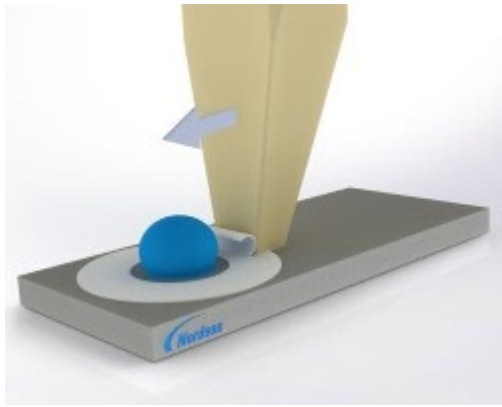




Passivation shear

Testing interconnections on the surface of devices with passivation layers is difficult. This is due to the nature of the protective coating which is well-adhered to the surface. Further complications arise from the interconnects (such as solder balls) being entrenched up to 10um within the layer. Passivation shear is designed to cut through the layer and only record the shear force from the interconnect of interest.

Introduction

Surface passivation of high chemical stability is seen increasingly in semiconductor device fabrication because it functions as a shielding layer for use in harsh environments. The layer is often spin-coated directly onto the device or grown from the substrate which pacifies the chemical instability, hence the term passivation. These layers range in thickness from nanometres to tens of microns.

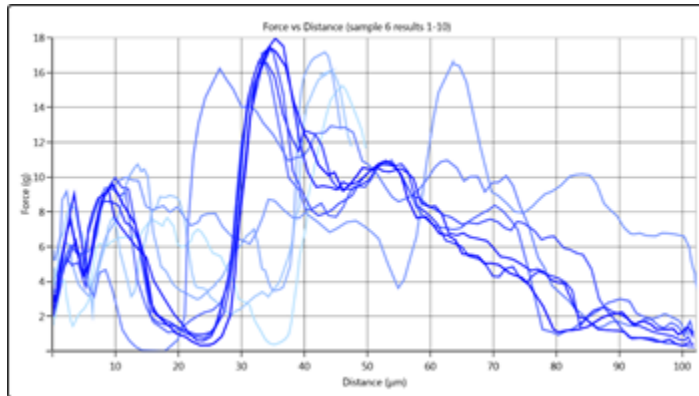
Testing of interconnects or bonds situated within the passivation layer poses a unique challenge and if improperly tested may lead to inconsistent results.

<https://youtu.be/2iaisyUldDg>

Traditional Passivation Shear

Testing of interconnects or bonds situated within the passivation layer poses a unique challenge and if improperly tested may lead to inconsistent results. Force profiles collected from passivation shear data will show multiple peak loads. Layer inconsistency and variability alongside the possibility that debris can get trapped underneath the tool leads to increased frictional forces. As a result, it's not uncommon to have a fluctuation in passivation results, making it difficult to differentiate failure force of the interconnect.

Results from typical passivation shear tests:



Introducing SMART Passivation Shear, with BumpFinder

Nordson Dage's SMART passivation shear sequence utilises innovative technology to drastically reduce production issues of entrenched interconnects. It reduces analysis time, making the test procedure simpler & faster all whilst reducing operator errors and false calls.

The sharp passivation tool will touch the surface, record the height, move forward slowly until it detects contact on the tool tip with long-standing precision load detection technology all cartridges utilise. The tool will then move backward to the designated offset and perform the typical passivation shear through the material until a set distance is reached. This intelligence of the Paragon™ software prioritises the data collection from the interconnect, showing the operator the data required for analysis only. The fixed displacement parameter ensures that the passivation build-up on the tool tip does not trigger a false end of test or indeed the contact of the interconnect with the wall of passivation behind it.

<https://youtu.be/mgYZdMqs4GY>

Results using SMART passivation shear:

