substrate can be performed after the forming of the first overmold on the first side of the packaging substrate. In some embodiments, the mounting of the first component on the first side of the packaging substrate can be performed after the forming of the second overmold on the second side of the packaging substrate.

[0017] In some teachings, the present disclosure relates to a method for fabricating a packaged module. The method includes forming or providing a packaging substrate having a non-mounting side and a mounting side, with the packaging substrate including a plurality of conductive features on the mounting side of the packaging substrate to provide electrical connections for the packaged module. The conductive features are formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation. The method further includes mounting a component on the mounting side of the packaging substrate, forming an overmold on the mounting side of the packaging substrate, mounting a component on the non-mounting side of the packaging substrate, and forming an overmold on the non-mounting side of the packaging substrate. The method further includes removing a portion of the overmold on the mounting side to expose a surface for each conductive feature, and providing a solderable material layer dimensioned to cover the surface of each conductive feature.

[0018] In an aspect, the present disclosure relates to a packaged module that includes a packaging substrate having a first side and a second side, an overmold implemented on the second side of the packaging substrate, with the overmold defining a mounting surface to allow mounting of the packaged module on a circuit board, and a plurality of conductive features implemented on the second side of the packaging substrate to provide electrical connections for the packaged module. The conductive features are formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation. Each conductive feature has a surface that is substantially coplanar with or recessed with respect to the mounting surface. The packaged module further includes a solderable material layer dimensioned to cover the surface of each conductive feature.

[0019] For purposes of summarizing the disclosure, certain aspects, advantages and novel features of the inventions have been described herein. It is to be understood that not necessarily all such advantages may be achieved in accordance with any particular embodiment of the invention. Thus, the invention may be embodied or carried out in a manner that achieves or optimizes one advantage or group of advantages as

WHAT IS CLAIMED IS:

1. A packaged module comprising:

a packaging substrate having a first side and a second side;

first and second components mounted on the first and second sides of the packaging substrate, respectively;

first and second overmolds implemented on the first and second sides of the packaging substrate, respectively, the second overmold defining a mounting surface to allow mounting of the packaged module on a circuit board;

a plurality of conductive features implemented on the second side of the packaging substrate to provide electrical connections for the packaged module, the conductive features formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation, each conductive feature having a surface that is substantially coplanar with or recessed with respect to the mounting surface of the second overmold; and

a solderable material layer dimensioned to cover the surface of each conductive feature.

2. The packaged module of claim 1 wherein each conductive feature is implemented as a conductive post.

3. The packaged module of claim 1 wherein the conductive material includes copper.

4. The packaged module of claim 1 wherein the mounting operation includes a reflow soldering operation.

5. The packaged module of claim 1 wherein the surface of the conductive feature is substantially coplanar with the mounting surface of the second overmold.

6. The packaged module of claim 5 wherein the solderable material layer has a thickness that protrudes beyond the mounting surface of the second overmold.

7. The packaged module of claim 6 wherein the solderable material layer includes a lateral edge that extends laterally beyond a lateral boundary of the surface of the respective conductive feature.

8. The packaged module of claim 1 wherein the surface of the conductive feature is recessed with respect to the mounting surface of the second overmold.

9. The packaged module of claim 8 wherein the solderable material layer is dimensioned to partially or fully fill the recess defined by the surface of the respective conductive feature and the mounting surface of the second overmold.

10. The packaged module of claim 9 wherein the solderable material layer partially fills the recess such that an exposed surface of the solderable material layer and the mounting surface of the second overmold define a shallow recess.

11. The packaged module of claim 9 wherein the solderable material layer fully fills the recess such that an exposed surface of the solderable material layer is substantially coplanar with or protrudes beyond the mounting surface of the second overmold.

12. The packaged module of claim 1 further comprising a shielding layer or a shielding feature configured to provide shielding functionality.

13. A method for fabricating a packaged module, the method comprising:

forming or providing a packaging substrate having a first side and a second side;

mounting a first component on the first side of the packaging substrate;

forming a first overmold on the first side of the packaging substrate to encapsulate the first component;

mounting a second component on the second side of the packaging substrate;

implementing a plurality of conductive features on the second side of the packaging substrate to provide electrical connections for the packaged module, the conductive features formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation;

forming a second overmold on the second side of the packaging substrate to encapsulate the second component and each of the conductive features;

removing a portion of the second overmold to expose a surface for each conductive feature; and

providing a solderable material layer dimensioned to cover the surface of each conductive feature.

14. The method of claim 13 wherein the implementing of the conductive features includes mounting conductive posts to the second side of the packaging substrate.

15. The method of claim 13 wherein the conductive material includes copper.

16. The method of claim 13 wherein the mounting operation includes a reflow soldering operation.

17. The method of claim 13 wherein the removing of a portion of the second overmold includes a grinding operation that results in the surface of the conductive feature being substantially coplanar with the mounting surface of the second overmold.

18. The method of claim 17 wherein the providing of the solderable material layer is implemented such that the solderable material layer has a thickness that protrudes beyond the mounting surface of the second overmold.

19. The method of claim 18 wherein the providing of the solderable material layer is implemented such that the solderable material layer includes a lateral edge that extends laterally beyond a lateral boundary of the surface of the respective conductive feature.

20. The method of claim 13 wherein the removing of a portion of the second overmold includes forming a recess on the mounting surface of the second overmold to expose the surface of each conductive feature.

21. The method of claim 20 wherein the removing of a portion of the second overmold further includes removing a thickness of the second overmold, prior to the

forming of the recess, to define a new mounting surface that is closer to the surface of each conductive feature.

22. The method of claim 21 wherein the removing of the thickness of the second overmold includes a grinding operation such that the new mounting surface of the second overmold is substantially planar.

23. The method of claim 20 wherein the removing of a portion of the second overmold includes performing a laser operation to form the recess to expose the surface of each conductive feature.

24. The method of claim 20 wherein the providing of the solderable material layer includes partially or fully filling the recess with the solderable material layer.

25. The method of claim 24 wherein the solderable material layer partially fills the recess such that an exposed surface of the solderable material layer and the mounting surface of the second overmold define a shallow recess.

26. The method of claim 24 wherein the solderable material layer fully fills the recess such that an exposed surface of the solderable material layer is substantially coplanar with or protrudes beyond the mounting surface of the second overmold.

27. The method of claim 13 further comprising forming a shielding layer or a shielding feature to provide a shielding functionality for the packaged module.

28. The method of claim 13 wherein the mounting of the second component and implementing of the plurality of conductive features on the second side of the packaging substrate is performed after the forming of the first overmold on the first side of the packaging substrate.

29. The method of claim 13 wherein the mounting of the first component on the first side of the packaging substrate is performed after the forming of the second overmold on the second side of the packaging substrate.

30. A method for fabricating a packaged module, the method comprising:

forming or providing a packaging substrate having a non-mounting side and a mounting side, the packaging substrate including a plurality of conductive features on the mounting side of the packaging substrate to provide electrical connections for the packaged module, the conductive features formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation;

mounting a component on the mounting side of the packaging substrate;

forming an overmold on the mounting side of the packaging substrate;

mounting a component on the non-mounting side of the packaging substrate;

forming an overmold on the non-mounting side of the packaging substrate;

removing a portion of the overmold on the mounting side to expose a surface for each conductive feature; and

providing a solderable material layer dimensioned to cover the surface of each conductive feature.

31. A packaged module comprising:

a packaging substrate having a first side and a second side;

an overmold implemented on the second side of the packaging substrate, the overmold defining a mounting surface to allow mounting of the packaged module on a circuit board;

a plurality of conductive features implemented on the second side of the packaging substrate to provide electrical connections for the packaged module, the conductive features formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation, each conductive feature having a surface that is substantially coplanar with or recessed with respect to the mounting surface; and

a solderable material layer dimensioned to cover the surface of each conductive feature.