CLAIMS:

1. An apparatus for probing die electricity, comprising:

a substrate;

a converting plate, having a first surface and a second surface that are arranged opposite to each other and respectively have a plurality of first and second conductive elements disposed thereon;

a needle module, configured with a plurality of needles; and

a reinforcement structure, disposed at a position between the converting plate and the substrate;

wherein, the plural first conductive elements are arranged coupling respectively to the substrate, and the plural second conductive elements are respectively and electrically connected to the plural needles of the needle module.

2. The apparatus of claim 1, wherein the reinforcement structure is configured with a panel and a plurality of via holes formed boring through the panel; and each of the plural via holes is provided for at least one of the plural first conductive elements to fit therein.

3. The apparatus of claim 2, wherein there are a plurality of projections formed on the panel within an area thereof corresponding to the substrate for allowing the plural projections to abut against the substrate so as to construct a plurality of exhaust passages accordingly to be used for exhausting waste gases resulting from a reflow soldering process for connecting the substrate to the converting plate.

4. The apparatus of claim 3, wherein the width of each exhaust passage equals to the aperture width of each via hole in the panel.

5. The apparatus of claim 3, wherein by the arrangement of the plural projections, there are a first exhaust passage and a second exhaust passage to be formed in a manner that the first exhaust passage and the second exhaust passage are arranged intersecting with each other.

6. The apparatus of claim 3, wherein the cross section area of each via hole is larger than that of each first conductive element.

7. The apparatus of claim 3, wherein each of the exhaust passage is formed in a height smaller than or equal to half the thickness of the panel.

8. The apparatus of claim 2, wherein there are a plurality of projections formed on the panel within an area thereof corresponding to the converting plate for allowing the plural projections to abut against the converting plate so as to construct a plurality of exhaust passages accordingly to be used for exhausting waste gases resulting from a reflow soldering process for connecting the substrate to the converting plate.

9. The apparatus of claim 1, wherein the substrate is substantially a circuit board that has a plurality of third conductive elements arranged thereon and respectively connecting to the plural first conductive elements.

10. The apparatus of claim 1, wherein the reinforcement structure is formed in an area smaller than or equal to the area enclosed within the outer circumference of the plural second conductive elements.

11. The apparatus of claim 1, wherein the substrate further comprises:

a circuit board, having a plurality of third conductive elements disposed thereon;

a strengthening plate, arranged at a position between the reinforcement structure and the circuit board, having a plurality of fourth conductive elements and a plurality of fifth conductive elements that the plural fourth conductive elements are disposed on one surface of the strengthening plate, and the plural fifth conductive elements are disposed on another surface opposite to the one for the fourth conductive elements, while allowing the plural fourth conductive elements to be connected electrically and respectively to the plural third conductive elements, and the plural fifth conductive elements to be connected electrically and respectively to the plural first conductive elements.

12. The apparatus of claim 11, wherein the reinforcement structure is integrally formed with the strengthening plate.

13. The apparatus of claim 1, wherein the converting plate is formed in a thickness smaller than or equal to 1 mm.

14. The apparatus of claim 11, wherein there is further comprising an elastic conductive element arranged at a position between the strengthening plate and the

circuit board; the elastic conductive element includes a support panel and a plurality of conductors, and each of the plural conductors is arranged penetrating the support panel for allowing two opposite ends of the conductor to connect electrically and respectively to the strengthening plate and the circuit board, and simultaneously enabling the electrical connection between each conductor to the strengthening plate and the circuit board to be adjustable by the use of a fixing element; the fixing element is configured with a stiffness, a frame and a clip in a manner that the stiffness is fixed secured to a surface of the circuit board by a plurality of first locking units, the frame is fixed secured to another surface of the circuit board by the plural first locking unit, and the clip is fixed secured to the frame by a second locking unit so as to be clamped upon the strengthening plate.

15. An apparatus for probing die electricity, comprising:

a substrate;

a converting plate, having a first surface and a second surface that are arranged opposite to each other and respectively have a plurality of first and second conductive elements disposed thereon;

a needle module, configured with a plurality of needles; and

a reinforcement structure, made from a polymer gel, disposed at a position between the converting plate and the substrate within at least one reinforcement area defined in the first surface;

wherein, the plural first conductive elements are arranged coupling respectively to the substrate, and the plural second conductive elements are respectively and electrically connected to the plural needles of the needle module.

16. The apparatus of claim 15, wherein each of the at least one reinforcement area defined in the first surface is provided for the reinforcement structure of the polymer gel to be formed therein, and the reinforcement structure is substantially a strengthening plate having a plurality of elements of polymer gel disposed thereon at positions corresponding to the reinforcement area.

17. The apparatus of claim 16, wherein the reinforcement structure formed inside the at least one reinforcement area is a structure selected from the group consisting of: a solid structure, a ring-like structure and an assembly of a plurality of ring-like

structures.

18. The apparatus of claim 17, wherein there are a plurality of grooves formed on a surface corresponding to the ring-like structure and the substrate.

19. The apparatus of claim 15, wherein there is a gap formed between the surface of the reinforcement structure in the at least one reinforcement area and the corresponding substrate.

CLAIMS

1. An apparatus for probing die electricity, comprising:

a substrate;

a converting plate, having a first surface and a second surface that are arranged opposite to each other and respectively have a plurality of first and second conductive elements disposed thereon, a first pitch between two neighboring second conductive elements being smaller than a second pitch between two neighboring first conductive elements;

a needle module, configured with a plurality of needles; and

a reinforcement structure, disposed at a position between the converting plate and the substrate, the reinforcement structure having a plurality of via holes and at least one of the first conductive is being received in each of the via holes;

wherein, the plural first conductive elements are arranged coupling respectively to the substrate, and the plural second conductive elements are respectively and electrically connected to the plural needles of the needle module.

2. The apparatus of claim 1, wherein the reinforcement structure is configured with a panel and the plurality of via holes, and

wherein the plurality of via holes are formed boring through the panel.

3. The apparatus of claim 2, wherein there are a plurality of projections formed on the panel within an area thereof corresponding to the substrate for allowing the plural projections to abut against the substrate so as to construct a plurality of exhaust passages accordingly to be used for exhausting waste gases resulting from a reflow soldering process for connecting the substrate to the converting plate.

4. The apparatus of claim 3, wherein the width of each exhaust passage equals to the aperture width of each via hole in the panel.

5. The apparatus of claim 3, wherein by the arrangement of the plural projections, there are a first exhaust passage and a second exhaust passage to be

formed in a manner that the first exhaust passage and the second exhaust passage are arranged intersecting with each other.

6. The apparatus of claim 3, wherein the cross section area of each via hole is larger than that of each first conductive element.

7. The apparatus of claim 3, wherein each of the exhaust passage is formed in a height smaller than or equal to half the thickness of the panel.

8. The apparatus of claim 2, wherein there are a plurality of projections formed on the panel within an area thereof corresponding to the converting plate for allowing the plural projections to abut against the converting plate so as to construct a plurality of exhaust passages accordingly to be used for exhausting waste gases resulting from a reflow soldering process for connecting the substrate to the converting plate.

9. The apparatus of claim 1, wherein the reinforcement structure is formed in an area smaller than or equal to the area enclosed within the outer circumference of the plural second conductive elements.

10. The apparatus of claim 1, wherein the substrate further comprises:

a circuit board, having a plurality of third conductive elements disposed thereon;

a strengthening plate, arranged at a position between the reinforcement structure and the circuit board, having a plurality of fourth conductive elements and a plurality of fifth conductive elements that the plural fourth conductive elements are disposed on one surface of the strengthening plate, and the plural fifth conductive elements are disposed on another surface opposite to the one for the fourth conductive elements, while allowing the plural fourth conductive elements to be connected electrically and respectively to the plural third conductive elements, and the plural fifth conductive elements to be connected electrically and respectively to the plural first conductive elements.

11. The apparatus of claim 10, wherein the reinforcement structure is integrally formed with the strengthening plate.

12. The apparatus of claim 10, wherein there is further comprising an elastic conductive element arranged at a position between the strengthening plate and the circuit board; the elastic conductive element includes a support panel and a plurality of conductors, and each of the plural conductors is arranged penetrating the support panel for allowing two opposite ends of the conductor to connect electrically and respectively to the strengthening plate and the circuit board, and simultaneously enabling the electrical connection between each conductor to the strengthening plate and the circuit board to be adjustable by the use of a fixing element; the fixing element is configured with a stiffness, a frame and a clip in a manner that the stiffness is fixed secured to a surface of the circuit board by a plurality of first locking units, the frame is fixed secured to another surface of the circuit board by the plural first locking unit, and the clip is fixed secured to the frame by a second locking unit so as to be clamped upon the strengthening plate.

13. The apparatus of claim 1, wherein the converting plate is formed in a thickness smaller than or equal to 1 mm.

14. The apparatus of claim 1, wherein the substrate is substantially a circuit board that has a plurality of third conductive elements arranged thereon and respectively connecting to the plural first conductive elements.