Abstract

SEMICONDUCTOR DEVICE AND METHOD OF FORMING SACRIFICAL PROTECTIVE LAYER TO PROTECT SEMICONDUCTOR DIE EDGE DURING SINGULATION

A semiconductor wafer contains a plurality of semiconductor die separated by a saw street. An insulating layer is formed over the semiconductor wafer. A protective layer is formed over the insulating layer including an edge of the semiconductor die along the saw street. The protective layer covers an entire surface of the semiconductor wafer. Alternatively, an opening is formed in the protective layer over the saw street. The insulating layer has a non-planar surface and the protective layer has a planar surface. The semiconductor wafer is singulated through the protective layer and saw street to separate the semiconductor die while protecting the edge of the semiconductor die. Leading with the protective layer, the semiconductor die is mounted to a carrier. An encapsulant is deposited over the semiconductor die and carrier. The carrier and protective layer are removed. A build-up interconnect structure is formed over the semiconductor die and encapsulant.

(FIG. 5)