

4.1.5 Bonding

Once the sample is patterned and everything looks good, the last step in the fabrication process is to mount the sample into a chip carrier and connect wires to the Ohmic contacts and to the gate electrodes. Two versions of this so-called *bonding* are widely used. In ball bonding, the tip of a gold wire is molten locally by a discharge or a flame, and is pressed against a bond pad defined on the sample surface. The sample is heated to a moderate temperature, say 200 °C, and a connection forms via thermo - compression. The second scheme is known as wedge bonding, see Fig. 4.17. Here, the wire is pressed against the bond pad and rubbed across it with an ultrasonic frequency. The friction force is sufficient to locally melt the materials, and an alloy is formed which holds the wire in place. After the second bond, the wire is pulled and breaks at the weakest point, which is right after the position of the wedge.

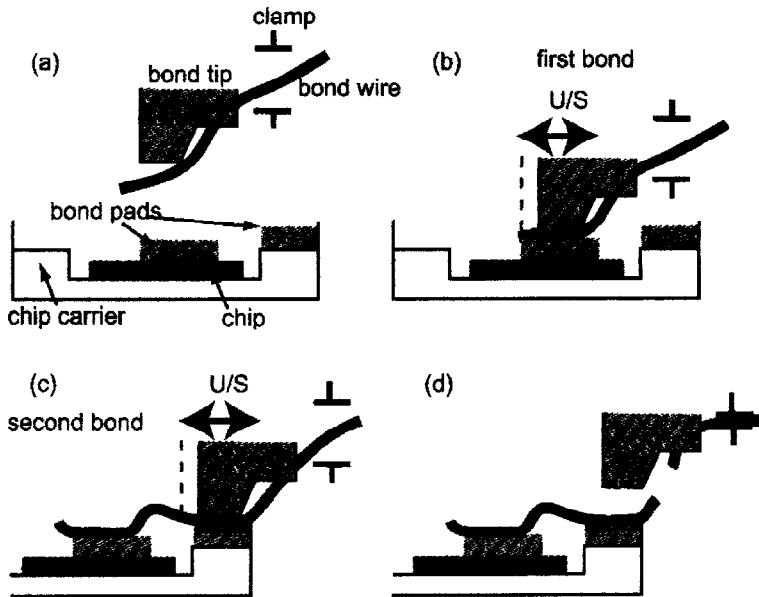


Figure 4.17: Wedge bonding. (a): the bond tip containing the wire is positioned on top of the bond pad on the sample. (b): the wire is wedged onto the bond pad, and the tip is retracted with the wire clamp open. (c): the second bond on the pad integrated in the chip carrier. Here, the tip retracts with the clamp closed, and the wire breaks behind the second wedge.