SEMICONDUCTOR DEVICES HAVING THROUGH-CONTACTS AND RELATED FABRICATION METHODS

ABSTRACT

Apparatus for semiconductor device structures and related fabrication methods are provided. One method for fabricating a semiconductor device structure involves forming a layer of dielectric material overlying a doped region formed in a semiconductor substrate adjacent to a gate structure and forming a conductive contact in the layer of dielectric material. The conductive contact overlies and electrically connects to the doped region. The method continues by forming a second layer of dielectric material overlying the conductive contact, forming a voided region in the second layer overlying the conductive contact, forming a third layer of dielectric material overlying the voided region, and forming another voided region in the third layer overlying at least a portion of the voided region in the second layer. The method continues by forming a conductive material that fills both voided regions to contact the conductive contact.

Fig. 8