

Optimizing the Plasma Treatment Process Prior to Conformal Coating to Eliminate ESD Induced Failures Without Impact on Coating Performance

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Abstract

Conformal coatings are being used more often to protect modern electronic devices from harsh environments, such as under the hood of an automobile or in the sweaty palms of an app-user's hands. It has been demonstrated that plasma treatment of such electronic assemblies can greatly enhance the adhesion of a subsequently applied conformal coating. Since plasmas are electrostatic discharges one might expect issues with damage to devices exposed to plasma. While such damage is rare there are certain sensitive electronic components that require extra care when it comes to plasma processing.

In this paper, we will present our investigative findings regarding the effects of plasma treatment prior to conformal coating. We will demonstrate the effects plasma can have on typical board components as well as ESD-sensitive components. We will also demonstrate the areas of coating adhesion, material flow characteristics and enhancement in the selectivity of the conformal coating process. The paper will share the results comparing performance on legacy printed circuit materials to high performance materials. Conformal coating materials will include acrylics, polyurethanes and silicones. The effects of plasma process parameters on conformal coating properties will also be shared.