

## Tin Whisker Mitigation and Growth Test

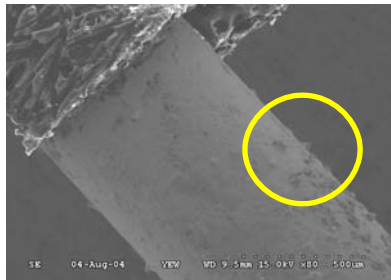
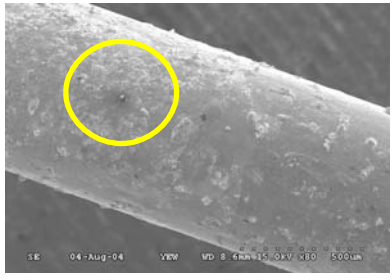
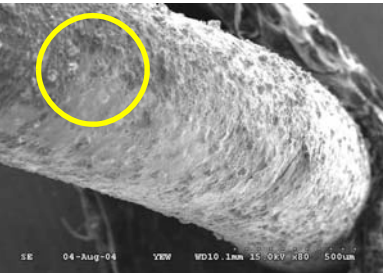

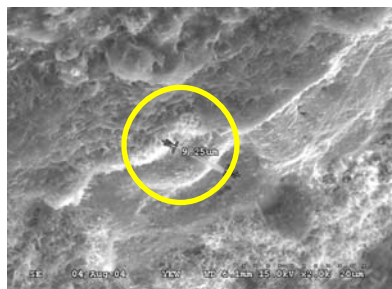

- Choice of Plating:**  
 Won-Top Electronics Co., Ltd. selects pure matte tin plating as its primary plating of choice. Matte tin does not use chemical additives. The grain structure is larger and does not have shiny appearance of bright tin.
- Control of Plating Process:**  
 To ensure the purity of the chemicals used in the plating process, the purity level is frequently monitored, especially for the carbon and copper.
- iNEMI Suggested Treatment:**  
 Won-Top Electronics Co., Ltd. adopts a 150°C, 60 minute post plate anneal heat treating for the lead free products. This bake helps to form a uniform layer of tin-copper intermetallic at the interface between the copper leadframe and the tin plating. The layer of intermetallic has been approved to reduce the potential for tin whisker growth.

### Test Condition

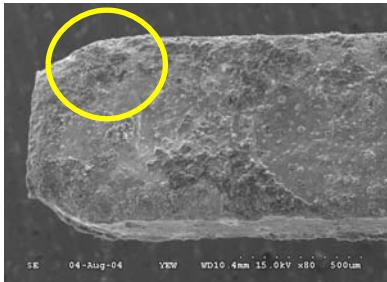
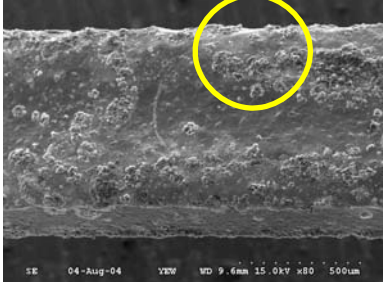
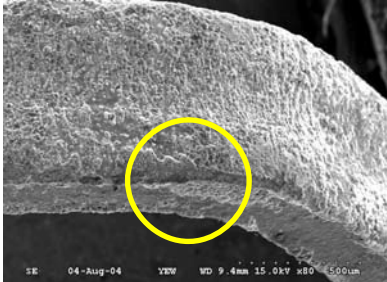
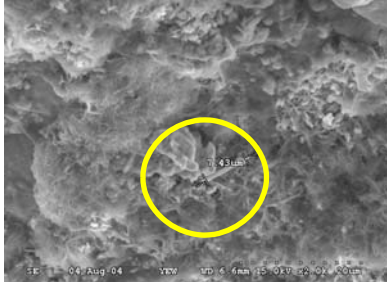

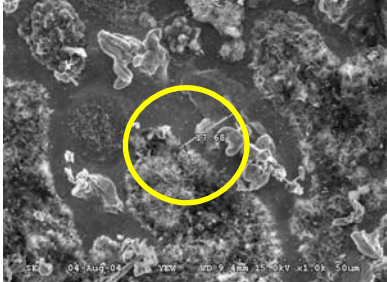
Test Item	Industry Standard	Test Condition	Result
Medium Temperature Storage Bake	N/A	50°C, 1344 hrs	PASS
Temperature Cycling	SONY SS-00254-8	-55°C to 80°C, 1000 cycles	PASS

### Test Result

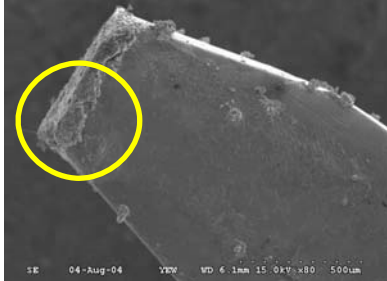
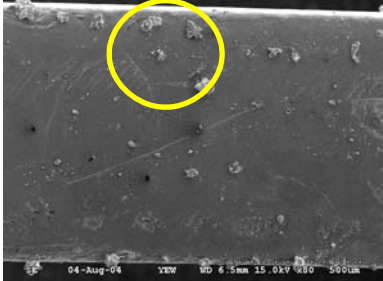
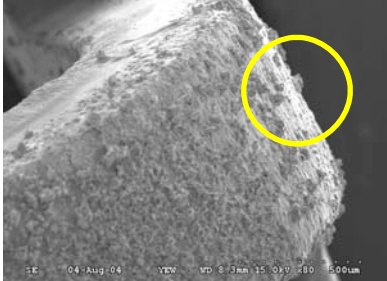
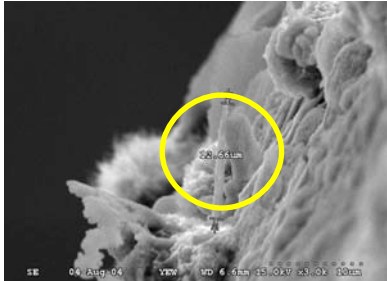
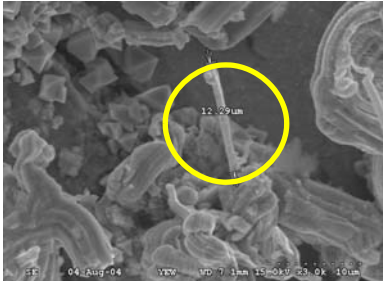

#### 1. Axial Lead Diode

Lead Top	Lead Trim	Lead Bent
		
		
4.7um whisker	9.3um whisker	13.7um whisker

## 2. SMD & Power-pack Rectifier

Lead Top	Lead Trim	Lead Bent
		
		
7.4um whisker	8.5um whisker	17.7um whisker

## 3. Bridge Rectifier

Lead Top	Lead Trim	Lead Bent
		
		
12.7um whisker	12.3um whisker	22.7um whisker