

DEVICE WITHOUT ZERO MARK LAYER

ABSTRACT

Devices and methods for forming a device are disclosed. The method includes providing a substrate having first and second surfaces. At least one through silicon via (TSV) opening is formed in the substrate. The TSV opening extends through the first and second surfaces of the substrate. An alignment trench corresponding to an alignment mark is formed in the substrate. The alignment trench extends from the first surface of the substrate to a depth shallower than a depth of the TSV opening. A dielectric liner layer is provided over the substrate. The dielectric liner layer at least lines sidewalls of the TSV opening. A conductive layer is provided over the substrate. The conductive layer fills at least the TSV opening to form TSV contact. A redistribution layer (RDL) is formed over the substrate. The RDL layer is patterned using a reticle to form at least one opening which corresponds to a TSV contact pad. The reticle is aligned using the alignment mark in the substrate.

Fig. 4a