

Abstract

A semiconductor device has a photonic semiconductor die. The photonic semiconductor die is disposed on a carrier with a photonic circuit of the photonic semiconductor die oriented toward the carrier. An e-bar is disposed on the carrier. An encapsulant is deposited over the photonic semiconductor die and e-bar. A first surface of the encapsulant is backgrinded to expose the e-bar. A first build-up interconnect structure is formed over the first surface of the encapsulant. A second build-up interconnect structure is formed over a second surface of the encapsulant. The photonic circuit is exposed through an opening of the second build-up interconnect structure.

(Fig. 7a)