WHAT IS CLAIMED IS:

1. A semiconductor apparatus, comprising:

a base substrate, provided with a first groove in the base substrate;

a through silicon via (TSV) structure, disposed in the base substrate, a first end of the TSV structure being exposed in the first groove, and a distance between an end surface of the first end and a bottom wall of the first groove being smaller than a depth of the first groove; and

a first insulation layer, disposed in the base substrate, a first blind hole concentric with the first groove being provided in the first insulation layer, and the first blind hole making at least a portion of the first end of the TSV structure exposed to the base substrate exposed to the first insulation layer;

wherein the semiconductor apparatus further comprise: a heat conductive layer group, disposed in the first blind hole, the heat conductive layer group being at least in contact with an end surface of the first end of the TSV structure, and a thickness of each heat conductive layer in the heat conductive layer group decreases with an increase of a distance from the end surface of the first end; and a heat dissipation layer group, connected to the heat conductive layer group, and extending towards a side distal from the TSV structure;

wherein the first end of the TSV structure exposed to the base substrate is exposed to the first insulation layer;

the heat conductive layer group comprises:

a first heat conductive layer, disposed as a cylindrical shape with a bottom and sleeved at the first end;

a second heat conductive layer, disposed as a cylindrical shape with a bottom and sleeved at a side of a portion of the first heat conductive layer distal from the TSV structure; and

a third heat conductive layer, disposed at a side of a portion of the second heat conductive layer distal from the TSV structure; and

the heat dissipation layer group comprises:

a first heat dissipation layer, connected to an edge of a cylinder wall of the first heat conductive layer and located at a side of the first insulation layer distal from the base substrate;

a second insulation layer, located at a side of the first heat dissipation layer proximal to the TSV structure;

a second heat dissipation layer, connected to an edge of a cylinder wall of the second heat conductive layer and located at a side of the second insulation layer distal from the base substrate;

a third insulation layer, located at a side of the second heat dissipation layer proximal to the TSV structure; and

a third heat dissipation layer, connected to an edge of the third heat conductive layer and located at a side of the third insulation layer distal from the base substrate.

2. A semiconductor apparatus, comprising:

a base substrate;

a through silicon via (TSV) structure, disposed in the base substrate, a first end of the TSV structure being exposed in the base substrate, and a distance between an end surface of the first end and a bottom wall of a first blind hole being smaller than a depth of the first blind hole; and

a first insulation layer, disposed in the base substrate, a first blind hole being provided in the first insulation layer, and the first blind hole making at least a portion of the first end of the TSV structure exposed to the base substrate exposed to the first insulation layer;

wherein the semiconductor apparatus further comprises:

a heat conductive layer group, disposed in the first blind hole, the heat conductive layer group being at least in contact with an end surface of the first end of the TSV structure, and a thickness of each heat conductive layer in the heat conductive layer group decreases with an increase of a distance from the end surface of the first end; and

a heat dissipation layer group, connected to the heat conductive layer group, and extending towards a side distal from the TSV structure;

wherein the first end of the TSV structure exposed to the base substrate is exposed to the first insulation layer;

the heat conductive layer group comprises:

a first heat conductive layer, disposed as a cylindrical shape with a bottom and sleeved at the first end;

a second heat conductive layer, disposed as a cylindrical shape with a bottom and sleeved at a side of a portion of the first heat conductive layer distal from the TSV structure; and

a third heat conductive layer, disposed at a side of a portion of the second heat conductive layer distal from the TSV structure; and

the heat dissipation layer group comprises:

a first heat dissipation layer, connected to an edge of a cylinder wall of the first heat conductive layer and located at a side of the first insulation layer distal from the base substrate;

a second insulation layer, located at a side of the first heat dissipation layer proximal to the TSV structure;

a second heat dissipation layer, connected to an edge of a cylinder wall of the second heat conductive layer and located at a side of the second insulation layer distal from the base substrate;

a third insulation layer, located at a side of the second heat dissipation layer proximal to the TSV structure; and

a third heat dissipation layer, connected to an edge of the third heat conductive layer and located at a side of the third insulation layer distal from the base substrate.

3. The semiconductor apparatus of claim 1 or 2, further comprising:

a plurality of radiation fins, each being in a cylindrical shape with a bottom having a bottom wall and a sidewall, the bottom wall being connected to an end of the heat dissipation layer group distal from the TSV structure, and the sidewall extending towards a side distal from the TSV structure.

4. The semiconductor apparatus of claim 3, wherein at least one of the radiation fins is connected between heat dissipation layer groups of two adjacent TSV structures.

5. The semiconductor apparatus of claim 1 or 2, further comprising:

a dielectric layer, disposed at a side of the heat dissipation layer group distal from the TSV structure; and

a metal barrier layer, disposed at a side of the dielectric layer distal from the TSV structure.

6. A three-dimensional integrated circuit, comprising:

the semiconductor apparatus according to any one of claims 1-5.

7. A method for manufacturing a semiconductor apparatus, comprising:

providing a base substrate, a first groove being provided in the base substrate;

disposing a through silicon via (TSV) structure in the base substrate, a first end of the TSV structure being exposed in the first groove, and a distance between an end surface of the first end and a bottom wall of the first groove being smaller than a depth of the first groove; and

forming a first insulation material layer in the base substrate, and patterning the first insulation material layer to form a first insulation layer and a first blind hole concentric with the first groove, the first blind hole making at least a portion of the first end of the TSV structure exposed to the base substrate exposed to the first insulation layer;

forming a heat conductive layer group and a heat dissipation layer group, the heat conductive layer group being disposed in the first blind hole, the heat conductive layer group being at least in contact with an end surface of the first end of the TSV

structure, a thickness of each heat conductive layer in the heat conductive layer group decreases with an increase of a distance from the end surface of the first end, and the heat dissipation layer group being connected to the heat conductive layer group and extending towards a side distal from the TSV structure;

wherein the first end of the TSV structure exposed to the base substrate is exposed to the first insulation layer; and the forming a heat conductive layer group and a heat dissipation layer group comprises:

forming a first heat conductive material layer at the first end of the TSV structure and a side of the first insulation layer distal from the base substrate and patterning the first heat conductive material layer to form a first heat conductive layer and a first heat dissipation layer, the first heat conductive layer being formed as a cylindrical shape with a bottom and being sleeved at the first end, and the first heat dissipation layer being connected to an edge of a cylinder wall of the first heat conductive layer and located at a side of the first insulation layer distal from the base substrate;

forming a second insulation material layer at a side of the first heat conductive layer distal from the base substrate, a side of the first heat dissipation layer distal from the base substrate, and the side of the first insulation layer distal from the base substrate, and patterning the second insulation material layer to form a second blind hole and a second insulation layer, an orthogonal projection of the second blind hole on the base substrate being at least partially overlapped with an orthogonal projection of the first heat conductive layer on the base substrate so as to expose at least a portion of the first heat conductive layer;

forming a second heat conductive material layer at a side of the second insulation layer distal from the base substrate and the side of the first heat conductive layer distal from the base substrate, and patterning the second heat conductive material layer to form a second heat conductive layer and a second heat dissipation layer, the

second heat conductive layer being formed as a cylindrical shape with a bottom and being sleeved at a side of a portion of the first heat conductive layer distal from the TSV structure, and the second heat dissipation layer being connected to an edge of a cylinder wall of the second heat conductive layer and located at a side of the second insulation layer distal from the base substrate;

forming a third insulation material layer at a side of the second heat conductive layer distal from the base substrate, a side of the second heat dissipation layer distal from the base substrate, and the side of the second insulation layer distal from the base substrate, and patterning the third insulation material layer to form a third blind hole and a third insulation layer, an orthogonal projection of the third blind hole on the base substrate being at least partially overlapped with an orthogonal projection of the second heat conductive layer on the base substrate so as to expose at least a portion of the second heat conductive layer; and

forming a third heat conductive material layer at a side of the third insulation layer distal from the base substrate and the side of the second heat conductive layer distal from the base substrate, and patterning the third heat conductive material layer to form a third heat conductive layer and a third heat dissipation layer, the third heat conductive layer being disposed at a side of a portion of the second heat conductive layer distal from the TSV structure, and the third heat dissipation layer being connected to an edge of the third heat conductive layer and located at a side of the third insulation layer distal from the base substrate.

8. A method for manufacturing a semiconductor apparatus, comprising:

providing a base substrate;

disposing a through silicon via (TSV) structure in the base substrate, a first end of the TSV structure being exposed in the base substrate, and a distance between an end surface of the first end and a bottom wall of a first blind hole being smaller than the depth of the first blind hole; and

forming a first insulation material layer in the base substrate and at the first end of the TSV structure, and patterning the first insulation material layer to form a first insulation layer and the first blind hole, the first blind hole making at least portion of the first end of the TSV structure exposed to the base substrate exposed to the first insulation layer;

forming a heat conductive layer group and a heat dissipation layer group, the heat conductive layer group being disposed in the first blind hole, the heat conductive layer group being at least in contact with an end surface of the first end of the TSV structure, a thickness of each heat conductive layer in the heat conductive layer group decreases with an increase of a distance from the end surface of the first end, and the heat dissipation layer group being connected to the heat conductive layer group and extending towards a side distal from the TSV structure;

wherein the first end of the TSV structure exposed to the base substrate is exposed to the first insulation layer; and the forming a heat conductive layer group and a heat dissipation layer group comprises:

forming a first heat conductive material layer at the first end of the TSV structure and a side of the first insulation layer distal from the base substrate and patterning the first heat conductive material layer to form a first heat conductive layer and a first heat dissipation layer, the first heat conductive layer being formed as a cylindrical shape with a bottom and being sleeved at the first end, and the first heat dissipation layer being connected to an edge of a cylinder wall of the first heat conductive layer and located at a side of the first insulation layer distal from the base substrate;

forming a second insulation material layer at a side of the first heat conductive layer distal from the base substrate, a side of the first heat dissipation layer distal from the base substrate, and the side of the first insulation layer distal from the base substrate, and patterning the second insulation material layer to form a second blind hole and a

second insulation layer, an orthogonal projection of the second blind hole on the base substrate being at least partially overlapped with an orthogonal projection of the first heat conductive layer on the base substrate so as to expose at least a portion of the first heat conductive layer;

forming a second heat conductive material layer at a side of the second insulation layer distal from the base substrate and the side of the first heat conductive layer distal from the base substrate, and patterning the second heat conductive material layer to form a second heat conductive layer and a second heat dissipation layer, the second heat conductive layer being formed as a cylindrical shape with a bottom and being sleeved at a side of a portion of the first heat conductive layer distal from the TSV structure, and the second heat dissipation layer being connected to an edge of a cylinder wall of the second heat conductive layer and located at a side of the second insulation layer distal from the base substrate;

forming a third insulation material layer at a side of the second heat conductive layer distal from the base substrate, a side of the second heat dissipation layer distal from the base substrate, and the side of the second insulation layer distal from the base substrate, and patterning the third insulation material layer to form a third blind hole and a third insulation layer, an orthogonal projection of the third blind hole on the base substrate being at least partially overlapped with an orthogonal projection of the second heat conductive layer on the base substrate so as to expose at least a portion of the second heat conductive layer; and

forming a third heat conductive material layer at a side of the third insulation layer distal from the base substrate and the side of the second heat conductive layer distal from the base substrate, and patterning the third heat conductive material layer to form a third heat conductive layer and a third heat dissipation layer, the third heat conductive layer being disposed at a side of a portion of the second heat conductive layer distal from the TSV structure, and the third heat dissipation layer being connected

to an edge of the third heat conductive layer and located at a side of the third insulation layer distal from the base substrate.

9. The method for manufacturing a semiconductor apparatus of claim 7 or 8, further comprising:

forming a fourth insulation material layer at a side of the heat dissipation layer group distal from the TSV structure and patterning the fourth insulation material layer to form a fourth insulation layer and a plurality of fourth blind holes; and

forming a fourth heat conductive material layer at a side of the fourth insulation layer distal from the TSV structure and sides of the plurality of fourth blind holes distal from the TSV structure, and patterning the fourth heat conductive material layer to form a plurality of radiation fins, each radiation fin being in a cylindrical shape with a bottom having a bottom wall and a sidewall, the bottom wall being connected to an end of the heat dissipation layer group distal from the TSV structure, and the sidewall extending towards a side distal from the TSV structure.

10. The method for manufacturing a semiconductor apparatus of claim 9, wherein at least one of the radiation fins is connected between heat dissipation layer groups of two adjacent TSV structures.

11. The method for manufacturing a semiconductor apparatus of claim 7 or 8, further comprising:

forming a dielectric layer at a side of the heat dissipation layer group distal from the TSV structure; and

forming a metal barrier layer at a side of the dielectric layer distal from the TSV

structure.