Abstract

SEMICONDUCTOR DEVICE AND METHOD OF FORMING DISCONTINUOUS ESD PROTECTION LAYERS BETWEEN SEMICONDUCTOR DIE

A semiconductor wafer has a plurality of semiconductor die separated by a saw street. The wafer is mounted to dicing tape. The wafer is singulated through the saw street to expose side surfaces of the semiconductor die. An ESD protection layer is formed over the semiconductor die and around the exposed side surfaces of the semiconductor die. The ESD protection layer can be a metal layer, encapsulant film, conductive polymer, conductive ink, or insulating layer covered by a metal layer. The ESD protection layer is singulated between the semiconductor die. The semiconductor die covered by the ESD protection layer are mounted to a temporary carrier. An encapsulant is deposited over the ESD protection layer covering the semiconductor die. The carrier is removed. An interconnect structure is formed over the semiconductor die and encapsulant. The ESD protection layer is electrically connected to the interconnect structure to provide an ESD path.

(Fig. 5)