



## Copper Wirebonding – A Technology Review

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### Course Summary

Beginning in late 2000's, a serious effort to reduce cost of assembly of large pincount devices was undertaken by a few key integrated semiconductor manufacturers. This was a response to the significant increases in the cost of Gold. A decade later, the shipments of integrated circuits using Cu-wirebonds has sky-rocketed and its acceptance has spread over a broad range of customers and commercial industries, including the Automotive industry. The Hired industries have generally stayed away from the migration to Cu so far due to concerns over reliability and durability of products built with Cu-wire. Recently there has been an interest to consider use of Cu-wire in some applications where it might be appropriate.

This tutorial will provide a comprehensive review of the current status of Cu-wirebond based on lessons from non-military/aerospace industries. It will cover a wide range of materials, starting with the historical aspects and ending with a review of the latest developments in the field. Much of the tutorial will focus on the manufacturability, current qualification practices and reliability of Cu-wirebonded products. With a better understanding of the issues and the current status, the attendees will have the tools to better assess risks in their own applications.

### Instructor Bio



**Dr. Mukul Saran** is a Senior Member of Technical Staff (SMTS) and a reliability engineer at Texas Instruments. He has completed 22 years at Texas Instruments. During this time, he has held various technical and leadership positions, including in fab process development & engineering, ASIC packaging and Quality/Reliability Engineering. He was responsible for qualification of Cu-wirebond technology across a broad range of T.I. products, silicon technologies, fabs and AT-sites over nearly 6-7 years. Prior to joining Texas Instruments, Dr. Saran had spent 7 years doing R&D in Silicon Process Technology development at Nortel in Ottawa, Canada.

Dr. Saran holds a Ph.D. degree in Physics from the University of Manitoba, Canada. Following his Ph.D. he completed two years as a research associate at the National Research Council of Canada, Ottawa. He holds 14 patents in processing & packaging, and several published papers.