Shallow Amorphizing Implant For Gettering Of Deep Secondary End Of Range Defects

Abstract

A pocket implant process to reduce defects. We provide a gate structure, on a semiconductor substrate doped with a first conductivity type dopant. We perform a pocket amorphizing implantation procedure to form a pocket implant region adjacent to the gate structure, and an amorphous pocket region. Next, we perform a shallow amorphizing implant to form an amorphous shallow implant region. The amorphous shallow implant region being formed at a second depth above the amorphous pocket region. The substrate above the amorphous shallow implant region preferably remains crystalline. We perform a S/D implant procedure to form Deep S/D regions. We perform an anneal procedure preferably comprised of a first soak step and a second spike step to recrystalilze the amorphous shallow implant region and the amorphous pocket region, The defects created by the pocket implant are reduced by the shallow amorphous implant.

Figure 1