

WHAT IS CLAIMED IS:

1. A semiconductor module, comprising:
a circuit board;
a first semiconductor package over the circuit board; and
a connection structure on the circuit board and connecting the circuit board and the first semiconductor package,
wherein the first semiconductor package includes a first package substrate,
wherein a difference between thermal expansion coefficients of the connection structure and the circuit board is less than a difference between thermal expansion coefficients of the circuit board and the first package substrate,
wherein the first package substrate includes a core, and
wherein the core is of or includes glass fiber or resin.
2. The semiconductor module as claimed in claim 1, wherein the first semiconductor package is spaced apart from the circuit board.
3. The semiconductor module as claimed in claim 1 or claim 2, wherein:
the circuit board includes a circuit line, and
the connection structure includes the same material as that of the circuit line,
wherein the same material includes at least one of copper (Cu), aluminum (Al), nickel (Ni), iron (Fe), tungsten (W), silver (Ag), gold (Au), or an alloy thereof.

4. The semiconductor module as claimed in any one of the previous claims, wherein:

the connection structure includes a plurality of outer leads and a plurality of inner leads between the outer leads, the inner leads being connected to corresponding outer leads, and

the outer leads are in contact with the circuit board.

5. The semiconductor module as claimed in claim 4, wherein the inner leads are arranged in first and second directions intersecting each other,

the outer leads extend in the first direction, and

the outer leads are spaced apart from each other in the second direction.

6. The semiconductor module as claimed in claim 4 or claim 5, wherein the first semiconductor package is between the circuit board and the connection structure.

7. The semiconductor module as claimed in claim 6, wherein the first semiconductor package includes:

a plurality of solder balls on one side of the first package substrate; and

a first semiconductor chip on an opposite side of the first package substrate,

wherein the solder balls are in contact with the inner leads.

8. The semiconductor module as claimed in claim 7, wherein the first semiconductor package further includes:

a second semiconductor chip between the first semiconductor chip and the circuit board;

a plurality of bonding wires connecting the second semiconductor chip and the first package substrate; and

a first molding layer covering the first and second semiconductor chips.

9. The semiconductor module as claimed in any one of claims 6 to 8, wherein the connection structure is longer in a stacking direction than the first semiconductor package.

10. The semiconductor module as claimed in any one of claims 6 to 9, wherein the connection structure has a recession surrounded by the outer leads, and the first semiconductor package is disposed in the recession.

11. The semiconductor module as claimed in claim 4 or claim 5, wherein the connection structure is between the circuit board and the first semiconductor package,

the first semiconductor package further includes a plurality of solder balls on one side of the first package substrate,

the outer leads are in contact with the circuit board, and

the inner leads are in contact with the solder balls.

12. The semiconductor module as claimed in any one of the previous claims, wherein the connection structure is of a single layer.

13. A semiconductor package structure, comprising:
a connection structure including a plurality of outer leads and a plurality of inner leads between the outer leads; and
a semiconductor package on the connection structure and including:
a package substrate,
a plurality of solder balls on a first side of the package substrate, and
a semiconductor chip on a second side of the package substrate, opposite the first side,
wherein the inner leads are in contact with corresponding solder balls,
wherein the outer leads are bent from the inner leads,
wherein the connection structure has a recession surrounded by the outer leads, wherein the semiconductor chip and the solder balls are disposed in the recession.

14. The semiconductor package structure as claimed in claim 13, wherein
the outer leads are correspondingly connected to the inner leads;
the inner leads are arranged in first and second directions intersecting each other,
the outer leads extend in the first direction, and
the outer leads are spaced apart from each other in the second direction.

15. The semiconductor package structure as claimed in any one of claims 13 or 14, wherein the connection structure is of a single layer.

16. The semiconductor package structure as claimed in any one of claims 13 or 14, wherein:

the semiconductor package further includes a molding layer on the second side of the package substrate, and

the molding layer is physically spaced apart from the connection structure.

17. A semiconductor module, comprising:

a circuit board; and

a semiconductor package structure on the circuit board,

wherein the semiconductor package structure includes:

a connection structure including a plurality of outer leads and a plurality of inner leads between the outer leads; and

a semiconductor package between the circuit board and the connection structure and including

a package substrate,

a plurality of solder balls on a first side of the package substrate, and

a semiconductor chip on a second side, opposite the first side, of the package substrate,

wherein the inner leads are in contact with the solder balls,

wherein the outer leads are in contact with the circuit board.

18. The semiconductor module as claimed in claim 17, wherein a difference between thermal expansion coefficients of the connection structure and the circuit board is less than a difference between thermal expansion coefficients of the circuit board and the package substrate.