

Claims

1. A method of manufacturing a lead frame, the method comprising the steps of:
providing an electrically-conductive base material having first and second planar
sides;
5 forming a patterned conductive layer on the first planar side of the base material;
etching the second planar side of the base material at portions with respect to
exposed portions on the first planar side of the base material comprising the patterned
conductive layer, to form partially-etched portions on the second planar side of the base
material;
10 providing a non-conductive filling material over the second planar side of the
base material, wherein the filling material fills spaces inside the partially-etched portions
on the second planar side of the base material to form adjacent portions of the filling
material and a plurality of conductive portions on the second planar side of the base
material; and
15 etching the exposed portions of the first planar side of the base material
comprising the patterned conductive layer to form partially-etched portions on the first
planar side of the base material that combine with the partially-etched portions on the
second planar side of the base material to thereby form a plurality of separate
conductive regions on the first planar side of the base material, each conductive region
20 being electrically conductive with at least a respective one of the plurality of conductive
portions on the second planar side of the base material.
2. The method of claim 1, wherein the step of forming the patterned conductive
layer on the first planar side of the base material involves the use of a photoresist mask.
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3. The method of claim 1, wherein the step of forming the patterned conductive
layer on the first planar side of the base material involves electrolytic plating.
4. The method of claim 1, wherein the step of etching the second planar side of the
base material comprises etching a depth which is more than 60% of the thickness of the
30 base material to form the partially-etched portions on the second planar side of the base
material.

5. The method of claim 1, wherein the plurality of conductive regions on the first planar side of the base material have a larger surface area than the plurality of conductive portions on the second planar side of the base material.

5 6. The method of claim 5, wherein the steps of etching the first and second planar sides of the base material include forming the partially-etched portions on the first and second planar sides of the base material which are generally dome-shaped.

7. The method of claim 1, further comprising the step of plating the plurality of
10 conductive portions on the second planar side of the base material.

8. The method of claim 7, wherein the step of plating the plurality of conductive portions on the second planar side of the base material is performed after the step of filling the filling material inside the partially-etched portions on the second planar side of
15 the base material, so that the filling material inside the partially-etched portions serves as a mask for plating the conductive portions on the second planar side of the base material.

9. The method of claim 7, wherein the step of plating the conductive portions on the
20 second planar side of the base material is performed before the step of etching the second planar side of the base material to form the partially-etched portions on the second planar side of the base material.

10. The method of claim 9, wherein the step of plating the conductive portions on the
25 second planar side of the base material involves the use of a photoresist mask.

11. A semiconductor package fabricated using a lead frame manufactured by the method of claim 1.

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CLAIMS

1. A method of manufacturing a lead frame, the method comprising the steps of:

5 providing an electrically-conductive base material having first and second planar sides;

forming a patterned conductive layer on the first planar side of the base material;

10 etching the second planar side of the base material at portions with respect to exposed portions on the first planar side of the base material comprising the patterned conductive layer, to form partially-etched portions on the second planar side of the base material;

15 providing a non-conductive filling material over the second planar side of the base material, wherein the filling material fills spaces inside the partially-etched portions on the second planar side of the base material to form adjacent portions of the filling material and a plurality of conductive portions on the second planar side of the base material;

20 after the step of providing a non-conductive filling material over the second planar side of the base material, etching the exposed portions of the first planar side of the base material comprising the patterned conductive layer to form partially-etched portions on the first planar side of the base material that combine with the partially-etched portions on the second planar side of the base material to thereby form a plurality of separate conductive regions on the first planar side of the base material, each conductive region being electrically conductive with at
25 least a respective one of the plurality of conductive portions on the second planar side of the base material, and wherein the step of etching the second planar side of the base material comprises etching a depth which is more than 60% of the thickness of the base material to form the partially-etched portions on the second planar side of the base material;

30 after the etching of the exposed portions of the first planar side, plating the plurality of conductive portions on the second planar side of the base material.

2. A method of manufacturing a lead frame, the method comprising the steps of:

providing an electrically-conductive base material having first and second planar sides;

5 forming a patterned conductive layer on the first planar side of the base material;

etching the second planar side of the base material at portions with respect to exposed portions on the first planar side of the base material comprising the patterned conductive layer, to form partially-etched portions on
10 the second planar side of the base material;

providing a non-conductive filling material over the second planar side of the base material, wherein the filling material fills spaces inside the partially-etched portions on the second planar side of the base material to form adjacent portions of the filling material and a plurality of conductive portions on the second
15 planar side of the base material; and

after the step of providing a non-conductive filling material over the second planar side of the base material, etching the exposed portions of the first planar side of the base material comprising the patterned conductive layer to form partially-etched portions on the first planar side of the base material that combine
20 with the partially-etched portions on the second planar side of the base material to thereby form a plurality of separate conductive regions on the first planar side of the base material, each conductive region being electrically conductive with at least a respective one of the plurality of conductive portions on the second planar side of the base material;

25 wherein the step of etching the second planar side of the base material comprises etching a depth which is more than 60% of the thickness of the base material to form the partially-etched portions on the second planar side of the base material.

3. The method of claim 2, wherein the step of forming the patterned conductive layer on the first planar side of the base material involves the use of a photoresist mask.

5 4. The method of claim 2 or claim 3, wherein the step of forming the patterned conductive layer on the first planar side of the base material involves electrolytic plating.

10 5. The method of any one of claims 2 to 4, wherein the plurality of conductive regions on the first planar side of the base material have a larger surface area than the plurality of conductive portions on the second planar side of the base material.

15 6. The method of claim 5, wherein the steps of etching the first and second planar sides of the base material include forming the partially-etched portions on the first and second planar sides of the base material which are generally dome-shaped.

20 7. The method of any one of claims 2 to 6, further comprising the step of plating the plurality of conductive portions on the second planar side of the base material.

25 8. The method of claim 7, wherein the step of plating the plurality of conductive portions on the second planar side of the base material, is performed after the step of etching the exposed portions of the first planar side of the base material.

30 9. The method of claim 7 or claim 8, wherein the step of plating the plurality of conductive portions on the second planar side of the base material is performed after the step of filling the filling material inside the partially-etched portions on the second planar side of the base material, so that the filling material

inside the partially-etched portions serves as a mask for plating the conductive portions on the second planar side of the base material.

10. The method of any one of claims 7 to 9, wherein the step of plating the
5 conductive portions on the second planar side of the base material is performed before the step of etching the second planar side of the base material to form the partially-etched portions on the second planar side of the base material.