MODULE HAVING DUAL SIDE MOLD WITH METAL POSTS

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims priority to U.S. Provisional Application No. 63/168,856 filed March 31, 2021, entitled MODULE HAVING DUAL SIDE MOLD WITH METAL POSTS, the disclosure of which is hereby expressly incorporated by reference herein in its respective entirety.

BACKGROUND

Field

[0002] The present disclosure relates to packaged electronic modules having dual side mold with metal posts.

Description of the Related Art

[0003] In electronic applications such as radio-frequency (RF) applications, circuits and related devices can be implemented in a packaged module. Such a packaged module can then be mounted on a circuit board such as a phone board.

SUMMARY

[0004] In accordance with an aspect, the present disclosure relates to a packaged module that includes 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, and first and second overmolds implemented on the first and second sides of the packaging substrate, respectively, with the second overmold defining a mounting surface to allow mounting of the packaged module on a circuit board. The packaged module further includes 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 of the second overmold. The packaged module further includes a solderable material layer dimensioned to cover the surface of each conductive feature.

[0005] In some embodiments, each conductive feature can be implemented as a conductive post. In some embodiments, the conductive material can include copper. In some embodiments, the mounting operation can include a reflow soldering operation.

[0006] In some embodiments, the surface of the conductive feature can be substantially coplanar with the mounting surface of the second overmold. The solderable material layer can have a thickness that protrudes beyond the mounting surface of the second overmold. The solderable material layer can include a lateral edge that extends laterally beyond a lateral boundary of the surface of the respective conductive feature.

[0007] In some embodiments, the surface of the conductive feature can be recessed with respect to the mounting surface of the second overmold. The solderable material layer can be dimensioned to partially or fully fill a recess defined by the surface of the respective conductive feature and the mounting surface of the second overmold. The solderable material layer can partially fill the recess such that an exposed surface of the solderable material layer and the mounting surface of the second overmold define a shallow recess. The solderable material layer can fully fill 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.

[0008] In some embodiments, packaged module can further include a shielding layer or a shielding feature configured to provide shielding functionality.

[0009] According to an aspect, the present disclosure relates to a method for fabricating a packaged module. The method includes 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, with the conductive features being formed from conductive material having a sufficiently high melting temperature so that the conductive features do not melt during a mounting operation, and forming a second overmold on the second side of the packaging substrate to encapsulate the second component and each of the conductive features. The method further includes 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.

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 that does 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