

ABSTRACT

A semiconductor device includes first gate electrodes including a first lower electrode, a first upper electrode disposed above the first lower electrode and including a first pad region, and one or more first intermediate electrodes disposed between the first lower electrode and the first upper electrode. Second gate electrodes include a second lower electrode, a second upper electrode disposed above the second lower electrode, and one or more second intermediate electrodes disposed between the second lower electrode and the second upper electrode. The second gate electrodes are sequentially stacked above the first upper electrode, while exposing the first pad region. The first lower electrode extends by a first length, further than the first upper electrode, in a first direction. The second lower electrode extends by a second length, different from the first length, further than the second upper electrode, in the first direction.

FIG. 9A