

# PRODUCT EVALUATION



**Date: January 24, 2008**

**PRODUCT EVALUATION REPORT FOR  
R-NET 752/753 SERIES PRODUCTS  
TIN WHISKER TEST**

**Purpose:**

To evaluate tin whisker growth situation of R-net 752/753 series products with pure tin terminations 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 752/753 series products, 752181562GP samples are submitted to test. Samples are divided into three groups, six samples in each group; go through different test condition as outlined in *Table 1*.

	<b>Stress Type</b>	<b>Test Conditions</b>	<b>Sample Size</b>	<b>Inspection Intervals</b>	<b>Duration</b>
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 termination construction:

- Inner electrode: Silver.
- Inner plating: Nickel plating.
- Outer plating: Tin plating.

**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.

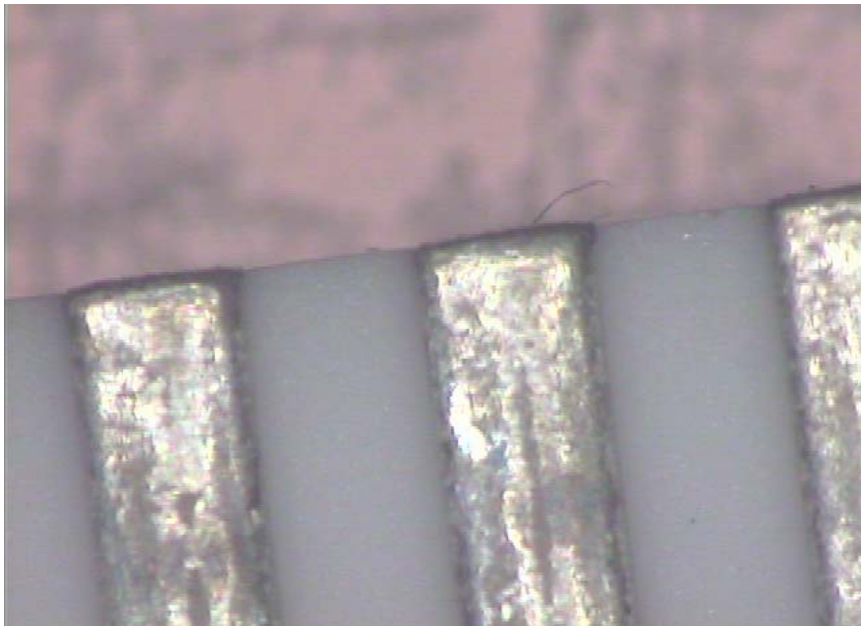
**Test Result:**

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 and 2000 hours ambient temperature/humidity storage.

After 3000 hours ambient temperature/humidity storage, tin whisker was found on 1pc sample (Figure 1). The total measured whisker length is 301 microns.



*Figure 1*

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