

## **STANDARD PROCEDURES AND PRACTICES**

**Number:** SPP-005

**Subject:** Pin #1 Orientation for TAB Packages

**Effective Date:** 20 June 1991

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### **BACKGROUND**

When mounted on a substrate, a TAB (or chip-on-tape) package may assume any of four configurations depending on the relative orientation of the die and tape as shown in Figure 1. Because the manufacturer of the component may not know what orientation the user prefers and because some orientations are mirror images of each other, a special convention for identifying pin #1 and defining the method of counting leads must be established.

### **PRACTICE**

There shall be a feature, called the Pin #1 orientation feature, on each TAB package. This feature shall be contained in an area located at one corner of the subject packages and shall be visible from either side of the package. Pin #1 shall be located directly adjacent to, and counterclockwise from, this index corner when the package is viewed as-mounted on a PC board.

### **APPLICATION INFORMATION**

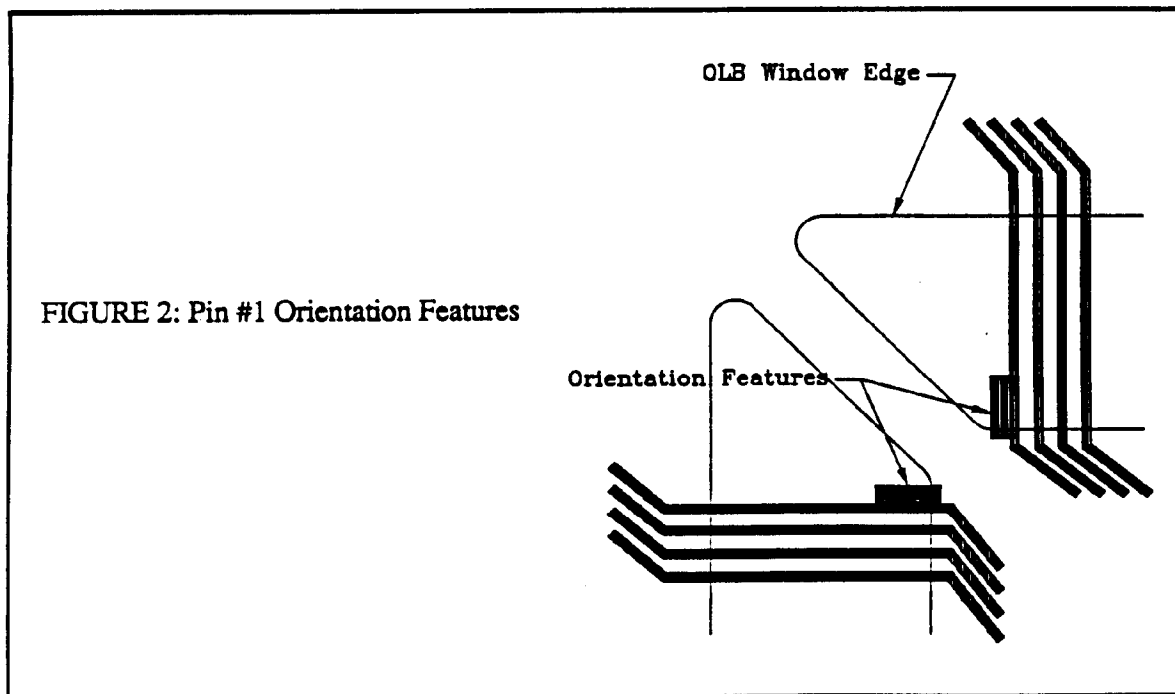
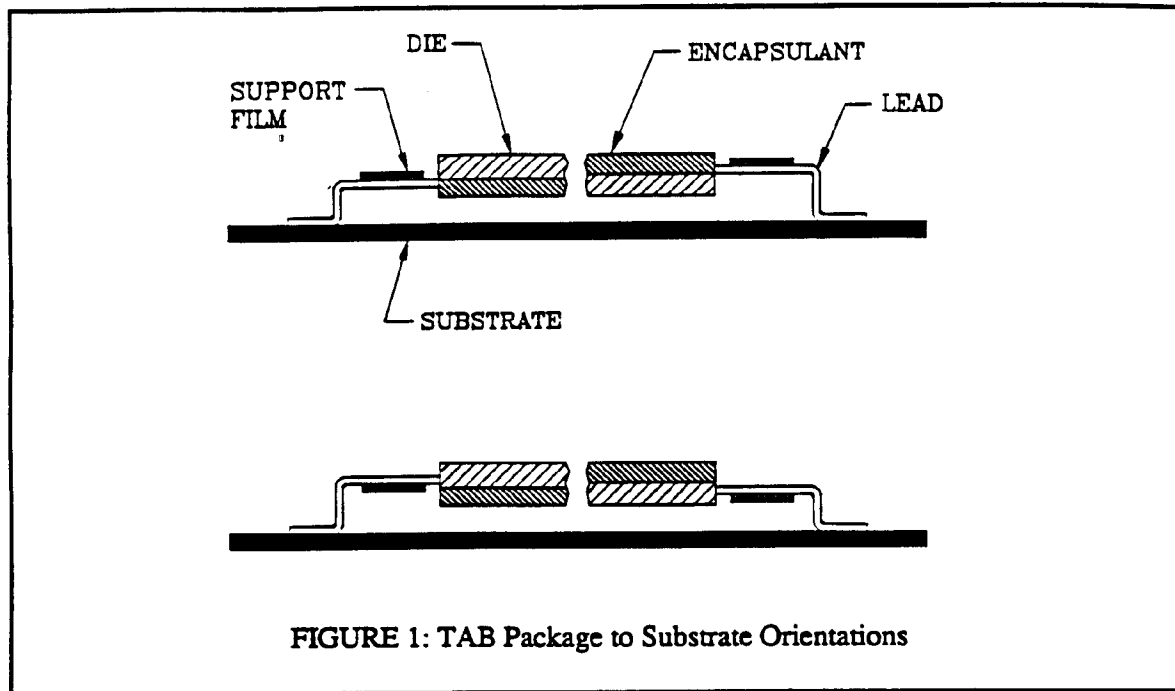
This policy consists of two parts: definition of an orientation feature and a convention for numbering leads. The policy defines a numbering convention that is independent of the differences in configuration of a TAB package in use.

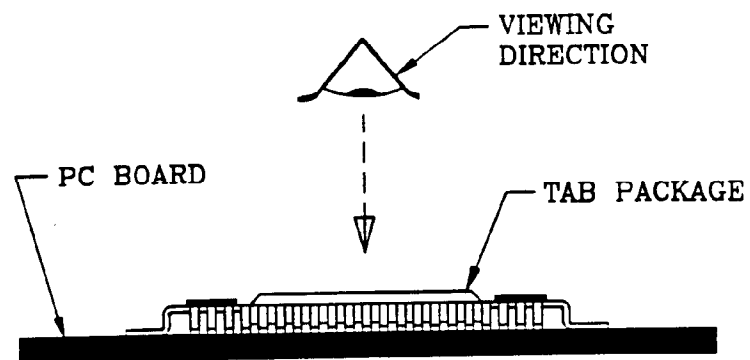
The orientation feature defines the location from which lead numbering begins. The feature shall be symmetric about the pin #1 corner and clearly visible from either side of the TAB package. The preferred feature shall be a widened portion of the two leads immediately adjacent to and straddling the Pin #1 corner as shown in Figure 2. When a tape frame is mounted in a slide carrier, the pin #1 corner shall be aligned with the orientation chamfer in the corner of the carrier (see Figure 4).

Pin #1 shall then be located directly adjacent to, and counterclockwise from, this index corner when the package is viewed as-mounted on a substrate (Figure 3); pin numbering shall continue in this counterclockwise direction around the package. This convention means that for constant die orientation, polyimide-up and -down configurations of a given device will have different pin number/function relationships.

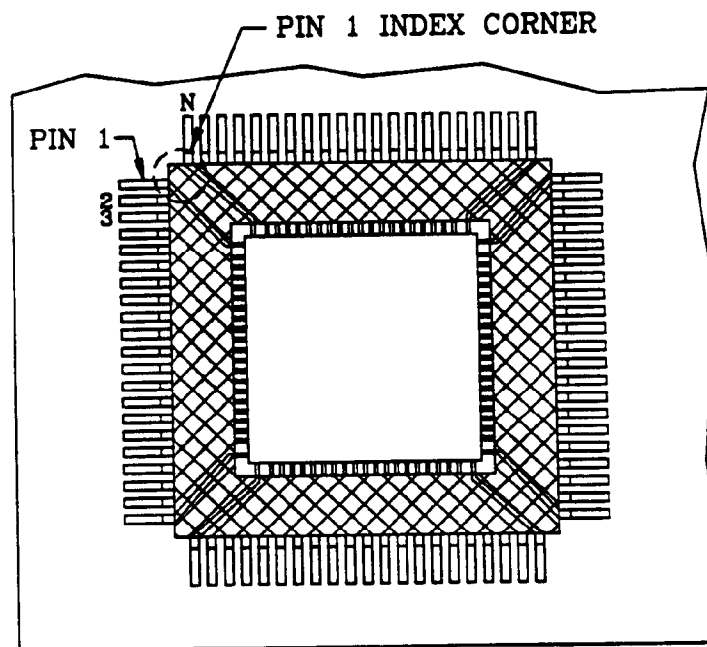
The advantages of this policy are that only one form of pin #1 orientation feature is used regardless of the configuration on the TAB package when mounted on a substrate and that all packages on a substrate follow the same lead numbering rotation. Thus, substrate designers have a known and consistent footprint numbering scheme to use.

This policy does, however, require the device maker to prepare two pin number/function tables for each device/tape orientation and the user must exercise requisite caution when designing with these devices.





SIDE VIEW



TOP VIEW

FIGURE 3: Pin #1 Location and Numbering Direction

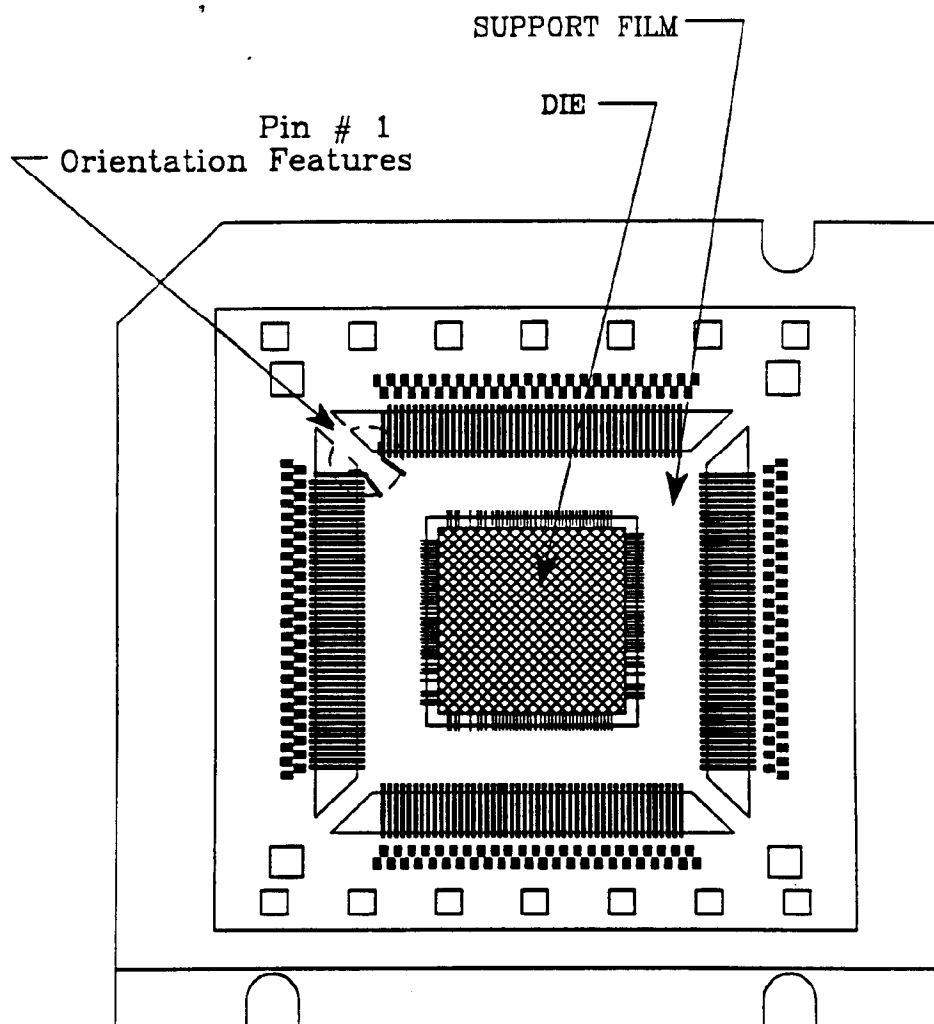


FIGURE 4: TAB Package/Slide Carrier Orientation