

Press release

Hanau, January 24, 2019

Avoiding risks of electrochemical migration and associated short circuits

The new Microbond® SMT650 solder paste developed by Heraeus Electronics achieves a consistently high surface resistance. Combining the new F650 flux system with the Innolot® alloy delivers superior reliability—particularly in miniaturized systems in the automotive industry.

What exactly is electrochemical migration? Electrochemical migration is a form of corrosion that negatively affects the reliability and service life of electronic components. It is caused by moisture—either during the circuit board manufacturing process or due to external factors. Miniaturization and the resulting minuscule distances between conductor paths lead to greater electric field intensity, which in turn increases the risk of electrochemical migration.

One example are the control units in vehicles: Fluctuations in temperature can lead to condensation, and this can result in moisture reaching the circuit board. When combined with flux residue, this moisture can lead to negative interactions such as the formation of dendrites and eventually lead to short circuits. To prevent this from happening, Heraeus Electronics has developed its new Microbond® SMT650 solder paste.

Its material composition provides a consistently high surface resistance that prevents electrochemical migration. Exactly how does the paste do this? The critical element is the chemical composition of the new flux: “With our F650 flux system, we have managed to find a good balance between nitrogen-atmosphere coating, excellent printing characteristics, and surface resistance,” notes Manu Noé Vaidya, product manager at Heraeus Electronics.

Furthermore, Microbond® SMT650 is compatible with many of the coatings used to protect electronics and circuit boards. In addition, the specially developed F650 flux system can be combined with different alloys. The Innolot® alloy from Heraeus Electronics is designed for use in highly demanding applications, such as those in the automotive industry.

Innolot® contains a range of metals whose high thermomechanical stability increases the service life of the entire electronic component. In a nutshell: This means longer use under higher temperatures. “For applications with low thermomechanical requirements, we offer F650 solder paste with a tin-silver-copper alloy (SAC),” says Manu Noé Vaidya. “This allows our customers to use precisely the right product for their application while expending a minimum of effort and expense on qualification.”