A Model to Describe Intermittency Phenomena in Electrical Connectors

C. Maul [(*)], J. W. McBride [(**)]

(*) TaiCaan Technologies Ltd.
2 Venture Road
Chilworth Science Park
Southampton, SO16 7NP, U. K.
Tel.: +44 (0)7815 618 031
C.Maul@taicaan.com

(**) School of Engineering Sciences
Mechanical Engineering
University of Southampton
Southampton, SO17 1BJ, U. K.
Tel.: +44 (0)23 8059 2895
J.W.McBride@soton.ac.uk

Abstract

Fretting is known to be a major cause of contact deterioration and failure, particularly in tin-plated contacts. During fretting the contact resistance generally increases slowly with time. Superimposed to this slow increase in contact resistance are rapid changes in contact resistance within fractions of a second, called intermittences or short duration discontinuities.

Hi-speed measurements of contact voltage-drop and contact current have been carried out and the results are evaluated using general contact theory. It is shown that sudden changes in contact resistance can be caused by a surface film and by melting of current carrying asperities.

Keywords: Intermittence, intermittency phenomena, discontinuity, contact resistance, fretting corrosion, tin-plating