BACKGROUND

[0005] Present systems, methods and/or architectures for forming electronic packages having interposers are inadequate. Further limitations and disadvantages of conventional and traditional approaches will become apparent to one of skill in the art, through comparison of such approaches with the present invention as set forth in the remainder of the present application with reference to the drawings.

SUMMARY OF INVENTION

[0005a] According to a first aspect of the present invention, there is provided a method of manufacturing a semiconductor device, the method comprising: forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate; connecting a semiconductor die to the redistribution layer facing an upper portion of the interposer; encapsulating the semiconductor die in an encapsulant; removing the dummy substrate from the interposer; and thinning the encapsulant.

[0005b] According to a second aspect of the present invention, there is provided a method of manufacturing a semiconductor device, the method comprising: forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate; and removing the dummy substrate from the interposer, wherein said removing the dummy substrate comprises grinding the dummy substrate.

[0005c] According to a third aspect of the present invention there is provided a method of manufacturing a semiconductor device, the method comprising: forming an interposer comprising: a redistribution layer and a dielectric layer; and an under bump metal on which at least a portion of the redistribution layer is formed; connecting a semiconductor die to the redistribution layer facing an upper portion of the interposer; encapsulating the semiconductor die by using an encapsulant; thinning the encapsulant to expose a top surface of the semiconductor die; and connecting a bump to the under bump metal.

What is claimed is

1. A method of manufacturing a semiconductor device, the method comprising:

forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate;

connecting a semiconductor die to the redistribution layer facing an upper portion of the interposer;

encapsulating the semiconductor die by using an encapsulation; and

removing the dummy substrate from the interposer.

2. The method as claimed in claim 1, wherein the dummy substrate comprises at least one of: silicon and/or glass.

3. The method as claimed in claim 1, wherein the dielectric layer comprises at least one of: a silicon oxide layer, a silicon nitride layer, and/or a polymer layer.

4. The method as claimed in claim 1, comprising forming a solder on the redistribution layer facing the upper portion of the interposer, and wherein said connecting a semiconductor die comprises connecting the semiconductor die to the solder.

5. The method as claimed in claim 1, comprising, after said connecting the semiconductor die, filling an underfill between the semiconductor die and the interposer.

6. The method as claimed in claim 1, comprising, after said encapsulating the semiconductor die, grinding the encapsulant to expose a top surface of the semiconductor die.

7. The method as claimed in claim 1, wherein said removing the dummy substrate comprises grinding and etching the dummy substrate to expose a portion of the redistribution layer facing a lower portion of the interposer.

8. The method as claimed in claim 1, comprising connecting a bump to the redistribution layer facing a lower portion of the interposer, said connecting a bump comprising: forming an under bump metal on the redistribution layer facing the lower portion of the interposer; and connecting the bump to the under bump metal.

9. The method as claimed in claim 1, wherein said forming the interposer comprises forming an under bump metal on which at least a portion of the redistribution layer will be formed.

10. The method as claimed in claim 8, comprising mounting the connected bump to a circuit board.

11. The method as claimed in claim 10, comprising filling an underfill between the interposer and the circuit board.

12. The method as claimed in claim 10, comprising attaching a cover to the circuit board to cover the semiconductor die.

13. The method as claimed in claim 1, wherein said forming the interposer comprises:

forming a seed layer on the dummy substrate;

forming and patterning the redistribution layer on the seed layer;

forming the dielectric layer outside the redistribution layer; and

removing the seed layer.

14. The method as claimed in claim 1, wherein the forming of the interposer comprises:

forming a seed layer on the dummy substrate;

forming an under bump metal on the seed layer;

forming and patterning the redistribution layer on the under bump metal;

forming the dielectric layer outside the redistribution layer; and

removing the seed layer.

15. The method as claimed in claim 14, wherein said forming an under bump metal comprises removing the seed layer formed outside the under bump metal.

16. A method of manufacturing a semiconductor device, the method comprising:

forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate; and

removing the dummy substrate from the interposer.

17. The method as claimed in claim 16, wherein said removing the dummy substrate comprises grinding and etching the dummy substrate to expose a portion of the redistribution layer.

18. The method as claimed in claim 16, wherein said forming the interposer comprises forming an under bump metal on which at least a portion of the redistribution layer will be formed.

19. A semiconductor device comprising:

an interposer comprising a redistribution layer and a dielectric layer;

a semiconductor die connected to the redistribution layer facing an upper portion of the interposer;

encapsulant encapsulating the semiconductor die; and

a bump connected to the redistribution layer facing a lower portion of the interposer.

20. The semiconductor device as claimed in claim 19, wherein under bump metal is disposed inside the interposer.

Claims:

1. A method of manufacturing a semiconductor device, the method comprising:

forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate;

connecting a semiconductor die to the redistribution layer facing an upper portion of the interposer;

encapsulating the semiconductor die in an encapsulant;

removing the dummy substrate from the interposer; and

thinning the encapsulant.

2. The method as claimed in claim 1, wherein the dummy substrate comprises at least one of: silicon and/or glass.

3. The method as claimed in claim 1, wherein the dielectric layer comprises at least one of: a silicon oxide layer, a silicon nitride layer, and/or a polymer layer.

4. The method as claimed in claim 1, comprising forming a solder on the redistribution layer facing the upper portion of the interposer, and wherein said connecting a semiconductor die comprises connecting the semiconductor die to the solder.

5. The method as claimed in claim 1, comprising, after said connecting the semiconductor die, filling an underfill between the semiconductor die and the interposer.

6. The method as claimed in claim 1, wherein said thinning the encapsulant comprises grinding the encapsulant to expose a top surface of the semiconductor die.

7. The method as claimed in claim 1, wherein said removing the dummy substrate comprises grinding and etching the dummy substrate to expose a portion of the redistribution layer facing a lower portion of the interposer.

8. The method as claimed in claim 1, comprising connecting a bump to the redistribution layer facing a lower portion of the interposer, said connecting a bump comprising:

forming an under bump metal on the redistribution layer facing the lower portion of the interposer; and connecting the bump to the under bump metal.

9. The method as claimed in claim 1, wherein said forming the interposer comprises forming an under bump metal on which at least a portion of the redistribution layer will be formed.

10. The method as claimed in claim 8, comprising mounting the connected bump to a circuit board.

11. The method as claimed in claim 10, comprising filling an underfill between the interposer and the circuit board.

12. The method as claimed in claim 10, comprising attaching a cover to the circuit board to cover the semiconductor die.

13. The method as claimed in claim 1, wherein said forming the interposer comprises:
forming a seed layer directly on the dummy substrate;
forming and patterning the redistribution layer on the seed layer;
forming the dielectric layer outside the redistribution layer; and
removing the seed layer.

14. The method as claimed in claim 1, wherein the forming of the interposer comprises:
forming a seed layer on the dummy substrate;
forming an under bump metal directly on at least a portion of the seed layer;
forming and patterning the redistribution layer on the under bump metal;
forming the dielectric layer outside the redistribution layer; and

removing the at least a portion of the seed layer on which the under bump metal was directly formed.

15. The method as claimed in claim 14, wherein said removing the at least a portion of the seed layer is performed after said removing the dummy substrate.

16. A method of manufacturing a semiconductor device, the method comprising:

forming an interposer comprising a redistribution layer and a dielectric layer on a dummy substrate; and

removing the dummy substrate from the interposer, wherein said removing the dummy substrate comprises grinding the dummy substrate.

17. The method as claimed in claim 16, wherein said removing the dummy substrate comprises grinding and etching the dummy substrate to expose a portion of the redistribution layer.

18. The method as claimed in claim 16, wherein said forming the interposer comprises forming an under bump metal on which at least a portion of the redistribution layer will be formed.

19. A method of manufacturing a semiconductor device, the method comprising:

forming an interposer comprising:

a redistribution layer and a dielectric layer; and

an under bump metal on which at least a portion of the redistribution layer is formed;

connecting a semiconductor die to the redistribution layer facing an upper portion of the interposer;

encapsulating the semiconductor die by using an encapsulant;

thinning the encapsulant to expose a top surface of the semiconductor die; and

connecting a bump to the under bump metal.

20. The method as claimed in claim 19, wherein said forming comprises forming the redistribution layer and the dielectric layer on a dummy substrate, the method comprising removing the dummy substrate from the interposer by, at least in part, grinding and etching the dummy substrate to expose a portion of the redistribution layer facing a lower portion of the interposer.