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Reflow Profiling

The Benefits of Implementing a Ramp-to-Spike Profile

To be presented by AIM

Abstract

The issue of reflow profiling continues to be a compex topic. The pains often associated with profiling can be reduced greatly if certain guidelines are followed and if there is a strong understanding of the variables that can be encountered during the reflow process. This paper shall discuss the appropriate guidelines and troubleshooting methods for reflow profiling, and in particular shall focus upon the benefits of implementing the linear ramp-to-spike profile.

Delta T (T) is defined as the variation of temperature found on an assembly during the reflow process. Too large of a T can result in soldering defects, so to combat T a Ramp-Soak-Spike (RSS) reflow profile often is utilized. However, when using a newer-style reflow oven, the T often is minimized or eliminated; thus, the soak zone of the reflow profile becomes an unnecessary step. Because of this, the implementation of a linear Ramp-To-Spike (RTS) reflow profile should be considered. Benefits such as reduced energy costs, reduced solder defects, increased efficiency, improved wetting, and a simplification of the reflow profile process may be experienced when using the RTS profile

Included in this paper are the suggested process parameters for setting up the RSS and RTS profiles and the chemical and metallurgical reactions that occur at each set point of these profiles. The paper concludes with a discussion and pictures of several profile-related defects. Each of these defects is described, analyzed, and instructions are given for troubleshooting these defects.