

## Heavy Copper Wire Bonding for Mass Production

**Speaker: Mike McKeown**, Michael Brökelmann, Dirk Siepe, Matthias Hunstig, Kris Oftebro

Hesse Mechatronics, Inc., Mineola, NY

E-Mail: [michael.mckeown@hesse-mechatronics.us](mailto:michael.mckeown@hesse-mechatronics.us)

### Abstract

Copper wire as a bonding material for the top side connection of power semiconductors is highly desired. One current drawback in heavy copper wire bonding is the relatively low lifetime of the consumables. The bonding tool wear mechanisms and the corresponding factors are investigated. To reduce wear, different approaches are tested in long-term bonding tests. Optimized bonding tool tip geometry and tool material are two of these factors. Optimized bonding parameters were investigated as well and show a significant improvement in bonding tool lifetime. Wear and lifetime of the cutter and the wire guide are also examined. Additionally, the impact of bonding tool wear on different aspects of bond quality is addressed. It is also shown how wear can be monitored by machine process data recording and how a derived signal correlates to the actual wear status. These major advances in heavy copper wire bonding now make it a robust, reliable and efficient interconnection technology.