

## **Microwave and Millimeter Wave Multi-Chip Module Manufacturing**

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### **Abstract**

Microwave and millimeter wave technology has seen the proliferation of MMIC technology across a wide device array as well as and basic semiconductor materials: Silicon, GaAs, AlGaAs, SiGe, GaN, InP etc. Design and Manufacturing is increasingly connecting these monolithic devices along with supporting passive components like capacitors, inductors, and resistors. In RF through infrared technology, the careful placement of supporting components especially in the “Z” axis can be the difference between meeting electrical performance requirements and not. Very often this means dealing with soldered components in close proximity to epoxied components which have very different requirements for things like metallization, cleaning, tooling, and inspection.

HXI, LLC of Harvard, MA designs and manufactures microwave and millimeter wave components and multi-chip modules for a variety of military and commercial applications. HXI works closely with Monzite Corporation of Nashua, NH, who performs most assembly tasks for HXI, including MMIC die attach and gold wire/ribbon bonding using both hard and soft substrate materials. The presentation will show a number of examples of component and multi-chip module manufacturing.

Monzite Corporation provides specialized manufacturing, design and subcomponents to the Aerospace & Defense and Industrial markets with technologies across the microwave/millimeter/infrared/visible electromagnetic spectrum. Implementing these technologies requires specialized processes and design consideration when supporting AS&D because of the long operating life in harsh environment requirement these markets demand.