Abstract

SEMICONDUCTOR DEVICE AND METHOD OF FORMING BUILD-UP INTERCONNECT STRUCTURES OVER CARRIER FOR TESTING AT INTERIM STAGES

A semiconductor device has a first interconnect structure formed over the carrier. A semiconductor die is disposed over the first interconnect structure after testing the first interconnect structure to be known good. The semiconductor die in a known good die. A vertical interconnect structure, such as a bump or stud bump, is formed over the first interconnect structure. A discrete semiconductor device is disposed over the first interconnect structure or the second interconnect structure. An encapsulant is deposited over the semiconductor die, first interconnect structure, and vertical interconnect structure. A portion of the encapsulant is removed to expose the vertical interconnect structure. A second interconnect structure is formed over the encapsulant and electrically connected to the vertical interconnect structure. The first interconnect structure or the second interconnect structure includes an insulating layer with an embedded glass cloth, glass cross, filler, or fiber.
(Fig.4i)