used to make day to day decisions.

3. Disciplined focus on key semiconductor product and knowing when to outsource and insource as necessary.
4. Maintaining high standards of maintenance and cleanliness.

How Compound Semiconductor manufacturing technology was advanced?

Demonstrating that a non-foundry model is still viable advances the compound semiconductor industry by:

1. Shows organizations they can still produce their own product if appropriate conditions exist.
2. Enhances corporate diversity in the industry.
3. Maintains a larger customer base for the tool and materials vendors.
4. Demonstrates to younger companies that are pursuing fabrication technologies outside the mainstream that they do not have to rely on a foundry.

Conclusion

This particular case has furthered a company that is not only a part of the compound semiconductor industry, but now provides test and measurement equipment in the mm-wave and THz space that will give the industry continued life as the silicon portion of the industry continues to advance.