REDUCED DEFECTIVITY IN CONTACTS OF A SEMICONDUCTOR DEVICE COMPRISING REPLACEMENT GATE ELECTRODE STRUCTURES BY USING AN INTERMEDIATE CAP LAYER

ABSTRACT

Superior contact elements may be formed in semiconductor devices in which sophisticated replacement gate approaches may be applied. To this end, a dielectric cap layer is provided prior to patterning the interlayer dielectric material so that any previously created cracks may reliably be sealed prior to the deposition of the contact material, while the removal of any excess portion thereof may be performed without an undue interaction with the electrode metal of the gate electrode structures. Consequently, a significantly reduced defect rate may be achieved.

Figure 2a.