Contact Stress Relaxation and Resistance Change Relationships in Accelerated Heat Age Testing

Abstract

This paper reviews the development of the presently adopted practice of heat age reliability testing, (temperature life testing), and formally identifies and addresses the inherent concerns of this procedure. A 302 day heat age test has been completed to evaluate the resistance behavior of two D subminiature contact designs at three different elevated temperatures. The results indicate that in heat age conditioning, resistance is affected by mechanisms other than normal force degradation. Furthermore, the effect that reduction in normal force may have on a contact may not be evident unless the contact is disturbed. Therefore, changes in resistance as a result of heat aging are not necessarily indicative of changes that may occur due to loss of normal force in actual use. This investigation suggests that accelerated heat age testing should be primarily used as a preconditioning test prior to exposing contacts to other environments where reduced normal force may make parts more susceptible to other failure mechanisms.

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