Claims

What is claimed:

1. A semiconductor device, comprising:

a substrate as a single material including a base plate and a row of first bodies and a row of second bodies extending from a surface of the base plate, wherein the surface of the base plate completely surrounds each of the row of first bodies and each of the row of second bodies;

a semiconductor die disposed between the row of first bodies and the row of second bodies;

an encapsulant deposited around the semiconductor die and over the substrate around each of the row of first bodies and each of the row of second bodies, wherein the encapsulant includes a plurality of first openings extending to each of the row of first bodies and to each of the row of second bodies;

a conductive layer formed in at least one of the first openings and contacting at least one of the row of first bodies; and

an insulating layer formed over the encapsulant and extending into the at least one of the first openings over the conductive layer.

2. The semiconductor device of claim 1, wherein the substrate consists of a non-conductive material.

3. The semiconductor device of claim 1, further including a second opening formed in the encapsulant and extending to the semiconductor die.

4. The semiconductor device of claim 3, wherein the conductive layer extends into the second opening to contact the semiconductor die.

5. The semiconductor device of claim 1, wherein a surface of the encapsulant is coplanar with a surface of the semiconductor die.

6. The semiconductor device of claim 1, further including a conductive via formed through the semiconductor die.

7. A semiconductor device, comprising:

a semiconductor die;

an encapsulant deposited around the semiconductor die, wherein the encapsulant includes a plurality of first openings arranged in a row and formed from a first surface of the encapsulant partially through the encapsulant;

a conductive layer formed over the first surface of the encapsulant and extending into the first openings in the encapsulant; and

an insulating layer formed over the conductive layer and extending into the first openings over the conductive layer;

wherein the encapsulant includes a plurality of second openings arranged in a row and formed from a second surface of the encapsulant opposite the first surface of the encapsulant partially through the encapsulant and aligned with the first openings and extending to the conductive layer.

8. The semiconductor device of claim 7, further including a substrate formed as a single material including a base plate and a row of first bodies and a row of second bodies extending from

a surface of the base plate, wherein the surface of the base plate completely surrounds each of the row of first bodies and each of the row of second bodies and further that the row of first bodies and the row of second bodies are disposed in the second openings in the encapsulant.

9. The semiconductor device of claim 8, wherein the substrate consists of a non-conductive material.

10. The semiconductor device of claim 7, further including a third opening in the encapsulant extending to the semiconductor die.

11. The semiconductor device of claim 10, wherein the conductive layer extends into the third opening to contact the semiconductor die.

12. The semiconductor device of claim 10, wherein the third opening exposes an entire surface of the semiconductor die.

13. The semiconductor device of claim 7, further including a conductive via formed through the semiconductor die.

14. A semiconductor device, comprising:

a semiconductor die;

an encapsulant deposited over the semiconductor die, wherein the encapsulant further includes a plurality of first openings arranged in a row and formed from the first surface of the encapsulant partially through the encapsulant; and

a conductive layer formed over the first surface of the encapsulant and extending into the first openings in the encapsulant;

wherein the encapsulant includes a plurality of second openings arranged in a row and formed from a second surface of the encapsulant opposite the first surface of the encapsulant partially through the encapsulant and aligned with the first openings and extending to the conductive layer.

15. The semiconductor device of claim 14, further including a substrate formed as a single material including a base plate and a row of first bodies and a row of second bodies extending from the base plate, wherein the row of first bodies and the row of second bodies are disposed in the second openings in the encapsulant.

16. The semiconductor device of claim 15, wherein the substrate consists of a non-conductive material.

17. The semiconductor device of claim 14, further including a third opening formed in the encapsulant and extending to the semiconductor die.

18. The semiconductor device of claim 17, wherein the third opening exposes an entire surface of the semiconductor die.

19. The semiconductor device of claim 14, further including a conductive via formed through the semiconductor die.

20. The semiconductor device of claim 14, further including an insulating layer formed over the conductive layer and extending into the first openings over the conductive layer.

21. A semiconductor device, comprising:

a substrate formed as a single material including a base plate and a row of first bodies and a row of second bodies extending from the base plate with a die mounting site on the base plate disposed between the row of first bodies and the row of second bodies;

a semiconductor die disposed over the die mounting site;

an encapsulant deposited around the semiconductor die and over the substrate around each of the row of first bodies and each of the row of second bodies, wherein the encapsulant further includes a plurality of first openings arranged in a row and formed from the first surface of the encapsulant partially through the encapsulant and extending to each of the row of first bodies and to each of the row of second bodies; and

a conductive layer formed in at least one of the first openings and contacting at least one of the row of first bodies or at least one of the row of second bodies.

22. The semiconductor device of claim 21, wherein the substrate consists of a non-conductive material.

23. The semiconductor device of claim 21, further including an insulating layer formed over the conductive layer and extending into the at least one of the first openings over the conductive layer.

24. The semiconductor device of claim 21, further including a conductive via formed through the semiconductor die.