錫須生長影響因素
及預防措施

報告大綱

何為錫須?

客戶聲音

錫須生長原理及限制錫須生長之策略

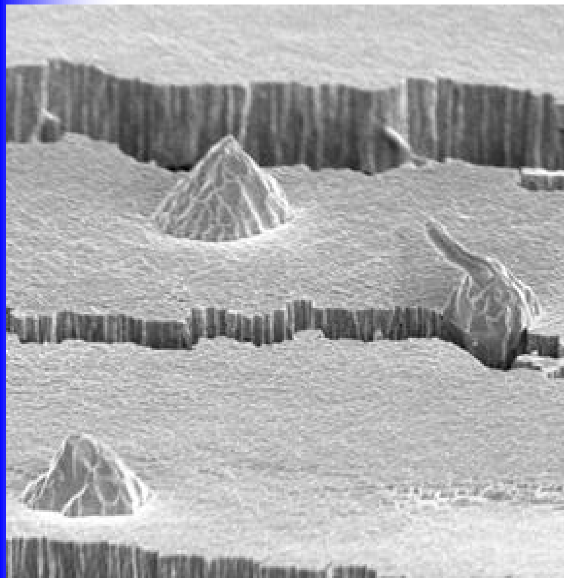
1.底層材料之影響

2.外界因素之影響（劃傷及折彎）

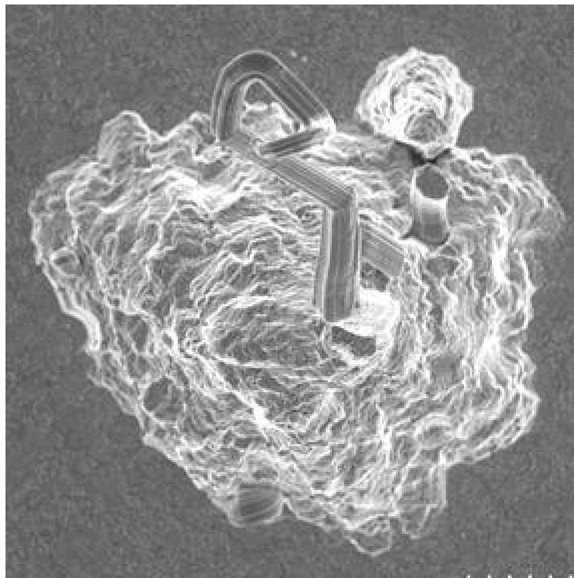
3.錫鍍層厚度之影響

4.鎳鍍層厚度之影響

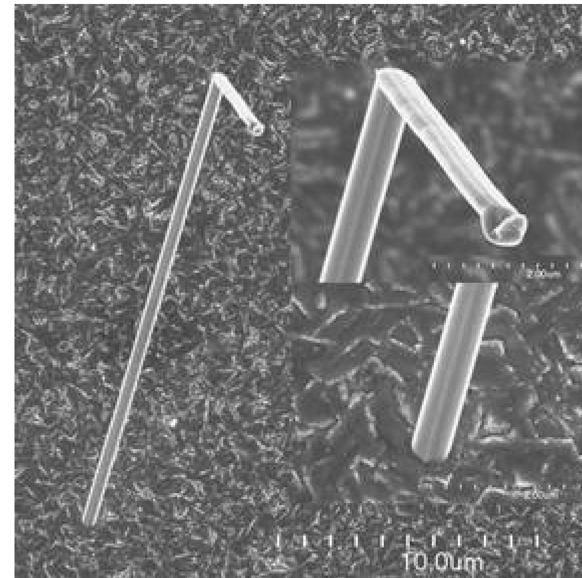
錫須（生長過程）



小丘狀（生長初期）

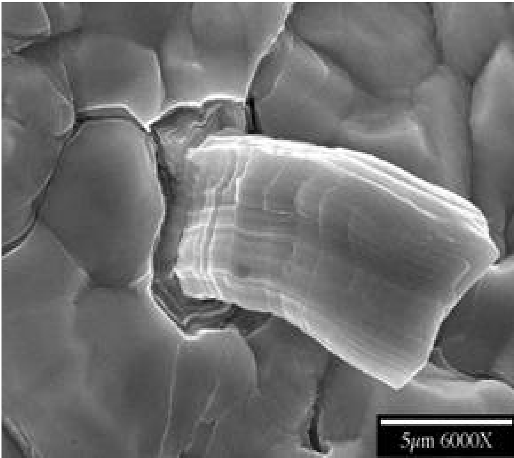


生長期間形狀



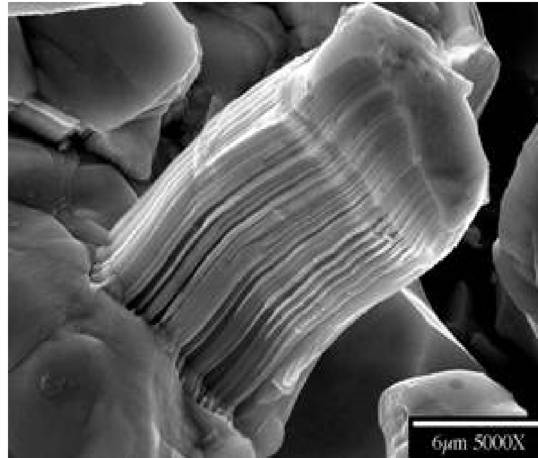
成形後錫須

錫須（生長方式）



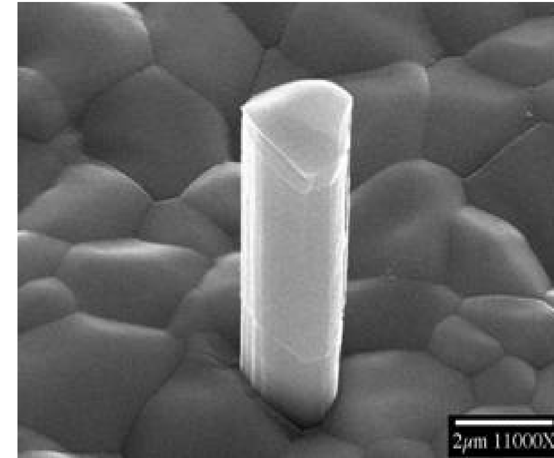
呈環狀生長

錫晶粒層狀生長，
逐漸向外推



呈條紋狀生長

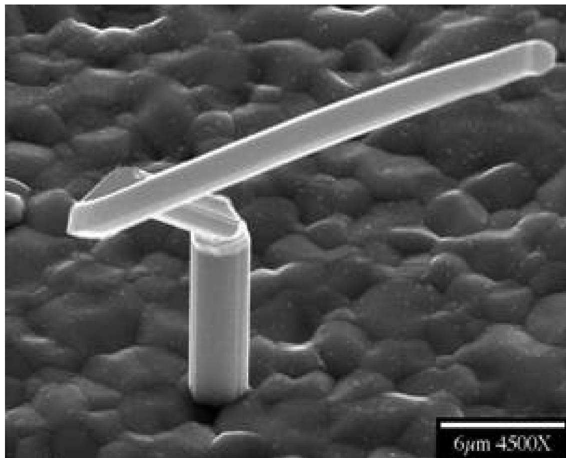
錫晶粒垂直方向生
長，逐漸積累



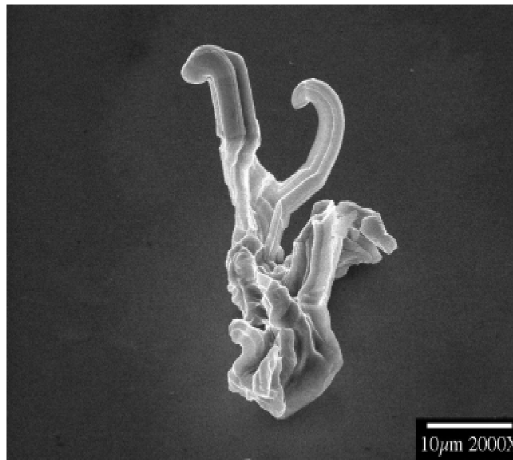
交錯方式生長

錫晶粒兩種生長方
式並存

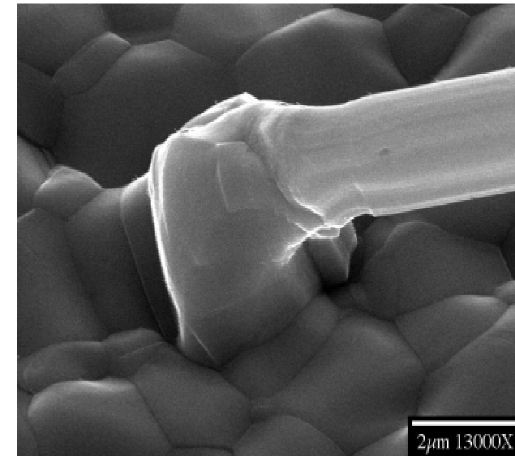
錫須（生長形態）



繩　　狀



枝　　狀



從小丘狀開始生長

錫須生長過程中，客觀因素的影響或是錫晶粒排列取向改變使錫須生長方向發生改變，形成不同生長形態的錫須。

客戶聲音

DELL要求

F. Tin Whisker Evaluation

Dell is currently evaluating industry practices regarding tin whisker testing. At this time, Dell is not requiring a standardized test to evaluate tin whiskers, however, it is recommended that pure tin plated components be tested according to one or more of the following procedures: 1) Storing at 60°C/95%RH for 500 hours followed by SEM analysis; 2) Thermal cycling 500 times from -55°C/85°C followed by SEM analysis; and/or 3) Store at room atmosphere conditions for 500 hours followed by SEM. The maximum allowable whisker length is 50 microns.

Provide the specifics of any Sn whisker evaluation that has been performed and state results.

錫須生長原理及限制錫須生長之策略

底層材料之影響

底層材料不同時，

錫鍍層與底層材

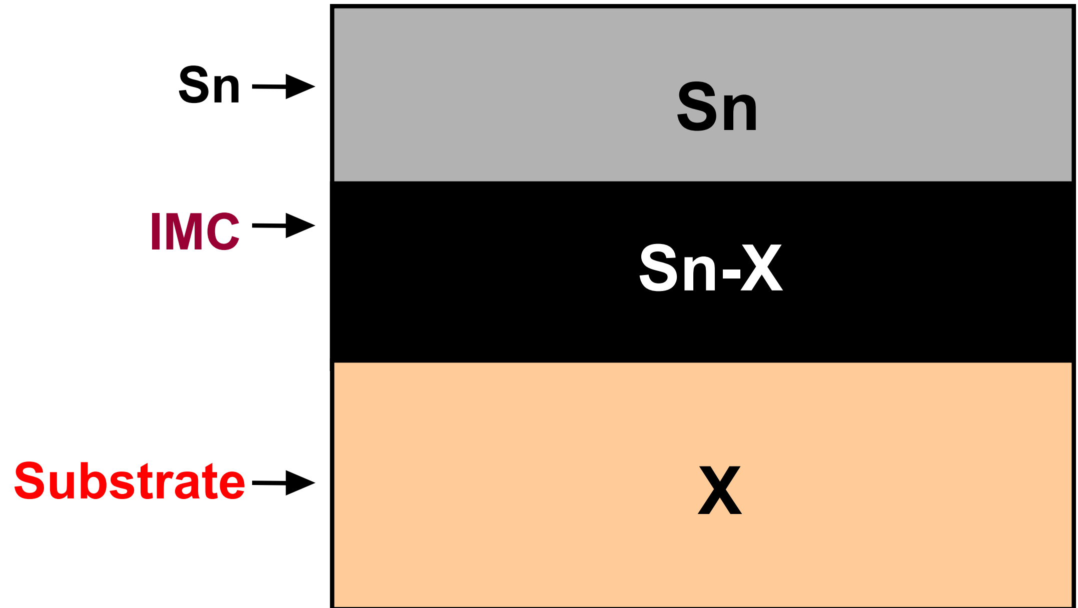
料間形成IMC

（Intermetallic）

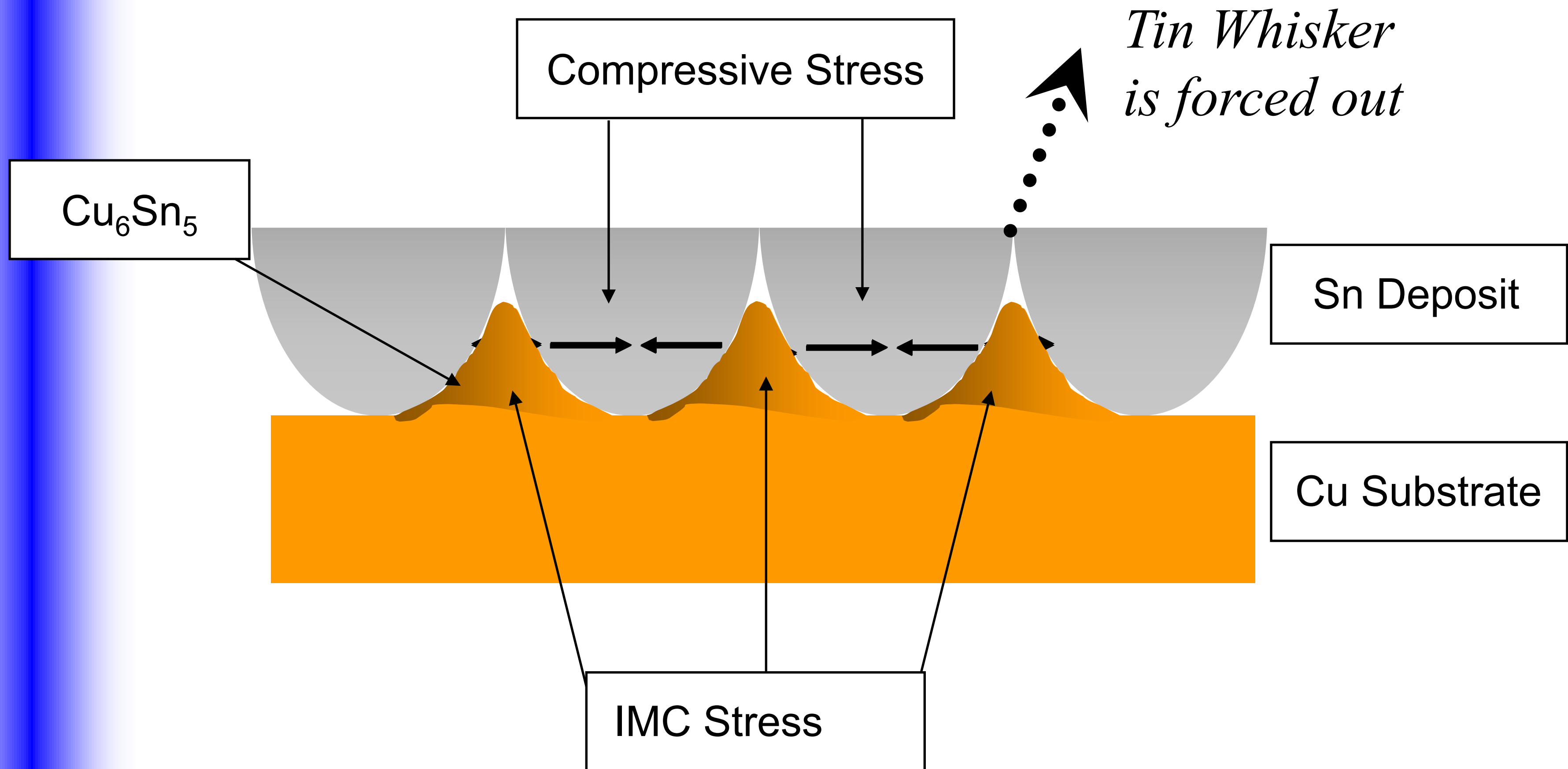
量與速率不同，

此時錫鍍層錫須

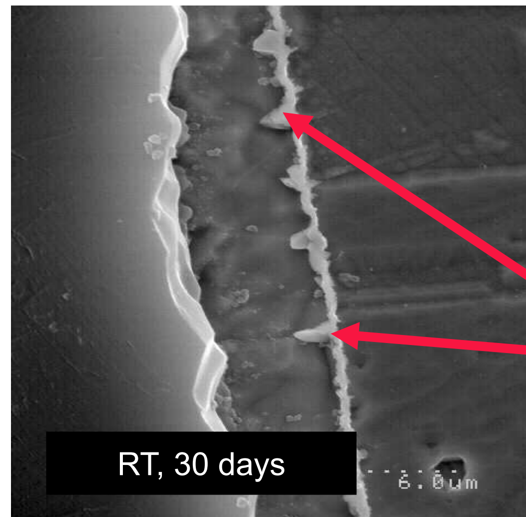
生長機會則不同



底層材料之影響（底鍍層為Cu材）



錫銅 IMC（金屬間化合物）生長特性
Aging: Room Temp



錫銅 IMC 數量增加並向錫層晶界處滲透對錫鍍層形成壓力

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