



Our Commitment

As Apex Microtechnology leads the semiconductor hybrid amplifier industry, we are committed to quality, innovation, and continuous improvement. Our advanced manufacturing capabilities—spanning hybrids, monolithic chips, and open-frame devices—are backed by evolving equipment, refined processes, and a quality-first mindset. Explore how our expertise drives performance, reliability, and customer satisfaction.

PACKAGING

A crucial consideration in any design, the package choice lends reliability, protection, ease of heatsinking to its hybrid microcircuit. Apex has a wide variety of standard and custom package options, including metal can, power SIP, open-frame, plastic overmolds, and state-of-the-art multi-chip modules. These are made possible by our process capabilities below:

- ❖ Welded nickel caps
- ❖ Fine and gross leak testing
- ❖ Ceramic cavity lids
- ❖ Plastic cavity lids
- ❖ Solder dip lead finishing
- ❖ Lead forming and shear
- ❖ Lead frame fabrication
- ❖ Custom marking
- ❖ Automated epoxy application
- ❖ Multi-chip modules



AUTOMATED PROCESSES

Apex excels in bringing a product to market quickly, thanks to the automation in our factory and ease of prototyping.

- ❖ Automated surface mount construction - FR4 and insulated metal substrate (IMS)
- ❖ Laser trim - for target resistor value, target parameter, and temperature drift compensation
- ❖ Automated test equipment (ATE)
- ❖ Military qualification tests, including but not limited to:
 - Temperature cycle -65°C to +125°C
 - Burn-in: +125°C for 160 hours
 - Constant acceleration 5000G
 - Temperature test 25°C, -55°C, 125°C
 - Fine leak, helium leak detection
 - Gross leak

Manufacturing Processes

Thick Film Printing on Substrates

A classic method of high-density conductor fabrication, screen printing allows Apex to shrink down power circuits by orders of magnitude compared to discrete implementations. Our thick-film-on-substrate processes are the first step in creating many of Apex's world-class amplifiers, and they play a big role in "getting the heat out" for our high-power product line.

- ❖ Beryllia, alumina, and aluminum nitride substrates
- ❖ Gold and silver conductor paste
- ❖ Thick film resistor and thermistor paste
- ❖ Glass dielectric layers

Wire Bonding

Another space-saving method of circuit construction, wire bonding bare die to substrates, pins, or other bare die is a technique Apex uses for high-current, high-reliability, and low parasitic performance. Various sizes, shapes, and materials are used to optimize each circuit.

- ❖ Aluminum wirebond - 0.00125" to 0.020" wire diameter
- ❖ Copper-core-aluminum wire (CuCorAl .006)

Bare Die Processing

As a hybrid manufacturing site since 1980, bare die is our strong suit here at Apex. We have automated our full production line, including pick-and-place, die attachment methods, cleaning processes, and other back-end processes:

- ❖ Epoxy die attach (non-conductive & conductive epoxy options)
- ❖ Solder die attach
- ❖ Sintered & pressure-assisted sintered silver die attach
- ❖ Wafer slicing, backgrind, and backmetal desposition
- ❖ Cleaning - aqueous, ultrasonic, and plasma
- ❖ Vapor phase reflow
- ❖ Chip-on-board (FR4 or IMS)
- ❖ Silicone protective coating

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