CLAIMS

What is claimed is:

1. A microelectronic package comprising;

an organic polymer substrate;

an organic polymer bridge embedded in the substrate;

a first interconnect structure at a first location of the organic polymer bridge and a second interconnect structure at a second location of the organic polymer bridge; and

an electrically conductive path in the organic polymer bridge connecting the fist interconnect structure to the second interconnect structure.

2. The microelectronic package of claim 1 wherein the organic polymer substrate contains a recess and the organic polymer bridge is embedded into the recess using an organic polymer.

3. The microelectronic package of claim 2 wherein the organic polymer substrate and the organic polymer bridge are made from the same organic polymer.

4. The microelectronic package of claim 2 wherein the organic polymer substrate and the organic polymer bridge are made from different organic polymers.

5. The microelectronic package of claim 1 wherein the organic polymer substrate is created using a first set of design rules having a first wire width and first wire spacing and wherein the organic polymer bridge is created using a second set of design rules having a second wire width and a second wire spacing.

6. The microelectronic package of claim 5 wherein the first wire width is larger than the second wire width and the first wire spacing is larger than the second wire spacing.

7. The microelectronic package of claim 1 wherein the organic polymer bridge has a total thickness of less than about 20μm.

8. An organic bridge adapted to interconnect a plurality of die, the organic bridge comprising:

a metal routing layer;

a metal pad layer;

interleaved organic polymer dielectric layers; and

wherein there is no layer made substantially of silicon.

9. The organic bridge of claim 8 wherein all layers have a combined thickness less than about 30μm.

10. The organic bridge of claim 8 wherein all layers have a combined thickness of about 15μm.

11. The organic bridge of claim 8 wherein the metal pad layer comprises a plurality of interconnect structures.

12. The organic bridge of claim 11 wherein a first of the plurality of interconnect structures is adapted to connect to a first die and wherein a second of the plurality of interconnect structures is adapted to connect to a second die.

13. The organic bridge of claim 8 further comprising an additional metal layer and an additional interleaved organic polymer dielectric layer.

14. A microelectronic package comprising:

an organic polymer package substrate; and

an organic polymer bridge comprising a metal pad layer, a metal routing layer and interleaved dielectric layers, the organic polymer bridge being embedded in the organic polymer package substrate.

15. The microelectronic package of claim 14 wherein the organic polymer bridge has a thickness of about 15μm to about 20μm.

16. A method comprising:

providing an organic bridge comprising:

a metal routing layer;

a metal pad layer;

interleaved organic polymer dielectric layers;

providing an organic package substrate having a recess formed therein; and

bonding the organic bridge into the recess of the organic package using an organic polymer.

17. The method of claim 16, wherein all layers of the organic bridge have a thickness of less than about 15μm.

18. The method of claim 16, wherein all layers of the organic bridge have a thickness of less than about 20μm.

19. The method of claim 16 wherein the metal pad layer comprises a plurality of interconnects and wherein the method further comprises bonding a first die to one of the plurality of interconnects and bonding a second die to another of the plurality of interconnects, the bonding of the first die and the second die being accomplished using thermo-compression based bonding.

20. The method of claim 16, wherein the organic bridge is bonded into a single buildup layer of the organic package substrate.

CLAIMS

What is claimed is:

1. A microelectronic package comprising;
an organic polymer substrate created using a first set of design rules having a first wire width and first wire spacing;

an organic polymer bridge embedded in the substrate, created using a second set of design rules having a second wire width and a second wire spacing;

a first interconnect structure at a first location of the organic polymer bridge and second interconnect structure at a second location of the organic polymer bridge; and

an electrically conductive path in the organic polymer bridge connecting the first interconnect structure to the second interconnect structure.

2. The microelectronic package of claim 1 wherein the organic polymer substrate contains a recess and the organic polymer bridge is embedded into the recess using an organic polymer.

3. The microelectronic package of claim 2 wherein the organic polymer substrate and the organic polymer bridge are made from the same organic polymer.

4. The microelectronic package of claim 2 wherein the organic polymer substrate and the organic polymer bridge are made from different organic polymers.

5. The microelectronic package of claim 1 wherein the first wire width is larger than the second wire width and the first wire spacing is larger than the second wire spacing.

6. The microelectronic package of claim 1 wherein the organic polymer bridge has a total thickness of less than about 20 μm.

7. An organic bridge adapted to interconnect a plurality of die, the organic bridge comprising:
a plurality of metal routing layers;

a metal pad layer;

interleaved organic polymer dielectric layers between each metal routing layer and the metal pad layer; and

wherein there is no layer made substantially of silicon.

8. The organic bridge of claim 7 wherein all layers have a combined thickness less than about 30 μm.

9. The organic bridge of claim 7 wherein all layers have a combined thickness of about 15 μm.

10. The organic bridge of claim 7 wherein the metal pad layer comprises a plurality of interconnect structures.

11. The organic bridge of claim 10 wherein a first of the plurality of interconnect structures is adapted to connect to a first die and wherein a second of the plurality of interconnect structures is adapted to connect to a second die.

12. A microelectronic package comprising:
an organic polymer package substrate created using a first set of design rules having first wire width and first wire spacing; and

an organic polymer bridge created using a second set of design rules having a second wire width and a second wire spacing, the organic polymer bridge comprising a metal pad layer, a metal routing layer and interleaved dielectric layers, the organic polymer bridge being embedded in the organic polymer package substrate.

13. The microelectronic package of claim 12 wherein the organic polymer bridge has a thickness of about 15 μm to about 20 μm.

14. A method comprising:
providing an organic bridge comprising:
a plurality of metal routing layers;

a metal pad layer;

interleaved organic polymer dielectric layers between each metal routing layer and the metal pad layer, wherein there is no layer made substantially of silicon;

providing an organic package substrate having a recess formed therein; and

bonding the organic bridge into the recess of the organic package using an organic polymer.

15. The method of claim 14, wherein all layers of the organic bridge have a thickness of less than about 15 μm.

16. The method of claim 14, wherein all layers of the organic bridge have a thickness of less than about 20 μm.

17. The method of claim 14 wherein the metal pad layer comprises a plurality of interconnects and wherein the method further comprises bonding a first die to one of the plurality of interconnects and bonding a second die to another of the plurality of interconnects, the bonding the first die and the second die being accomplished using thermo-compression based bonding.

18. The method of claim 14, wherein the organic bridge is bonded into a single buildup layer of the organic package substrate.