DIFFUSION BARRIER FOR SURFACE MOUNT MODULES

ABSTRACT

A surface-mount package structure for reducing the ingress of moisture and gases thereto is disclosed. The surface-mount structure includes a sub-module having a dielectric layer, semiconductor devices attached to the dielectric layer, a first level 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, 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 a substrate structure, with a dielectric material positioned between the dielectric layer and the substrate structure to fill in gaps in the surface-mount structure. A diffusion barrier layer is applied over the sub-module, adjacent the first and second level I/O connections, and extends down to the substrate structure to reduce the ingress of moisture and gases from a surrounding environment into the surface-mount structure.

Figure 1