

Abstract

A semiconductor device includes a semiconductor die and an encapsulant deposited over and around the semiconductor die. A semiconductor wafer includes a plurality of semiconductor die and a base semiconductor material. A groove is formed in the base semiconductor material. The semiconductor wafer is singulated through the groove to separate the semiconductor die. The semiconductor die are disposed over a carrier with a distance of 500 micrometers (μm) or less between semiconductor die. The encapsulant covers a sidewall of the semiconductor die. A fan-in interconnect structure is formed over the semiconductor die while the encapsulant remains devoid of the fan-in interconnect structure. A portion of the encapsulant is removed from a non-active surface of the semiconductor die. The device is singulated through the encapsulant while leaving encapsulant disposed covering a sidewall of the semiconductor die. The encapsulant covering the sidewall includes a thickness of 50 μm or less.

(Fig.22k)