

PRODUCT EVALUATION



Date: January 24, 2008

**PRODUCT EVALUATION REPORT FOR
R-NET 766/767/768 SERIES PRODUCTS
TIN WHISKER TEST**

Purpose:

To evaluate tin whisker growth situation on R-net 766/767/768 series products with tin alloy leads built in CTS Tianjin.

Sampling Plan and Test Plan:

The tin whisker test sampling plan and test plan are based on JESD22A121.01: Test Method for Measuring Whisker Growth on Tin and Tin Alloy Surface Finishes.

For R-net 766/767/768 series products, 767163101GP samples were submitted to test. Samples are divided into three groups, six samples in each group; go through different test condition as outlined in *Table 1*.

	Stress Type	Test Conditions	Sample Size	Inspection Intervals	Duration
Group A	Temperature Cycling	-55C to 85C, air to air, 10mins dwell at each temp zone.	6pcs	500 cycles	1000 cycles
Group B	Ambient Temperature / Humidity Storage	30 °C and 60% RH	6pcs	1000 hours	3000 hours
Group C	High Temperature / Humidity Storage	60°C and 90% RH	6pcs	1000 hours	3000 hours

Table 1: Test conditions.

Sample lead construction:

- Inner material (lead wire): From inside to outside.
 - ◆ Cuprum.
 - ◆ Nickel plating.
 - ◆ Tin plating.
- Outer material: Tin 96.5%, Silver 3%, Cuprum 0.5%.

Definitions Criteria for Tin Whisker:

As defined in JESD22A121.01, the criteria of tin whiskers are:

- An aspect ratio (length/width) greater than 2.
- Can be kinked, bent or twisted.
- Usually have a uniform cross-sectional shape.
- Typically consist of a single columnar filament that rarely branches.
- May have striations along the length of the column and/or rings around the circumference of the column.
- Length of 10 microns or more.

Test Result:

Visual inspection is performed at initial, each inspection intervals and the end of the test with optical microscope of 80X magnification.

Group A: No whisker found after 500 cycles and 1000 cycles temperature cycling.

Group B: No whisker found after 1000 hours, 2000 hours and 3000 hours ambient temperature/humidity storage.

Group C: No whisker found after 1000 hours, 2000 hours and 3000 hours high temperature/humidity storage.