

and the at least one thermal conduction structure 14 are covered by the second insulation layer 16. In an embodiment, the second insulation layer 16 is made of resin or any other appropriate insulation material with high thermal conductivity.

[0031] Then, as shown in FIG. 1L, a laser drilling process is performed to form plural openings 16a in the second insulation layer 16 at the locations corresponding to the electrodes 15 or the contact pads 13a. Then, a desmearing process is performed to remove the contaminant retained in the openings 16a. The electrodes 15 or the contact pads 13a run through the second insulation layer 16. Moreover, the electrodes 15 or the contact pads 13a are exposed through the corresponding openings 16a. In this embodiment, the number of the openings 16 is larger than or equal to the number of the electrodes 15.

[0032] Then, as shown in FIG. 1M, a blind via plating process is performed to fill a conductive material in the openings 16a. Consequently, a metal line 18 is formed on the second insulation layer 16 and plural conductive vias 17 are formed in the second insulation layer 16. Consequently, the plural electrodes 15 are electrically connected with the metal line 18 through the plural conductive vias 17. Moreover, the electrodes 15 may be electrically connected with the external circuit (not shown) through the metal line 18. Meanwhile, a power module 2 with the embedded package structure is fabricated.

[0033] Hereinafter, a process of fabricating the semi-package unit 1 of FIG. 1A will be illustrated with reference to FIGS. 2A~2C. FIGS. 2A~2C are schematic cross-sectional views illustrating the process of fabricating the semi-package unit 1 of FIG. 1A. Firstly, as shown in FIG. 2A, a thermal release film 23, the electronic component 11 and the at least one thermal conduction structure 14 are provided. Then, the electronic

layer 10. Moreover, the thermal conduction structure 14 is located at least a side of the electronic component 11.

[0038] Then, as shown in FIG. 4B, a metal layer 12 is formed on the surface 1a of the semi-package unit 1 to cover the conducting terminals 110, the first insulation layer 10, the surface 111 of the electronic component 11 and the thermal conduction structure 14. In an embodiment, the metal layer 12 is formed by depositing a metal layer, such as a copper (Cu) layer, a TiW/Cu layer, a NiCr/Cu layer or a combination thereof, on the surface 1a of the semi-package unit 1. Then, a photoresist layer 21 is formed on the metal layer 12.

[0039] Then, as shown in FIG. 4C, exposure and developing processes are performed to remove a part of the photoresist layer 21 and define a patterned photoresist zone 21b with a photomask (not shown). Consequently, a part of the metal layer 12 is exposed. The part of the metal layer 12 corresponding to the conducting terminals 110 is uncovered by the patterned photoresist zone 21b.

[0040] Then, as shown in FIG. 4D, the part of the metal layer 12 uncovered by the patterned photoresist zone 21b is removed. Consequently, the conducting terminals 110 are exposed.

[0041] Then, as shown in FIG. 4E, the patterned photoresist zone 21b is removed. The remaining metal layer 12 is defined as a metal mask 12a.

[0042] The following steps as shown in FIGS. 4F~4M are similar to the steps as shown in FIGS. 1F~1M, and are not redundantly described herein.

[0043] From the above descriptions, the present invention provides a packaging process of an electronic component. The conducting terminals of the electronic component may be made of a non-copper metallic material. Since the type of the electronic component is not stringently limited, the

WHAT IS CLAIMED IS:

1. A packaging process of an electronic component, the packaging process comprising steps of:

(a) providing a semi-package unit comprising a first insulation layer and an electronic component, wherein the electronic component is partially embedded within the first insulation layer, the electronic component comprises at least one conducting terminal disposed on a surface of the semi-package unit without being covered by the first insulation layer;

(b) forming a metal layer over the surface of the semi-package unit and removing a part of the metal layer, so that a metal mask is formed on the surface of the semi-package unit and the at least one conducting terminal uncovered by the metal mask is exposed;

(c) forming a metal re-distribution layer on the metal mask and the at least one conducting terminal, so that the metal mask and the at least one conducting terminal is covered by and contacted with the metal re-distribution layer; and

(d) removing a part of the metal re-distribution layer and a part of the metal mask, so that at least one contact pad corresponding to the at least one conducting terminal is produced;

wherein the step (b) comprises sub-steps of:

forming the metal layer to cover the first insulation layer, the electronic component and at least one thermal conduction structure of the semi-package unit;

forming a photoresist layer on the metal layer;

performing exposure and developing processes to remove a part of the photoresist layer, thereby defining a patterned photoresist zone, wherein a part of the metal layer corresponding to the at least one conducting terminal is uncovered by the patterned photoresist zone;

removing the part of the metal layer uncovered by the patterned photoresist zone, so that the at least one conducting terminal is exposed; and

removing the patterned photoresist zone, so that the metal mask is produced.

2. The packaging process according to claim 1, wherein the conducting terminal is made of a non-copper metallic material.

3. The packaging process according to claim 1, wherein the semi-package unit comprises at least one thermal conduction structure, the at least one thermal conduction structure is partially embedded within the first insulation layer, and located at a side of the electronic component.

4. The packaging process according to claim 3, wherein the step (a) comprises sub-steps of:

providing a release film, and placing the electronic component and the at least one thermal conduction structure on the release film, wherein the at least one conducting terminal of the electronic component is contacted with the release film;

laminating the first insulation layer on the release film, so that the electronic component and a part of the thermal conduction structure are covered by the first insulation layer; and

removing the release film, so that the at least one conducting terminal of the electronic component is exposed to the first insulation layer and the semi-package unit is produced.

5. The packaging process according to claim 1, wherein after the step (b), the at least one conducting terminal uncovered by the metal mask is further subjected to a plasma cleaning process.

6. The packaging process according to claim 1, wherein in the step (c), the metal re-distribution layer is formed by a depositing process or an

electroplating process.

7. The packaging process according to claim 1, wherein the metal re-distribution layer is made of copper or a copper-containing material.

8. The packaging process according to claim 1, wherein the step (d) comprises sub-steps of:

forming a photoresist layer on the metal re-distribution layer;

performing exposure and developing processes to remove a part of the photoresist layer, thereby defining a patterned photoresist zone corresponding to the at least one conducting terminal, wherein a part of the metal re-distribution layer uncovered by the patterned photoresist zone is exposed;

performing an etching process to remove the part of the metal re-distribution layer uncovered by the patterned photoresist zone and the metal mask; and

removing the patterned photoresist zone, thereby producing the at least one contact pad corresponding to the at least one conducting terminal, wherein the conducting terminal and the corresponding contact pad are collaboratively defined as an electrode.

9. The packaging process according to claim 1, wherein after the step (d), the packaging process further comprises steps of:

forming a second insulation layer to cover the at least one contact pad, the electronic component, and the first insulation layer;

performing a laser drilling process to form at least one opening in the second insulation layer at location corresponding to the at least one contact pad;

performing a desmearing process to treat the at least one opening, wherein the at least one contact pad is exposed through the corresponding opening;

performing a plating process to fill a conductive material in the at least one opening, so that plural conductive vias and a metal line is formed.