

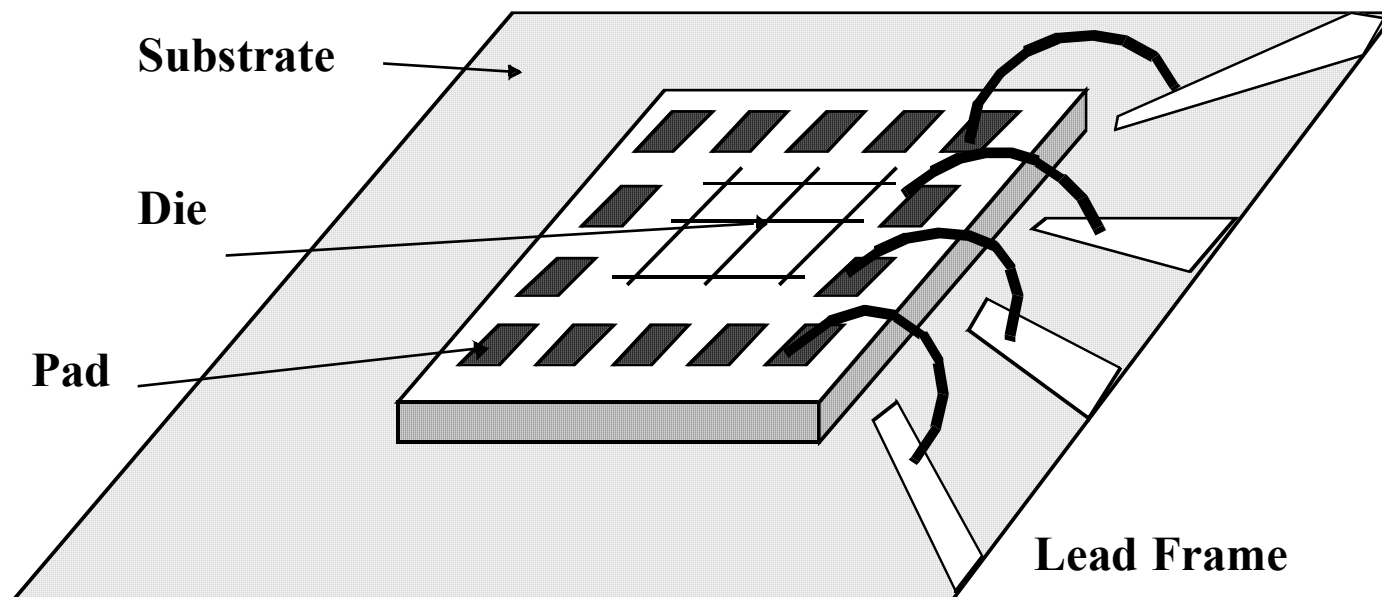
Packaging

Packaging Requirements

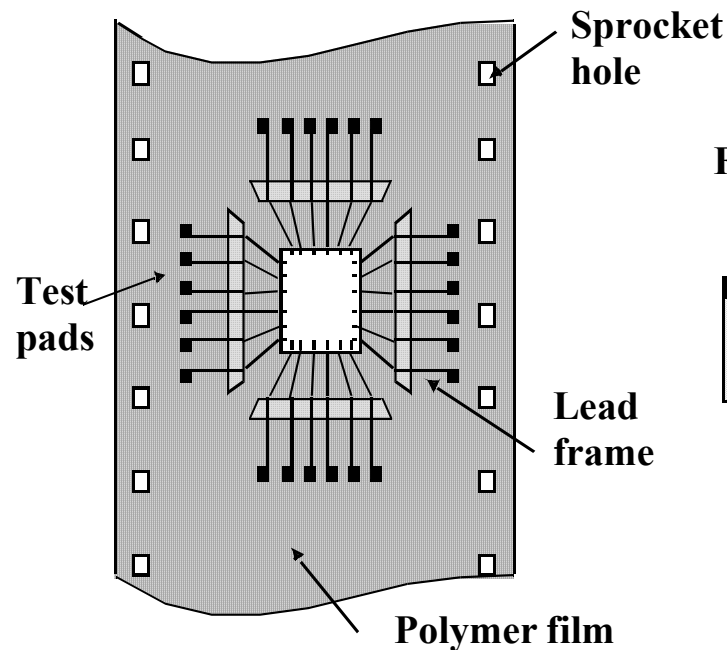
- ❑ **Electrical: Low parasitics**
- ❑ **Mechanical: Reliable and robust**
- ❑ **Thermal: Efficient heat removal**
- ❑ **Economical: Cheap**

Bonding Techniques

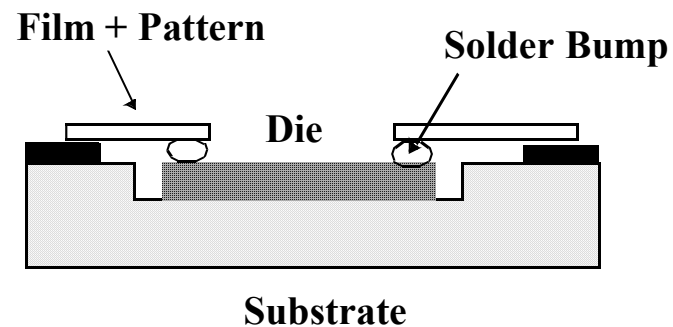
Wire Bonding



Tape-Automated Bonding (TAB)

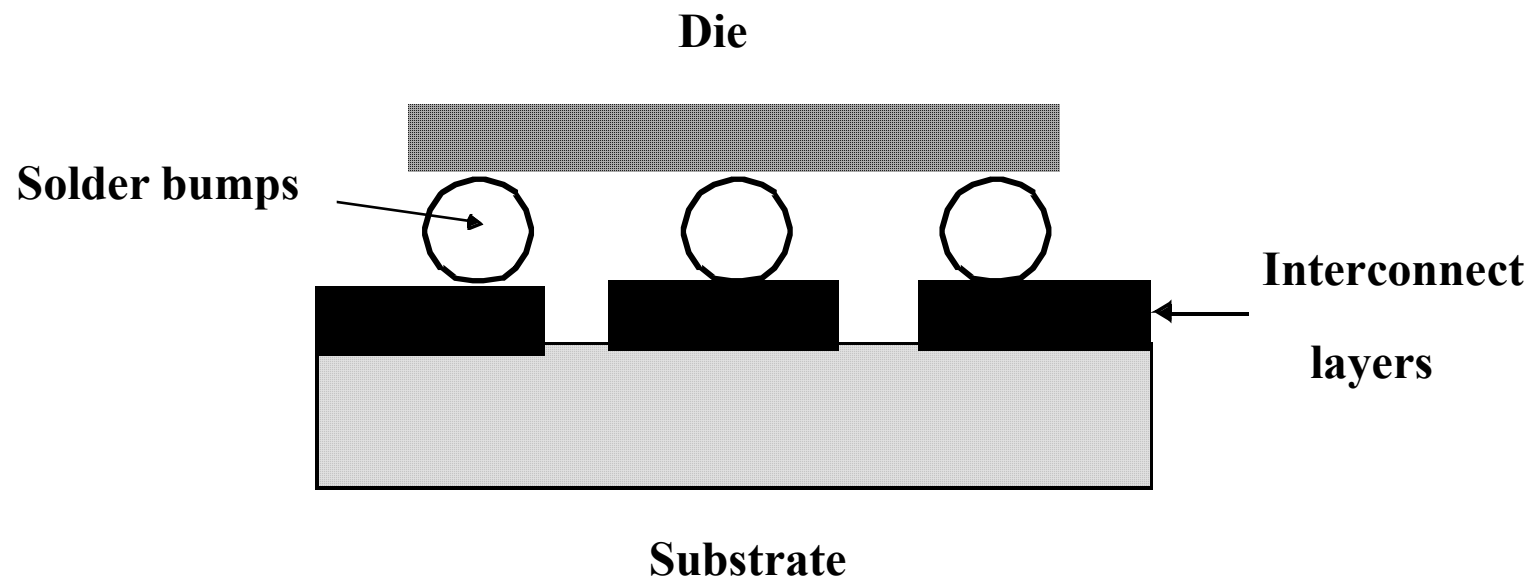


(a) Polymer Tape with imprinted wiring pattern.

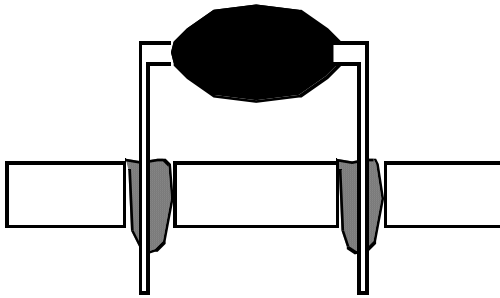


(b) Die attachment using solder bumps.

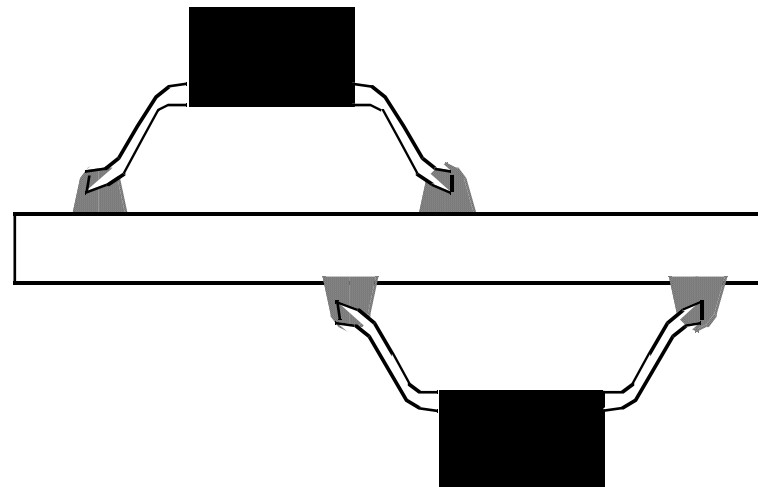
Flip-Chip Bonding



Package-to-Board Interconnect

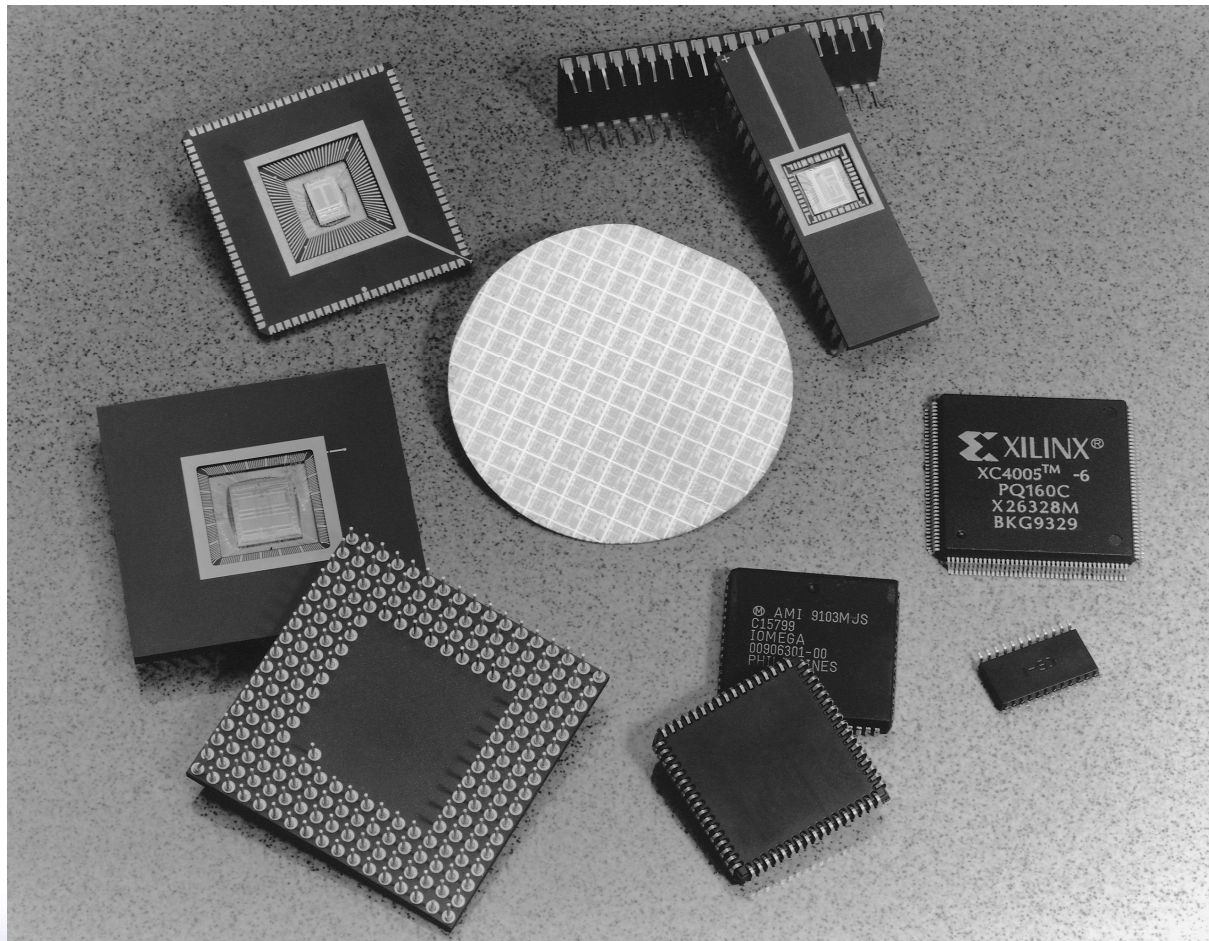


(a) Through-Hole Mounting



(b) Surface Mount

Package Types



Package Parameters

Package Type	Capacitance (pF)	Inductance (nH)
68 Pin Plastic DIP	4	35
68 Pin Ceramic DIP	7	20
256 Pin Pin Grid Array	5	15
Wire Bond	1	1
Solder Bump	0.5	0.1

Typical Capacitances and Inductances of Various Package and Bonding Styles (from [Sze83])

Multi-Chip Modules

