

WHAT IS CLAIMED IS:

1. An apparatus for supplying a mold resin to multiple semiconductor elements mounted on a substrate; comprising

a lower die that supports the substrate on which the multiple semiconductor elements are mounted;

an upper die with a polymer film to mold the resin for the multiple semiconductor elements on the substrate;

wherein the lower die includes an electrically insulated region for supporting the substrate.

2. The apparatus of Claim 1, wherein the electrically insulated region includes a ceramic member.

3. The apparatus of Claim 2, wherein the ceramic member is a ceramic plate attached to the lower die.

4. The apparatus of Claim 3, wherein the ceramic plate is housed in a cavity formed in the lower die.

5. The apparatus of Claim 1, wherein the electrically insulated region comprises an insulating film disposed on the lower die.

6. The apparatus of Claim 5, wherein the insulating film is attached to the surface of the lower die through the medium of an adhesive.

7. The apparatus of Claim 1, wherein the electrically insulated region is larger than the surface area of the mounted substrate.

8. The apparatus of Claim 1, wherein the lower die includes a sealing member to enclose the electrically insulated region.

9. The apparatus of Claim 8, wherein the lower die includes multiple air intake holes in a region encircled by the sealing member for creating a vacuum state in which resin is molded.

10. The apparatus of Claim 1, wherein the upper die includes multiple recesses with a suction hole.

11. The apparatus of Claim 1, wherein the substrate includes a first principal surface on which semiconductor elements are mounted; a second principal surface opposite the first principal surface, and a first conductive region exposed on the first principal surface, and the first conductive region is electrically connected to the semiconductor elements.

12. The apparatus of Claim 11, wherein the first conductive region is uncovered from the molded resin.

13. The apparatus of Claim 11, wherein the substrate includes a second conductive region on the second principal surface, and the second conductive region is electrically connected to the first conductive region or semiconductor elements.

14. The apparatus of Claim 1, wherein the substrate is a multilayer circuit board.

15. A method for manufacturing a semiconductor device; comprising:
- providing a substrate that includes a first principal surface and a second principal surface opposite the first principal surface;
- placing semiconductor elements on the first principal surface;
- placing the substrate on an insulating region of a lower die;
- pressing an upper die in which multiple shape-forming parts are formed against the lower die through the medium of a polymer film; and
- supplying a liquid resin for molding the semiconductor elements.
16. The manufacturing method of Claim 15, wherein the lower die includes a ceramic member, and the second principal surface of the substrate is mounted on the ceramic member.
17. The manufacturing method described in Claim 15, wherein the lower die includes an insulating film, and the second principal surface of the substrate is mounted on the insulating film.
18. The manufacturing method described in Claim 15, wherein the insulating region is larger than the second principal surface of the substrate.
19. The manufacturing method described in Claim 15, wherein the polymer film is held by suction in the multiple shape-forming parts by air intake from air intake holes formed in the upper die.
20. The manufacturing method described in Claim 15, wherein the substrate includes a first conductive region on the first principal surface, and the first conductive region is electrically connected to semiconductor elements.
21. The semiconductor manufacturing device described in Claim 21, wherein the first conductive region is uncovered by the molded resin.
22. The manufacturing method described in Claim 15, wherein the substrate includes a second conductive region on the second principal surface, and the second conductive region is electrically connected to the first conductive region or semiconductor elements.

23. The manufacturing method described in any one of Claims 15, wherein the substrate is a multilayer circuit board.

24. The manufacturing method described in any one of Claims 15, further comprising a step of cutting the substrate into individual semiconductor elements.

25. The manufacturing method described in any one of Claims 20, further comprising a step of stacking terminals of a second semiconductor device onto the first conductive region on the first principal surface of the substrate.