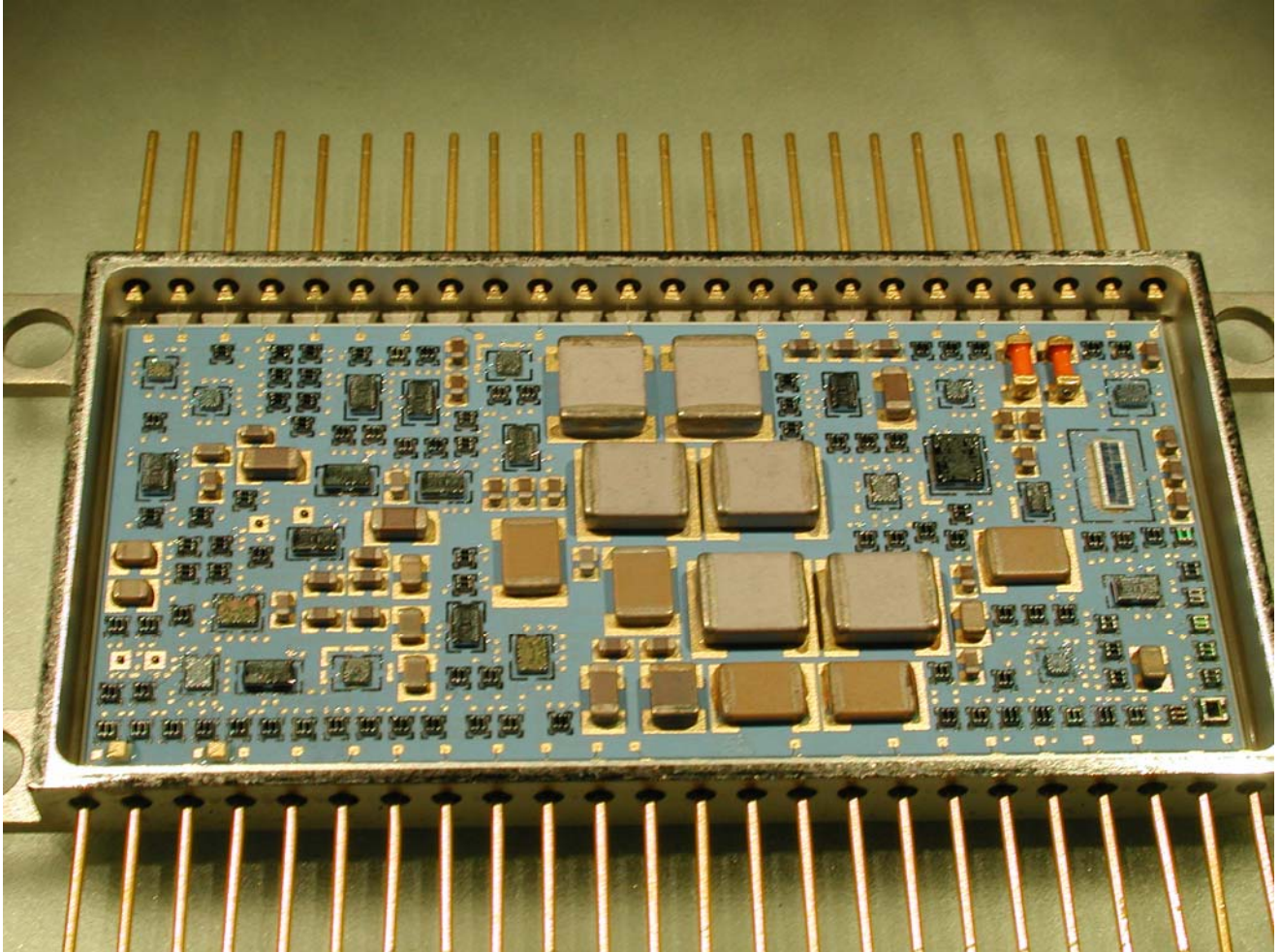


## Hybrid Technology

In the market of electronics the integration of components in to single smaller assembly is always continuing.

Hybrid technology increase packing density, usually involving a mixed active and passive components. shows a typical space application. with a lot number of connections.



The manufacturing stages interconnects some passive components such as resistors printed on a ceramic substrate. With Hybrid technology several important aspects may be taken to satisfy the requirements such as track width, proximity of tracks to bonding pads, bondability, loop heights, heat dissipation and so on must be considered.

In thick film technology the functional interconnects, tracking and resistors are created by printing various pastes onto the different levels of the substrate. In thin film technology the interconnects and tracking are deposited galvanically onto the ceramic substrate, resistors and other passive components being added using printing and soldering techniques.

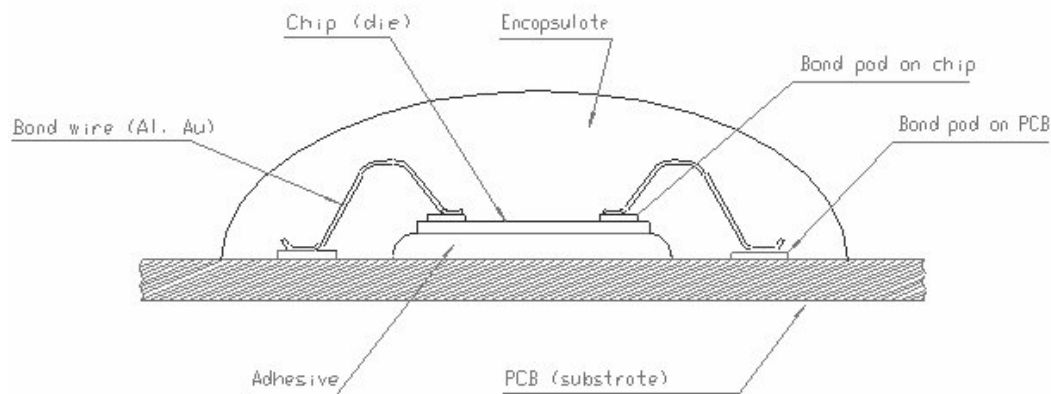
After, all remaining devices (passive and active) are mounted, the chips are placed onto the substrate using die bonders, the electrical connections between chips and substrate are made with gold or aluminum wire bonders and the whole unit is then mounted in a package.

Hybrid technology reduces space, enables large integration devices into a very small area. If standard surface mount technology were used it would occupy up to 20 times the area used with hybrid techniques.

Manufacturing hybrid circuits satisfies a large number of application such as medical technology, aerospace, military, automotive and communications where hybrid circuits are indispensable.

Over the years considerable effort has been devoted to develop methods of utilizing the benefits of hybrid technology but at lower cost.

Results show that the tried and tested printed circuit technology is still the best available for complex circuitry, if certain improvements are implemented which allow bare die to be placed and bonded easily and reliably.



Above; the silicon chip is glued directly to the substrate and then connected by bonding with an aluminum wire or a gold wire with a diameter from 17.5 to 50  $\mu\text{m}$  (no exhaustive list). An encapsulation resin (Glop top) can be dispensed on the unit or locally to guarantee stability against thermal and mechanical efforts, and to protect the assembly.