

Novacap Inc. Statement dated 29 September 2005

A DC/DC converter manufactured by International Rectifier was identified to contain a capacitor with a pure tin termination by EDS testing during a DPA. The identified capacitor was manufactured by Novacap Inc.

The capacitor was purchased in August 2001 to Novacap part number 1210X332K501N~~M~~H for which the termination designator "N" originally specified nickel barrier, 90Sn/10Pb. Novacap Inc., subsequently changed the "N" designator from nickel barrier, 90Sn/10Pb to specify nickel barrier, 100% tin. The designator for 90Sn/10Pb was changed to "Y". International Rectifier was not aware of the designator change. Further investigation has identified other parts purchased with the "N" designator that potentially have the same problem.

MIL-PRF-38534, *General Specification for Hybrid Microcircuits*, paragraph E.4.2.7.1 states that the use of pure tin is prohibited from internal element finishes. Tin is considered to be pure if it contains less than three percent alloy material. In addition, NASA requirements prohibit the use of pure tin in any application due to a phenomenon called "whisker growth" and/or "sublimation" (refer to the following web site for further information. <http://nepp.nasa.gov/whisker/>). Industry studies have shown that the use of a pure tin finish can promote the growth of tin (Sn) whiskers, which might cause potential reliability risks related to electrical shorts, debris, or contamination. MIL-PRF-123, the *Performance Specification for Fixed Ceramic Capacitors* states that tin plating is prohibited as a final finish or as an undercoat. Tin-lead (Sn-Pb) finishes are acceptable provided that the minimum lead content is four percent. For additional information, see ASTM B545 (*Standard Specification for Electrodeposited Coatings of Tin*).

To date, no field operational failures have been reported to International Rectifier that was directly or indirectly related to a 100% tin issue.

IR is currently researching hybrids manufactured (capacitors, where used) and plans to notify customers in direct receipt of affected product.