

## 摘 要

隨著可攜式消費性電子產品的增加，封裝體的體積日益減小，具細導線間距、無鉛、低溫製程等優點的異方性導電膠膜愈來愈受到重視。

本文是利用真實 IC 晶片以異方性導電膠膜，利用相同製程參數貼附在 PI 軟膜上，將整個結構體置於不同溫濕環境及熱循環作用下，於常溫進行接觸電阻值量測與剪力測試；另外在利用不同測試環境溫度下，與不同之頻率進行整個結構體的四點彎矩疲勞測試。

實驗結果發現，經過環境時效作用後的接觸電阻值並不會有改變，但在時效作用初期剪力強度會增加，經過 250 小時或 100 次熱循環後，其強度趨於穩定；在彎矩疲勞壽命方面，隨溫度升高，疲勞壽命值迅速減少，其中以測試頻率較低的，其變化幅度較大，而測試環境之溫度對於接觸電阻值之特性會有影響。

關鍵字：異方性導電膜、彎矩測試、剪力測試、可靠度測試

## Abstract

With the increasing of portable consumer electrical products, the volume of packaging is decreasing. Packaging by anisotropic conductive film (ACF) have paid much attention to its fine pitch, lead free and low temperature manufacture process. We use real IC mounted on PI film by ACF. Then put the specimens aging in different temperatures, high humidity and thermal cycles. After that, we measure the variation of contact resistances and shear strengths of them. On the other hand, the specimens are under both different temperature and frequency by four-point bending fatigue test. We've found that the contact resistances are without changing after environmental aging. But the shear strengths will grow up at the beginning, then decrease to a stable value after 250 hours or 100cycles. In bending test, when test environment temperature increase, fatigue life of low frequency decay faster than high frequency, and the contact resistance will be affected by temperature.

Key words : anisotropic conductive film (ACF), reliability, bending test,  
shear test