CLAIMS

What is claimed is:

1. A microelectronic device package comprising:

a microelectronic device having an active surface and an opposing back surface, wherein a thickness of the microelectronic device is defined by the distance between the microelectronic device active surface and the microelectronic device back surface; and

at least one secondary device electrically connected to the microelectronic device, wherein the at least one secondary device is positioned proximate the microelectronic device within the thickness of the microelectronic device.

2. The microelectronic device package of claim 1, wherein the at least one secondary device comprises at least one capacitor.

3. The microelectronic device package of claim 1, further including an electrically conductive path between the at least one secondary device and the microelectronic device comprising:

a dielectric layer disposed over the microelectronic device;

a first conductive via extending through the dielectric layer electrically connected to the at least one secondary device;

a second conductive via extending through the dielectric layer electrically connected to the microelectronic device; and

a conductive trace electrically connecting the first conductive via to the second conductive via.

4. The microelectronic device package of claim 2, wherein the dielectric layer is disposed over the at least one secondary device.

5. A method of forming a microelectronic device package comprising:

providing a microelectronic device having an active surface and an opposing back surface, wherein a thickness of the microelectronic device is defined by the distance between the microelectronic device active surface and the microelectronic device back surface;

positioning at least one secondary device proximate the microelectronic device within the thickness of the microelectronic device; and

electrically connecting the secondary device to the microelectronic device.

6. The method of claim 5, wherein positioning the at least one secondary device proximate the microelectronic device within the thickness of the microelectronic device

comprises positioning at least one capacitor proximate the microelectronic device within the thickness of the microelectronic device.

7. The method of claim 5, further including an electrically conductive path between the at least one secondary device and the microelectronic device comprising:

disposing a dielectric layer over the microelectronic device;

forming a first conductive via extending through the dielectric layer electrically connected to the at least one secondary device;

forming a second conductive via extending through the dielectric layer electrically connected to the microelectronic device; and

forming a conductive trace electrically connecting the first conductive via to the second conductive via.

8. The method of claim 5, wherein forming the dielectric layer further includes disposing the dielectric layer over the at least one secondary device.

9. A method of forming a microelectronic device package comprising:

forming a sacrificial material layer on a carrier;

forming an opening through the sacrificial material layer to expose a portion of the carrier;

forming at least one secondary device pad on the sacrificial material layer;

attaching a microelectronic device to the carrier within the sacrificial material layer opening, wherein the microelectronic device has an active surface, an opposing back surface, and a thickness defined by the distance between the microelectronic device active surface and the microelectronic device back surface;

disposing a dielectric layer over the microelectronic device and the at least one secondary device pad;

forming an electrically conductive path between the at least one secondary device pad and the microelectronic device;

removing the sacrificial material layer; and

attaching a secondary device to the at least one secondary device pad, wherein the secondary device is disposed within the thickness of the microelectronic device.

10. The method of claim 9, wherein attaching the secondary device to the at least one secondary device pad comprises attaching a capacitor to the at least one secondary device pad.

11. The method of claim 9, wherein forming the electrically conductive path between the at least one secondary device pad and the microelectronic device comprises:

forming at least one opening through the dielectric layer to the secondary device pad;

forming at least one opening through the dielectric layer to the microelectronic device;

disposing a conductive material within the openings to form at least one secondary device pad conductive via and at least one microelectronic device conductive via; and

forming at least one conductive trace between the at least one secondary device pad conductive via and the at least one microelectronic device conductive via.

12. A method of forming a microelectronic device package comprising:

forming at least one stand-off on a carrier;

forming a sacrificial material layer on the carrier and the at least one stand-off;

forming an opening through the sacrificial material layer to expose a portion of the carrier;

attaching a microelectronic device to the carrier within the sacrificial material layer opening, wherein the microelectronic device has an active surface, an opposing back surface, and a thickness defined by the distance between the microelectronic device active surface and the microelectronic device back surface;

attaching at least one secondary device to the at least one stand-off, wherein the at least one secondary device is position within the thickness of the microelectronic device.;

disposing a dielectric layer over the microelectronic device and the at least one secondary device;

forming an electrically conductive path between the at least one secondary device pad and the microelectronic device;

removing the at least one stand-off; and

removing the sacrificial material layer.

13. The method of claim 12, wherein attaching at least one secondary device to the at least one stand-off comprises attaching a capacitor to the at least one stand-off.

14. The method of claim 12, wherein forming the electrically conductive path between the at least one secondary device pad and the microelectronic device comprises:

forming at least one opening through the dielectric layer to the secondary device pad;

forming at least one opening through the dielectric layer to the microelectronic device;

disposing a conductive material within the openings to form at least one secondary device pad conductive via and at least one microelectronic device conductive via; and

forming at least one conductive trace between the at least one secondary device pad conductive via and the at least one microelectronic device conductive via.

15. A method of forming a microelectronic device package comprising:

forming a stand-off material layer on a carrier;

forming an opening through the stand-off material layer to expose a portion of the carrier;

forming a sacrificial material layer on the stand-off material layer and within the stand-off material layer opening;

forming an opening through the sacrificial material layer to expose a portion of the stand-off material layer and a portion of the carrier;

attaching a microelectronic device to the carrier, wherein the microelectronic device has an active surface, an opposing back surface, and a thickness defined by the distance between the microelectronic device active surface and the microelectronic device back surface;

attaching at least one secondary device to the at least one stand-off material layer, wherein the at least one secondary device is position within the thickness of the microelectronic device.;

disposing a dielectric layer over the microelectronic device and the at least one secondary device;

forming an electrically conductive path between the at least one secondary device pad and the microelectronic device; and

removing the at least one stand-off.

16. The method of claim 15, wherein attaching the at least one secondary device to the at least one stand-off material layer comprises attaching a capacitor to the at least one stand-off material layer.

17. The method of claim 15, further including removing the sacrificial material layer.

18. The method of claim 15, wherein forming an electrically conductive path between the at least one secondary device pad and the microelectronic device comprises:

forming at least one opening through the dielectric layer to the secondary device pad;

forming at least one opening through the dielectric layer to the microelectronic device;

disposing a conductive material within the openings to form at least one secondary device pad conductive via and at least one microelectronic device conductive via; and

forming at least one conductive trace between the at least one secondary device pad conductive via and the at least one microelectronic device conductive via.

19. The method of claim 16, wherein forming the stand-off material layer on the carrier comprises forming a photoresist stand-off material layer on the carrier.

20. The method of claim 19, further comprising crosslinking the photoresist stand-off material layer.

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What is claimed is:

1. A microelectronic device package comprising:
a microelectronic device having an active surface and an opposing back surface, wherein a thickness of the microelectronic device is defined by the distance between the microelectronic device active surface and the microelectronic device back surface;

at least one secondary device electrically connected to the microelectronic device, wherein the at least one secondary device is positioned proximate the microelectronic device within the thickness of the microelectronic device; and

a dielectric layer disposed over the microelectronic device active surface and the at least one secondary device;

wherein the dielectric layer abuts a portion of the microelectronic device between the microelectronic device active surface and the microelectronic back surface, and wherein the microelectron back surface and a portion of the microelectronic device between the microelectronic device active surface and the microelectronic back surface is exposed through the dielectric layer.

2. The microelectronic device package of claim 1, wherein the at least one secondary device comprises at least one capacitor.

3. The microelectronic device package of claim 1, further including an electrically conductive path between the at least one secondary device and the microelectronic device comprising:
a first conductive via extending through the dielectric layer electrically connected to the at least one secondary device;

a second conductive via extending through the dielectric layer electrically connected to the microelectronic device; and

a conductive trace electrically connecting the first conductive via to the second conductive via.

4. The microelectronic device package of claim 3, wherein the dielectric layer is disposed over the at least one secondary device.

5. The microelectronic device package of claim 3, wherein the dielectric layer comprises a silica-filled epoxy.