

RELIABLE SURFACE MOUNT INTEGRATED POWER MODULE

ABSTRACT

A surface mount packaging structure that yields improved thermo-mechanical reliability and more robust second-level package interconnections is disclosed. The surface mount packaging structure includes a sub-module having a dielectric layer, semiconductor devices attached to the dielectric layer, a first level metal interconnect structure electrically coupled to the semiconductor devices, and a second level I/O connection electrically coupled to the first level interconnect and formed on the dielectric layer on a side opposite the semiconductor devices, with the second level I/O connection configured to connect the sub-module to an external circuit. The semiconductor devices of the sub-module are attached to the first surface of a multi-layer substrate structure, with a dielectric material positioned between the dielectric layer and the multi-layer substrate structure to fill in gaps in the surface-mount structure and provide additional structural integrity thereto.

Figure 1