

Tucson

Date May 13, 2005

Sheet 1 of 2

**Project Title**

RoHS – Compliance Program

**Report No.****2005-01****Subject Title**

Conversion of Tusonix parts to become RoHS compliant

**Prepared By**

Randy Cook

**Dept No.**

54

**Date**

5/13/05

**Approved By****Date****Scope/Text (Attach Additional Sheets as Required)****Technical Summary:**

Beginning in April of 2003 Tusonix entered a project to transition to RoHS compliant products. From May of 2003 until August of 2004 engineering conducted an extensive industry product search of lead-free alloys, acquired sample lead-free alloys, and conducted evaluations to determine the lead-free alloys best for use in Tusonix product manufacturing.

In August of 2004 Tusonix began an extensive product evaluation using the alloys selected. For the evaluation 73 products were chosen representing 21 product groups. Individual engineering projects were designed for each of the 73 products having a lead-free product lot and a standard product control lot. Tusonix manufacturing facility carried out the evaluations under typical per product manufacturing conditions.

**Test Performed, results:**

Manufacturing recorded all process variables for the standard product and the lead-free product lots. Lots were manufactured and tested in parallel to obtain reliable concurrent results.

Each lot was subjected to the following body of tests:

**Group I**

Initial readings for Capacitance, Df, Insulation Resistance, Flash, and Insertion Loss were conducted and results recorded.

Thermal Shock - Five cycles of; -55° C to +25° C to +125° C to +25° C.

Steady-State Humidity - Conditions: 90% to 95% RH, 40° C, 30 VDC, for 504 hours.

Post test readings for Capacitance, Df, Insulation Resistance, Flash, and Insertion Loss were conducted and results recorded.

**Group II**

Initial readings for Capacitance, Df, Insulation Resistance, Flash, and Insertion Loss were conducted and results recorded.

**Distribution**

John Lane

Kent Liesemeyer

Thomas Spuhler

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**Test Performed, results (cont.):**

Terminal Strength - Conditions: 5 LB pull for 10 seconds.

Resistance to Soldering Heat - Conditions: Flux 5 sec. min., 10 sec. max.; Dip within .050" of part body; Heat to 260° C, +/- 5° C.

Life Test - Conditions: Temperature 125° C; 1000 hours; 1.5 X working voltage.

Post test readings for Capacitance, Df, Insulation Resistance, Flash, and Insertion Loss were conducted and results recorded.

**Conclusions:**

Steady-State Humidity test was conducted to create an environment for tin whisker growth as described in "INEMI Tin Whisker Accelerated Test Project Test Method for Evaluating Tin Whisker Growth on Plated Surfaces" 6/17/04 - Revision 6.1. After 504 hours in the conditions described above parts were prepared or sectioned to expose surfaces of high tin concentrations. Photographs were taken at 60X and 200X. No whisker growth has been detected. The samples were stored and will be evaluated at intervals to determine if whisker growth has occurred.

Testing confirms Electrical and Mechanical function of lead-free alloys is consistent with lead bearing alloys.