CLAIMS

1. A method for manufacturing a Z-directed component for insertion into a mounting hole in a printed circuit board, comprising:

extruding a substrate material according to the shape of the Z-directed component;

selectively applying a conductive material to the extruded substrate material; and

forming the Z-directed component from the extruded substrate material.

2. The method of claim 1, wherein extruding the substrate material according to the shape of the Z-directed component includes extruding a channel through the substrate material, wherein the extruded channel is formed in one of an interior portion of the extruded substrate material and along a longitudinal edge of the extruded substrate material.

3. The method of claim 1, further comprising extruding the substrate material in longitudinal segments and combining the longitudinal segments according to the shape of the Z-directed component.

4. The method of claim 3, wherein the longitudinal segments are combined after they are extruded.

5. The method of claim 3, wherein the longitudinal segments are combined in a continuous process downstream from their extrusion.

6. The method of claim 5, further comprising supporting the extruded longitudinal segments with a moving member from a downstream end of the substrate material as it advances.

7. The method of claim 1, further comprising:

dividing the extruded substrate material into a plurality of layers of the Z-directed component, wherein selectively applying the conductive material to the extruded substrate material includes applying the conductive material to a surface of at least one of the layers; and

combining a stack of the layers to form the Z-directed component.

8. The method of claim 7, wherein applying the conductive material to the surface of the at least one layer includes:

applying a mask to a top surface of the at least one layer that restricts the application of conductive material to selected portions of the at least one layer; and

screening conductive material through the mask onto the at least one layer,

wherein the mask includes one of a physical mask placed on the top surface of the at least one layer and a photoresist layer applied to and developed on the top surface of the at least one layer.

9. The method of claim 7, wherein applying the conductive material to the surface of the at least one layer includes spin coating a top surface of the at least one layer with liquid conductive material and then selectively etching conductive material from the top surface of the at least one layer.

10. The method of claim 7, wherein applying the conductive material to the surface of the at least one layer includes:

positioning the at least one layer in a constraining plate having a side wall surface that is spaced from a side wall channel in the at least one layer forming a gap therebetween; and

applying conductive material in the gap formed between the side wall surface of the constraining plate and the side wall channel in the at least one layer to plate the side wall channel in the at least one layer with the conductive material.

11. The method of claim 7, wherein combining the stack of the layers to form the Z-directed component includes heating and compressing the stacked layers to form an aggregate part.

12. The method of claim 11, wherein the layers are compressed with a plug that includes a recess formed in an end thereof having a tapered rim around a periphery of the recess that forms a corresponding taper in at least one of a top surface and a bottom surface of the Z-directed component when the stack of formed layers is combined.

13. A method for manufacturing a Z-directed component for insertion into a mounting hole in a printed circuit board, comprising:

extruding a substrate material through an extrusion die having a chamber defining the shape of the extruded substrate material including forming at least one channel through the substrate material with a corresponding projection in the extrusion die;

dividing the extruded substrate material into a plurality of layers of the Z-directed component according to the thickness of each layer;

applying a conductive material to a surface of at least one of the layers; and

combining a stack of the layers to form the Z-directed component.

14. The method of claim 13, further comprising extruding the substrate material in longitudinal segments and combining the longitudinal segments according to the shape of the Z-directed

component, wherein the projection is positioned along an edge of the chamber and forms a partial channel in each extruded segment, and a complete channel is formed in an interior portion of the substrate material when the segments are combined.

15. The method of claim 13, wherein the projection is spaced inward from an edge of the chamber and connected to the edge of the chamber by a support member, and a gap formed in the extruded substrate material by the support member is eliminated by rejoining corresponding portions of the substrate material, wherein the corresponding portions of the substrate material are rejoined in one of a continuous process downstream from extrusion and after extrusion is complete.

CLAIMS

1. A method for manufacturing a Z-directed component for insertion into a mounting hole in a printed circuit board, comprising:

extruding a substrate material through an extrusion die having a chamber defining the shape of the extruded substrate material including forming at least one channel through the substrate material with a corresponding projection in the extrusion die;

dividing the extruded substrate material into a plurality of layers of the Z-directed component according to the thickness of each layer;

applying a conductive material to a surface of at least one of the layers; and

combining a stack of the layers to form the Z-directed component.

2. The method of claim 1, further comprising extruding the substrate material in longitudinal segments and combining the longitudinal segments according to the shape of the Z-directed component, wherein the projection is positioned along an edge of the chamber and forms a partial channel in each extruded segment, and a complete channel is formed in an interior portion of the substrate material when the segments are combined.

3. The method of claim 1, wherein the projection is spaced inward from an edge of the chamber and connected to the edge of the chamber by a support member, and a gap formed in the extruded substrate material by the support member is eliminated by rejoining corresponding portions of the substrate material.

4. The method of claim 3, wherein the corresponding portions of the substrate material are rejoined after extrusion is complete.

5. The method of claim 3, wherein the corresponding portions of the substrate material are rejoined in a continuous process downstream from extrusion.

6. The method of claim 5, further comprising supporting the extruded longitudinal segments with a moving member from a downstream end of the substrate material as it advances.

7. The method of claim 1, wherein combining the stack of the layers to form the Z-directed component includes heating and compressing the stacked layers to form an aggregate part.