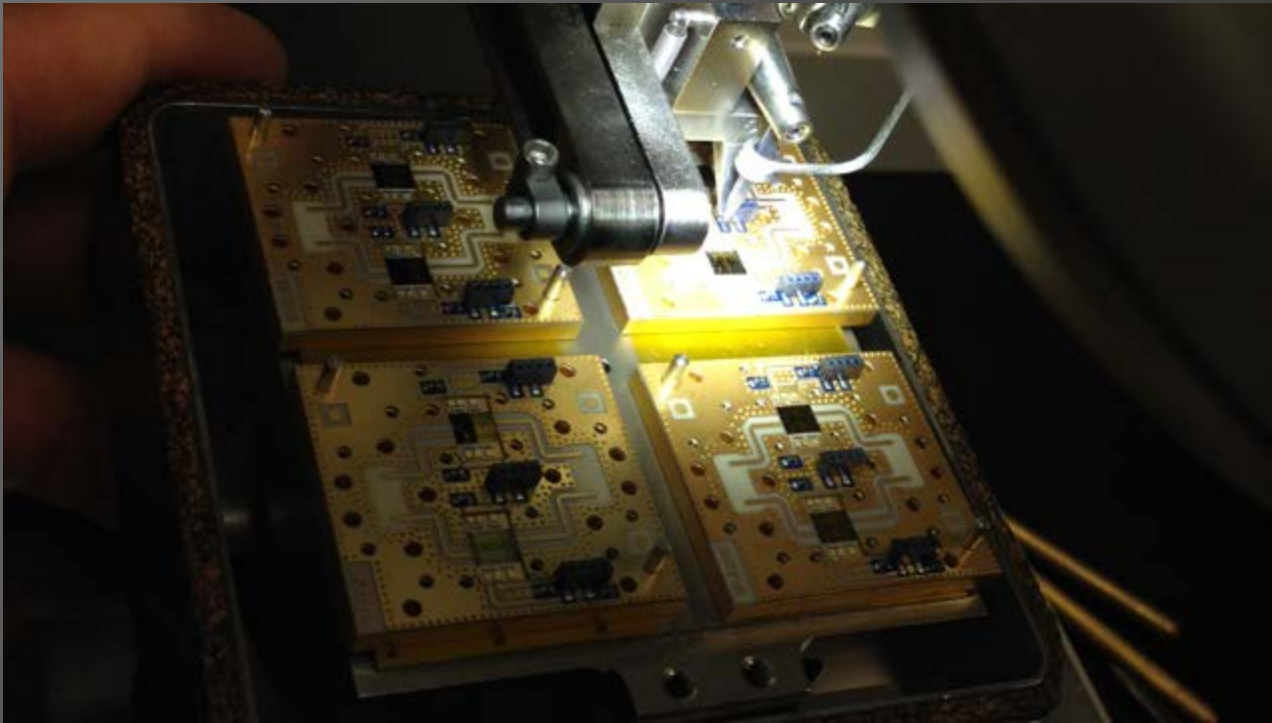


Contract Manufacturing For the RF Microwave World



Introduction

- ◉ My name is Jim Morgan and I am the President of SemiGen a full service microwave company that addresses the marketplace with manufacturing testing and products used in RF Microwave Electronics.
- ◉ Today's discussion is about the changing landscape in traditional rf microwave builds and the important role Contract Assembly can play.



Traditional Landscape

- Most all RF Microwave companies in the past have had internal MIC labs that are proficient in manufacturing microwave modules. One of the biggest issues our industry faces is the lack of new people coming up to learn and understand microwave assembly.
- If you have your veteran operator sitting at a wire bonder you know doubt have not even thought about their retirement or departure. Its not until you lose a key person that we understand the potential difficulty in finding a qualified replacement.
- With the downturn in the defense market over the last decade we have witnessed companies consolidate resources and scale back the work force. Today having a reliable CM to turn to for critical assemblies is necessary to be able to provide total manufacturing solutions or fill a delivery need when internal capacity reaches a point of need.



- Due to the changes in the workforce when the landscape begins to grow again OEM's of any size will quickly realize that they can not support demand. Training time is detrimental to shipping products so filling that gap with a quality CM may be a viable choice.
- The first choice in moving your company forward is selecting a manufacturer that understands microwave assembly and semiconductors in general. How can you be tasked with the installation of a MMIC chip without the knowledge of what that chip should look like. What acceptable visual criteria is and when to avoid building a part that is questionable.
- Many new companies are forming by using the outsource model. It has been a proven success in the semiconductor world to outsource fab services and now companies are seeing the benefit of outsourcing.

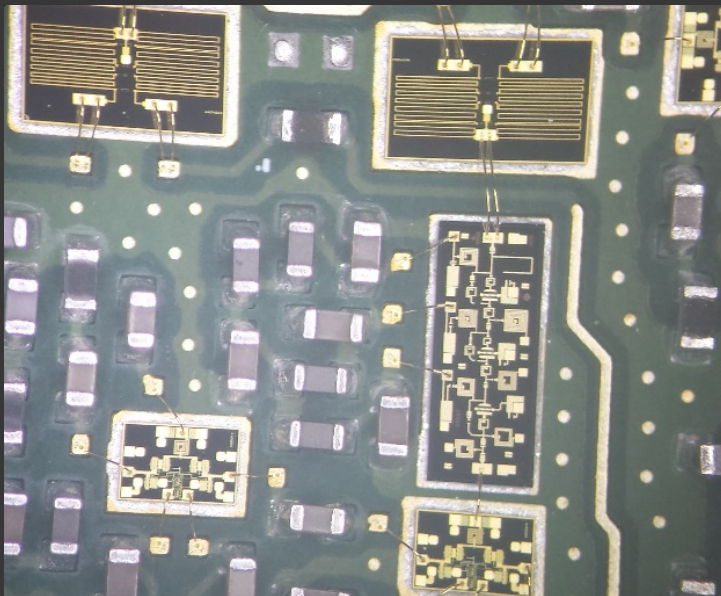
Finding The Right Supplier

- Build to print is a word often associated with negative thoughts. People typically look at outsourcing as taking jobs away from the company or not having the experience to build what legacy products you may have. The landscape has changed with the economic downturn this industry has seen. SemiGen bridges a gap between a traditional CM and your internal assembly talents.
- Having device knowledge in general is very important in being able to select a quality outsourcing solution. A successful manufacturing partner must understand the products they are building and in some cases how they work.



Advancing Designs Demand Manufacturing Expertise

- Mix Technology where designers combine the use of low cost surface mount components installed on a board right next to MMiC or similar die can create manufacturing hurdles.



MMiC with PCBA

Advancing Designs Demand Manufacturing Expertise

- Higher Frequency designs that use PCBA and Chip & Wire to achieve optimum performance face problems with bond length, loop height and deep access bonding.



35Ghz Switch

New Ideas New Ways to Build

- Parallel Gap welding of beam leads and ribbons has been around for years. As one example of changes in the manufacturing techniques SemiGen uses a process we call TC Waffle Attachment.
- By using any wire bonder and a waffle tool sold by Geiser the operator can use thermal compression tack bonding as a reliable and better alternative to tradition parallel gap welders. Beam lead devices are not subjected to the dangers of arcing from gap welders and trace damage from over power. This method relies on metal surfaces to have a minimum of 75 micro inches of gold for the attachment of ribbons, wires and beam leads.





RF Microwave Full Service Provider

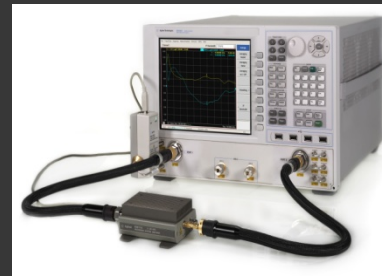
Hybrid
Assembly



PCB
Assembly



Testing to
50GHz

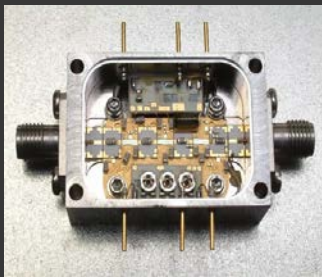


DESIGN

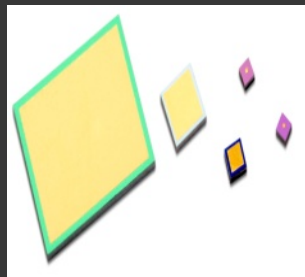


RF Microwave Full Service Provider

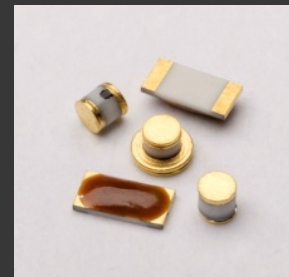
Board &
Module
Repair



RF
Passive
Semi's



RF Custom
Semi's



Bonding
Supplies
Management



Conclusion

- Outsourcing your company's manufacturing is a difficult decision. As company's face higher demand for their products manufacturing help is going to be needed. Companies can not just rely on temp agencies and new hires to provide quality fast assembly. SemiGen is one company that separates itself from the usual and provides a partnership in manufacturing high quality devices.
- Drawing review, manufacturing plans, first article builds, testing, engineering and quality are all standards your manufacturing choice needs to have. Build to print is at new level and my company is leading the way in servicing RF Microwave manufacturing needs.





SemiGen



www.semigen.net