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IPC-MS-810

Guidelines for High Volume Microsection

Developed by the Automatic Microsectioning Task Group (7-10b) of the Testing Committee (7-10) of IPC

Users of this standard are encouraged to participate in the development of future revisions.

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Guidelines for High Volume Microsection

1 SCOPE

High volume microsection is a process. These guidelines discuss the many variables and problems associated with the process from sample removal to micro-etch. The guidelines do not promote any one vendor's process, but discuss the variables common to high volume microsection.

The process variables and problems are organized so the reader can research a specific issue or overview the variables of a process area.

2 APPLICABLE DOCUMENTS

2.1 IPC

IPC-D-275 Design Standard for Rigid Printed Boards and Rigid Printed Board Assemblies

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

3 SAMPLE REMOVAL PROCESS

3.1 Sample Location

3.1.1 Coupon Test Strip Companies generally use a ''home grown'' or military conformance coupon for microsection inspection. IPC-D-275 outlines the attributes a coupon test strip should exhibit based on the product type being built.

Benefits:

- Production parts are not lost due to microsection testing.
- The internal and external features are the same from panel to panel to facilitate SPC data collection.
- The strips may be used to screen product as required.
- The customer can correlate to your microsection results easier because you both sample in the same location on the same test design.

Drawbacks:

- Space is lost on the panel that could be used to build parts.
- The test strip may not be representative of the associated part.

3.1.2 Part The actual production parts are used for microsection inspection.

Benefits:

- Space is not wasted on the panel due to test strips.
- There are no paneling constraints that dictate where the test strip must be placed to preserve part correlation.
- There is less of an issue over how representative the test strip is to the associated part.

Drawbacks:

- Microsection inspection of parts may not be cost effective for product with a high unit cost.
- For MLBs, multiple samples are usually microsectioned to inspect all the inner layer connections for each panel. These multiple samples can significantly increase the sample plan.
- The test results may not agree with the customer's results because microsections were taken on different locations of the part. This can only be resolved by providing the part sample locations to the customer.

3.2 Removal Method Regardless the method chosen, the cutting edge should remain a minimum of 0.25 cm [0.100 in] from the edge of the target plated-through-hole (PTH) pads. This is to prevent cutting deformation causing damage to the sample which may lead to false failures. The only exception to this guideline is abrasive cut-off wheels.

3.2.1 Fracturing This method is usually used in conjunction with routing to remove samples from brittle material (i.e., polyimide). The sample is routed leaving a finger tab that holds the sample in the panel. Fracturing is when the operator pushes or cuts the sample out of the panel by breaking the finger tab. The benefits and drawbacks of routing will be discussed in that section.

Benefits:

- The samples are routed and remain with the panel. This resolves panel traceability issues when the actual sample is not serialized.
- The samples, test strip, and parts are routed at one time. This prevents unnecessary use of costly production routers to only rout the sample.

Drawbacks:

- The finger tabs width needs to be optimized to keep the sample in the test strip during handling and permit an operator to push the sample out. The tab width may be different for families of products and/or board thickness. Thick boards may require needle nose pliers (or equivalent) to break the finger tabs.
- The location of the tab needs to be as far from the target PTHs and microsection tooling holes as possible. This will minimize the likelihood that material stresses will be transferred to the sample when it is pushed out.