

ABSTRACT

A semiconductor device may include a plurality of dies stacked in a vertical direction, wherein each of the plurality of dies includes: a first substrate; a cell capacitor on the first substrate; a cell transistor on the cell capacitor; a second substrate, wherein a vertical level of the second substrate is higher than a vertical level of the cell transistor; a peripheral circuit transistor on the second substrate; and a through via passing through the first substrate and the second substrate in the vertical direction.

FIG. 3