

4.5. Die attach

Die attach - is taking the die from the singulation step and placing it in the package or lead frame. This process is made up of two or three steps, die attach paste or solder placement and accurate placement of the die in the package. As packages and die become bigger and the current and speeds go up; it puts greater demands on the die attach machine to dispense the paste in a very controlled way to minimize bond line thickness and keep the die aligned on the leadframe. K&S, AlphaSem and ESEC are popular.

Figure 4.4 illustrates a leadframe prior to die attach, the leadframe is the base to which the die will be attached. The leadframe illustrated is a leadframe for 6 pin DIPs and has 20 positions. Each rectangular pad on the leadframe will have a die placed on it during die attach. The die will be connected to the leadframe and finally the leadframe broken apart in later steps.

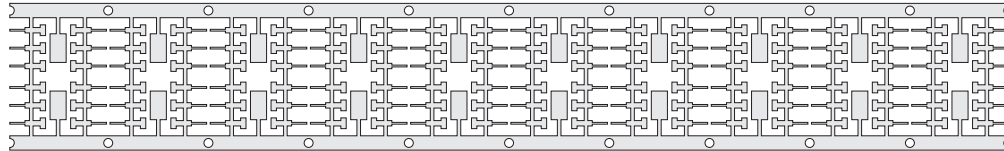


Figure 4.4. Leadframe prior to die attach.

Die attach may be done by using an epoxy, solder or eutechnic die mount.

Epoxy die mount is the most common method of attaching ICs. For epoxy die mount a controlled amount of epoxy is dispensed onto the leadframe, see figure 4.5 left side, and then the die is placed on the epoxy, see figure 4.5 right side.

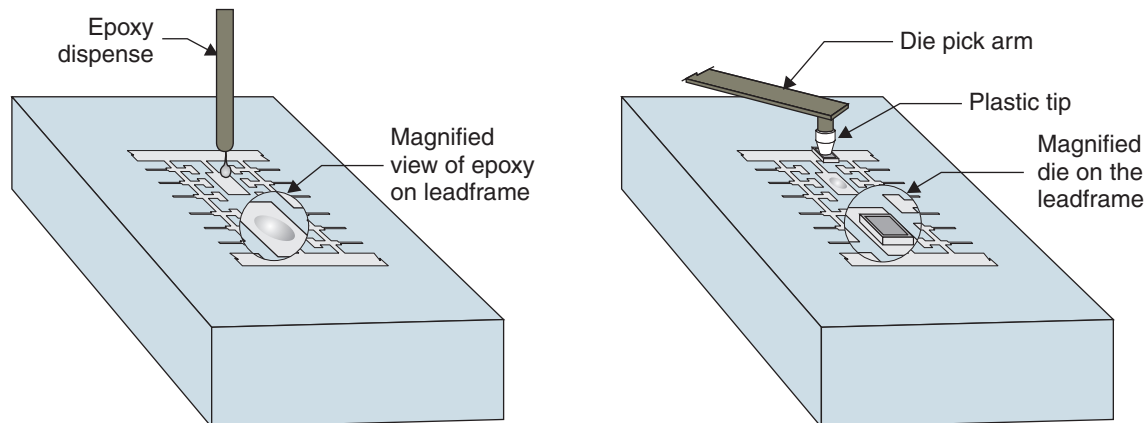


Figure 4.5. Epoxy die attach. Note only a section of the leadframe is shown.

When the die being mounted generates a lot of heat, solder die attach may be used. Figure 4.6 illustrates a copper leadframe that has been plated selectively - only where the die will be soldered down. The rest of the frame is left un-plated to improve heat conduction.

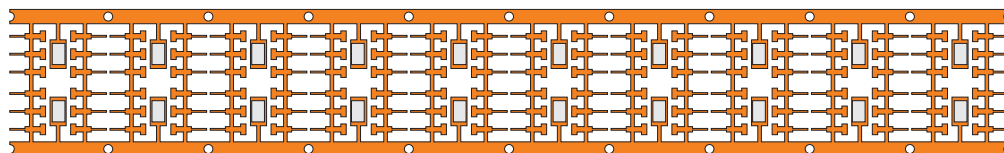


Figure 4.6. Selectively plated leadframe ready for solder die attach.