

Project Summary:

Resistance Reduction in Trimmed Resistors

DfR Solutions served as a consultant to a major biomedical instrument manufacturer to discover issues relating to resistance reduction in trimmed resistors after removing the passivation layer from the top of the resistor. Some areas of potential loss were observed in the selection of resistive material, elevated hydrogen levels creating a reducing environment, and different potentials across the kerf. Further action was recommended, to include accelerated shock testing, exploration of resistor paste material, comparison of kerf length to voltage drift behavior, and examination of failure mode when exposure to dry hydrogen mixture.

Keywords: biomedical instrument, defibrillator, trimmed resistors, resistance reduction, passivation layer, hydrogen level, reducing environment, reduction reaction in exposed resistor, platinum catalyst, life testing, residual gas analysis, RGA, SIMS, kerf, voltage drift behavior, resistor paste material, dry hydrogen mixture, polymeric materials absorbing moisture