METHODS OF STRESSING TRANSISTOR CHANNEL
WITH REPLACED GATE AND RELATED STRUCTURES

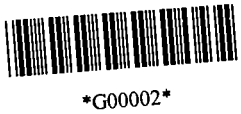
ABSTRACT

Methods of stressing a channel of a transistor with a replaced gate and related structures are disclosed. A method may include providing an intrinsically stressed material (130) over the transistor (102A, 102B) including a gate (110) thereof; removing a portion of the intrinsically stressed material (130) over the gate (110); removing at least a portion of the gate (110), allowing stress retained by the gate (110) to be transferred to the channel; replacing (or refilling) the gate (110) with a replacement gate (160); and removing the intrinsically stressed material. Removing and replacing the gate (110) allows stress retained by the original gate (110) to be transferred to the channel, with the replacement gate (160) maintaining (memorizing) that situation. The methods do not damage the gate dielectric. A structure may include a transistor having a channel including a first stress that is one of a compressive and tensile and a gate including a second stress that is the other of compressive and tensile.

Fig. 7.



162162



G00002